



THERMAL FLOW METERS PROVIDE THESE ADVANTAGES FOR:

- Furnaces
- Boilers
- Ovens
- Heaters
- Kilns
- Smelters
- Dryers
- Heat-treating systems
- Natural gas back-up power systems
- Emission reduction systems



Figure 1: Thermal mass flow meters excel in natural gas measurement for combustion submetering, reporting greenhouse gas emissions, and energy consumption & efficiency.

THERMAL FLOW METERS HELP WITH COMBUSTION PROCESS OPTIMIZATION

Improving combustion control reduces energy costs for boilers, furnaces & other heat-treating equipment.

Accurate, repeatable measurement of air and natural gas, at low and varying flow rates, is a critical variable in advanced combustion control and can help improve efficiency, reduce fuel consumption and enhance process quality. Improving combustion control reduces energy costs for operating

kilns, dryers, furnaces and other heat-treating equipment. Although manufacturers have made significant improvements in process heating efficiency, the total energy use for process heating in the U.S. is expected to increase. With overall thermal efficiency of process equipment varying from 15% to 80%, compared to the thermal efficiency of steam generation (65% to 85%), there is clearly an opportunity to achieve significant energy savings, improve productivity and enhance competitiveness.

The U.S. Department of Energy's Industrial Technologies Program (www.eere.energy.gov) has identified improved burner control systems as a significant opportunity for reducing energy operating costs, waste and environmental emissions. Tuning burners to reduce excess air is a cost-effective technique for reducing heat lost in exhaust. Monitoring and adjusting air-to-fuel ratios to maintain optimum combustion not only conserves fuel but also helps reduce emissions. This is also important in the wake of EPA regulations (40 CFR Part 98 Subpart C and 40 CFR Part 63) requiring monitoring and reporting of emissions.

One of the most effective techniques for improving efficiency and reducing emissions in these applications is a precise control strategy, based on mass flow measurement of fuel and airflow rates. Sophisticated burner control systems optimize air/fuel ratio control to obtain peak thermal efficiency over the entire range of the burner, and to facilitate proactive emissions control. Mass flow control of air and fuel is used to automatically correct for changes in temperature or pressure that affect combustion performance.

Many systems also integrate fuel totalizing, air/fuel flow and valve position analog outputs for DCS interfacing and remote system monitoring. In addition to the primary benefits of direct measurement of mass flow rate, low-flow sensitivity, and fast response, the no-moving parts design also helps reduce maintenance costs.

Thermal flow meters are ideal to measure the fuel gas and can be programmed for a custom fuel gas composition. Air flow measurement systems allow direct, accurate measurement at entry point of all air lines - more efficient than O₂ trim solutions (measuring O₂ off the back end of the boiler). Thermal provide the best solution for your combustion application needs. Contact K&I Instruments for more information!