



Air Monitor Products for Industrial Applications

FAQs

Air Monitor
Precision Airflow Measurement
An ONICON Brand

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FAQs - Frequently Asked Questions

1. Air Monitor products use what technology?

Air Monitor products use multi point averaging pitot tube technology coupled with ultra low, high accuracy, differential pressure measurement to measure air flow in any industrial environment Clean or Dirty.

Pitot Averaging Technology

The Air Monitor multi-point self-averaging pitot averaging technology is unique in that it is a pure instrument measuring true velocity pressure (total pressure – true static pressure). Other technologies measure a reference pressure on the back or side of the probe resulting in a DP that is not true velocity pressure as derived from Bernoulli's Equation. This reference pressure requires the use of correction factors that vary with Reynolds number (i.e. velocity and density changes) in order to relate the measured DP to true velocity pressure. The Air Monitor system also utilizes the Fechheimer method of true static pressure measurement along with a chamfered impact or total pressure measurement to provide an accurate velocity pressure measurement and do so with pitch and yaw angles up to ± 30 degrees without requiring additional corrections.

Differential Pressure Technology

Differential Pressure technology is commonly used to measure fluid velocity due to their well-defined relationship. The square root of the differential pressure is proportional to the velocity of the fluid. In ducted systems the total pressure consists of the velocity pressure and static pressure. By measuring the total and static pressures in a duct, the velocity pressure can be obtained by subtracting static pressure from total pressure. This is achieved in practice by directly measuring the differential pressure between the two.

Air flow measurement over a large velocity range requires an extensive selection of DP transducers with multiple upper range limits (URLs) to fit the required application - from ultra low range like 0.05" w.c. URL transducer and higher. Air monitor offers this ultra low range DP sensing capability coupled with the Auto-zero function to provide a highly accurate DP measurement with long term calibration stability starting for 0.05" w.c. URL transmitters.

2. What fluids can Air Monitor flow systems be used to measure?

Air Monitor products are used for:

- Clean airflow
- Dirty airflow
- Combustion airflow
- Air and gas pressure measurement

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Rev. A



3. What advantages do Air Monitor flow systems offer over competitors?

AMC Best in Class Value Propositions:

- Air Monitor provides an engineered systems approach.
 - Each application is carefully evaluated, analyzing available straight run, flow turndown needs, accuracy requirements, potential for plugging, density variation, material compatibility, and the velocity pressure range to appropriately select the best primary element, flow transmitter, and AUTO-purge as needed for a system that will meet the customer's needs.
- Best accuracy in the industry in low flow, large duct applications
- AMC transmitters can measure lowest DP in the industry
- As little as zero straight run required
- Non-uniform flow profile problem solved: flow conditioners plus cross-duct, multiple measurement points = excellent large duct measurement accuracy
- Dirty applications are no problem with Auto-Purge feature
- Excellent stability, repeatability, and accuracy with auto-zero feature
- Full start-up services: duct traverse studies, training

4. How does the flow system operate effectively with particulate matter in dirty airflows?

Air Monitor's AUTO-purge III is designed for applications where the continuous exposure to airborne particulate might impair the measurement accuracy of the sensing elements.

When activated by an Air Monitor flow transmitter or a distributed control system, a combination of valves are operated to introduce high pressure, high volume air into the flow measurement device's sensing ports for a short duration while simultaneously isolating the transmitter from over-pressurization and holding transmitter output at its last measured value during the purge cycle. This periodic purging assists in maintaining the sensing ports of the total and static pressure manifolds in a clear unobstructed condition.

5. In what industries are Air Monitor products used?

- Refineries
- Foundries
- Aerospace
- Energy / Power
- Electronics Manufacturing
- Food & Beverage
- Pharmaceutical
- Automotive
- Chemical
- Wastewater
- Pulp & Paper
- Environmental

6. In what applications are Air Monitor products used?

- Combustion Airflow
 - Power boilers
 - Combination / biomass boilers
 - Recovery boilers
 - CFBs
 - Fired heaters
 - Kilns (lime, ceramic, cement)
 - Digester gas
 - Thermal oxidizers
- Dirty Airflow
 - Pneumatic conveyors
 - Primary air for pulverized coal
 - Paper drying
 - Cyclic nucleotide-gated channels (CNGCs) & High volume, low concentration or non-condensable gases (HVLC)
 - Dust collection systems
 - Stack flow measurement
 - Cement
 - Quench exhaust
 - Combustion airflow
 - Paint spray booths
- Clean Process Airflow
 - Clean room pressurization
 - Quench airflow
 - Semiconductor
 - LCD glass
 - Engine test stands / dynamometer
 - Product testing
 - Process development / pilot plant
 - Aeration to digester
 - Paint spray booths
 - Fluidized bed systems



7. How do I know which product is right for my process?

Air Monitor has a full line of products designed with materials suitable for industrial applications.

Contact our application engineers to get help choosing the right products for your application and process conditions or visit our website for more information or a link to your local representative for assistance:

Industrial applications: amcsales@airmonitor.com

8. How accurate are the Air Monitor flow systems?

Accuracy is dependent on the products used in the application and the quantity and placement of sensing elements in the flow measurement system. Accuracy for a system ranges between $\pm 0.5\%$ reading for some products to $\pm 2\%$ reading for others. Air Monitor offers superior "as installed accuracies" in difficult situations. These as-installed accuracies are accompanied by a very forgiving installation guideline.

Air Monitor products offer the best accuracy in the industry in low flow, large duct airflow applications.

Air Monitor excels where competitors fail in conditions with limited straight pipe runs, very large duct areas, or very low flow rates.

When Air Monitor is not confident in the accuracy of a given installation due to limited straight run, a field test is performed to verify the system in place. This three-dimensional traverse test measures true velocity vectors at multiple points across the duct following AMCA, ASHRAE, and 40CFR60 & 75 guidelines. Pitch and Yaw angles are measured and accounted for, resulting in the most accurate field verification in the industry.

Contact an application engineer to learn more about the accuracy of the Air Monitor product best suited to your application:

Industrial applications: amcsales@airmonitor.com

9. How often is recalibration required after installation?

Air Monitor transmitters are furnished with an automatic zeroing circuit capable of electronically adjusting the transmitter zero at predetermined time intervals while simultaneously holding the transmitter output signal.

The automatic zeroing circuit eliminates all output signal drift due to thermal, electronic, or mechanical effects, as well as the need for initial or periodic transmitter zeroing. For transmitters operated in temperature-controlled spaces (with no thermal effect upon span), this automatic zeroing function essentially produces a "self-calibrating" transmitter. The automatic zeroing circuit will re-zero the transmitter to within $\pm 0.1\%$ of its operating span; for a transmitter with a ± 0.02 IN w.c. operating span, this represents a zeroing capability within ± 0.00002 IN w.c.

To permit manual calibration of the transmitter, an electronic switch is provided for manual positioning of the zeroing valve.

Transmitters incorporating the AUTO-zero feature remain stable for years. Customers with the most demanding applications in critical flow control loops will typically calibrate every one or two years.

Air Monitor's primary elements do not require calibration.

10. How durable are the Air Monitor products?

Air Monitor products for industrial and power systems are made with stainless steel suitable to operate in clean or harsh and particulate-laden applications at temperatures ranging from -20°F to 900°F. These Industrial products can be constructed with any material required to match the systems in which they are being installed. Common configurations include an all welded 3/16" thick casing with all welded flow conditioners and sensing elements. The typical lifespan of an Air Monitor system is 20 to 30 years.

Configurations are available in exotic alloys to handle corrosion and high temperature along with optional tungsten carbide coatings for erosive applications.

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11. What size ductwork or pipes can the meters be used in?

Depending on the sensing element type, Air Monitor standard products can measure flow in pipes ranging from 0.75" to 132" diameter or in ducts ranging from 8"x8" to 120"x120" in size. Sizes larger than these are readily available.

For more information on sizing, contact an application engineer to learn more about the Air Monitor products best suited to your application:

Industrial applications: amcsales@airmonitor.com

12. Can Air Monitor flow systems be connected to a SCADA system?

Yes. Air Monitor transmitters are equipped with digital outputs, analog outputs, and offer network communication options.

For more information on communications options or transmitter functions and features, contact an application engineer to learn more about the Air Monitor product best suited to your application:

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13. What are Air Monitor's lead times? Do you have off-the-shelf products?

Lead times are dependent on the product and the complexity of the design needed to meet an application's flow measurement needs. Everything manufactured at Air Monitor is tailored to a specific application and is not built until ordered. No unit will be sitting on a shelf but will be built and calibrated to an applications specific purpose and flow conditions.



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