



ISABELLENHÜTTE

**Press Information
Isabellenhütte 1 / 2018**

D-Dillenburg, January 2017

Isabellenhütte technology partner of Formula E

IVT-F: High-precision measurement technology in Formula E racing series

Isabellenhütte uses the Formula E racing series as an innovation driver for its measurement technology products in order to expose the shunt-based IVT measurement technology to the harshest requirements. The future generations of IVT series products will benefit from the knowledge gained.

Isabellenhütte has once again demonstrated its expertise in a high-performance environment with the shunt-based IVT-F measurement system developed specifically for formula racing. The IVT-F used in all Formula E race cars is responsible for measuring the charge and discharge volumes of the battery units. These achieve high energy densities when high voltages are applied. This is why the isolation electric strength of the measurement sensors must be correspondingly high. It is a key quality feature that distinguishes the IVT measurement systems.

The shunt-based IVT-F measurement system is a custom-made production. The device must meet elementary physical and technological framework conditions due to the regulations. In the racing trim, the sensor system used must be extremely precise and highly insulating. With a plastic potting that surrounds the IVT-F, the standard insulation used from the standard product IVT-S, which is between 600 and 800 volts, is therefore additionally amplified. In this way, the IVT-F achieves a real isolation electric strength of 1,000 volts. The very good linearity, the custom-made electronics, the quick sampling and the excellent calibration realize a precise measurement.

The heat generated while racing is countered by the IVT-F with a high temperature resistance. The system designed from resistant special materials has a very low temperature coefficient. It protects the IVT-F from malfunctioning. The system ensures precise measurement results up to an operating temperature of +105°C. A microcontroller monitors the sensor status in order to meet the safety requirements.

As with the standard product IVT-S, an AD converter in the IVT-F also ensures a precise transformation of the voltage drop into digital signals. A CAN bus interface was installed for the data transfer. It ensures the communication between IVT-F and the battery control unit.

"Our series products and our customers benefit from our success in Formula E," says Athier Lafta, product manager for precision management at Isabellenhütte. With the knowledge gained in Formula E regarding improved insulation electric strength, Isabellenhütte also developed the series measurement technology IVT-MOD further and launched its successor IVT-S "in order to meet the increased requirements of car manufacturers, including requirements for increased system voltage."

About Isabellenhütte Heusler

The measurement systems from Isabellenhütte Heusler GmbH & Co. KG are leading technology in the field of shunt-based current measurement systems. The company combines its precision measurement systems under the brand name ISAscale®.

Isabellenhütte Heusler GmbH & Co. KG has been owned by the Heusler family since 1827. Around 850 employees work at the company headquarters and production location in Dillenburg (Hesse). www.isabellenhuetten.de