

CHOOSING A FLOW MONITOR

With the current installed base of flow monitors getting older and the availability of parts and support getting scarce, many users are looking at replacement in the next few years. Replacing your existing flow monitor with a different type, or upgrading the existing system becomes a decision worth weighing.

There are two major flow measurement technologies – ultrasonic and S-type pitot tube. We admit to a bias towards S-type pitot tubes – and with good reason: they're simple, easy to use, and very reliable. When measuring any parameter, the simplest method that works is usually the best.

S-type pitot tube systems utilize a pitot tube assembly like the one shown. Pressure differential (ΔP) is measured by subtracting the low-pressure reading from the high-pressure reading. Temperature and this ΔP are used in the Bernoulli equation to calculate velocity. Flow is calculated by multiplying velocity by the cross sectional area of the stack or duct.



There are many advantages to this method of flow measurement:

- The system allows for calibration checks against a primary standard – an inclined manometer.
- The system requires no special tools such as a dual trace oscilloscope or computer to set it up and calibrate it.
- It requires no calibration fudge factors, such as a curve fit to provide accurate readings.
- Any competent plant technician can maintain it.
- It is based upon a very simple concept – the fundamental laws of mass and momentum.
- The components used to measure the differential pressure and the temperature are standard off-the-shelf type components – not special components that lock a user into a specific supplier.
- It can be up to 50% less costly than other flow technologies.

As anyone familiar with a RATA knows, the S-type pitot tube is the reference method used and accepted by the EPA. It has long been the established method due to its high degree of accuracy,

simplicity of design, and ease of calibration and maintenance.

Ultrasonic flow monitors were often installed because of fear of stratification or cyclonic flow – users feel they are more forgiving. These sites should have ample RATA data to see if this is the case and if there is a true indication of flow problems.

A single pitot tube will usually comply with the EPA recommendations for flow measurement location. If there is stratification, then two or more pitots can be installed and connected to provide an average velocity to compensate. In some cases, if the particulate loading is not severe, an “averaging” type pitot tube can be installed.

On new or existing installation, or where flow is required due to a Title V Permit or participation in a NOx trading program, a S-type pitot tube flow system is simple to install and maintain and will not become obsolete anytime in the near future.

DILUTION SYSTEM TIP:

Don't replace your CO₂ towers on your dilution system air dryers every time they fail. They can be repacked and re-used.



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CEMS NEWSLETTER

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Dilution System Maintenance Tip:

How to minimize CO2 tower replacement costs.



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