FLUID COMPONENTS INTERNATIONAL LLC

ST51 Syngas Flow Meter Excels In Combined Heat and Power (CHP) Systems

Precision Flow Accuracy and Repeatability Under Haz Ex Conditions

San Marcos, CA —Process engineers responsible for on-site plant biomass combined heat and power (CHP) systems will find the rugged and reliable **ST51 Series Thermal Mass Flow Meter** from **Fluid Components International (FCI)** provides continuously accurate measurement of syngas fuel flow to the CHP engine.

Biomass CHP process systems provide both heat and power in one highly efficient process. Wood chips are fed into the system similar to a regular biomass boiler, but instead of feeding it oxygen to burn the wood chips, they are heated in an environment without any oxygen to around 1300°F (700°C). In this environment instead of burning the wood, the synthesis gases are extracted from it.

The syngases are a mixed composition of N_2, CO, CO_2, H_2, CH_4 and trace O_2. After extraction, the gas is run through cooling coils and ash filters to produce a clean syngas that is then used to fuel an engine connected to a generator to provide electricity. The heat produced by the engine, instead of being cooled by a radiator, is then fed into the plant's heating system.

This is a highly efficient, low emission process for creating plant electricity, which depends on accurate, repeatable, and reliable gas flow measurement under high heat and pressure. In many regions, there are government sponsored subsidies or tax relief benefits for CHP system installations, some of which require combining the gas flow rate with a gas analyzer to calculate energy value (e.g. kW/hr).

To ensure the biomass process is active and producing enough syngas to power the CHP engine (as well as to compute the correct energy value), the output flow of syngas needs to be measured accurately and with high repeatability. FCI's ST51 Series Thermal Mass Flow Meters are an ideal solution because of their ability to be calibrated for mixed process gases, their all-welded closed sensor design ensuring no leak path for H_2 gas safety and their global Ex agency safety approvals for Zone 1/Division 1 hazardous areas with potentially explosive gases.

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The ST51 flow meter is an insertion-style flow meter developed for use in pipe diameters from 2.5 to 24 inches [63 to 610 mm]. It is specifically designed for the flow measurement of methane-based gases such as biogas, digester gas, landfill gas, natural gas, and for air, compressed air or nitrogen.

The ST51 Meter is an insertion style instrument that can be easily installed into the pipe via a 0.5 or 0.75 inch NPT compression fitting. It features a measurement range from 0.3 SFPS to 400 SFPS [0.08 MPS to 122 MPS] with turndown ratio of 100:1 and with accuracy of ±1 percent reading, ±0.5 percent full scale. Depending on the chosen configuration, they are suitable for process temperatures from 250°F (121°C) to 350°F (177°C) and pressures from 150 psig [10 bar(g)] to 500 psig [34 bar(g)].

Designed with a no-moving parts non-clogging thermal mass flow sensor, the ST51 Meter features precision, lithography structured platinum RTD sensors embedded in FCI's equal mass small diameter, all metal thermowells. Combined with microprocessor electronics and precision calibration, this meter achieves excellent accuracy with a fast response. There is virtually no maintenance required over a long-life for an exceptionally low life-cycle cost.

The ST51 Meter's electronics are housed in a rugged IP67 rated enclosure with dual conduit ports in either NPT or M20 threading. The instrument comes standard with dual 4-20 mA outputs and a 500 Hz pulse output.

Optional features available include HART as well as a higher process temperature service range, NAMUR compliant 4-20 mA outputs and a SIL compliance rating. The transmitter/electronics can be integrally mounted with the flow element (probe) or be remote mounted to best match the installation requirements.

Fluid Components International is a global company committed to meeting the needs of its customers through innovative solutions for the most challenging requirements for sensing, and measuring flow, pressure and temperature of gases.

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