

Thermal Flow Meter with VIP Flow Conditioner Supports Green Fuel Cell Energy To Reduce Carbon Emissions

Highly Accurate, Dependable Process Gas Flow Measurement

San Marcos, CA — Sophisticated fuel cell technology projects now rely on the precision [ST80 Thermal Mass Flow Meters](#) with [Vortab \(VIP\) Flow Conditioners](#) from [Fluid Components International](#) for accurate gas flow measurement to provide clean electric power while reducing or eliminating harmful emissions such as carbon, NOX and SOX that damage the environment.

These advanced thermal mass flow meters coupled with tab-type flow conditioners are helping process and plant engineers support green fuel cell energy initiatives that produce electricity, hydrogen and water. The design and implementation of such projects also helps industrial plant owners benefit from California's Bioenergy Market Adjusting Tariff Program (BioMAT) for reselling excess electricity while allowing them to move closer to zero emissions at their sites.

In such fuel cell projects, the ST80 Flow Meter and VIP Flow Conditioner are installed for the monitoring of multiple fuel cell process applications: (1) fuel gas primary feed; (2) fuel gas pressure relief; (3) deoxidizer relief line flow; (4) cooling tower vent, anode exhaust gas; and (5) fresh air blower discharge flow. VIP flow conditioners are utilized upstream from the meters when less than ideal pipe straight-run conditions could impact overall measurement accuracy.

Designed with FCI's Adaptive Sensor Technology™ (AST™), the ST80 Flow Meter features an innovative, patented hybrid sensor drive. This measuring technique combines, for the first time, both of the industry's highly proven constant power (CP) and constant temperature (CT) thermal dispersion sensing technologies in the same instrument.

Beyond this breakthrough in measurement drive technology, there is a choice of four different flow sensor element designs to ensure best installed performance, including FCI's newest wet gas solution. The Wet Gas MASter™ sensor developed for the ST80 Series optimizes the sensor head design and installation to prevent condensation droplets, entrained moisture or rain from contacting the thermowells, which ensures steady, reliable measurement.

Beyond the ST80 Flow Meter's applications versatility, it is suitable for pipe diameters from 1 to 99 inches (25 to 2500 mm) and air/gas temperatures up to 850°F (454°C). They feature accuracy of ±1% of



reading, $\pm 0.5\%$ of full scale and repeatability of $\pm 0.5\%$ of reading with flow rates as low as 0.25 up to 1000 SFPS (0.07 to 305 NMPS) and 100:1 turndown.

For user simplicity and flexibility, this meter's outputs and user interface choices are extensive and it interfaces with virtually any control system and/or set-up or configuration devices. Standard outputs include dual, NAMUR NE43 compliant 4-20 mA analog outputs, HART (version 7), Modbus 485 and a USB port (for interfacing with configuration freeware). Foundation Fieldbus or PROFIBUS PA or DP can be optionally added. The optional backlit LCD display provides digital and bar graph readouts of the flow rate and temperature, totalized flow, alarms, diagnostics feedback and even a user defined label/tag field.

The rugged ST80 Flow Meter's transmitter enclosure is NEMA 4X/IP67 rated, selectable for NPT or metric conduit port threading and is available in both aluminum and stainless steel. In hazardous areas, the transmitter can be remotely located up to 1000 feet (305 m) apart from the flow element. The instrument also carries global approvals for use in hazardous areas and a 3rd party evaluation that demonstrates compliance to IEC 61508.

The Vortab VIP Flow Conditioner neutralizes flow profile irregularities caused by elbows, valves, blowers, compressors, and other flow disturbances that commonly occur in piping and duct runs. The VIP provides a swirl-free, repeatable flow profile that flow meters require for accurate measurement. The VIP is particularly effective with wide-turndown and/or low flow sensitive flow meter technologies (e.g. thermal dispersion) to provide a highly repeatable flow profile during laminar, transitional and turbulent flow conditions.

FCI solves flow and level measurement applications with advanced thermal dispersion technologies. With 50+ years' experience and the largest installed base of thermal flow meters, flow switches and level switches, count on FCI to know your application and have the solutions.