

B500



Applications

- Process Control
 - Curing & Coating Applications
 - Clean Manufacturing
 - HVAC
 - Duct Flow Reversal
 - Laboratory & Research
 - Critical Environment Sensing
 - R&D
 - Prototype Testing
- and more...

Overview

The B500 is a universal voltage, bi-directional air velocity and air temperature sensor with both analog and digital communications outputs.

The bi-directional sensor outputs both the velocity of the air, as well as airflow direction, in real-time.

In addition, the B500 provides the air temperature of the flow being measured. Designed with conformal coated electronics and sealed enclosure, the B500 is rugged and versatile. The B500 is suitable for combustion, curing, process control, cleanroom, and other demanding applications where air velocity, temperature and flow direction are needed. The analog output may be configured to voltage or mA styles, and can be augmented with simultaneous digital communication, either UART or I²C. The B500 series is configured to order, with a variety of velocity ranges, mechanical lengths, and output communication styles available in industry leading lead-times.



Bi-Directional Head

Mechanical Features

- Innovative “outside the duct” installation: Single hole for mounting sensor assembly, without need for screws, or hands inside the duct.
- Optimized flow geometry with segregation of velocity and temperature elements for highest accuracy.
- Aerodynamic cross section to minimize flow disturbance.
- Robust, sealed probe assembly uses corrosion and UV resistant materials.
- Conformal coated sensing elements and electronics for environmental protection.
- Plenum-rated cabling (2m [6ft]) suitable for HVAC, laboratory, and process control applications.
- RoHS compliant.
- CE certified

Electrical & Performance Features

- Industry-leading air velocity performance, with repeatability within 1%.
- $\pm 1^{\circ}\text{C}$ temperature accuracy
- Best in class acceptance angle performance.
- Universal 24VAC/VDC supply voltage.
- mA and voltage analog outputs available.
- Digital UART & I²C communication outputs available.
- May be configured as an airflow switch with open drain output.
- Both air velocity and temperature analog outputs may be configured as voltage or current.
- Multi-sensor addressing capability.
- Configurable velocity averaging for smoother sensor response
- <10 second start-up time and 400ms response time.

Degree Controls, Inc.

is an ISO-9001 certified, world-class designer and manufacturer of airflow sensing, monitoring, and control solutions. With over 20 years of proven experience, we pride ourselves on delivering solutions which provide the value, differentiation, and service required by our customers, to meet the rapidly changing competitive landscape that they face.

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Specifications

Velocity Range	-20 to +20 m/s (-4,000 to +4,000 fpm)
Operating Temperature	0°C to 60°C (32°F to 140°F)
Storage Temperature	-40°C to 105°C (-40°F - 221°F)
Relative Humidity (non-condensing)	5-95%
Supply Power Requirements	24VAC/DC ±10%, <65mA nominal @ 24V
Velocity & Temperature Output	0-5V or 0-10V, 0-20mA or 4-20mA output
Digital Output	UART or I ² C available for flow and temperature information.
Alarm Output	Open drain, configurable trip point
Housing Construction	Polycarbonate (PC), UL94-V0 (head) UL94-HB (housing)
Plenum Rated Cable	22 AWG
Environmental Protection	IP65 electronics, including conformal coated sensing element

Air Velocity Performance

Repeatability ±1% of reading (under identical conditions)

Range

-1.0 to 1.0 m/s (-200 to 200 fpm)
 -10 to 10 m/s (-2,000 to 2,000 fpm)
 -20 to 20 m/s (-4,000 to 4,000 fpm)

Accuracy*

± (1% of reading + 0.05 m/s [10 fpm])
 ± (4% of reading + 0.10 m/s [20 fpm])
 ± (5% of reading + 0.15 m/s [30 fpm])

Deadband**

-0.15 to 0.15 m/s (-30 to 30 fpm)
 -0.5 to 0.5 m/s (-100 to 100 fpm)
 -1.0 to 1.0 m/s (-200 to 200 fpm)

*within compensation range

**range of velocities where the direction and velocity are not discernible by the sensor

Resolution: 0.1°C

Temperature Compensation Range

Temperature Compensation Range: The B500 is a thermal airflow sensor; it is sensitive to changes in air density and indicates velocity with reference to a set of standard conditions (21°C (70°F), 760mmHg (101.325kPa), and 0%RH). The B500 has been designed so that when used over the stated temperature compensation range, the sensor indicates very close to actual air velocity and minimal compensation is only required to account for changes in barometric pressure or altitude.

Part Number Format

B500 - L - V - O - F

L = Sensor Length

1 = 183mm [7.2"] max insertion depth = 140 mm [5.5"]
 2 = 287mm [11.3"] max insertion depth = 245 mm [9.6"]

V = Velocity Profile

A = -1.0 to 1.0 m/s (-200 to 200 fpm)
 B = -10 to 10 m/s (-2,000 to 2,000 fpm)
 C = -20 to 20 m/s (-4,000 to 4,000 fpm)

O = Output Configuration

1 = 0 – 5 VDC air velocity output only
 2 = 0 – 5 VDC air velocity and air temperature (dual outputs)
 3 = 0 – 10 VDC air velocity output only
 4 = 0 – 10 VDC air velocity and air temperature (dual outputs)
 5 = 0 - 20 mA air velocity only
 6 = 0 - 20 mA air velocity and air temperature (dual outputs)
 7 = 4-20 mA air velocity only
 8 = 4-20 mA air velocity and air temperature (dual outputs)
 9 = UART communication only
 • Analog with UART/ I²C is available - call DegreeC



Gland Nut (left) or °C Clamp (right) fitting options available

F = Fitting

1 = Gland Nut
 2 = °C Clamp



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