PRODUCT MANUAL

START NOW

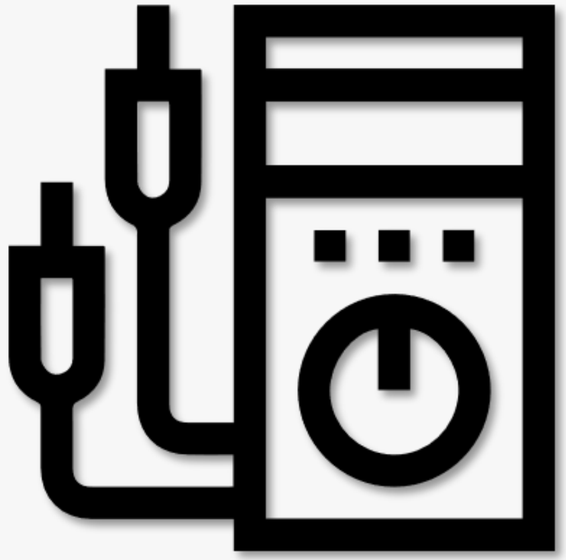
RARA ELECTRONIC

CONTETNS

WHERE TO USE?

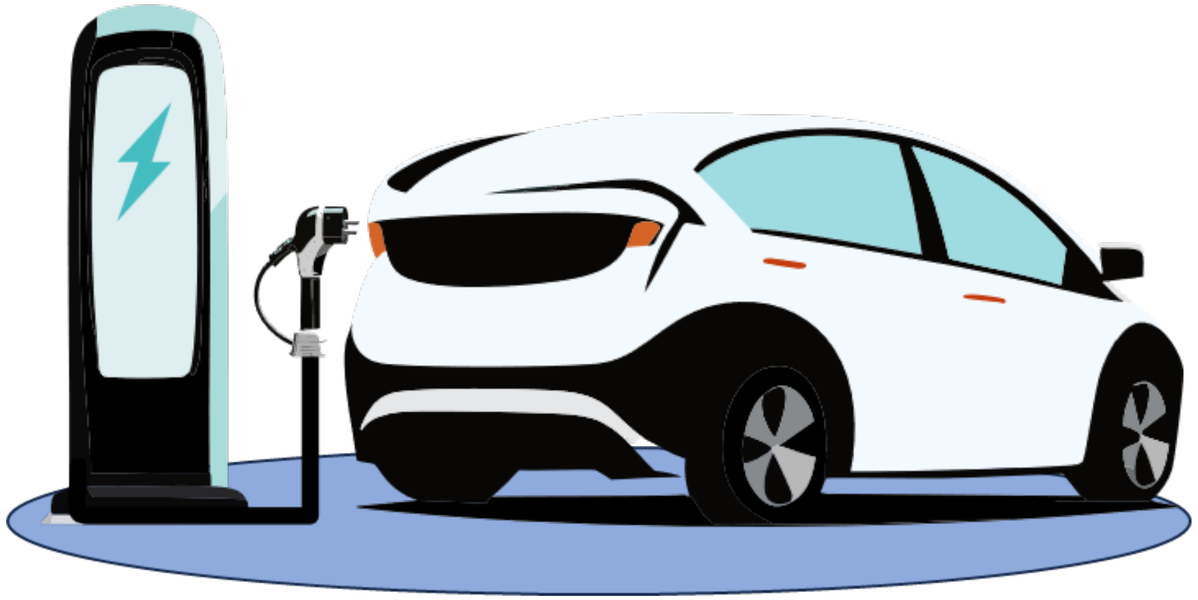
ELECTRIC CAR

BATTERY TESTER



ELECTRIC CAR (EV, HEV, PHEV)

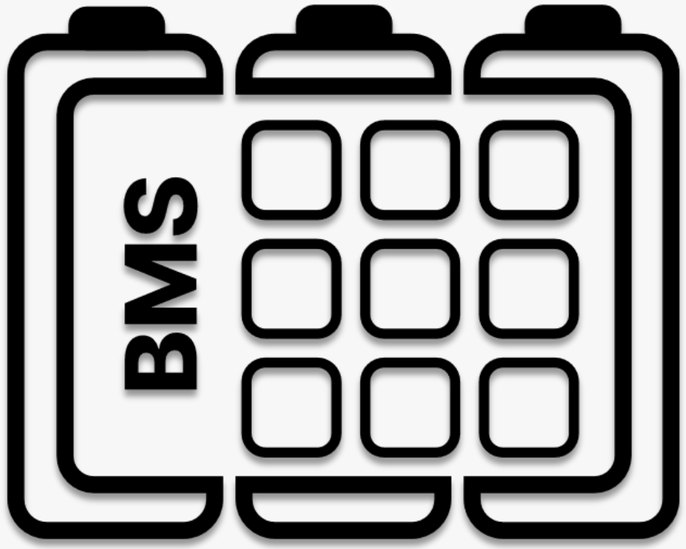
It's an environmentally friendly vehicle powered by electricity, which moves using electric power. Although it was developed before gasoline vehicles, it hadn't been practical. However, with recent serious concerns about environmental pollution and resource shortages, there's been intense competition among automotive companies worldwide to develop electric vehicles



1. Resistors For EV Charger Model
2. Current Sensing Resistors For BMS/IBS
3. Resistor For Battery Cell Balancing
4. Resistors For DC-DC Convertor / Invertor / OBC
5. Pre-charge Resistor For PRA/BDU

Back

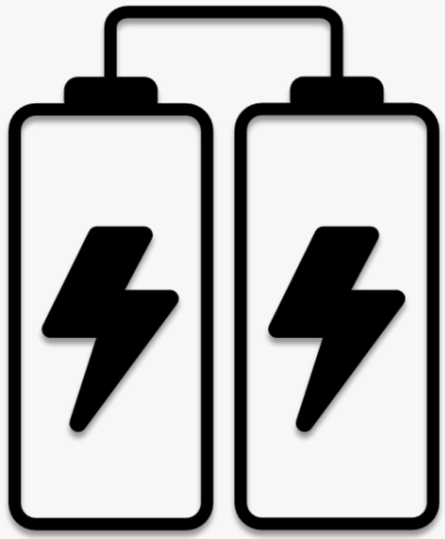
BMS



Battry Management System

It manages and controls the safety, performance, and lifespan of batteries.

BATTERY PACK



Battery Packs

It's a device for storing and supplying electrical energy, physically protecting and electrically controlling the batteries that supply power to electric vehicles.

Back

Electric car drive system

DC-DC Convertors

It is a device that converts high voltage to low voltage to supply power to peripheral devices.

OBC

It enables charging of the batteries installed inside environmentally friendly vehicles (plug-in hybrids, electric cars) from an external power source.

INVERTOR

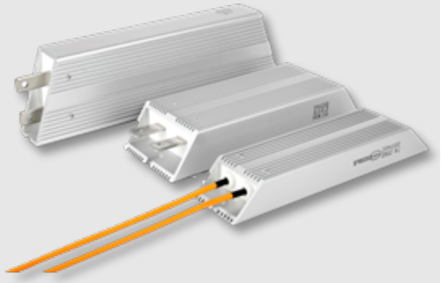
It is a device that converts direct current electricity to alternating current and controls the motor.

Back

Resistors for EV Charger Model

RQR

RH



IRH/IRV

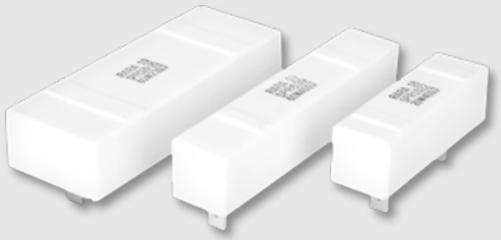
KZG

LR

Back

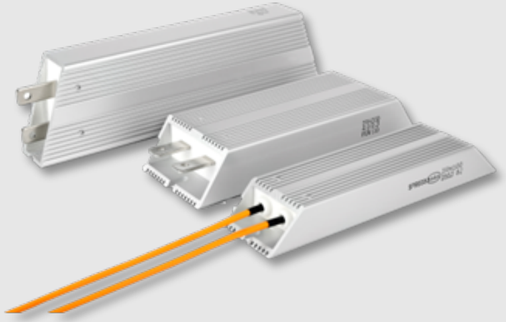
Pre-charge Resistors

It functions to limit the charging current, protecting high-voltage circuits. It is used in Power Receiving Assemblies (PRA) and Battery Disconnect Units (BDU), which connect the drive switch and the battery to control the flow or cut off the electricity.



AQL

RH



IRH/IRV

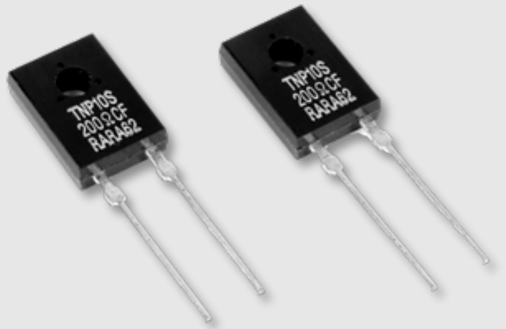
Back

Battery Cell Balancing Resistors

It is an essential component used in battery packs or battery management systems where multiple battery cells are connected. It helps minimize the voltage difference between cells by regulating the voltage of each battery cell, thereby optimizing the performance of the battery pack.

SMW

RW

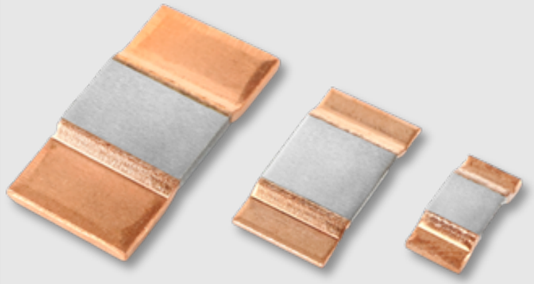


TNP

Back

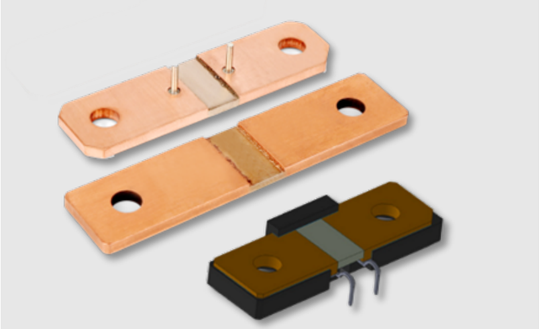
Current Sensing Resistors

Current sensing resistors, also known as shunt resistors, are resistors used for current sensing purposes in circuits. They are used to monitor and test charging currents to perform battery charging safely and efficiently. They provide accurate values necessary for current measurement and are utilized to measure the voltage when current flows through the circuit.



ECS

LPS



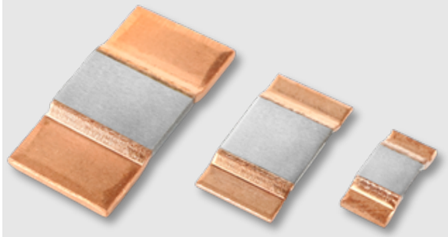
TCS

LR

Back

Resistors for DC-DC Convertors (Snubber) / Invertors / OBC

RQR



ECS

CSR0207

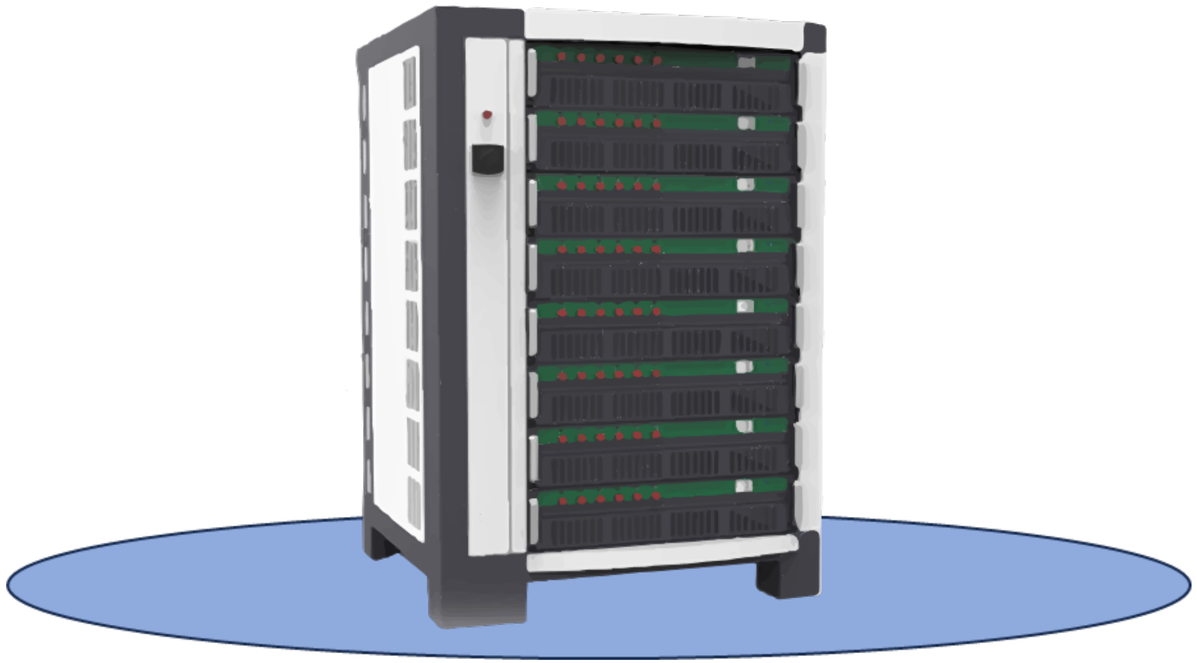
SMW

LR

Back

Battery tester

It is a device used to measure and evaluate the performance of batteries.
By conducting charge and discharge tests on batteries, it detects defective products in advance and ensures product performance. It is used in the research and development of secondary battery manufacturers, battery pack manufacturers, battery research institutions, and small-scale production companies to accurately assess the health of batteries and support safe and efficient operation.



1. Current Sensing Resistors
2. Gain Resistors for OP AMPs

Back

Current Sensing Resistors

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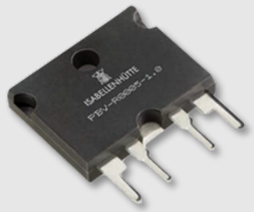
LR

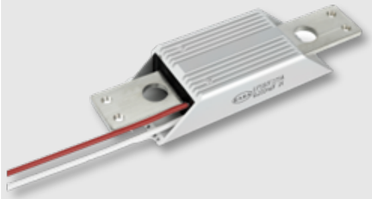
UHPS



PBV

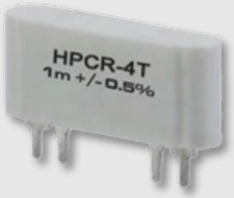
HPS

A-H

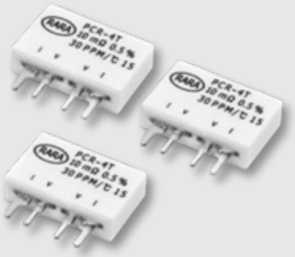


LPS

IRH-F



HPCR-4T



PCR-4T

Back

Gain Resistors for OP AMPs

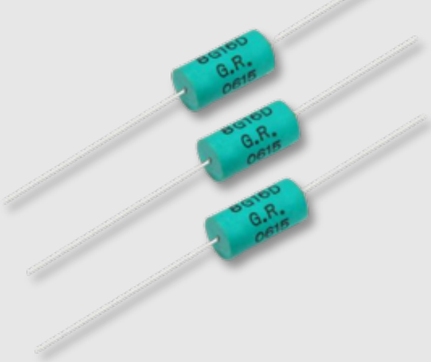
*OP AMPs : High-performance amplifier

*Gain Resistors : It adjusts the gain, which refers to the amplification level.

AR

MFR

MFD



8G16

Back

WHERE TO USE?

SERVO DRIVE

INVERTER

Current Sensing Resistors

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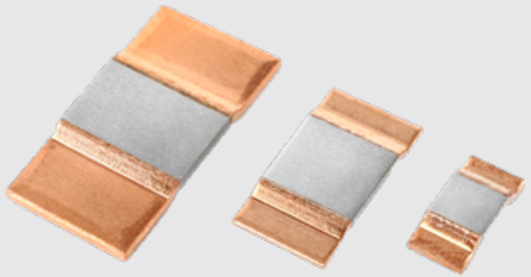
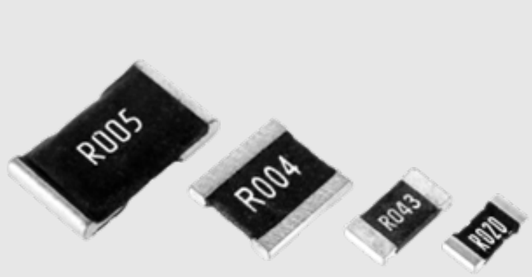


ECS



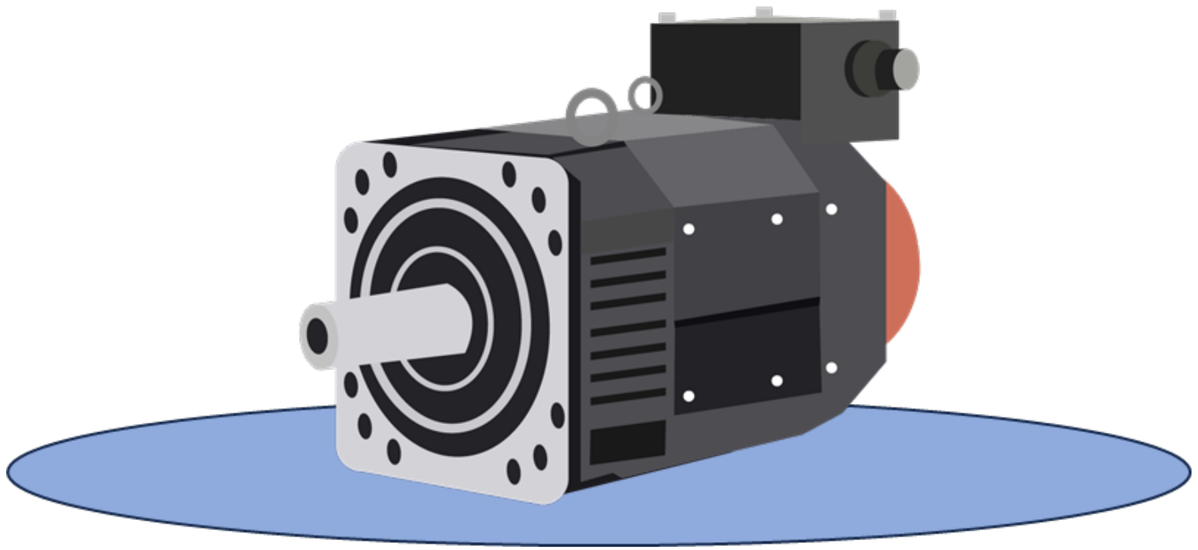
LR

MPR

Back

Servo Drive

A power supply unit that drives servo motor
Servo Motor: A control motor with fast response and a wide speed control range, classified into DC servo motor and AC servo motor depending on their power source. Most AC servo motor are three-phase servo motor, designed to repeat operations such as stop, start, and reverse, with considerations made in design to improve heat dissipation or accelerate changes in operation.



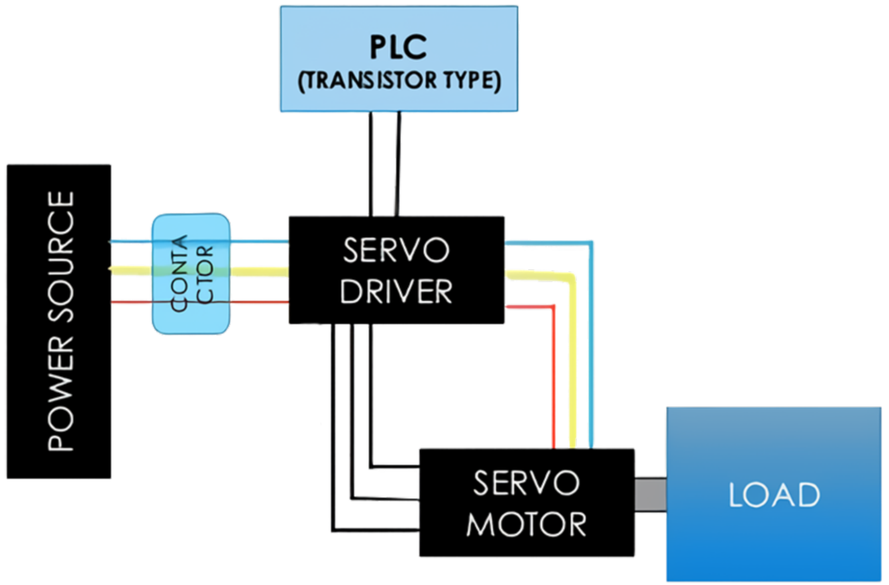
1. Electric Discharge Machiune
2. Motion Simulator
3. Electric Injection Machine
4. Sewing Machine
5. Machine Tools
6. Robot Controller
7. Chip Mounter
8. Servo Press

Back

Servo Drive Mechanism

SERVO

DRIVE MECHANISM



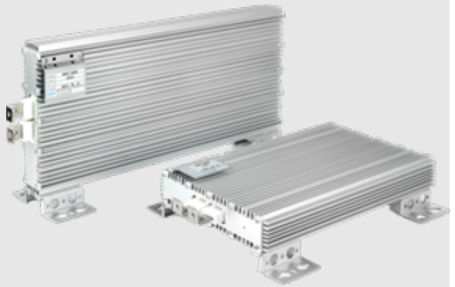
Back

Regenerative resistor & Braking resistor

IRS

IRN/IRF

RH



MBH/MBV

IRH/IRV

Back

Inverter

It is a device that electrically converts direct current into alternating current. It receives power from commercial power sources (220V, 440V), converts the voltage and frequency within the inverter, and supplies power to the electric motor to control the motor's speed, thereby minimizing unnecessary power wastage. It is a power electronics device.

1. HVAC:Heating,Ventilation,Air Conditioning
2. Electric Injection Machine
3. Wind power / Solar Energy Generator
4. Knitting machine
5. Washing Machine
6. Chain Electric Hoist
7. Industry Pump
8. Industry Fan
9. Elevator
10. Tower Crane

Back

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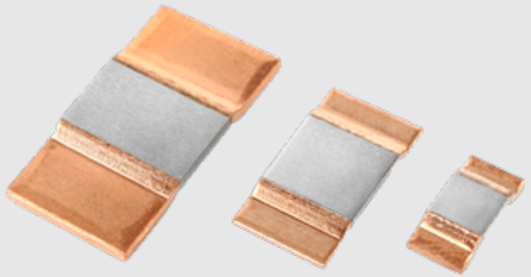
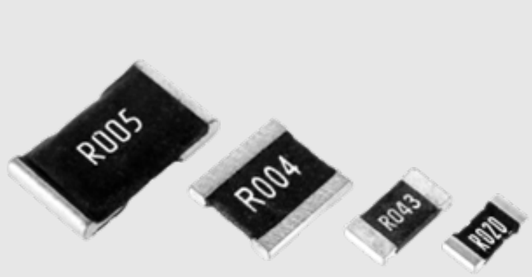


ECS



LR

MPR

Back

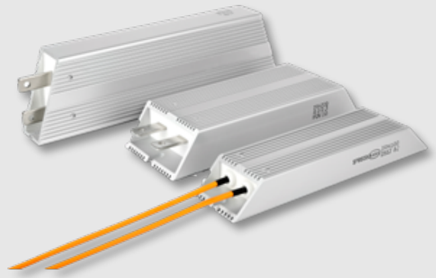
Regenerative resistor & Braking Resistor
Charge/Dis-charge Resistor

RQR

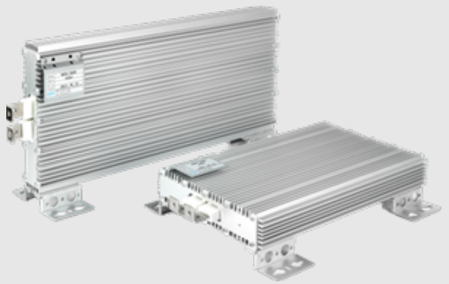
RH

IRN/IRF

IRS



IRH/IRV

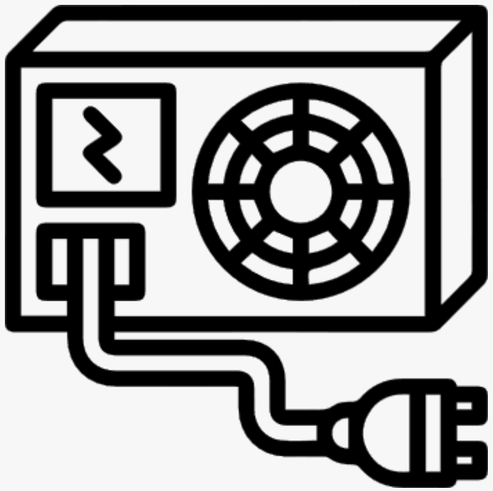


MBH/MBV

Back

WHERE TO USE?

POWER SUPPLY

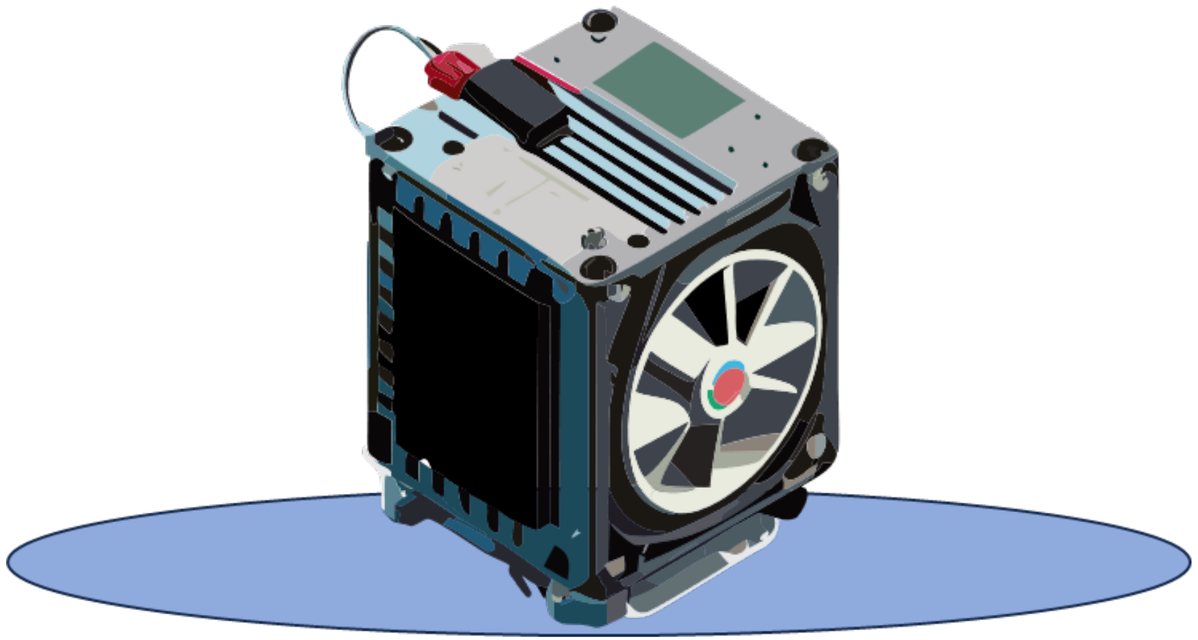


ESS

Back

Power supply unit

It is a device that supplies the necessary voltage and current to operate electronic devices.



1. Switching Mode Power Supply
2. AC / DC Converter DC / DC Converter
3. Wireless Power Solutions Of Converter
4. Programmable DC Power Supply
5. Telecom Power System
6. High Voltage Power Supply
7. RF Generator
8. Plasma Power Supply

Back

Current Sensing Resistors

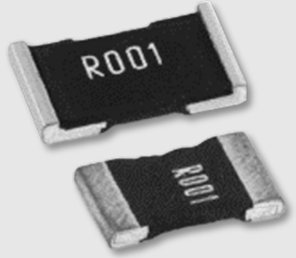
Current sensing resistors, also known as shunt resistors, are resistors used for current sensing purposes in circuits. They are used to monitor and test charging currents to perform battery charging safely and efficiently. They provide accurate values necessary for current measurement and are utilized to measure the voltage when current flows through the circuit.

ECS

MPR

CFS

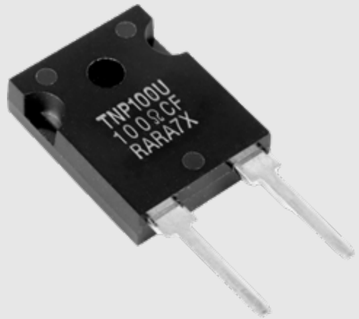
RSR



LR

Back

Road Resistor
Snubber Resistor
Damping Resistor



TNP

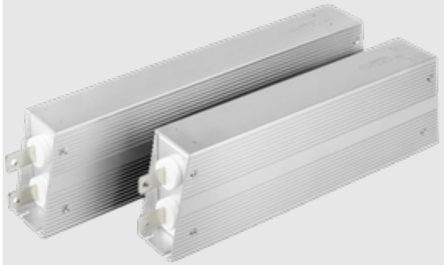
TPM

Voltage Dividing Resistor
Charge/Dis-Charge Resistor
Surge Resistor

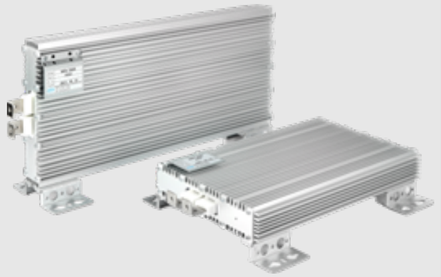
RH

IRN/IRF

IRH/IRV



IRM

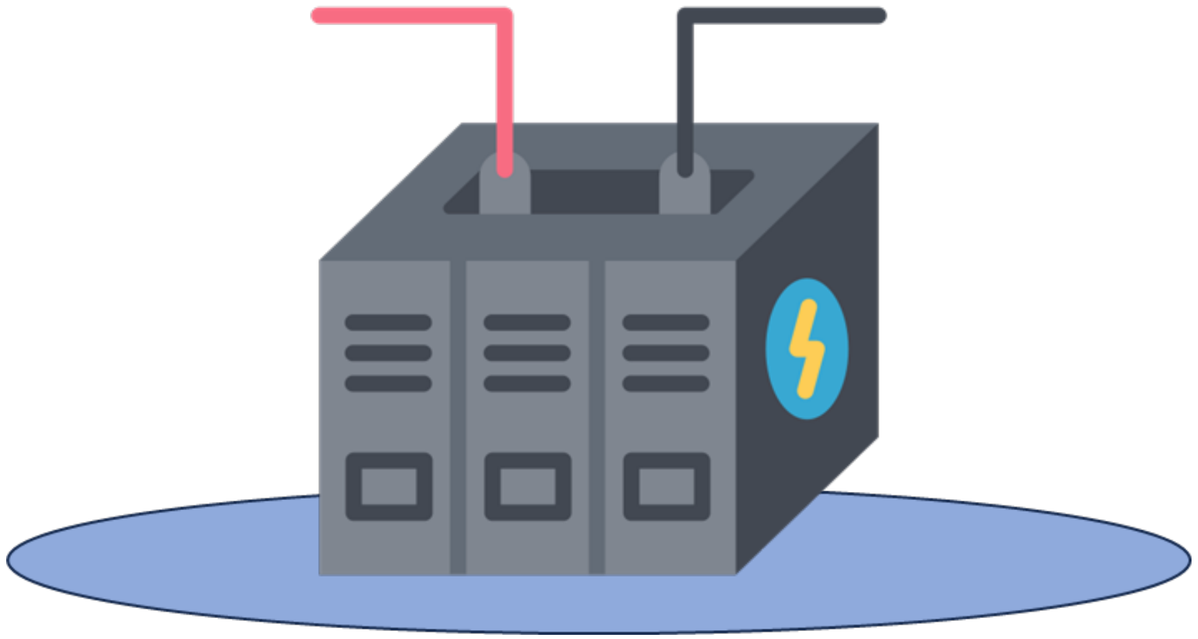


MBH/MBV

Back

ESS(Energy Storage System)

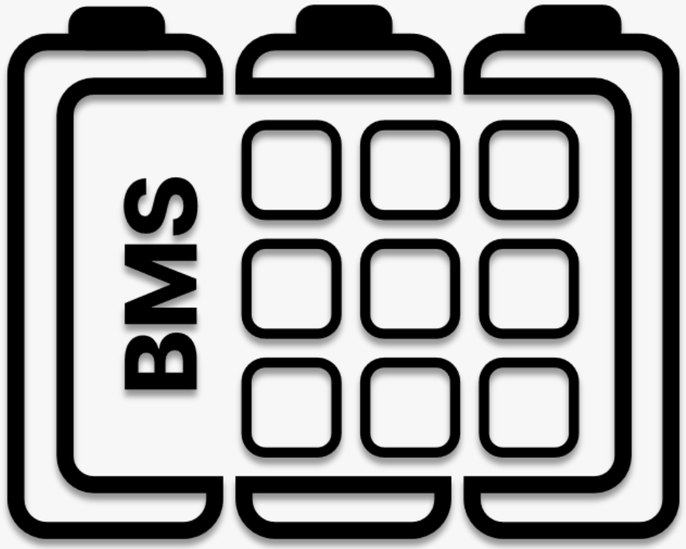
It refers to products that store electricity when power demand is low and utilize the stored electricity when demand is high, thereby improving energy efficiency and enhancing the stable operation of the power grid. This includes batteries for storing electricity and related devices that efficiently manage the batteries.



1. Pre-charge Resistor
2. Current Sensing Resistor of BMS/EMS
3. Battry Cell Balancing Resistor
4. DC-DC Convertor of PCS
5. Current Sensing Resistor of BPC
   BPC:Battery Connection Panel

Back

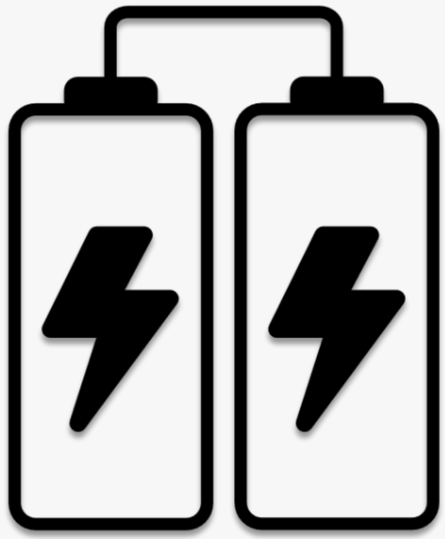
BMS



Battry Management System

It manages and controls the safety, performance, and lifespan of batteries.

PCS

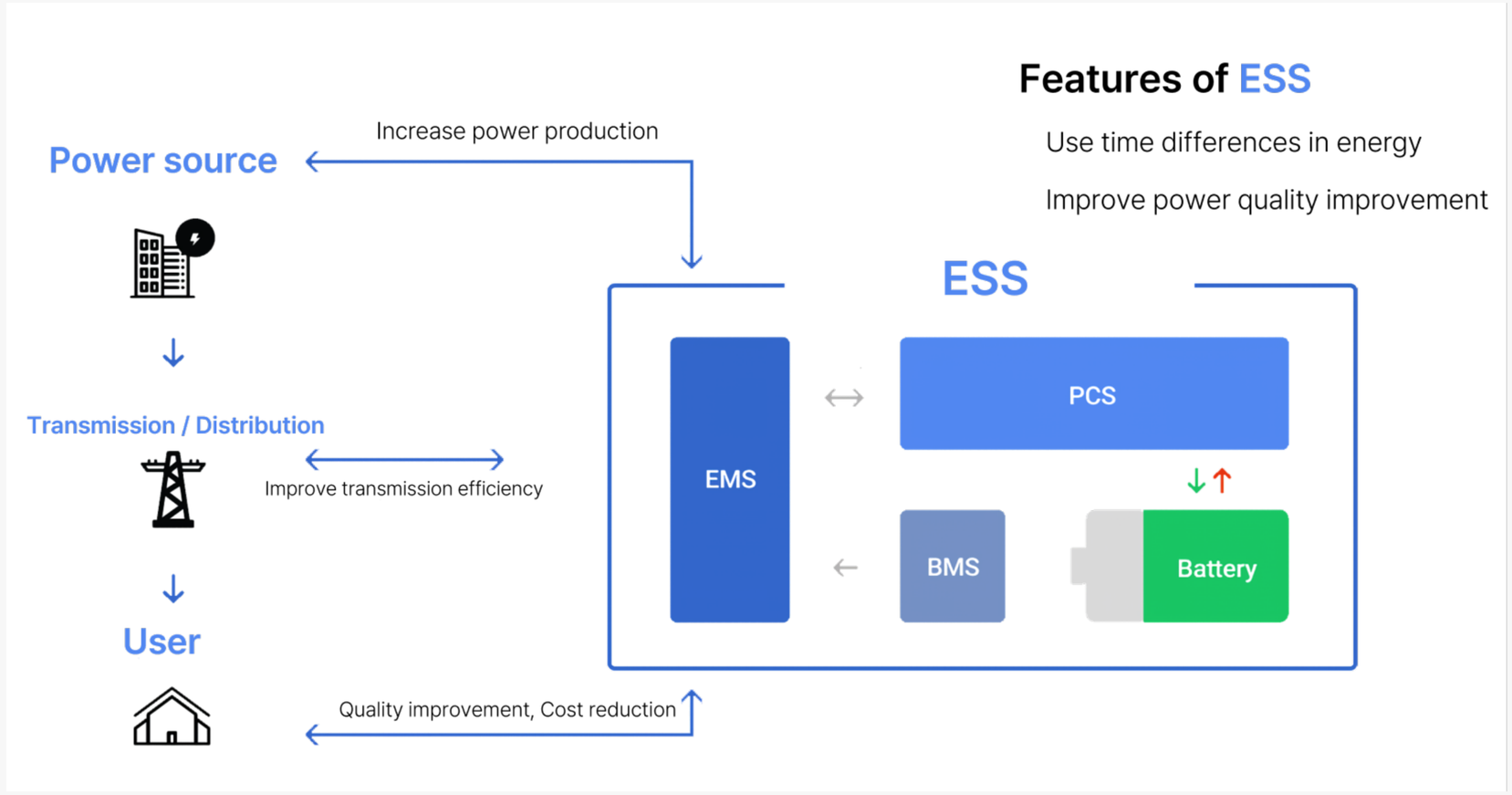


Power Conversion System

It is a device that converts alternating current (AC) to direct current (DC) during battery charging and converts DC to AC during discharge while controlling the output.

Back

ESS Configuration Chart



Back

DC-DC Convertor of PCS

RH

Back

Battery Cell Balancing Resistors

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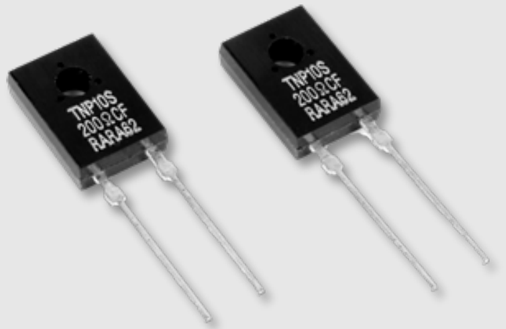
SMW

RW



TNP

Back

Pre-charge Resistors

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IRF

IRH/IRV

EW

Back

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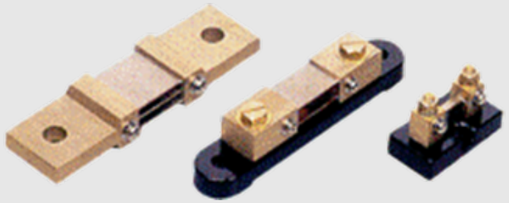
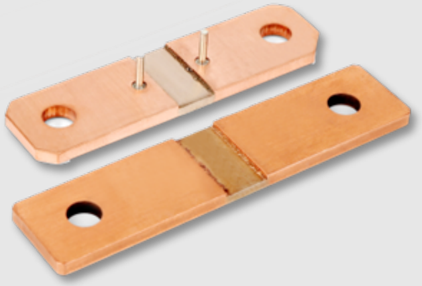
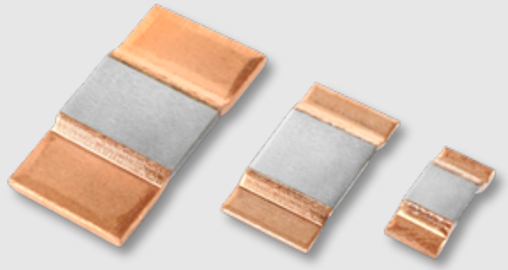


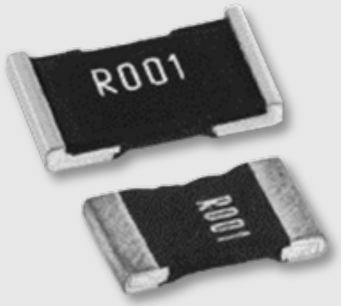
RSR



TCS



ECS



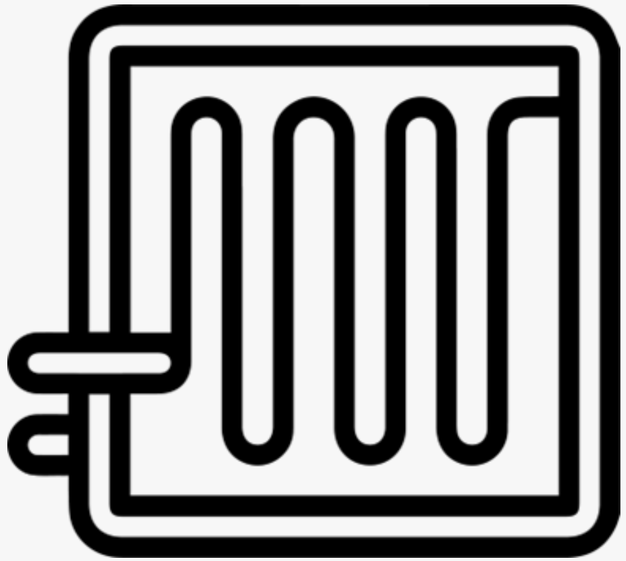
LR

Back

WHERE TO USE?

SMART WIRING DEVICE

HYDROGEN FUEL CELL



Back

SMART WIRING DEVICE

It refers to outlets and switches that can reduce power consumption even when the power to electrical devices is turned off so as long as the power cord is plugged in.
They actively manage and control electricity usage to save energy more efficiently in offices and homes, reducing inefficient energy consumption

1. BEMS
   Beilding Energy Management System
2. FEMS
   Factory Energy Management System
3. HEMS
   Home Energy Management System
4. Lighting Control System

Back

EMS

FEMS

Factory Energy Management System

It is a factory energy management system that enables systematic energy savings by understanding the operation of factory equipment, inefficient process environment control, and energy consumption analysis

BEMS

Building Energy Management System

It is a Building Energy Management System (BEMS) that integrates construction technology, ICT technology, and energy-saving technology to collect energy usage information in buildings and analyze data to efficiently manage the building's energy usage.

HEMS

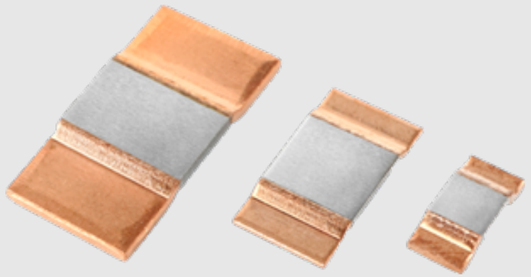
Home Energy Management System

It is a home energy management system that monitors the power consumption of household appliances in real-time, provides features such as standby power reduction, lighting control, and heating/cooling control, and enables users to control power usage to save electricity costs.

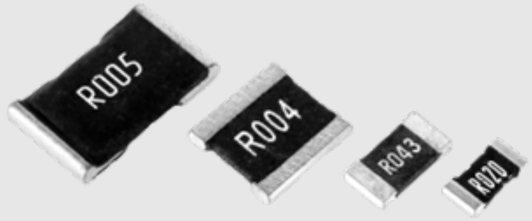
Back

Current Sensing Resistors

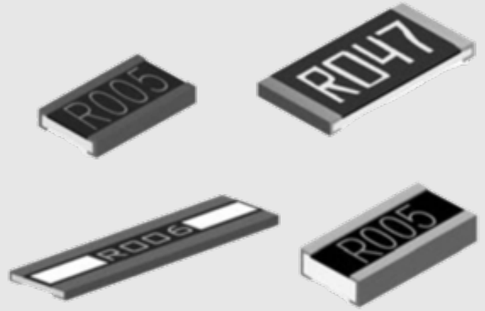
Current sensing resistors, also known as shunt resistors, are resistors used for current sensing purposes in circuits. They are used to monitor and test charging currents to perform battery charging safely and efficiently. They provide accurate values necessary for current measurement and are utilized to measure the voltage when current flows through the circuit.



ECS



LR



CS

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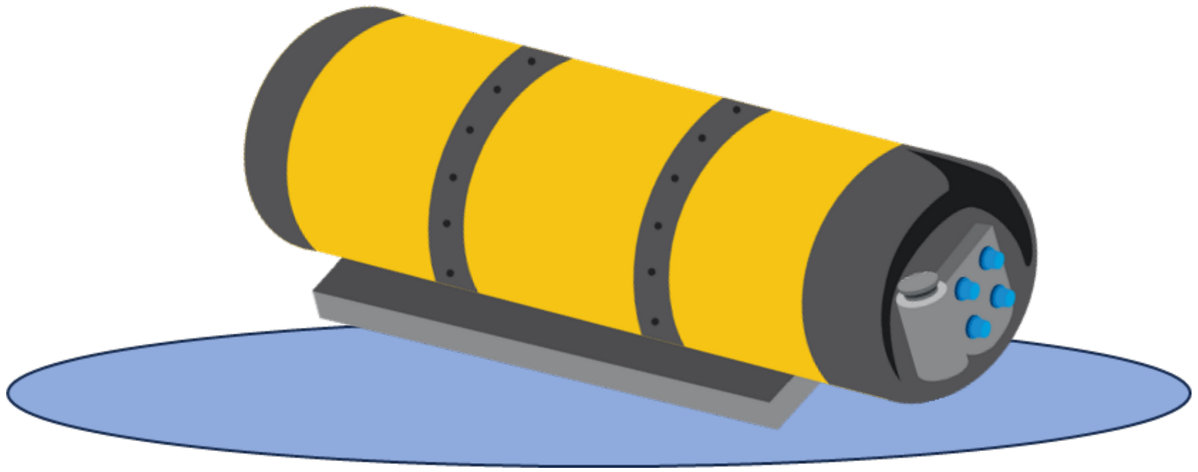
Hydrogen Fuel Cells

It is a battery that converts the energy generated from oxidizing hydrogen into electricity, which is a clean energy source. A hydrogen fuel cell reacts hydrogen extracted from fuels such as petroleum and gas with oxygen in the air to produce water and electrical energy. This method, which utilizes oxidation-reduction reactions rather than traditional turbine generation methods, is more energy-efficient.



1. Dummy Load of Voltage Limiting Device
2. Braking Resistor of PCS(INVERTOR)
3. Dis-charge Resistor of PCS(Invertor)
4. Current Limiting Resistor of Stack
5. NER(Neutral Earthing Resistor) of PSM(Power Supply Module)

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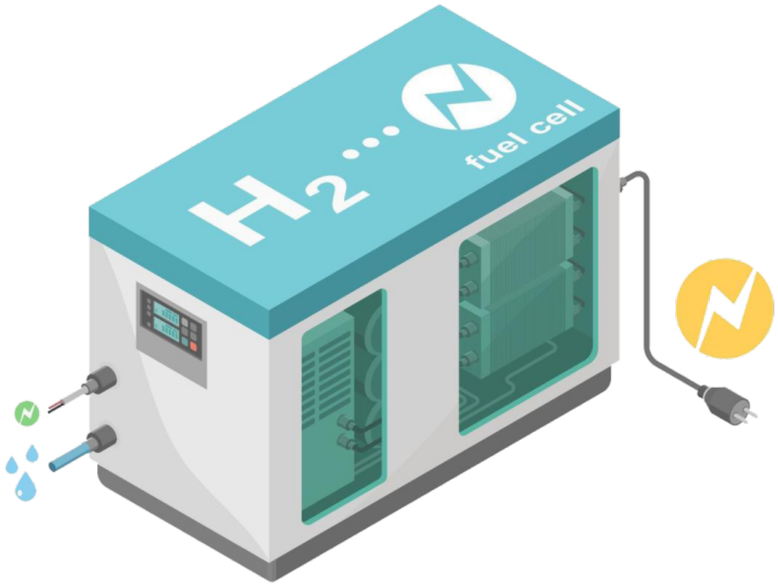
What is a hydrogen fuel cell electric car?

Hydrogen fuel cell vehicles (FCEVs) use a propulsion system similar to electric cars, where the energy stored in hydrogen is converted into electricity by fuel cells. Unlike conventional internal combustion engine vehicles, they do not produce harmful exhaust emissions. FCEVs supply fuel using pure hydrogen gas stored in the vehicle's tank. They also feature other advanced technologies, such as regenerative braking systems that capture energy lost during braking and store it in a battery, to enhance efficiency.



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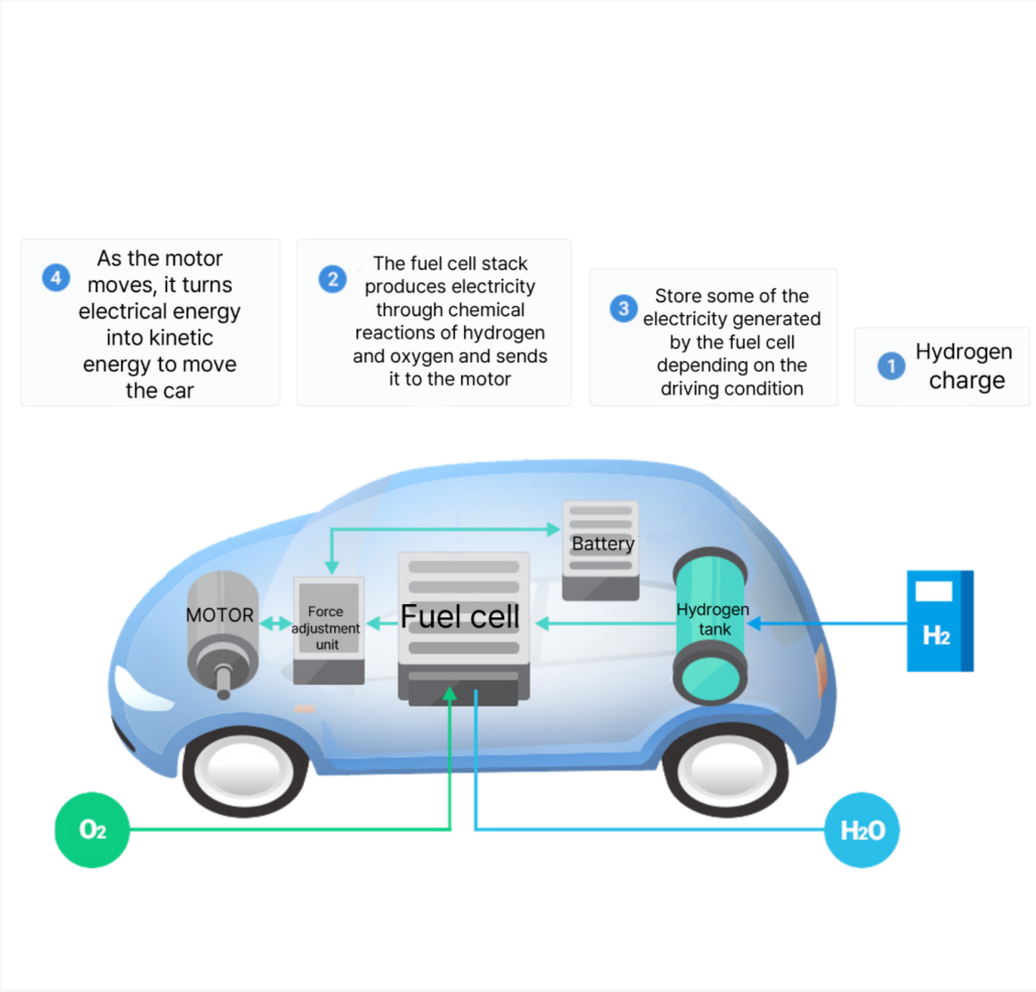
How Hydrogen Fuel Cell Works

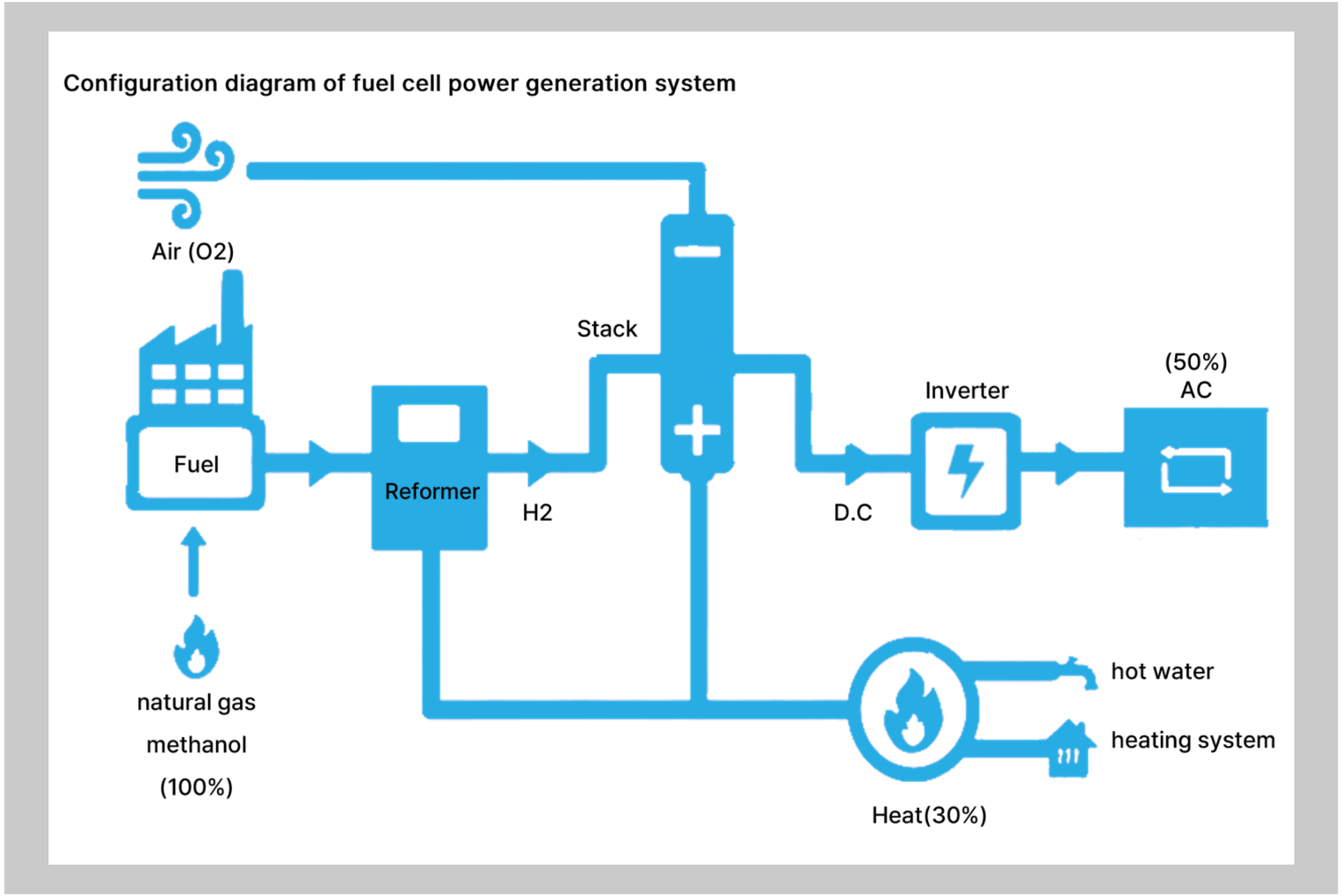
The most common type of fuel cell for vehicle applications is the Proton Exchange Membrane (PEM) fuel cell. In PEM fuel cells, a membrane electrode assembly is sandwiched between an anode (negative electrode) and a cathode (positive electrode).

Hydrogen is introduced to the anode, while oxygen (from the air) is introduced to the cathode. Hydrogen molecules are then broken down into protons and electrons through electrochemical reactions at the fuel cell catalyst The protons then migrate through the membrane to the cathode.

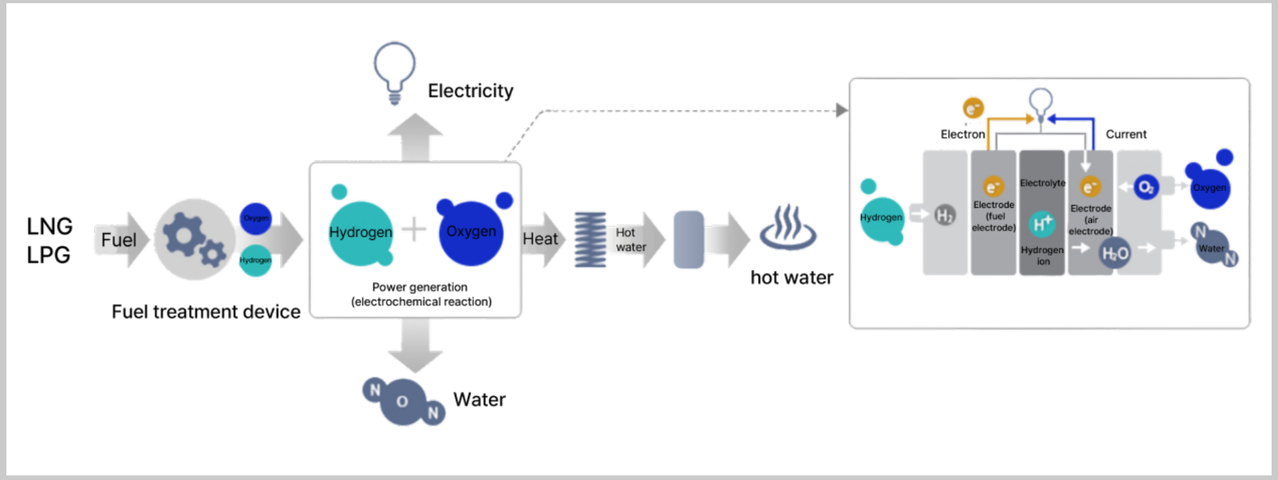
Meanwhile, the electrons travel through an external circuit to perform work (supply power to an electric vehicle), and then recombine with the protons on the cathode side, combining with oxygen molecules to form water



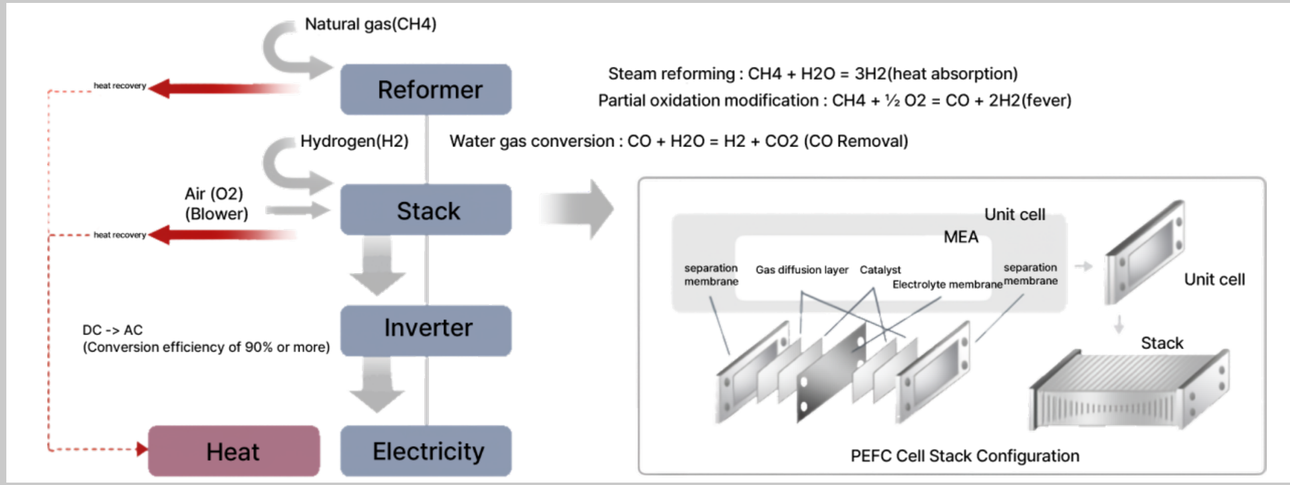
Configure hydrogen fuel cell development system



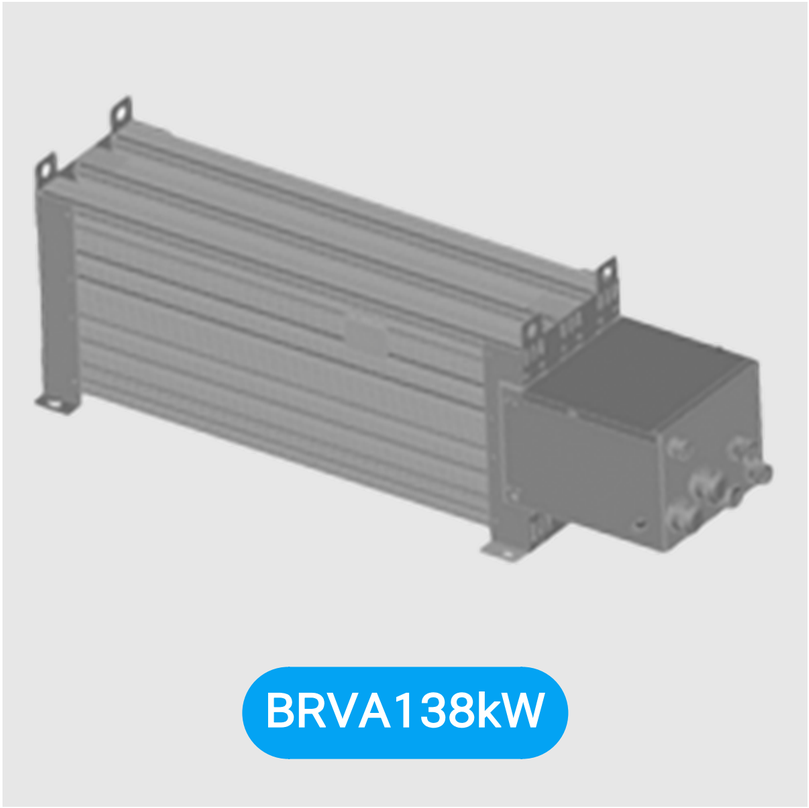
Hydrogen fuel cell structure



Configure hydrogen fuel cell system



Dummy Load of Voltage Limiting Device



BRVA138kW

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NER (Neutral Earthing Resistor) of PSM (Power Supply Module)

TPU800W

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Current Limiting Resistor of Stack
EMS:Electicity System Module

MBH

Dis-charge Resistor of PCS(Invertor)

IRN/IRF

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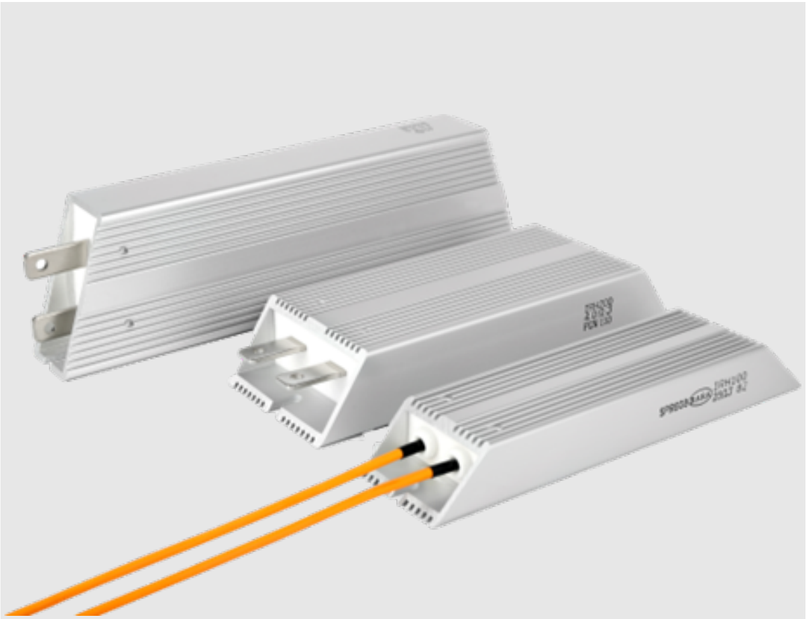
Braking Resistor of PCS(Invertor)



IRH/IRV

EWS

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