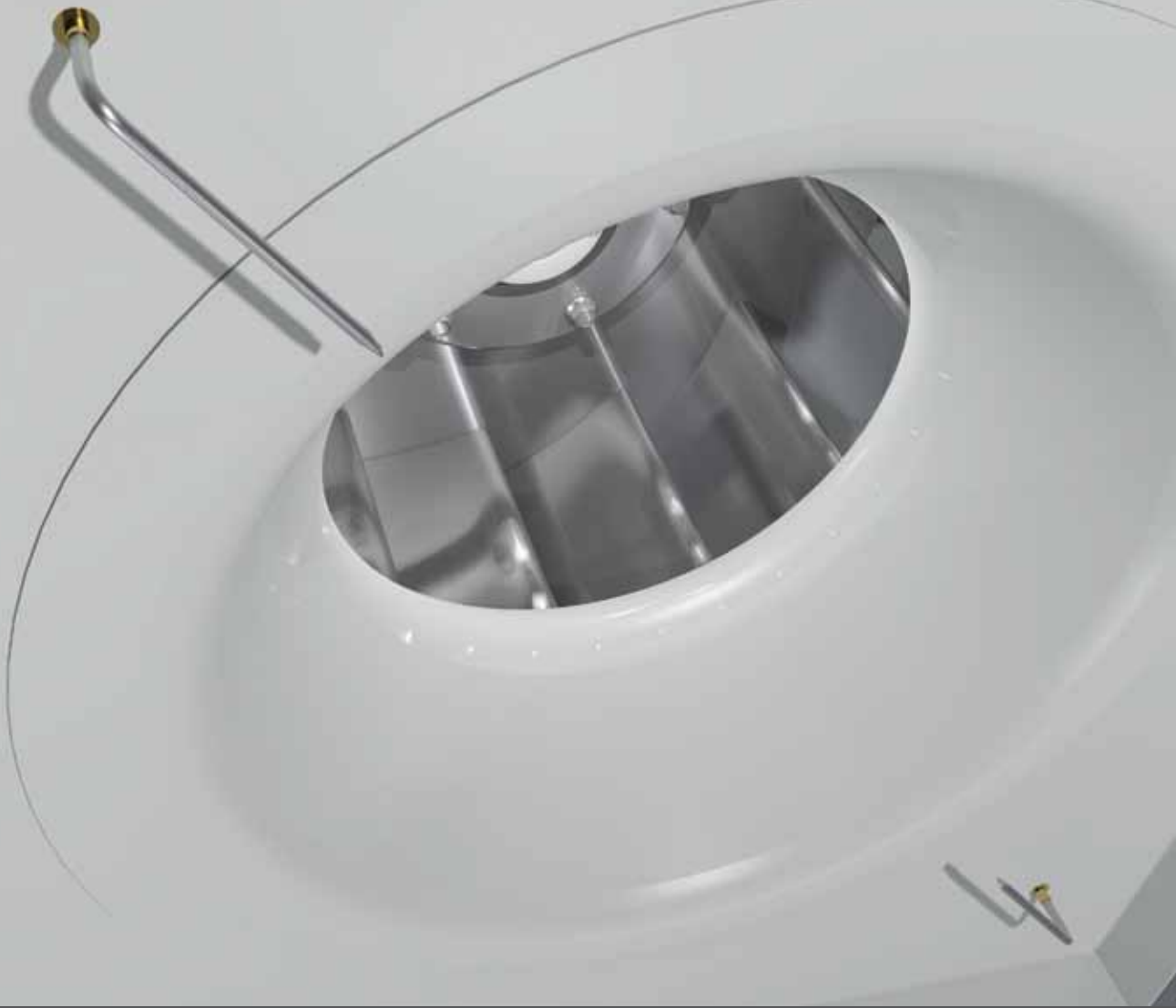


Flow Monitoring System

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

- Accurate
- No System Effect
- Reliable



 **GREENHECK**
Building Value in Air.

August
2010

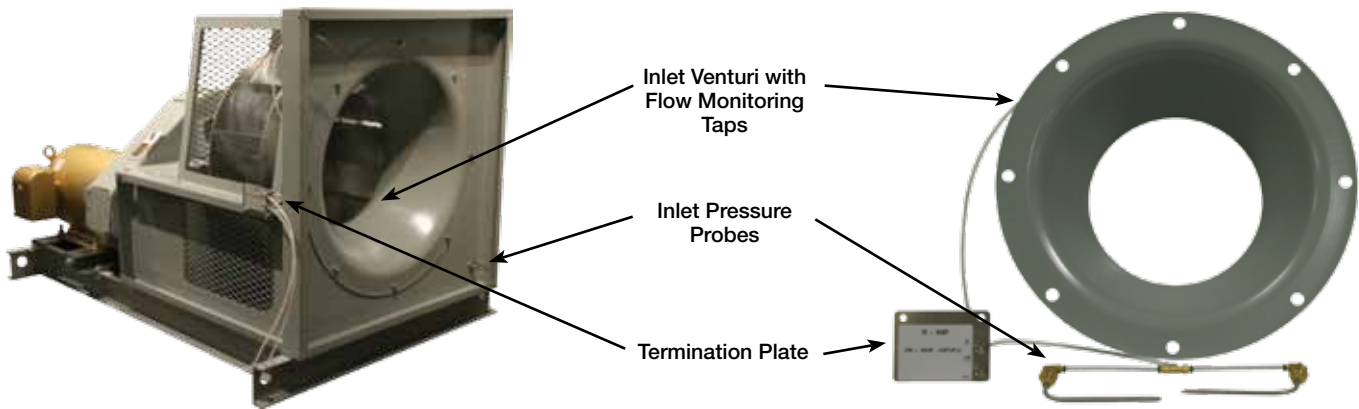
The Sure-Aire™ airflow monitoring system is ideal for HVAC applications where flow verification is required for proper system balancing, improving air quality, and controlling industrial processes.

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

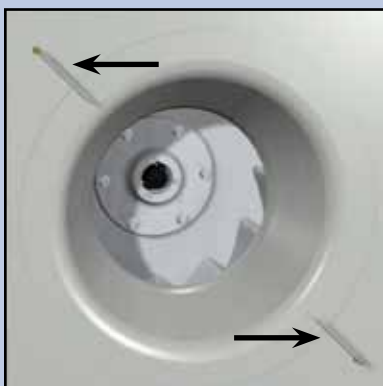
Sure-Aire™ Advantages

- Flow accuracy to within 3%
- Multiple pressure taps provide a true averaged pressure drop reading
- No increase in the fan energy consumption or sound levels
- Ships completely assembled from factory
- Includes termination plate with low pressure and high pressure taps



Sure-Aire™ Operation

The Sure-Aire™ system determines airflow by measuring the pressure drop across the fan inlet venturi. This is the same approach used by accredited laboratories for certifying fan performance. The Sure-Aire™ method measures the flow without restricting airflow like traditional flow monitoring probes. The result is accurate flow measurement without increased energy consumption or higher sound levels.



Noninvasive Probes

Sure-Aire™ System

Noninvasive pitot type probes and static pressure taps are installed to measure the pressure drop through the inlet venturi.

Airflow CFM is calculated based on the resulting pressure drop through the venturi.

Termination plate includes high and low pressure ports along with an airflow calibration equation specific to each fan.



Termination Plate

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. The disadvantage of traditional flow probe stations is an increase in system resistance, which can significantly detract from the fan's performance and cause the system to under perform. To compensate for the added pressure loss, the fan RPM and horsepower must increase. This results in added energy consumption and higher overall sound levels.

Single Width Centrifugal or Plenum Fan (Wheel Diameter)	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/library/videos to observe the Sure-Aire and pressure drop demonstration.



Traditional Invasive Flow Probes

Optional Electronics Package

The Greenheck Sure-Aire™ airflow measurement system is available with electronics for reading the fan performance. Resulting data can be tied to the facility Building Automation System (BAS).

- Real time digital LCD display that shows fan performance
- NEMA-4 enclosures are suitable for indoor or outdoor mounting
- Provides a 4-20 mA linear signal for interfacing
- Accuracy to 0.5% of full scale at 77°F
- Suitable for 100 - 240 volt AC (50 or 60 Hz)
- Compatible with most Building Automation Systems (BAS)
- Ships loose for field mounting and wiring



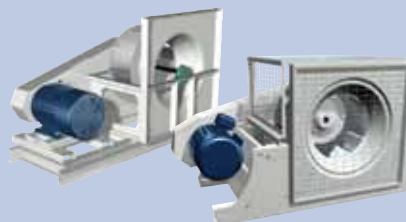
Programmable Differential Pressure Controller

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

Applicable Products for the Sure-Aire™ System



QEI
Mixed Flow Fans



QEP/QEM
Plenum Fans



BISW/AFSW
Single Width Centrifugal Fans



BIDW/AFDW
Double Width Centrifugal Fans

The Sure-Aire flow monitoring system is also available on Greenheck Vektor™ products. Consult the Flow Monitoring System, Sure-Aire™ for Vektor Laboratory Exhaust Systems catalog for specific information.

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 probes 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 probe(s) to be mounted in low velocity zone near fan inlet. Flow probe(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 Probes - 6061 Aluminum
Tube Fittings:
 - Housing: PBT Resin
 - O-ring: NBR
 - Release Button: POM
 - Grab Ring: Stainless SteelTubing:
 - Nylon 1/4 inch (standard) 0-180°F (-17 - 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: 0-5, 0-10, 0-25, 0-50, 0-100 inches wg
9. **Termination Plate Output Connections**
1/4 inch push connector

Optional Electronics

1. **Input Power**
120 VAC, 60 Hz, 0.2 A
2. **Input Process Connections**
1/8-27 NPT, terminated outside enclosure
3. **Input Range**
0-5, 0-10, 0-25, 0-50, 0-100 inches wg depending on model
4. **Enclosure**
NEMA-4 - indoor or outdoor use (field mounted)
5. **Transmitter**
 - Accuracy +/- 0.5% of full scale at 77°F
 - Pressure Limit: 9 psi for 0-100 range only 5 psi (135 inches wg for all others)
 - Temperature Limit: 32-140°F (0-60°C)
6. **Digital Display**
 - 4 digit display, 0.6 inch LCD
 - Programmed for CFM reading for most applications. Some displays will show differential pressure and not CFM.
7. **Analog Output**
4-20 mA DC into 900 ohms max

The Sure-Aire™ electronics package requires field mounting.

Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the shipment date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Greenheck will not be responsible for any removal or installation costs.

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



Prepared to Support
Green Building Efforts

