AVS Series 1000 Series
Air Velocity Sensors

features
• Measures airflow directly
• Ultra-sensitive to low velocity
• All solid-state
• Cost-effective
• Easy to use
• Choice of outputs, including 0-10V or 4-20mA
• Access to tight locations
• Temperature readings available

overview
The Cambridge AccuSense AVS-1000 Series are embedded, thermistor-based sensors, developed to provide direct, continuous measurements of ultra-low air velocity. The AVS-1000 Series feature velocity ranges as low as 0-0.5 m/s (0-100 fpm); the highest velocity range is 0-5 m/s (0-1000 fpm). Users can also specify custom ranges, to fit the particular needs of their own applications. The specially designed, small sensors allow easy access to obtain measurements even in remote and tight locations.

Directly obtaining airflow measurements greatly increases monitoring accuracy and efficiency. Traditional methods using differential pressure result in extremely low readings which are difficult to measure economically and accurately.

AVS-1000 Series sensors are available in two versions, bi-directional or non-directional. The non-directional sensor measures the maximum velocity passing the sensor. The bidirectional sensor gives a positive or negative reading to indicate the direction of the airflow. (see page 5)

Applications:
• Isolation rooms
• Clean rooms
• Fume hoods
• Biological safety cabinets
• Leak detection
• Gas metering for duct work
• HVAC
• Process Control

An all solid-state construction ensures durability and stable operation, while the processing electronics inside the AVS Series perform temperature compensation and linearization of output. Applications for this new technology include airflow monitoring in sensitive environments such as isolation rooms, clean rooms, fume hoods and biological safety cabinets, as well as leak detection and gas metering for duct work, HVAC and process control.

Supply voltage options include 12V or 24 VDC, with outputs of 0-10V or 4-20mA. Packaging options include plastic or metal case with pins or DB9 connections. A new metal case with an aluminium wand is now available, called the Universal Package.
1000 Series Air Velocity Sensors

**Application:**
Fume Hoods

The AVS can be mounted into the side wall or incoming duct to measure and control face velocities of fume hoods.

**Application:**
Cleanrooms

Mount several AVS sensors by inlets, outlets, filters and other critical areas. Transmit the data over long distances for continuous monitoring of airflow.

**Application:**
Isolation Rooms

A bi-directional AVS is optimal for monitoring isolation rooms and operating rooms where air velocity and direction are critical.

**Application:**
Air Ducts

Use the AVS as a replacement for cumbersome conversion of pressure measurements to an airflow reading.
1000 Series Air Velocity Sensors

Supply | Minimum | Nominal | Maximum
--- | --- | --- | ---
12D | 10 | 12 | 16 VDC
24D | 18 | 24 | 30 VDC

Accuracy From 15 to 35°C 5% of full scale, 3% of full scale at 21°C
Accuracy Below 30 fpm not guaranteed

Operating Temperature | -10°C to 70°C
Storage Temperature | -40°C to 100°C
Supply Current | 50 mA nominal
Repeatability at 25°C | ±1% full scale
Response Time | 100 ms std., other response times available
Output Resolution | 256 steps
Warm-up Time | 10 minutes maximum
Current Loop Load | 0-200 ohms
Relative Humidity (non-condensing) | 10% to 90% RH

Cable | Shielded Teflon (diameter 1.78 mm)

Connector Configuration

3 Pin Header
1 = Supply (Vcc)
2 = Return (GRD)
3 = Output

DB9
1 = Supply (Vcc)
2 = Output
6 = Return (GRD)
Remaining pins on DB9 connector reserved for future use

Case Material:
Plastic: ABS
Metal: Powder Coated Aluminium

Weight:
Plastic: 36 grams
Metal: 80 grams

All dimensions are in millimetres
A.) Plastic Case
B.) Metal Case
C.) 9 Pin D-Sub

Specifications subject to change without notice.
At low velocities, the equivalent pressure measurements become very small and difficult to measure accurately and economically with traditional pressure sensors.

The AVS Series gives its strongest signals at the lowest velocities, thus eliminating the inaccuracies caused by converting minute differential pressures to an airflow reading.

**Sample Response, Non-Directional**

![Graph showing airflow vs. pressure for non-directional response](image)

**Sample Response, Bi-Directional**

![Graph showing airflow vs. pressure for bi-directional response](image)

**Airflow vs. Pressure**

![Graph showing airflow vs. pressure](image)
Bi-directional dot facing flow is positive direction. Logo facing flow is in negative direction. All dimensions are in millimetres.

### Part Number Format

<table>
<thead>
<tr>
<th>AVS</th>
<th>XX</th>
<th>XXX</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Velocity Sensor</td>
<td>Series</td>
<td>Supply Voltage</td>
<td>Case</td>
<td>Velocity Range (See Below)</td>
<td>Output</td>
<td>Cable Length (Shielded)</td>
<td>Connector Options</td>
<td></td>
</tr>
<tr>
<td>10 = Non-Directional Sensor</td>
<td>12D = 12VDC</td>
<td>0 = Plastic</td>
<td>D = 200 fpm F = 500 fpm H = 1000 fpm</td>
<td>2 = 0-10V</td>
<td>1 = 1m</td>
<td>2 = Panel Mount 3 Pin Header (plastic case)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 = Bi-Directional Sensor</td>
<td>24D = 24VDC Metal Case Only</td>
<td>1 = Metal</td>
<td>J = 0.5 m/s L = 1.0 m/s N = 2.5 m/s P = 5 m/s</td>
<td>3 = 4-20 mA</td>
<td>2 = 2m</td>
<td>4 = Female DB9 (metal case)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Velocity Ranges

- **Non-Directional** – Choose 1 letter for ending velocity range: e.g., B = 100 fpm. Overall velocity range is 0 to 100 fpm.
- **Bi-Directional** – Choose 1 letter for the ending velocity which will represent both the negative and positive velocity (e.g., an AVS with the letter D has a velocity range of -200 to +200 fpm).

Accuracy on the bi-directional AVS begins from the bottom of the negative range to the top of the positive range (e.g., -200 to +200 calibration’s full scale is 400 fpm).
AVS Series
Universal Air Velocity Sensor

features
- Measures airflow directly
- Linear Output
- Ultra-sensitive to low velocity
- Rugged
- Cost-effective
- Bi-directional option available
- Easy to use
- Choice of outputs, including 0-10V or 4-20mA

overview
The new AVS Universal Series by Cambridge AccuSense, are thermistor-based transducers specially designed to obtain direct measurements of ultra-low air velocities, covering a range that starts as low as 0-100 fpm full scale (0-.5m/s), and reaching up to 0-1000 fpm (0-5 m/s); the output is linear with velocity.

With a standard response time of approximately 100 milliseconds, these new transducers feature accuracy of ±3% of full scale at room temperature, and eliminate the need to convert differential pressure readings in order to obtain an equivalent airflow measurement.

Individually calibrated in Cambridge AccuSense’s NIST traceable wind tunnels, the rugged AVS Universal Series is also offered in a bi-directional version that provides a positive or negative reading, depending on the direction of the airflow. The large thermistor signal ensures minimal drift, improved stability and better sensitivity at low velocities than traditional measurement methods. The unit is powered by 12-24VDC; output choices include 0-10V or 4-20 mA.

Applications for this new technology include monitoring airflow at HEPA filters to control fans and blowers, and to monitor critical processes in clean rooms such as mini-environments. Additional uses include measuring airflow in fume hoods, biosafety cabinets, wind tunnels, and HVAC duct work.

The AVS Universal Series provides a cost-effective and efficient alternative to traditional methods.
### Specifications

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>12D</td>
<td>10</td>
<td>16 VDC</td>
</tr>
<tr>
<td>24D</td>
<td>12</td>
<td>30 VDC</td>
</tr>
</tbody>
</table>

Accuracy From 15 to 35°C 5% of full scale, 3% of full scale at 21°C

Operating Temperature: -10°C to 70°C

Storage Temperature: -40°C to 100°C

Supply Current: 50 mA nominal

Repeatability at 25°C: ±1% full scale

Response Time: 100 ms std., other response times available

Output Resolution: 256 steps

Warm-up Time: 3 minutes maximum

Current Loop Load: 0-200 ohms

Relative Humidity (non-condensing): 10% to 90% RH

Cable: Shielded Teflon (diameter 1.78 mm), 24” long

**Connector Configuration**

<table>
<thead>
<tr>
<th></th>
<th>3 Pin Header</th>
<th>DB9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply (Vcc)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Return (GRD)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Output</td>
<td>6</td>
</tr>
</tbody>
</table>

Remaining pins on DB9 connector reserved for future use

Case Material: Black Anodized Aluminium

Weight: 1 lbs maximum

---

### Part Number Format

<table>
<thead>
<tr>
<th><strong>AVS</strong></th>
<th><strong>XX</strong></th>
<th><strong>XXX</strong></th>
<th><strong>X</strong></th>
<th><strong>X</strong></th>
<th><strong>X</strong></th>
<th><strong>X</strong></th>
<th><strong>X</strong></th>
</tr>
</thead>
</table>

#### Air Velocity Sensor

**Series**

- 10 = Non-Directional Sensor
- 11 = Bi-Directional Sensor

**Supply Voltage**

- 12D = 10 - 16 VDC
- 24D = 12 - 24 VDC

**Case**

- 2 = Universal Package

**Velocity Range**

(See Below)

- B = 100 fpm
- D = 200 fpm
- F = 500 fpm
- H = 1000 fpm
- J = 0.5 m/s
- L = 1.0 m/s
- N = 2.5 m/s
- P = 5 m/s

Custom Ranges Available

**Output**

- 2 = 0-10V
- 3 = 4-20 mA

**Wand**

- 0 = 12.5” Stainless Steel Rod

**Connector Options**

- 4 = Female DB9

---

### Velocity Ranges

**Non-Directional** – Choose 1 letter for ending velocity range: e.g., B= 100 fpm. Overall velocity range is 0 to 100 fpm.

**Bi-Directional** - Choose 1 letter for the ending velocity which will represent both the negative and positive velocity (e.g., an AVS with the letter D has a velocity range of -200 to +200 fpm).

Accuracy on the bi-directional AVS begins from the bottom of the negative range to the top of the positive range (e.g. -200 to +200 calibration’s full scale is 400 fpm).