

May 19, 2022

OMRON Launches "G9KB" Relay for High-Capacity Electricity Storage Systems, Contributing to Realization of a Decarbonized Society with its " Switching Technology"

OMRON Corporation (HQ: Shimogyo-Ku, Kyoto. President and CEO: Yoshihito Yamada) has announced the release of a new high voltage DC relay "G9KB" for high-capacity household electricity storage systems globally.

OMRON aims to contribute to the realization of a decarbonized society by expanding product line-ups, including G9KB, with low power consumption for energy-saving equipment. G9KB safely cuts off the direct current in household storage systems that have been increasing in capacity. It also plays a role in encouraging renewable energy by downsizing products.



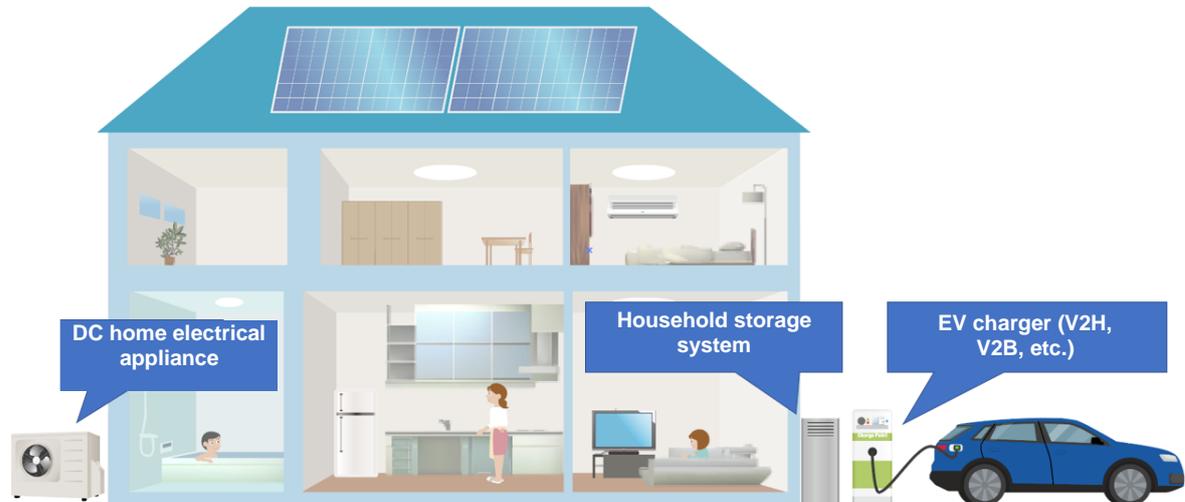
"G9KB" high voltage DC relay supporting 600 VDC / 50A (L 50.5mm x W 37.0mm x H 50.5mm)

Recently, there has been a growing need for electricity storage systems for the realization of carbon neutrality and for the enforcement of resilience in natural disasters. Therefore, the capacity of household storage batteries, which aimed for the domestic consumption of the electric power generated by the solar power generation system, has been increasing. To achieve high capacity, the challenge is to secure the safety of products and downsize parts.

OMRON has been working on developing a technology that connects and switches electricity safely and securely and this high voltage DC relay "G9KB comes equipped with the same. By adopting the arc cut-off technology^{*1} and the new 3D arc simulation technology created by industry-academia collaboration, the relay handles the charging of electricity storage system, switching control and safe cut-off of the direct current which runs during discharging. In the 3D arc simulation technology, OMRON has established a method to analyze the safe cut-off process of the high voltage DC and to reflect the analysis result to the component structure design. With these technologies, the compact high voltage DC relay which securely and safely cuts off DC is realized and it also ends up contributing to the downsizing and weight reduction of the customer's products.

OMRON strives to create new solutions with a focus on leading-edge devices and modules. These solutions are made available globally and aim to work towards the realization of a decarbonized society through customers' products and services.

Major Applications



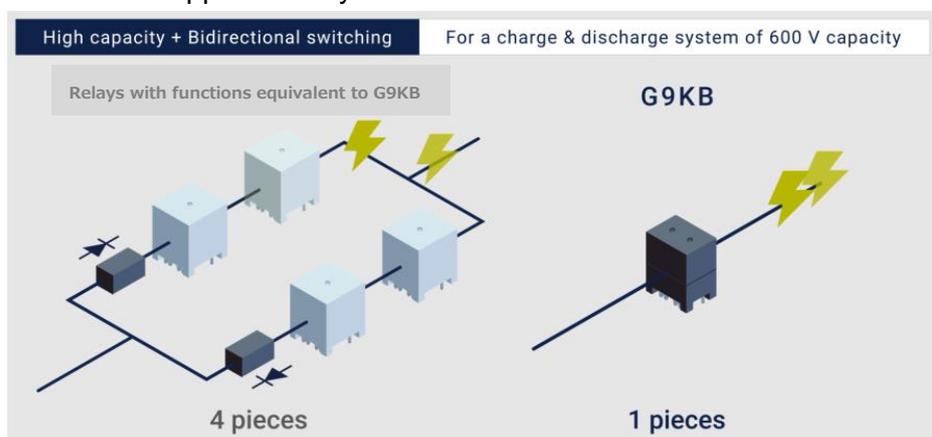
Main Features of “G9KB”

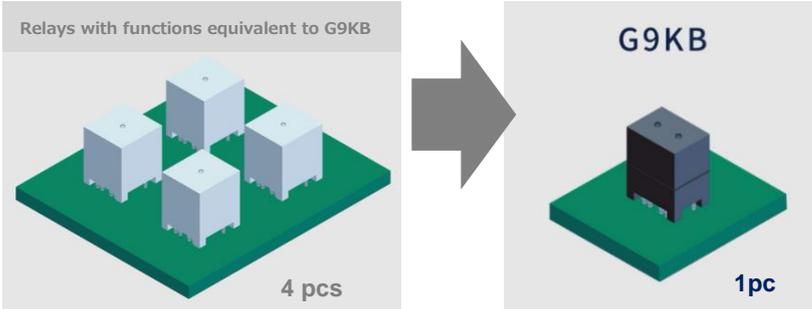
① High-capacity DC relay supporting DC power supply applications

- Connecting and disconnecting 600 VDC/50A; supports equipment and applications which open/close high DC load.
- Safety standards (UL60947-4-1, EN61810-10) required for solar power generation system components and electricity storage system components acquired. G9KB simplifies the application procedure for safety standards of the customer’s products.

② Contributing to the downsizing and energy saving of customers’ products

- In the 600 V high voltage system, DC switching control and safe cut-off have been achieved with one relay.
- When compared with one-way relays having equivalent functions, the board floor gets reduced to approximately 75%^{*2}.
- When compared with one-way relays having equivalent functions, the coil consumption power gets reduced to approximately 60%^{*3}.

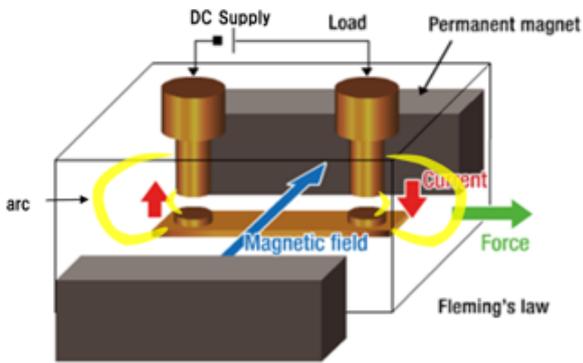




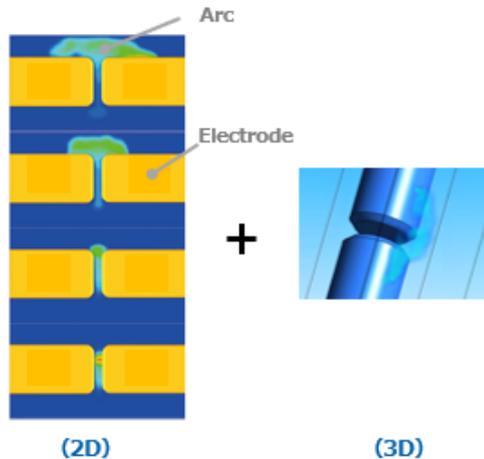
③ Through combinations of these technologies, both - high safety levels and downsizing - achieved.

- By using the magnetic field generated from the permanent magnet located near the contact point, the arc discharge^{*4} between relay contacts in DC cut-off becomes elongated. With this arc cut-off technology^{*1}, high capacity DC can be securely and safely cut off.
- By using the 3D arc simulation technology generated in industry-academia collaboration, the speed and quality of design and technology verification improved. By visualization of arc phenomenon, the arc cut-off process inside the relay streamlined, and downsizing the component body realized.

Arc cut-off technology



Arc simulation technology(CAE)



Major Specifications of “G9KB”

Item	G9KB
Contact Configuration	1a
Contact Gap	>3.6 mm
Contact Resistance	≤5 mΩ ^{*5}
Rating	600 VDC/50A (Resistance load)
Electric Service Life (Resistance Load)	±2,000 times at rated load (Switching frequency: 1 second ON - 9 seconds OFF at 85°C, 25 to 75% RH) The recommended voltage of Zener diode is 3 times that of the rated voltage.



Main Contact Polarity	None
Mechanical Service Life	1,000,000 times (Switching frequency: 10,800 times/h)
Coil Voltage	12 VDC / 24 VDC (Hold voltage: 45 to 60%)
Coil Power Consumption	Approx. 2.8 W (Hold voltage: At 45%: 0.57W)
Operating Temperature	-40 to +85°C
Size	L 50.5 x W 37.0 x H 50.5 mm
Terminal	PCB
Structure	Flux resistant
Safety Standard	UL60947-4-1, EN61810-10, CQC

Browse through this link for more : <https://components.omron.com/us-en/products/relays/G9KB>

*1 Arc cut-off technology: A technology which cuts off the arc generated between contacts when opening the relay contact by using the magnetic field from the permanent magnet located near the contact.

*2 Reduced to approx. 75%: In-company investigation in May 2022

*3 Reduced to approx. 60%: In-company investigation in May 2022

*4 Arc discharge: Arc is an electrical discharge in the air through increase of electrical conductivity due to dissociation and disaggregation of gas molecules in high air temperature such as several thousand degrees or higher.

*5 Contact resistance ≤ 5 m Ω : Measuring condition 6 VDC, 20 A (after 30 seconds) Voltage drop method

About Device and Module Solutions Business Company

Working with the mission - "With our devices and modules, create customer value, and contribute to people and society on the planet" – the purpose of OMRON's **Device and Module Solutions Business Company** is to provide core parts to connect and disconnect electricity globally such as relays, switches, connectors, and devices such as sensors which are used as the eyes and ears for a wide variety of products. For more information, please visit : <https://components.omron.com/us-en/>.

About OMRON Corporation

OMRON Corporation is a global leader in the field of automation based on its core technology of "Sensing & Control + Think." OMRON's business fields cover a broad spectrum, ranging from industrial automation and electronic components to social systems, and healthcare. Established in 1933, OMRON has about 30,000 employees worldwide, working to provide products and services in around 120 countries and regions. For more information, visit OMRON's website: <https://www.omron.com/global/en/>

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