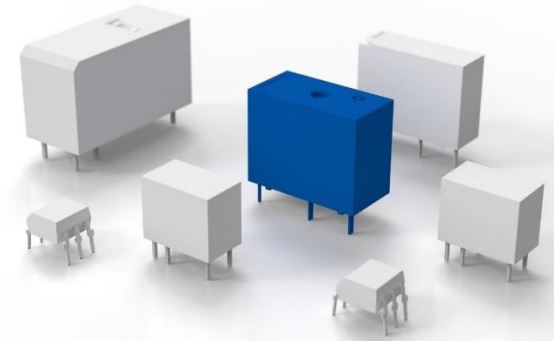




G9KA-1A1B-E

PCB High Power Relay

**carrying/breaking 300 A max at 1,000 VAC
with N.C. auxiliary contact**



OMRON Corporation
Device & Module Solutions Company

Aug 2025



Overview

- New high power relay adding **N.C. auxiliary contact** to existing G9KA-1A-E for contact failure monitoring
- Main contact specifications including **1,000 VAC 300 A** with **low contact resistance of 0.2 mOhm max**
- This relay would be especially suitable (but not limited) for applications which requires **higher reliability** such as **PV/ESS Inverters, Fast EV chargers** and **Power Supply/UPS**, proposing **smaller space** needed and **less labor cost** in assembly needed compared to conventional contactors.

Model		G9KA-1A-E	G9KA-1A1B-E
Contact Form		SPST-NO (1a)	SPST-NO + SPST-NC (1a1b)
Max. Switching Voltage	Main	1,000 VAC	(Same as left)
	Aux	(N/A)	30 VDC
Max. Switching Current	Main	300 A	(Same as left)
	Aux	(N/A)	1 A
Contact Resistance	Main	0.2 m Ohm max.	(Same as left)
Coil Power Consumption		5,000 mW (1,012 mW at 45% holding)	6,000 mW (1,012 mW at 41% holding)
Outline Dimensions (Max values)		56.7 mm x 51.0 mm x (H) 54.5 mm	56.7 mm x 61.0 mm x (H) 58.4 mm

especially for

- ✓ **PV/ESS Inverters**
- ✓ **Fast EV Chargers**
- ✓ **Power Supply/UPS**

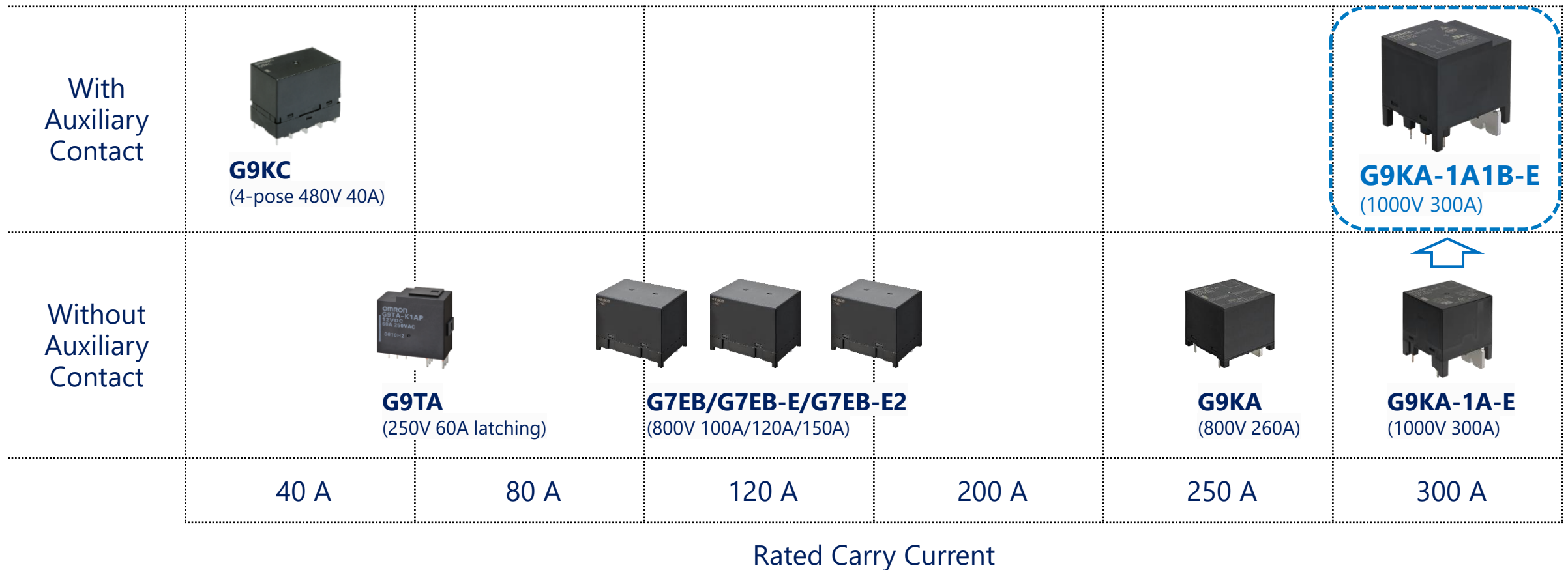


Smaller Space & Less Labor Cost needed in assembly for customers compared to conventional contactors

Product Positioning

- G9KA-1A1B-E is **the first relay with auxiliary contact in Omron's >50 A high power** relays.
- Even on the market, >200A PCB relays with auxiliary contact are rarely available.
- Same as G9KA-1A-E, this relay has **the highest voltage & current ratings** in Omron's PCB relays.

Omron PCB High Power AC Relays (>40A)



Background of Product Launch

- As getting higher capacity of PCB relays, customers prefer to replace contactors with PCB relays. However, it was **an issue that most of PCB relays did not have auxiliary contact** option. With requests from several customers, Omron determined to add auxiliary contact option to G9KA-1A-E.

PCB Relays are getting Higher capacity

- ✓ With improving high current PCB technology, PCB relays are expanding the range of applications (getting higher capacity)

Issue of Replacing Contactors with PCB Relays

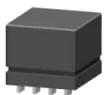
- ✓ Some manufactures prefer PCB solution for downsizing and cost reduction.
- ✓ Most of existing PCB relays did not have auxiliary contact
- ✓ Most of contactors have auxiliary contacts and contactor users are utilizing the function for fault monitoring

Areas where replacement of contactor is in progress

Switching device type

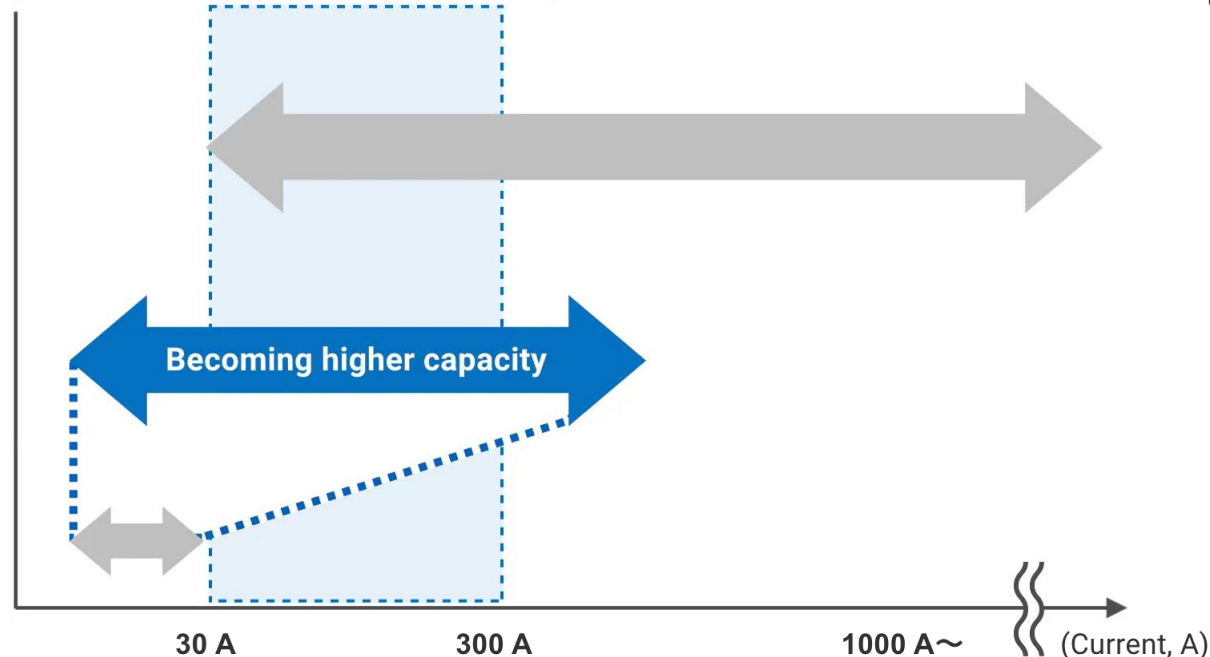


Contactor
Electromagnetic
contactor



PCB relay

Conventional PCB relay



Providing Solution

- ✓ With requests from several customers, Omron had determined to add auxiliary contact to G9KA-1A-E.
- ✓ Besides G9KA-1A-E, Omron is also considering to add relays with auxiliary contact option.

New Product Main Spec (1/2)

- Main contact ratings are same as existing G9KA-1A-E.
- Adding **30 VDC 1 A Normally Closed SPST Auxiliary Contact** for welding failure monitoring.

Model Number	G9KA-1A-E	G9KA-1A1B-E
Contact Form	Main: SPST-NO (1a)	Main: SPST-NO + Aux: SPST-NC (1a1b)
Max. Switching Voltage	Main: 1,000 VAC	Main: (Same as G9KA-1A-E) Aux: 30 VDC
Max. Switching Current	Main: 300 A	Main: (Same as G9KA-1A-E) Aux: 1 A
Rated Carry Current	Main: 300 A	Main: (Same as G9KA-1A-E) Aux: 1 A
Rated Load & Electrical Durability (Resistive) (1s On - 9s OFF) (Ambient 85 deg.C)	Main: 1,000 VAC making 50 A, carrying 300 A, breaking 50 A 30,000 operations min. 1,000 VAC making 150 A, carrying 300 A, breaking 300 A 10 operations min.	Main: (Same as G9KA-1A-E) Aux: 30 VDC 1 A 100,000 operations min.
Mechanical Durability	100,000 operations min.	(Same as G9KA-1A-E)
Contact Resistance	Main: 0.2 m Ohm max.	Main: (Same as G9KA-1A-E) Aux: 100 m Ohm max.

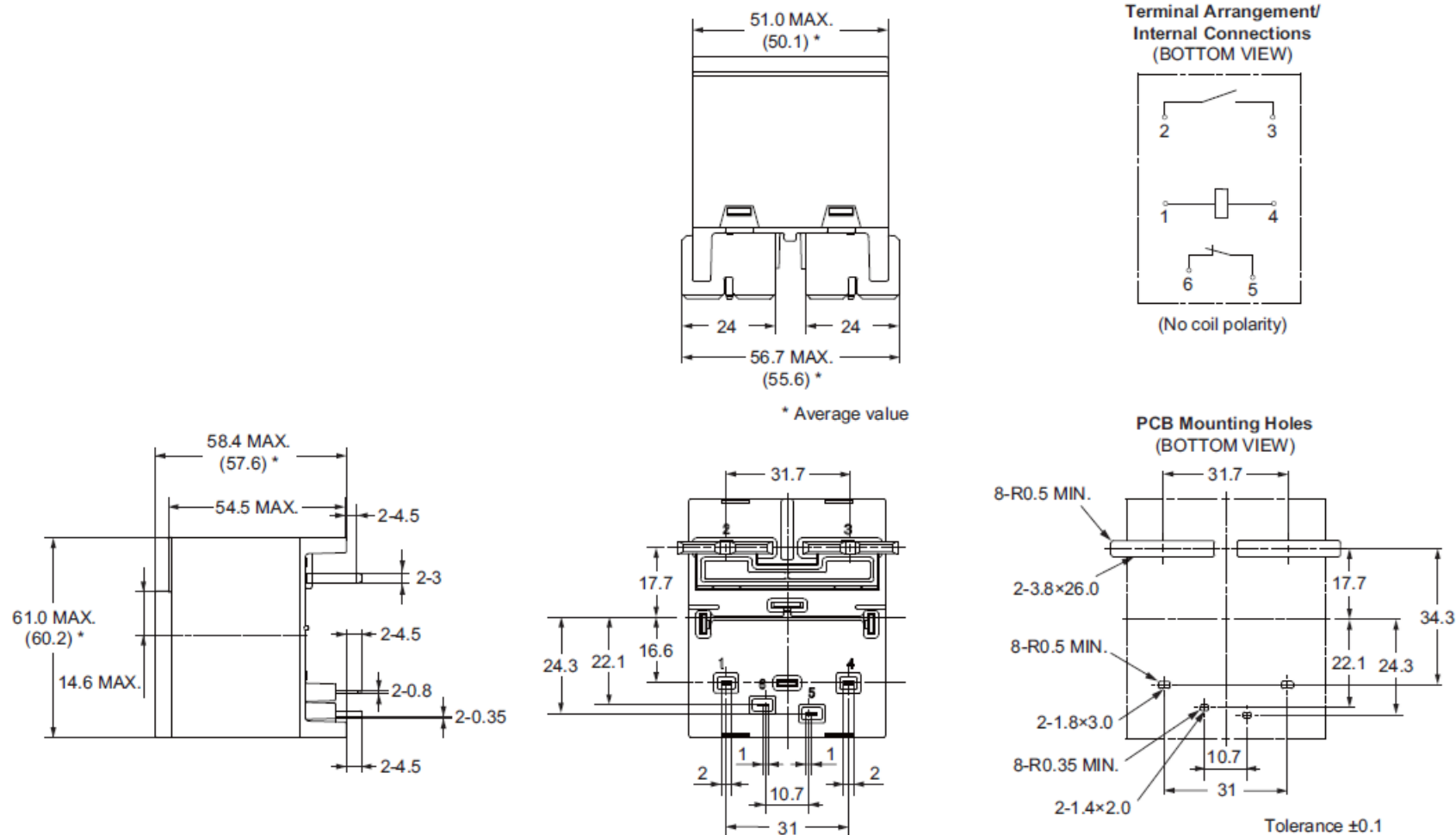
New Product Main Spec (2/2)

- The range of coil holding voltage is slightly changed and coil power consumption at the lowest holding voltage is same as G9KA-1A-E.
- Outline dimensions are also slightly changed. Refer to the next page for details.

Model Number	G9KA-1A-E	G9KA-1A1B-E
Contact Gap	Main: 4.0 mm min.	Main: (Same as G9KA-1A-E)
Dielectric Strength	Main: 5,000 VAC between coil and contacts 2,000 VAC between contacts of the same polarity	Main: (Same as G9KA-1A-E) Aux: 500 VAC between coil and contacts 400 VAC between contacts of the same polarity 5,000 VAC between main and auxiliary contacts
Coil Rated Voltage	12 VDC, 24 VDC	(Same as G9KA-1A-E)
Coil Max. Voltage	120% of rated voltage (23 deg.C)	110% of rated voltage (23 deg.C)
Coil Holding Voltage	45% to 60% of rated voltage	41% to 55% of rated voltage
Coil Power Consumption	Approx. 5,000 mW at rated voltage Approx. 1,012 mW at 45% holding voltage	Approx. 6,000 mW at rated voltage Approx. 1,012 mW at 41% holding voltage
Failure Rate (Reference value)	Main: 5 VDC 1 A (M Level)	Main: (Same as G9KA-1A-E) Aux: 5 VDC 1 mA (M Level)
Outline Dimensions (Max values)	(L) 56.7 mm x (W) 51.0 mm x (H) 54.5 mm	(L) 56.7 mm x (W) 61.0 mm x (H) 58.4 mm Refer to the next page

Dimensions

- Outline dimensions of G9KA-1A1B-E are slightly longer than G9KA-1A-E in width (51 mm to 61 mm) and height (54.5 mm to 58.4 mm).
- **Main contact pins and coil pins are compatible with G9KA-1A-E.**



New Product Features & Benefits

- **Reliable auxiliary contact** could accelerate replacing contactors with PCB relays, providing benefits of **smaller space** needed & **less labor cost** in assembly needed.

Features

Reliable Auxiliary Contact

- ✓ Conformed to mirror contact structure specified by IEC/EN 60947-4-1 Annex F7.2
- ✓ Bifurcated crossbar gold plated contact can provide min. switching load of 5 VDC 1 mA (reference value)

High Carry Current & Low Contact Resistance

- ✓ Same as existing G9KA, 300 A of rated carry current & max. 0.2 m Ohm of contact resistance of main contacts are one of highest spec in PCB relays

Smaller Size than Contactors

PCB mounting

Benefits

Applicable for Reliable Systems

- ✓ High reliability of auxiliary contact is one of keys to be applied to systems which requires high reliability of operation.

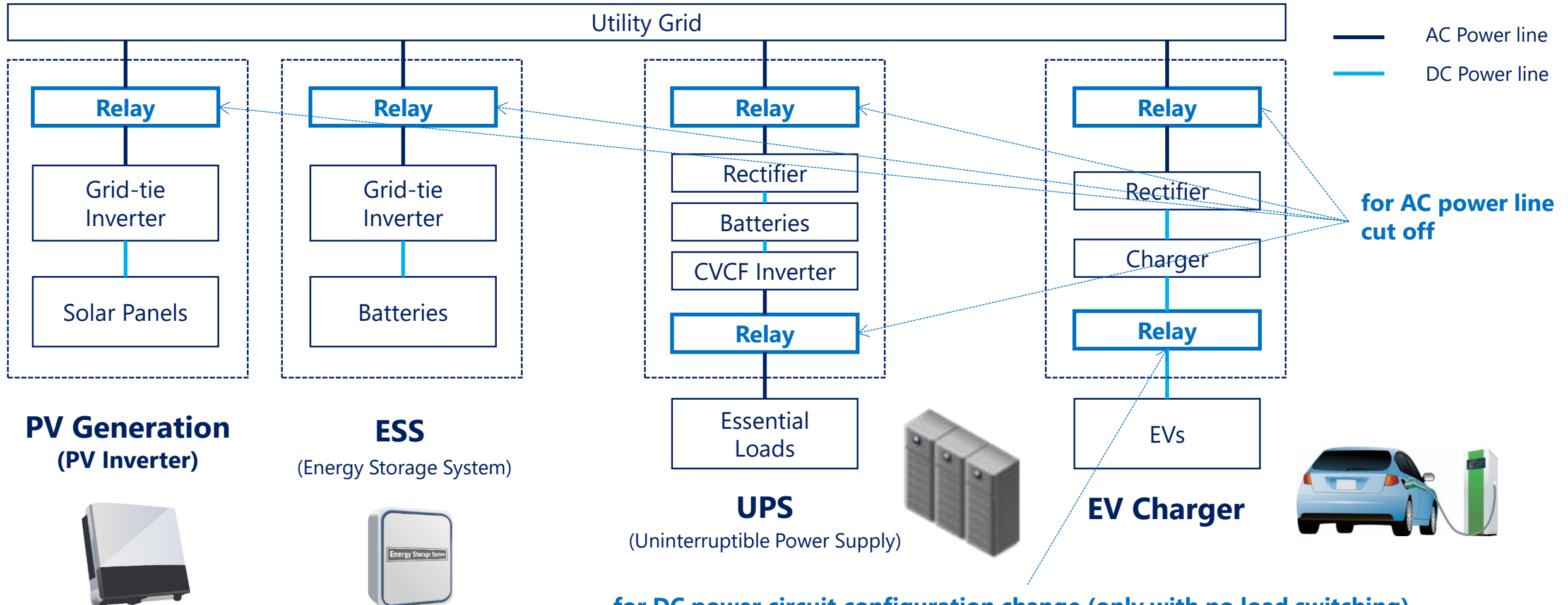
Easy to replace Contactors

- ✓ Designers can replace conventional contactors with auxiliary contact with less design modifications.

Smaller Space needed & Less Labor Cost in assembly needed by replacing Contactors with this relay

Target Applications

- G9KA-1A1B-E would be especially suitable (but not limited) for applications which **requires higher reliability** such as **PV/ESS Inverters, Fast EV chargers** and **Power Supply/UPS**

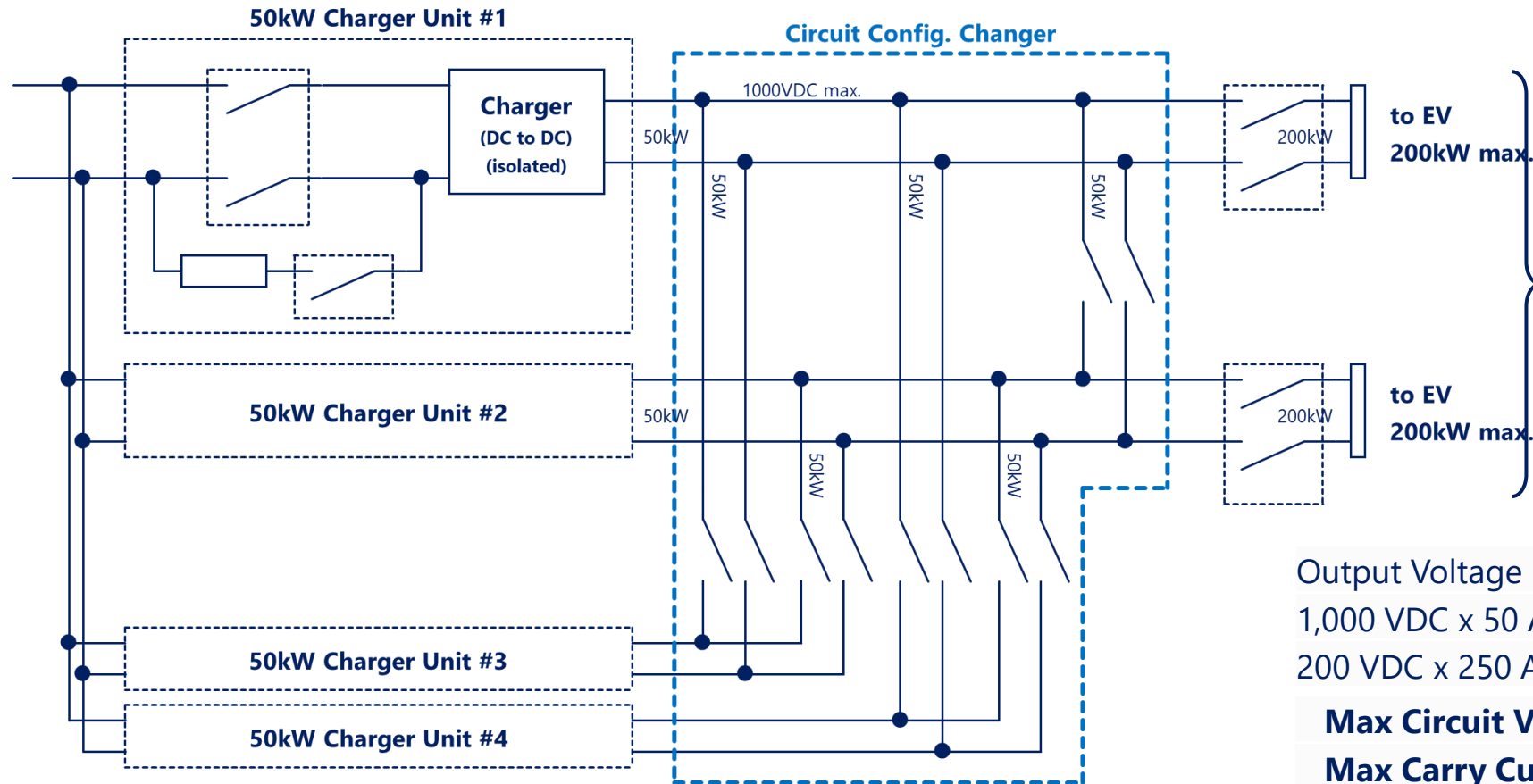


for DC power circuit configuration change (only with no load switching)

No load switching (dry switching) applications may have risks of contact resistance increase. Please inform Omron in advance when dry switch application will be considered.

Example of Application (Output Circuit Changer in Fast EV Charger)

- G9KA-1A1B-E could be applied to circuit configuration changer in Fast EV Charger.



Configuration Profile

Config.	Output#1	Output#2
1	200kW	0kW
2	150kW	50kW
3	100kW	100kW
4	50kW	150kW
5	0kW	200kW

Only with No Load Switching

Output Voltage Range : 250 to 1,000 VDC

$1,000 \text{ VDC} \times 50 \text{ A} = 50 \text{ kW}$

$200 \text{ VDC} \times 250 \text{ A} = 50 \text{ kW}$

Max Circuit Voltage 1,000 VDC

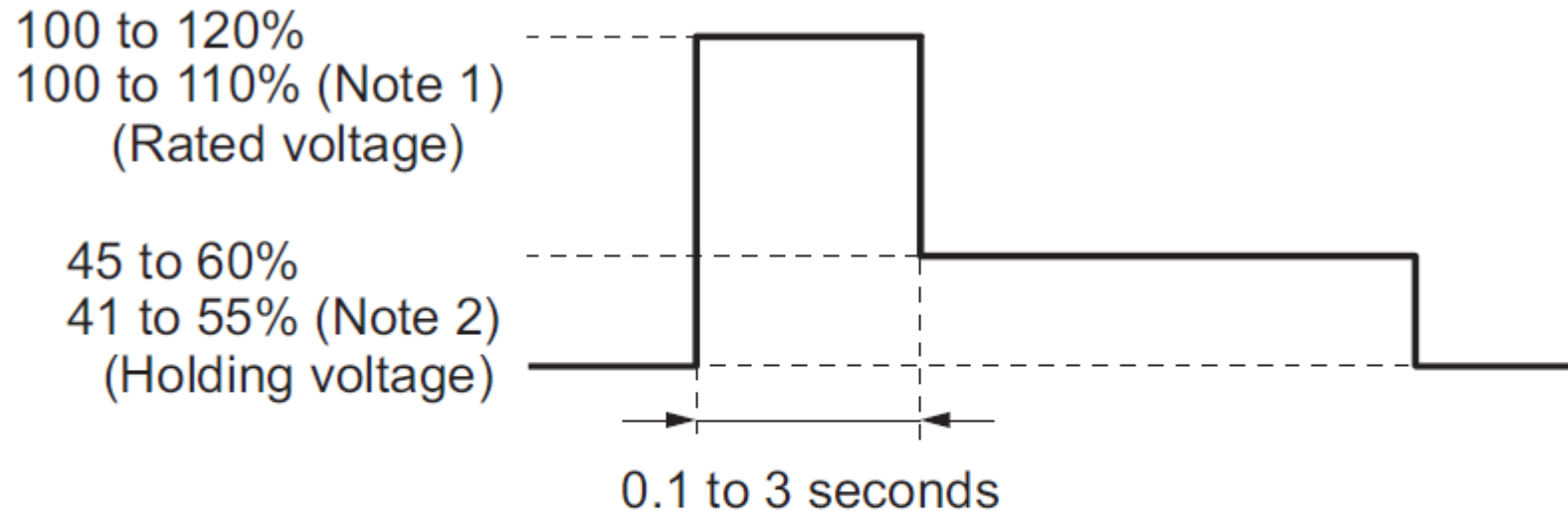
Max Carry Current 250A

G9KA-1A1B-E applicable

*No load switching (dry switching) applications may have risks of contact resistance increase.
Please inform Omron in advance when dry switch application will be considered.*

Precautions : Holding Voltage should be applied

- G9KA-1A1B-E **MUST BE USED at Holding Voltage** after making.
- Please note that holding voltage specification for G9KA-1A1B-E is slightly different from existing G9KA-1A-E.
- For the detail of holding voltage, please refer to the Datasheet, White Paper, or ask us.



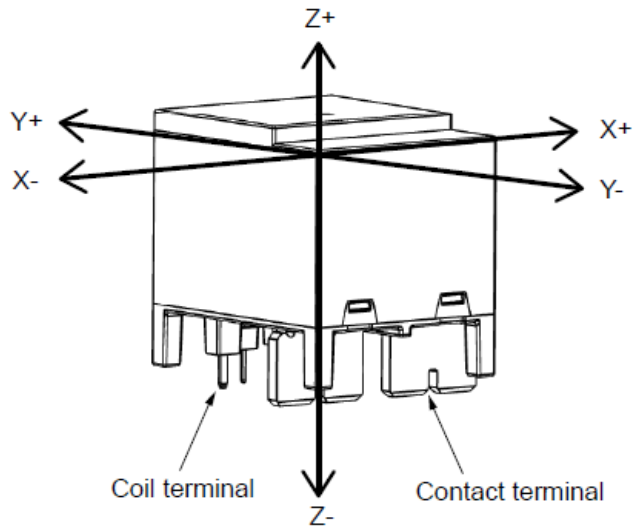
Note 1. 100 to 110% for G9KA-1A1B-E only.

Note 2. 41 to 55% for G9KA-1A1B-E only.

Precautions : Malfunction Shock Resistance on each direction

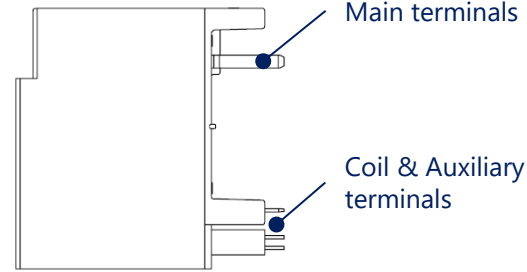
- Malfunction shock resistance is different depending on its mounting direction.
- Please be careful that mounting direction meets with required shock resistance in your design.

Mounting direction and Malfunction shock resistance for this relay



Mounting direction Y+

Upper side



Mounting direction

Mounting directions
other than that
illustrated on the left

Malfunction shock resistance

Excitation : 98 m/s²
No excitation : 25 m/s²

Malfunction shock resistance

Excitation : 98 m/s²
No excitation : 98 m/s²

Model Number Variations of G9KA-1A1B-E

- G9KA-1A1B-E has 2 model number variations based on rated coil voltage (12 VDC & 24 VDC).

Variations of G9KA Series



Classification	Contact form	Enclosure rating	Model	Rated coil voltage	Minimum packing unit
Standard	SPST-NO (1a)	Flux protection	G9KA-1A	12 VDC 24 VDC	36 pcs/box
High-Capacity	SPST-NO (1a)		G9KA-1A-E		
	Main: SPST-NO (1a) Aux: SPST-NC (1b)		G9KA-1A1B-E		

Variations of G9KA-1A1B-E Model

Model Number	Description
G9KA-1A1B-E DC12	High-Capacity Model (1,000 VAC 300 A), with N.C. Auxiliary Contact , Coil Voltage of 12 VDC
G9KA-1A1B-E DC24	High-Capacity Model (1,000 VAC 300 A), with N.C. Auxiliary Contact , Coil Voltage of 24 VDC



Thank You