



# Accurate Airflow Measurement for Demanding Industrial Applications

PRECISE, RELIABLE, TRUSTED  
**SOLUTIONS**  
IN AIRFLOW MEASUREMENT

- CLEAN AIRFLOW
- COMBUSTION AIRFLOW
- DIRTY AIRFLOW
- PRESSURE MEASUREMENT

***Air Monitor***  
Precision Airflow Measurement  
An ONICON Brand

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## INDUSTRIAL APPLICATIONS

**COMBUSTION AIRFLOW APPLICATIONS** – A variety of equipment used in industrial applications like boilers, furnaces, etc are tuned with an optimal air to fuel ratio to improve efficiency and achieve optimal process performance. Measuring airflow is key to finding this ratio and achieving combustion optimization. An optimized system will also result in less maintenance costs over time.

**Power, Biomass, and Recovery Boilers** – Regardless of the fuel type used to power the boiler, measuring the air flow into the combustion chamber is necessary to calculate the perfect air to fuel ratio. A system that is running too lean or too rich results in either performance or cost issues.

**Heaters, Furnaces, Ovens, and Kilns** – Whether for ceramics and glass or annealing and debinding, the industrial sector relies on heat from a variety of sourced burner equipment to perform essential process functions. With some processes requiring extremely high temperatures, fuel costs can become burdensome. Combustion optimization of burner equipment lowers operating costs by increasing efficiencies.

**CLEAN AIR PROCESS APPLICATIONS** – Clean airflow measurement in industrial applications like quench airflow or aeration to digesters requires a higher level of accuracy to ensure that process efficiencies are maintained, and the system is operating at capacity. Achieving accurate airflow measurement in large ducts or in systems with up or downstream disturbances can be tricky. A flow meter system by Air Monitor is the most accurate, low velocity, large-duct capable flow meter in the world and offers engineered solutions for challenging industrial applications.

**Aeration to Digesters** – Typically used in an activated sludge sewage treatment plant, aerobic digesters require precise airflow measurement to ensure that the appropriate amount of oxygen is supplied to the bacteria that break down organic matter during the aerobic process.

		Industries						
		P&P	Power/ Utilities	Refining	Mining	Food & Bev	O&G Exploration	Manufacturing
Applications	Aeration Control		FGD Control		Flotation Column	Fermentation Control		
	Combustion Optimization	Black liquor Bark Furnaces	Gas Turbine Control	Burner Control		Oven Controls	Flare optimization	Solvent Recovery
	Pneumatic Conveying		Pulverized Coal	Pressurized air		Material filling		Paint Booths QC
	Material Drying	Coating dryer Wood drying		Bulk material drying	Solids drying	Solids drying Seed Dryers Coatings		Cement Kiln Ceramic Oven Solids drying Fiber Quench
	Air Flow Verification	Digester Gas Flow	Control room pressure	Tank Blanketing			Control room pressure	Greenhouse air flow Stack Vent Gas
	Boiler Control	Kraft process	Gas Turbine Air/Fuel Mix	Air/Fuel Mix		Air/Fuel Mix		Air/Fuel Mix



**DIRTY AIR PROCESS APPLICATIONS** – Unlike clean airflow applications, particulate matter is found in dirty airflows. Air Monitor offers the AUTO-purge III system to ensure that the sensing elements are kept free of debris and the highest accuracy can be maintained.

**Dust Collection Systems** – Optimizing airflow in dust collection systems is crucial for product quality and offers important benefits such as extending filter life, energy efficiency, and cost savings. To get the best results, the airflow must be accurately measured to achieve an optimal airflow control strategy.

**Quench Exhaust** - A quench tower or condenser is used to condition a high temperature, polluted air stream. This enables particulate, acid gases, metals and other emissions to be removed after use of thermal treatment systems. These systems can include incinerators, reactors, boilers, and other process systems that produce contaminated gas streams at high temperatures. Interruption airflow can reduce the system’s ability to remove enough of the contaminants to comply with environmental regulations. So, accurate airflow measurement is a necessary component of quenching.

**PRESSURE MEASUREMENT** – Maintaining positive air pressure in an area effectively improves air quality by controlling the migration of air contaminants by inducing drafts between spaces.

**Clean room Pressurization** – Product quality in electronics manufacturing depends on the ability to keep dust and other particulate matter out of a clean-room space. For a system to maintain the right room pressure, it must be able to measure that pressure and adjust key area airflow ventilation in a timely manner.

Industries								Applications
Wastewater	Automotive	Electronics Mfg	Aerospace	Foundries	Pharma.	Petrochemical / Chemical		
Aeration pools		LCD Glass					Aeration Control	
Boilers Heat Exchangers	Steam boilers		Heat Treating Composite Curing	Melting Furnaces		Recovery Boilers	Combustion Optimization	
				Frac sand Resin coated sands Ceramics	Tablet granulations Excipients Active ingredients Finished tablets	Mixing / Blending Powders	Pneumatic Conveying	
			Paint booths		Pill Coating	Fluidized Bed	Material Drying	
Digesters	Paint Booths	Semiconductor	Wind Tunnel Testing				Air Flow Verification	
					Medicinal drying Sterilization / Purification	Incinerators Thermal Oxidizers	Boiler Control	



## **CAMS COMBUSTION AIRFLOW MANAGEMENT SYSTEM**

The Air Monitor Power CAMS™ (Combustion Airflow Management System) is designed to fulfill the need for a reliable and accurate means of flow measurement in combustion airflow applications. This single engineered package consists of two components. The CAMM™ (Combustion Airflow Management Module) contains the microprocessor based instrumentation to measure the airflow and manage the purge cycle. The AUTO-purge protects against any performance degradation of the duct-mounted measurement device(s) due to the presence of airborne particulate.



## **AUTO-purge III AUTOMATIC PURGING AT REGULAR FIELD-SELECTABLE INTERVALS**

Air Monitor's AUTO-purge III is designed for applications where the continuous exposure to airborne particulate might impair the measurement accuracy of Air Monitor's CA (Combustion Airflow) Station or VOLU-probe/SS array. When activated by an Air Monitor smart flow transmitter such as the VELTRON II, MASS-tron II or VELTRON DPT-plus, 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. This periodic purging assists in maintaining the sensing ports of the total and static pressure manifolds in a clear, unobstructed condition.

## **VELTRON DPT-plus MICROPROCESSOR-BASED ULTRA-LOW RANGE PRESSURE & FLOW TRANSMITTER**

The VELTRON DPT-plus transmitter is 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 operating in a moderately steady temperature location (thus no thermally induced span drift), this automatic zeroing function essentially produces a "self-calibrating" transmitter. The automatic zeroing circuit will re-zero the transmitter to within 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 VELTRON DPT-plus, an electronic switch is provided to permit manual positioning of the zeroing valve.





## **CA Station COMBUSTION AIRFLOW MEASUREMENT STATION**

Air Monitor's ruggedly constructed CA (Combustion Airflow) Station, with both integral airflow processing cell and Fechheimer-Pitot measurement technology, is engineered to meet challenging operating conditions while providing mass flow measurement of PA, SA, and OFA within an accuracy of  $\pm 2-3\%$  of actual airflow. The CA Station measures the total and static pressure components of airflow. The combination and dispersion of total and static pressure sensing ports minimizes the effect of directional airflow, and the addition of the honeycomb airflow processing cell makes the CA Station extremely effective at accurately measuring airflow in limited straight duct runs.



## **VOLU-probe/SS and VOLU-probe/SM STAINLESS STEEL AIRFLOW TRAVERSE PROBES**

The VOLU-probe/SS and VOLU-probe/SM stainless steel airflow traverse probes are ideally suited for new installations or retrofit applications requiring accurate airflow measurement in locations having limited straight pipe runs. VOLU-probe/SS consists of two side-by-side manifolds (one for static and the other for total pressure) traversing the pipe or duct and connected by a single manifold used to average the sensed pressures. Alternatively, the VOLU-probe/SM has two manifolds constructed in a tube-in-tube design with multiple total and static pressure sensing ports along the length of the probe to traverse the airstream in a single line across the duct or pipe, providing separately averaged pressures at the signal connections. While VOLU-probe/SS can be used in both clean or particulate laden applications, the VOLU-probe/SM is more effective in clean air applications. Both probes offer excellent accuracy at  $\pm 2-3\%$  of actual flow, operate in temperatures ranging from  $-20^{\circ}\text{F}$  to  $900^{\circ}\text{F}$ , and can be used over a velocity range of 400 to 10,000 FPM.

## **ACCU-flo/NP NOZZLE PITOT FLOW STATION**

The ACCU-flo/NP is a combination precision nozzle and multi-point, self-averaging, Fechheimer-Pitot airflow measuring station. When combined with an ultra high accuracy transmitter such as Air Monitor's VELTRON II, MASS-tron II or VELTRON DPT-plus, the ACCU-flo/NP provides high accuracy ( $\pm 0.5\%$ ) flow measurement for process monitoring and control applications. Due to the combined effect of the integral flow straightener cell and the nozzle, the ACCU-flo/NP requires little or no upstream straight run to achieve its published measurement accuracy. Constructed of either type 316 stainless steel or carbon steel with a combination of welded and bolted flanges, the ACCU-flo/NP is capable of operation up to  $900^{\circ}\text{F}$  and is suitable for corrosive gases within the limitations of 316 stainless steel.





## **LO-flo/SS STAINLESS STEEL PITOT TRAVERSE PROBE**

The LO-flo Pitot Traverse Station is a combination air equalizer-straightener with self-averaging Pitot tube traverse station. The LO-flo is fabricated entirely of type 316 stainless steel with all welded construction. It is capable of operation up to 1000°F and is suitable for application to corrosive gases within the limitation of the 316 stainless steel construction. The LO-flo provides highly accurate measurement of low air volumes from 2 to 2000 CFM for monitoring, indicating, and controlling applications when coupled with ultra-low span electronic differential pressure or flow transmitters (such as the Air Monitor VELTRON II, MASS-tron II, and VELTRON DPT-plus transmitters).



## **SAP STATIC AIR PRESSURE SENSORS**

The Air Monitor SAP family of static air probes is designed for room or space pressurization applications where it is essential that the static pressure level within a room or space, and that of a reference pressure (corridor, adjacent space, outdoor location, etc.), be accurately sensed, free of pulsations or effects of air movement in the vicinity of the sensing probe(s). The SAP/R can also be utilized to sense the static pressure within fan inlet and discharge plenums or large ducts, where the presence of multi-directional and turbulent airflows prohibit the use of flow sensitive static pressure tips or probes.

## **SOAP STATIC OUTSIDE AIR PROBE**

The SOAP was designed for accurate and instantaneous sensing of outside static air pressure levels without being adversely impaired by the presence of directionalized gusting wind. Typical locations are an elevated position in an outdoor parking lot, in a below ground location like a parking garage with non-forced ventilation, or on a rooftop mounted pole sufficiently elevated to be outside any anticipated wind induced pressure envelope.





## VELTRON II SMART TRANSMITTER

The VELTRON II Transmitter is an ultra-low differential pressure and flow smart transmitter. With its  $\pm 0.1\%$  of natural span accuracy, it is intended for the most critical and demanding industrial applications requiring the utmost accuracy and long-term stability. The VELTRON II transmitter is 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 operating in temperature controlled spaces (with no thermal effect upon span), this automatic zeroing function essentially produces a self-calibrating transmitter.



## MASS-tron II MULTI-VARIABLE FLOW COMPUTER

The MASS-tron II Multi-variable Mass Flow Transmitter is a VELTRON II Transmitter with the addition of both process temperature and pressure compensation. This ultra high accuracy transmitter includes analog outputs for process differential pressure, temperature and absolute pressure, an analog input for process temperature, and a temperature compensation selection feature.

## CEMS SYSTEMS CONTINUOUS EMISSIONS MONITORING

Required for differential pressure flow monitoring systems is a back purging means to ensure that the in-stack flow monitor probe has its pressure sensing ports and averaging manifold maintained free of particulate build-up and vapor condensation. When activated by Air Monitor's MASS-tron/CEM or the Data Acquisition System (DAS), the AUTO-purge/CEM System sequentially operates a combination of failsafe valves to automatically back purge the sensing lines and the STACK-probes with high volume/high pressure compressed air for a short duration, while simultaneously isolating the transmitter from over-pressurization. Standard AUTO-purge/CEM construction mounts all components in a steel NEMA 4 rated enclosure, with all wetted parts made of copper or brass. The AUTO purge/CEM is optionally available in a stainless steel NEMA 4X enclosure, with stainless steel wetted parts for corrosive applications.





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