

MAKING THE REVOLUTIONARY THE INEVITABLE



## ELECTRIC VEHICLE & INFRASTRUCTURE

EVERY CONNECTION COUNTS

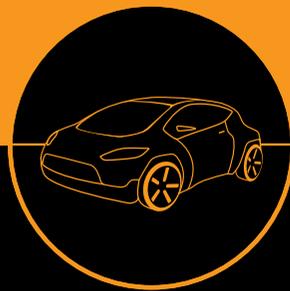


## FROM GENERATION TO DESTINATION, TE CONNECTIVITY IS ENABLING THE EV AGE.

This is truly an exciting time. Electric mobility is changing the way engineers are thinking about automobiles—the way they're designed and engineered, the way they're fueled, the way the fuel is delivered. Everything is being re-imagined. And with more than 50 years of experience in automotive connectivity systems, high-voltage electricity, and pushing innovation from one industry to the next, TE is ready to complete the connections our customers need to safely, efficiently and reliably make electric mobility a reality.

You can count on TE for:

- **Safety** - experienced in extra-high-voltage applications (800kV+)
- **Reliability** - proven in harsh automotive applications
- **Efficiency** - innovative cost-effective solutions
- **Engineering Excellence** - designing and manufacturing worldwide



## TURNING ELECTRONS INTO INDEPENDENCE.

Vehicles represent one of the most challenging engineering environments in the world. Exposed to regular temperature fluctuations, continuous vibration and frequent neglect, they're still expected to operate flawlessly for years. Electric vehicles take the requirements to an even higher level: They need reduced mass to improve the power-to-weight ratio. The high-voltage electricity must be shielded to protect the function of in-vehicle electronics. And, of course, the safety of consumers, technicians and emergency first responders cannot be compromised. That's why OEMs rely on the safety and reliability of our contactors, sensors, harnesses, connectors and terminals.

- **Contactors, Relays & Circuit Protection** protect system integrity by extinguishing arc energy when turned on or cut off from the full load of the electrical system.
- **High Voltage Terminals & Connectors** safely, securely and reliably transfer data and power between the battery and other voltage devices.
- **Cable Assemblies** offer flexibility in design and routing to help reduce weight, installation time and costs.
- **Sensors** accurately measure and communicate mission-critical powertrain, hydraulic and thermal information throughout the vehicle, and to the driver.
- **Application Tooling** meets your ever-changing wire harness and printed-circuit board needs in-house, from one-off to high-volume, automated systems.





**AMP+ Low-Medium  
Current Connectors & Headers  
- HVA280**

*With over 3,000 combinations, this touch-safe 2-3 position AMP+ connector and header family has a safe, reliable solution for you. Not limited by the header on your device, the same interface is used for individually shielded wire and multi-core wire.*



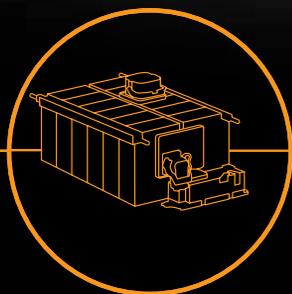
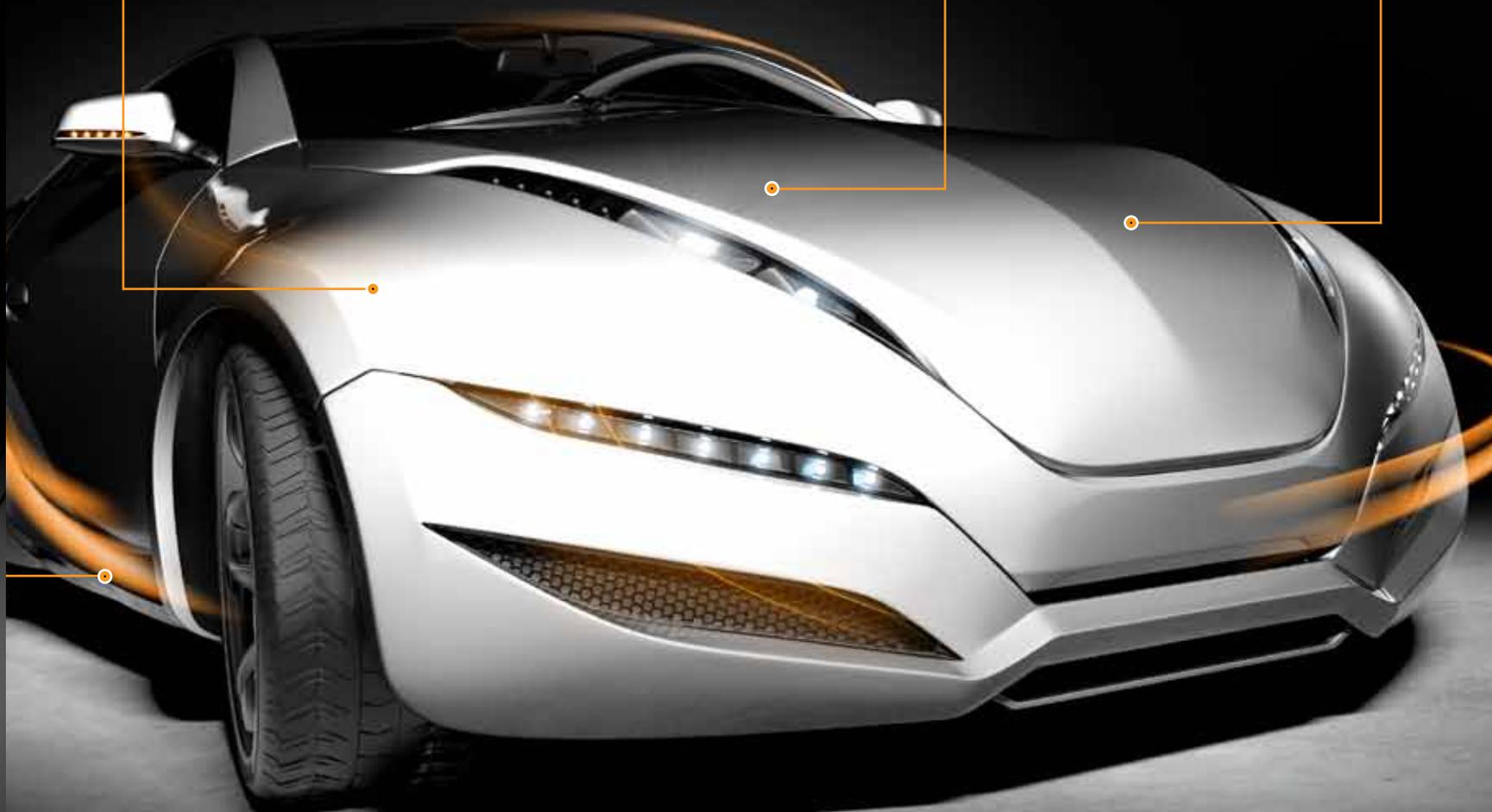
**Multi-Coil Resolver (MCR)**

*The TE multi-coil resolver determines synchronous rotor position by scanning magnetic fields. Withstands rotation speeds up to 20,000 RPM, shock and vibration.*



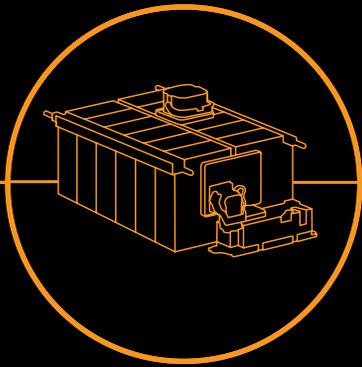
**AMP+ High Current  
Connectors & Headers  
- HVP800**

*AMP+ touch-safe 2-3 position high current connectors and headers with integrated HVIL and multiple routing options meet AK 4.3.3, LV215-1 specifications for EV applications.*



**DELIVERING MOBILITY.  
CHARGE AFTER CHARGE.**

As the heart of the electric vehicle, battery technology is one of the challenges in making EVs an everyday reality. TE is teaming with battery manufacturers to increase performance—and reduce size and costs. Both critical steps to making EV happen.



## CONNECTING AND PROTECTING THE BATTERY. FROM INSIDE OUT.

All the biggest challenges of electric vehicles are concentrated in one place: the battery. Capacity issues. Safety concerns. And power-to-weight trade-offs. TE is helping solve the puzzles with safe, reliable and low-mass connectivity solutions—inside the battery, and out. More than 50 years of experience with high voltage gives us a unique perspective and ability to connect, protect, and manage the flow of power in, out and around the pack.



### *EV 200 Contactor*

*TE's contactor family switches high-voltage power on and off, providing the capability of handling arc conditions. Hermetically sealed—*inherently safe, operates in harsh environments with no oxidation or contamination of coils or contacts, including long periods of non-operation.



### *AMP+ Manual Service Disconnect*

*No tools are required for TE's touch-safe solution for disconnecting the internal HV battery pack and protecting service technicians, emergency first responders and high-voltage wiring harness assemblies.*

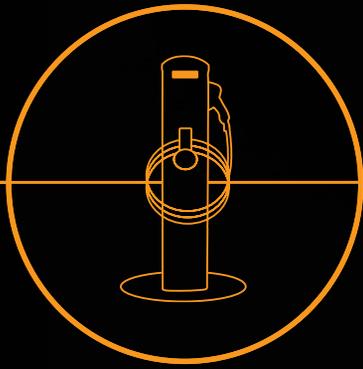


### *Metal Hybrid PPTC - MHP*

*The TE metal hybrid PPTC provides overcurrent circuit protection with arc-suppression capability in a small package. The double-make/double-break contact design smoothly transfers and shunts fault current from the bimetal to the PPTC, effectively eliminating arcing, welding and contact damage. Available in configurations supporting up to 800VDC.*

- **High Voltage Terminals & Connectors** safely, securely and reliably transfer data and power between the battery and other voltage devices.
- **High Voltage Cable Assemblies** offer flexibility in design and routing to help reduce weight, installation time and costs.
- **High Voltage DC Relays & Contactors** provide battery switching and backup, power control and circuit protection throughout the vehicle—many are hermetically sealed to operate in harsh or explosive environments.
- **Circuit Protection Devices** help protect from damage due to abnormal high currents that could cause overheat conditions.
- **High Power Distribution & Disconnects** protect the battery by measuring current and regulating power distribution in the pre-charge and in-use stages, and provide emergency shut-down when needed.
- **Thermal Sensors** are used for over-temperature signaling. They provide “silicon-like” performance (in a passive component), reduce footprint needs and support simple distributed monitoring.
- **Cell-to-Cell & Module-to-Module Contacts** are designed to be compact, accommodate large positional mismatch and maintain robust connection despite cell-to-cell movement.





## MOBILITY SIMPLIFIED. ONE CHARGE AT A TIME.

Taking electric vehicles mainstream means being able to take them anywhere. And back. But that kind of freedom will require charging solutions as common and easy to use as gas stations. TE is helping enable electric mobility by creating safe, high-quality components for every part of the charging station—and making them affordable. Our experience with high-voltage energy distribution and Smart-Grid technology gives us insight into the needs of this important market segment.



*TE and Plug Smart level 1 smart charging solution*

## More than a complete charging solution. A smart one.

Smart charging solutions enable customers to meter their EV's electricity consumption, and communicate data via innovative smart charging cords and inlets.

## YOU SUPPLY THE SHELL, WE'LL SUPPLY EVERYTHING ELSE.

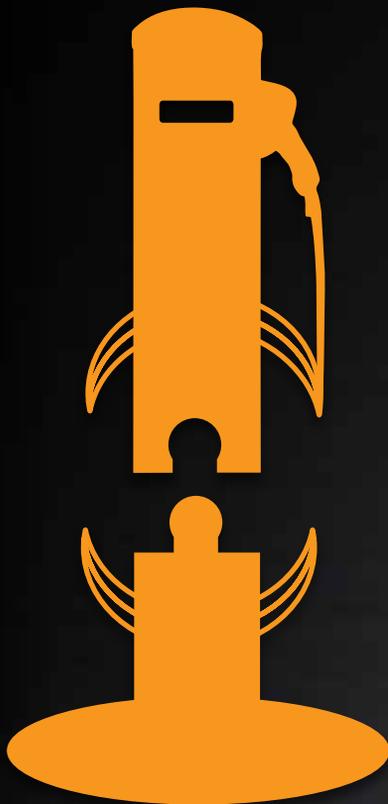
TE has everything it takes to create your EV charging solution, except the box it goes in. From cables to contactors, meters to card readers, screens to sockets, we've already solved how it all goes together.

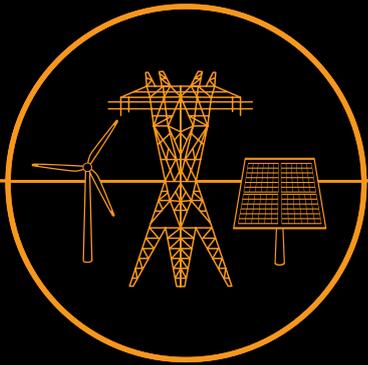
**Level 1 & 2 Charging Coupler Cable Assemblies, Contactors/Relays, & Inlets** safely deliver electricity to the vehicle to charge the battery.

**Meters** accurately measure how much charge each vehicle consumes for proper billing.

**Touch Screens** make every transaction easy and intuitive for drivers.

**Additional technologies** include card reader connectors, grid connectors, base connectors, data and power connectivity, and power line filters that TE supplies to make your charging station solution a reality.





## THE MOBILE GRID STARTS HERE.

The safe, reliable transmission of power from the grid to users is nothing new to utilities. Or TE. We've been connecting and protecting the flow of high-voltage electricity for years. Now we're pushing that experience in new directions to help you bring electric mobility to the masses.

**Power Distribution** panels, switchboards and breakers reduce installation costs and time-to-market while simultaneously providing longevity and ease of use.

**Power Measurement & Control** components provide continuous monitoring and automatic control of the power flow to protect against damage down the line.



### **Raychem High Voltage Outdoor Termination - OHVT**

*The Raychem high voltage outdoor termination is designed for voltage up to 170kV and to operate under severe environmental conditions. Polymeric insulated cables of various designs can be adopted with respect to shielding and metal sheath.*



### **Raychem Screened Adaptors**

*Raychem separable screened adaptors are designed to connect single- and three-core polymeric cables to medium voltage equipment (transformers, switchgears, motors, etc.) using bushings type C according to EN50181, up to 24kV. Their wide application range allows a minimum number of bodies to cover several different cable cross-sections without the need for additional cable adaptors.*



## CONVERTING THE POTENTIAL INTO THE INEVITABLE.

We're more than your source for world-class technology. We're your partner in innovation. We work side-by-side with engineers in virtually every industry to create smarter, faster, better answers to the challenges of tomorrow. No matter what your business is bringing to EV, you can depend on us to help complete the connection.

- **Major OEMs** around the globe rely on TE technologies
- **One of the largest suppliers** of automotive connections in the world
- **14,000+** patents
- **Recipient** of Thomson Reuters 2011 Top 100 Global Innovator<sup>sm</sup> award



Learn more about what the TE Electric Vehicle & Infrastructure team can do for you at [te.com/ev](http://te.com/ev)

## FOR MORE INFORMATION

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