

Flow Monitoring System Sure-Aire™ for Centrifugal, Mixed Flow and Plenum Fans

- Accurate
- No System Effect
- Reliable



 **GREENHECK**
Building Value in Air.

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The Sure-Aire™ airflow monitoring system is ideal for HVAC applications where flow verification is required for proper system balancing, improving air quality, and controlling industrial processes.

Typical Applications

- Packaged, custom or built-up air handlers
- Clean rooms
- Fume exhaust systems
- Stairwell pressurization
- Isolation rooms
- General exhaust, supply or return air systems

Sure-Aire Advantages

- Flow accuracy to within 3%
- Pressure taps provide a true averaged pressure drop reading
- No increase in the fan energy consumption or sound levels
- Ships completely assembled from factory
- Non-invasive flow measurement

Sure-Aire Operation

The Sure-Aire system determines airflow by measuring the pressure drop across the fan inlet venturi. The airflow is then calculated based on the pressure drop and a K-Factor specific to each fan size. This is the same flow measurement approach used by AMCA accredited laboratories for certifying fan performance. The Sure-Aire system measures airflow without the use of traditional restricting flow measuring probes. The result is accurate flow measurement without increased fan energy consumption or higher sound levels.

Sure-Aire Components

- 1** Simple connection to labeled high and low pressure lines
- 2** Inlet pressure pitot type port
- 3** Pressure taps located at narrowest point on inlet venturi for highest accuracy with piezometer ring for true average pressure reading



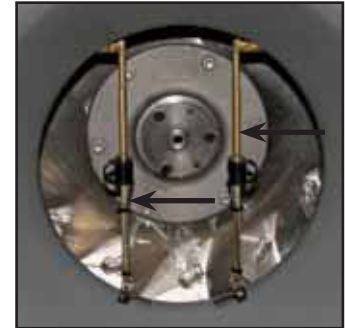
Disadvantage of Traditional Invasive Flow Probes

Measurements within the inlet cone are desirable because of the uniform, high velocity airflow through the cone. For this reason, traditional flow probes are generally mounted into the smallest diameter of the inlet cone. Mounting flow probes in this fashion causes turbulence and increases system resistance. This can significantly detract from the fan's performance and cause the system to underperform. To compensate for the added pressure loss, the fan RPM and horsepower must be increased. This results in additional energy consumption and higher overall sound levels. These increased static pressures can range from approximately 0.5 in. wg to greater than 3.0 in. wg (see table below).

Single-Width Centrifugal or Plenum Fan (Wheel Diameter in Inches)	Max Class I	Max Class II	Max Class III
	Static Pressure Loss (in. wg)		
20	1.2	2.0	3.2
36	0.8	1.3	2.1
73	0.4	0.7	1.1

Expected pressure loss based on fan size and class due to invasive flow probes. Performance taken at 70% wide open volume (%WOV) and at maximum class RPM.

Visit www.greenheck.com and enter **Sure-Aire** in the search to observe the Sure-Aire pressure drop demonstration.



Traditional Invasive Flow Probes

Optional Electronics Package

The Sure-Aire system is available with a preprogrammed differential pressure transmitter for measuring the fan performance. Resulting data can be tied to the facility Building Management System (BMS).

- Real time digital LCD display that shows fan performance
- NEMA-4 (IP56) enclosure suitable for indoor or outdoor mounting
- Provides linear differential pressure output signal (4-20 mA or 2-10 VDC)
- Accuracy to $\pm 0.5\%$ of full scale at 77°F (25°C)
- Two available input options: 100 - 240 volt, AC
24 volt, AC or DC
- Compatible with most Building Management Systems (BMS)
- Ships loose for field mounting and wiring



Programmable Differential Pressure Transmitter

Note: The differential pressure transmitter should be mounted within 75 feet of termination plate.

Applicable Products for the Sure-Aire™ System



QEI/QEID
Mixed Flow Fans



APD/APF/APH/APM
Plenum Fans



HPA
Plenum Fans



USF-400 & CSW
Single Width
Centrifugal Fans



BIDW/AFDW
Double Width
Centrifugal Fans

The Sure-Aire flow monitoring system is also available on Greenheck Vektor® products.

Specifications

Fans equipped with Sure-Aire™ Flow Monitoring shall include the following:

Flow monitoring station shall monitor the pressure difference between the fan inlet and the smallest diameter of the inlet cone.

Volumetric flow to be calculated from empirically derived formulas based on testing by the fan manufacturer.

Flow monitoring station shall not use air restricting flow devices that reduce fan performance or create additional fan sound.

Four (4) low-pressure sensor orifices, equidistantly spaced, shall be located at the smallest diameter of the inlet cone venturi. Flow tubes from each venturi sensor to extend to a termination plate mounted on the fan housing.

High-pressure flow port(s) to be mounted in low velocity zone near fan inlet. Flow port(s) from the high-pressure sensor shall extend to a termination plate mounted on the fan housing.

Termination plate shall include a low-pressure connection, a high-pressure connection and a listing of the empirically determined flow rate coefficient.

Flow monitoring station shall accurately measure the pressure differential to within +/- 3%.

Flow monitoring station to be installed by the fan manufacturer as part of the standard fan assembly.

Optional: Flow monitoring station to be supplied with electronics package that includes pressure transmitter and LCD digital readout.



Technical Details

Flow Element

1. **Accuracy** - Within +/- 3.0% of actual flow
2. **Resistance to airflow** - No measurable amount
3. **Effect on sound** - No measurable amount
4. **Operating velocity range**
100 to 20,000 fpm (0.5 to 100 m/s)
5. **Material and temperature limits**
Static ports - 6061 Aluminum
Tube fittings:
 - Housing: PBT resin
 - O-ring: NBR
 - Release button: POM
 - Grab ring: Stainless SteelTubing:
 - Nylon 1/4 inch (standard) -60-200°F (-51-82°C)
 - Copper 1/4 inch (optional) 0-200°F (-17-93°C)
6. **Humidity**
All elements 0-100% non-condensing
7. **Corrosion resistance**
Good air and mild acid gas resistance, excellent solvent and aromatic hydrocarbon resistance
8. **Output signal**
Calibrated for the following ranges: 0-8.30, 0-22.14, 0-41.52, 0-83.04, 0-138.40 in. wg
9. **Termination plate output connections**
1/4 inch push connector

Optional Electronics

1. **Input power**
 - 100 - 240 VAC, 50-60 Hz
 - 24 VDC, 24 VAC
2. **Input process connections**
1/4 inch quick connect
3. **Input range**
0-8.30, 0-22.14, 0-41.52, 0-83.04, 0-138.40 in. wg
4. **Enclosure**
NEMA-4 (IP56) indoor or outdoor use, field mounted
5. **Transmitter**
 - Accuracy +/- 0.5% of full scale at 77°F (25°C)
 - Pressure limit: 70 psi (1938 in. wg)
 - Temperature limit: 32-140°F (0-60°C)
6. **Digital display**
 - 2.8 inch 320x240 TFT LCD display
 - Programmed for CFM reading
7. **Analog output**
 - 4-20 mA DC into 900 ohms max or 2-10 VDC
 - Linear to the differential pressure

The Sure-Aire electronics package requires field mounting.



Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.



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Green Building Efforts

