

# RETHINK CHARGING EFFICIENCY

EV CHARGING SOLUTIONS



**OMRON**



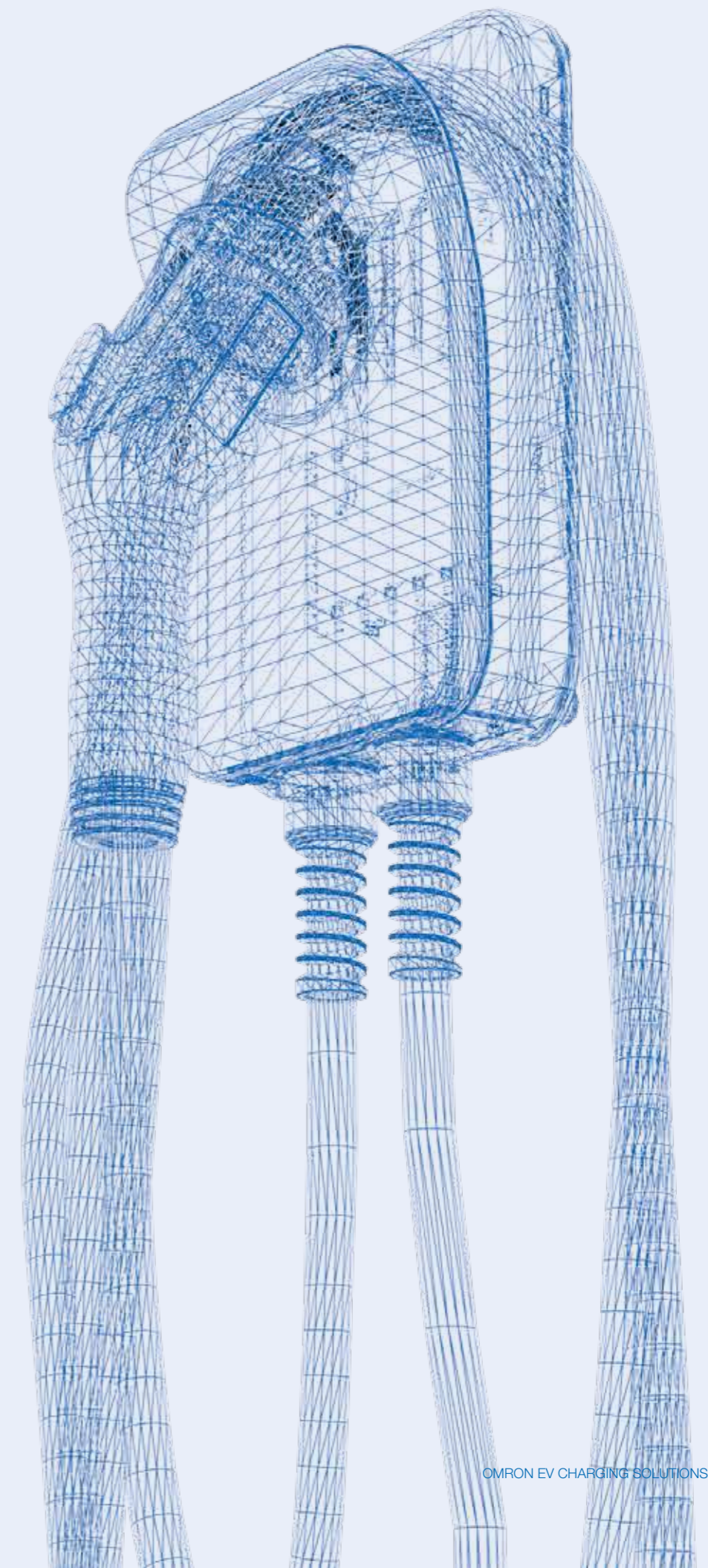
# Driving excellence in EV charging

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



## Electronic lock control

**G5NB**  
AC250V 5A



## Ground fault detection

**G6J-Y**  
DC800V 10mA



## Charging sequence control

**G6DN**  
AC250V 5A



## Control circuit

**A6D**



**A6R/A6RS**



## AC disconnect

**G9KC**  
AC480V 40A



## Connecting detection

**D2HW**



**D2AW**



**D2AW-R**



**D2GW**



**D2EW**



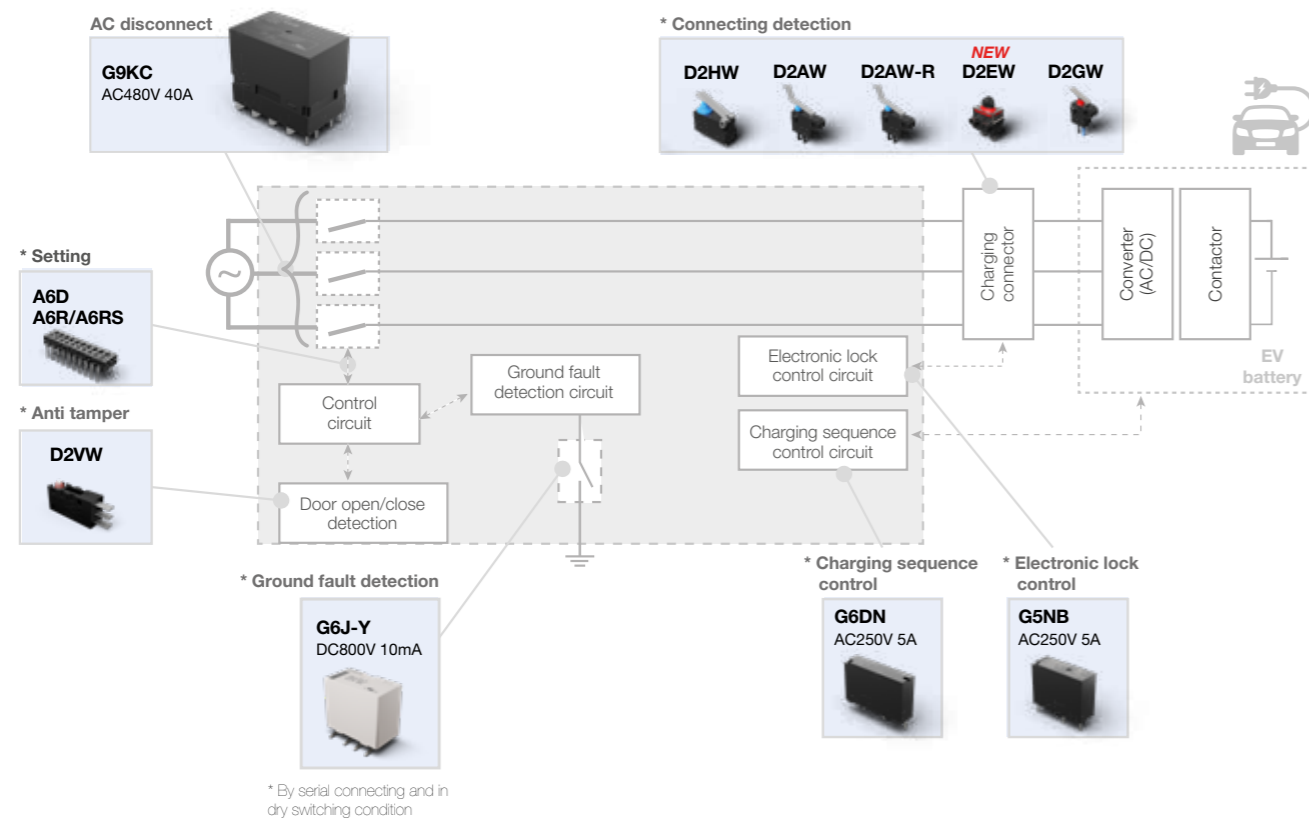
## Door open/close detection

**D2VW**



## Signal relay for controller area network (CAN)

**G6J-Y**  
DC30V 1A /  
AC125V 0.3A



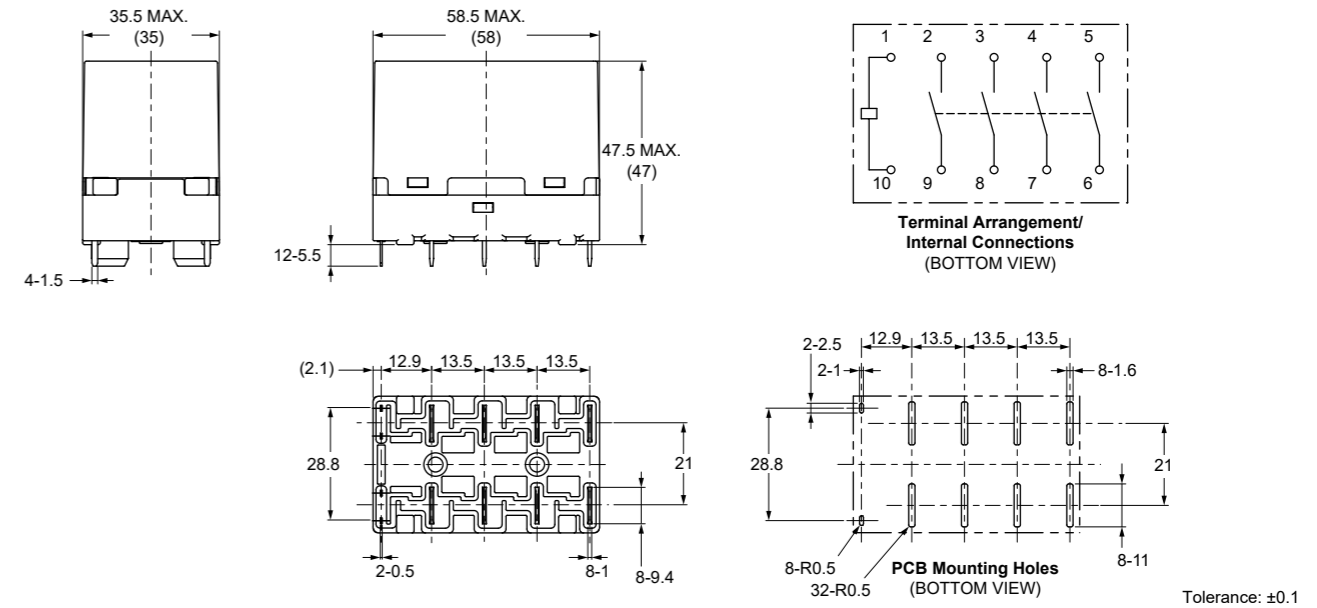


# G9KC

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.



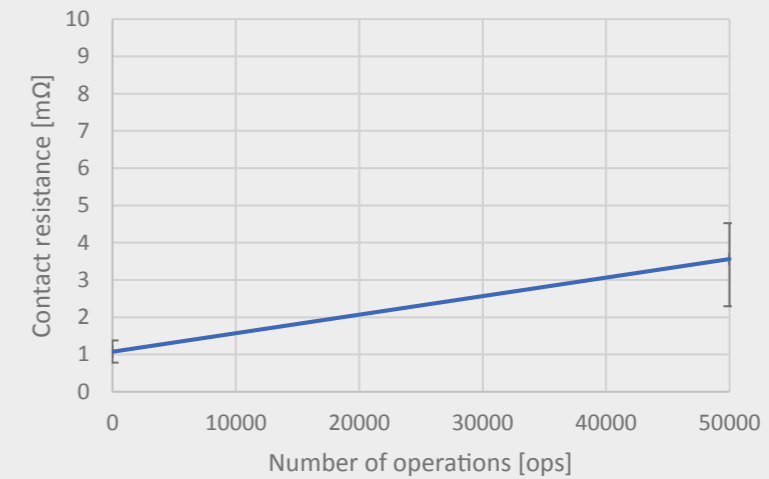
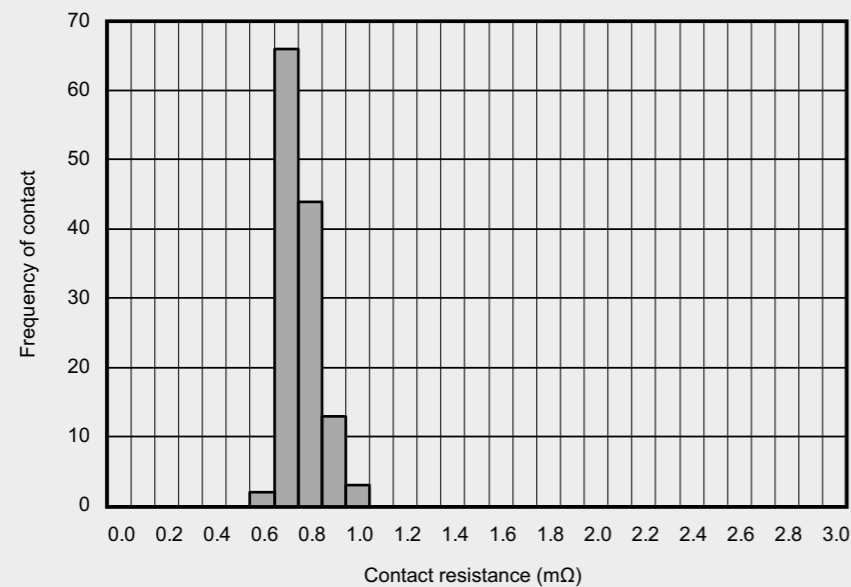
## G9KC features

- 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)
- Developed to the highest Japanese design standards

## Build efficiency into your designs

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

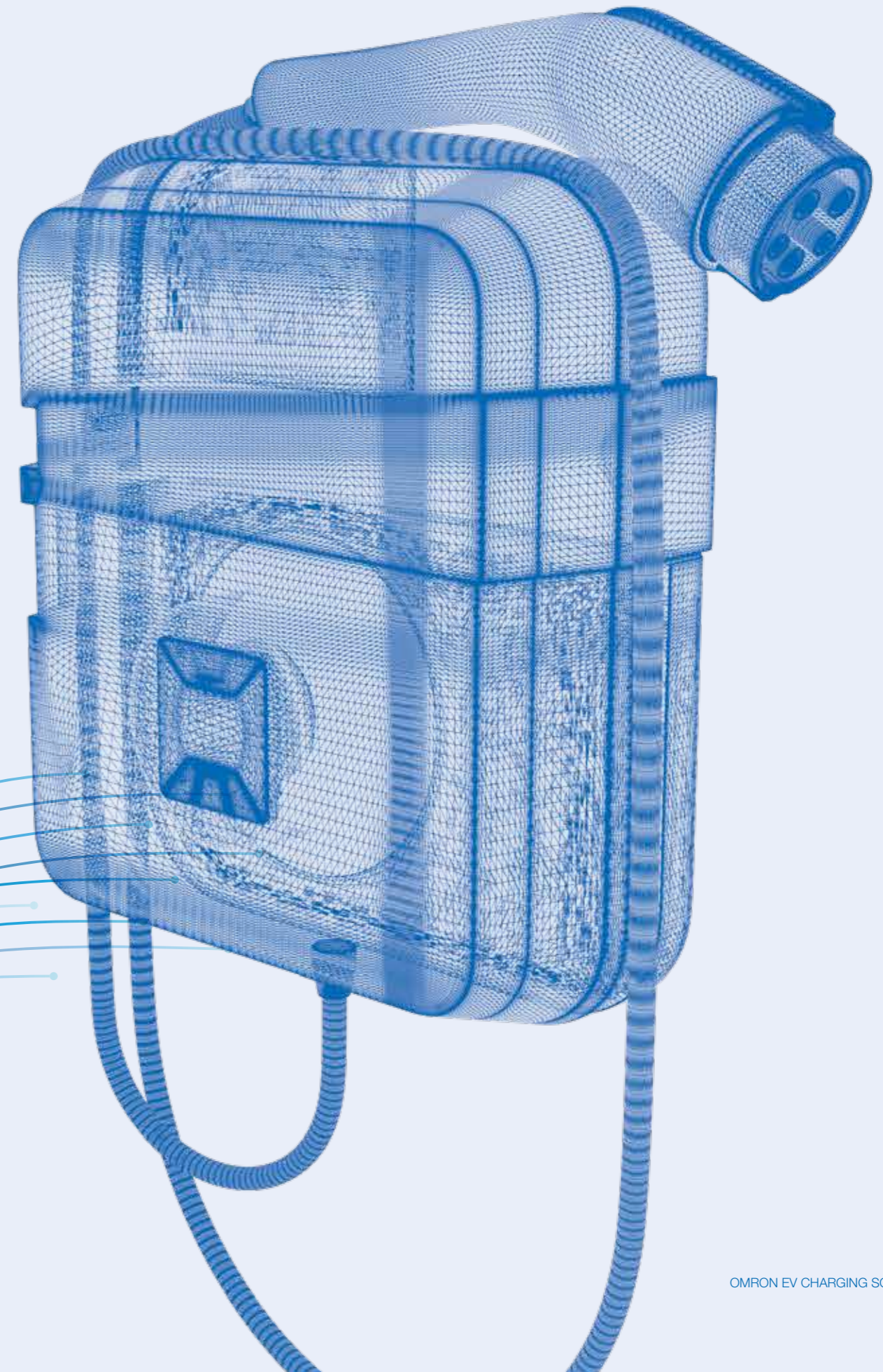
## Low contact resistance for high wallbox performance



- 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-E relay (offering up to 120A AC carry 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



## AC disconnect

**G5PZ**  
AC250V 20A



**G9TB**  
AC276V 120A  
(latching)



**G9TA**  
AC250V 60A  
(latching)



## DC safety shutdown

**G9KB**  
DC600V 50A



**G9KB-E**  
800V 100A



**G7L-X-SI**  
DC1000V 20A



## DC pre-charge/discharge

**G6QE**



**G2RG-X**  
DC500V 10A



**G5PZ-X**  
DC200/400V 20A



## Connecting detection

**D2HW**



**D2AW**



**D2GW**

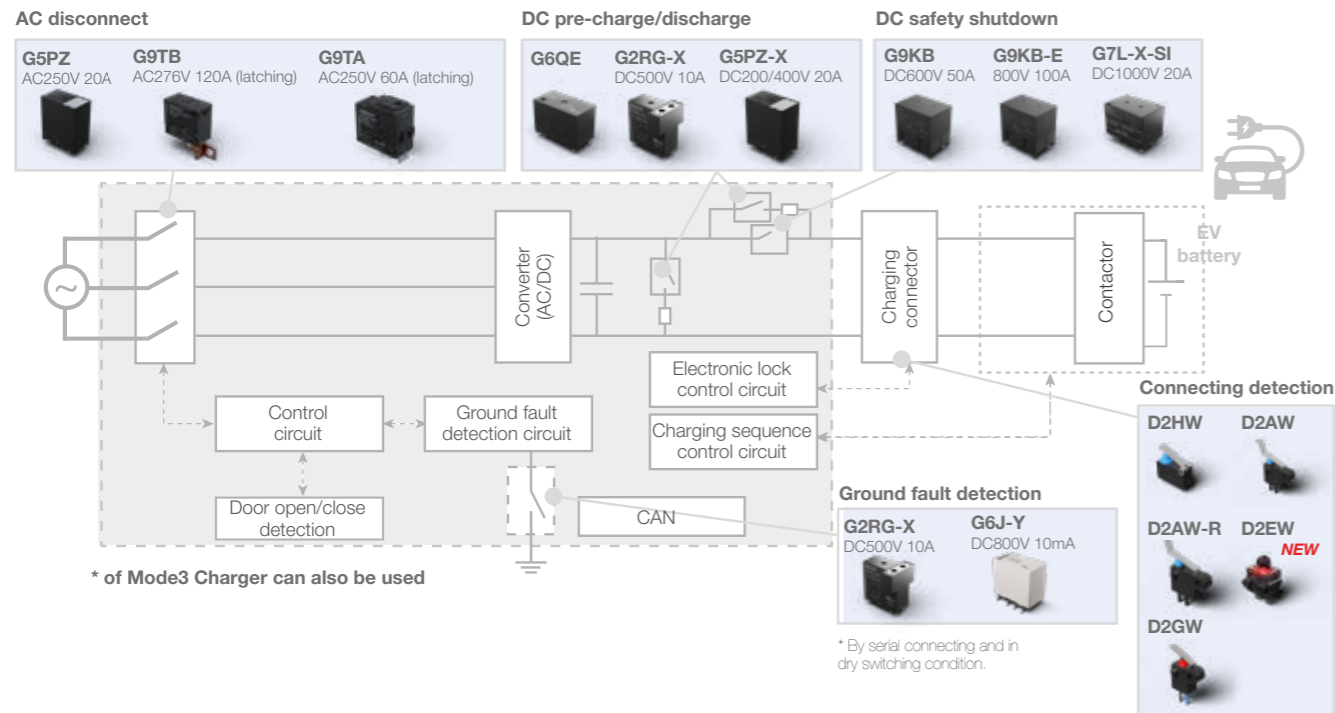


## Ground fault detection

**G2RG-X**  
DC500V 10A

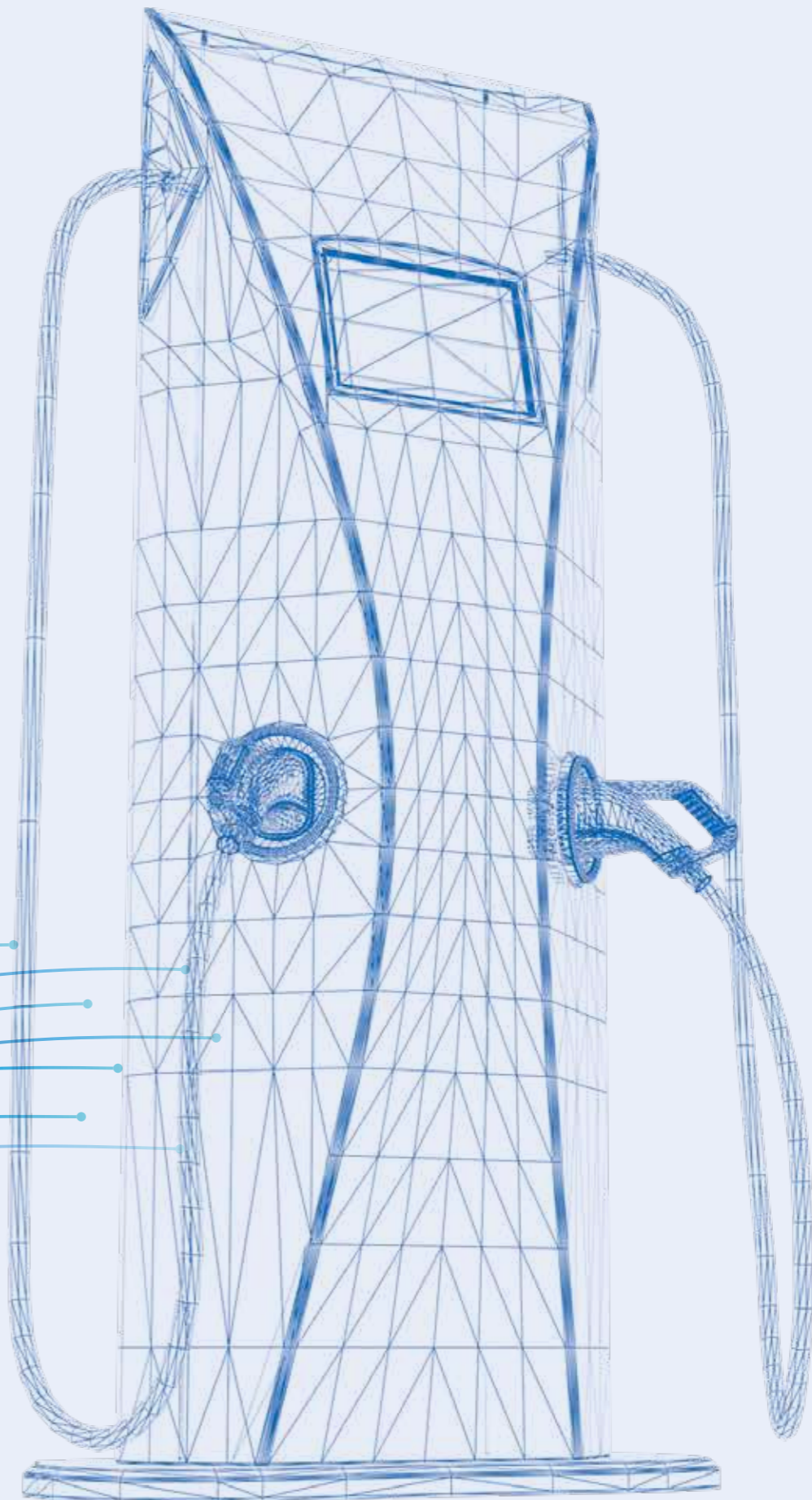


**G6J-Y**  
DC800V 10mA



# 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 800 and 900V 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.





# DC fast charger product lineup



## DC disconnect

**G9EC-X1**  
DC1000V 100A



## For matrix switches

**G9KA**  
DC1000V 200A



## AC inrush prevention

**G6QG**  
AC480V 55A



**G7EB**  
AC480V 100A



## DC pre-charge/discharge

**G7L-X**  
DC1000V 25A



## AC disconnect

**G7EB**  
AC480V 100A



**G9KA**  
AC800V 260A



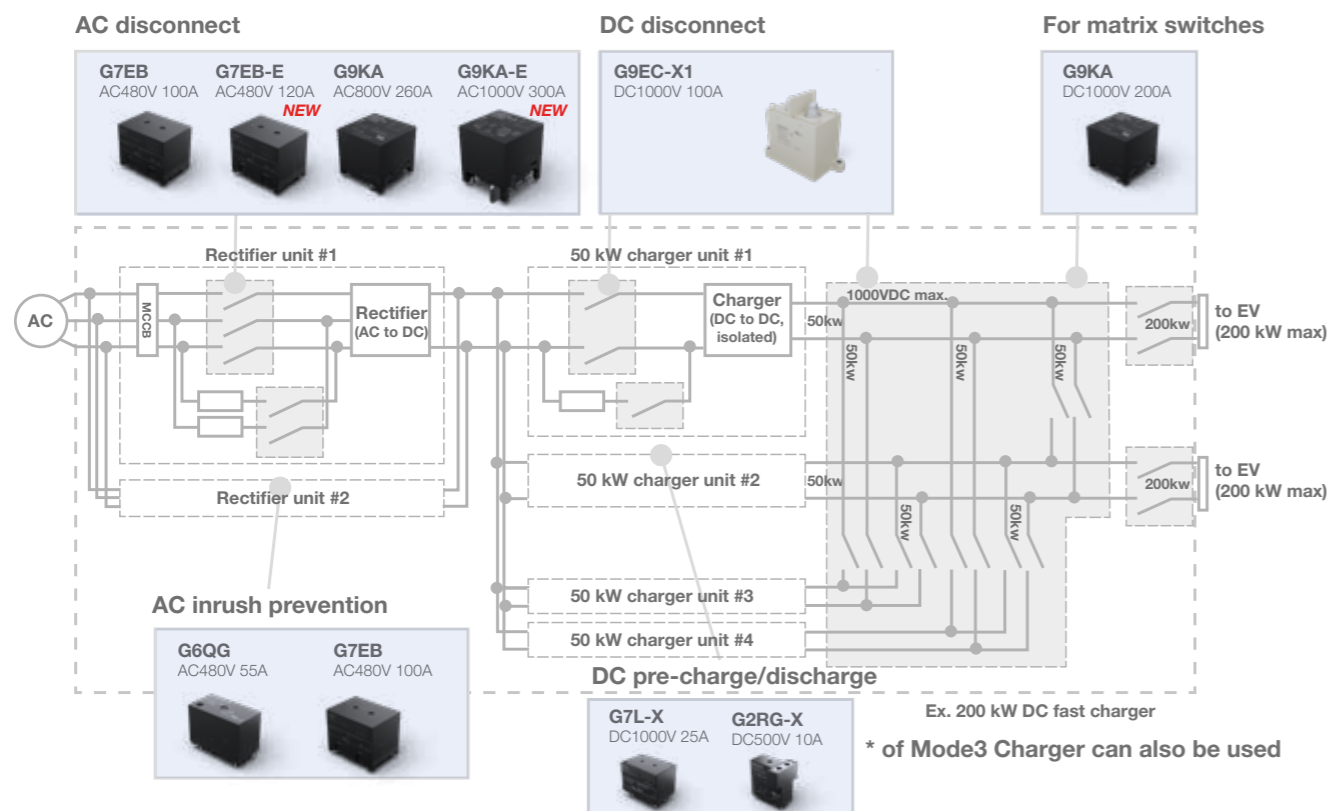
**G7EB-E**  
AC480V 120A



**G9KA-E**  
AC1000V 300A



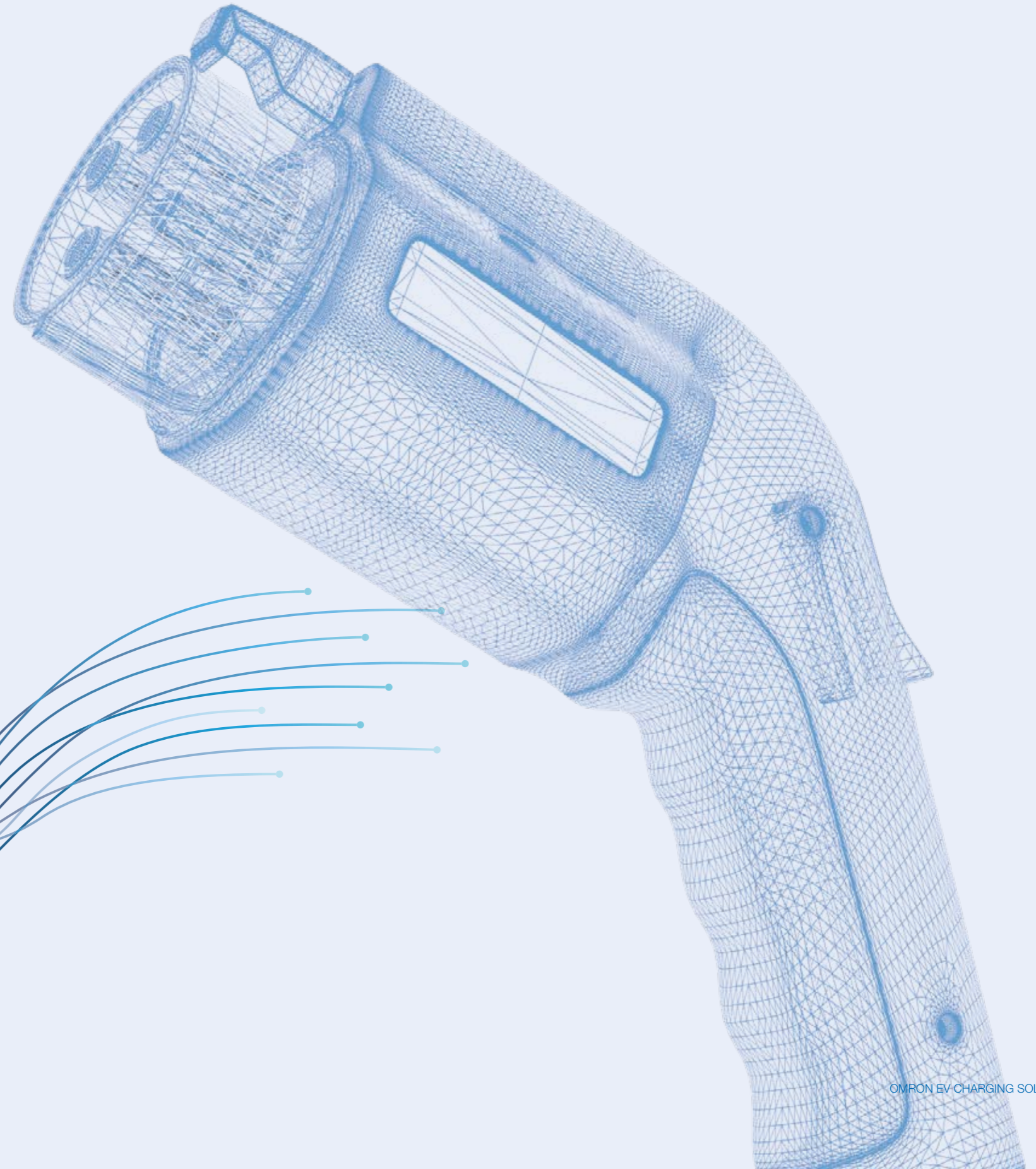
**G2RG-X**  
DC500V 10A



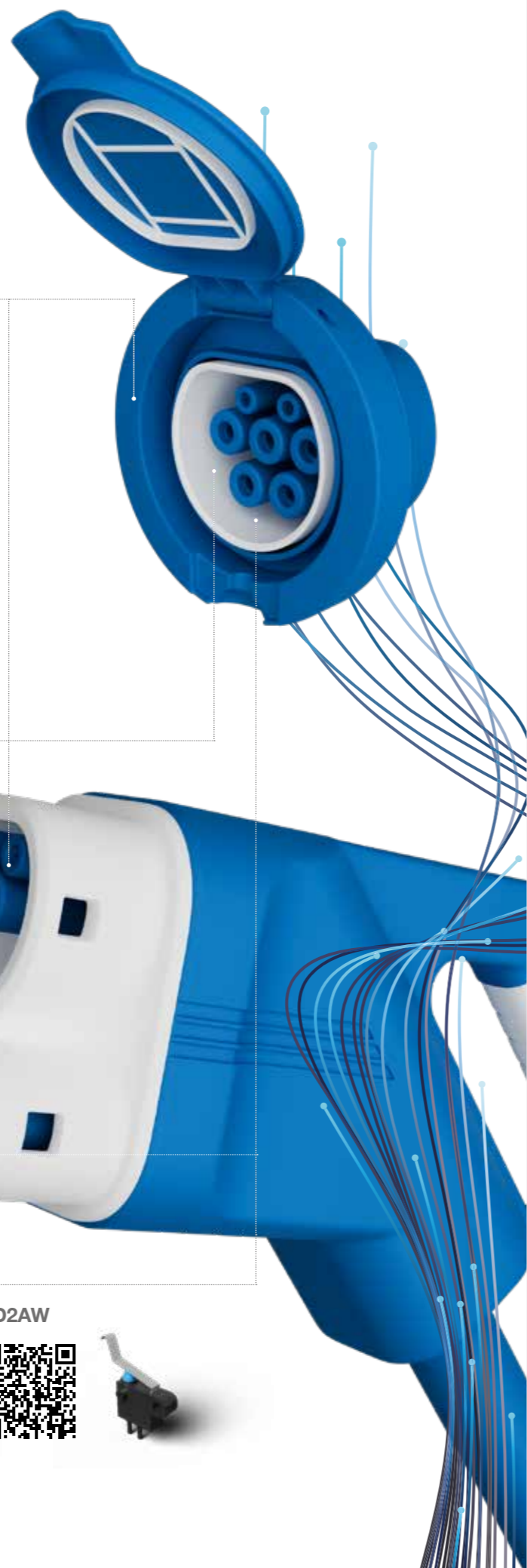


# Charger plugs and sockets

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



### Sealed ultra subminiature basic switch

D2EW



### Sealed ultra subminiature basic switch

D2GW



D2HW



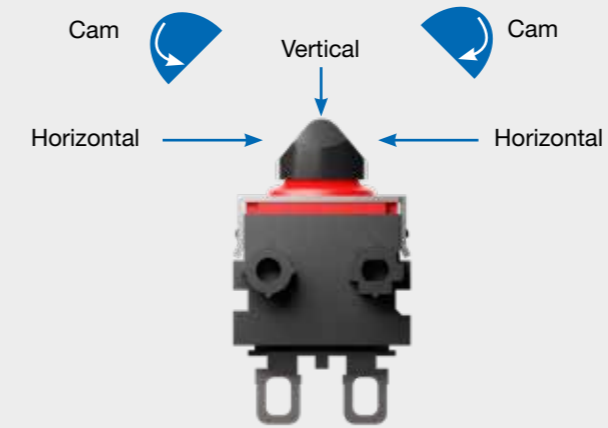
D2AW



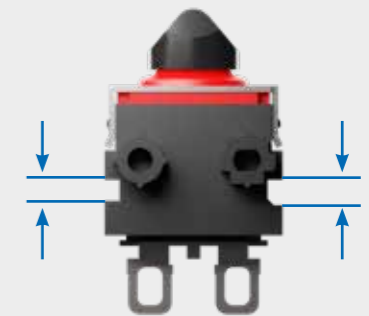
### D2EW-R: smart fault detection for the control pilot (CP)

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 PCB or press-fit terminals.

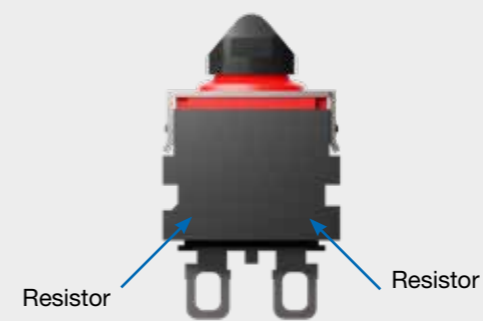
#### Multi- and high-angle operation for easier design



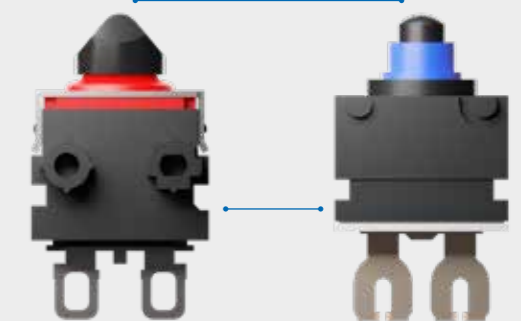
#### Unique asymmetrical shape prevents misalignment



#### 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	$\infty$
	ON	$=0$
Abnormal condition	Short-circuit	0
	Disconnection	$\infty$

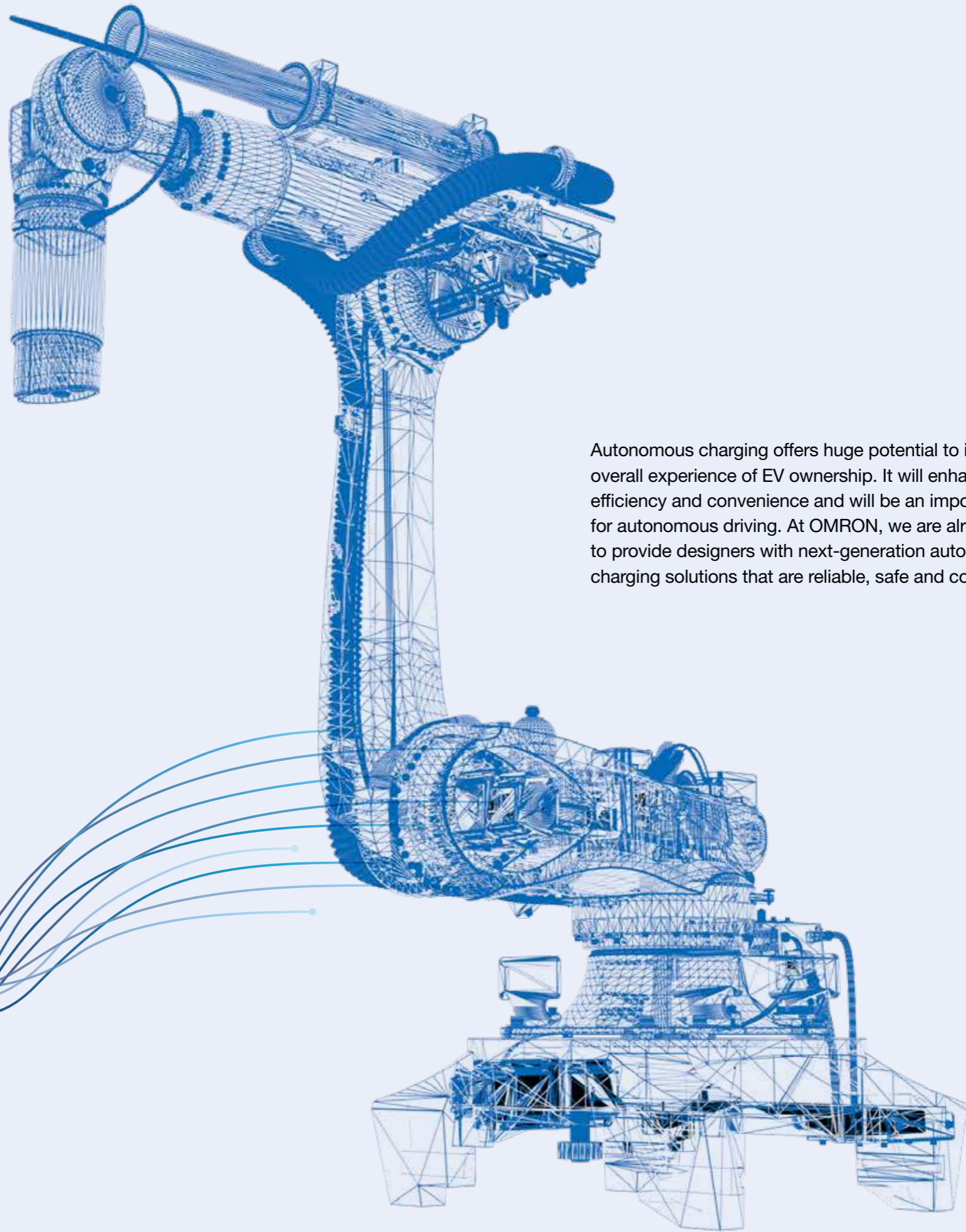
$\infty \rightarrow 0$   
ON? SHORT?

$R1 + R2$   
 $R2$   
0  
 $\infty$

OUTPUT DIFFERENT SIGNALS

D2EW (w/o resistors) may output " $\infty$ " under abnormal conditions (" $\infty$ " 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 with EV socket detection

Any light, any colour, any socket

Our unique 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.

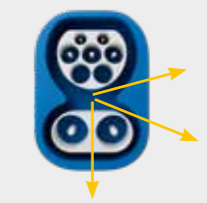
## Expanding the possibilities of socket detection



EV socket detection



Socket Pin detection



Socket angle detection



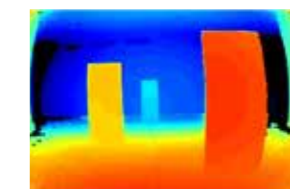
Socket type distinction

Adaptable for CCS1/2, NACS, CHAdeMO, J1772 (Type 1/2), Chaoji, GB/T (DC/AC) and MCS types.

## B5L 3D TOF sensor module



### B5L TOF sensor output



**2D output**  
Outputs distance value of each pixel

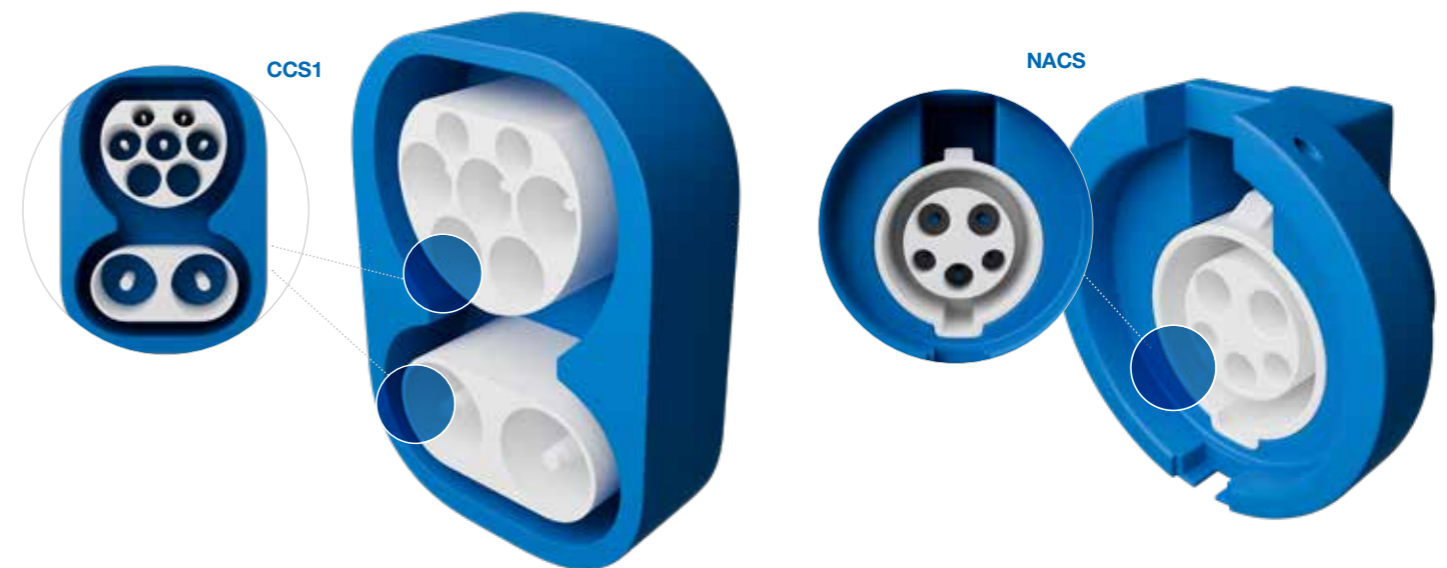


**3D output**  
Outputs X, Y, Z coordinates of each pixel

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
- Combination of TOF Sensor and optimised algorithm can detect CCS, CHAdeMO, NACS and customised socket types
- Can detect depth and shape of virtually any target receptacle shape, enabling superior detection compared to 2D Lidar camera based systems

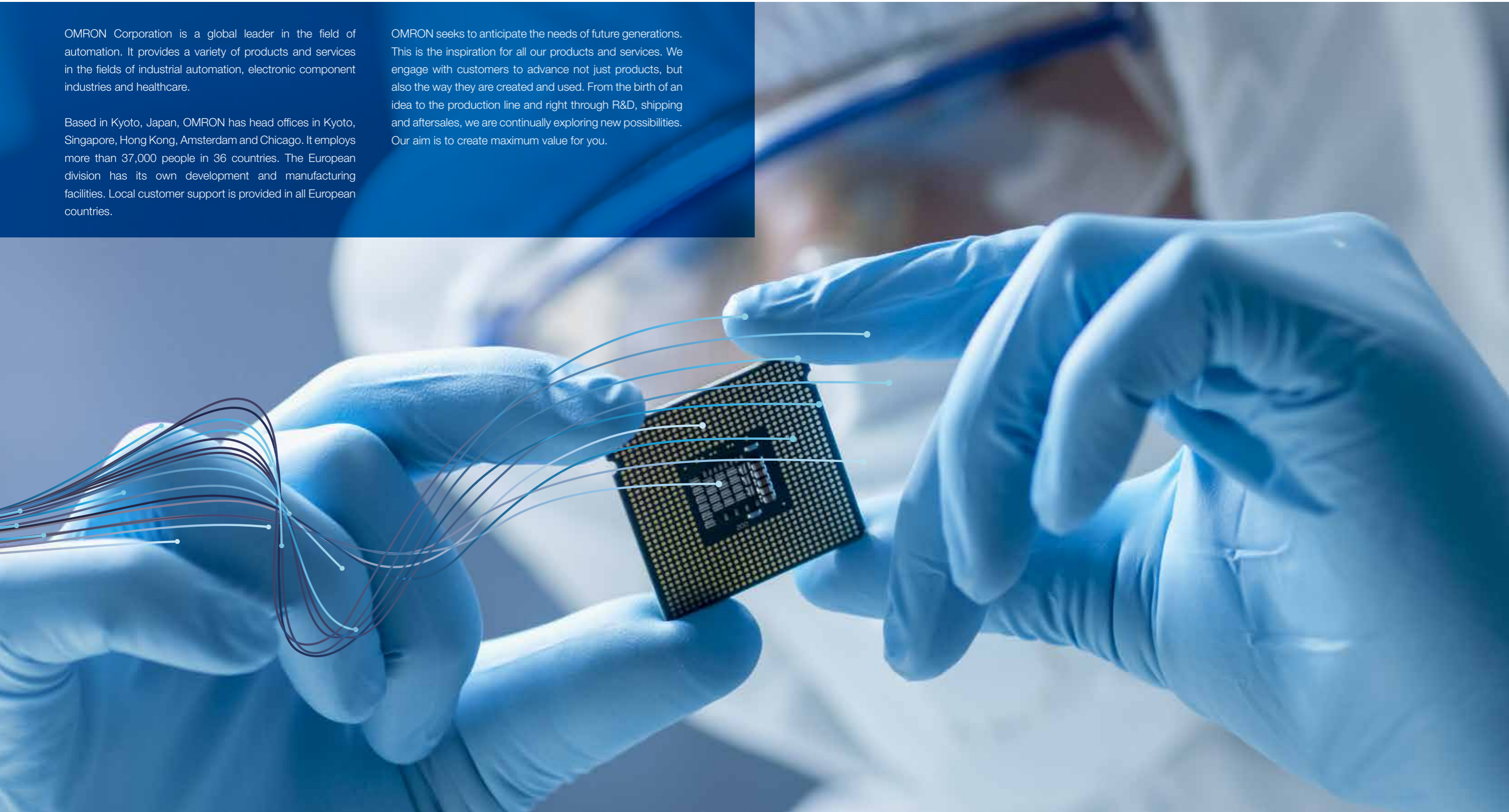


# About OMRON

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.







## EUROPEAN HEAD OFFICE

OMRON ELECTRONIC COMPONENTS EUROPE B.V.  
Wegalaan 57  
2132 JD Hoofddorp  
The Netherlands  
Tel: +31 23 568 1200  
Fax: +31 23 568 1222  
Email: info-components-eu@omron.com

## EUROPEAN SALES OFFICES

**CENTRAL AND EASTERN EUROPE**  
Karadzicova 14  
82108 Bratislava  
Slovakia  
Tel: +421 2 5824 0900  
Fax: +421 2582 40999

**UK, IRELAND, BENELUX AND NORDIC**  
OMRON Electronic Components Europe BV  
Opal Drive, Fox Milne, Milton Keynes  
MK15 0DG  
United Kingdom  
Tel: +44 1908 258 221

**ITALY**  
Viale Certosa 49  
20149 Milano  
Italy  
Tel: +39 02 3268 850  
Fax: +39 02 3268 851

**FRANCE AND IBERIA**  
OMRON Electronic Components Europe BV  
3 parvis de la Garde  
94130 Nogent-sur-Marne  
France  
Tel: +33 1 41817230

B24EV-EN-01



[components.omron.com/eu](http://components.omron.com/eu)

*OMRON Electronic Components Europe BV reserves the right to make any changes to the specifications of the products described in this brochure at its sole discretion and without prior notice.*