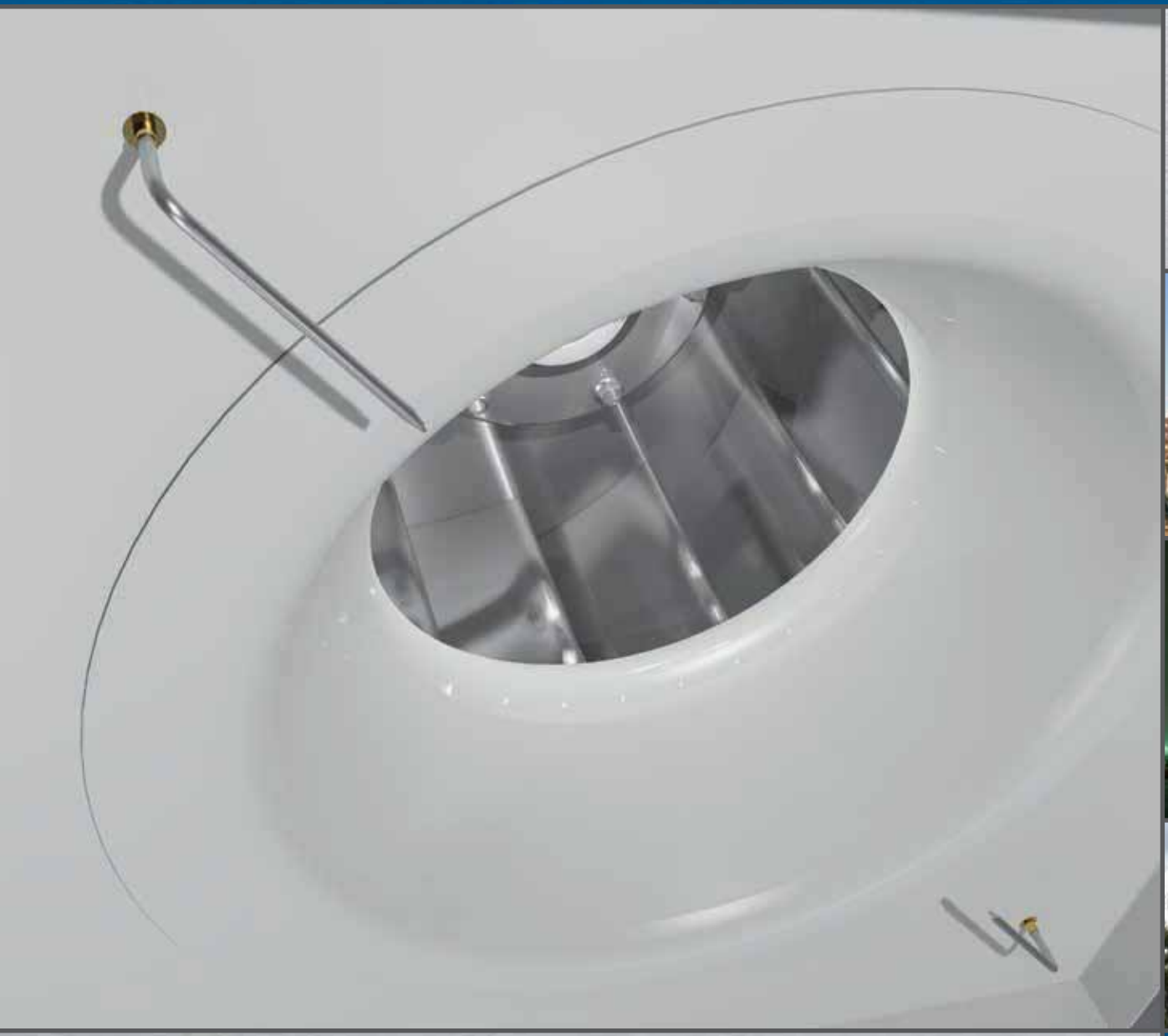
Flow Monitoring System

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

• Accurate • No System Effect • Reliable











GREENHECK®

Building Value in Air.

March
2013

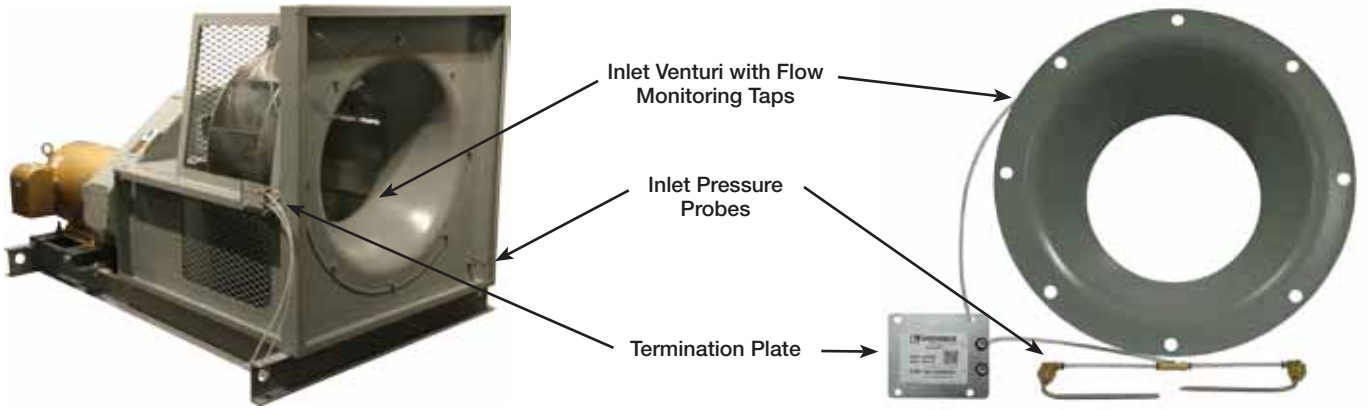
The Sure-Aire™ airflow monitoring system is ideal for HVAC applications where flow verification is required for proper system balancing, improving air quality, and controlling industrial processes.

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. The airflow is then calculated based on the pressure drop and a K factor specific to each fan size. This is the same approach used by accredited laboratories for certifying fan performance. The Sure-Aire method measures the flow without causing turbulence in the venturi resulting in 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. Mounting the flow probes in this fashion causes turbulence and increases the system resistance. This 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 additional 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.



Traditional Invasive Flow Probes

Visit www.greenheck.com/library/videos to observe the Sure-Aire and pressure drop demonstration.

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 (IP 56) enclosure suitable for indoor or outdoor use
- Provides a 4-20 mA or 2-10 VDC signal linear to differential pressure for interfacing
- Accuracy to 0.5% of full scale at 77°F
- Two available input options: 100 - 240 volt, AC
  24 volt, AC or DC
- Compatible with most Building Automation Systems (BAS)
- Ships loose for field mounting and wiring



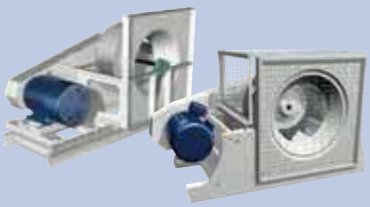
Programmable Differential Pressure Controller

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



HPA
Plenum 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 Steel

   Tubing:
   - 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
4. **Enclosure**
   NEMA-4 (IP 56) indoor or outdoor use, field mounted
5. **Transmitter**
   - Accuracy +/- 0.5% of full scale at 77°F
   - 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.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

Prepared to Support Green Building Efforts

GREENHECK
Building Value in Air.

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