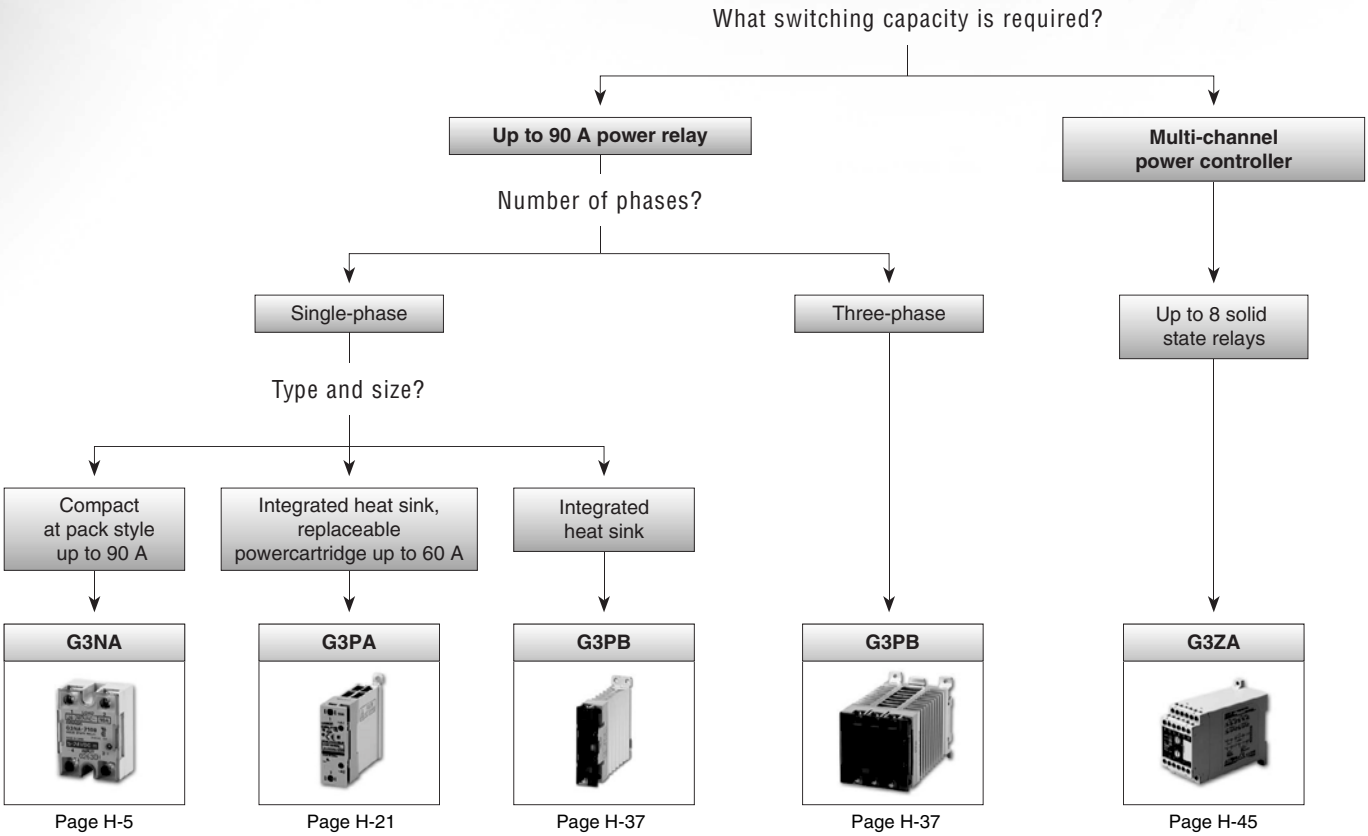
Solid state relays

Omron offers a comprehensive range of solid state relays (SSRs) that provides the perfect load switching for temperature control applications. These SSRs are a fast, reliable and cost-effective partner to our temperature controllers.

Combinations of temperature controller and SSR are available to handle almost any application, including heater bands for plastics extrusion processes, packaging machinery and heater elements in general manufacturing.



Now there's a clever way to regulate heater power

G3ZA – compact and easy to integrate!

The G3ZA can control up to 8 solid state relays (SSRs) via a single RS-485 2-wire link to your PLC or PC. There's no need for conversion units or digital output cards – the G3ZA automatically converts the power control signal into a more manageable trigger signal for standard SSRs.

This multi-channel power controller uses a special trigger method and offset control to provide precise heater power regulation. It's faster than standard SSR switching, and it's less noisy and more cost-effective than phase angle control. Available in four versions, the compact G3ZA is easy to install, program and operate.

Table of contents

Selection table

	Mounting	Panel mounted							Socket mounted	
Selection criteria										
	Model	G3NE	G3NA	G3NH	G3PA	G3PB	G3PB	G3PC	G3B	G3BD
	Type of Load	Normal resistors Middle and long wave IR heater	Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater	Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors	Normal resistors Middle and long wave IR heater	Normal resistors Middle and long wave IR heater	Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater
	1-phase control	■	■	■	■		■	■	■	■
	2-phase control					■				
	3-phase control					■				
	Function	Heater control	Heater control, motor	Heater control	Heater control				Panel-mounted interfaces	
	Relay compatible								MK compatible	MK compatible
	Max. current rating	20 A	50 A	150 A	60 A	45 A	45 A	20 A	5 A	3 A
Load voltage / current [VAC]	24 to 240		■		■					
	100 to 240	■		■			■	■	■	
	180 to 440			■						
	200 to 480		■		■	■	■			
	100 / 110									
	200 / 230									
Load voltage / current [VDC]	5 to 200		■							
	5 to 110									■
	4 to 48									
	5 to 24									
Input voltages (VDC or VAC)	5 VDC	■								
	12 VDC	■								
	24 VDC	■								
	5 to 24 VDC		■	■	■				■	■
	12 to 24 VDC				■	■	■	■		
	24 VAC				■					
	100 to 120 VAC		■	■						
	200 to 240 VAC		■	■						
Features	Built-in heat sink			■	■	■	■	■		
	Zero-cross	□	■	■	■	■	■	■		
	Built-in varistor	■	■	■		■				
	LED operation indicator		■	■	■	■	■	■	■	■
	Protective cover		■	■	■	■	■	■		
	3-phase loads via 3 single-phase SSRs		■	■	■	■				
	Replaceable power cartridge		■		■					
	Alarm output							■		
	Built-in failure detection				■			■		
	SSR open circuits detection							■		
	SSR short circuits detection							■		
Mounting	DIN-rail		■	■	■	■	■	■	■	■
	Screw	■	■		■	■	■	■	■	■
	Page	CD	H-5	CD	H-21	H-37		CD	CD	

Socket mounted						Power regulator	
							
G3F	G3FD	G3H	G3HD	G3R-I	G3R-O	G3PX	G3ZA
Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater	Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater	Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater Transformers and inductors	Normal resistors Middle and long wave IR heater Quarz heaters, short wave IR heater, elements made from siliconcarbide Normal resistive load With open delta connection	Depends on the SSR used Distributes loop / control output levels (mV%) to SSRs
■	■	■	■		■	■	Depends on the SSR used
							Depends on the SSR used
							Depends on the SSR used
Panel-mounted interfaces						Heater control	Intelligent power control
MY compatible	MY compatible	LY compatible	LY compatible	G2RS compatible / input unit	G2RS compatible		
5 A	3 A	3 A	3 A	100 mA	2 A	60 A	Depends on the SSR used
■		■			■		■
							■ 400 to 480
						■	
						■	
	■						
	■		■		■		
				■			
■		■					
■		■					
■		■					
■	■	■	■	■	■		
■	■			■			
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						■	
■	■	■	■		■	■	
■	■	■	■	■	■	■	■
						■	
							■
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							■
■	■	■	■	■	■		■
■	■	■	■	■	■	■	■
CD		^CD		CD		CD	H-45

■ Standard □ Available ☐ No / not available

LEADING IN SERVICE

Focussed, progressive, distinctive. Be assured, choose Omron

At Omron we set high standards for ourselves. Our products are known all over the world for their unrivalled quality. But we offer more than just excellent quality. In an environment that places ever greater demands with regard to service, quality and costeffectiveness, other things are important too. Providing a top-quality service is what we do every day, including extra service as standard. This helps to ensure that we can provide tailor-made solutions for applications more effectively and more quickly.

More and more companies are choosing Omron as they seek to work in a partnership that is based on reliability and certainty.

Omron – the reassuring choice.

International standards and approvals

Our products carry all relevant international standards and approvals, including CCC (Chinese Compulsory Certification), which makes exporting your system much easier.

- Reliability, also for your customers
- Maximum flexibility
- Confidence

5-day repair service

More and more people are choosing Omron, as a high degree of reliability is a key feature of its products. You can always rely on Omron. Even if a product unexpectedly malfunctions, our repair team is ready to swing into action.

- Product repaired and returned to you within 5 days, including collection and delivery
- You can track the status of your repair on-line
- Repairs within warranty are completely free-of-charge

For more information please visit the Service & Support section at http://omron-industrial.com

EPLAN for Omron products

The majority of standard Omron products are provided in digital EPLAN format, which means that a few clicks of your mouse are all that is needed to design the right product into your switching panel.

For more information please visit: http://omron-industrial.com/en/eplan/

- Very easy to use
- Always the right product
- Reduced engineering time

Downloadable 2-D and 3-D CAD drawings

Designers of switching panels and machines can download clear 2-D and 3-D CAD drawings for all current products from http://omron-industrial.com/en/2D3D, which can easily be incorporated into your design.

- Large number of formats supported for greater flexibility
- Readily available
- Convenience that saves you time

Solid State Relays
G3NA

New Models with 75-A and 90-A Output Currents Join the Previous Models with 5- to 40-A Output Currents.

- AC Output Relays with 75-A and 90-A output currents have been added to the G3NA Series. The standard versions of these models provide certification for international standards (-UTU).
- All models feature the same compact dimensions to provide a uniform mounting pitch.
- Built-in varistor effectively absorbs external surges.
- Operation indicator enables monitoring operation.
- Protective cover for greater safety.
- Standard models certified by UL and CSA and -UTU models by VDE (TÜV).

Model Number Structure

■ Model Number Legend

G3NA-□□□□□-□
1 2 3 4 5 6 7

1. **Basic Model Name**
   G3NA: Solid State Relay
2. **Load Power Supply**
   Blank: AC output
   D: DC output
3. **Rated Load Power Supply Voltage**
   2: 200 VAC or 200 VDC
   4: 400 VAC
4. **Rated Load Current**
   05: 5 A
   10: 10 A
   20: 20 A
   40: 40 A
   50: 50 A
   75: 75 A
   90: 90 A
5. **Terminal Type**
   B: Screw terminals
6. **Zero Cross Function**
   Blank: Equipped with zero cross function (AC-output models only)
7. **Certification**
   Blank: Standard models (certified by UL and CSA)
   UTU: Certified by UL, CSA, and TÜV

Ordering Information

■ List of Models

Isolation	Zero cross function	Indicator	Applicable output load (see note 1.)	Rated input voltage	Model
Phototriac	Yes	Yes	5 A at 24 to 240 VAC (See note 2.)	5 to 24 VDC	G3NA-205B DC5-24
Photocoupler				100 to 120 VAC	G3NA-205B AC100-120
				200 to 240 VAC	G3NA-205B AC200-240
Phototriac			10 A at 24 to 240 VAC (See note 2.)	5 to 24 VDC	G3NA-210B DC5-24
Photocoupler				100 to 120 VAC	G3NA-210B AC100-120
				200 to 240 VAC	G3NA-210B AC200-240
Phototriac			20 A at 24 to 240 VAC (See note 2.)	5 to 24 VDC	G3NA-220B DC5-24
Photocoupler				100 to 120 VAC	G3NA-220B AC100-120
				200 to 240 VAC	G3NA-220B AC200-240
Phototriac			40 A at 24 to 240 VAC (See note 2.)	5 to 24 VDC	G3NA-240B DC5-24
Photocoupler				100 to 120 VAC	G3NA-240B AC100-120
				200 to 240 VAC	G3NA-240B AC200-240
Phototriac			75 A at 24 to 240 VAC (See note 2.)	5 to 24 VDC	G3NA-275B-UTU DC5-24
Photocoupler				100 to 240 VAC	G3NA-275B-UTU AC100-240
Phototriac			90 A at 24 to 240 VAC (See note 2.)	5 to 24 VDC	G3NA-290B-UTU DC5-24
Photocoupler				100 to 240 VAC	G3NA-290B-UTU AC100-240
	---		10 A at 5 to 200 VDC	5 to 24 VDC	G3NA-D210B DC5-24
				100 to 240 VAC	G3NA-D210B AC100-240
	Yes		10 A at 200 to 480 VAC	5 to 24 VDC	G3NA-410B DC5-24
				100 to 240 VAC	G3NA-410B AC100-240
			20 A at 200 to 480 VAC	5 to 24 VDC	G3NA-420B DC5-24
				100 to 240 VAC	G3NA-420B AC100-240
			40 A at 200 to 480 VAC	5 to 24 VDC	G3NA-440B DC5-24
				100 to 240 VAC	G3NA-440B AC100-240
			50 A at 200 to 480 VAC (See note 2.)	5 to 24 VDC	G3NA-450B DC5-24
			75 A at 200 to 480 VAC (See note 2.)	5 to 24 VDC	G3NA-475B-UTU DC5-24
				100 to 240 VAC	G3NA-475B-UTU AC100-240
			90 A at 200 to 480 VAC (See note 2.)	5 to 24 VDC	G3NA-490B-UTU DC5-24
				100 to 240 VAC	G3NA-490B-UTU AC100-240

*The standard models are certified by UL and CSA. To order a TÜV-certified model, add "-UTU" to the model number.

Note: 1. The applicable output load depends on the ambient temperature. Refer to *Load Current vs. Ambient Temperature* in *Engineering Data.*

2. Loss time increases under 75 VAC. (Refer to page H-18.) Confirm operation with the actual load.

■ Accessories (Order Separately)

One-touch Mounting Plates

Model
R99-12 FOR G3NA

Mounting Bracket

Model	Applicable SSR
R99-11	G3NA-240B, G3NA-440B

Heat Sinks

Slim Models Enabling DIN-rail Mounting

Model	Applicable SSR
Y92B-N50	G3NA-205B, G3NA-210B, G3NA-D210B, G3NA-410B, G3NA-210T(L)
Y92B-N100	G3NA-220B, G3NA-420B, G3NA-220T(L)
Y92B-N150	G3NA-240B, G3NA-440B
Y92B-P250	G3NA-450B
Y92B-P250NF (See note.)	G3NA-275B-UTU, G3NA-290B-UTU, G3NA-475B-UTU, G3NA-490B-UTU

Note: The Y92B-P250NF is scheduled for release on May 1, 2004.

Low-cost Models

Model	Applicable SSR
Y92B-A100	G3NA-205B, G3NA-210B, G3NA-D210B, G3NA-220B, G3NA-410B, G3NA-420B
Y92B-A150N	G3NA-240B, G3NA-440B
Y92B-A250	G3NA-440B

Specifications

■ Ratings

Input (at an Ambient Temperature of 25 °C)

Model	Rated voltage	Operating voltage	Impedance (See note 1.)	Voltage level	
				Must operate voltage	Must release voltage
G3NA-2□□B	5 to 24 VDC	4 to 32 VDC	7 mA max. (See note 2.)	4 VDC max.	1 VDC min.
	100 to 120 VAC	75 to 132 VAC	36 kΩ±20%	75 VAC max. (See note 3.)	20 VAC min. (See note 3.)
	200 to 240 VAC	150 to 264 VAC	72 kΩ±20%	150 VAC max. (See note 3.)	40 VAC min. (See note 3.)
G3NA-4□□B	5 to 24 VDC	4 to 32 VDC	5 mA max. (See note 2.)	4 VDC max.	1 VDC min.
G3NA-D210B	100 to 240 VAC	75 to 264 VAC	72 kΩ±20%	75 VAC max.	20 VAC min.
G3NA-275B-UTU **G3NA-290B-UTU**	5 to 24 VDC	4 to 32 VDC	15 mA max. (See note 2.)	4 VDC max.	1 VDC min.
G3NA-475B-UTU **G3NA-490B-UTU**	100 to 240 VAC	75 to 264 VAC	72 kΩ±20%	75 VAC max.	20 VAC min.

Note: 1. The input impedance is measured at the maximum value of the rated supply voltage (for example, with the model rated at 100 to 120 VAC, the input impedance is measured at 120 VAC).

2. With constant current input circuit system. The impedance for the G3NA-2□□B-UTU is 15 mA max.

3. Refer to *Temperature Characteristics (for Must Operate Voltage and Must Release Voltage)* in *Engineering Data* for further details.

Output

Model	Applicable load				
	Rated load voltage	Load voltage range	Load current (See note 1.)		Inrush current
			With heat sink (See note 2.)	Without heat sink	
G3NA-205B	24 to 240 VAC	19 to 264 VAC	0.1 to 5 A (at 40°C)	0.1 to 3 A (at 40°C)	60 A (60 Hz, 1 cycle)
G3NA-210B			0.1 to 10 A (at 40°C)	0.1 to 4 A (at 40°C)	150 A (60 Hz, 1 cycle)
G3NA-410B	200 to 480 VAC	180 to 528 VAC	0.2 to 10 A (at 40°C)	0.2 to 4 A (at 40°C)	
G3NA-220B	24 to 240 VAC	19 to 264 VAC	0.1 to 20 A (at 40°C)	0.1 to 4 A (at 40°C)	220 A (60 Hz, 1 cycle)
G3NA-420B	200 to 480 VAC	180 to 528 VAC	0.2 to 20 A (at 40°C)	0.2 to 4 A (at 40°C)	
G3NA-240B	24 to 240 VAC	19 to 264 VAC	0.1 to 40 A (at 40°C)	0.1 to 6 A (at 40°C)	440 A (60 Hz, 1 cycle)
G3NA-440B	200 to 480 VAC	180 to 528 VAC	0.2 to 40 A (at 40°C)	0.2 to 6 A (at 40°C)	
G3NA-450B	200 to 480 VAC	180 to 528 VAC	0.2 to 50 A (at 40°C)	0.2 to 6 A (at 40°C)	
G3NA-D210B	5 to 200 VDC	4 to 220 VDC	0.1 to 10 A (at 40°C)	0.1 to 4 A (at 40°C)	20 A (10 ms)
G3NA-275B-UTU	24 to 240 VAC	19 to 264 VAC	1 to 75 A (at 40°C)	1 to 7 A (at 40°C)	800 A (60 Hz, 1 cycle)
G3NA-475B-UTU	200 to 480 VAC	180 to 528 VAC	1 to 75 A (at 40°C)	1 to 7 A (at 40°C)	800 A (60 Hz, 1 cycle)
G3NA-290B-UTU	24 to 240 VAC	19 to 264 VAC	1 to 90 A (at 40°C)	1 to 7 A (at 40°C)	1,000 A (60 Hz, 1 cycle)
G3NA-490B-UTU	200 to 480 VAC	180 to 528 VAC	1 to 90 A (at 40°C)	1 to 7 A (at 40°C)	1,000 A (60 Hz, 1 cycle)

Note: 1. The load current varies depending on the ambient temperature. Refer to *Load Current vs. Ambient Temperature* under *Engineering Data*.

2. When an OMRON Heat Sink (refer to *Options*) or a heat sink of the specified size is used.

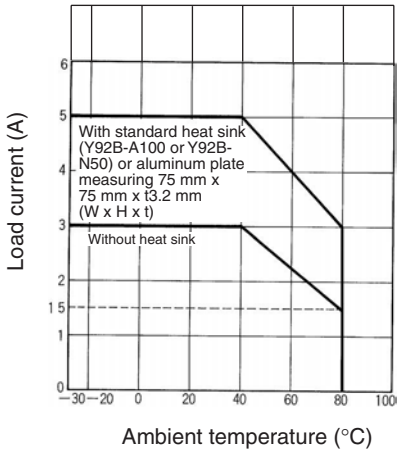
■ Characteristics

Item	G3NA-205B	G3NA-210B	G3NA-220B	G3NA-240B	G3NA-410B	G3NA-420B	G3NA-440B	G3NA-450B	G3NA-D210B	G3NA-275B-UTU	G3NA-290B-UTU	G3NA-475B-UTU	G3NA-490B-UTU
Operate time	1/2 of load power source cycle + 1 ms max. (DC input) 3/2 of load power source cycle + 1 ms max. (AC input)								1 ms max. (DC input) 30 ms max. (AC input)	1/2 of load power source cycle + 1 ms max. (DC input) 3/2 of load power source cycle + 1 ms max. (AC input)			
Release time	1/2 of load power source cycle + 1 ms max. (DC input) 3/2 of load power source cycle + 1 ms max. (AC input)								5 ms max. (DC input) 30 ms max. (AC input)	1/2 of load power source cycle + 1 ms max. (DC input) 3/2 of load power source cycle + 1 ms max. (AC input)			
Output ON voltage drop	1.6 V (RMS) max.				1.8 V (RMS) max.				1.5 V max.	1.6 V (RMS) max.		1.8 V (RMS) max.	
Leakage current	5 mA max. (at 100 VAC) 10 mA max. (at 200 VAC)				10 mA max. (at 200 VAC) 20 mA max. (at 400 VAC)				5 mA max. (at 200 VDC)	5 mA max. (at 100 VAC) 10 mA max. (at 200 VAC)		10 mA max. (at 200 VAC) 20 mA max. (at 400 VAC)	
Insulation resistance	100 MΩ min. (at 500 VDC)												
Dielectric strength	2,500 VAC, 50/60 Hz for 1 min									4,000 VAC, 50/60 Hz for 1 min			
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.75-mm single amplitude (1.5-mm double amplitude)												
Shock resistance	Destruction: 1,000 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. 60 g			Approx. 70 g	Approx. 80 g				Approx. 70 g	Approx. 120 g			

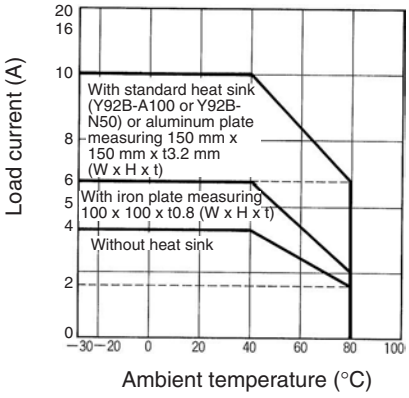
Engineering Data

Load Current vs. Ambient Temperature

G3NA-205B



G3NA-210B/410B



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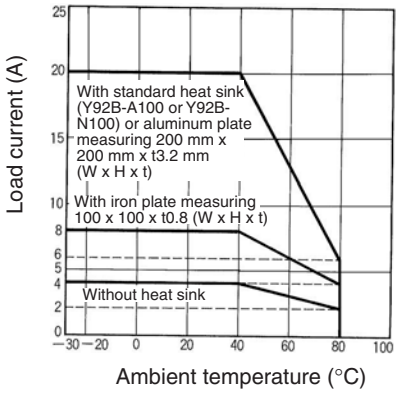
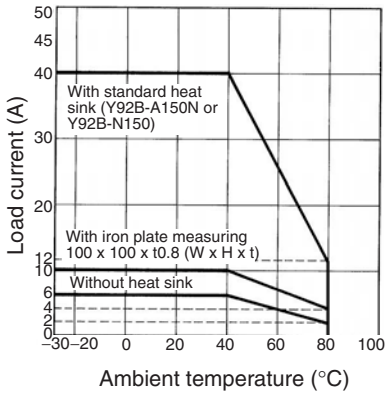
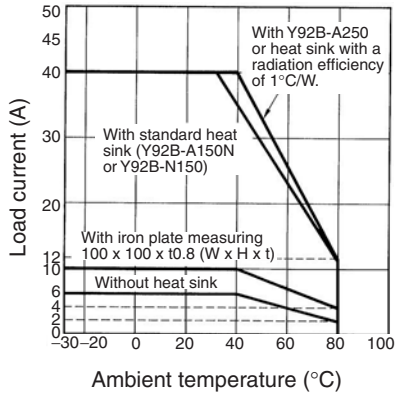


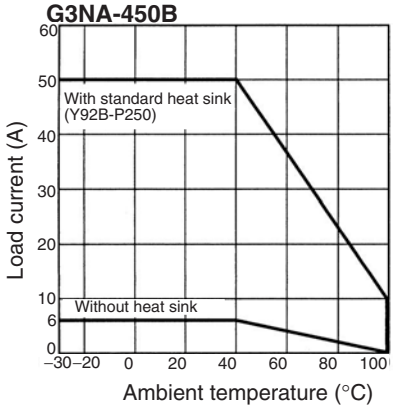
G3NA-240B



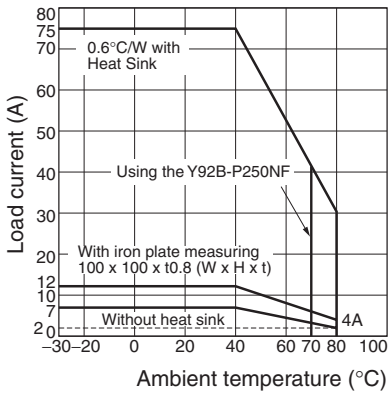
G3NA-440B



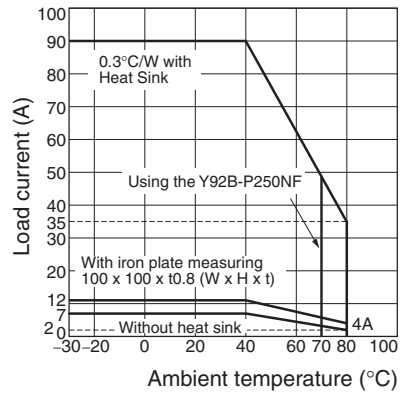
G3NA-450B



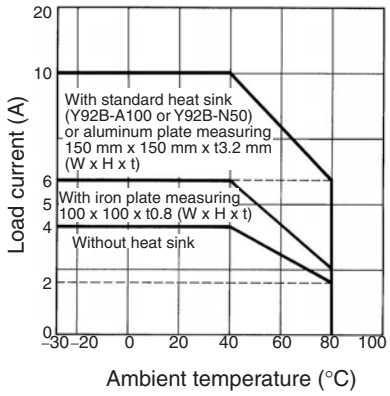
G3NA-275B-UTU
G3NA-475B-UTU



G3NA-290B-UTU
G3NA-490B-UTU



G3NA-D210B

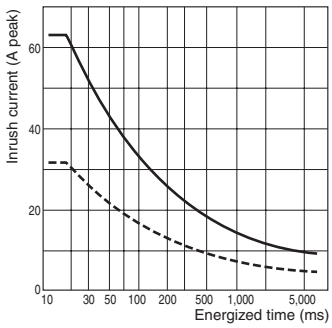


Note: The ambient operating temperature of the Y92B-P250NF is −30 to 70°C. Be sure the operating temperature is within this range.

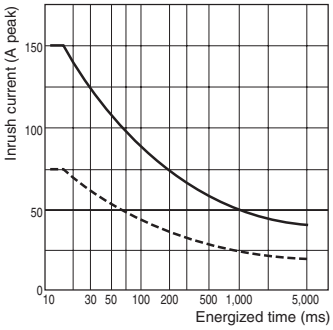
One Cycle Surge Current

The values shown by the solid line are for non-repetitive inrush currents.
Keep the inrush current below the values shown by the dotted line if it occurs repetitively.

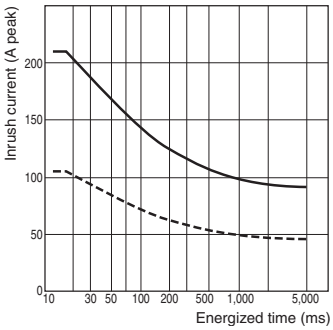
G3NA-205B



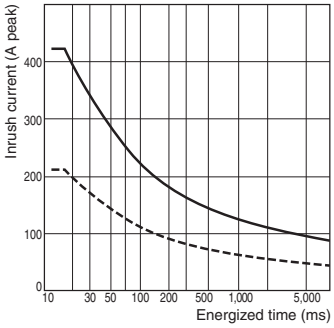
G3NA-210B
G3NA-410B



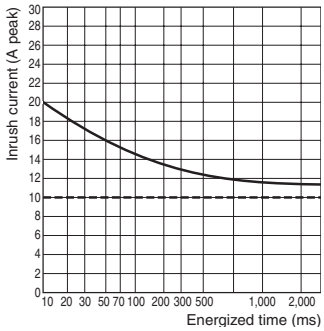
G3NA-220B
G3NA-420B



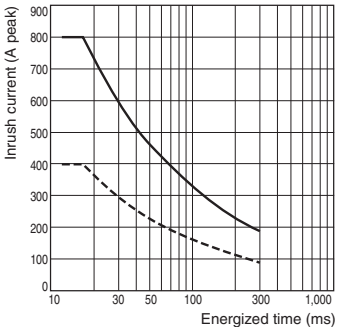
G3NA-240B
G3NA-440B/-450B



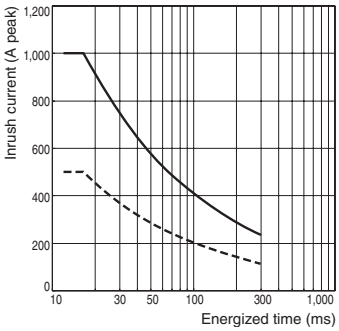
G3NA-D210B



G3NA-275B-UTU
G3NA-475B-UTU

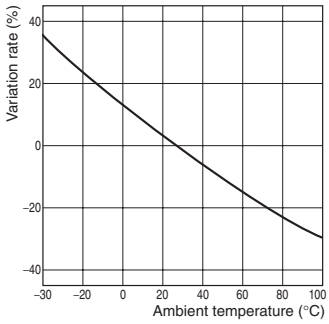


G3NA-290B-UTU
G3NA-490B-UTU



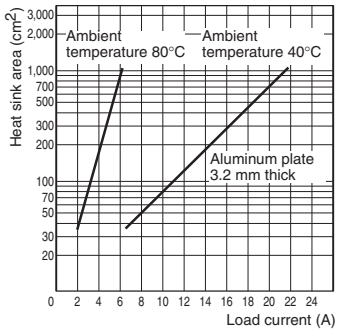
Temperature Characteristics (for Must Operate Voltage and Must Release Voltage)

G3NA-2□□B AC input



Heat Sink Area vs. Load Current

G3NA-220B



Note: The heat sink area refers to the combined area of the sides of the heat sink that radiate heat. For example, 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 450 cm^2. Therefore, if the heat sink is square, one side of the heat sink must be 15 cm ($\sqrt{450\ (cm^2)/2}$) or longer.

Thermal Resistance Rth (Back of Junction SSR) (Examples)

Model	Rth (°C/W)
G3NA-205B	3.22
G3NA-210B	2.62
G3NA-220B	1.99
G3NA-240B	0.45
G3NA-275B-UTU G3NA-475B-UTU G3NA-290B-UTU G3NA-490B-UTU	0.45
G3NA-D210B	2.62

Thermal Resistance Rth of Heat Sinks (Examples)

Model	Rth (°C/W)
Y92B-N50	2.8
Y92B-N100	1.63
Y92B-N150	1.38
Y92B-A100	1.63
Y92B-A150N	1.37
Y92B-A250	1.00
Y92B-P250NF	0.46

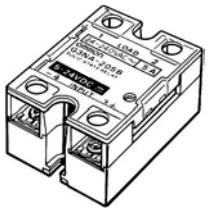
Note: When using a commercially available heat sink, use one with a thermal resistance equal to or less that the OMRON Heat Sink.

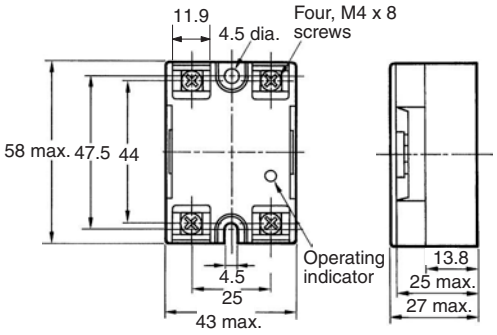
Dimensions

■ Relays

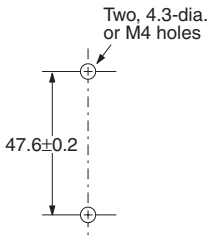
Note: All units are in millimeters unless otherwise indicated.

G3NA-205B, G3NA-210B, G3NA-220B, G3NA-410B, G3NA-420B

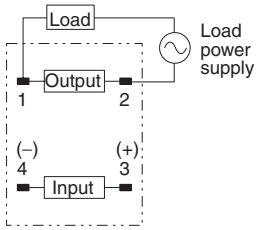




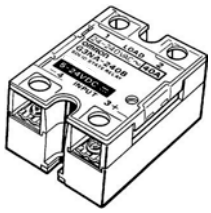
Mounting Holes

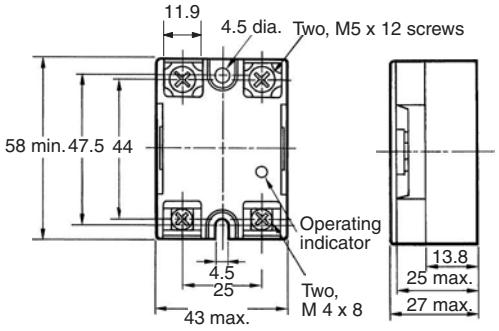


Terminal Arrangement/ Internal Connections (Top View)

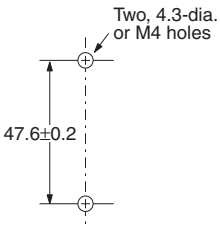


G3NA-240B, G3NA-440B

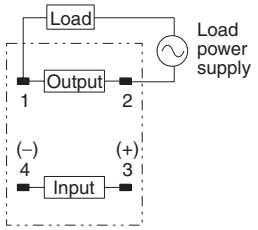




Mounting Holes

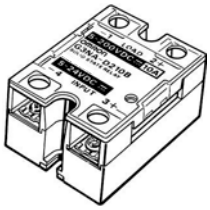


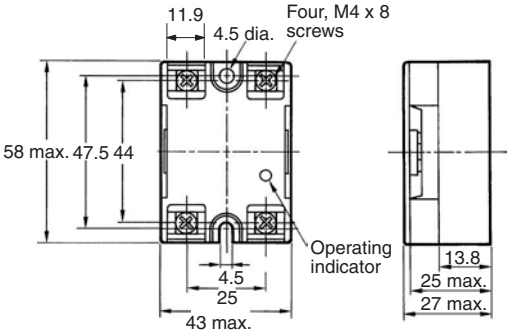
Terminal Arrangement/ Internal Connections (Top View)



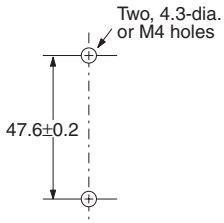
G3NA-D210B

Note: The load can be connected to either the positive or negative side.

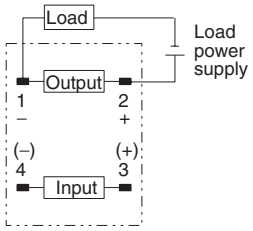




Mounting Holes

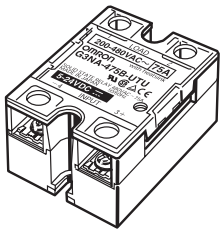


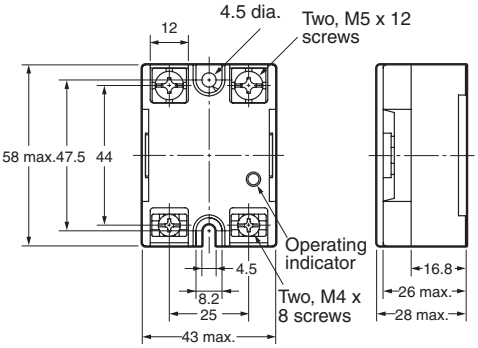
Terminal Arrangement/ Internal Connections (Top View)



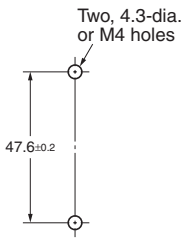
Note: When connecting the load, either the positive or negative side of the load terminals can be connected.

G3NA-275B-UTU, G3NA-475B-UTU, G3NA-290B-UTU, G3NA-490B-UTU

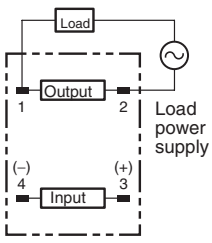




Mounting Holes



Terminal Arrangement/ Internal Connections (Top View)

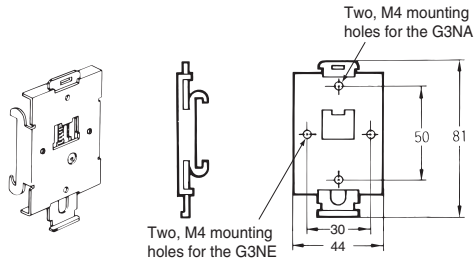


■ Options (Order Separately)

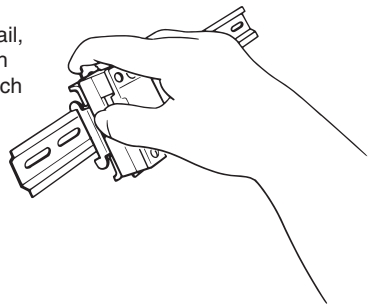
One-touch Mounting Plate

The One-touch Mounting Plate is used to mount the GN3A to a DIN-rail.

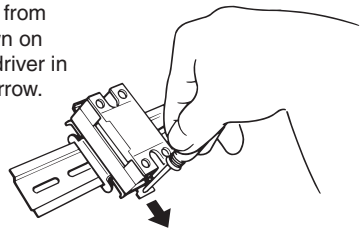
R99-12 FOR G3NA (for the G3NA and G3NE)



To mount the Relay to DIN- rail, first mount it to the One-touch Mounting Plate and then attach it to the DIN-rail as shown in the diagram.



To remove the Relay from the DIN-rail, pull down on the tab with a screwdriver in the direction of the arrow.

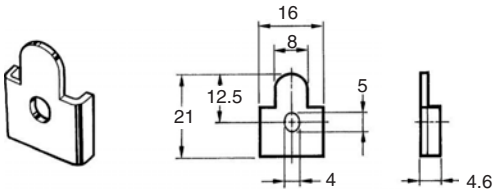


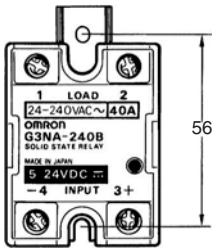
- When a Relay is mounted to DIN-rail, use it within the rating for a Relay without a heat sink.
- Use the following DIN-rails: PFP-100N or PFP-100N2.

Mounting Bracket

R99-11 (for the G3NA-240B, G3NA-440B)

Use Mounting Bracket R99-11 so that the G3NA-240B/-440B can be mounted with the same pitch as that of the G3N-240B.



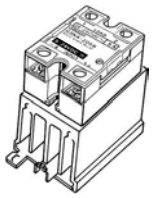


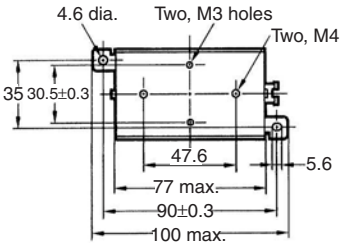
Heat Sinks

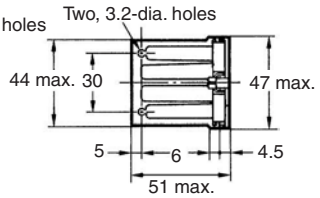
Y92B-N50 Heat Sink (for the G3NA-205B, G3NA-210B, G3NA-D210B, G3NA-410B, G3NE-210T(L))

For surface mounting, a 30% derating of the load current is required (from the *Load Current vs. Ambient Temperature* graphs).

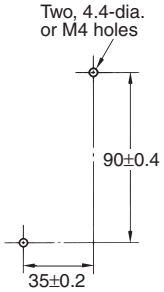
The orientation indicated by the external dimensions is not the correct mounting orientation. When opening mounting holes, refer to the mounting hole dimensions.







Mounting Holes

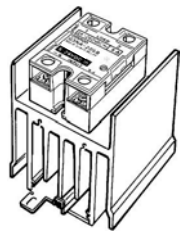


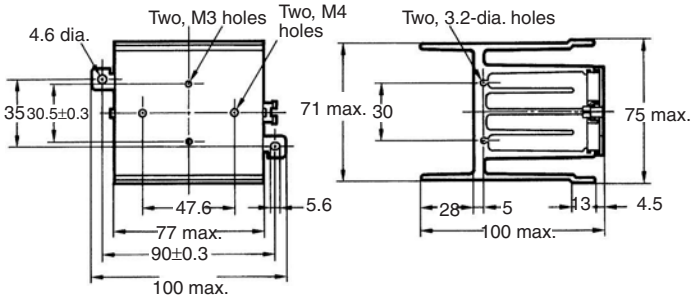
Weight: approx. 200 g

Y92B-N100 Heat Sink (for the G3NA-220B, G3NA-420B, G3NE-220T(L))

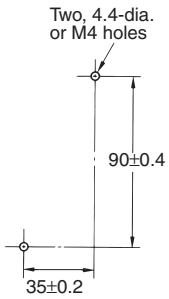
For surface mounting, a 30% derating of the load current is required (from the *Load Current vs. Ambient Temperature* graphs).

The orientation indicated by the external dimensions is not the correct mounting orientation. When opening mounting holes, refer to the mounting hole dimensions.





Mounting Holes

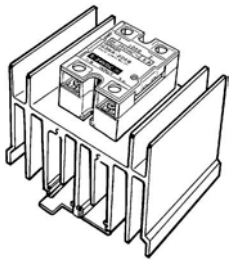


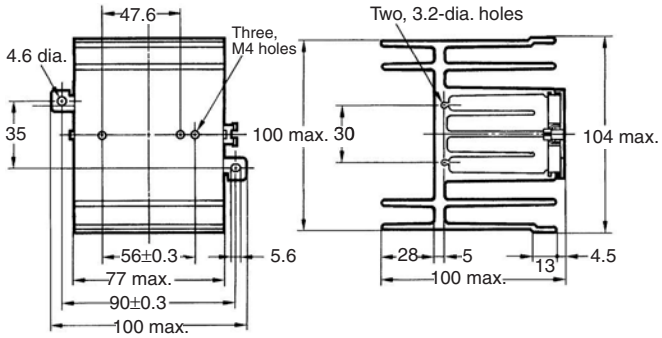
Weight: approx. 400 g

Y92B-N150 Heat Sink (for the G3NA-240B, G3NA-440B)

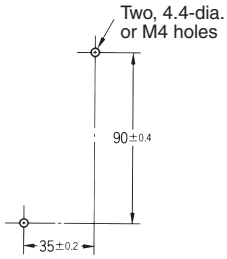
For surface mounting, a 30% derating of the load current is required (from the *Load Current vs. Ambient Temperature* graphs).

The orientation indicated by the external dimensions is not the correct mounting orientation. When opening mounting holes, refer to the mounting hole dimensions.





Mounting Holes



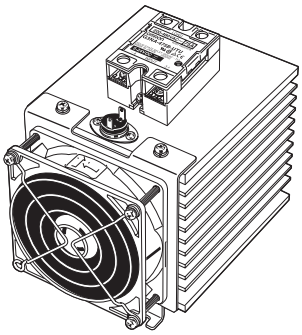
Weight: approx. 560 g

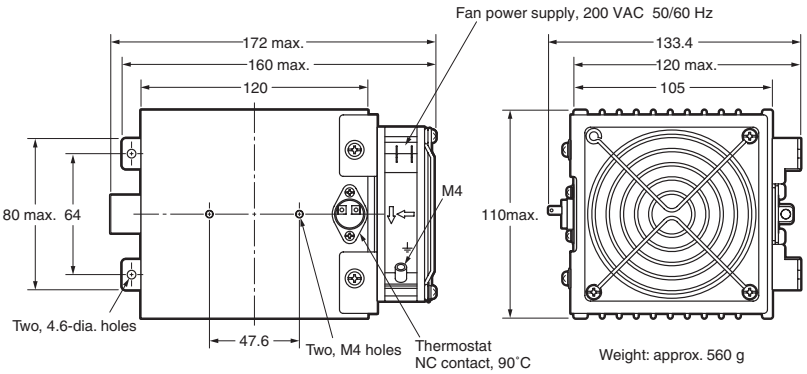
Y92B-P250NF Heat Sink (for the G3NA-275B-UTU, G3NA-475B-UTU, G3NA-290B-UTU, G3NA-490B-UTU)

(The Y92B-P250NF is scheduled for release on May 1, 2004.)

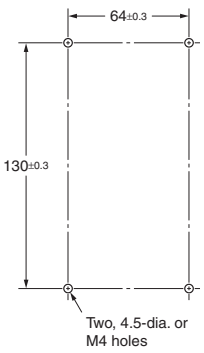
The orientation indicated by the external dimensions is not the correct mounting orientation. When opening mounting holes, refer to the mounting hole dimensions.

Observe the precautions given in Mounting Method under *Precautions for Correct Use*.

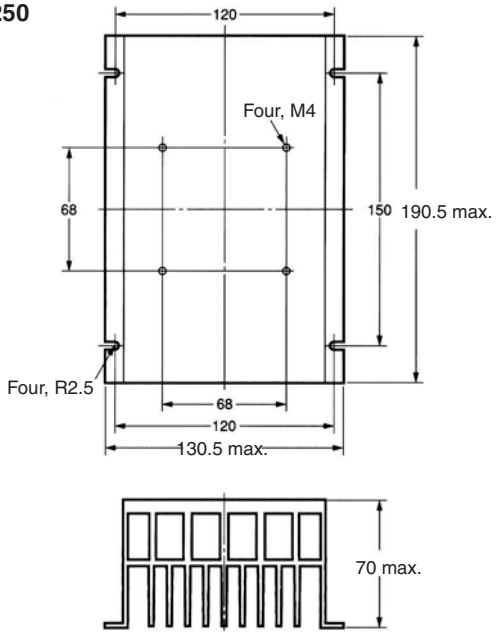




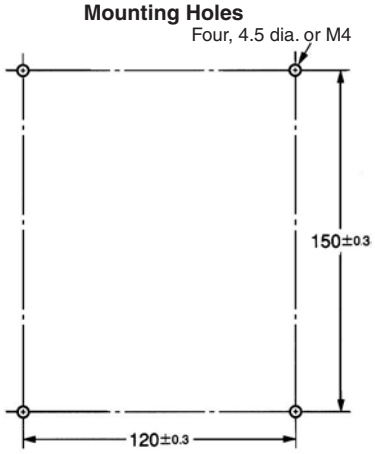
Mounting Holes



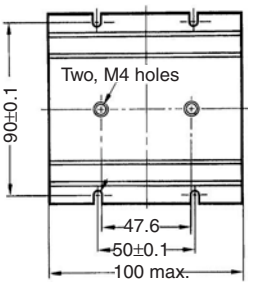
Y92B-P250



Mounting Holes

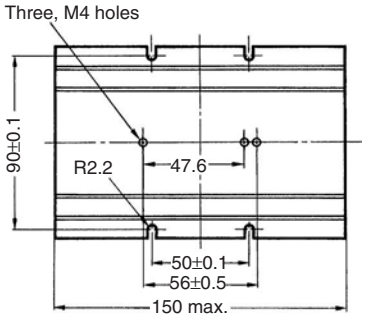


Y92B-A100 Heat Sink (for the G3NA-205B, G3NA-210B, G3NA-220B, G3NA-410B, G3NA-420B, G3NA-D210B)



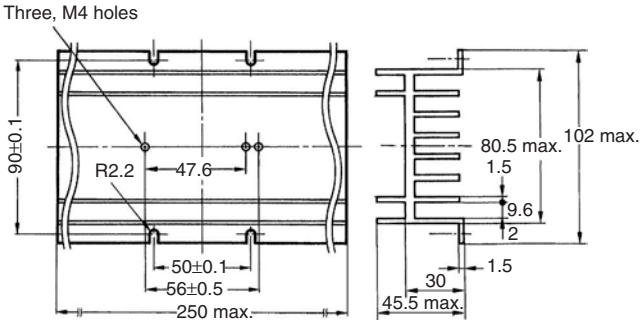
Weight: approx. 210 g

Y92B-A150N Heat Sink (for the G3NA-240B, G3NA-440B)



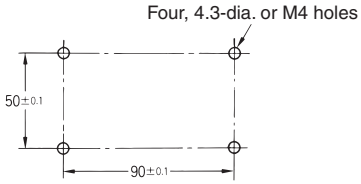
Weight: approx. 310 g

Y92B-A250 Heat Sink (for the G3NA-440B)



Weight: approx. 510 g

Mounting Holes
Y92B-A100
Y92B-A150
Y92B-A250



For surface mounting, a 30% derating of the load current is required (from the *Load Current vs. Ambient Temperature* graphs).

The orientation indicated by the external dimensions is not the correct mounting orientation. When opening mounting holes, refer to the mounting hole dimensions.

Safety Precautions

⚠ Caution

Touching the charged section may occasionally cause minor electric shock. Do not touch the G3NA terminal section (the charged section) when the power supply is ON. Be sure to attach the cover before use.

⚠ Caution

The G3NA and heat sink will be hot and may occasionally cause minor burns. Do not touch the G3NA or the heat sink either while the power supply is ON, or immediately after the power is turned OFF.

⚠ Caution

The internal snubber circuit is charged and may occasionally cause minor electric shock. Do not touch the G3NA's main circuit terminals immediately after the power is turned OFF.

⚠ Caution

Be sure to conduct wiring with the power supply turned OFF, and always attach the terminal cover after completing wiring. Touching the terminals when they are charged may occasionally result in minor electric shock.

⚠ Caution

Do not apply a short-circuit to the load side of the G3NA. The G3NA may rupture. To protect against short-circuit accidents, install a protective device, such as a quick-burning fuse, on the power supply line.

■ Precautions for Safe Use

Although OMRON continuously strives to improve the quality and reliability of our relays, the G3NA contains semiconductors, which are generally prone to occasional malfunction and failure. Maintaining safety is particularly difficult if a relay is used outside of its ratings. Always use the G3NA within the rated values. When using the G3NA, always design the system to ensure safety and prevent human accidents, fires, and social damage even in the event of G3NA failure, including system redundancy, measures to prevent fires from spreading, and designs to prevent malfunction.

1. G3NA malfunction or fire damage may occasionally occur. Do not apply excessive voltage or current to the G3NA terminals.
2. Heat Dissipation
   - Do not obstruct the airflow to the G3NA or heat sink. Heat generated from an G3NA error may occasionally cause the output element to short, or cause fire damage.
   - Be sure to prevent the ambient temperature from rising due to the heat radiation of the G3NA. If the G3NA is mounted inside a panel, install a fan so that the interior of the panel is fully ventilated.
   - Mount the G3NA in the specified orientation. If the G3NA is mounted in any other orientation, abnormal heat generation may cause output elements to short or may cause burning.
   - Do not use the G3NA if the heat sink fins are bent, e.g., as the result of dropping the G3NA. Heat dissipation characteristics will be reduced, possibly causing G3NA failure.
   - Apply a thin layer of Toshiba Silicone's YG6260 or Sinetsu Silicone's G746, or a similar product to the heat sink before mounting
   - If a material with high thermal resistance, such as wood, is used, heat generated by the G3NA may occasionally cause fire or burning. When installing the G3NA directly into a control panel so that the panel can be used as a heat sink, use a panel material with low thermal resistance, such as aluminum or steel.
   - Use the specified heat sink or one with equivalent or better characteristics.
3. Wire the G3NA and tighten screws correctly, observing the following precautions
   Heat generated by a terminal error may occasionally result in fire damage. Do not operate if the screws on the output terminal are loose.
   - Abnormal heat generated by wires may occasionally result in fire damage. Use wires suitable for the load current.
   - Abnormal heat generated by terminals may occasionally result in fire damage. Do not operate if the screws on the output terminal are loose.

     Tightening Torque

Screw size	Tightening torque
M4	1.2 N·m
M5	2.0 N·m

   - Abnormal heat generated by terminals may occasionally result in fire damage. When tightening terminal screws, be sure that no non-conductive foreign matter is caught in screw.
   - For GN3A Relays of 40 A or higher, use crimp terminals of an appropriate size for the wire diameter for M5 terminals.
   - Do not use any wires with damaged sheaths. These may cause electric shock or leakage.
   - Do not place wiring in the same conduit or duct as high-voltage lines. Induction may cause malfunction or damage.
   - Use wires of an appropriate length, otherwise malfunction and damage may result due to induction.
   - Mount the DIN-rail securely. Otherwise, the DIN-rail may fall.
   - Be sure that the G3NA clicks into place when mounting it to DIN-rail. The G3NA may fall if it is not mounted correctly.
   - Do not mount the G3NA when your hands are oily or dirty, e.g., with metal powder. These may cause G3NA failure.
   - Tighten the G3NA screws securely.
     Tightening torque: 0.78 to 0.98 N·m
   - Tighten the heat sink screws securely.
     Tightening torque: 0.98 to 1.47 N·m
4. Preventing Overheating
   When using the High-capacity Heat Sink (Y92B-P250NF), always use a thermostat or other method to protect from overheating in the event that the fan stops.
5. Do Not Touch Fan Blades
   When the fan is operating, do not touch the fan blades with any part of your body or allow foreign matter to come into contact with the blades. Always attach the enclosed finger guard when using the G3NA.
6. Operating Conditions
   - Only use the G3NA with loads that are within the rated values. Using the G3NA 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.
7. Do not transport the G3NA under the following conditions. Failure or malfunction may occur.
   - Conditions under which the G3NA will be exposed to water
   - High temperatures or high humidity
   - Without proper packing

Operating and Storage Locations

Do not use or store the G3NA 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.
- Do not use or store in locations subject to high temperatures or high humidity.
- Do not use or store in locations subject to salt damage.
- Do not use or store in locations subject to rain or water drops.

■ Precautions for Correct Use

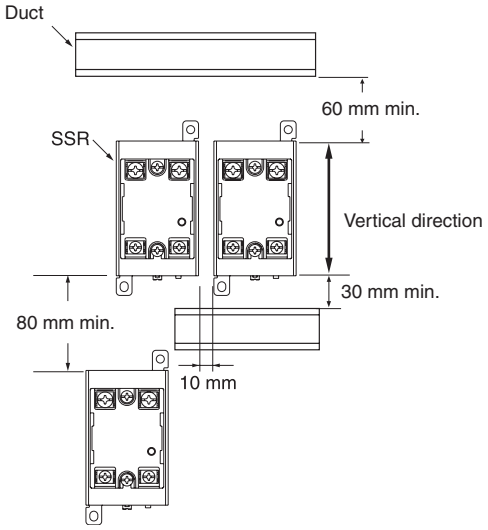
Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effect on product performance.

Before Actual Operation

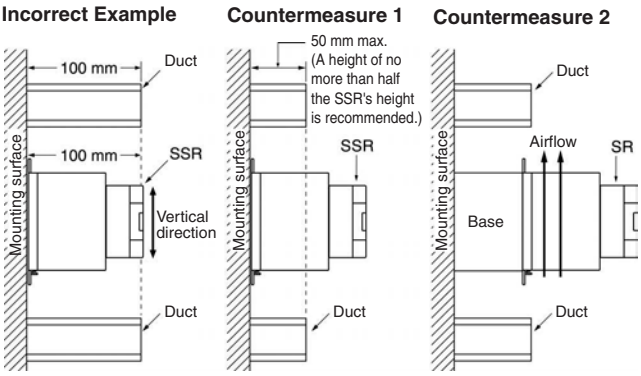
1. The G3NA in operation may cause an unexpected accident. Therefore it is necessary to test the G3NA under the variety of conditions that are possible. As for the characteristics of the G3NA, it is necessary to consider differences in characteristics between individual SSRs.
2. Unless otherwise specified, the ratings in this catalog 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 (standard test conditions according to JIS C5442). It will be necessary to provide the above conditions as well as the load conditions if the user wants to confirm the ratings of specific G3NAs.

Mounting Method

SSR Mounting Pitch (Panel Mounting)



Relationship between SSRs and Duct Height

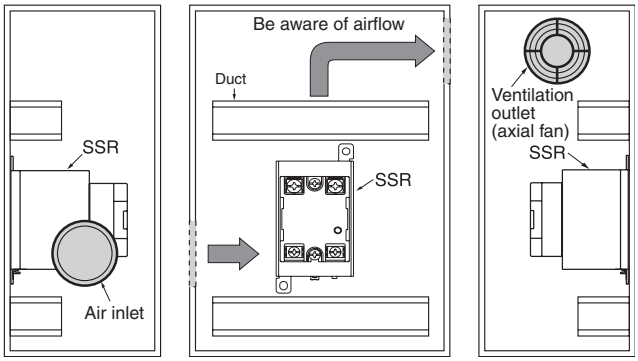


Do not surround the SSR with ducts, otherwise the heat radiation of the SSR will be adversely affected.

Use short ducts.

If the ducts cannot be shortened, place the SSR on a metal base so that it is not surrounded by the ducts.

Ventilation Outside the Control Panel



If the air inlet or air outlet has a filter, clean the filter regularly to prevent it from clogging to 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 SSRs 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 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.)

Load current (A)	5 A	10 A	20 A	40 A	75 A	90 A
Required number of fans per SSR	0.08	0.16	0.31	0.62	1.2	1.44

Example: For 10 SSRs with load currents of 10 A,
0.16 x 10 = 1.6
Thus, 2 fans would be required.

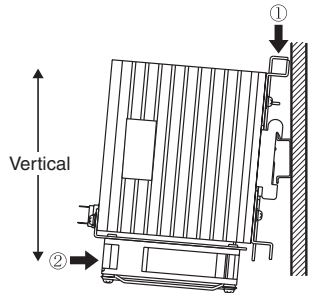
Size of fans: 92 mm^2, Air volume: 0.7 m^3/min,
Ambient temperature of control panel: 30 °C

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

High-capacity Heat Sink (Y92B-P250NF)

DIN-rail Mounting

- Assembled DIN-rails are heavy. Mount the DIN-rails securely. Be sure that the Heat Sink is securely locked to the DIN-rail.
- Attach End Plates (PFP-M, order separately) to both ends of the Units on the DIN-rail to hold them in place.
- To mount a Heat Sink to a DIN-rail, press down at the point indicated by arrow 1 in the diagram and then press in the Heat Sink at the point indicated by arrow 2.



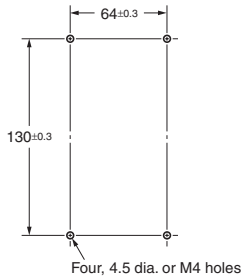
Applicable DIN-rail

Mounting is possible on TE35-15Fe (IEC 60715) DIN-rails. DIN-rails from the following manufacturers can be used.

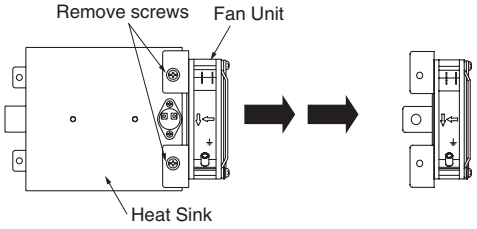
Manufacturer	Thickness: 1.5 mm	Thickness: 2.3 mm
Schneider	AM1-DE2000	---
WAGO	210-114 or 210-197	210-118
PHOENIX	N35/15	N35/15/15-2.3

Direct Mounting

- Prepare mounting holes as shown in the diagram. Tightening torque: 0.98 to 1.47 N·m



- When mounting a Heat Sink directly, first remove the Fan Unit, then mount the Heat Sink by itself before attaching the Fan Unit again. (Remove the two screws shown in the following diagram.)



- First, temporarily mount the Heat Sink with the bottom two screws and then attach the top two screws with the mounting bracket sandwiched between the Heat Sink and mounting surface. Finally, tighten all four screws.

Ratings and Characteristics of High-capacity Heat Sink (Y92B-P250NF)

Fan Ratings

Rated voltage	200 V
Operating voltage	85% to 110% of rated voltage
Frequency	50/60 Hz
Rated current (See note.)	0.085 A at 50 Hz 0.072 A at 60 Hz
Rated speed (See note.)	2,500 r/min at 50 Hz 2,850 r/min at 60 Hz

Note: Average values.

Thermostat Ratings

Operating temperature	Approx. 90°C
Contact ratings	3 A at 240 VAC, resistive load 3 A at 24 VDC, resistive load

Fan/Thermostat Characteristics

Insulation class (Fan)	VDE: E (120°C) UL: A (105°C) CSA: B (130°C)
Protection class	1
Insulation resistance	100 MΩ min. (at 500 VDC) between power supply connections and non-charged metal part
Dielectric strength	Fan: 2,000 VAC for 1 min Thermostat: 1,500 VAC for 1 min Between power supply connections and non-charged metal part
Ambient operating temperature	–30 to 70°C (with no icing)
Storage temperature	–40 to 85°C (with no icing)
Ambient operating humidity	25% to 85%

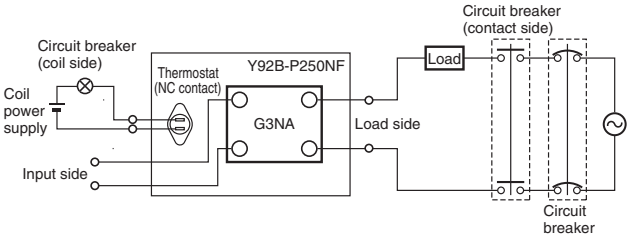
- Use a commercial power supply (50/60 Hz) for the Fan.
- Be sure to turn OFF the power supply and wait for the blades to stop before inspecting the Fan.
- High-precision ball bearings are used in the fan and these may be damaged if the Fan is dropped or otherwise subjected to shock. The life and characteristics of the Fan will be reduced if the bearings are damaged. Do not subject the Fan to shock.
- The life of the Fan depends on the ambient temperature, As a guideline, the Fan life is 40,000 hours for continuous usage at 40°C.
- Be sure there are no objects near the air vents that would restrict air flow and no loose objects, such as electrical lines.
- The Fan is an OMRON R87F-A4A-93HP (200 VAC) Fan. Use the same model of Fan for replacement.
- The tightening torque of the mounting screw when replacing the Fan is 0.38 to 0.50 N·m.
- Terminals equivalent to Faston #110 are used for the Fan power supply terminals.
- Refer to the following table for the OMRON Fan power supply plug cables (order separately).

Cable length	UL/CSA approved	Conforming to Electrical Appliance and Material Safety Law
1 m	R87F-PC	R87F-PCJT
2 m	R87F-PC-20	R87F-PCJT-20

- Connect the ground screw hole on the fan to **PE**.

Preventing Overheating with a High-capacity Heat Sink (Y92B-P250NF)

- When the High-capacity Heat Sink is used, high-capacity switching at 75 A or 90 A requires forced cooling with a fan. Connect the Fan to a power supply according to its ratings specifications.
- If the Fan stops due to a power supply error, due to foreign matter in the power supply connection, or due to aging, the Heat Sink will heat to high temperatures, possibly resulting in failure of the SSR or adverse affects on other devices. Implement an overheating prevention measure, such as turning OFF the load current, if the Heat Sink overheats.
- A thermostat is provided to detect overheating. The thermostat uses a NC contact, i.e., the circuit will be opened for overheating. This thermostat can be used to stop the operation of the SSR. Implement an overheating prevention measure by using this signal to output an alarm or perform another response applicable to the system. Also, confirm that there is no problem with the overall system.
- Do not connect the thermostat directly to the load power supply. Connect it to a contactor or other shutoff device connected above the SSR.
- Terminals equivalent to Faston #187 are used for the thermostat terminals.
- Do not place heat-dissipating silicon grease on the thermostat.
- Do not solder the thermostat terminals.
- The following diagram shows a protective circuit example.



Ventilating a High-capacity Heat Sink (Y92B-P250NF)

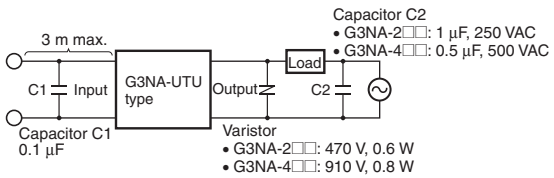
- Refer to *Ventilation Outside the Control Panel*.

Operating Conditions

- Do not apply currents exceeding the rated current otherwise, the temperature of the G3NA may rise excessively.
- 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.
- Do not apply overvoltages to the input circuit or output circuit. Failure or burning may result.
- Do not drop the G3NA or otherwise subject it to abnormal shock. Malfunction or failure may result.
- Keep the cooling system running continuously during the ON/OFF operation of the SSR. This is to allow residual heat to dissipate while the SSR is OFF.

Noise Terminal Voltage According to EN55011

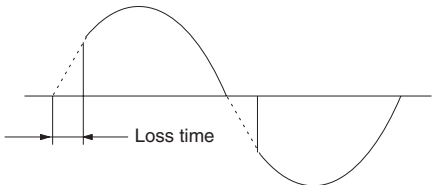
The G3NA-UTU complies with EN55011 standards when a capacitor is connected to the load power supply as shown in the following circuit diagram.



- Connect capacitor C1 to both sides of the input terminals for a G3NA with a DC input.
- Connect capacitor C2 to both sides of the load power supply output.
- Connect the varistor to both sides of the G3NA output terminals.
- Do not use an input line that is longer than 3 m.

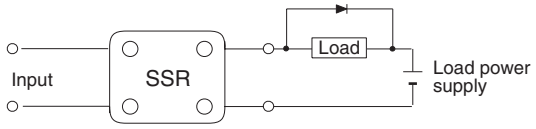
Loss Time

The loss time will increase when the G3NA is used at a low applied voltage or current. Be sure that this does not cause any problems.



Using DC Loads

For a DC or L load, a diode should be connected in parallel the load to absorb the counter electromotive force of the load.



Fuses

Connect a quick-break fuse in series with the load as a short-circuit protection measure. Use one of the fuses in the following table or one with equivalent or better characteristics.

Recommended Fuses

G3NA rated load current	Fuse model	Manufacturer	Applicable SSR
5 A	60LFF5	Kyosan Electric Manufacturing Company	G3NA-205B
8 A	60LFF8		G3NA-210B
10 A	60LFF10		
15 A	60LFF15		G3NA-220B
20 A	60LFF20 50SHA20		
25 A	60PFF25 50SHA25		G3NA-240B
30 A	60PFF30 50SHA30		
40 A	50SHA40		
45 A	50SHA45		
50 A	50SHA50		G3NA-275B-UTU
75 A	50SHA75		
80 A	50SHA80		G3NA-290B-UTU
100 A	50SHB100		

Reverse Connection

The output terminal side of the G3NA-D210B is connected to a built-in diode to protect the SSR from damage that may result from reverse connection. The SSR, however, cannot withstand one minute or more if the wires are connected in reverse. Therefore, pay the utmost attention not to make polarity mistakes on the load side.

■ Precautions on Operating and Storage Environments

1. Operating Ambient Temperature

The rated value for the ambient operating temperature of the G3NA is for when there is no heat build-up. 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 G3NA may exceed the rated value resulting in malfunction or burning.

When using the G3NA, 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 G3NA may increase as a result of environmental conditions (e.g., climate or air-conditioning) and operating conditions (e.g., mounting in an airtight panel).

2. Transportation

When transporting the G3NA, observe the following points. Not doing so may result in damage, malfunction, or deterioration of performance characteristics.

- Do not drop the G3NA or subject it to severe vibration or shock.
- Do not transport the G3NA if it is wet.
- Do not transport the G3NA under high temperatures or humidity.
- Do not transport the G3NA without packing it properly.

3. Vibration and Shock

Do not subject the G3NA to excessive vibration or shock. Otherwise the G3NA may malfunction and internal components may be deformed or damaged, resulting in failure of the G3NA to operate.

To prevent the G3NA from abnormal vibration, do not install the G3NA in locations or by means that will subject it to vibration from other devices, such as motors.

4. Solvents

Do not allow the G3NA or the resin portion of the Fan's thermostat to come in contact with solvents, such as thinners or gasoline. Doing so will dissolve the markings on the G3NA.

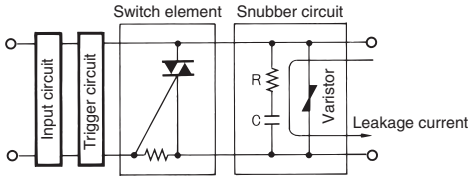
5. Oil

Do not allow the G3NA 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 G3NA even when there is no power input. Therefore, always turn OFF the power to the input or load and check that it is safe before replacing or wiring the G3NA.



2. Screw Tightening Torque

Tighten the G3NA terminal screws properly. If the screws are not tight, the G3NA will be damaged by heat generated when the power is ON. Perform wiring using the specified tightening torque.

3. Handling Relays

Do not mount the G3NA when your hands are oily or dirty, e.g., with metal powder. These may cause G3NA failure.

4. Do Not Drop

Be careful not to drop a Relay or Heat Sink onto any part of your body while working. Injury may result. This is particularly true for the High-capacity Heat Sink (Y92B-P250NF), which weighs 2.5 kg.

Warranty and Application Considerations

Read and Understand this Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS 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 OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON *Warranty and Limitations of Liability.*

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Cat. No. J146-E2-01

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

Solid State Relays
G3PA

Extremely Thin Relays Integrated with Heat Sinks

- Downsizing achieved through optimum design of heat sink.
- Mounting possible via screws or via DIN-rail.
- Close mounting possible for linking terminals. (Except for G3PA-260B-VD and G3PA-450B-VD-2.)
- Applicable with 3-phase loads.
- Replaceable power element cartridges.
- Comply with VDE 0160 (finger protection), with a dielectric strength of 4,000 V between input and load.
- Comply with VDE 0805, IEC 950.
- Certified by UL, CSA, and VDE (reinforced insulation).

Model Number Structure

■ Model Number Legend

G3PA-□□□□-□-□
1 2 3 4 5 6 7

1. **Basic Model Name**
   G3PA: Solid State Relay
2. **Rated Load Power Supply Voltage**
   2: 200 VAC
   4: 400 VAC
3. **Rated Load Current**
   10: 10 A
   20: 20 A
   30: 30 A
   40: 40 A
   50: 50 A
   60: 60 A
4. **Terminal Type**
   B: Screw terminals
5. **Zero Cross Function**
   Blank: Equipped with zero cross function
   L: Not equipped with zero cross function
6. **Certification**
   VD: Certified by UL, CSA, and VDE
7. **Special Specifications**
   Blank: Standard models
   2: 480 V models

Ordering Information

■ List of Models

Model	Isolation	Zero cross function	Indicator	Rated output load	Rated input voltage
G3PA-210B-VD	Phototriac coupler	Yes	Yes	10 A at 24 to 240 VAC	5 to 24 VDC
G3PA-220B-VD				20 A at 24 to 240 VAC	
G3PA-240B-VD				40 A at 24 to 240 VAC	
G3PA-260B-VD				60 A at 24 to 240 VAC	
G3PA-210BL-VD		No		10 A at 24 to 240 VAC	
G3PA-220BL-VD				20 A at 24 to 240 VAC	
G3PA-240BL-VD				40 A at 24 to 240 VAC	
G3PA-260BL-VD				60 A at 24 to 240 VAC	
G3PA-210B-VD		Yes		10 A at 24 to 240 VAC	24 VAC
G3PA-220B-VD				20 A at 24 to 240 VAC	
G3PA-240B-VD				40 A at 24 to 240 VAC	
G3PA-260B-VD				60 A at 24 to 240 VAC	
G3PA-420B-VD				20 A at 180 to 400 VAC	12 to 24 VDC
G3PA-430B-VD				30 A at 180 to 400 VAC	
G3PA-420B-VD-2				20 A at 200 to 480 VAC	
G3PA-430B-VD-2				30 A at 200 to 480 VAC	
G3PA-450B-VD-2				50 A at 200 to 480 VAC	

Note: When ordering, specify the rated input voltage.

Replacement Parts

Name	Carry current	Load voltage range	Model	Applicable SSR	VDE certification
Power Device Cartridge	10 A	19 to 264 VAC	G32A-A10-VD DC5-24	G3PA-210B-VD DC5-24	Yes
			G32A-A10L-VD DC5-24	G3PA-210BL-VD DC5-24	
			G32A-A10-VD AC24	G3PA-210B-VD AC24	
	20 A		G32A-A20-VD DC5-24	G3PA-220B-VD DC5-24	
			G32A-A20L-VD DC5-24	G3PA-220BL-VD DC5-24	
			G32A-A20-VD AC24	G3PA-220B-VD AC24	
	40 A		G32A-A40-VD DC5-24	G3PA-240B-VD DC5-24	
			G32A-A40L-VD DC5-24	G3PA-240BL-VD DC5-24	
			G32A-A40-VD AC24	G3PA-240B-VD AC24	
	60 A		G32A-A60-VD DC5-24	G3PA-260B-VD DC5-24	
			G32A-A60L-VD DC5-24	G3PA-260BL-VD DC5-24	
			G32A-A60-VD AC24	G3PA-260B-VD AC24	
	20 A	150 to 440 VAC	G32A-A420-VD DC12-24	G3PA-420B-VD DC12-24	
	30 A		G32A-A430-VD DC12-24	G3PA-430B-VD DC12-24	
	20 A	180 to 528 VAC	G32A-A420-VD-2 DC12-24	G3PA-420B-VD-2 DC12-24	
	30 A		G32A-A430-VD-2 DC12-24	G3PA-430B-VD-2 DC12-24	
	50 A		G32A-A450-VD-2 DC12-24	G3PA-450B-VD-2 DC12-24	

■ Other Units (Order Separately)

Units that Enable 2-line Switching of 3-phase Power

Name	Current flow	Model	Applicable SSR
Short-circuit Unit	10 A	G32A-D20	G3PA-210B-VD, G3PA-210BL-VD
	20 A		G3PA-220B-VD, G3PA-220BL-VD G3PA-420B-VD, G3PA-420B-VD-2
	30 A	G32A-D40	G3PA-430B-VD, G3PA-430B-VD-2
	40 A		G3PA-240B-VD, G3PA-240BL-VD

Specifications

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

Input

Model	Rated voltage	Operating Voltage range	Input current impedance	Voltage level	
				Must operate voltage	Must release voltage
G3PA-210B-VD	5 to 24 VDC	4 to 30 VDC	7 mA max.	4 VDC max.	1 VDC min.
G3PA-220B-VD					
G3PA-240B-VD					
G3PA-260B-VD					
G3PA-210BL-VD	5 to 24 VDC	4 to 30 VDC	20 mA max.	4 VDC max.	1 VDC min.
G3PA-220BL-VD					
G3PA-240BL-VD					
G3PA-260BL-VD					
G3PA-210B-VD	24 VAC	19.2 to 26.4 VAC	1.4 kΩ±20%	19.2 VAC max.	4.8 VAC min.
G3PA-220B-VD					
G3PA-240B-VD					
G3PA-260B-VD					
G3PA-420B-VD	12 to 24 VDC	9.6 to 30 VDC	7 mA max.	9.2 VDC max.	1 VDC min.
G3PA-430B-VD					
G3PA-420B-VD-2					
G3PA-430B-VD-2					
G3PA-450B-VD-2					

Output

Model	Applicable load			
	Rated load voltage	Load voltage range	Load current	Inrush current
G3PA-210B(L)-VD	24 to 240 VAC (50/60 Hz)	19 to 264 VAC (50/60 Hz)	0.1 to 10 A	150 A (60 Hz, 1 cycle)
G3PA-220B(L)-VD			0.1 to 20 A	220 A (60 Hz, 1 cycle)
G3PA-240B(L)-VD			0.5 to 40 A	440 A (60 Hz, 1 cycle)
G3PA-260B(L)-VD			0.5 to 60 A	440 A (60 Hz, 1 cycle)
G3PA-420B-VD	180 to 400 VAC (50/60 Hz)	150 to 440 VAC (50/60 Hz)	0.5 to 20 A	220 A (60 Hz, 1 cycle)
G3PA-430B-VD			0.5 to 30 A	440 A (60 Hz, 1 cycle)
G3PA-420B-VD-2	200 to 480 VAC (50/60 Hz)	180 to 528 VAC (50/60 Hz)	0.5 to 20 A	220 A (60 Hz, 1 cycle)
G3PA-430B-VD-2			0.5 to 30 A	440 A (60 Hz, 1 cycle)
G3PA-450B-VD-2			0.5 to 50 A	440 A (60 Hz, 1 cycle)

Refer to *Engineering Data* for further details.

■ Characteristics

Item	G3PA-210B(L)-VD	G3PA-220B(L)-VD	G3PA-240B(L)-VD	G3PA-260B(L)-VD	G3PA-420B-VD	G3PA-420B-VD-2	G3PA-430B-VD	G3PA-430B-VD-2	G3PA-450B-VD-2
Operate time	1/2 of load power source cycle + 1 ms max. (DC Input, -B models) 1 1/2 of load power source cycle + 1 ms max. (AC Input) 1 ms max. (-BL models)								
Release time	1/2 of load power source cycle + 1 ms max. (DC Input) 1 1/2 of load power source cycle + 1 ms max. (AC Input)								
Output ON voltage drop	1.6 V (RMS) max.				1.8 V (RMS) max.				
Leakage current	5 mA max. (at 100 VAC) 10 mA max. (at 200 VAC)		10 mA max. (at 100 VAC) 20 mA max. (at 200 VAC)		20 mA max. (at 400 VAC)	20 mA max. (at 480 VAC)	20 mA max. (at 400 VAC)	20 mA max. (at 480 VAC)	
I^2t	260 A^2s		1,260 A^2s		260 A^2s	1,800 A^2s	1,800 A^2s		1,800 A^2s
Insulation resistance	100 MΩ min. (at 500 VDC)								
Dielectric strength	4,000 VAC, 50/60 Hz for 1 min								
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.375–mm single amplitude (Mounted to DIN-rail)								
Shock resistance	Destruction: 300 m/s^2 (mounted to DIN-rail)								
Ambient temperature	Operating: –30°C to 80°C (with no icing or condensation) Storage: –30°C to 100°C (with no icing or condensation)								
Certified standards	UL508, CSA C22.2 (No.14, No.950), EN60950 File No. 5915ÜG				UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 6642ÜG	UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 133127ÜG	UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 6642ÜG	UL508, CSA C22.2 (No.14), EN60947-4-3 File No. 133127ÜG	
Ambient humidity	Operating: 45% to 85%								
Weight	Approx. 260 g	Approx. 340 g	Approx. 460 g	Approx. 900 g	Approx. 290 g	Approx. 290 g	Approx. 410 g	Approx. 410 g	Approx. 900 g

Operation

■ Replacement Parts

G32A-A Power Device Cartridge

The G32A-A Power Device Cartridge (a Triac Unit) can be replaced with a new one. When the temperature indicator has changed from pink to red, the triac circuitry may have malfunctioned possibly by an excessive flow of current, in which case, dismount the damaged cartridge for replacement.

The damaged cartridge can be replaced with a new one without disconnecting the wires from the G3PA.

Improve the heat radiation efficiency of the G3PA before replacing the cartridge.

The G32A-A Power Device Cartridge can withstand an excessive current for a short period of time, such as may be caused accidentally by the short circuitry of the load, in which case the temperature indicator will not turn red.

Be sure to turn OFF the power supply when replacing the Cartridge. Supplying power with the Cartridge removed may result in malfunction.

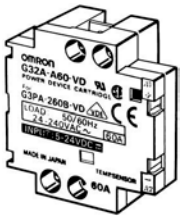
Appearance

G32A-A10(L)-VD

G32A-A20(L)-VD

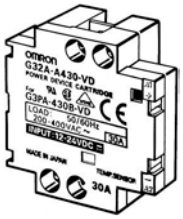
G32A-A40(L)-VD

G32A-A60(L)-VD



G32A-A420-VD(-2)

G32A-A430-VD(-2)



G32A-A450-VD-2

Replacing Power Device Cartridges

When replacing Power Device Cartridges, use the specified model. Using a Power Device Cartridge other than the specified one will result in faulty operation and destruction of the elements.

■ Replacement Procedure

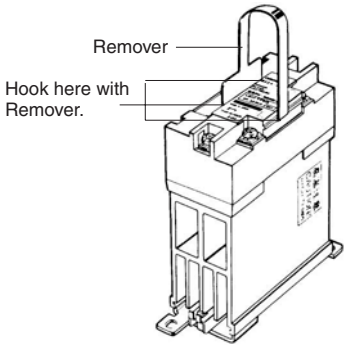
G32A-A10(L)-VD/G32A-A20(L)-VD/G32-A420-VD(-2)

Use the special tool (provided) to extract the cartridge for replacement with a new one.

Extraction

Follow the procedures below to dismount the Power Device Cartridge from the G3PA.

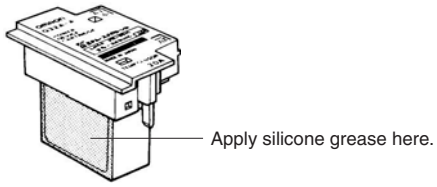
1. **Switch off the power.**
2. Remove the terminal cover.
3. Hook the indented part of the cartridge with the tool and pull up on the cartridge to remove it.



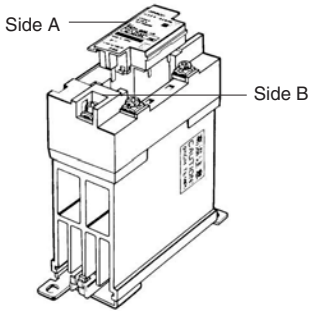
Mounting

Follow the procedures below to mount the Power Device Cartridge on the G3PA.

1. Apply silicone grease (provided with the G32A-A) to the entire surface of the heat sink.



2. Make sure that there is no dust or pieces of wire on the heat sink of the G32A-A or the G3PA.
3. Insert the cartridge into the opening of the G3PA so that the letters on the cartridge and those on the G3PA are in the same direction and side A and side B are even.



4. Attach the terminal cover.
5. Switch on the power and check the G3PA to be sure it works properly.

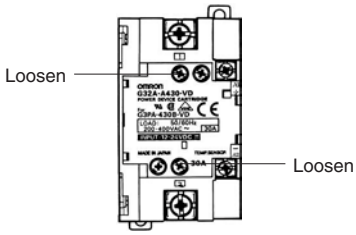
G32A-A40(L)-VD/G32A-A60(L)-VD/G32A-A430-VD(-2)/G32A-A450-VD-2

The G32A Power Device Cartridge is mounted and secured with screws to the G3PA Unit.

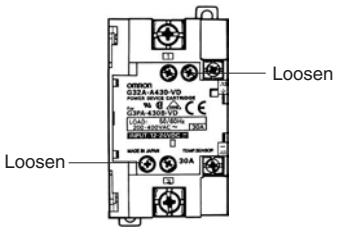
Extraction

Follow the procedures below to dismount the G32A-A Power Device Cartridge from the G3PA.

1. **Switch off the power.**
2. Remove the terminal cover.
3. Loosen the two centered screws on the sides to dismount the cartridge. The screws are connected to terminals 1 and 2.



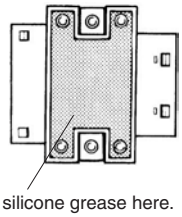
4. Loosen the screws on both the corners.



5. Hold the indented part of both the corners to dismount the cartridge.

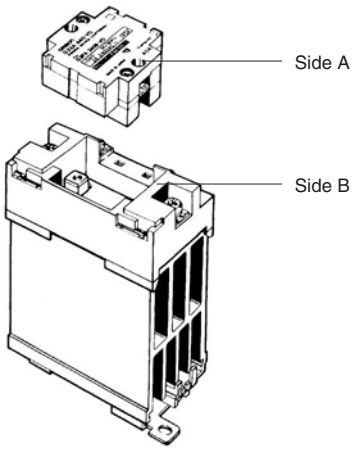
Mounting

1. Apply silicone grease to the entire surface of the heat sink.



2. Make sure that there is no dust or pieces of wire on the heat sink of the G32A-A or the G3PA.

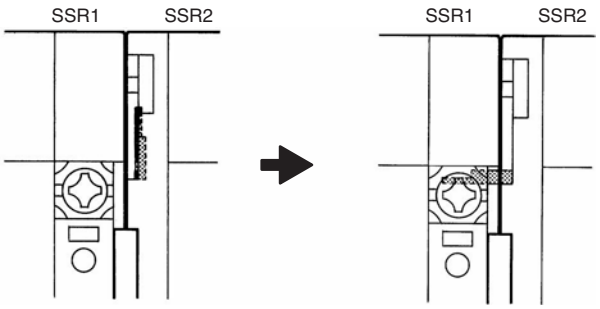
3. Insert the cartridge into the opening of the G3PA so that side A and side B are even.



4. Tighten the screws on both the corners with a tightening torque of 0.59 to 0.78 N·m.
5. Tighten the screws on both the sides with a tightening torque of 0.59 to 0.78 N·m.
6. Attach the terminal cover.
7. Switch on the power and check the G3PA to be sure it works properly.

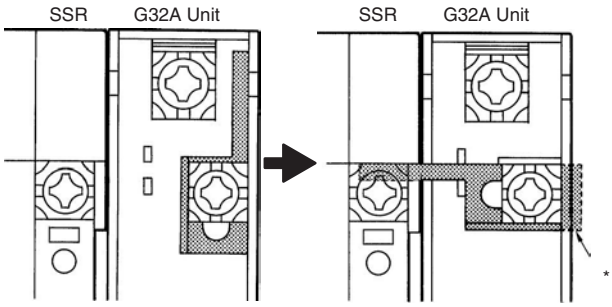
■ Linking Terminal Connection

• Connecting with linking terminal for G3PA-210B(L)-VD, -220B(L)-VD, -240B(L)-VD and G3PA-420B-VD(-2), G3PA-430B-VD(-2).



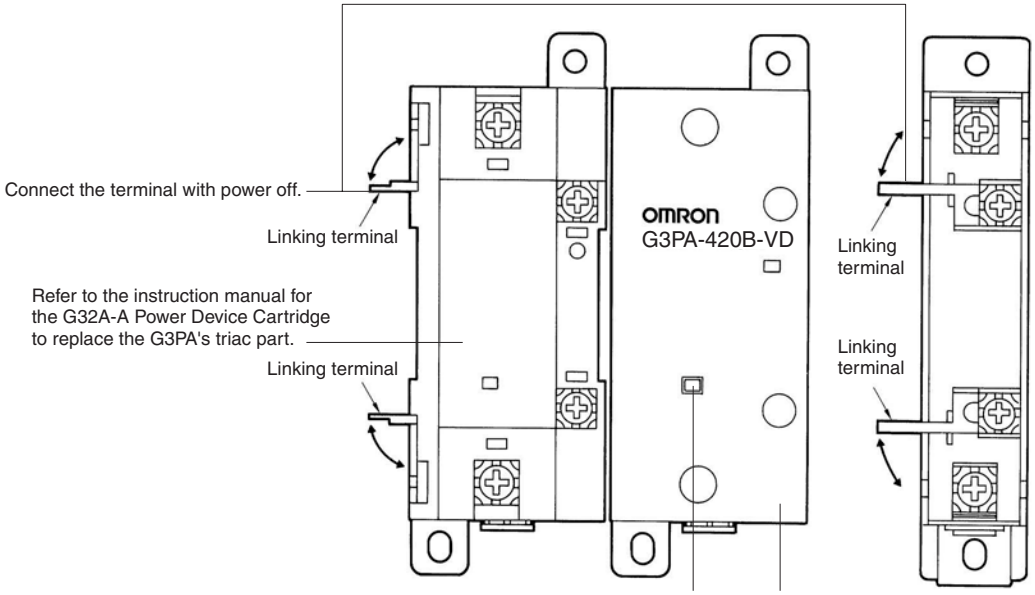
1. When SSRs are close mounted, loosen the M3.5 Sems screw and flip the linking terminal down.
2. Insert the linking terminal securely into the center of the screw and tighten the screw.

• Connecting with linking terminal for G32A.



* The cover will not fit if the terminal protrudes.

1. When SSR are close mounted, loosen the M3.5 Sems screw on the G32A and flip the linking terminal down.
2. Insert the linking terminal securely into the center of the screw and tighten the screw. Ensure that the linking terminal does not protrude.



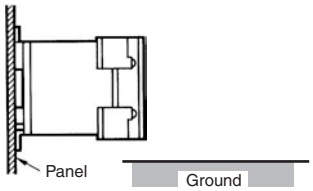
When the temperature indicator has turned from pink to red, the G32-A-A Power Device Cartridge may have malfunctioned, in which case the cartridge must be replaced with a new one.

Use the terminal cover to prevent accidents due to electric shock.

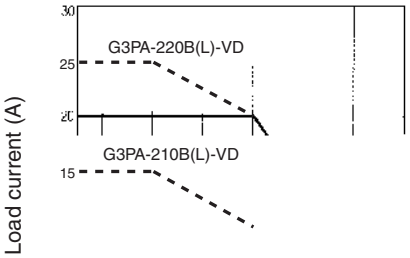
Engineering Data

Load Current vs. Ambient Temperature

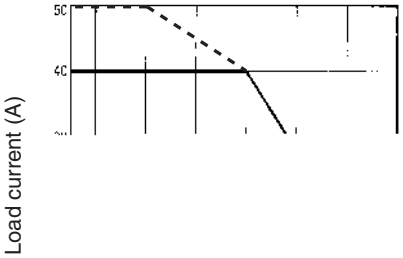
Vertical Mounting



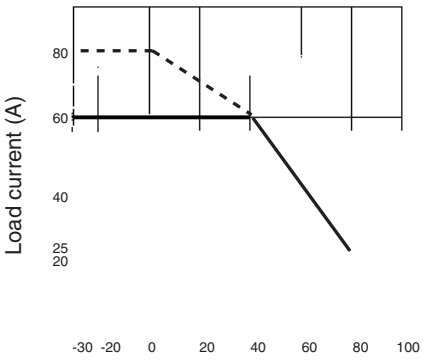
G3PA-210B(L)-VD, G3PA-220B(L)-VD



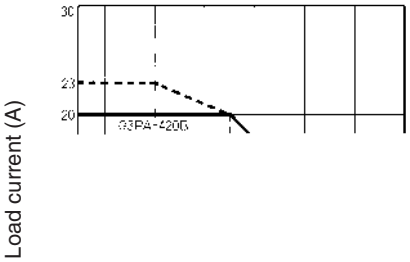
G3PA-240B(L)-VD



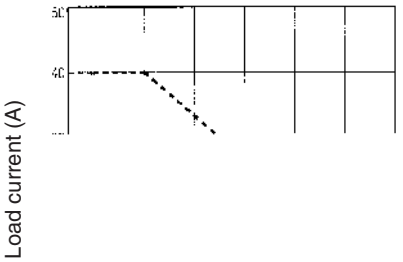
G3PA-260B(L)-VD



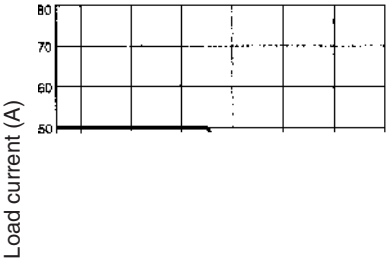
G3PA-420B-VD, G3PA-420B-VD-2



G3PA-430B-VD, G3PA-430B-VD-2



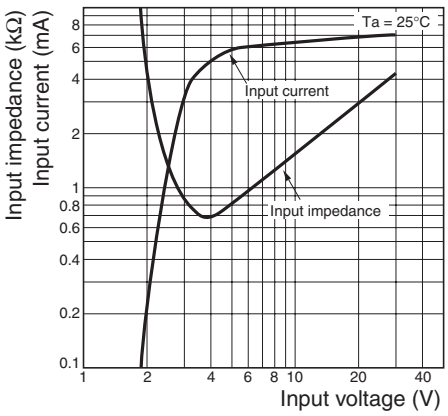
G3PA-450B-VD-2



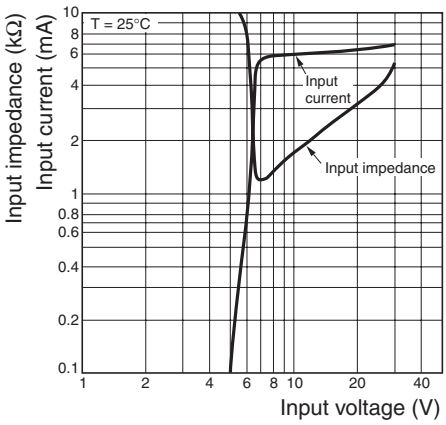
Note: Close mounting is possible for a maximum of three Units by reducing the load current by 20%. (A minimum clearance of 10 mm must be provided when mounting four or more Units.)

Input Voltage vs. Input Current

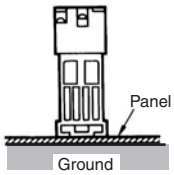
G3PA-2□0B-VD



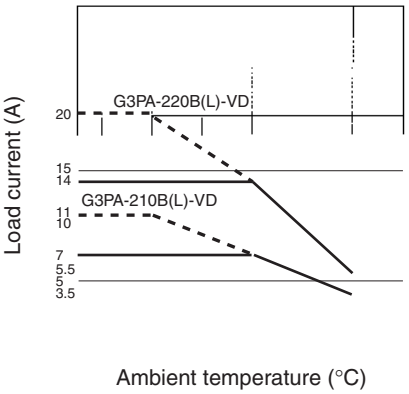
G3PA-4□0-VD, G3PA-4□-VD-2



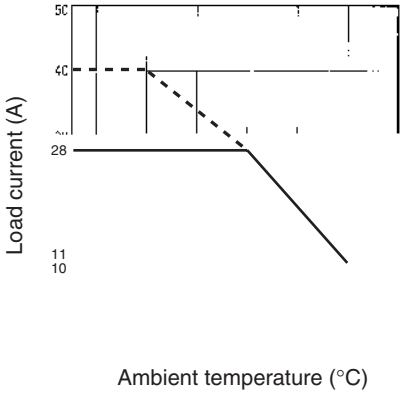
Horizontal Mounting



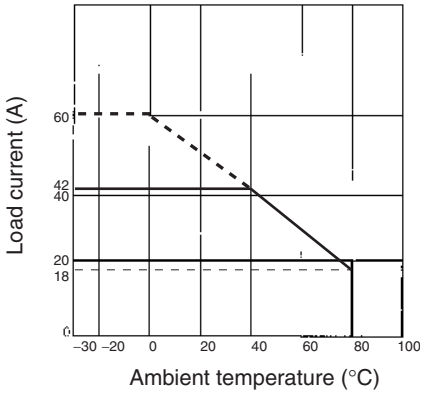
G3PA-210B(L)-VD, G3PA-220B(L)-VD



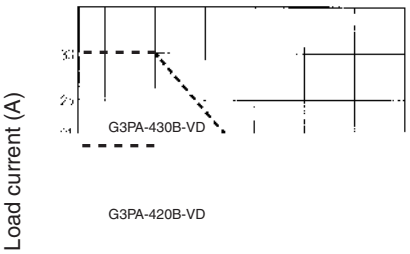
G3PA-240B(L)-VD



G3PA-260B(L)-VD

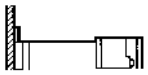


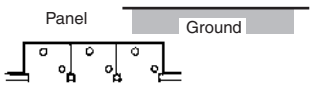
G3PA-420B-VD, G3PA-430B-VD
G3PA-420B -VD-2, G3PA-430B-VD-2



G3PA-450B-VD-2

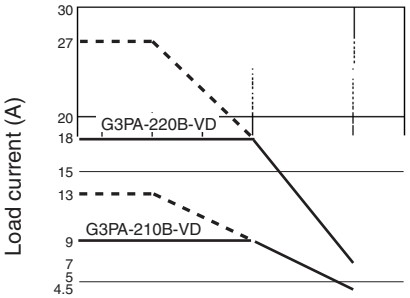
Close Mounting (Up to Three)



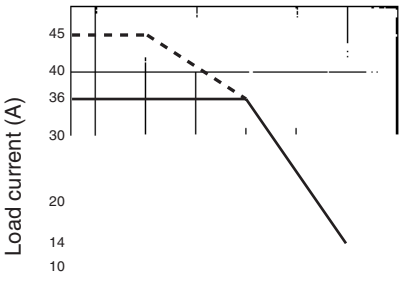


DIN track

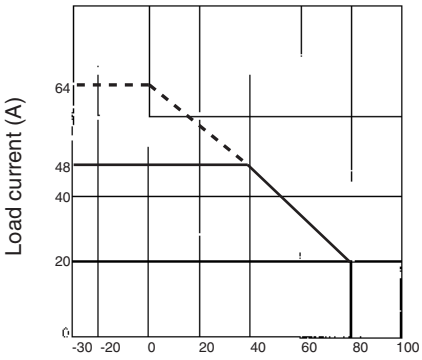
G3PA-210B(L)-VD, G3PA-220B(L)-VD



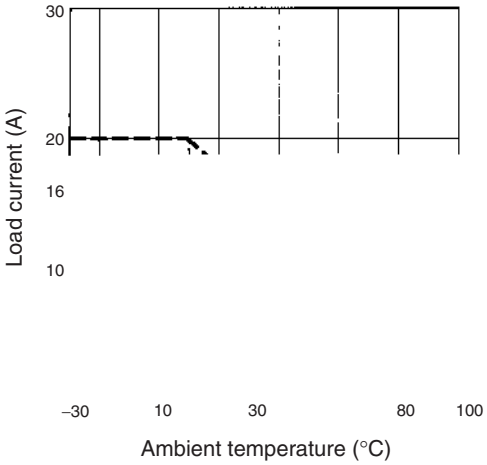
G3PA-240B(L)-VD



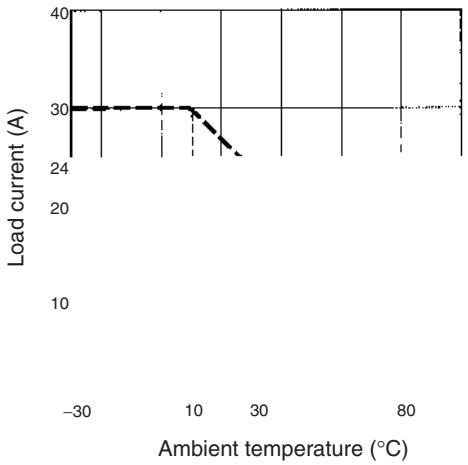
G3PA-260B(L)-VD



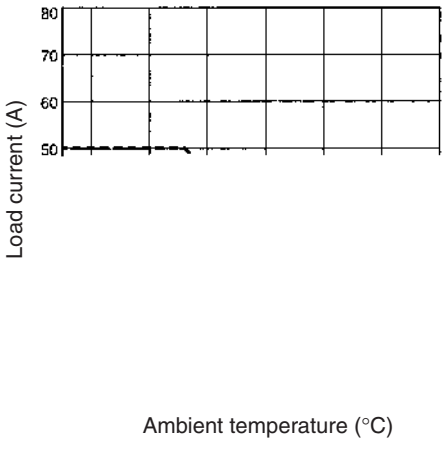
G3PA-420B-VD, G3PA-420B-VD-2



G3PA-430B-VD, G3PA-430B-VD-2



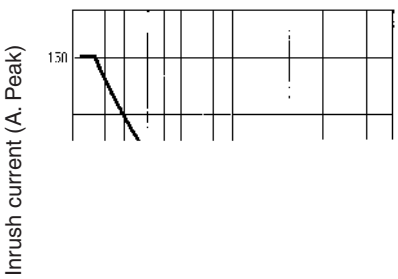
G3PA-450B-VD-2



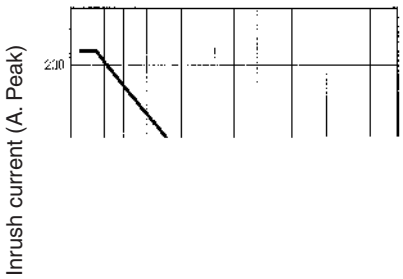
One Cycle Surge Current: Non-repetitive

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

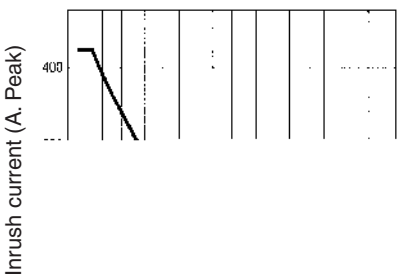
G3PA-210B(L)-VD



G3PA-220B(L)-VD, G3PA-420B-VD, G3PA-420B-VD-2



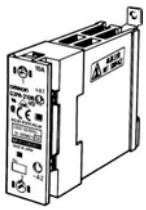
G3PA-240B(L)-VD/260B(L)-VD, G3PA-430B-VD, G3PA-430B-VD-2, G3PA-450B-VD-2



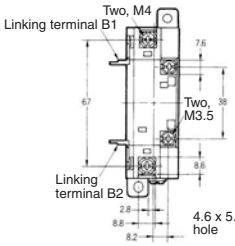
Dimensions

Note: All units are in millimeters unless otherwise indicated.

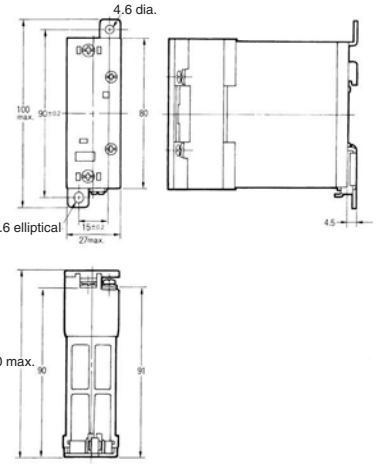
G3PA-210B(L)-VD



Without Terminal Cover

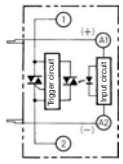


With Terminal Cover

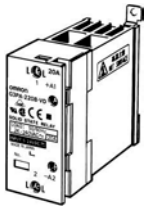


Mounting Holes

Terminal Arrangement/ Internal Connections



G3PA-220B(L)-VD



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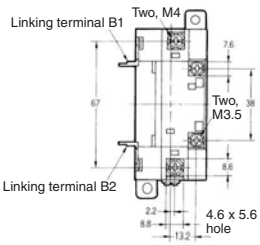

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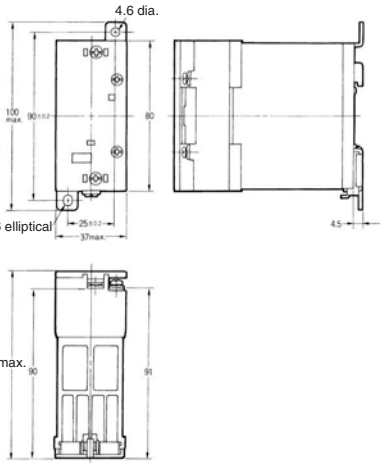
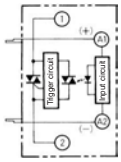
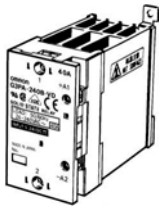


Mounting Holes

Terminal Arrangement/ Internal Connections



G3PA-240B(L)-VD



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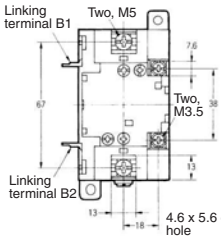

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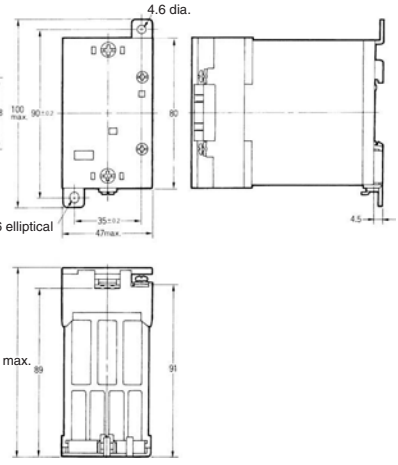
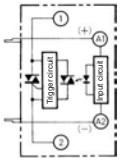


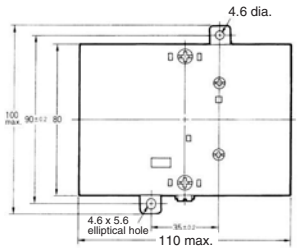
Mounting Holes

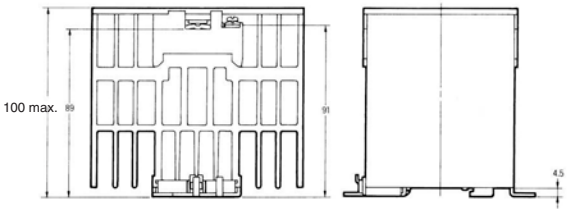
Terminal Arrangement/ Internal Connections



G3PA-260B(L)-VD
G3PA-450B-VD-2

With Terminal Cover





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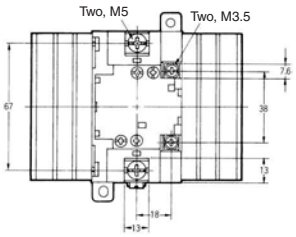
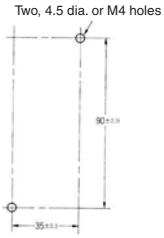
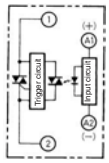


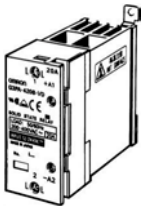
Mounting Holes



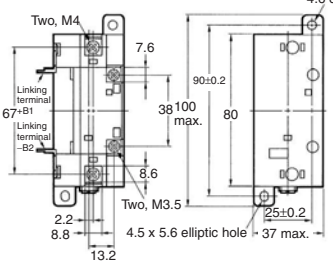
Terminal Arrangement/ Internal Connections



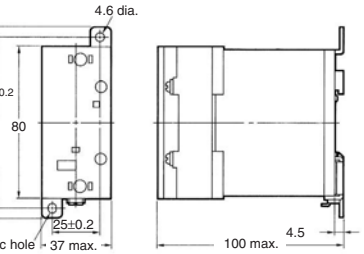
G3PA-420B-VD, G3PA-420B-VD-2

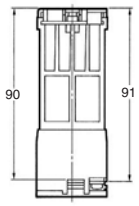


Without Terminal Cover

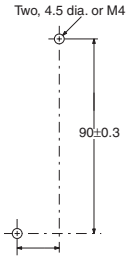


With Terminal Cover

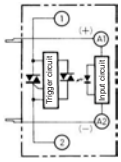




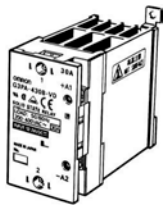
Mounting Holes



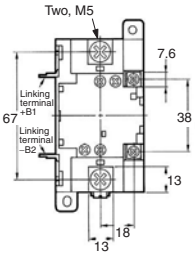
Terminal Arrangement/ Internal Connections



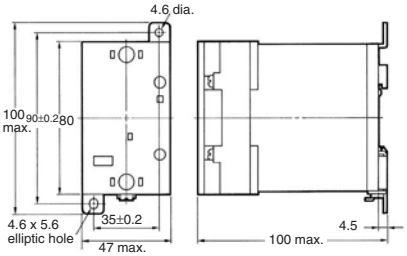
G3PA-430B-VD, G3PA-430B-VD-2

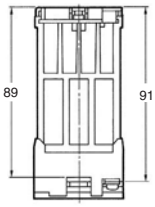


Without Terminal Cover

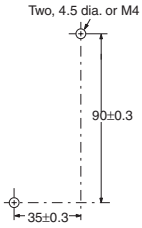


With Terminal Cover

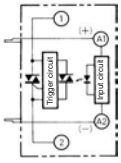




Mounting Holes



Terminal Arrangement/ Internal Connections



Safety Precautions

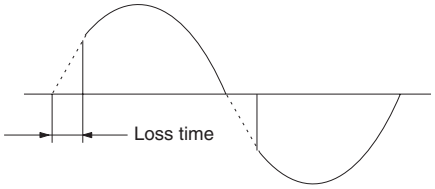
■ Precautions for Correct Use

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

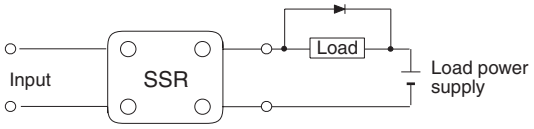
Load Connection

For an AC load, use a power supply rated at 50 or 60 Hz.
The maximum operating frequency is 10 Hz.
The G3PA-(VD) has a built-in varistor for overvoltage protection.

At a low applied voltage, such as 24 VAC, the load current is not fully supplied. When the Unit is switched ON, the voltage required to power the Unit deprives the output signal of the necessary voltage level and thus creates loss time. The lower the load voltage is, the greater the loss time is. This condition, however, will not create any serious problems.



For a DC or L load, a diode should be connected in parallel the load to absorb the counter electromotive force of the load.

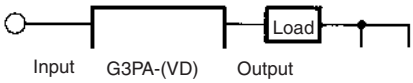


When attaching a heat sink to the G3PA-(VD), in order to facilitate heat dissipation, apply silicone grease or equivalent heat-conductive grease on the heat sink. (Toshiba Silicone, Shinetsu Silicone, etc.)

Tighten the mounting screws of the heat sink with a torque of 0.78 to 0.98 N·m.

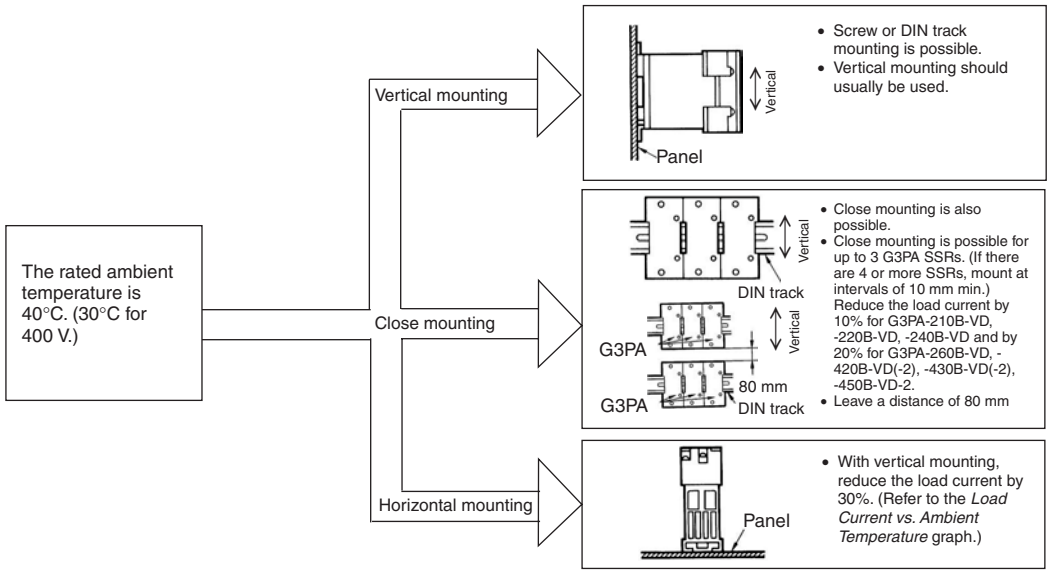
Noise Terminal Voltage according to EN55011

The G3PA-(VD) complies with EN55011 standards when a capacitor is connected to the load power supply as shown in the following circuit diagram.



Recommended Capacitor: 1 μF, 250 VAC

Mounting

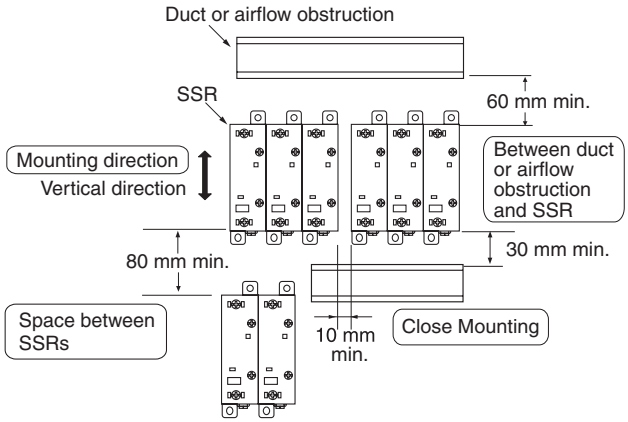


Note: Leave a distance of 60 mm min. between SSRs and ducts (especially above the SSR).

Close Mounting

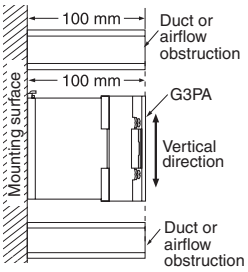
SSR Mounting Pitch

Panel Mounting (At a rated ambient temperature of 40°C).



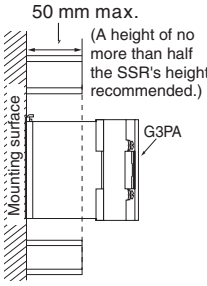
Relationship between SSRs and Ducts

Duct Height



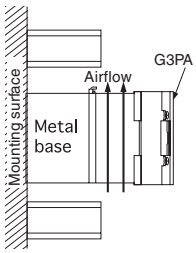
Do not surround the SSR with ducts, otherwise the heat radiation of the SSR will be adversely affected.

Countermeasure (1)



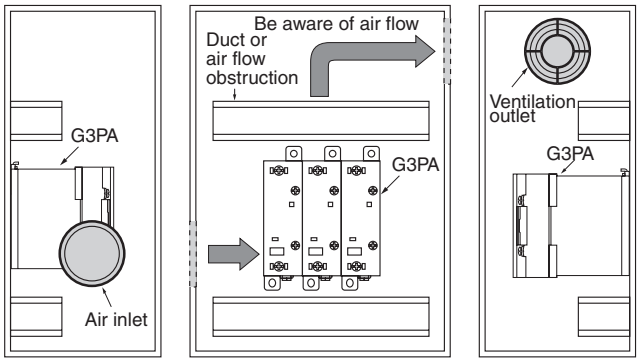
Use short ducts.

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.)

Load current (A)	10 A	20 A	30 A	40 A	60 A
Required number of fans per SSR	0.16	0.31	0.47	0.62	0.93

Example: For 10 SSRs with load currents of 20 A,
0.31 x 10 = 3.1
Thus, 4 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.

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

Cat. No. K094-E2-06

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

Solid State Relays (Single-phase)
G3PB

Compact, Slim-profile SSR with Heat Sink, Offering Heater Control for 480-VAC Rated Loads

- Compact design achieved by optimizing heat sink shape.
- DIN-rail mounting possible in addition to screw mounting.
- Conforms to CE Marking, EN (VDE approval), CSA, and VDE standards.
  (UL pending)

Note: Refer to *Precautions* on page H-41.

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**
   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. **Number of Elements**
   Blank: Single-phase models
6. **Construction**
   Blank: DIN-rail mounting and built-in heat sink
7. **Certification**
   VD: Certified by CSA and VDE

Ordering Information

■ List of Models

Isolation method	Zero cross function	Operation indicator	Rated input voltage	Rated output load (See note.)	Model number
Phototriac coupler	Yes	Yes (yellow)	12 to 24 VDC	15 A, 200 to 480 VAC	G3PB-515B-VD 12 to 24 VDC
				25 A, 200 to 480 VAC	G3PB-525B-VD 12 to 24 VDC
				35 A, 200 to 480 VAC	G3PB-535B-VD 12 to 24 VDC
				45 A, 200 to 480 VAC	G3PB-545B-VD 12 to 24 VDC

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

■ Accessories (Order Separately)

Mounting DIN-rail	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)

Input

Item	Common
Rated voltage	12 to 24 VDC
Operating voltage range	9.6 to 30 VDC
Rated input current	7 mA max.
Must operate voltage	9.6 VDC max.
Must release voltage	1 VDC min.

Output

Item	G3PB-515B-VD	G3PB-525B-VD	G3PB-535B-VD	G3PB-545B-VD
Rated load voltage	200 to 480 VAC (50/60 Hz)			
Load voltage range	180 to 528 VAC (50/60 Hz)			
Applicable load current (See note.)	0.1 to 15 A (at 40°C)	0.1 to 25 A (at 40°C)	0.5 to 35 A (at 25°C)	0.5 to 45 A (at 25°C)
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)	128 A^2s	1,350 A^2s		6,600 A^2s
Applicable load (with Class-1 AC resistive load)	6 kW max. (at 400 VAC)	10 kW max. (at 400 VAC)	14 kW max. (at 400 VAC)	18 kW max. (at 400 VAC)

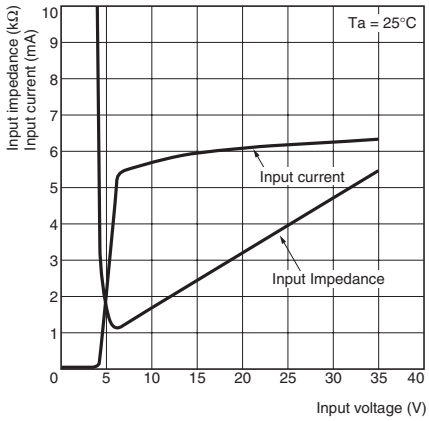
Note: The applicable load current varies depending on the ambient temperature. For details, refer to *Load Current vs. Ambient Temperature* in Engineering Data.

■ Characteristics

Item	G3PB-515B-VD	G3PB-525B-VD	G3PB-535B-VD	G3PB-545B-VD
Operate time	1/2 of load power source cycle + 1 ms max.			
Release time	1/2 of load power source cycle + 1 ms max.			
Output ON voltage drop	1.8 V (RMS) max.			
Leakage current	20 mA max. (at 480 VAC)			
Insulation resistance	100 MΩ min. (at 500 VDC)			
Dielectric strength	2,500 VAC, 50/60 Hz for 1 min			
Vibration resistance	Destruction: 10 to 55 to 10 Hz, 0.375-mm single amplitude (0.75-mm double amplitude) (Mounted to DIN-rail)			
Shock resistance	Destruction: 294 m/s^2 (DIN-rail 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%			
Certified standards	CSA22.2 No. 14 EN60947-4-3			
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 — IEC947-4-11			
Weight	Approx. 240 g		Approx. 400 g	

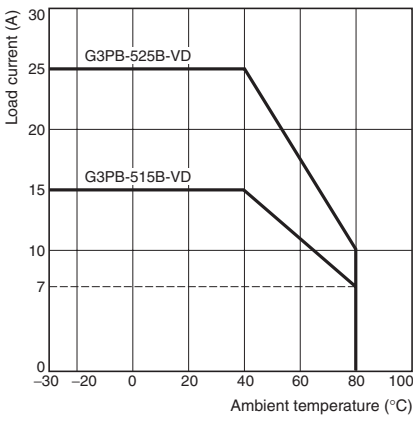
Engineering Data

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

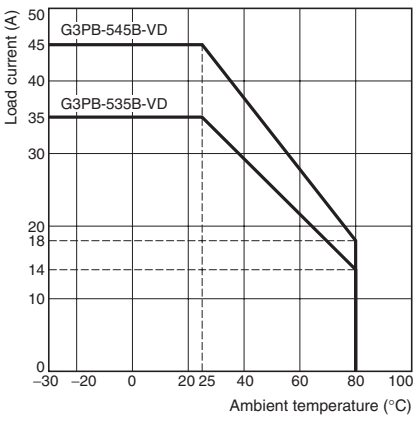


Load Current vs. Ambient Temperature

G3PB-515B-VD, G3PB-525B-VD



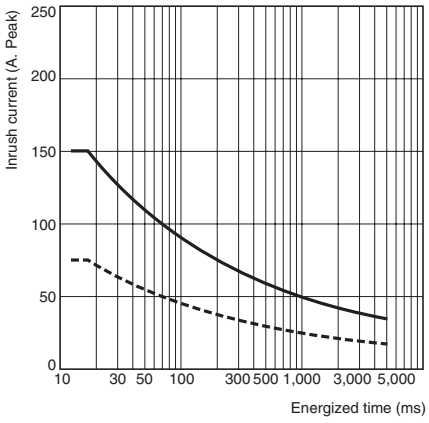
G3PB-535B-VD, G3PB-545B-VD



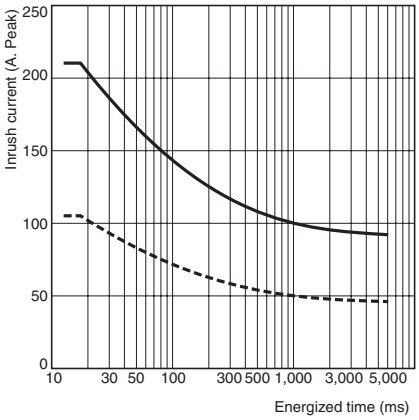
One Cycle Surge Current: Non-repetitive

Keep the inrush current to below the inrush current resistance value (i.e., below the broken line) if it occurs repetitively.

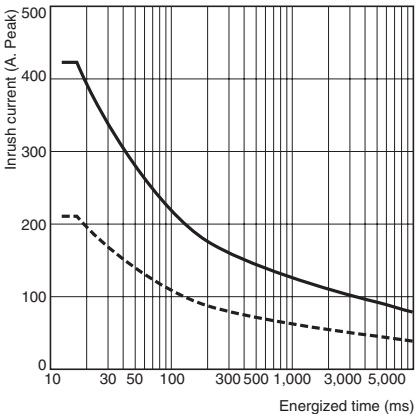
G3PB-515B-VD



G3PB-525B-VD

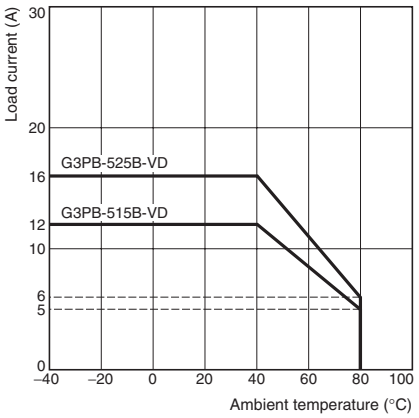


G3PB-535B-VD, G3PB-545B-VD

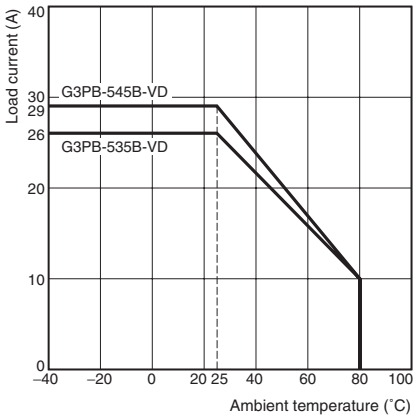


Close Mounting (8 Relays)

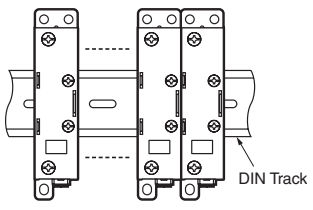
G3PB-515B-VD, G3PB-525B-VD



G3PB-535B-VD, G3PB-545B-VD



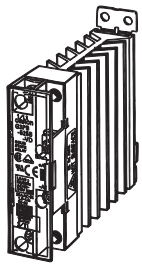
Close Mounting Example

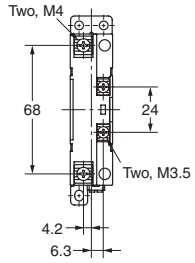


Dimensions

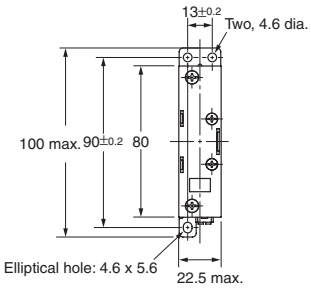
Note: All units are in millimeters unless otherwise indicated.

G3PB-515B-VD
G3PB-525B-VD

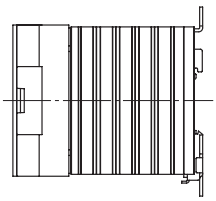




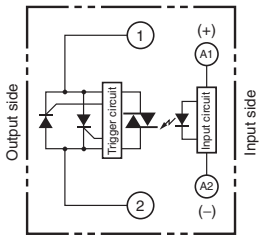
Note: Without terminal cover.



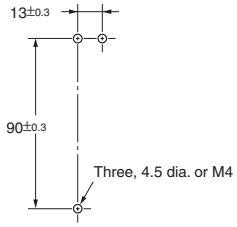
Note: With terminal cover.

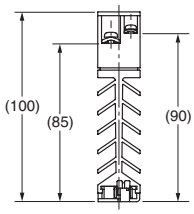


Terminal Arrangement/ Internal Circuit Diagram

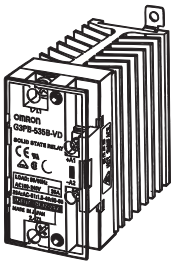


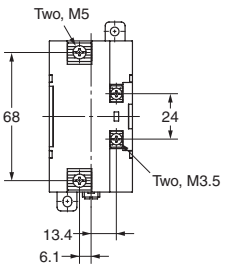
Mounting Holes



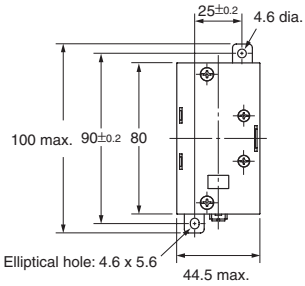


G3PB-535B-VD
G3PB-545B-VD

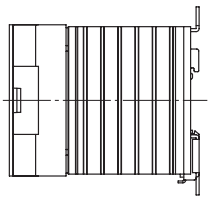




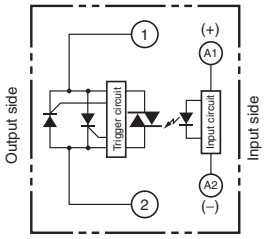
Note: Without terminal cover.



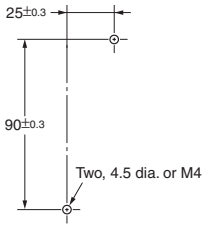
Note: With terminal cover.

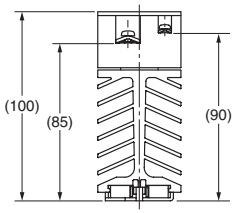


Terminal Arrangement/ Internal Circuit Diagram



Mounting Holes

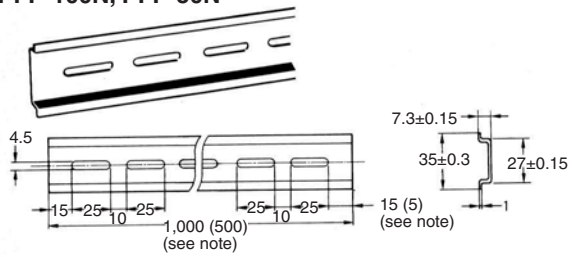




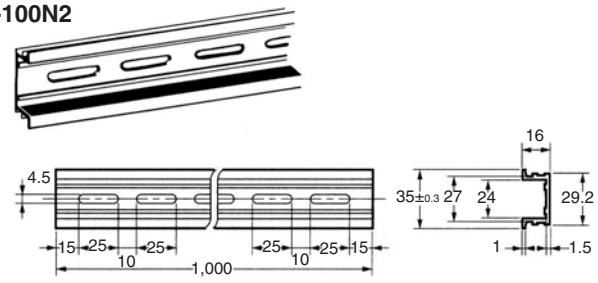
Accessories (Order Separately)

Mounting Tracks

PFP-100N, PFP-50N



PFP-100N2



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

Safety Precautions

⚠ CAUTION

Touching the charged section may occasionally cause minor electric shock. Do not touch the G3PB terminal section (the charged section) when the power supply is ON. Be sure to attach the cover before use.

The G3PB and heat sink will be hot and may occasionally cause minor burns. Do not touch the G3PB or the heat sink either while the power supply is ON, or immediately after the power is turned OFF.

The internal snubber circuit is charged and may occasionally cause minor electric shock. Do not touch the G3PB's main circuit terminals immediately after the power is turned OFF.

Be sure to conduct wiring with the power supply turned OFF, and always attach the terminal cover after completing wiring. Touching the terminals when they are charged may occasionally result in minor electric shock.

Do not apply a short-circuit to the load side of the G3PB. The G3PB may rupture. To protect against short-circuit accidents, install a protective device, such as a quick-burning fuse, on the power supply line.

■ Precautions for Safe Use

Although OMRON continuously strives to improve the quality and reliability of our relays, the G3PB contains semiconductors, which are generally prone to occasional malfunction and failure. Maintaining safety is particularly difficult if a relay is used outside of its ratings. Always use the G3PB within the rated values. When using the G3PB, always design the system to ensure safety and prevent human accidents, fires, and social damage even in the event of G3PB failure, including system redundancy, measures to prevent fires from spreading, and designs to prevent malfunction.

1. Do not apply voltage or current above the rated values to the G3PB terminals. Doing so may cause G3PB malfunction or fire damage.

2. Heat Dissipation

- Do not obstruct the airflow to the G3PB or heat sink. Heat generated from an G3PB error may occasionally cause the output element to short, or cause fire damage.
- Be sure to prevent the ambient temperature from 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.
- Be sure to install the G3PB using the specified mounting direction. Otherwise, heat generated from a G3PB error may cause the output element to short or burn.
- 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 SSR may be damaged due to the decreased heat dissipation capacity.
- When installing the G3PB directly into a control panel, use a panel material with low thermal resistance, such as aluminum or steel. If a material with high thermal resistance, such as wood, is used, heat generated by the G3PB may cause fire or burning.

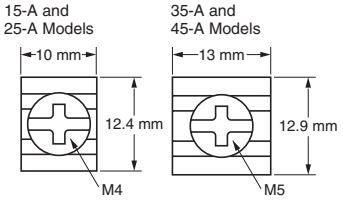
3. Perform wiring and tighten screws correctly, according to the following precautions. If wiring is incorrect or screws are not tightened sufficiently, the G3PB may be damaged by abnormal heat generated when the power is turned ON.

- Make sure that all lead wires are appropriate for the load current. Heat generated by a wiring error may result in burning.
- Do not operate if the screws on the output terminal are loose. Heat generated by a terminal error may result in fire damage.

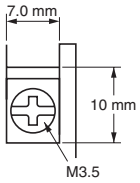
Wiring

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

Output Terminal Section (Single-phase Models)



Input Terminal Section



- Output terminals are charged even when the Relay is turned OFF. Touching the terminals may result in electric shock. To isolate the Relay from the power supply, install an appropriate circuit breaker between the power supply and the Relay.

Tightening Torque

Section	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

- Make sure that non-conducting materials are not caught when tightening the terminal screws. Otherwise, the heat generated from a terminal error may result in burning.
- Be sure to use M5 crimp terminals that are an appropriate size for the wire diameter when wiring G3PB with a load current of 35 A min.
- Do not use wires with a damaged sheath. Doing so may result in electric shock or a short circuit.
- Do not wire power lines or high-tension lines along with the lines of the G3PB in the same conduit or duct. Doing so may result in damage or malfunction due to induction.
- Use wires of an appropriate length. Wires of insufficient length may result in malfunction, failure, or burning due to induction.
- Mount the DIN-rail securely. Not doing so may cause the DIN-rail to fall.
- Make sure that the G3PB clicks securely into place when it is mounted to the DIN-rail. Not doing so may cause the G3PB to fall.
- Do not install the G3PB using hands that are dirty with oil or metal dust. Doing so may result in a malfunction.
- Tighten the heat sink screws securely to a tightening torque of 0.98 to 1.47 N·m.

4. Usage Conditions

- Select a load within the rated values. Not doing so may result in malfunction, failure, or burning.
- Use a power supply within the rated frequency range. Not doing so may result in malfunction, failure, or burning.

5. Do not transport the G3PB under the following conditions. Doing so may result in malfunction, failure, or deterioration of performance characteristics.

- When the G3PB is wet.
- During high temperatures or high humidity.
- When the G3PB is not packaged.

6. 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 −30 to 80°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 100°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, or in locations subject to rain or water drops.
- Do not use or store in locations subject to high temperatures or high humidity.
- Do not use or store in locations subject to static electricity or noise.
- Do not use or store in locations subject to strong electric or magnetic fields.
- Do not use or store in locations subject to radioactivity.

■ Precautions for Correct Use

Before Actual Operation

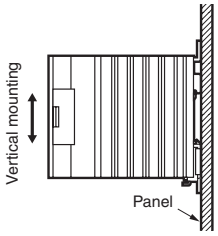
1. The G3PB in operation may cause an unexpected accident. Therefore it is necessary to test the G3PB under the variety of conditions that are possible. For example, the characteristics of the G3PB must always be considered in terms of the differences in characteristics between individual G3PBs.

2. Unless otherwise indicated, the rated values in this catalog have all been tested according to JIS C5442 standards 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. To confirm the ratings of specific G3PBs, the same operating environment conditions must be provided in addition to the load conditions.

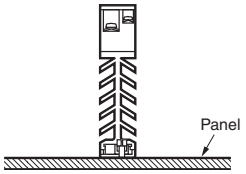
Mounting Method

Mount the DIN-rail-mounting G3PBs firmly to the DIN-rail and secure End Plates on both sides to prevent the G3PB falling due to its heavy weight. Also mount direct-mounting G3PBs securely in the panel.

Vertical Mounting



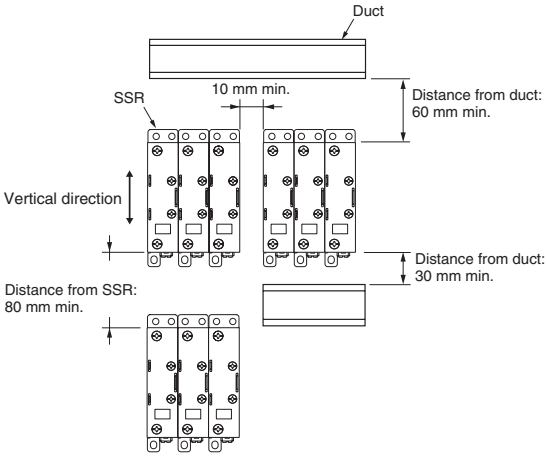
Horizontal Mounting



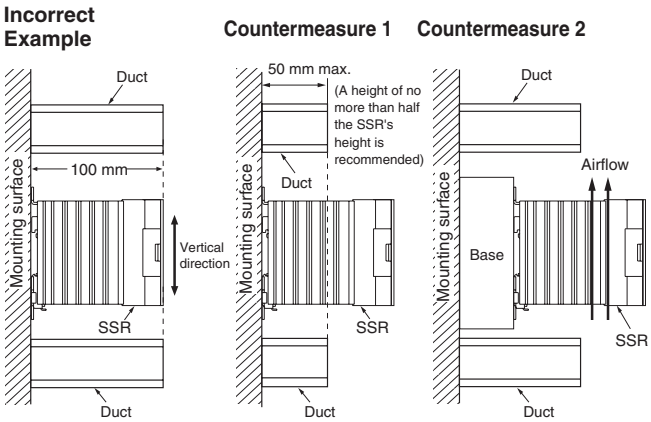
Note: Make sure that the load current is 50% of the rated load current when the G3PB is mounted horizontally. For details on close mounting, refer to the related information under performance characteristics.

SSR Mounting Pitch

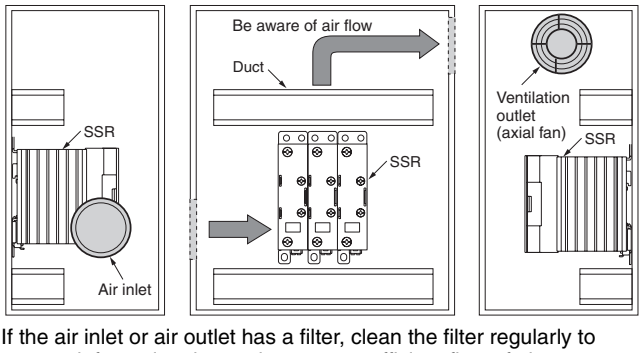
Panel Mounting



Relationship between SSRs and Ducts



Ventilation Outside the Control Panel



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°C 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.)

Load current (A)	15 A	25 A	35 A	45 A
Required number of fans per SSR	0.23	0.39	0.54	0.70

Example: For 10 SSRs with load currents of 15 A,
$0.23 \times 10 = 2.3$
Thus, 3 fans would be required.

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

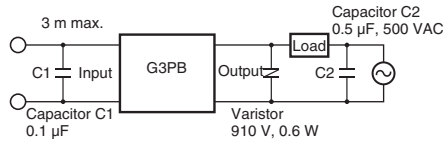
If there are other instruments that generate heat in the control panel other than SSRs, additional ventilation will be required.

Operating Conditions

- Do not apply currents exceeding the rated current otherwise, the temperature of the G3PB may rise excessively.
- Be sure to install protective devices on the power supply side, such as fuses and non-fuse breakers, as protection against accidents due to short-circuiting.
- Do not apply overvoltages to input or output circuits. Doing so may cause Relay failure or burning.

EMC Directive Compliance

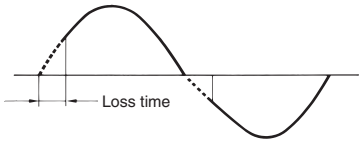
The G3PB complies with EMC Directives when capacitors and varistors are used, as shown in the following diagram.



- The capacitor C1 must be connected between the input terminals for G3PBs with DC inputs.
- The capacitor C2 must be connected to the load power supply outputs.
- C1 and C2 must not be electrolytic capacitors.
- The varistor must be connected between the output terminals of the G3PB.
- The input cable must be no longer than 3 m.

Loss Time

If the load power supply is used under a low voltage or current, the loss time will increase. Before operating the G3PB, make sure that this loss time will not cause problems.



Precautions on 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 heat build-up. 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 or 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 or air-conditioning) and operating conditions (e.g., mounting in an airtight panel).

2. Transportation

Do not drop the G3PB or subject the G3PB to abnormal vibration or shock during transport and installation. Doing so may result in malfunction, failure, or deterioration of performance characteristics.

3. Vibration and Shock

Do not subject the G3PB to excessive vibration or shock. Otherwise the SSR may malfunction and internal components may be damaged.

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

4. 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 G3PB.

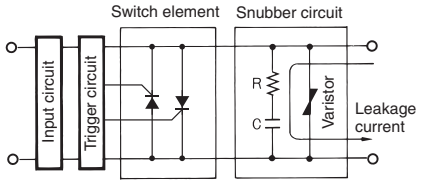
5. Oil

Do not allow the SSR 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 power 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 to the rated torque. If the screws are not tightened sufficiently, the G3PB may be damaged by heat generated when the power is ON.

3. Installation

Do not install the G3PB using hands that are dirty with oil or metal dust. Doing so may result in a malfunction.

4. Do Not Drop

Be careful not to drop the product during installation, mounting, or otherwise handling the G3PB.

Warranty and Application Considerations

Read and Understand this Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS 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 OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

PERFORMANCE DATA

Performance data given in this catalog 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON *Warranty and Limitations of Liability.*

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Cat. No. J152-E2-01A

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

Multi-channel Power Controller
G3ZA

Optimum Cycle Control for High-precision Control with Low Noise

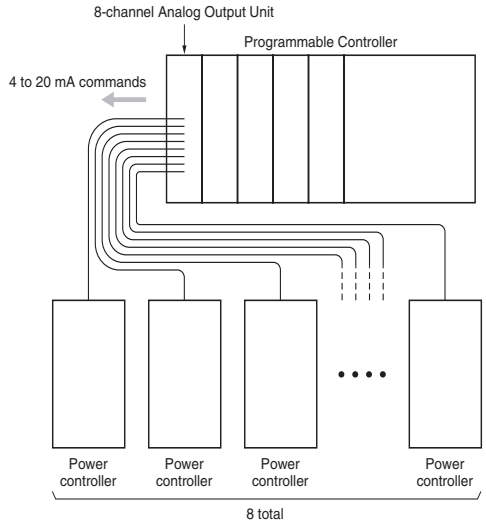
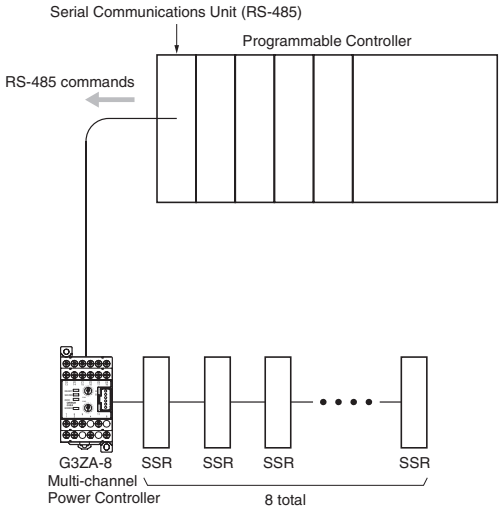
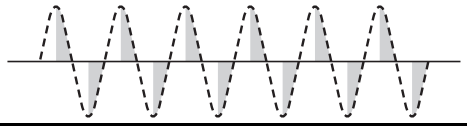
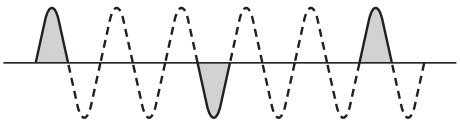
- Smaller than a Normal Power Controller.
- Enables low-noise power control in combination with zero-cross SSRs.
- One Controller can control up to 8 SSRs.
- RS-485 communications to set manipulated variables and heater burnout detection.
- CE Marking

Note: Refer to *Precautions* on page H-51 for safety information.

NEW

Features

Comparison between the G3ZA and Normal Power Controllers

Item	Normal Power Controllers	G3ZA
Connections		
Control method	**Phase Control** • Response is fast and high-precision temperature control is possible. • Harmonics and noise are problems. 	**Optimum Cycle Control (High-precision Zero Cross Control)** • Outputs are turned ON and OFF each half cycle. • Zero-cross control is performed. • Noise is suppressed while achieving high-speed response with high-precision temperature control. 

Model Number Structure

■ Model Number Legend

G3ZA- □ □ □ □ □ - □ - □
1 2 3 4 5 6 7

No.	Meaning	Code	Specifications
1	No. of control points	4	4 channels
		8	8 channels
2	Control method	None	Optimum cycle control
3	Current transformer input	H	Yes
		A	None

No.	Meaning	Code	Specifications
4	Load power supply voltage	2	100 to 240 VAC
		4	400 to 480 VAC
5	Communications specifications	03	RS-485
6	Communications protocol	FLK	CompoWay/F
7	International standards	UTU	Approved by TÜV/UL/CSA.

Ordering Information

■ List of Models

Name	Number of control channels	Heater burnout detection	Load power supply voltage	Model
Multi-channel Power Controller	4	Supported	100 to 240 VAC	G3ZA-4H203-FLK-UTU
			400 to 480 VAC	G3ZA-4H403-FLK-UTU
	8	Not supported	100 to 240 VAC	G3ZA-8A203-FLK-UTU
			400 to 480 VAC	G3ZA-8A403-FLK-UTU

Note: When using the heater burnout detection function, CTs must be ordered separately.

■ Accessories (Order Separately)

Name	Hole diameter	Model
Current Transformer (CT)	5.8 dia.	E54-CT1
	12.0 dia.	E54-CT3

Name	Model
DIN-rail	PFP-100N
	PFP-50N
End Plates (stoppers)	PFP-M

Specifications

■ Ratings

Item / Load power supply voltage range	100 to 240 VAC	400 to 480 VAC
Power supply voltage	100 to 240 VAC (50/60 Hz)	
Operating voltage range	85 to 264 VAC	
Power consumption	16 VA max.	
Load power supply voltage	100 to 240 VAC	400 to 480 VAC
Load power supply voltage range	75 to 264 VAC	340 to 528 VAC
Manipulated variable input	0.0% to 100.0% (via RS-485 communications)	
Current transformer input (See note.)	Single-phase AC, 0 to 50 A (primary current of CT)	
Trigger output	One voltage output for each channel, 12 VDC ±15%, Max. load current: 21 mA (with built-in short-circuit protection circuit)	
Alarm output	NPN open collector, one output Max. applicable voltage: 30 VDC, Max. load current: 50 mA Residual voltage: 1.5 V max., Leakage current: 0.4 mA max.	
Indications	LED indicators	
Ambient operating temperature	–10 to 55°C (with no icing or condensation)	
Ambient operating humidity	25% to 85%	
Storage temperature	–25 to 65°C (with no icing or condensation)	
Elevation	2,000 m max.	
Accessories	Instruction Sheet	

Note: CT inputs are provided only on Models with heater burnout detection.

■ Performance

Current indication accuracy	±3 A (for Models with heater burnout detection)
Insulation resistance	100 MΩ min. (at 500 VDC) between primary and secondary
Dielectric strength	2,000 VAC, 50/60 Hz for 1 min between primary and secondary
Vibration resistance	Vibration frequency: 10 to 55 Hz, acceleration: 50 m/s^2 in X, Y, and Z directions
Shock resistance	300 m/s^2 three times each in six directions along three axes
Weight	Approx. 200 g (including terminal cover)
Degree of protection	IP20
Memory protection	EEPROM (non-volatile memory) (number of writes: 100,000)
Installation environment	Overvoltage category III, pollution degree 2 (according to IEC 60664-1)
Approved standards	UL508 (Listing), CSA22.2 No. 14 EN50178 EN61000-6-4 (EN55011: 1998, A1: 1999 Class A, Group 1) EN61000-6-2: 2001

■ Communications Specifications

Transmission line connections		Multipoint
Communications method		RS-485
	Max. transmission distance	500 m
	No. of nodes	31 (via multidrop connections)
Synchronization method		Stop-start synchronization
Communications baud rate		9.6, 19.2, 38.4 or 57.6 kbps, Default: 9.6 kbps
Transmission code		ASCII
Communications data length		7 or 8 bits, Default: 7
Communications stop bits		1 or 2 bits, Default: 2
Communications parity		Vertical parity: None, even, or odd, Default: Even
Flow control		None

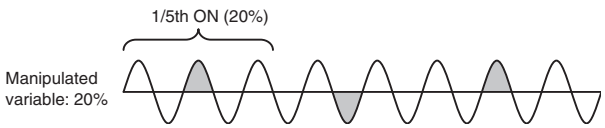
■ Current Transformer Specifications (Order Separately)

Item	Specification	
Model number	E54-CT1	E54-CT3
Max. continuous heater current	50 A	120 A (See note.)
Dielectric strength	1,000 VAC for 1 min	
Vibration resistance	98 m/s^2, 50 Hz	
Weight	Approx. 11.5 g	Approx. 50 g
Accessories	None	Connection terminals (2) Plugs (2)

Note: The maximum continuous current of the G3ZA is 50 A.

Optimum Cycle Control

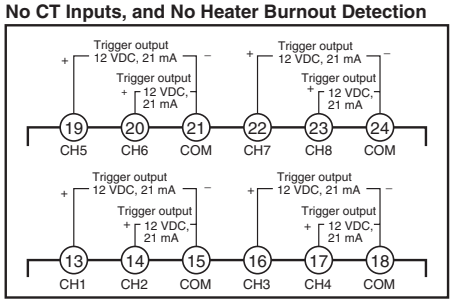
- Optimum cycle control is performed by driving SSRs according to load power detection and trigger signals. (Zero-cross SSRs are used.)
- Noise is suppressed while ensure high-speed response by turning outputs ON and OFF each half cycle to achieve high-precision temperature control.



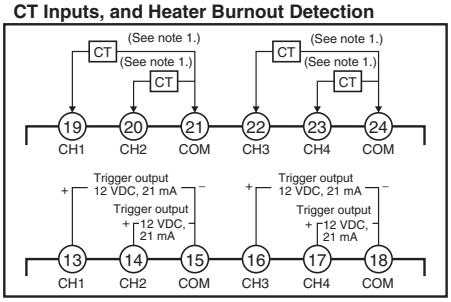
Connections

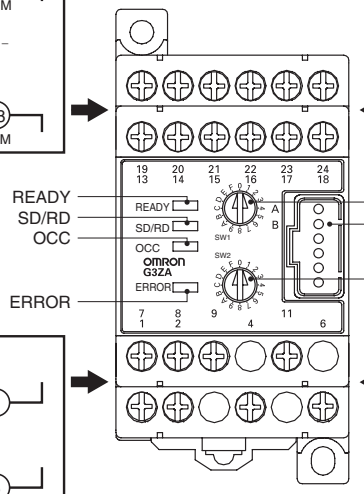
■ Terminal Arrangement

Models with 8 Channels (Control Points), No CT Inputs, and No Heater Burnout Detection

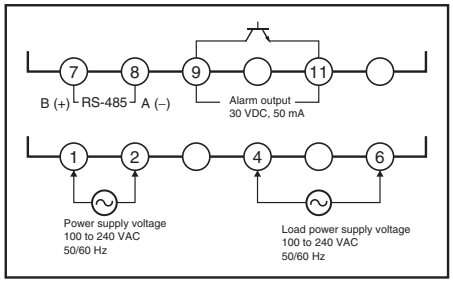


Models with 4 Channels (Control Points), CT Inputs, and Heater Burnout Detection



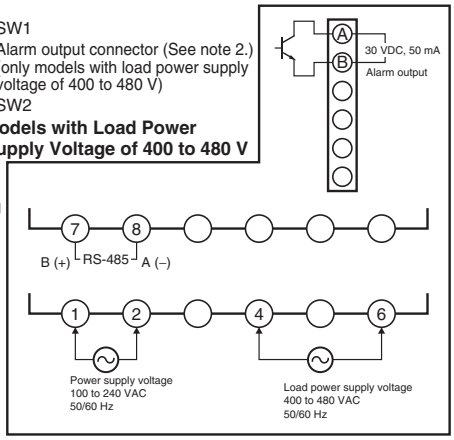


Models with Load Power Supply Voltage of 100 to 240 V



Note: Connect the power supply (100 to 240 VAC) for the G3ZA across terminals 1 and 2 and the load power supply for the SSR loads across terminals 4 and 6.

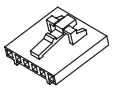
Models with Load Power Supply Voltage of 400 to 480 V



Note: Connect the power supply (100 to 240 VAC) for the G3ZA across terminals 1 and 2 and the load power supply for the SSR loads across terminals 4 and 6.

Note: 1. Applicable CTs: E54-CT1 and E54-CT3

2. Use C-Grid SL connectors from Molex Inc.



C-Grid SL Housing
Model: 51030-6303

C-Grid SL Housing (press-fit)
Model: 52109-0660

Operation Indicators

Operation indicator	Meaning
READY (Green)	Lit while power is being supplied.
SD/RD (Orange)	Lit while communicating with the host.
OCC (Orange)	Lit while a control output is ON.
ERROR (Red)	Lights or flashes when an error is detected.

Setting Switches

- Always turn OFF the power supply before setting the switches. The switch settings are read only when the power supply is turned ON.
- Use a flat-blade screwdriver to set the switches and be sure not to leave a switch set between two settings.


SW1


SW2

Communications Unit Number

Set a communications unit number on SW1 so that the host system can identify the Controller.

SW1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Unit No.	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15

▲ Default

Note: A unique unit number must be set for each node (Controller) on the same communications line. Do not set the same unit number for more than one node.

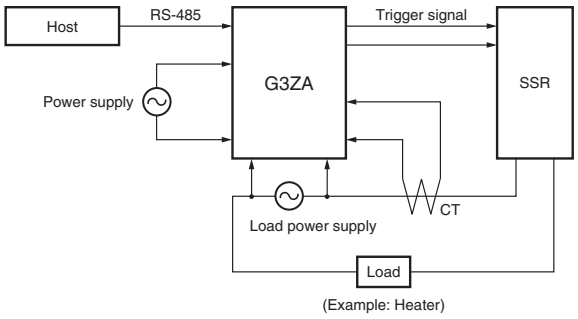
Communications Baud Rate

Set the baud rate for communicating with the host system on SW2.

SW2	0	1	2	3	4 to F
Baud rate	9.6	19.2	38.4	57.6	Do not set.

▲ Default

■ Connection Configuration



(Example: Heater)

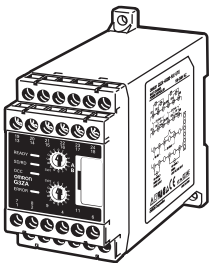
Note: Connect a power supply with the same phase as the SSRs to the load power supply terminals on the G3ZA.

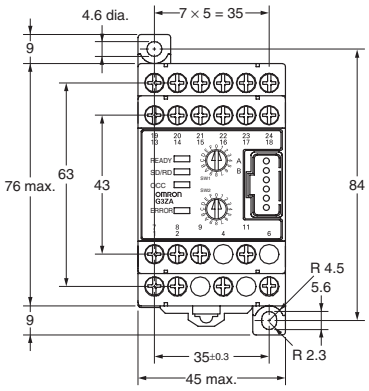
Dimensions

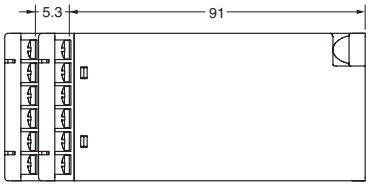
Note: All units are in millimeters unless otherwise indicated.

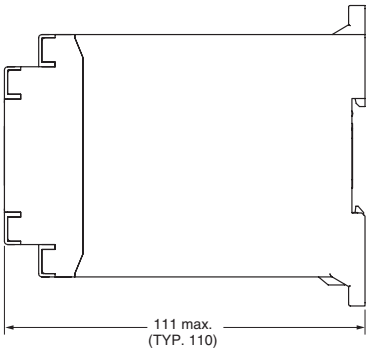
■ Multi-channel Power Controllers

G3ZA-4H203-FLK-UTU
G3ZA-4H403-FLK-UTU
G3ZA-8A203-FLK-UTU
G3ZA-8A403-FLK-UTU

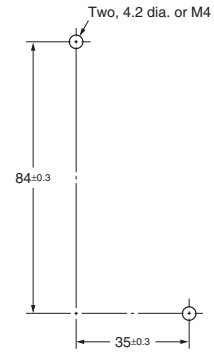








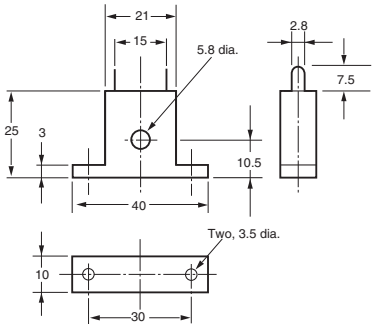
Mounting Hole Dimensions (For Direct Mounting)



■ Accessories (Order Separately)

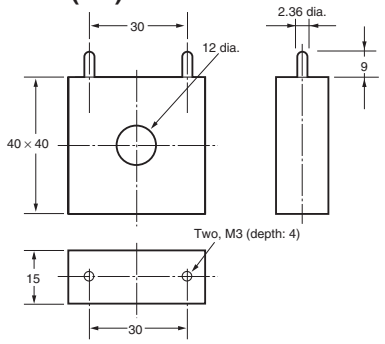
Current Transformer (CT)

E54-CT1



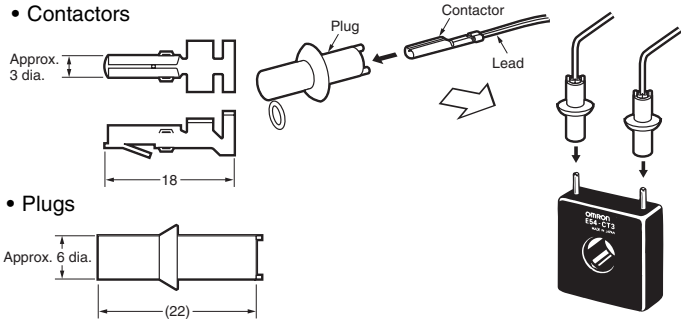
Current Transformer (CT)

E54-CT3



E54-CT3 Accessories

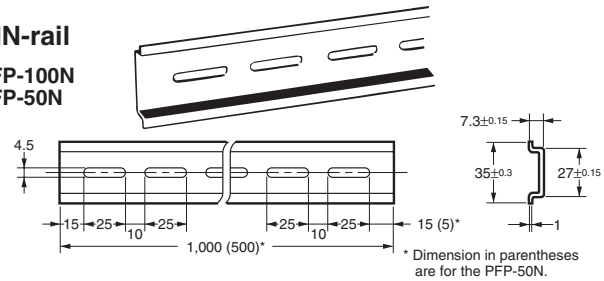
• Contactors



• Plugs

DIN-rail

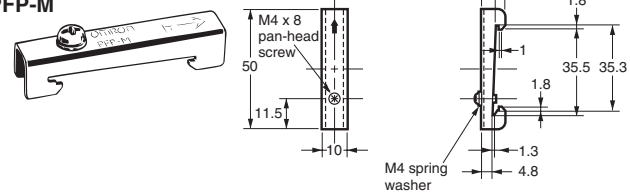
PFP-100N
PFP-50N



* Dimension in parentheses are for the PFP-50N.

End Plate (Stopper)

PFP-M



Precautions

⚠ WARNING

Do not touch the terminals and the wires while power is being supplied. Doing so may possibly result in electric shock. Make sure that the terminal cover is installed before using the product.

⚠ CAUTION

Do not allow pieces of metal, wire clippings, or fine metallic chips or filings from installation to enter the product. Doing so may occasionally result in electric shock, fire, or malfunction.

Do not use the product in locations of flammable or explosive gases. Doing so may occasionally result in minor or moderate explosion, causing minor or moderate injury, or property damage.

Do not attempt to disassemble, repair, or modify the product. Doing so may occasionally result in minor or moderate injury due to electric shock.

Perform correct setting of the product according to the application. Failure to do so may occasionally cause unexpected operation, resulting in minor or moderate injury, or damage to the equipment.

Ensure safety in the event of product failure by taking safety measures, such as installing a separate monitoring system to provide alarms for preventing excessive temperature rise. Product failure may occasionally prevent control operation, resulting in damage to the connected facilities and equipment.

Tighten the terminal screws securely using a tightening torque within the following ranges. Loose screws may occasionally cause fire, resulting in minor or moderate injury, or damage to the equipment.
Terminal screws: 0.40 to 0.56 N.m

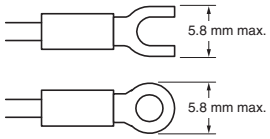
■ Precautions for Safe Use

1. Do not use the product in the following locations.
   - Locations subject to direct radiant heat from heating equipment
   - Locations where the product may come into contact with water or oil
   - Locations subject to direct sunlight
   - Locations where dust or corrosive gases (in particular, sulfuric or ammonia gas) are present
   - Locations subject to extreme temperature changes
   - Locations where icing or condensation may occur
   - Locations subject to excessive shocks or vibration
2. Use this product within the rated load and power supply.
3. Ensure that the rated voltage is achieved no longer than 2 s after turning the power ON.
4. Use/store within the rated temperature and humidity ranges.
5. Minimum mounting distance of G3ZA is 10 mm.
   When mounting the G3ZA near the SSRs, mount the G3ZA so as to not interfere with the heat dissipation of the SSR.
6. Use the specified size of insulated-type crimp terminals (M3, width: 5.8 mm max.) for wiring and attach insulative sleeves. To connect bare wires, use AWG22 (cross section: 0.326 mm^2) to AWG14 (cross section: 2.081 mm^2) to wire the power supply terminals and AWG22 (cross section: 0.326 mm^2) to AWG16 (cross section: 1.039 mm^2) for other terminals.
7. Be sure to confirm the correct terminal and polarity when wiring the terminal block and connectors.
8. Do not connect any conductors to unused terminals.
9. In order to prevent inductive noise, wire the lines connected to the product separately from power lines carrying high voltages or currents. Do not wire in parallel with or in the same cable as power lines. Other measures for reducing noise include running lines along separate ducts and using shield lines.
10. Attach a surge suppressor or noise filter to peripheral devices that generate noise (in particular, motors, transformers, solenoids, magnetic coils, or other devices that have an inductance component).
    Do not install the product near devices generating strong high-frequency fields or surges. When using a noise filter, check the voltage and current and install it as close to the product as possible.
11. For a safety disconnection of the power-line in the application, the equipment must be provided with disconnecting devices suitable for isolation.
    (e.g., circuit breakers defined in IEC60947-2, power switches defined in IEC60947-3, power plugs, etc.)
12. The G3ZA is for **single-phase loads only**. Connect only single-phase zero-cross SSRs.
    Do not connect three-phase SSRs, magnetic relays, or SSRs that do not have a zero-cross function.

■ Precautions for Correct Use

Wiring

Use M3 crimp terminals.

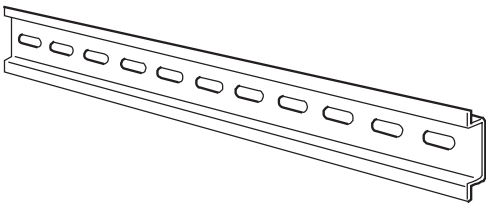


Use wires that withstand a minimum of 70 °C.

DIN-rail

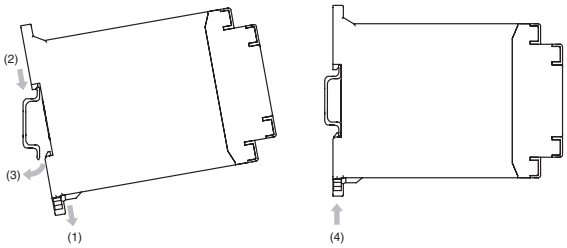
Secure the DIN-rail with screws in at least three locations.

DIN-rail: PFP-50N (50 cm)/PFP-100N (100 cm)



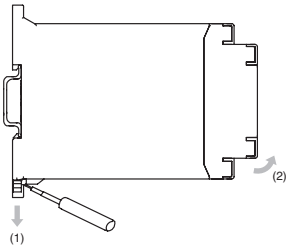
Mounting the G3ZA

Mount the G3ZA as shown in the diagram. First, pull down the DIN-rail mounting hook (1) and hook the top of the G3ZA on the DIN-rail (2). Then press the G3ZA onto the DIN-rail far enough so that it can be locked in place (3) and push the DIN-rail mounting hook up to lock the G3ZA in place (4).



Removing the G3ZA

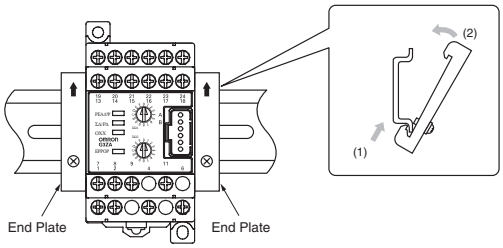
Use a flat-blade screwdriver to pull down the DIN-rail mounting hook (1) and then pull out on the bottom of the G3ZA (2).



Mounting End Plates

Be sure to mount an End Plate on each side of the G3ZA so that it does not slide on the DIN-rail.

To mount an End Plate, hook the bottom of the End Plate on the bottom of the DIN-rail (1), place the top of the End Plate on the DIN-rail (2), and then pull down on the End Plate. Tighten the screw on the End Plate to secure it.



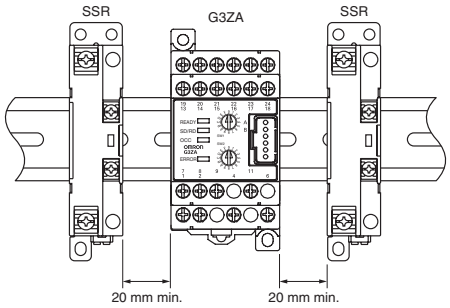
Note: Always mount one End Plate on each side of the G3ZA.

Installation Example

When installing the SSRs next to the G3ZA, provide sufficient space between the G3ZA and SSRs, as shown in the following diagram.

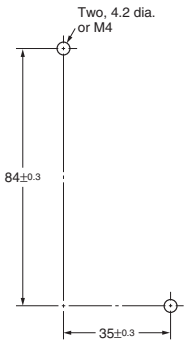
Reference example:
When applying 10 A to the G3PA-210B-VD (a manipulated variable of 100%), **separate the SSRs from the G3ZA by at least 20 mm**.

Do not touch the G3ZA while power is being supplied.



Mounting with Screws

Mounting Dimensions (Unit: mm)



Warranty and Application Considerations

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS, OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS 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 OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

Cat. No. J147-E2-01A

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