

FOX APPLICATION GUIDE

Thermal Flow Meters Help With Combustion Process Optimization

TYPICAL APPLICATIONS INCLUDE:

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

Improving combustion control reduces energy costs for burners, furnaces, and 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.

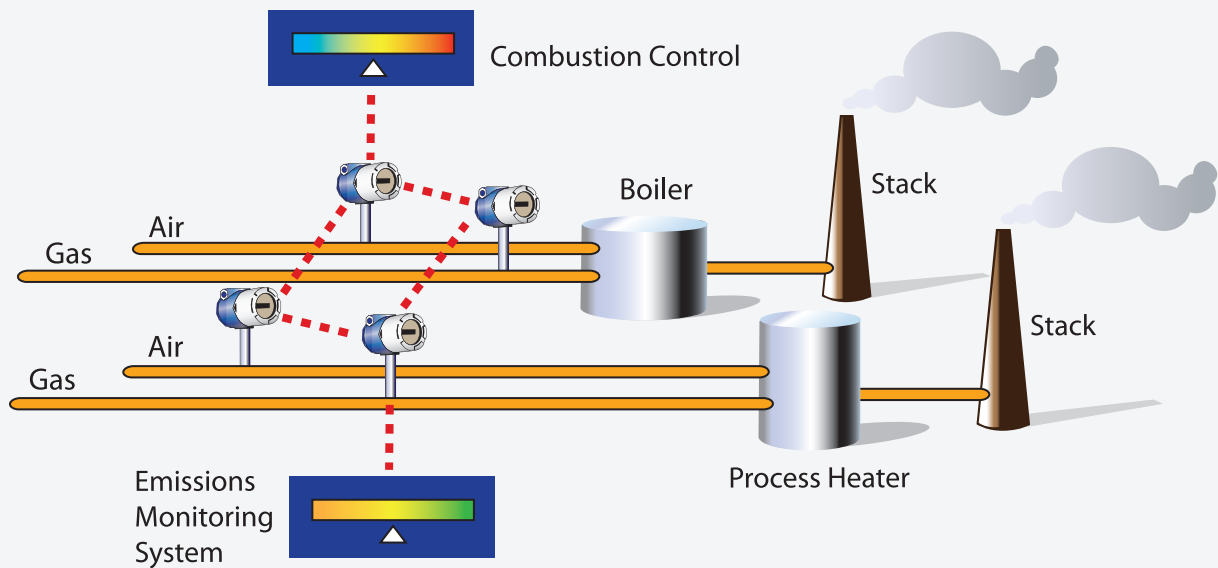
Although manufacturers have made significant improvements in process heating efficiency, the total energy use for process heating in the U.S. is expected to increase. With overall thermal efficiency of process equipment varying from 15% to 80%, compared to the thermal efficiency of steam generation (65% 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



Burner combustion optimization requires the ideal air-to-fuel ratio.



Thermal mass flow meters tied into a combustion control system including a boiler, process heater, and an emissions monitoring system.

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.

Fox Thermal has partnered with Air Monitor to provide integrated solutions: Fox Thermal flow meters are ideal to measure the fuel gas and can be programmed for a custom fuel gas composition. Air Monitor's 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). Fox Thermal and Air Monitor provide the best solution for your combustion application needs. Contact Fox Thermal for more information!



The Model FT4A thermal mass flow meter from Fox Thermal.



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