

Rugged Thermal Mass Flow Meter Resists Corrosion in Biogas Environments

Robust Construction with Full Safety Approvals
For Precision Accuracy and High Reliability



San Marcos, CA — Engineers responsible for biogas production involving industrial organic waste and municipal wastewater treatment will appreciate the fact that the rugged and reliable [ST51A Biogas Flow Meter](#) from [Fluid Components International \(FCI\)](#) combines superior measurement accuracy with high reliability and dependability.

Biogas from organic waste such as food or meat processing plants, fermentation systems for dairy products or wineries and breweries, as well as on-farm manure, and sewage treatment plants, is often digested under anaerobic conditions in reactor tanks. The output is valuable biogas, which is measured with flow meters to support green co-gen energy systems or for disposal by flaring.

This potent mixture of combustible methane (CH₄), carbon dioxide (CO₂), water and trace levels of corrosive hydrogen sulfide (H₂S), gas is problematic for many flow measuring technologies. The combustible properties of CH₄ gas require HazEx safety approvals. In addition the corrosive, sticky nature of the H₂S particles affects the performance and can clog many flow sensors, leading to frequent, labor-intensive cleanings.

FCI's rugged thermal mass ST51A Biogas Flow Meter is designed specifically for dirty, potentially hazardous biogas processes. It provides system operators with highly accurate and repeatable mass flow measurement to facilitate system control, log gas production data and provide mandated safety and environmental reporting information.

To survive in biogas processes, the ST51 Flow Meter comes standard with rugged 316 stainless steel body construction and Hastelloy-C22 thermal sensors. It features a no-moving parts, non-clogging design, which eliminates the need for constant cleaning under wet, dirty biogas conditions. The ST51A meter comes with full global Division 1, Zone 1, Ex safety approvals.

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The meter's electronics are housed in a durable NEMA 4X, IP67 dust/water ingress protected and rugged, all-metal (aluminum or 316L stainless steel) enclosure with dual conduit ports in either NPT or M20 threading. The transmitter can be integrally mounted with the flow element (probe) or can be remote mounted for installation flexibility. The instrument comes standard with dual 4-20 mA, NAMUR NE43 compliant outputs and a 500 Hz pulse output.

The model ST51A adds digital communications via the HART, Version 7 protocol. It provides plant staff with digital data on flow rate and temperature parameters, the instrument's health, fault diagnostics and asset management info. It also features the capability to make field configuration changes if needed by using standard HART portable communicators. All of FCI's thermal mass flow meters with HART protocol communications are certified and registered with the FieldComm Group.

This insertion-style flow meter is available in multiple probe lengths for installation into pipe diameters from 2.5 inches to 24 inches [63 mm to 610 mm]. It is easily connected into the pipe via a 1/2 inch or 3/4 inch NPT compression fitting. Its insertion style design requires only a simple, single point tap into the process piping that requires minimal technician time.

The ST51A Flow Meter utilizes constant power thermal dispersion mass flow technology, which employs a slightly heated sensor that provides a subtle drying effect on condensating moisture to make it highly effective (accurate) in moist biogas applications. Built-in temperature compensation circuitry provides correct readings under variable climate conditions—cold winters and hot summers.

The ST51A Flow Meter operates over a wide measurement range of 0.3 SFPS to 400 SFPS [0,08 MPS to 122 MPS] with 100:1 turndown. The instrument's standard accuracy is $\pm 2\%$ reading, $\pm 0.5\%$ full scale, with an optional configuration to provide higher accuracy to $\pm 1\%$ reading, $\pm 0.5\%$ full scale.

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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