FOX APPLICATION GUIDE

Thermal Flow Meters For Natural Gas Applications

FOX THERMAL FLOW METERS PROVIDE THESE ADVANTAGES:

- Exceptional low-flow sensitivity provides accurate measurement over a wide range of venting, flaring and combustion applications
- Sub-metering natural gas usage for a variety of industrial facilities with multiple processes or buildings
- Check meters to verify utility billing and usage
- University campuses and industrial parks to allocate fuel costs to various buildings or tenants
- 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
- Improve combustion efficiency in:
  - Furnaces
  - Boilers
  - Ovens
  - Heaters
  - Kilns
  - Smelters
  - Dryers
  - Heat-treating Systems
  - Natural Gas Back-up Power Systems
  - Emission Reduction Systems
  - Building Automation

SUB-METERING

Benefits of cost accounting for individual processes and buildings.

In addition to rising energy prices, pressure from regulatory agencies to reduce emissions and improve efficiency has spurred manufacturers to engage in sub-metering.

Industrial facilities and organizations with multiple buldings or processes place great value on accounting of natural gas consumption because of its many benefits:

- Exposing high consumption points within large gas feed systems
- Identifying leaks in fuel feed lines
- Evaluations of equipment efficiency
- Diagnosing process inefficiencies
- Promote conservation

Current economic uncertainty has been another major motivating factor for manufacturers to save energy and cut operating costs. Such challenges are brining about a wave of energy conscious approaches to processing applications.

Sub-metering natural gas consumption is ideal for:

- Applying energy costs to Cost of Goods accounting
- Analyzing aging process equipment
- Periodic equipment efficiency auditing

IMPROVE COMBUSTION EFFICIENCY

Achieve significant energy savings, improve productivity, and enhance competitiveness.

The first step toward energy savings is to identify the optimal air-to-fuel ratio by monitoring air and fuel flow rates to burners. Tuning burners to reduce excess fuel usage brings direct savings, but avoiding excess air flow reduces the amount of heat lost in the exhaust. Aditional savings from reduced electricity costs will also be achieved through efficent operation.

With the correct air-to-fuel ratio, less heat is lost up the stack and fewer hydrocarbons are released. An excess of hydrocarbons can lead to an increase in the need for shut downs to clean igniters. Equipment that operates with less downtime increses overall productivity.

Lowering operation costs through energy savings and

increasing productivity will lead to an edge over your competitors. Improving combustion efficency is a cost-effective way of gaining this edge without resorting to replacing expensive equipment. A regular monitoring schedule and precise control strategy will generate gains and enhance process quality.

REDUCE EMISSIONS, OBTAIN CARBON CREDITS OR AVOID FINES

Some areas in the United States have begun to institute forms of carbon credit programs, but these programs are not widely practiced yet. Alternatively, outside of the United States, ratifying countries of the Kyoto Protocol have been actively participating in the Clean Development Mechanism for many years. Emission limits are set and identified on permits, then a certain amount of these permits are distributed (allocated or sometimes sold) to firms. Those firms that are able to stay within their permitted emission amounts may sell off their remaining permits to firms that were unable to stay within their permitted limits.

The goal of such programs is to reward low-polluters and motivate high-polluters to invest in new or better technological solutions that reduce their emissions. In the short term, low-polluters benefit from the money gained by trading off their excess permits. In the long term, the world benefits from the decrease in pollution that results from the energy efficiency gained and emissions reduced.

Another motivating force to reduce emissions is the increasing pressure from regulatory agencies to reduce emissions and improve efficiency or performance standards of equipment that produces pollutants. In the United States, the Environmental Protection Agency (EPA) has instituted many regulations regarding the Protection of the Environment (Title 40). Part 98 of Title 40 deals with monitoring emissions from the various industries (grouped by Subparts). For example, Title 40 Part 98 Subpart W deals with the Petroleum & Natural Gases Systems industry. It defines what type of facilities are affected by the rule, how to calculate their emissions, and details procedures for reporting.

Air Quality Management Districts are responsible for ensuring attainment and maintenance of the Clean Air standards, and industries affected by Title 40 CFR are required to report their emissions to the EPA. Many industries are being affected by these rules and regulations and Fox Flow Meters have worked effectively for companies that need accurate flow measurement in order to achieve compliance.

State and regional agencies have published rules and regulations regarding NOx and CO2 emissions from industrial, institutional and commercial boilers, steam generators and process heaters. Owners or operators of units subject to these regulations may install a non-resetting totalizing fuel flow meter (TFF) to measure the fuel used by each individual unit. The regulations specify mass flow measurement of fuel usage and if a volumetric flow meter is installed it must compensate for pressure and temperature using integral gauges. Thermal mass flow meters deliver a direct reading of mass flow rate of natural gas and other fuel gases — without temperature and pressure compensation — and provide a simple, reliable and cost-effective method for tracking and reporting fuel consumption.

With inline and insertion flow meters, you get precision flow measurement. Our white paper describes how you can improve accountability, reduce waste and enhance emissions monitoring processes with thermal flow meters. Direct mass flow monitoring of natural gas and other fuel gases is the key to optimizing combustion processes and streamlining accounting procedures.

Designed for easy installation in fuel gas and air feed lines, Fox Thermal flow meters can help you:

- Monitor emissions for EPA reporting requirements
- Analyze demand
- Improve efficiency
- Reduce waste
- Provide accurate reports for sub-metering
- Facilitate custody transfer
- Help resolve billing disputes

FOX® THERMAL

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