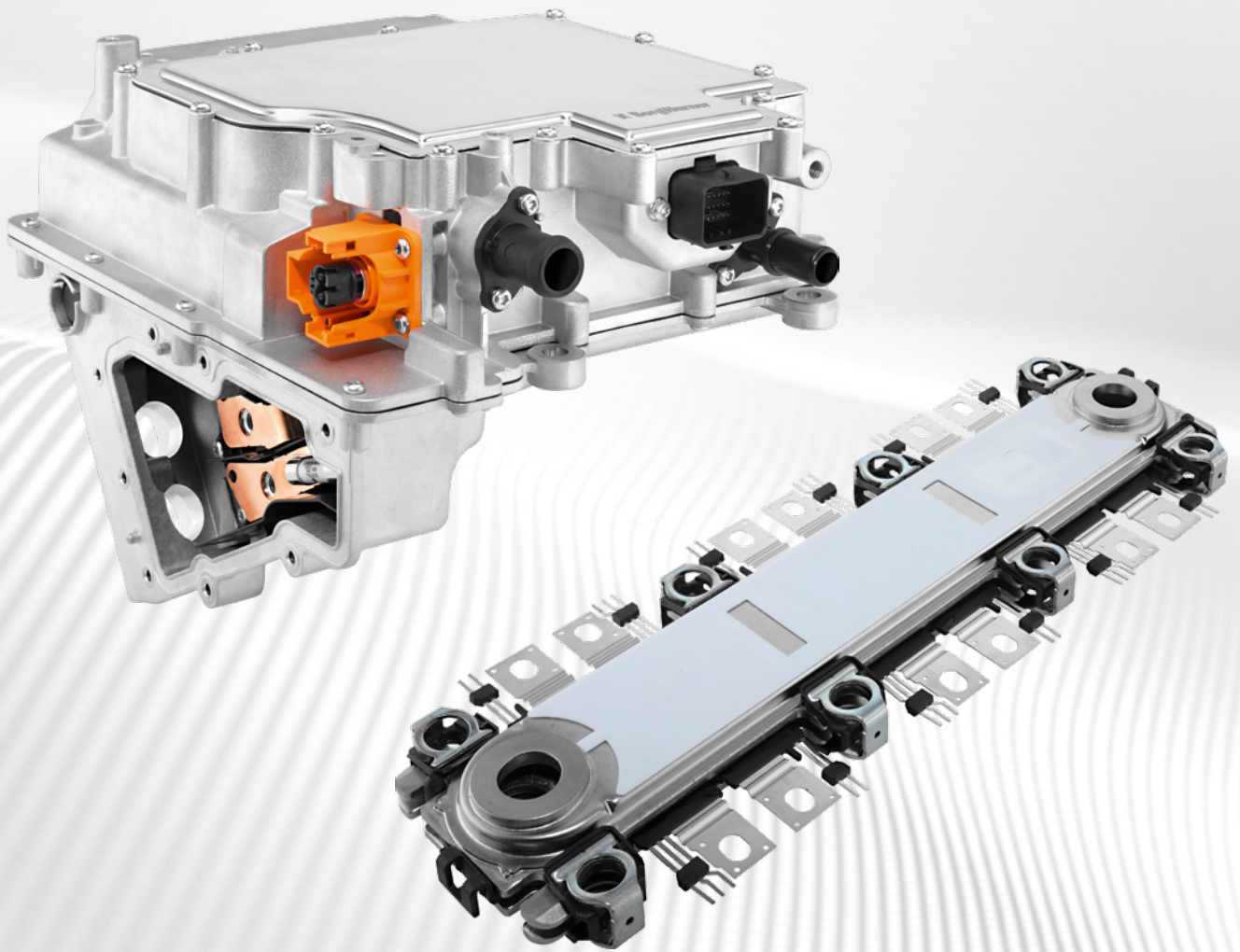


# Explore our Technologies

# High Voltage Inverter

from BorgWarner



# High Voltage Inverter from BorgWarner

## BorgWarner's High Voltage Single Inverter

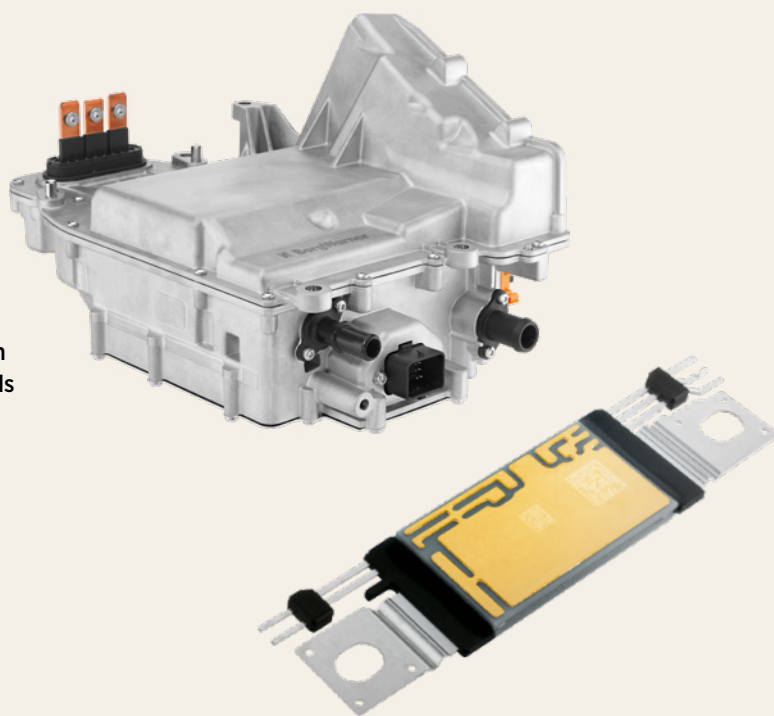
uses a silicon carbide (SiC)-based power switch for 800-volt application that can deliver increased efficiency for enhanced voltage flexibility, improved recharging times, better endurance range.

### Technical Features

- Using the patent Viper power switch
- The switch has the dual-sided cooling capabilities. This unique cooling structure provides a more compact, efficient power module. When compared with previous generations of inverters, this dual-cooled power switch enables weight reductions of 40 percent, overall size reductions of 30 percent and higher power densities of 25 percent.
- The switch's design also eliminates wire bonds – the complex web of wiring that provides the path for the current to flow through the switch via the inverter's connections to and from the battery and motor. Eliminating the wire bonds and moving to soldered interconnectors, translates into better durability.
- The use of silicon carbide (SiC) MOSFET. SiC devices offer 2–3 times lower on-state voltage drop than Si, 10x higher breakdown field than Si. It has better thermal conductivity and better high-temperature stability. The higher voltage means that the cables are lighter than the low-voltage cables. It also has a smaller power size than silicon and a faster switching speed. Faster switching speeds mean lower switching losses, with SiC reducing switching losses by 70%. Therefore, it is especially suitable for high switching speed or power occasions. The advantages of SiC power electronics are particularly evident in 800 V battery systems.

### System Benefits

- It enables electrical systems up to 800 volts and extends plug-in hybrid vehicle (PHEV) and battery electric vehicle (BEV) range by approximately 5%, and cuts charging times when compared to 400-volt systems
- It delivers up to a 70% reduction in switching losses, depending upon the drive cycle, which provides OEMs with the ultimate in performance and cost flexibility when designing electrified propulsion systems
- It features a patented, dual-sided-cooled SiC-based power switch that's 40% lighter and 30% smaller compared to previous generations of inverters
- Its dual-sided cooling capabilities allow for less semiconductor area, and therefore less SiC material, which cuts costs versus other SiC-based inverters
- It leverages the industry's leading no wire-bond power switch design for improved durability and enhanced packaging
- Its unique design allows it to be scaled and adapted to lower and higher voltage systems, giving OEMs much-needed flexibility and economies of scale in managing the multiple voltage and current levels required by PHEVs and BEVs



Find out more about our High Voltage Inverter here!

[borgwarner.com](http://borgwarner.com)

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