

electric & hybrid

vehicle technology international

HYPER MANIC

Sitting at the top of the hypercar power tree is a rip-roaring Ferrari featuring advanced powertrain electrification. *E&H* reveals all the LaFerrari secrets



Make some Noise

It's time for the automotive industry's eco-saviors to be heard as well as seen



July 2014

LIFE AFTER LITHIUM

The pressure is on for battery developers to come up with more powerful solutions, but choosing the right chemistry is no easy task

WATER BABIES

Hydrogen fuel cells are back – or are they? *E&H* investigates the next-gen FCEVs being readied for market launch

COMMERCIAL INTERESTS

E-powertrains are growing in popularity in the automotive world, but the same can't yet be said for commercial vehicles

High-voltage connections

Using a safe, reliable, high-voltage cable system enabled a burgeoning sportscar project to combine high-performance motoring with a hybrid drive system

▶ Kepler Motors is building a special kind of hypercar. Founder Russ Wicks combines classic sportscar attributes with an innovative hybrid drive concept in the Kepler Motion hypercar. To do so, the world record holder relies on Huber+Suhner products.

The Kepler Motion hypercar offers unrivaled precision, exclusivity, safety and efficiency. Wicks, the holder of several world speed records on land and on water, has created a high-performance vehicle with a unique hybrid drive concept.

The rear wheels are driven by a modified Ford EcoBoost V6 engine with a capacity of 3.5 liters, generating 558ps. Two Remy electric motors are mounted on the front axle totaling 253ps driving the front wheels. The total output of 811ps launches the Motion to 100km/h (62mph) in under 2.5 seconds. Each electric motor is powered by a battery block supplying 400V/600A through a high-voltage distribution unit (HVDU). From this box, the power is routed through the Huber+Suhner Radox Automotive Connection System (RACS) to two inverters.

The three-pin, high-voltage RACS connection system consists of two 35mm² battery cables and a unique connection plate with a space-saving design that enables a safe, efficient connection

The high-voltage distribution unit inside the Kepler Motion hypercar



The Kepler Motion hypercar uses RACS in its hybrid drive

between the HVDU and secondary high-voltage assemblies.

"We first saw the RACS connection system at Drayson Racing, which was our first contact with Huber+Suhner," says Wicks. "The innovative direct connection enables us to connect our high-voltage components with fewer parts, and thus at a lower cost, and with less fault potential." One other benefit that attracted Kepler Motors to Huber+Suhner was the ability to use a smaller cable bend radius in the design, which saved cable length and weight.

RACS also enables the connection between the inverters and the two Remy electric motors – using a two-pin assembly based on three 50mm² battery cables.

The high-voltage connectivity system is a customer-specific assembly that is available in a

single-, two- or three-pin design. It is supplied with Huber+Suhner Radox cables and a connection plate that is developed in-house. Customers can specify the type of connections and cable length/cross-section themselves. RACS has a shielded high-voltage connection and is protected to IP69K. With a low electrical resistance of <10mΩ between the connector and the HVDU, and with a high-current capability, the system proves its worth.

Radox battery cables are high-temperature-resistant products with a reduced outer diameter. The cable is highly resistant to temperature, ozone, weathering and hydrolysis, and has excellent resistance to battery acid and cooling agents. It is also resistant to oils, fuels and other fluids used inside and outside of the motor compartment. Because of its

electron beam cross-linked Radox insulation, the cable has, despite the reduced outer diameter, excellent resistance to heat, pressure and abrasion. In addition, the Radox battery cable has outstanding dielectric properties. The flame-retardant insulation does not melt or flow at high temperatures and is easy to strip.

A total of 50 Motions are planned, starting in 2014. "We were looking for a manufacturer of reliable high-voltage connections for our production," says Wicks. "We believe we have found the right partner in Huber+Suhner, which offers us the safety and reliability that we need for our hypercar." ©

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