



DEGREE CONTROLS, INC.

Your Partner for Airflow Sensing & Controls

F300

Application

- Clean Tech & Laboratory
 - Biological Safety Cabinets
 - Chemical Fume Hoods
 - Laminar Flow Hoods
 - Clean Benches
 - HEPA & Filter Boxes
- HVAC
 - Heat Exchangers
 - Airflow Ventilation
- High Performance Electronics
 - Energy Balance Testing
 - Data Racks
 - Telecom Shelters
 - Data Logging

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.

Degree Controls, Inc.
18 Meadowbrook Dr.
Milford, NH 03055

603.672.8900 or 1.877.334.7332
sales@degreeC.com
www.degreeC.com

Overview

The F300 series is a versatile and rugged, high-performance air velocity and air temperature sensor with both analog and digital communication outputs.

Designed with conformal coated electronics and sealed enclosure, the F300 is suitable for demanding applications, including those in corrosive or alkaline environments. With its robust, splash proof design, and UV tolerant construction, the F300 is designed to handle a wide range of product and process control air flow applications. The voltage output may be configured 0-5V or 0-10V, and can be augmented with simultaneous digital communication, either UART or I²C. The F300 series is configured to order, with a variety of velocity ranges, mechanical lengths, and output communication styles.

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.
- Printed insertion depth markers and flow direction arrow.
- Conformal coated sensing elements for environmental protection.
- 2m [6 ft] plenum-rated cabling suitable for HVAC, laboratory and process control applications.
- RoHS compliant
- CE certified

Electrical & Performance Features

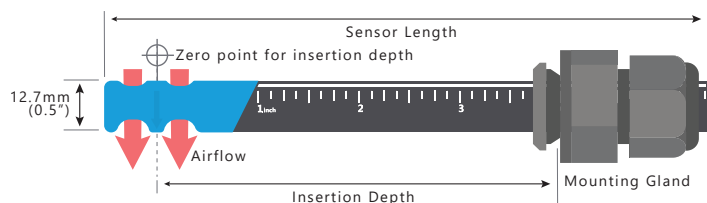
- Industry-leading air velocity performance, with repeatability within 1%.
- 1°C air temperature accuracy.
- Best in class acceptance angle performance.
- 12 VDC nominal voltage input.
- Configurable voltage output for velocity AND temperature.
- Simultaneous digital communication is available.
- May be configured as an airflow switch with open drain output.
- Multi-sensor addressing capability.
- Configurable velocity averaging for smoothing sensor response.
- <10 second start-up time and 400ms response time.



Specifications

Velocity Range	0.15m/s to 20m/s (30 fpm 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 to 221°F)
Response Time	400ms
Relative Humidity (non-condensing)	5-95%
Supply Power Requirements	4.5 - 15 VDC, 35mA nominal

Velocity & Temperature Output	0-5V or 0-10V 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



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

Mechanical Sizes & Installation

Three sensor lengths available, to accommodate insertion depths of 30mm [1.25"] to 245mm [9.6"]. See graphic above for insertion "zero point" datum.

Air Velocity Performance

Repeatability $\pm 1\%$ of reading (under identical conditions)

Air Velocity Range

0.15 to 1.0 m/s (30 to 200 fpm)
0.5 to 10 m/s (100 to 2,000 fpm)
1.0 to 20 m/s (200 to 4,000 fpm)
**within compensation range*

Air Velocity Accuracy*

$\pm (1\% \text{ of reading} + 0.05 \text{ m/s [10 fpm]})$
 $\pm (4\% \text{ of reading} + 0.10 \text{ m/s [20 fpm]})$
 $\pm (5\% \text{ of reading} + 0.15 \text{ m/s [30 fpm]})$

Resolution: 0.1°C

Temperature Compensation Range

Temperature Compensation Range: The F300 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 F300 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

F300 - L - V - O

L = Sensor Length

1 = 152mm [6.0"] max insertion depth = 110 mm [4.3"]
2 = 211mm [8.3"] max insertion depth = 169 mm [6.7"]
3 = 287mm [11.3"] max insertion depth = 245 mm [9.6"]

V = Velocity Profile

A = 0.15 to 1.0 m/s [30 to 200 fpm]
B = 0.5 to 10.0 m/s [100 to 2,000 fpm]
C = 1.0 to 20.0 m/s [200 to 4,000 fpm]

O = Output Configuration

1 = 0 - 5 VDC air velocity output only
2 = 0 - 5 VDC air temperature output only
3 = 0 - 5 VDC air velocity and air temperature (dual outputs)
4 = 0 - 10 VDC air velocity output only
5 = 0 - 10 VDC air temperature output only
6 = 0 - 10 VDC air velocity and air temperature (dual outputs)
7 = UART communication output (addressing available)
8 = I²C (3.3 VDC) communication output
• Analog with UART/ I²C is available - call DegreeC

Covered under US patent 6,829,930



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Degree Controls, Inc., a Nova Instruments company

NOVA
INSTRUMENTS



DEGREE CONTROLS, INC.

Your Partner for Airflow Sensing & Controls

F350

Application

- Chemical Fume Hoods
- Compact Electronics
- Curing and Coating
- Filter Boxes
- Fume Cupboards
- HVAC
- Medical Equipment
- Pressurized Cabinets
- Specialized Air Handlers
- Spray Booths
- Vent Sensing and Pressurized Containers

and products where...

- A miniature sensor head is needed
- Sensitivity to EMI
- High vibrations occur
- A PCB-mounted sensor is needed

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Overview

The F350 series is a versatile, high performance, air velocity and air temperature sensor where the sensor element is built remotely from the sensor electronics. In products where segregation of the sensing element and electronics is desirable, such as products involving high EMI sensitivity or extreme temperature, or those where the sensing area is too small for typical probe-style sensors, the F350 accepts 12VDC supply voltage and provides both voltage and digital communication outputs. The voltage output may be configured 0-5V or 0-10V, and can be augmented with simultaneous digital communication, either UART or I²C.

Choose from an array of remote sensor head styles, and with conformal coated electronics built in a UV-resistant, sealed electronics enclosure, the F350 is suitable for demanding applications, including those in corrosive or alkaline environments. The F350 is configured to your requirements, and is available with a variety of velocity ranges, sensor head styles, and output communication protocols to meet a diverse range of custom applications.

Mechanical Features

- Very compact electronics.
- Many optimized sensor head designs and mechanical constructions.
- Can be used with PC board-solderable sensor head.
- Robust, sealed probe assembly uses corrosion and UV resistant materials.
- Conformal coated sensing elements for environmental protection.
- 1m (3ft), shielded sensor element wire, and 2m (6ft) plenum rated, power and signal wire.
- RoHS compliant
- CE certified

Electrical & Performance Features

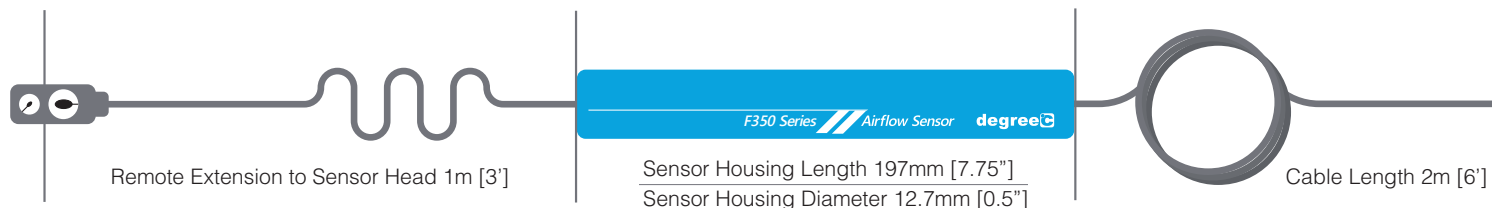
- Industry-leading air velocity performance, with repeatability within 1%.
- 1°C air temperature accuracy.
- Best in class acceptance angle performance.
- 12 VDC nominal voltage input.
- Custom lower voltage inputs are available.
- Configurable voltage output for velocity AND temperature.
- Simultaneous digital communication is available.
- May be configured as an airflow switch with open drain output.
- Multi-sensor addressing capability.
- Configurable velocity averaging for smoothing sensor response.
- <10 second start-up time and 400ms response time.



Specifications

Velocity Range	0.15m/s to 20m/s (30 fpm 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 to 221°F)
Response Time	400ms
Relative Humidity (non-condensing)	5-95%
Supply Power Requirements	4.5 - 15 VDC, 35mA nominal
Velocity & Temperature Output	0-5V or 0-10V 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) Flammability UL94-HB
Plenum Rated Cable	22 AWG
Remote Head Cable	Shielded Teflon
Environmental Protection	IP65 electronics, including conformal coated sensing element



Available Sensor Heads

Air Velocity Performance

Temperature Compensation Range

Part Number Format

Plastic Head (PC), Low Profile Head (LP), Extra Small Blade Head (XS)
Wands (W-inches): W1.25, W3, W5, W7; Custom Sizes Available
Special Applications: Sidewall (Mounted), Inline, PCB Mount (RFS300)

Repeatability $\pm 1\%$ of reading (under identical conditions)

Air Velocity Range

0.15 to 1.0 m/s (30 to 200 fpm)
 0.5 to 10 m/s (100 to 2,000 fpm)
 1.0 to 20 m/s (200 to 4,000 fpm)
 *within compensation range

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Resolution: 0.1°C

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F350 - H - V - O

H = Sensor Head

1 = PC Head
 2 = Low Profile Head
 3 = XS Blade Head
 4 = W1
 5 = W3 Stainless Steel Wand 3"
 6 = W5 Stainless Steel Wand 5"
 7 = W7 Stainless Steel Wand 7"
 8 = Sidewall
 9 = Inline
 10 = PCB RFS300

V = Velocity Profile

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 6 = 0 - 10 VDC air velocity and air temperature (dual outputs)
 7 = UART communication output (addressing available)
 8 = I²C (3.3 VDC) communication output
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