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Siemens: Coriolis flow meters offer excellence in integration for CNG Industry

In 2007 the European Commission unveiled an integrated energy and climate protection policy known as "An Energy Policy for Europe," which proposed that 10 % of vehicle fuels in the EU should originate from biofuel by 2020. This important declaration has stimulated interest in the compressed natural gas (CNG) industry among European automakers, who are now focusing increasingly greater attention on the production of natural gas vehicles.

The relatively compact area of Section 1 - Zone 1 is where all Ex equipment (e. g. valves and gas sensors) is located. The major advantage is that the Sitrans FCS200 sensor can be placed in Zone 1 whereas the Siflow FC070 Ex CT transmitter is placed in Zone 2, allowing the dispenser to utilize less space.

In line with this rapidly expanding demand for cars and trucks that utilize cleaner-burning CNG, a well-established German power industry contractor has taken steps to optimize the CNG dispensers it has been manufacturing since 2001. As part of this process, the company recently reassessed its flow meter supplier. A flow meter is an integral part of a CNG dispenser, as it is responsible for controlling and measuring the amount of CNG to be billed and taxed.
Ultimately, the company elected to switch to Coriolis mass flow meters from Siemens for installation within their CNG dispensers. They made this decision after careful consideration of several criteria, including ease of integration into existing systems, operational reliability, custody transfer approval, and accessibility and reliability of service and support.

Accurate Coriolis technology

Siemens Coriolis flow meters are energized by an electro-mechanical driver circuit which oscillates a pipe at its resonant frequency.
Two pick-ups are placed symmetrically, one on each side of the driver. When gas or liquid flows through the sensor, Coriolis forces act on the pipe and cause a deflection, which can be measured as a phase shift on the pick-ups.
This phase shift is proportional to the mass flow rate.
The flow-proportional signal, along with information about temperature and driver frequency, is fed into the transmitter for calculations of mass, volume, fraction, temperature and density. This method is extremely accurate because it is unaffected by changes in fluid density, pressure, viscosity or temperature – an essential characteristic of any meter being considered by the CNG industry.
The specific flow meter system chosen by the German power industry contractor combines the new Sitrans FCS200 sensor with the Siflow FC070 Ex CT transmitter.
The Sitrans FCS200 features Hastelloy tube material for high accuracy even at high pressures (0.5 % of rate up to 350 bar) and is capable of measuring flow rate up to 500 kg/min, lowering the amount of time necessary for fueling. It is available in three sizes (DN10, DN15 and DN25) to cover the full range of dispenser types, while its ultra-compact design enables smaller and more efficient CNG dispenser layout and construction in Ex Zone 1 – a benefit that sets the Siemens solution apart from competitors.
The Siflow FC070 Ex CT can be

Section 2 - Zone 2 is where all electronics (e. g. PLC for measurement and counter for payment) are located, with an intrinsically safe cable connecting Zones 1 and 2. Siflow FC070 Ex CT has an integrated border and requires no further Ex barrier investment.

remotely installed directly into the CNG dispenser in Ex Zone 2, reducing cabling and improving robustness. Additionally, its intrinsically reliable sensor interface guarantees safety even in hazardous applications.

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Integration is key

A major advantage of this particular CNG solution for the German contractor was the capability for direct integration. This is because the Sitrans FCS200 sensor and Siflow FC070 Ex CT transmitter are incorporated seamlessly into the Siemens Simatic S7 automation system. The transmitter simply clicks into a Simatic rack, a single cable connects to the sensor and then, with true "plug and play" compatibility, the flow meter is ready for operation. This modularity will also simplify any future expansion, saving the company a significant amount of time and money. Integration is further enhanced by the unique Sensorprom chip that is part of the transmitter. This chip stores all calibration data and settings for the lifetime of the product, enabling traceability and facilitating smooth troubleshooting. Use of Sensorprom also simplifies service procedures and transfers to new equipment. Since the same data are immediately accessible upon transfer of the chip from one flow meter to the next, the company is able to conserve resources in meter reprogramming and training of personnel – economies in time and cost of ownership rate that rate very highly.

CT approval and accessible support

Since the power industry contractor produces systems that dispense natural gas for sale to the public, custody transfer (CT) approval was another vital requirement. The Siflow FC070 Ex CT transmitter comes with CT-approved redundancy pulse and frequency outputs, which improves competitiveness in the management of stand-alone CNG dispensers and setups with multiple dispensers. CT approval ensures not only accurate consumption monitoring and CNG billing, but also optimal cost of ownership. Additionally, the company put a high priority on the ready availability of competent service. The Siemens global service network is comprised of qualified specialists in 150 countries covering all time zones, which means that a broad spectrum of support can be offered around the clock. They also offer extensive on-demand training provided via the internet and in classroom locations in multiple countries.

A smart choice

Compressed natural gas is a safer and more environmentally friendly alternative to gasoline or diesel fuel, and can be produced at a relatively low cost. Therefore, it should not be surprising that in the wake of rising fuel prices, heightened environmental concerns and the unveiling of a new energy and climate protection policy by the European Commission, interest in CNG continues to grow throughout Europe. As the usage of this type of gas increases, manufacturers are discovering that incorporating Siemens Coriolis flow meters into their CNG dispensers can result in highly accurate and reliable measurement of gas flow – ultimately leading to greater profitability.

Rail SpA: New Mobile plunger

In their Newsletter No.3, the Italian company states: after long tests and researches Rail announces the introduction on the market and on production of IG1, IG1 Apache, IG2 and IG5, the new mobile plunger with many advantages: reduction of the noise, better performance and better durability.
The full introduction on the mass production will be done gradually during the next months with the purpose to switch the production on this new type of mobile plunger, a patented solution. Other advantage is that it is interchangeable with the old plunger and there is no variation on the price. For customers and markets where is useful to point out the 'made in Italy' and also to celebrate the 150° Annivesary of the unity of Italy, the injector comes with revised look on the IG1 Apache configuration with the new anti-noise plunger.