

THERMAL FAN INLET **AIRFLOW SYSTEM** 

**The ELECTRA-flo/Fl** is a system of thermal probes and the associated hardware specifically designed for use in single or dual fan inlet and fan wall applications.



ON TIME DELIVERY

BEST CUSTOMER SERVICE

Measurement





# DESCRIPTION

Air Monitor's ELECTRA-flo/Fl Thermal Fan Inlet Airflow Probe utilizes dual point thermal dispersion technology sensors installed in the fan's inlet bell mouth at the throat to provide accurate measurement in fan arrays.

At the heart of Each ELECTRA-flo/Fl airflow measurement system is a pair of precision matched thermistors and an aerodynamic sensor aperture assembly to diminish impacting fan performance. The design construction and calibration of each thermistor sensor pair ensures the accuracy and long-term reliability of the ELECTRA-flo/Fl measurement system.

# **APPLICATIONS**

- Building Airflow Measurement and Control Accurate airflow measurement is crucial for controlling the distribution of conditioned air throughout a building's HVAC system
- Fan inlet airflow measurement, Single Inlet, Dual Inlet or Fan Wall installations - Measuring airflow at the source can provide the real time, actionable information required for the safe and efficient operation of building equipment.

# CALIBRATION

Individual sensors receive a multi-point, NIST\* traceable calibration of air velocity and temperature across the entire operating range.

### **FEATURES**

- Accurate Airflow Measurement for Critical Applications – System Measurement of ±3% of actual airflow
- Wide Airflow Velocity Measurement Range Accurate airflow velocity measurement from 0-10,000 FPM – Suitable for use in most HVAC applications
- **Ruggedized, Hermetically Sealed Sensors** Precision thermistors and heating circuit are encapsulated in a molded casing – the sensor design protects the thermistors from environmental effects, allowing the sensor assembly to be cleaned without damage.
- **Dedicated Transmitter with Display** Each airflow measurement system comes complete with a dedicated transmitter – factory matched and configured to guarantee system performance.
- Supports the Highest Number of Thermal Sensing Points Per Array in the Industry – Up to 32 measurement points per transmitter – More measuring points means more accurate measurements in challenging real world duct configurations.
- **Individual Sensor Diagnostics** The ELECTRA-flo transmitter is able to detect any sensor that is operating outside factory preset tolerances, remove that sensor's measured values from the overall airflow average, and generate a visual fault alarm on the LCD.
- **Multiple Communications Options** Native BACnet or MODBUS communication protocols are available for ease of integration into BAS
- **Multiple Analog Output Signals** Dual analog outputs provided for airflow and temperature easily configured in the field.
- **Output Signal Filtering** To eliminate flow signal pulsations, the ELECTRA-flo transmitter is equipped with a user selectable digital low pass noise filter.

\*National Institute of Standards and Technology



### **SPECIFICATIONS\***

ELECTRA-flo/Fl General Specifications					
ACCURACY	SYSTEM	±3% of system airflow from 0-10,000 FPM			
		$\pm 0.1^{\circ}$ F of air temperature from -20° F to 140°F			
SENSING METHOD	Thermal dispersion utilizing a pair of precision matched thermistors and dedicated processor per sensing node.				
INPUT POWER OPTIONS	24 VDC or 24 VAC				
MOUNTING CONFIGURATIONS	Fan Inlet installations utilize single or multiple sensors arrays connected to a single transmitter. Fan Inlet mounting consists of adjustable stainless steel brackets.				
NUMBER OF SENSORS PER FAN INLET	1 or 2				
ELECTRA-flo/Fl Probe Assembly					
ACCURACY INDIVIDUAL SENSOR Velocity: ±2% of reading from 0-10,000 FPM,		Velocity: ±2% of reading from 0-10,000 FPM,			
	ACCURACY	multi-point NIST traceable calibration			
		Iemperature: ±0.1%			
		Multi-point NIST traceable calibration of both temperature and velocity			
SENSOR TYPE	Hermetically sealed, matched thermistors with laser trimmed resistive heating element mounted in flow conditioning aperture.				
SENSOR SIGNAL PROCESSING	Dedicated microprocessor per each sensor node, all calibration data is stored in non-volatile memory.				
ELECTRICAL CONNECTIONS	Probe to transmitter connection: via a single, shielded plenum rated cable with locking mini-DIN connector.				
	Cable Length: Standard 10'. Optional cable lengths up to 100' can be provided.				

ELECTRA-flo/Fl Transmitter					
MAXIMUM NUMBER OF SENSORS	32 total sensors per pro	bbe array.			
DISPLAY	Backlit, <sup>1</sup> / <sub>4</sub> VGA (320 X 240) color TFT LCD. 2.75" X 2.0" display size. Field selectable in U.S. or S.I. units for velocity /flow and temperature, configurable via four button keypad located on front cover.				
POWER SUPPLY	24 VAC (+/- 4 VAC), or 24 VDC (20-40 VDC); 16-90 VA, varies based on the quantity of sensors (1-32), isolated and fused with reverse polarity protection.				
OUTPUT SIGNALS PROVIDED	Dual analog outputs, field configurable via user interface 0-5 VDC, 0-10 VDC, or 4-20 mA.				
FIELD ADJUSTABLE SCALING OF AIRFLOW VELOCITY AND TEMPERATURE	AVAILABLE OPTIONS	<ul> <li>Velocity Range: 0-10,000 FPM</li> <li>Temperature Range: 0 to 140°F</li> </ul>			
NETWORK OUTPUT COMMUNICATION	RS485	BACnet or MODBUS			
AMBIENT CONDITIONS	Temperature Limits: -20°F to 180°F Storage				
	Humidity: 0 to 99.5% RH, non-condensing				
ENCLOSURE	OPTIONS	NEMA 1 aluminum with hinged cover			
		Optional NEMA 13 or NEMA 4X			

\*SPECIFICATIONS subject to change without notice.



### **INSTALLATION INFORMATION**



Where double inlet centrifugal fans are utilized in HVAC system design, a set of ELECTRA-flo/Fl probes must be mounted in each fan inlet. When vane-axial fans are installed in a ducted configuration on the inlet side, the application may require the use of the ELECTRA-flo designed for ducted airflow. Contact Factory for recommendation.

The ELECTRA-flo/FI is designed to be installed in the environment found within the AHU itself, allowing for an easy and clean installation in fan wall (array) applications. Due to the ELECTRA-flo/FI's sensor architecture, **up to 32 individual fans can be measured** by simply daisy chaining all of the fan inlet sensors back to a single transmitter.





### **PROBE SIZE SELECTION**

ELECTRA-flo/Fl probes are ordered based upon the fan's minimum inlet diameter where the probes are to be mounted. Based upon the inlet diameter, select one of the eight adjustable standard sizes. The chart indicates the range of minimum inlet diameters that each standard size can accommodate.

Range Designator	Α	В	С	D	E	F	G	Н	I	J
Min Inlet Diameter	8.00"	9.00"	10.00"	12.00"	14.00"	17.00"	21.00"	27.00"	36.00"	48.00"
Max Inlet Diameter	8.99"	9.99"	11.99"	13.99"	16.99"	20.99"	26.99"	35.99"	47.99"	63.99"

### **CONSTRUCTION ATTRIBUTES**



### **MODEL ORDER SELECTION**

To apply the ELECTRA-flo/Fl to fan inlets, the following determinations must be made:

- 1. The ELECTRA-flo/Fl was designed specifically to mount in the minimum diameter point of the fan inlet bell.
- 2. When ordering, provide the minimum diameter (mounting location) of the fan inlet bellmouth. DO NOT provide fan wheel diameter.
- 3. When ordering, advise the presence and size of any fan shaft in the inlet.
- 4. Due to variations in fan design and construction, contact the Factory regarding application suitability for installation on fans having inlet vanes or dampers, extra large motor shafts, motor mounting in the fan inlet, and any auxiliary equipment that could interfere with probe mounting and connecting tubing.



# **ELECTRA-flo™ G5 Transmitter**

# **CONSTRUCTION ATTRIBUTES**



## DIMENSIONAL INFORMATION





### **MODEL SELECTION GUIDE**

#### Fan Probes Model Number Coding = E-flo/AABB-CDE

AA = Probe Style Mount FI = Fan Inlet BB = Number of fans/inl	ing lets	<b>C = Number of Prob</b> 1 = (1) probe per in 2 = (2) probes per in	<b>es per Inlet</b> let nlet		
01 = 1 fan $11 = 02 = 2$ fans (or DWD) $12 = 02 = 2$ fans	11 = 11 fans 12 = 12 fans	<b>D</b> = Materials of Construction 5 = 6063 anodized Al			
03 = 3 fans 04 = 4 fans 05 = 5 fans 06 = 6 fans 07 = 7 fans 08 = 8 fans 09 = 9 fans 10 = 10 fans	13 = 13 fans 14 = 14 fans 15 = 15 fans 16 = 16 fans	E = Fan Inlet Size $A = 8 to <9$ $B = 9 to <10$ $C = 10 to <12$ $D = 12 to <14$ $E = 14 to <17$ $F = 17 to <21$ $G = 21 to <27$	H = 27 to <36 I = 36 to <48 J = 48 to <64		

### Model Number Coding = E-flo G5-AB-CDEF-(SPC)

### **ELECTRA-flo G5 Transmitter**

#### A= Channel

- 1 = Thermal dispersion airflow transmitter with graphical LCD, two (2) programmable analog outputs and RS485 serial communications.
- 2 = Dual channel thermal dispersion airflow transmitter with graphical LCD, two (2) programmable analog outputs and RS485 serial communication.

#### B= Enclosure

- 1 = NEMA 1 enclosure with cord grips
- 2 = NEMA 4X SS enclosure w/o viewing window w/ cord grips
- 3 = NEMA 4X fiberglass enclosure w/ viewing window & cord grips
- 4 = NEMA 1 enclosure with conduit connection box
- 5 = NEMA 4X SS enclosure w/o viewing window w/ conduit conn.
- 6 = NEMA 4X fiberglass enclosure w/ viewing window & conduit conn.

#### **C= Outputs**

2 = Two (2) analog outputs and one (1) alarm output

#### **D** = Communications

1 = RS485

### E = Input Power

- 1 = 24 V AC/DC (Up to 24 sensors)
- 2 = 24 V AC/DC (25 to 32 sensors)
- F=Wiring Connection (A=1 use 1-4, A=2 use A-J)
  - 1 = Mini-DIN, XMTR to probe, 10ft
  - 2 = Mini-DIN, XMTR to probe, 25ft 3 = Mini-DIN, XMTR to probe, 50ft
  - 4 = Mini-DIN, XMTR to probe, 30ft
  - A = Mini-DIN, XMTR to probe, 10ft & 10ft
  - B = Mini-DIN, XMTR to probe, 10ft & 25ft

  - D = Mini-DIN, XMTR to probe, 10ft & 100ft
  - E = Mini-DIN, XMTR to probe, 25ft & 25ft
  - F = Mini-DIN, XMTR to probe, 25ft & 50ft
  - G = Mini-DIN, XMTR to probe, 25ft & 100ft
  - H = Mini-DIN, XMTR to probe, 50ft & 50ft
  - I = Mini-DIN, XMTR to probe, 50ft & 100ft
  - J = Mini-DIN, XMTR to probe, 100ft & 100ft

### SPC=Special Config

000 = None 101 = SS Tags

