



VORTEK^{G3}

VTFA Series

Digital Airflow Measurement for Fan Arrays



- Digital Airflow Sensing
- Modular Design
- Intuitive User Interface
- Stable – Drift Free
- Resistant to Contamination
- Not Affected by Humidity
- Not Affected by Temperature
- Not Affected by Altitude
- Linear Over Entire Range
- Low Power Requirements
- Universal Voltage and Current Output
- Native BACnet MS/TP Optional

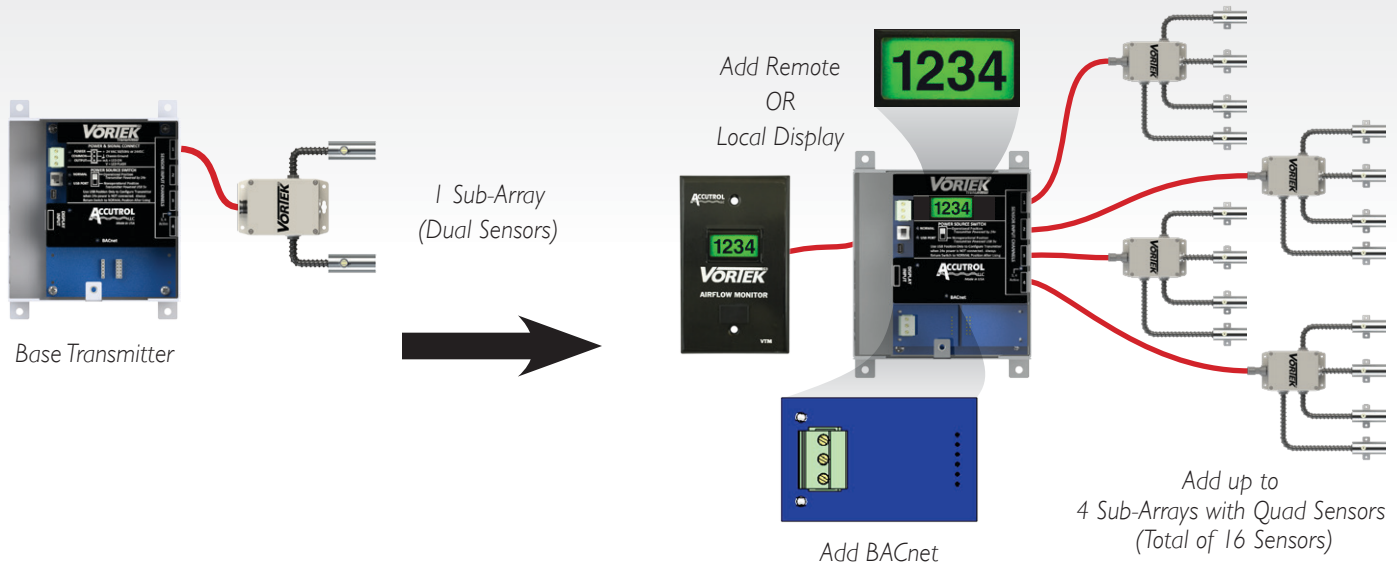


Tek-Air Airflow Products

Modular Design Concept

The VorTek^{G3} incorporates a unique, modular design concept. This enables you to order only the functions that are required for a specific application, thereby eliminating the need to pay for features that are not required. Instead of multiple electronics platforms for different applications or "series" of

models, the VorTek^{G3} simplifies user selection by utilizing a single electronics platform that can be used from a base of two sensing points up to sixteen sensing points. Any unit can be easily changed in the field to add sensors or reconfigure the range using the free Accutrol Insight graphical software.

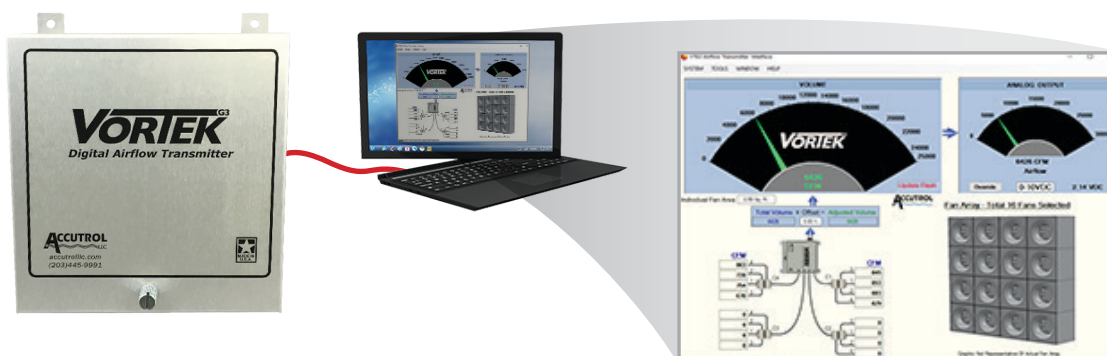


Insight User Interface

The innovative design of the VorTek^{G3} incorporates the use of the free Accutrol Insight graphical software, the same award-winning software used for the Accutrol AVC Fume Hood Control System. Gone is the frustration of older style alphanumeric displays and pushbuttons with a large decision tree user manual. The Insight software provides simple intuitive access to the configuration of the transmitter for different applications. The software connects to the VorTek^{G3} through

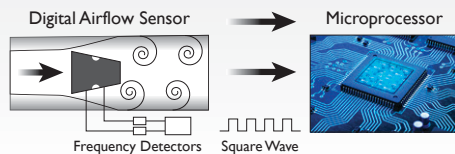
a standard USB connection providing quick and easy access for the following:

- **BAS** – Allows simple field changes to the transmitter range.
- **Commissioning** – Allows simple adjustment for unusual airflow profiles.
- **Owner** – Can make changes to ranges, number of sensors, etc. as the system requirements change.



Digital Airflow Sensing

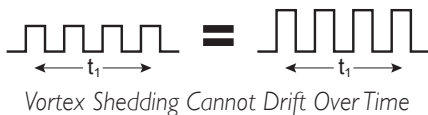
The VorTek^{G3} airflow measuring device is the **only** digital airflow sensing device on the HVAC market. By utilizing vortex shedding technology, the shedder mounted in the air stream creates pressure pulses, which are converted to an electronic frequency. This electronic frequency is related to airflow velocity in a linear manner. That is why the VorTek^{G3} is able to maintain high accuracy over a very large range.



Pressure Pulses Converted to Electronic Frequency

Stable – Drift Free

One of the many advantages of vortex shedding is that the sensing is not amplitude based and cannot drift over time. Therefore, no recalibration is required – ever.

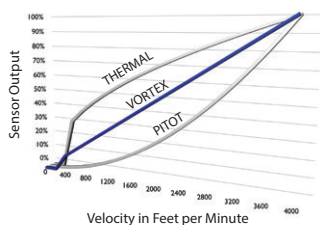


Vortex Shedding Cannot Drift Over Time

Other airflow sensors rely on an amplitude measurement device, which is susceptible to inaccuracies and drift.

- Pitot and orifice sensors rely on differential pressure transmitters, which require periodic calibration.
- Thermal airflow sensors use thermistors, which will drift over time and must be matched to the electronics.

Linear Airflow Measurement



Vortex Shedding Is Linear

The VorTek^{G3} is the **only** airflow measurement technology that is linear. The inherent physics of vortex shedding is a linear relationship between frequency and air velocity. That means that as air velocity changes,

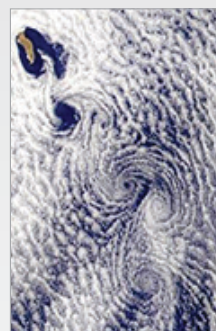
the frequency of the pulses changes in a linear manner. This eliminates the need for complicated curve matching associated with thermal devices.

Contamination Resistant

Vortex sensors are contamination resistant. Other airflow measurement technologies, such as thermal dispersion, are severely affected by contaminants in the air stream. As a thermistor gets coated with dust or dirt, the thermal transfer is impacted, seriously affecting the accuracy of the device.

Unaffected by Humidity, Temperature, Altitude

Vortex shedding is also unaffected by changes in air density and humidity, which do affect thermal airflow measurement systems.

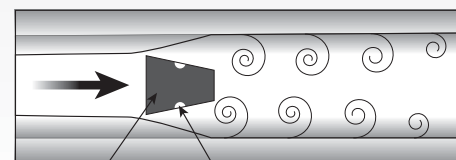


Vortex Shedding Around a Volcanic Island

How Vortex Sensing Works

The vortex shedding phenomena can be seen all around us in everyday life. Swirling vortices, or eddy currents, are generated whenever air flows around an obstruction in its path. Common examples are the eddy currents that develop behind rocks in a stream or the fluttering of a flag behind a flagpole. The satellite photo (left) shows clouds flowing around a volcanic island. As clouds pass the mountains, the vortices are created on a grand scale.

VorTek^{G3} sensors simply utilize this same vortex shedding phenomena to measure the velocity of the air on a smaller scale. As airflow passes around the trapezoidal shedder; it creates alternating low pressure vortices. Sensing ports on opposite sides of the shedder relay these pressure pulses to frequency detectors, which then output a digital signal to the electronics. The electronics subsequently convert these digital pulses to analog output signals.



BLUFF BODY **Sensing Ports**

Vortex Shedding on a Smaller Scale

Specifications

PERFORMANCE

Individual Sensor Accuracy	±2% of reading
Sensor FS Range	Factory Default - 12,000 FPM (3658 MPM) (software configurable)
Installed System Accuracy*	Fan inlet ±5% of reading per fan

ENVIRONMENTAL

Operating Temperature

Sensor	-20° to 140° F (-29° to 60° C)
Sensor Electronics	-20° to 150° F (-29° to 66° C)
Transmitter	-20° to 150° F (-29° to 66° C)
Display (optional)	-4° to 158° F (-20° to 70° C)

Storage Temperature

Sensor and Transmitter	-40° to 150° F (-40° to 66° C)
Display (optional)	-22° to 176° F (-30° to 80° C)

Humidity

Sensors	Non-condensing
Transmitter	0% to 90% non-condensing

MATERIALS OF CONSTRUCTION

Fan Inlet Sensors

Standard	ABS plastic shedder with aluminum shroud and base
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Enclosures

Standard	Transmitter: Aluminum alloy 5052-H32, 16 gauge Sub-Array: NEMA 4X polycarbonate plastic
Optional	Transmitter: NEMA 4X polycarbonate plastic Sub-Array: NEMA 4X polycarbonate plastic

Cables	Watertight
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ELECTRONICS

Input Power	24VAC ±20% 50-60Hz 2.4 VA (no options) 4.8 VA (includes display & BACnet options) 24VDC ±10% 1 W (no options) 3 W (includes display & BACnet options)
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Input Up to 16 sensors

Output 0-20mA, 4-20mA, 0-10v, 2-10v, 0-5v or 1-5v
(software configurable)*

Notes:

*Analog Output is for Total Flow;
Individual Fan Flow is available
when connected through BACnet.*

Configuration Port USB 2.0, Isolated, Mini B Connector

USB Power Switch Selects alternate power source for configuration when main power is not available. Draws 5v power from USB configuration port.

Status Indicators LED Status Indicators for: Power, Output, Configuration Port, Power Source Switch, Sensor Input Ch 3 and 4, Display and BACnet Communications

I/O Terminal Block 3 position vertical pluggable screw terminal block

Network Com Port (optional) **BACnet MS/TP** EIA 485 2-wire
Galvanically isolated
Data rates: 9600, 19200, 38400, 57600, 76800 and 115200
1/8 Unit load receiver input impedance
Network bias and EOL termination not provided within the transmitter

Display (optional) Remote mount or transmitter mount
Liquid Crystal Display, 2 lines x 8 characters with white LED backlight includes USB configuration port

* Installed Airflow accuracy is the actual system accuracy expected when installation meets or exceeds placement guidelines

VorTek^{G3} VTFA Fan Array Airflow Sensor Ordering Guide

VTFA [] - [] [] [] [] - [] [] [] - [] [] []

No. of Sub-Arrays

1 = 1 Sub-Array
2 = 2 Sub-Arrays
3 = 3 Sub-Arrays
4 = 4 Sub-Arrays

Sub-Array 1

1 = Single Sensor
2 = Dual Sensors
3 = Triple Sensors
4 = Quad Sensors

Sub-Array 2

0 = Not Used
1 = Single Sensor
2 = Dual Sensors
3 = Triple Sensors
4 = Quad Sensors

Sub-Array 3

0 = Not Used
1 = Single Sensor
2 = Dual Sensors
3 = Triple Sensors
4 = Quad Sensors

Sub-Array 4

0 = Not Used
1 = Single Sensor
2 = Dual Sensors
3 = Triple Sensors
4 = Quad Sensors

Options

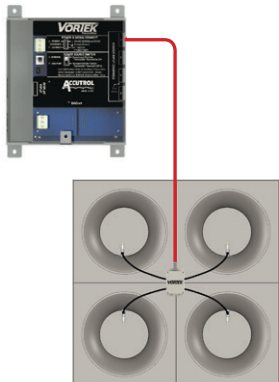
BLANK = No Options
B = BACnet MS/TP
D = Internal Transmitter Display
Note: Cannot be used with remote display.

Enclosures

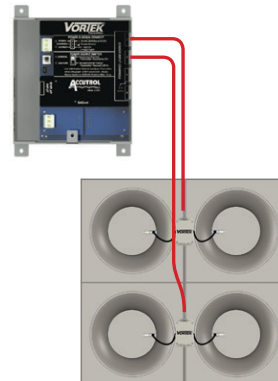
0 = Standard Xmtr
1 = NEMA 4X Xmtr

Cable Length

1 = Standard 25' (7.6m)
2 = 50' (15.2m)
3 = 75' (22.9m)
4 = 100' (30.5m)



Example: **VTFA1-4000-X0-B**



Example: **VTFA2-2200-X0-B**

VorTek^{G3} VTM



Optional Remote Airflow Monitor*

The VTFA is available with an optional airflow monitor that can be mounted remotely from the transmitter. The monitor is connected to the VTFA with factory cable and can be located up to 100' away. The VTM includes a mini USB connection to enable the operator to use the Insight User Interface without accessing the transmitter.

* Cannot be used with internal display.

VorTek^{G3} VTM Remote Airflow Monitor* Ordering Guide

VTM [] [] [] - []

Cable Length

000 = No cable
025 = 25' (7.6m)
Plenum Rated Cable
050 = 50' (15.2m)
Plenum Rated Cable
075 = 75' (22.9m)
Plenum Rated Cable
100 = 100' (30.5m)
Plenum Rated Cable

Cable Type

BLANK = Standard
Plenum Rated Cable
N = NEMA 4X
Watertight Cable

Your representative is: