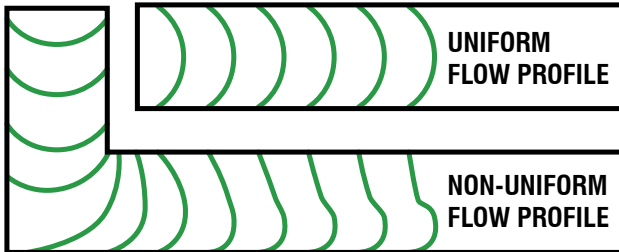




TECH TIP:

Improving Measurement Accuracy in Large Pipes, Ducts and Stacks

Without sufficient straight run of upstream and downstream piping, it is difficult to create a uniform, non-swirling, fully-developed flow profile within the flow conduit. Under such circumstances, it is difficult to obtain an accurate measurement of flow rate. Installations that are downstream of fans, louvers, bend, or abrupt cross-sectional area increases or decreases are particularly problematic.



In some installations, flow conditioning can be used to improve the flow profile, or multipoint flow meters can be spaced such that each sensor receives airflow from an equal concentric cross-sectional area of flow in the pipe or duct.

As shown in the drawing below, a flow-averaging scheme utilizing four single-point insertion-type flow meters can also provide a reliable, accurate measurement of mass flow rate and allows for servicing individual meters without shutting down the entire system.

As shown below, four thermal meters are mounted in the centroid (geometric center) of each quadrant of the pipe, duct or stack. The output of each meter can be averaged by a PLC or other control system to minimize the effects of non-uniform flow profiles.

BENEFITS

- Allows service of individual meters without shutting down the entire system
- Improves accuracy in installations where long straight runs of pipe are not available
- Minimizes effects of non-uniform flow profile and swirl

FEATURES

- Direct mass flow measurement without temperature and pressure compensation
- Exceptional low-flow sensitivity
- Fast response (1 sec)
- Low maintenance requirements
- No-moving-parts design is suitable for high-vibration industrial environments
- FM, FMc, ATEX, and IECEx approvals. CE mark

APPLICATIONS

- Boiler primary, secondary and tertiary combustion air for efficiency and NOx control
- High-temperature airflows with non-uniform temperature and velocity profiles
- Exhaust stack monitoring
- Flue gas recirculation monitoring
- Scrubber and precipitator balancing

