High Accuracy FCI Air/Gas Mass Flow Meters Enhance Thermal Oxidizer Performance

Enhancing Effectiveness of Pollution Control and Monitoring Systems That Remove Greenhouse Waste, Flue and Tail Gases

San Marcos, CA — Engineers responsible for designing, installing and operating thermal oxidizer systems to remove harmful hazardous air pollutants (HAPs) and volatile organic chemicals (VOCs) will find the ST100 Series and MT100 Series thermal flow meters from Fluid Components International (FCI) offer them the advantages of highly accurate measurement, simple installation and a low life-cycle cost.

FCI's ST100 Series thermal flow meters feature single- or dual-point thermal dispersion technology, combining precision flow sensors with feature- and function-rich electronics. These meters are ideal for use with thermal oxidizer systems. They offer a fast response, excellent repeatability and require virtually no maintenance based on their rugged no-moving parts design. Their digital display and transmitter meet both current and future needs for outputs, process information and communications with a choice of traditional analog or digital bus communications.

FCI's MT100 Thermal Flow Meters are an insertion type, multipoint instrument designed for complex thermal oxidizer systems, such as those with larger diameter pipes, flues, or rectangular ducts. These applications are difficult for ordinary flow meters because of distorted flow profiles and lack of straight-run, which can lead to inaccurate and non-repeatable flow measurement. The MT100 meter places up to eight flow sensing points in the flow stream and averages them, resulting in highly accurate and repeatable flow rate measurement.

Many processes in the petroleum refining, chemical/solvents, paint/coatings and photoelectric industries generate HAPs and VOCs, which generate greenhouse gases that contribute to the global warming phenomenon. Thermal oxidizers remove these gases from production process waste, flue and tail emissions before their release into the environment to meet federal, state and local clean air regulations.

The thermal oxidation process is used to destroy HAPs and VOCs, converting them into carbon dioxide ($C0_2$) and water vapor. While there are multiple manufacturers, designs and types of thermal oxidizer systems, they all depend on accurate air/gas flow measurement as these waste gases enter and exit the system.

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Accurate air/gas flow measurement and flow rate control are critical in order to prevent excessive VOC loading. Interruption in the exhaust and recirculation systems can also lead to a hazardous unsafe condition that potentially requires shutting down the production process. Depending upon the type of oxidizer and site requirements, typical air flow rates can range from 100 SCFM to 500,000 SCFM.

In thermal oxidizer applications, FCI's Model ST100 with VIP flow conditioner provides mass flow measurement over a wide flow range of solvent laden air, combustion air, natural gas feed and exhaust air. Accuracy is ±0.75% reading, ± 0.5% full scale with a 1 second response time. There is no significant pressure drop and the meter is easy to install in crowded locations with an optional hot tap version.

The ST100 meters are available in 316L SS or Hastelloy C-276 (NACE MR0175/ISO 15156). To support variable demand, the meter features a wide turndown ratio of 100:1, with optional 1000:1. They measure very low flows from 0.25 SFPS [0.08 Nm/sec] to very high up to 1,000 SFPS [300 Nm/sec]. For safety and reliability they meet IEC 61508 compliance requirements demonstrated through independent third party FMEDA (exida): SIL 1, HFT = 0.

For multipoint flow, the Models ST102 and MT100 offer dual-sensing or multi-point sensing, respectively, for larger line sizes. There is no significant pressure drop and they're relatively easy to install with an optional hot-tap configuration. They're available in 316L SS or Hastelloy C-276 (NACE MR0175/ ISO 15156).

The ST102 is accurate to ±075% reading, ±0.5% full scale with a 1 second response time; while the MT100 meter offers flow accuracy (at calibrated conditions) of ±1.75% of reading, ±0.5% of full scale Both meters feature a wide turndown ratio of 100:1, optional 1000:1. They measure very low flows from 0.25 SFPS [0.08 Nm/sec] to very high up to 1,000 SFPS [300 Nm/sec].

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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