



Improved Battery Performance – BorgWarner’s High Voltage Coolant Heater

- *Improves battery performance for Hybrid and Electric Vehicles*
- *Enhances driver comfort by providing rapid cabin heating*
- *Utilizes compact modular design with high thermal power density*

Auburn Hills, Michigan, September 12, 2018 – As the automotive industry continues to explore a variety of propulsion technologies, electric vehicles (EVs) and hybrid electric vehicles (HEVs) are becoming more popular than ever. BorgWarner, a global leader in propulsion systems for combustion, hybrid and electric vehicles, is announcing its innovative High Voltage Coolant Heater as part of the company’s Battery and Cabin Heater families. The technology improves battery performance by keeping the battery’s operating temperature within an optimal operating range and providing a consistent temperature distribution inside the battery pack and its cells. With its high thermal power density and fast response times due to its low thermal mass, the efficient technology also extends pure electric driving range by using less power from the battery. In addition it allows comfortable cabin temperatures to be generated in a short time.

“As demand for EVs and HEVs increases, thermal management is receiving growing attention. Our engineers developed two flexible, efficient systems to provide fast temperature response in daily use,” said Joe Fadool, President and General Manager, BorgWarner Emissions & Thermal Systems. “BorgWarner’s expertise in heating solutions helps automakers improve the overall efficiency of their applications, meeting new mobility trends and the demand for clean vehicles.”

How the Innovative Technology Works

BorgWarner’s latest High Voltage Coolant Heater features a thick film heating element (TFE). A compact contour enables flexible sizes and shapes while low thermal mass results in fast response times. The innovative technology not only offers high thermal power density, it also allows for direct temperature sensing. Different designs of BorgWarner’s High Voltage Coolant Heater are suitable for application with supply voltages between 180 and 800V, offer a power

range of between 3 and 10 kW, and are suitable for a broad range of applications. In addition, an intelligent safety concept prevents the High Voltage Coolant Heater from overheating during high electricity flow. The system recognizes various situations and can react to each.

The High Voltage Coolant Heater is available in two versions: Single Plate and Dual Plate. Compared to its Single Plate version which is responsible for either the thermal management of the battery or the heating of the cabin, the Dual Plate Heater manages both tasks at the same time. In addition, it provides up to 80 percent more heat transfer surface as it has two heater plates. Both versions are integrated into a robust aluminum housing that allows for excellent electromagnetic shielding. As the heat packages within this application are covered by the coolant, the heat power losses are minimized providing higher efficiency and extending the battery-powered driving range.

Other Heating Solutions from BorgWarner

BorgWarner’s Heater family includes another advanced technology: the High Voltage PTC Cabin Heater, which is a part of the company’s Cabin Heater family. This system is suitable for high-voltage as well as low-voltage applications, operates independently of waste heat and features positive temperature coefficient (PTC) components. The technology offers silent, rapid heating of the cabin while facilitating dual-zone functionality for the first time in the industry. A wide range of safety functions are integrated within the Heater. A number of these cabin heaters are in series production in various applications around the world.

About BorgWarner

BorgWarner Inc. (NYSE: BWA) is a global product leader in clean and efficient technology solutions for combustion, hybrid and electric vehicles. With manufacturing and technical facilities in 66 locations in 18 countries, the company employs approximately 29,000 worldwide. For more information, please visit borgwarner.com.



In addition to enabling comfortable cabin temperatures and reliable battery thermal management, BorgWarner's compact and lightweight High Voltage Coolant Heater extends the battery-powered driving range for hybrid and electric vehicles.

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