degreeC™

DEGREE CONTROLS,INC.

Your Partner for Airflow Sensing & Controls

F400

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

Overview

The F400 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 F400 is suitable for demanding applications, including those in corrosive or alkaline environments. With its robust, splash proof design, and UV tolerant construction, the F400 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 F400 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.
- 24 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.

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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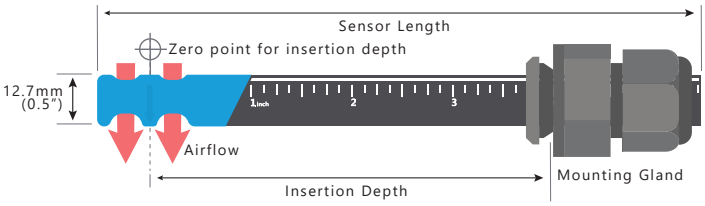
NOVA INSTRUMENTS

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	19 - 29 VDC, 15mA nominal



Velocity & Temperature Output	0-5V or 0-10V output
Digital Output	UART or I²C 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

Four 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 ±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*

± (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])

Resolution: 0.1°C

Temperature Compensation Range

Temperature Compensation Range: The F400 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 F400 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

F400 - L - V - O

L = Sensor Length
1 = 114mm [4.5"] max insertion depth = 72 mm [2.8"]
2 = 152mm [6.0"] max insertion depth = 110 mm [4.3"]
3 = 211mm [8.3"] max insertion depth = 169 mm [6.7"]
4 = 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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