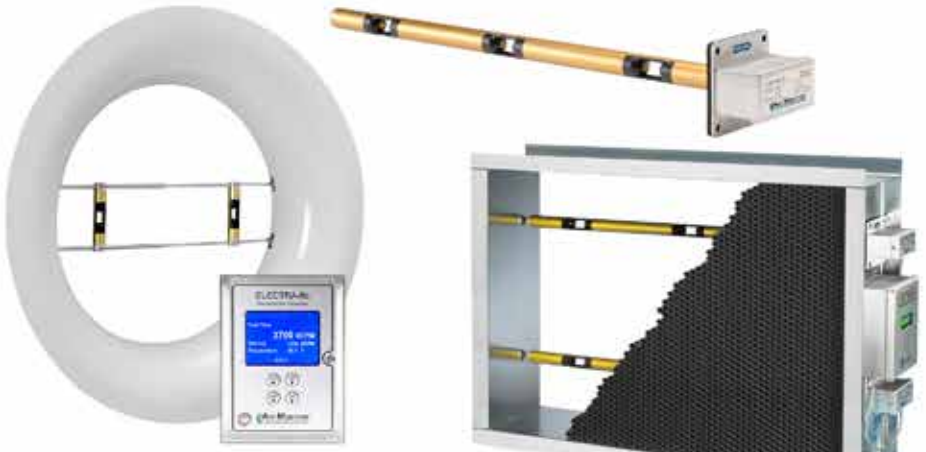
AIR MONITOR

AIRFLOW MEASUREMENT SOLUTIONS

Accurate Airflow Measurement for Commercial HVAC Applications



ELECTRA-flo Series

VOLU-probe Series

VOLU-flo OAM Series

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AIRFLOW MEASUREMENT APPLICATIONS

Air Monitor Corporation *was founded in 1967 with the invention of the first self-averaging Pitot tube airflow measuring station. Over the years, Air Monitor has increased its technology and product offerings, providing even more solutions for the demanding airflow measurement applications in the HVAC industry.*

HVAC APPLICATIONS

BUILDING AIRFLOW MEASUREMENT AND CONTROL - The distribution of conditioned air is still the primary means of heating and cooling most commercial buildings today. Proper airflow control within a building is not only important for the health and comfort of the building's occupants, it is also important for the health and long term performance and longevity of the building. Accurate airflow measurement allows the HVAC system to work effectively as designed, and efficiently as required to meet ever increasing energy conservation goals. Installations for this application include:

Ducted Airflow Measurement - Mechanical duct work is the most common means for distributing the conditioned air throughout most commercial buildings. The duct system provides the best opportunities for accurate airflow measurement due to its controlled dimensions, and the typical obstructions found within a duct system are generally well defined.

Fan Inlet/Discharge Measurement - Measuring airflow at the fan inlet presents challenges from a measurement technology stand point. Achieving accurate flow measurement at the fan inlet, without affecting fan performance, is an important consideration when selecting the correct meter. The large variation in airflow velocity, as well as the multiple fan configurations that exist within an AHU, must be taken into consideration. Measuring airflow at the fan inlet can be advantageous from an accessibility stand point as well as monitoring the performance of fan walls at the source.

Outdoor Air Measurement - Controlling the amount of outside air entering a building is required to maintain pressurization, meet energy efficiency goals, confirm compliance with local building codes and maintain the health of the building and its occupants. Accurate measurement of outside airflow is required for proper operation of today's high performance buildings. Outside air can pose a challenge regarding which metering technology to choose due to low airflow velocities, high moisture content in certain climates and the presence of airborne contaminants at the point of measure.

TECHNOLOGY	THERMAL DISPERSION AIRFLOW MEASUREMENT					DIFFERENTIAL PRESSURE			
						FIXED RESISTANCE		STATIC PORTS	
Applications	Installations	ELECTRA-flo SD	ELECTRA-flo Plus Probe Array	ELECTRA-flo /CM Probe Station	ELECTRA-flo /FI Fan Inlet Station	VOLU-flo OAM Outside Air Monitor	VOLU-flo OAM Outside Air Station	S.A.P. Static Pressure Sensor	S.O.A.P. Static Outside Air Probe
Building Airflow Measurement and Control	Ducted Airflow	✶	✶	✶					
	Fan Inlet				✶				
	Fan Discharge	✶	✶	✶					
	Outside Air Monitoring					✶	✶		
Building / Space Pressurization	Fan Tracking	✶	✶	✶	✶				
	Outside Pressure Reference							✶	✶
	Room / Space Pressurization							✶	
Indoor Air Quality	Outside Air Monitoring					✶	✶		
	Laboratory Hood Exhaust Duct								

BUILDING/SPACE PRESSURIZATION - Proper pressurization of buildings and indoor spaces is a crucial component required for the management of indoor air quality, maximizing energy efficiency and maintaining occupant health and comfort. Lack of control in regards to pressurization can lead to a host of problems including the infiltration of moisture, cold winter or hot summer drafts and doors that are difficult to open or slam shut. Some airflow measurement strategies for this application include:

Fan Tracking
Accurate measurement of entire airflow system including supply and return air, outside and relief air
Airflow measurement is a much more effective and accurate means of maintaining building pressurization when compared to static pressure measurements made throughout an entire building.

Outside Reference Pressure Measurement
Indoor pressures must be measured relative to a reference pressure, usually the outside air pressure

Room or Space Pressurization
Essential for managing indoor air quality, energy savings and occupant comfort
Prevents unintended pressure levels which can lead to complications for the building systems, the building envelope, and problems between adjacent spaces such as laboratories and hospital rooms.

INDOOR AIR QUALITY - Creating and maintaining proper indoor air quality in today's built environment can be a challenging task. The affect that poor indoor air quality has on building occupants can range from loss of efficiency/ performance to specific acute health issues. Airborne contaminants found within buildings come from a number of sources including people, processes and the materials used in building construction. Maintaining indoor air quality requires accurate airflow measurement. A few of the typical strategies implemented for this application include:

Outdoor Air Monitoring
Providing adequate dilution air to the occupied space within a building is the best way to control the level of contamination within the space. Bringing in the right amount of outside air is crucial to maintain proper building operation, meet energy conservation goals, and maintain the IAQ demanded in today's built environment. Accurately and continuously monitoring the outside air flowing into a building will allow the BAS to control the building as designed.

Laboratory & Hood Exhaust
Provides essential information to the lab system for maintaining occupant comfort and safety, space pressurization relative to the rest of the building and/or other spaces, and confirms fume hood operation.

DIFFERENTIAL PRESSURE PITOT TUBE VELOCITY PRESSURE AIRFLOW MEASUREMENT					TRANSMITTERS AND MONITORS				Installation
VOLU-probe Traverse Probe	VOLU-probe/VS Traverse Station	FAN-E Station	VOLU-probe/ FI Fan Inlet Station	Aluminum LO-flo Traverse Station	SENTRY Room Pressurization Monitor	VELTRON DPT2500-plus Transmitter	VELTRON II Transmitter	VOLU-trol/E (or F) Measurement & Control Station	
✶	✶	✶		✶		✶	✶		Ducted Airflow
			✶			✶	✶		Fan Inlet
✶	✶	✶				✶	✶		Fan Discharge
									Outside Air Monitoring
✶	✶	✶	✶			✶	✶		Fan Tracking
									Outside Pressure Reference
					✶	✶	✶	✶	Room / Space Pressurization
									Outside Air Monitoring
	✶(SS)	✶				✶	✶		Laboratory Hood Exhaust Duct

SELECT BY TECHNOLOGY

THERMAL DISPERSION **-** Thermal Dispersion technology is based on the principle that the amount of heat absorbed by a fluid is proportional to its mass flow. Thermal dispersion (mass) flow measurements are achieved by using two temperature sensors and a heat source located in a flow stream. By measuring the energy (heat) added to the flow stream and measuring the corresponding temperature change, mass flow can be derived. Each point of measurement utilizes two precision matched thermistors. One thermistor measures the ambient airflow temperature, while the other measures the differential temperature based on the amount of heat dispersed in the fluid. As airflow velocity increases, the rate of heat dispersion increases, and additional heat is required in order to maintain the differential temperature. Power is applied to the heating circuit in order to maintain a constant delta-T between the two thermistors. The relationship between airflow velocity and applied power is directly proportional to the airflow velocity.

Thermal dispersion is a highly reliable and robust method for accurately measuring airflow velocities in today's HVAC applications.

ELECTRA-flo SD Thermal Airflow & Temperature Measurement System

The ELECTRA-flo/SD Thermal Dispersion Measurement System is designed to measure airflow and temperature in small duct variable air volume applications. It is designed for use in ducts ranging in size from 4 – 16" in diameter.

It has two analog outputs, one for flow and one for temperature, which allow for improved control and efficiency in multi-zone VAV systems. It also allows for reduced minimum airflow settings and increased system efficiencies while still meeting indoor air quality requirements. The ELECTRA-flo/SD can also be ordered with either BACnet® or MODBUS® RS485 communications instead of the analog outputs.

Accuracy of ±2-3% of airflow reading from 0-3000 FPM

Accuracy of ±0.15° F for temperature

Each meter is provided with a N.I.S.T. calibration certificate

ELECTRA-flo Plus Thermal Airflow Measurement Probe Array

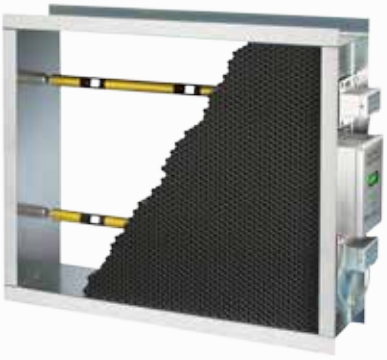
Rugged probes with aerodynamic sensor apertures - Requires less straight run

Up to 32 individual sensing points per transmitter - More sensing points for better accuracy

Daisy chain multiple probes per transmitter - Reduces cabling and conduit

N.I.S.T. traceable calibration - Guaranteed accuracy within ±2% of actual flow

ELECTRA-flo Transmitter included - Local data display, configuration and calibration, analog outputs of airflow and temperature



ELECTRA-flo/CM Plus Thermal Airflow Measurement Station

ELECTRA-flo Plus Thermal Probes mounted in rigid, welded, galvanized casing - Simplifies installation

Honeycomb cell air straightener - Reduces straight run requirements

ELECTRA-flo Transmitter included - Local data display, configuration and calibration, analog outputs of airflow and temperature

ELECTRA-flo/FI Thermal Fan Inlet Airflow Probe

Dual point thermal dispersion sensor probes mounted in sensor housing - Simplifies installation

Install directly in fan's inlet bell mouth at throat with virtually no pressure drop

ELECTRA-flo Transmitter included - Local data display, configuration and calibration, analog outputs of airflow and temperature

DIFFERENTIAL PRESSURE **-** 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 flow rate velocity of the fluid. In ducted systems the total pressure consists of the velocity pressure and static pressure. Velocity pressure cannot be measured directly; it must be derived. 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.

Airflow velocity can also be derived in systems by measuring the pressure drop associated with the airflow velocity as it moves through a fixed or known resistance.

Differential pressure measurements are the most widely used and cost-effective methods available for accurately measuring velocity in most HVAC applications. This technology has been used in various HVAC applications for decades, and today it remains a tried and trusted technology for airflow measurement.

FIXED RESISTANCE

VOLU-flo/OAM Outdoor Airflow Measurement Monitor

- Robust and reliable construction - Readings are unaffectedly by wind direction, airborne moisture and dirt
- Factory calibration - Guarantees accuracy within ±5%
- Measures inlet velocities as low as 150 FPM
- New and retrofit installations onto most single and dual inlet package air handlers
- Local display of data and direct analog interface with BAS for data logging and/or control of outside air dampers
- ASHRAE 62-189.1 compliant

VOLU-flo/OAM Outdoor Airflow Measurement Station

- Stainless steel sensors mounted directly onto rugged casing - Simplified installation
- Expanded metal provides known fixed resistance - Outside reference, inlet airflow and ambient temperature sensors
- Factory calibrated for selected applications - Guarantees accuracy

STATIC PRESSURE PORTS

S.A.P. - Static Air Pressure Sensor

- Steady, non-pulsating output of room, space or plenum pressure measurements.
- Aluminum or stainless steel construction

S.O.A.P. - Static Outside Air Probe

- Accurate and instantaneous sensing of outside static air pressure levels
- Unaffected by wind direction or gusts

PITOT TUBE VELOCITY PRESSURE AIRFLOW MEASUREMENT

VOLU-probe Pitot Airflow Measurement Traverse Probe

Multiple Pitot total and static pressure sensing points - Improved accuracy
Senses average total and static pressure traverses of an air stream
AMCA certified - Within ±2% certified accuracy

VOLU-probe/VS Pitot Airflow Measurement Traverse Station

One or more VOLU-probes factory mounted in a rigid, galvanized casing - Simplifies installation
Senses average total and static pressure traverses of an air stream
AMCA certified - Within ±2% certified accuracy
Patent No. 4,559,835

FAN-e Pitot Airflow Measurement Traverse Station

Multiple Pitot total and static pressure sensing points - Improved accuracy
Traverse station includes air straightening honeycomb cell - Reduces straight run requirements
AMCA certified - Within ±2% certified accuracy
Patent No. 3,748,901

Aluminum LO-flo Pitot Airflow Measurement Traverse Station

Measures airflow in small round duct work between 4" – 8" in diameter
Measures volumes between 35 – 1700 CFM
Accurate within ±2% of actual airflow

VOLU-probe/FI Pitot Fan Inlet Airflow Traverse Station

Pair of offset traverse probes mounts directly to fan's inlet bell mouth
Accurately measures inlet velocity pressure and calculable air volume
Aluminum or stainless
Patent No. 3,733,900

VOLU-probe/SS Stainless Steel Airflow Measurement Traverse Probe

Ideal for clean or harsh and particulate laden applications
Temperature range is -2° – 900° F
Accurate within ±2-3% of actual flow

TRANSMITTERS AND MONITORS

VELTRON II Transmitter

Ultra-low differential pressure and flow "smart" transmitter
Accurate within ±0.1% of natural span - Ranges from 25.0 to 0.05 IN w.c.
High accuracy and long term stability - Ideal for most critical and demanding HVAC applications
Microprocessor based configuration and calibration

VELTRON DPT 2500-plus

Ultra-low differential pressure and flow "smart" transmitter
Accurate within ±0.25% of natural span - Ranges from 25.0 to 0.05 IN w.c.
Ideal for demanding HVAC and process applications
Microprocessor based configuration and calibration

SENTRY Room Pressurization Monitor

Continuous monitoring and control differential pressure or rate of airflow between adjacent spaces - Ideal for laboratories, operating rooms and patient isolation areas

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