



For Immediate Release

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**Royal Power Solutions Unveils EV and Hybrid Vehicle Components;
New Connectors and Conductors Maximize Power and Save Energy**
Concept Approval Achieved on 20 American; 2 European Models

Carol Stream, Illinois, March 3, 2020 – Royal Power Solutions, a supplier of critical high-precision electrical power and signal distribution components, has introduced two breakthrough products that improve energy efficiency and overcome waste in electric and hybrid vehicles.

Royal's new High Power Lock Box (HPLB) is the industry's only high current connector (above 150 amps continuous current) that meets USCAR2 T4 (150° C) and V4 (severe vibration) requirements while also satisfying S3 standards for sealing under pressure spray. In addition, the company's new RigiFlex busbar with integrated HPLB terminals is the first product of its kind to include both rigid and flexible segments in one continuous seamless conductor that enables fully automated battery pack assembly.

For HPLB and RigiFlex, Royal has achieved concept approval on 22 vehicles in development in both the United States and Europe.

"While much of the auto industry is focused on developing EV software, we see unique opportunities to develop intellectual property that results in high-current connections able to withstand high-vibration and high temperature mechanical stresses while delivering a full system solution with innovative hardware like HPLB and RigiFlex," said Randy Ross, CEO of Royal. "We've are a Green Technology company that is applying 80 years of stamping and metal folding experience with Industry 4.0 technologies to create connector and conductor components that maximize power in electrified vehicles while allowing them to operate at peak efficiency."

High Power Lock Box

According to Royal's Vice President of Engineering and Product Development Jim Dawson, HPLB solves many problems that the hybrid and electric vehicle world has encountered in developing applications that can carry high currents, withstand heavy vibration and hold up to elevated temperatures.

Dawson describes HPLB as a "plug-in" solution with a smaller footprint -- less weight and reduced profile -- that replaces current "bolt-on" connection systems using machined studs and round terminals or eyelets with anti-rotational features.

"We've developed an advanced solution that supports Green initiatives for the market and improves the safety and handling of these critical high voltage energy storage and distribution systems," Dawson said. "It lowers resistance, reduces heat in system 'hot spots' and reduces assembly processes and associated time."

HPLB has been tested for use at elevated operating conditions defined by leading battery electric vehicle OEM's to further prove its robustness in application in the most challenging environments and applications.

While it was designed for the most advanced battery (BEV) and plug-in hybrid (HEV) electric vehicle systems and architectures, it has also proven to be a highly valued upgrade to standard internal combustion engine systems (ICE) which benefit from the improved installation and sealing functions and the superior performance under excessive heat and vibration, according to Dawson.

Royal has a family of HPLB products available to the industry in nine sizes ranging from Pico and Nano to 8x and 12x Beam LP (low profile).

Key product features include:

- Twice the current carry capacity in half the packaging space
- Industry leading current capacity above 125 °C
- 360° contacts (multi-contact terminal system)
- Eliminates dissimilar metals in the connection (preventing galvanic corrosion)
- Weight savings at 70% (recognized on Inverter and IDCM modules)
- Copper and aluminum available across product line

RigiFlex

The self-aligning, quick-connect RigiFlex -- with integrated HPLB terminals -- is the only busbar on the market that is rigid in some areas and flexible in other areas that require elevation changes. Dawson said the flexibility also works well across the battery pack in areas that require tolerance for expansion and contraction during charging and discharging cycles.

RigiFlex, according to Dawson, allows for more simple automation solutions at the customer manufacturing location.

Key product features include:

- Eliminates costly scrap, complex stamping dies and rigid-to-flexible joining processes while greatly improving time to market
- Ultra-efficient, reduced packaging where z-axis space is limited
- Easily scalable and available in copper or aluminum conductor materials
- Proprietary low insertion force push connection system

Dawson says HPLB and RigiFlex share common features Royal strives to incorporate in all its proprietary technology.

"Both products are configurable, cost-efficient, compact in packaging and flexible in giving customers critical options for expanding their pack designs," he said. "Some customers need 80, 120 and/or 160-kilowatt variations for their battery packs. Our products allow this to happen seamlessly without any special components or low volume parts."

About Royal Power Solutions

An Industrial Growth Partners (IGP) company, Royal Power Solutions, established in 1938, is a global leader in the development and production of critical high-precision power and signal distribution components. The company's headquarters and primary production facility is located in Carol Stream, Illinois. Royal acquired Horizon Die Company in 2018 and opened a second assembly plant in Querétaro, Mexico in 2019. www.royalpowersolutions.com High Power Lock Box is covered by U.S. patent no. 10,135,168 and other patents pending worldwide. <http://www.Royal.com/development/patents>. There are seven patents pending for RigiFlex in the U.S. and internationally.