



The Siflow FC070 from Siemens eases interfacing and integration into the end-of-line assembly in the application of diesel engines and components

IMPROVED FLOW

Diesel powertrains require accurate flow-measurement systems to develop new and more efficient technologies

■ **Flow measurement** is becoming an increasingly critical parameter in the development, production, quality assurance and control of diesel powertrains. The Coriolis sensors from Siemens combines versatility and performance independent of application, whether it is for fast-flow and transient measurement of pumps and nozzles, or the continuous engine-consumption measurement.

In diesel-engine production, quality is improved, waste is reduced, maintenance costs are kept low, and calibration is made easy. For example, the new Siflow FC070, combined with interfacing and integration into current or future end-of-line assembly, has made automation systems straight-forward through the standardized Simatic software and hardware tools.

Applications of flow metering include fuel pumps, fuel rails and injection nozzles. In terms of fuel pumps and rails, flow metering tests calibration and the continuous flow rate, and the injection nozzles test the flow rate along with step response.

The flowmeters must encompass essential requirements, such as enabling high-pressure levels, typically 100 to 400 bar. Because of

the complexity of the process, flow measurement alone is not enough – temperature levels and density are also vital parameters.

The Coriolis mass-flow meters have the ability to cope with higher pressure than the previous mechanical-based flow-meter systems, such as turbine meters and positive-displacement meters, which is very useful for diesel engines. The Siemens mass-flow meter enables in-line measurement for pressures up to 410 bar (5,945psi) – the mechanical meter's operation pressure is just 10 bar (145psi).

The Siemens mass-flow meters feature direct flow measurement. More specifically,



Siflow FC070 makes system integration easy: simply just turn on power and the system is ready to operate

the Sitrans FC2100 and Sitrans FC300 sensors measure the mass-flow rate directly in kg/sec without any conversions derived from temperature to density calculations and temperature compensation.

The Coriolis flow-meter system is independent of typical process parameters such as temperature and density. Direct measurement has the advantage of providing instant and reliable results and enhanced accuracy of more than 0.1%. It is also maintenance-free due to the absence of any moving parts to create obstruction, wear and pressure loss in the flow tube. On any production line where flow is to be measured, this system increases the overall efficiency level and reduces cost due to its 100% reliability.

The Coriolis flow-meter can perform multiparameter measurement because the resonant frequency of the oscillating pipe is proportional to the density of the pipe plus the liquid it contains. Once mass-flow rate and density is established, it is a simple matter to calculate the volume-flow rate. The Coriolis technology makes it possible to use a single unit to measure direct mass-flow in kg/sec, temperature, density and volume-flow-rate. This is useful for engine test rigs and fuel-flow conditioning.

Bus communication is no longer exclusively for communicating primary measurement parameters such as mass-flow or volume flow. It is becoming standard practice to check data that can then be related to the process conditions. For example, when measuring engine consumption levels, it is now possible to use the temperature and density measurement features of a mass-flow meter to control the conditioning of the fuel.

The new Siflow FC070 mass-flow transmitter brings with it a wealth of new opportunities for process efficiency that engineers can benefit from. One of the main advantages of the Siflow is its seamless and direct integration with well-established systems in the global automotive industry, such as standard interfaces Simatic Manager, PCS7 or Simatic PDM. All data is always fully traceable and is, in turn, also used in embedded intelligence to provide predictive diagnostics. **ETI**

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