

Measuring battery cooling liquid flow using high tech turbine flowmeters from TrigasDM

It is particularly important for the battery systems of electric cars to be cooled properly in order to avoid the rapid decrease in life expectancy that can result from overheating of the components. Overheating is not only caused by the engine, but also by high ambient temperatures during the summer. It can lead to strong spikes and rapid changes in temperature, which permanently damage the battery systems and shorten their service life. There are various cooling system concept on the market. The most commonly used air cooling system is not as effective as liquid based systems.



Regular water cooling systems, on the other hand, require a lot of storage space in the engine due to the large storage tank. And the additional weight reduces the driving range of the car.

As a result, the automotive industry is working hard on new cooling methods for the batteries of electric cars. Different cooling media are presently tested, like different mixtures of water and paraffin, antifreeze or various oils, such as CryoSolplus or Novec. New systems and media are now tested in the labs of the car manufacturers as well as independent developers. Long term trials are underway with Test vehicles on the road. The flow rates in the main line, as well as all secondary lines of the cooling circle in the engine are monitored to find out how much cooling media is reaching the different motor parts under varying driving behaviors. This will lead to the implementation of a consistent cooling method for the entire system.

The measurement of the cooling media must be very accurate, since even small differences will have a strong impact on the long-term use of the battery system.

Road tests are frequently conducted under quite harsh conditions. Therefore, a robust measuring system is needed, which must be suitable for various media and can measure with high accuracy unaffected by road vibration, under conditions of changing temperatures, pressures and viscosities.

An ideal solution for this is the TrigasDM Turbine Flowmeter, which is now regularly used by all major German car manufacturers for this application.

"We adapt our state-of-the-art turbines to the exact needs of car manufacturers" explains Christian Stöckle, Managing Director of TrigasDM. "Special fittings for each line or hose system enable an easy

adaption to the different test systems. A particularly small, weight-reduced version requires only minimal space and can be integrated easily into the existing pipes. And the light weight ensures that there are no additional vibrations in the system."



Crucial to the success of TrigasDM turbines is also the high-precision special calibration. This is the daily business of the sister company TrigasFI, known for 30 years as a specialist in flow calibration. The certified DAkkS laboratory calibrates flow meters of all measuring principles for various manufacturers and end customers. And, of course, the TrigasDM turbines get their final touch here.

A special UVC calibration for different viscosities makes it possible to use the turbine universally, even at changing temperatures and viscosities, without compromising the flowmeter's linearity of 0.1% or the repeatability of 0.05%. No doubt, this is one of the reasons why this high-tech turbine flowmeter is valued by manufacturers as well as by the research departments of the institutes and the laboratories of the automotive industry worldwide.