RETHINK CHARGING EFFICIENCY

EV CHARGING SOLUTIONS

OMRON

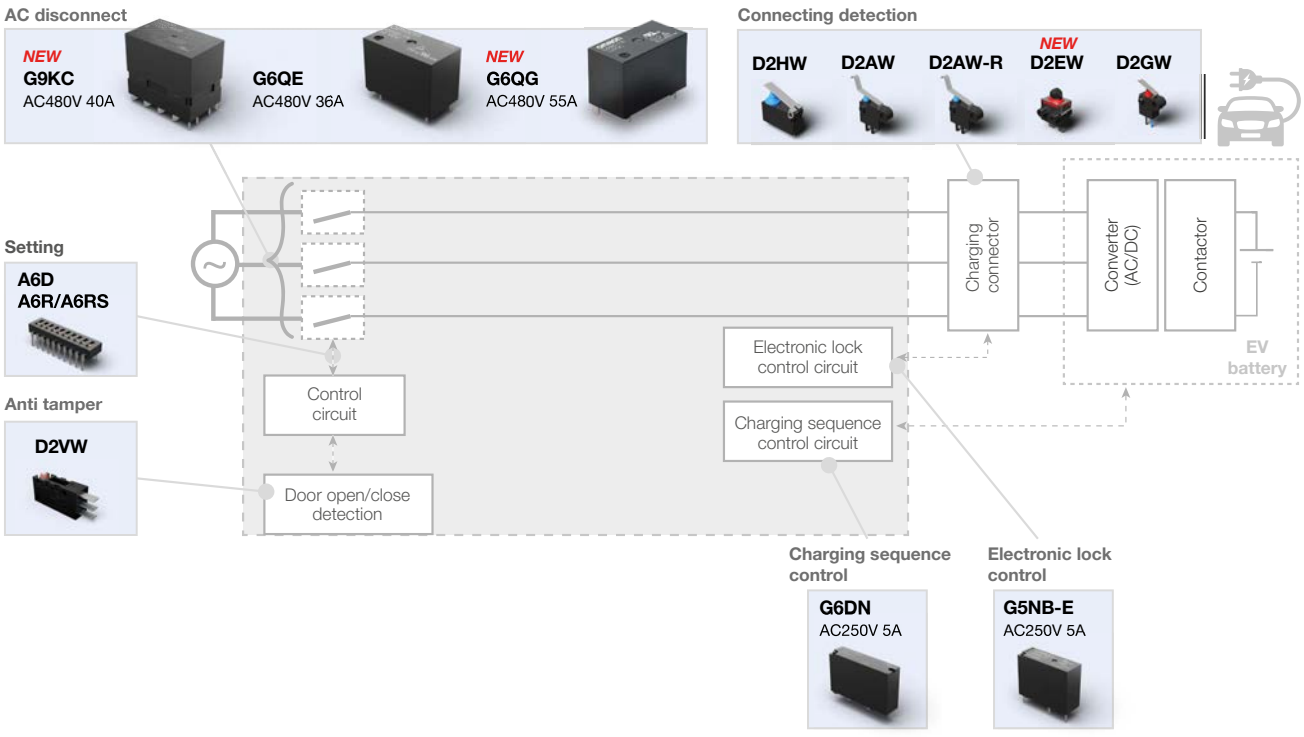
Driving excellence in EV charging

OMRON supports EV charger manufacturers with sustainable, energy-saving components that improve the efficiency and performance of their products. We offer a full range of relays, switches, sensors and connectors for AC and DC chargers. Trusted worldwide, our solutions assist charging, control, communication and detection, leading to charging technologies that are perfectly adapted to modern lifestyles.

AC wallbox chargers

Stationary AC wallbox chargers enable convenient charging in general households as well as commercial, industrial and public areas. Our dependable relays, switches and connectors meet the strictest quality standards while helping manufacturers to save on assembly time and costs. The lineup now includes our new G9KC 4-pole relay, which combines a compact format with low contact resistance for enhanced charger endurance and energy efficiency.

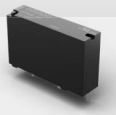
AC wallbox product lineup



Note : The listed voltage is maximum switching voltage. The listed current is maximum switching current.

Charging sequence control

G6DN
AC250V 5A



Electronic lock control

G5NB-E
AC250V 5A

Control circuit

A6D

A6R/A6RS

AC disconnect

G9KC
AC480V 40A

G6QE
AC480V 36A

G6QG
AC480V 55A

Door open/close detection

D2VW

Signal relay for controller area network (CAN)

G6J-Y
DC30V 1A / AC125V 0.3A

Connecting detection

D2HW

D2AW

D2AW-R

D2GW

D2EW

Note : The listed voltage is maximum switching voltage. The listed current is maximum switching current.

G9KC

Rethink efficiency for your wallbox products

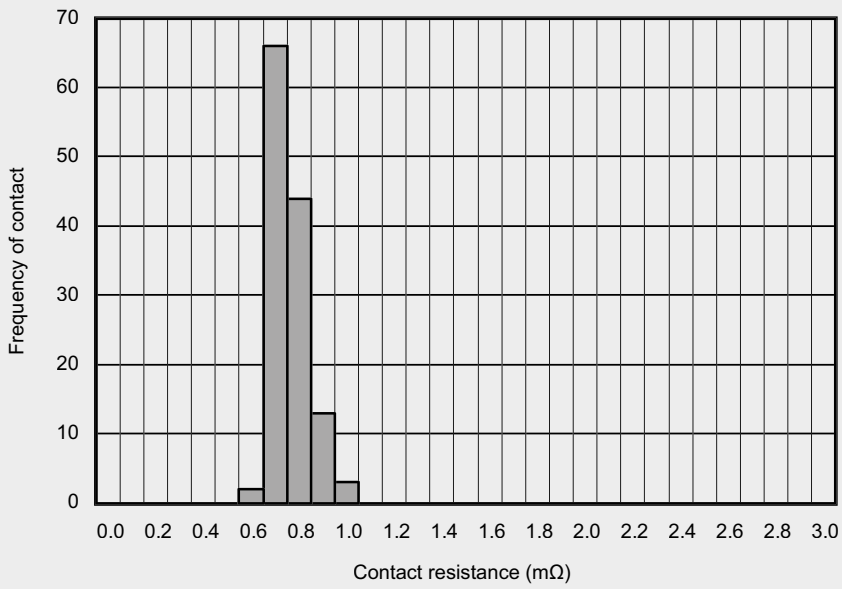
Our G9KC relay revolutionises the AC wallbox with new levels of energy efficiency and durability. This 480VAC 40A 4-pole high power relay offers low and stable contact resistance, making it perfect for your most demanding wallbox designs. As well as reducing energy consumption, it achieves lower heat dissipation for enhanced endurance and a longer lifecycle.

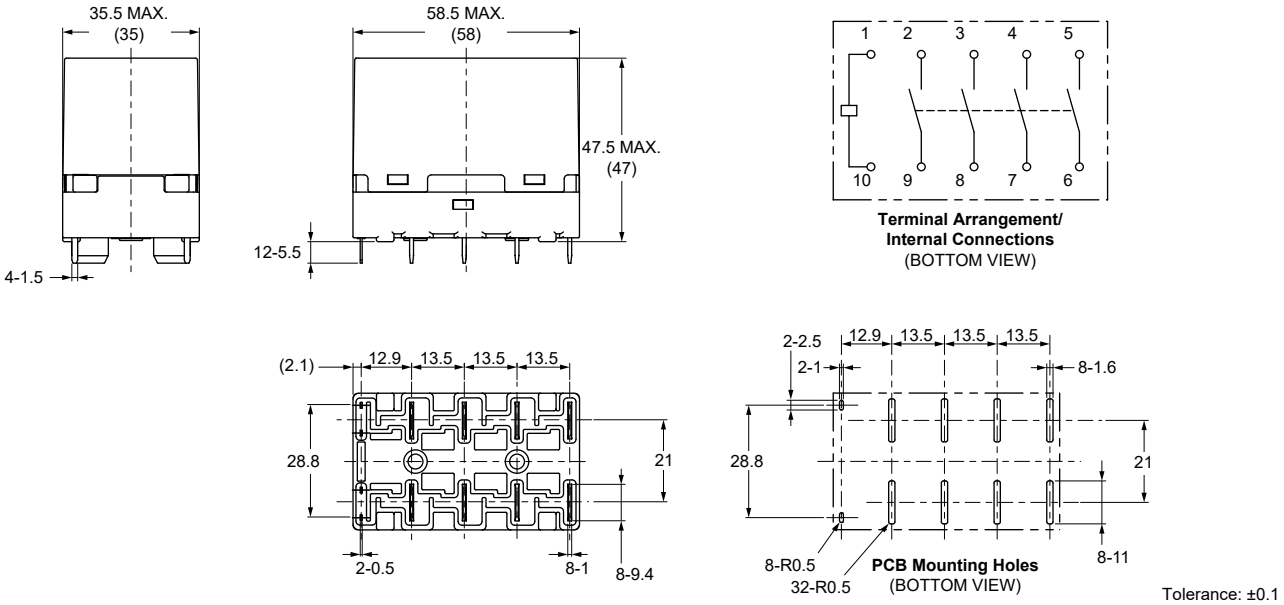
This compact, high-performing relay is an ideal component in EV chargers, battery systems, PV and hybrid inverters and UPS applications.

G9KC features

- 4a double-break, mechanically coupled main contact
- Low contact resistance
- 1b Aux. contact option complies with IEC 60947-4-1
- High short circuit compliance (IEC62955:2018)

Low contact resistance for high wallbox performance

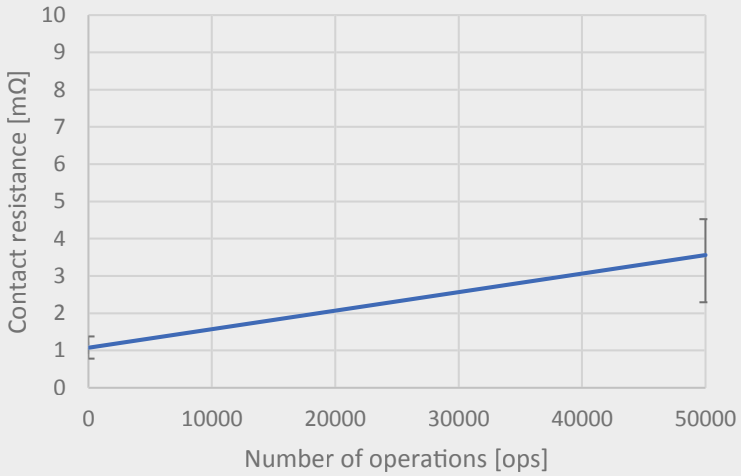




Tolerance: ±0.1

Build efficiency into your designs

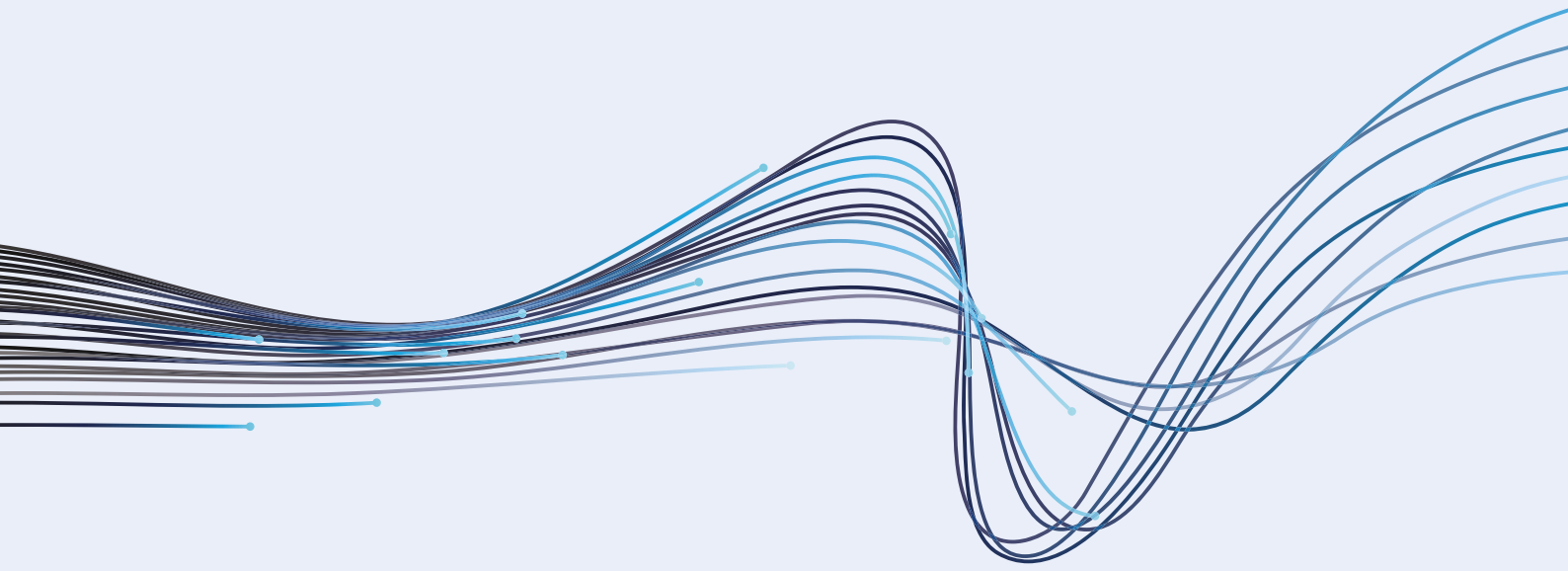
- Reduced temperature rise capability
- Energy-saving low and stable contact resistance
- Low coil power consumption
- Space-saving compact format

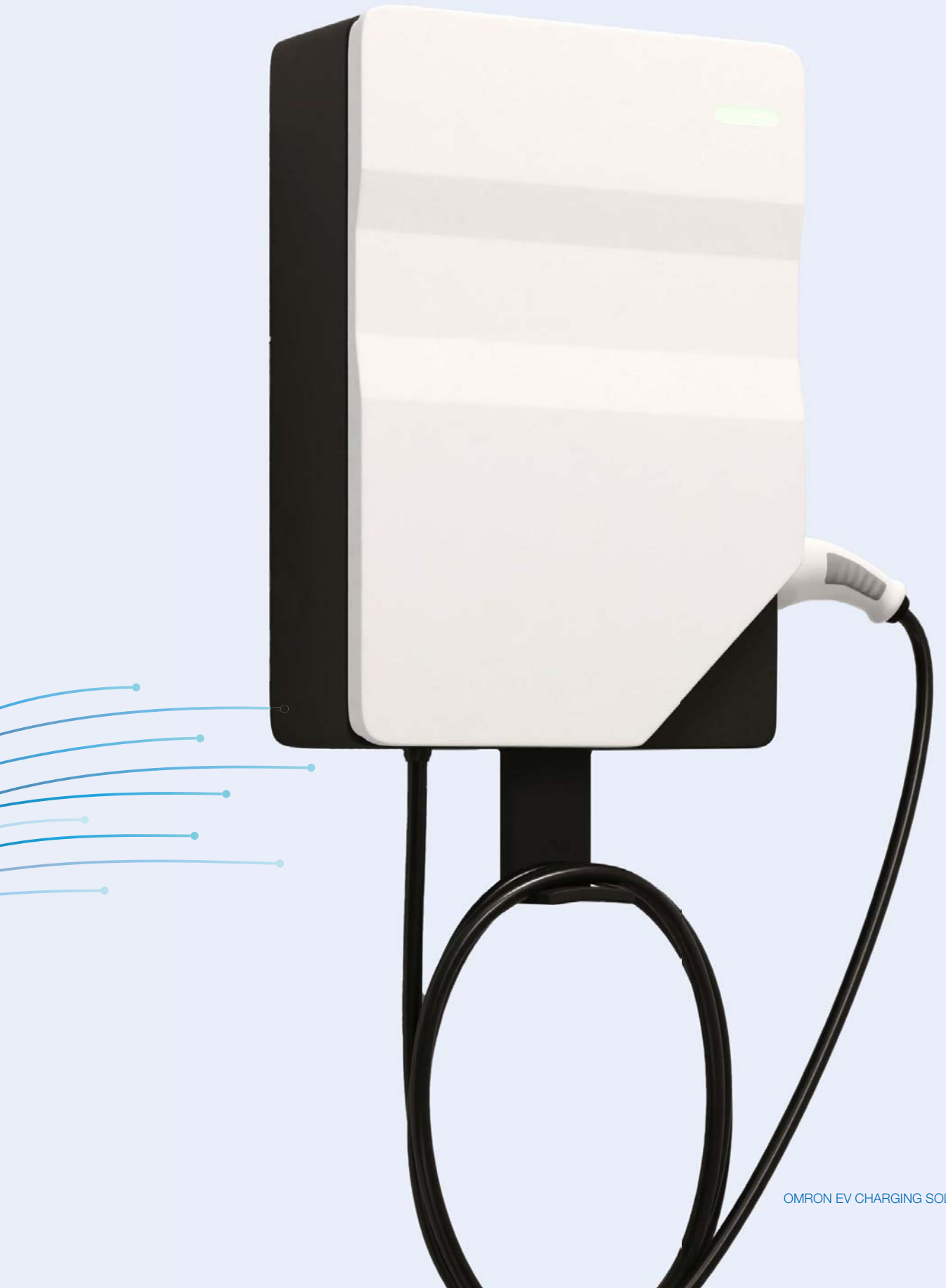


- Less localised PCBA heating leads to longer service life (improved charger endurance)
- Reduced risk of catastrophic failure of adjacent components resulting from heat-related stress
- Potential for shorter, more efficient charge cycles
- Helps to reduce the risk of overheating
- Increased flexibility for component placement and PCB design

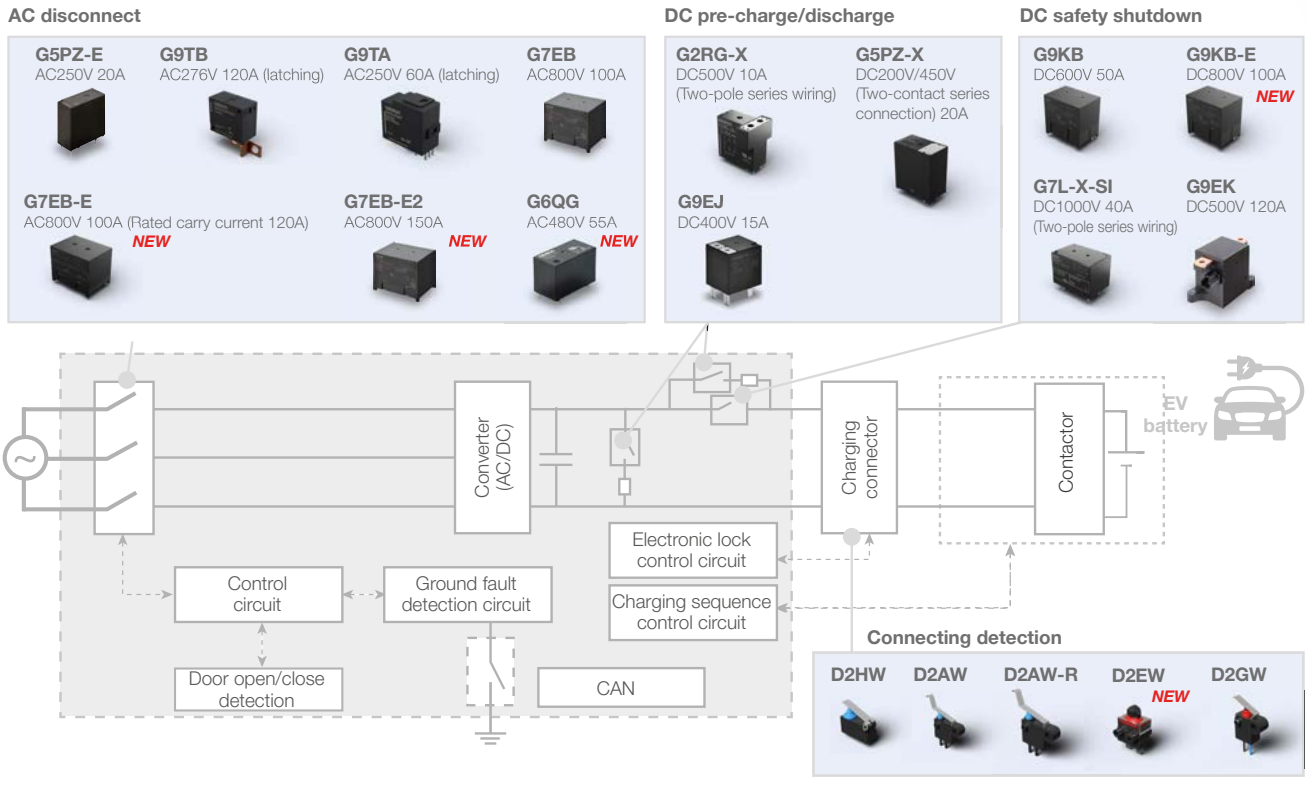
DC wallbox chargers

DC wallbox chargers are popular for their rapid charging efficiency, bi-directional capabilities and increasingly straightforward installation and use. We support manufacturers with an expanding range of relays and switches for commercial and Mode 4 charger applications encompassing energy storage, hybrid inverters and DC-DC converters. Our portfolio includes the enhanced G7EB-E2 relay (offering up to 150A AC switching current capability) and our G9KB-E compact DC power relay, which incorporates OMRON'S proven arc control technology for true bi-directional capability without derating.





DC wallbox product lineup



Note : The listed voltage is maximum switching voltage. The listed current is maximum switching current.

AC disconnect

G5PZ-E
AC250V 20A

G7EB
AC800V 100A

G7EB-E
AC800V 100A
(Rated carry current 120A)

G7EB-E2
AC800V 150A

G9TA
AC250V 60A (latching)

G9TB
AC276V 120A (latching)

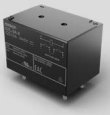
G6QG
AC480V 55A

DC safety shutdown

G9KB
DC600V 50A

G9KB-E
DC800V 100A

G7L-X-SI
DC1000V 40A
(Two-pole series wiring)



G9EK
DC500V 120A

Connecting detection

D2HW

D2AW

D2GW

D2AW-R

D2EW

DC pre-charge/discharge

G2RG-X
DC500V 10A
(Two-pole series wiring)

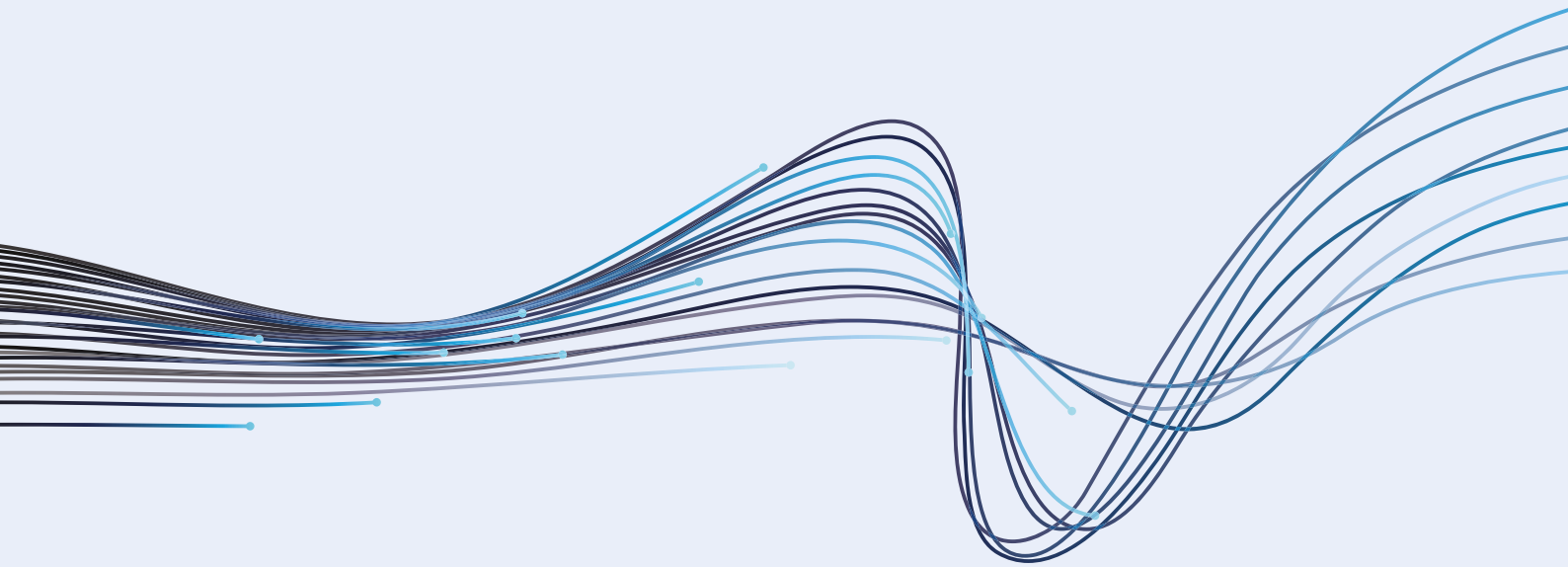
G5PZ-X
DC200V/450V
(Two-contact series connection)
20A

G9EJ
DC400V 15A

Note : The listed voltage is maximum switching voltage. The listed current is maximum switching current.

DC fast chargers

As investment in public EV charging ramps up across Europe, rapid and ultra-fast chargers are becoming an essential part of the infrastructure. DCFC (direct current fast charging) places extreme demands on components due to sustained high power usage. OMRON has developed a range of solutions for 1000V DC chargers, drawing on proven expertise in structures, materials and manufacturing. Purpose-built solutions include the G9KA-E high-power PCB relay, which protects performance with ultra-low and stable contact resistance.




EV CHARGING
COMPLETE
36 %
ELECTRIC CHARGER
Data Report
DATA 01
DATA 02
Time Remaining
06:01
EV STATION

DC fast charger product lineup

AC disconnect

G7EB
AC800V 100A

G7EB-E
AC800V 100A
(Rated carry current 120A)
NEW

G7EB-E2
AC800V 150A
NEW

G9KA
AC800V 260A

G9KA-E
AC1000V 300A
NEW

DC disconnect

G9EC-X1
DC1000V 100A

G9EK
DC500V 120A

G9KB
DC600V 50A

G9KB-E
DC800V 100A
NEW

For matrix switches*

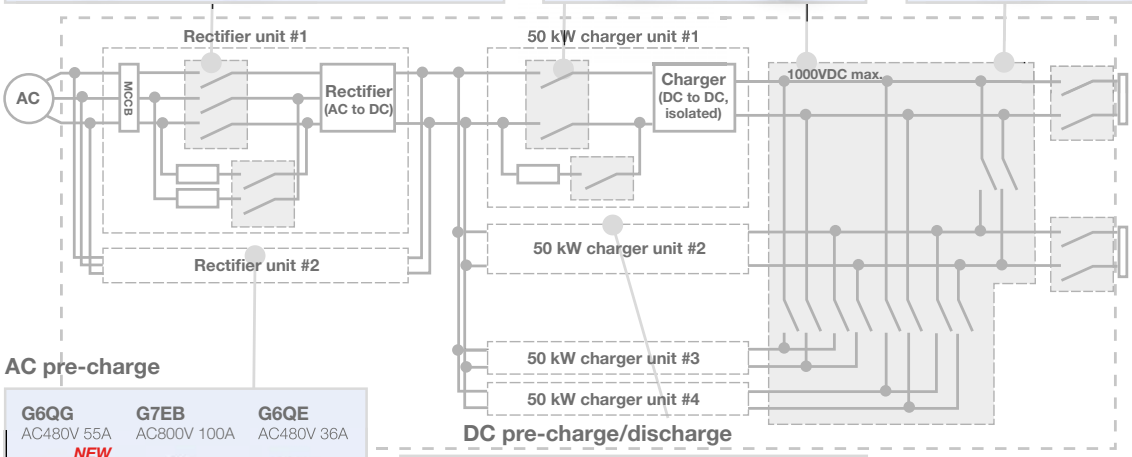
G9KA
AC800V 260A

G9KA-E
AC1000V 300A
NEW

G9TA
AC250V 60A

G9TB
AC276V 120A

*In this application, relays are typically required for carry current only



Ex. 200 kW DC fast charger

AC pre-charge

G6QG
AC480V 55A
NEW

G7EB
AC800V 100A

G6QE
AC480V 36A

DC pre-charge/discharge

G7L-X
DC1000V 40A
(Two-pole series wiring)

G2RG-X
DC500V 10A
(Two-pole series wiring)

G9EJ
DC400V 15A

Note : The listed voltage is maximum switching voltage. The listed current is maximum switching current.

DC disconnect

G9EC-X1
DC1000V 100A

G9KB
DC600V 50A

G9KB-E
DC800V 100A

G9EK
DC500V 120A

For matrix switches

G9KA
AC800V 260A

G9KA-E
AC1000V 300A

G9TA
AC250V 60A

G9TB
AC276V 120A

AC disconnect

G7EB
AC800V 100A

G7EB-E
AC800V 100A
(Rated carry current 120A)

G7EB-E2
AC800V 150A

G9KA
AC800V 260A

G9KA-E
AC1000V 300A

AC pre-charge

G6QG
AC480V 55A

G7EB
AC800V 100A

G6QE
AC480V 36A

DC pre-charge/ discharge

G7L-X
DC1000V 40A
(Two-pole series wiring)

G2RG-X
DC500V 10A
(Two-pole series wiring)

G9EJ
DC400V 15A

Note : The listed voltage is maximum switching voltage. The listed current is maximum switching current.

Charger plugs and sockets

Charging connectors need to be safe and reliable to facilitate long-term adoption by drivers. To ensure this, manufacturers rely on high quality detection switches. OMRON offers a wide variety of switches that meet the expectations of designers and users alike. The latest additions to our lineup have integrated resistor networks to detect various usage states and EV charging system failure conditions, and multi- and high-angle operation to prevent actuator misalignment.

New generation sealed basic switch

D2AW-R

D2EW-R

Sealed ultra subminiature basic switch

D2EW

Sealed ultra subminiature basic switch

D2GW

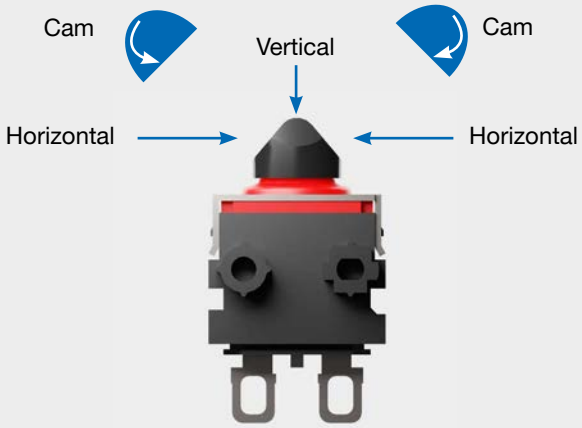
D2HW

D2AW

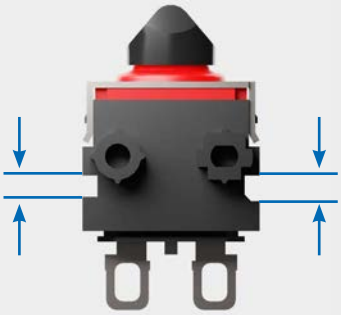
D2EW-R: smart fault detection for the control pilot (CP)

The new D2EW-R provides intelligent detection of EV charging system failures and usage states. Its integrated resistor network saves space while allowing detection of four different states – On, Off, Short circuit and Disconnection – as well as abnormal conditions. This compact, versatile switch features a sliding contact mechanism and can be supplied with several connection variations (e.g., PCB, solder, press-fit, lead wire)

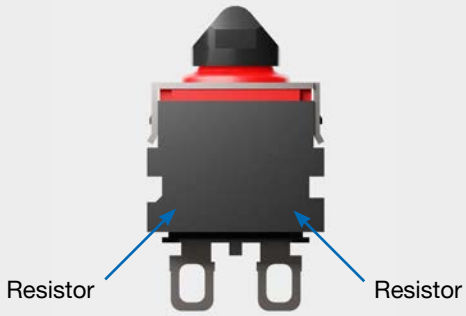
Multi- and high-angle operation for easier design



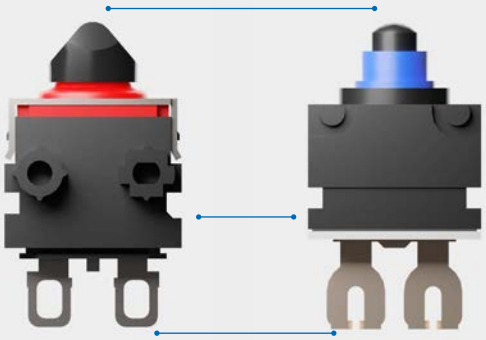
Unique asymmetrical shape prevents misalignment



Compact format with integrated resistor

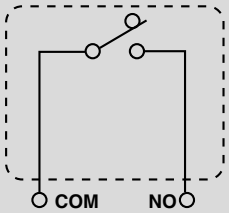
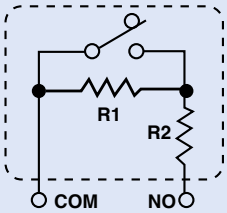


Compatible with D2GW



Two embedded chip resistors

D2EW-R coming soon

Switch type		D2EW (w/o chip resistors)	D2EW-R (w/2 chip resistors)
Circuit no.		0	1
Circuit diagram			
Switch	OFF	∞	R1 + R2
	ON	=0	R2
Abnormal condition	Short-circuit	0	0
	Disconnection	∞	∞

∞ -> 0
ON? SHORT?

OUTPUT
DIFFERENT SIGNALS

D2EW (w/o resistors) may output "∞" under abnormal conditions ("∞" is output signal when it is OFF). However, D2EW-R (w/2 chip resistors) can output different signals by detecting following modes: 1. OFF 2.ON 3. Short-circuit 4. Disconnection.

Autonomous charging

Autonomous charging offers huge potential to improve the overall experience of EV ownership. It will enhance charging efficiency and convenience and will be an important enabler for autonomous driving. At OMRON, we are already working to provide designers with next-generation autonomous charging solutions that are reliable, safe and cost-efficient.

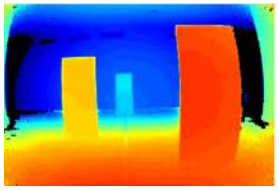
B5L Time of Flight (TOF) sensor

Any light, any colour, any socket

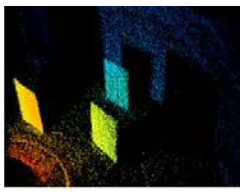
Our B5L TOF sensor can be used in combination with optimised algorithms to detect a range of EV socket types for autonomous charging. Its high ambient light immunity ensures stable detection under conditions equivalent to 100,000 lx. It is highly accurate, achieving 2% (2m), and extremely durable with a lifetime equivalent to five years under continuous driving.

B5L 3D TOF sensor module

B5L TOF sensor output



2D output
Outputs distance value of each pixel



3D output
Outputs X, Y, Z coordinates of each pixel

Scan the code below to see more information and specifications for this product:

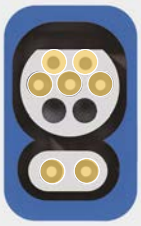
- Fast, accurate real-time 3D TOF detection of charger receptacle, with high repeatability
- Can detect depth and shape of virtually any target receptacle shape, enabling superior detection compared to 2D Lidar camera based systems

TOF Sensor for Socket Detection

By adding an algorithm* to process the output of the TOF sensor, the possibility of socket detection is expanded.

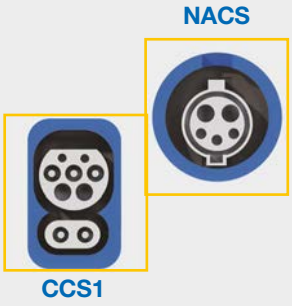
Algorithm is now under planning

EV socket detection



Socket Pin detection

Socket angle detection



Socket type distinction

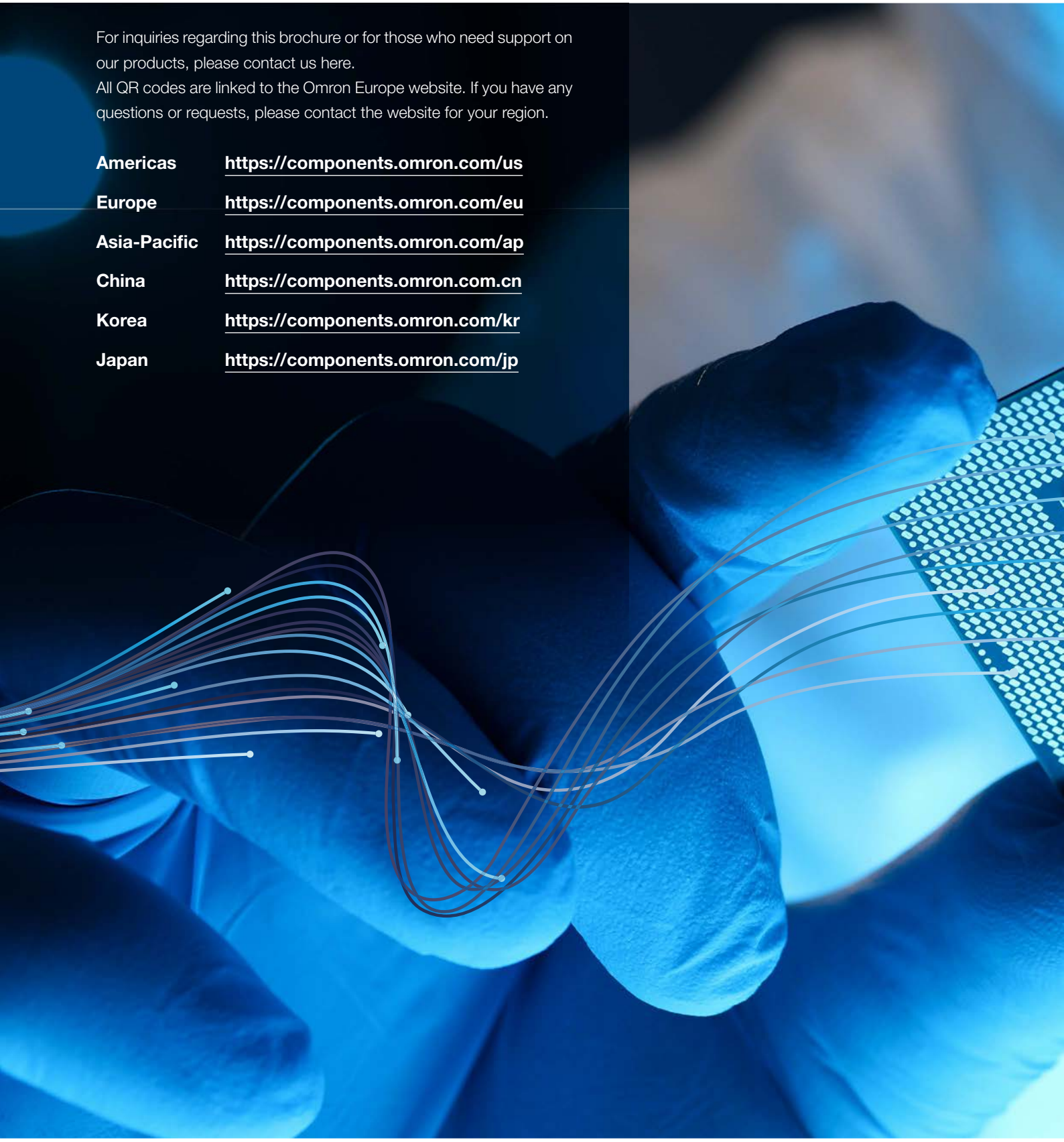
* Algorithm is now under planning. For more details, please inquire through our websites below.

Americas	https://components.omron.com/us
Europe	https://components.omron.com/eu
Asia-Pacific	https://components.omron.com/ap
China	https://components.omron.com.cn
Korea	https://components.omron.com/kr
Japan	https://components.omron.com/jp

INQUIRY

For inquiries regarding this brochure or for those who need support on our products, please contact us here.
All QR codes are linked to the Omron Europe website. If you have any questions or requests, please contact the website for your region.

Americas	**https://components.omron.com/us**
Europe	**https://components.omron.com/eu**
Asia-Pacific	**https://components.omron.com/ap**
China	**https://components.omron.com.cn**
Korea	**https://components.omron.com/kr**
Japan	**https://components.omron.com/jp**

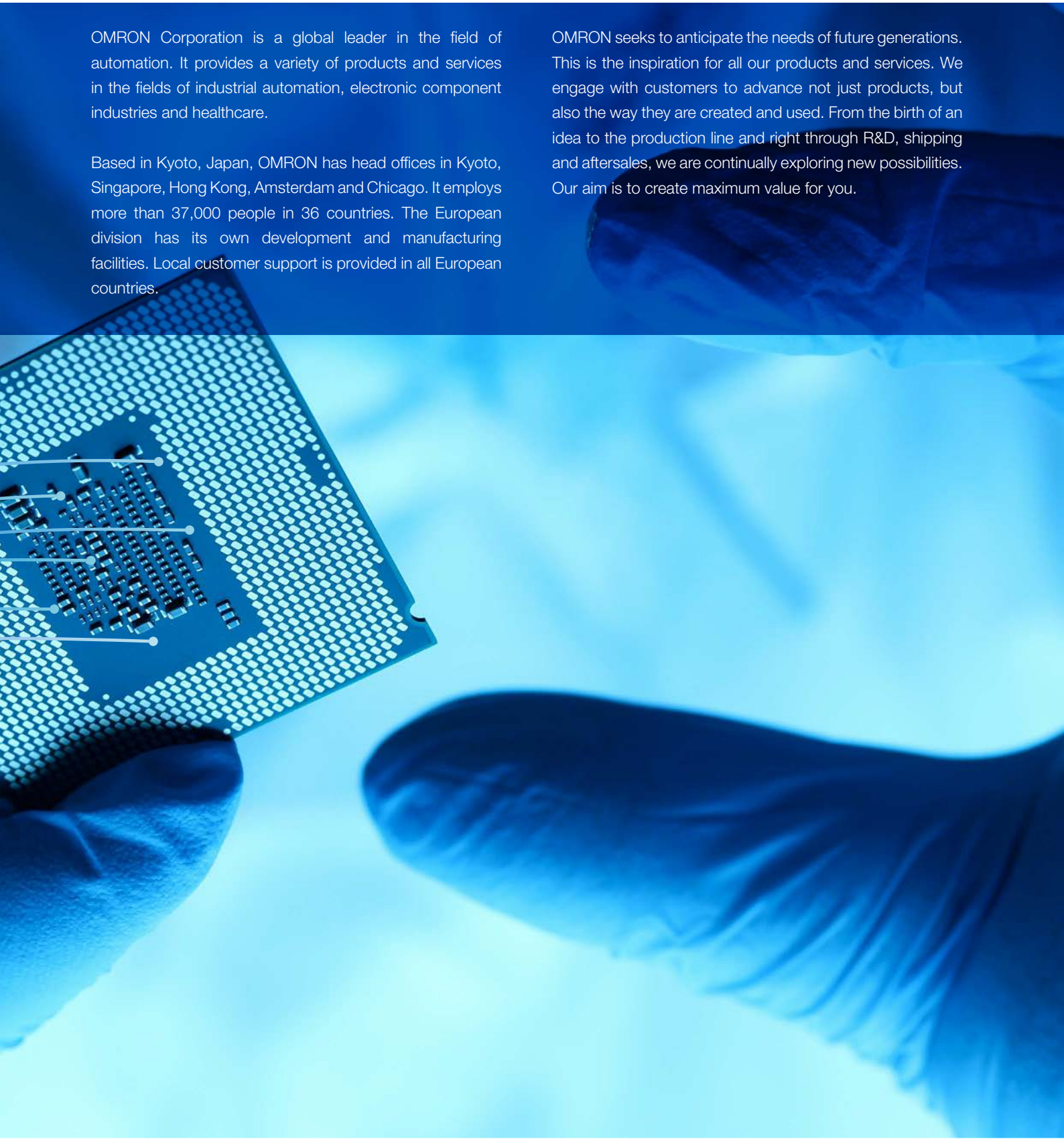


About OMRON

OMRON Corporation is a global leader in the field of automation. It provides a variety of products and services in the fields of industrial automation, electronic component industries and healthcare.

Based in Kyoto, Japan, OMRON has head offices in Kyoto, Singapore, Hong Kong, Amsterdam and Chicago. It employs more than 37,000 people in 36 countries. The European division has its own development and manufacturing facilities. Local customer support is provided in all European countries.

OMRON seeks to anticipate the needs of future generations. This is the inspiration for all our products and services. We engage with customers to advance not just products, but also the way they are created and used. From the birth of an idea to the production line and right through R&D, shipping and aftersales, we are continually exploring new possibilities. Our aim is to create maximum value for you.



Please check each region's Terms & Conditions by region website.

OMRON Corporation

Device & Module Solutions Company

Regional Contact

Americas
https://components.omron.com/us

Europe
https://components.omron.com/eu

Asia-Pacific
https://components.omron.com/ap

China
https://components.omron.com.cn

Korea
https://components.omron.com/kr

Japan
https://components.omron.com/jp

Cat. No. Y292-E1-01
0325 (0325)