

FOX APPLICATION GUIDE

Thermal Flow Meters for Pure Gas Applications

TYPICAL APPLICATIONS INCLUDE:

- Air Flow Measurement
- Argon Gas Flow Measurement
- Butane Gas Flow Measurement
- Carbon Dioxide Gas Flow Measurement
- Carbon Monoxide Gas Flow Measurement
- Ethane Gas Flow Measurement
- Helium Gas Flow Measurement
- Hydrogen Gas Flow Measurement
- Methane Gas Flow Measurement
- Nitrogen Gas Flow Measurement
- Oxygen Gas Flow Measurement
- Propane Gas Flow Measurement

Thermal Mass Flow Measurement

Fox Thermal flow meters use a constant temperature differential (constant ΔT) technology to measure mass flow rate of air and gases. The thermal mass flow sensor consists of two Resistance Temperature Detectors (RTD's). The sensor elements are constructed of a reference grade platinum wire wound around ceramic mandrels that are inserted into stainless steel or Hastelloy tubes.

The Reference RTD measures the gas temperature. The instrument electronics heat the mass flow sensor, or heated element, to a constant temperature differential (constant ΔT) above the gas temperature and measures the cooling effect of the gas flow. The electrical power required to maintain a constant temperature differential is directly proportional to the gas mass flow rate. The microprocessor then linearizes this signal to deliver a linear 4-20mA signal.

Fox Thermal Flow Meters Provide These Advantages

- Exceptional low-flow sensitivity provides accurate measurement over a wide range of oil & gas, industrial, biogas, and wastewater applications
- Stainless steel sensor is suitable for corrosive, particulate-laden gas streams
- No temperature and pressure compensation required
- Built-in alarms, totalizer and a wide variety of communications protocols available for easy interfacing with emissions management systems

Real time responsiveness for a variety of pure gas flow measurement applications

Pure gas mass flow meters from Fox Thermal deliver the highest level of accuracy for a wide range of applications. The Gas-SelectX® gas selection feature - available on the FT1, FT4A, and FT4X products - allows the user to choose from a list of pure gases such as these:



Carbon dioxide is commonly used in gas flow measurement for the food and beverage industry.



Pure gases like nitrogen, oxygen, and many others are commonly used in the manufacture of electronics components.

- Argon Mass Flow Meter

Fox Thermal flow meters offer both insertion and inline style meters for Argon flow metering.

- Carbon Dioxide Mass Flow Meter

Many industries - such as chemical, petrochemical, iron & steel, cement, and paper & pulp - emit CO₂ gas, and it is commonly used to neutralize process and waste water streams. Fox Thermal Meters are frequently used in these applications.

- Carbon Monoxide Mass Flow Meter

Although almost 80% of CO emissions are from transportation emissions, there are still many industries that need to measure this gas. In these applications, Fox Thermal uses the actual gas for calibration.

- Helium Mass Flow Meter

With helium becoming scarcer and its cost rising, it is more important than ever to monitor flow rates and to detect leaks in order to avoid the high-costs of process inefficiencies.

- Hydrogen Mass Flow Meter

Hydrogen is used in the pharmaceutical, chemical, petroleum, metallurgical, glass manufacturing, and electronics industries.

- Methane Mass Flow Meter

In biogas applications such as digester operations and coal gas recovery, methane plays a large part. Fox Thermal meters work very well with these applications by accurately measuring very low-flow rates.

- Nitrogen Mass Flow Meter

Nitrogen is used in purging applications for heating, ventilation and plumbing industries. Large volumes of nitrogen are also used by oil refineries and petrochemical industries for purging and blanketing operations, and it is being used at an increasing rate by the food industry.

- Oxygen Mass Flow Meter

Medical centers, clinics, and hospitals often have use for meters to measure the flow of oxygen. Fox Thermal maintains cleaning facilities for cleaning and bagging meters intended for use in oxygen applications. Fox Thermal meters are approved for use in oxygen applications including medical oxygen.



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