

ST100A Wet Gas Flow Meter Solves Biogas Moisture, Corrosion and Accuracy Issues

Ideal for Applications in Biogas, Landfill Gas, Wastewater Treatment Digester Gas and Rain Shielding in Power Plant and Refinery Stacks, and More

San Marcos, CA — With its innovative Wet Gas MASSTer thermal dispersion flow sensor, the [ST100A Flow Meter](#) from [Fluid Components International](#) solves wet gas and entrained moisture issues that affect biogas measurement accuracy in landfill co-gen power systems and wastewater treatment digester applications, as well as providing down-the-pipe rain shielding in power plants, refineries and other types of stack monitoring.



The ST100A Flow Meter with a Wet Gas MASSTer flow

sensor recently solved a biogas measurement problem at a wastewater treatment plant. The engineers at the site found that wet, sticky biogas was causing a corrosion issue affecting the flow sensors of their existing gas flow meters, leading to over-range and poor accuracy measurement issues.

The plant engineer believed a mixture of carbon dioxide (CO₂), water and trace amounts of hydrogen sulfide (H₂S) were corroding the 316 stainless steel sensors. To solve this problem, the FCI customer applications team suggested that its Model ST100A Wet Gas MASSTer Flow Meter with corrosion-resistant Hastelloy C-276 sensor tips would solve both problems.

The unique shielded mechanical design of FCI's wet gas sensor shunts water vapor away before it reaches the sensor and prevents any water vapor from collecting on the sensor head to avoid corrosion and therefore any measurement accuracy or consistency issues. The new ST100A Flow Meters were installed in 2021 and have performed without issue since then at the wastewater treatment plant—problem solved.

By shunting moisture, condensation and water droplets away from the ST100A's thermal mass flow sensor, accurate gas flow measurement is maintained while minimizing errors that could occur from a cooling effect on the sensor that might cause a spike or false high reading. FCI's wet gas sensor option can be used in applications that have either moisture entrained in the gas (annular mist) or for protection against down the pipe rain in larger, vertical stacks.

FCI's ST100 Flow Meters feature thermal dispersion mass flow sensors that are designed with constant power technology, which compensates for the variable temperatures commonly found in wet gas, which lead to poor measurement. They are calibrated to specific wet gas mixtures in FCI's NIST-approved

Calibration Laboratory, and this meter is available with both built-in pressure sensing and multiple calibration groups for accuracy under difficult wet gas conditions.

The ST100A Meter can be calibrated to measure virtually any wet gas composition, mixed gases, dirty gases and specialty gases. The basic insertion style air/gas flow meter features a thermal flow sensing element that measures flow from 0.25 to 1000 SFPS (0.07 NMPS to 305 NMPS) with accuracy of ± 0.75 percent of reading, ± 0.5 percent of full scale.

Constant power type thermal mass flow sensors are designed with platinum reference temperature detectors (RTDs). These advanced sensors detect process temperature changes in real time and automatically calculate the corresponding change in the wet gas flow rate. They are free of lag effects because they are inherently multi-variable, providing both the flow and temperature data necessary for accurate measurement.

The insertion style ST100A Flow Meter is ideal for wet gas measurement in larger line sizes with standard adjustable insertion lengths from 1 inch (25 mm) up to 60 inches (1,524 mm). It sets an industry benchmark in process and plant air/gas flow measurement, offering the most feature-rich and function-rich electronics available for versatility and installed value.

Whether the need is for 4-20 mA analog, frequency/pulse, alarm relays or digital bus communications such as HART, Profibus or Modbus, the ST100A Flow Meter is the perfect data communication solution in wet gas measurement. Should a plant's needs change over time or an upgrade be desirable, the ST100A Meter adapts as necessary with a plug-in card replacement that can be changed out by plant technicians in the field.

The ST100A Flow Meter's unique graphical, multivariable, backlit LCD display/readout brings new meaning to the term "process information" for local viewing of wet gas flow data. It provides the industry's most comprehensive information with continuous display of all process measurements and alarm statuses, and the ability to interrogate for service diagnostics.

The rugged ST100A Meters are suitable for service up to 850°F (454°C) and are available with integral or remote electronics (up to 1000 feet [300 meters]). They are agency approved for hazardous environments, including the entire instrument, the transmitter and the NEMA 4X/IP67 rated enclosure. In addition to SIL-1, approvals include ATEX, IECEx, FM and FMc.

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, level, and temperature.