



TRICOR® goes Formula 1

Application Story





## Fuel and fuel additive test system for final testing of Formula 1 gasoline pumps

### **Parker Hannifin Manufacturing Germany GmbH & Co. KG:**

Parker Hannifin is the world's leading manufacturer of motion and control technologies with annual revenue of over 13 billion dollars for the fiscal year 2012. The company develops and designs systems and precision technologies for mobile and industrial applications as well as for the aviation and space industry. The company employs around 60,000 employees in 48 countries around the world. Parker Hannifin clearly focuses on its customers. With its technical competence and broad range of core technologies, Parker Hannifin is uniquely positioned to deliver solutions for many of the world's largest technological challenges. Parker Hannifin works in partnership with its customers to increase their productivity and profitability.



The technical competence of Parker Hannifin reaches from the most important motion and control technologies – aviation and space, cooling and air conditioning technology, electromechanical, filtration, coupling technology, hydraulics, pneumatics, process control, sealing technology and EMI shielding.

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## APPLICATION:

Fuel and fuel additives test system for final testing of gasoline pumps at Parker Hannifin Manufacturing Germany GmbH & Co. KG in Mainz-Kastel. The pumps are utilized for Formula 1 racing.

Every single gasoline pump is tested and qualified on the test system under completely different operating parameters before they are delivered to the racing customers.

## TECHNICAL DATA:

	<b>TCM 0650-FA-HGSS-CSDS</b>
Flow range	9 - 600 kg/h
Work point	18...360 kg/h
Medium	ISOPAR H
Viscosity	0,7...5 mm <sup>2</sup> /s
Density	730...850 kg/m <sup>3</sup>
Medium temperature	+15 °C to +80 °C (+59 °F to +176 °C)
Operating pressure at TCM	4...5 bar
Display	Local LCD display
Interface	RS 485 (Modbus RTU)





## CHALLENGE:

A test system of high technical complexity is being designed and modeled for unlimited final testing of gasoline pumps for Formula 1 racing customers. To meet the very high demands for quality, this must cover the entire performance spectrum and provide the best possible testing conditions for the final test.

In the area of flow measurement, the task is to specify a highly accurate sensor for the most varied operating parameters. The conditions of utilization comprise a large spread in the temperature and the process pressure. This results in a change in the viscosity of the fuel.

In the first design, the KEM Küppers Elektromechanik GmbH considered turbine flow meters and TRICOR Coriolis mass flow meters. The solution with turbine flow meters required a cascading of various devices to cover the flow measurement range. Furthermore, different calibration curves needed to be used in order to measure up to the accuracy requirements.

## SOLUTION:

TRICOR Coriolis mass flow meter, by contrast, provides multiple technical advantages for this test bed. Flow meters using the Coriolis principle are significantly more accurate, faster and are almost completely independent from the medium properties in contrast to other flow meters. The TCM 0650 covers the entire testing measurement range.

With the TRICOR Coriolis solution, Parker Hannifin can cover the required temperature and process pressure range at the fuel test bed. There are no restrictions in regards to medium, viscosity or accuracy of measurement.

Additional components for a cascading measurement (such as needed with turbine flow meters) and the associated added expense could be eliminated.

## CUSTOMER ADVANTAGE:

All requirements can be met by the broad measurement range of the TCM 0650 with a single flow meter. It reduces not only the purchasing costs but also the costs for having replacement devices.

Using analog output signals and modbus TRU interfaces, mass flow, volume flow, temperature and medium density can be read out at the same time from the TRICOR Coriolis mass flow meter.

The TCM 0650 is the optimal solution for Parker Hannifin in order to master this challenging measuring task.

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