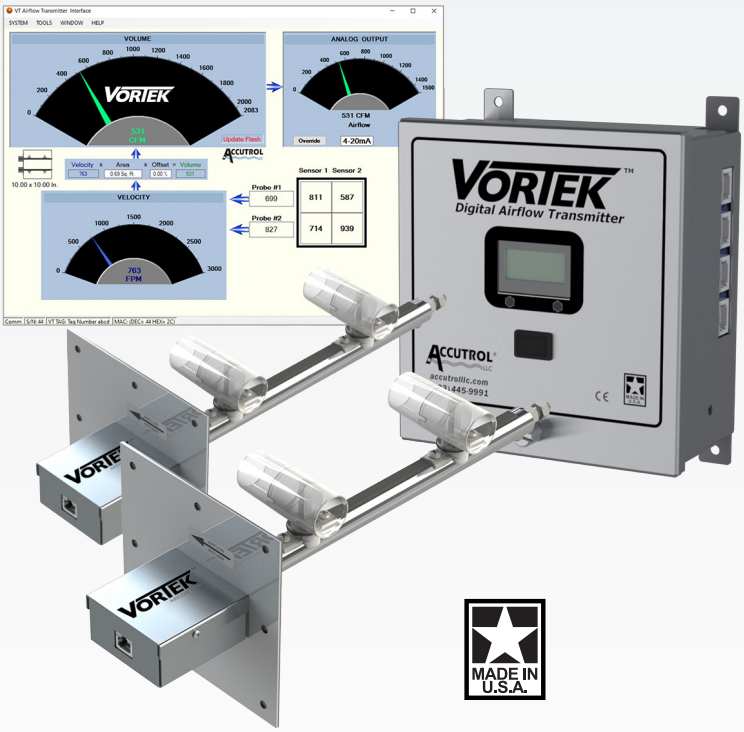
ACCUTROL® LLC

VORTEK®

VTD Series

Digital Airflow Measurement for Ducts

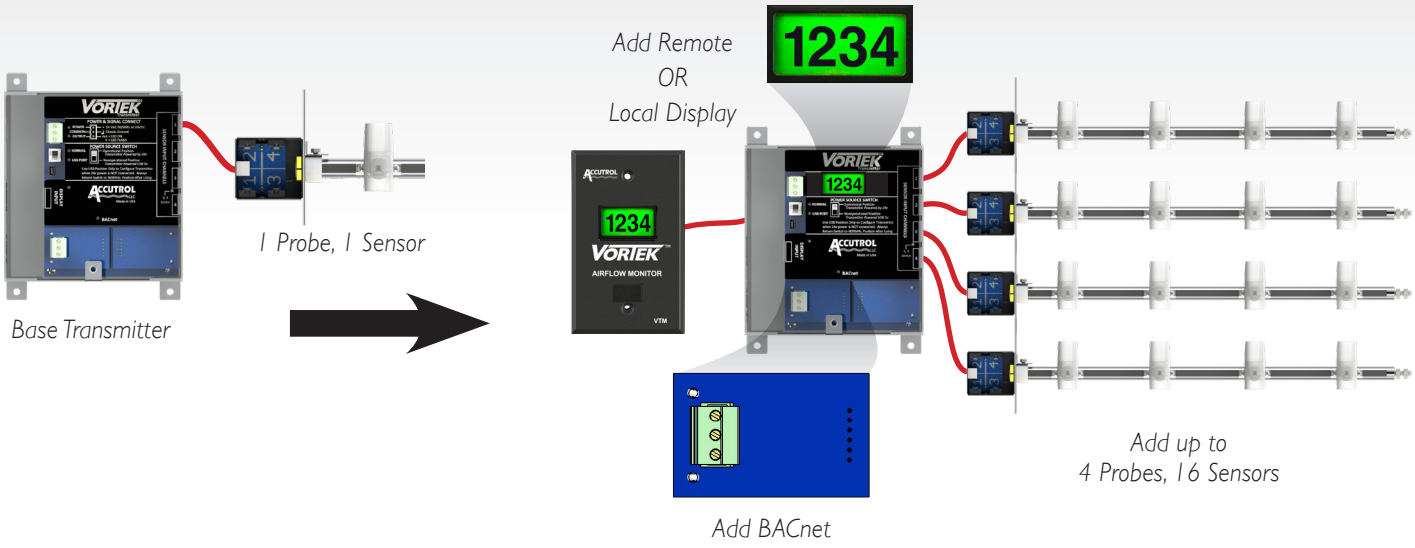


- Digital Airflow Sensing
- Modular Design
- Intuitive User Interface
- Stable – Drift Free
- Resistant to Contamination
- Not Affected by Humidity
- Not Affected by Temperature
- Not Affected by Altitude
- Linear Over Entire Range
- Low Power Requirements
- Universal Voltage and Current Output
- Native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

Accutrol, LLC • 21 Commerce Drive, Danbury, CT 06810 • 203-445-9991 • www.accutrolllc.com

Modular Design Concept

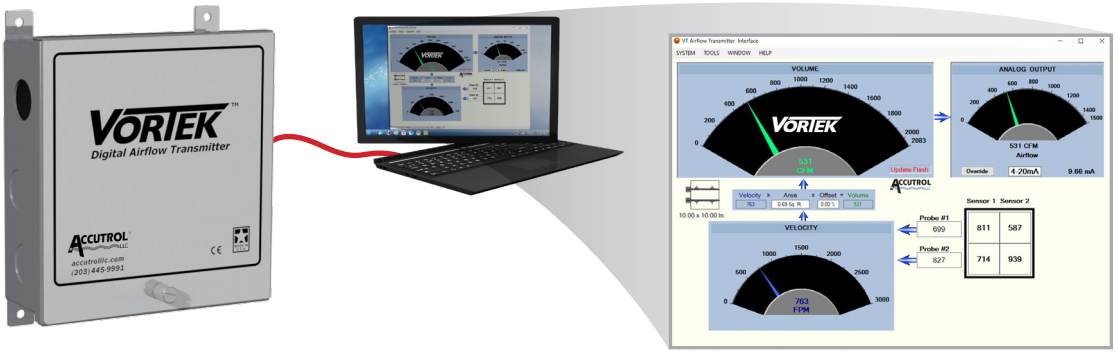
The VorTek incorporates a unique, modular design concept. This enables you to order only the functions that are required for a specific application, thereby eliminating the need to pay for features that are not required. Instead of multiple electronics platforms for different applications or "series" of models, the VorTek simplifies user selection by utilizing a single electronics platform that can be used from a base of one sensing point 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

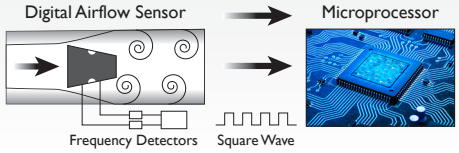
The innovative design of the VorTek incorporates the use of the free Accutrol Insight graphical software, the same award-winning software used for the Accutrol AVC Fume Hood Control System. Gone is the frustration of older style alphanumeric displays and pushbuttons with a large decision tree user manual.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

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



Digital Airflow Sensing

The VorTek 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 is able to maintain high accuracy over a very large range.



Pressure Pulses Converted to Electronic Frequency

Stable – Drift Free

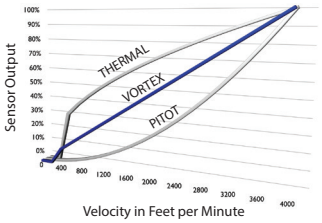
One of the many advantages of vortex shedding is that the sensing is not amplitude based and cannot drift over time. Therefore, no recalibration is required – ever.

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 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

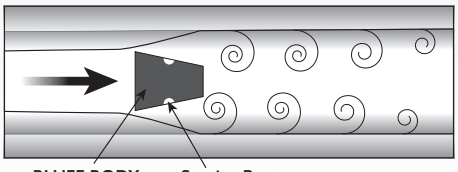
Vortex shedding is also unaffected by changes in air density and humidity, which do affect thermal airflow measurement systems.

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 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.



Vortex Shedding on a Smaller Scale

Specifications

PERFORMANCE

Accuracy	
Individual Sensors	±2% of reading (factory verified to NIST traceable standards)
System Accuracy	±3% of reading (installed accuracy expected when installation meets or exceeds minimum placement guidelines)
Repeatability	±0.1% of reading
Sensor FS Range	Factory default is 3000 FPM (15.24 m/s) (software configurable)

ENVIRONMENTAL

Operating Temperature	
Probe Types 1,3 & 5	-40° to 165° F (-40° to 74° C)
Probe Type 4	-40° to 320° F (-40° to 160° C)
Transmitter	-20° to 150° F (-29° to 66° C)
Display (optional)	-4° to 158° F (-20° to 70° C)
Storage Temperature	-22° to 165° F (-30° to 74° C)
Humidity	0% to 95% non-condensing

MATERIALS OF CONSTRUCTION

Insertion Probes	
Probe Type 1	Aluminum bar, galvanized steel mounting plate, aluminum hardware, zinc plated steel sensor mounting screws, PC sensor UL94 V-0, ether-based polyurethane tubing
Probe Type 3	304SS bar, 304SS mounting plate, 303SS sensor, ether-based polyurethane tubing
Probe Type 4	304SS bar, 304SS mounting plate, 303SS sensor, 304SS tubing
Probe Type 5	PTFE coated aluminum bar, 304SS mounting plate, 303SS hardware, 18-8 SS sensor mounting screws, PC sensor UL94 V-0, ether-based polyurethane tubing
Enclosures	
Standard	Transmitter: Aluminum alloy 5052-H32, 16 gauge Probe electronics: Galvanized Steel, 18 gauge
Optional	Transmitter: NEMA 4X polycarbonate plastic Probe electronics: NEMA 4X polycarbonate plastic
Cables	Plenum Rated

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

ELECTRONICS

Input Power	24VAC ±20% 50-60Hz 2.4 VA (no options) 4.8 VA (with display and BACnet options) 24VDC ±10% 1 W (no options) 3 W (with display and BACnet options)
Input	1 to 4 Probes with up to 4 Sensors per Probe (16 Sensors Max)
Output	0-20mA, 4-20mA, 0-10v, 2-10v, 0-5v or 1-5v (software configurable) 12-bit Resolution Capable of driving 1K ohm load
Configuration Port	USB 2.0, Isolated, **USB C 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, screw access on top, 12-30 AWG
Cables	Plenum rated cables provided with standard enclosures Outdoor rated cables with waterproof plug provided with NEMA 4X enclosures
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

VorTek VTD Duct Mounted Airflow Sensor Ordering Guide

VTD ☐☐ - ☐☐ - ☐☐ - ☐☐ - ☐☐

Duct Shape

1 = Round
2 = Rectangular
3 = Flat Oval

Probe Material

1 = Aluminum/Polycarbonate
2 = Discontinued
3 = 304SS/303SS
4 = 304SS/303SS (High Temp)
5 = PTFE coated Aluminum/Polycarbonate

Probe Quantity

1 = 1 Probe
2 = 2 Probes
3 = 3 Probes
4 = 4 Probes

Sensors Per Probe

1 = 1 Sensor per Probe
2 = 2 Sensors per Probe
3 = 3 Sensors per Probe
4 = 4 Sensors per Probe

Options

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

Enclosures

0 = Standard Transmitter, Standard Probe
1 = NEMA 4X Transmitter, Standard Probe
2 = Standard Transmitter, NEMA4 Probe
3 = NEMA 4X Transmitter, NEMA4 Probe
4 = Standard Xmtr, NEMA 4X Probe w/Purge
5 = NEMA 4X Xmtr, NEMA 4X Probe w/Purge

Cable Length

0 = Standard 10' (3.0m)
1 = 25' (7.6m)
2 = 50' (15.2m)
3 = 75' (22.9m)
Only available with Enclosure Type "0"
4 = 100' (30.5m)
Only available with Enclosure Type "0"

Probe Length

XX = Inches (04-72)
Note: Max. length for CPVC Probe Material is 60".

VorTek VTM Optional Remote Airflow Monitor*

The VTD is available with an optional airflow monitor that can be mounted remotely from the transmitter. The monitor is connected to the VTD 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 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: