



- Thermal Dispersion Technology
- Cost Effective Single Probe
- Volumetric Airflow Calibration
- *%-of-reading* Accuracy
- Velocity Pressure Output Option
- Temperature Output Models Available
- Analog and RS-485 Output Models
- Duct Insertion Mounting
- Integral Transmitter
- 3-year Warranty

The EF-x1000-T (ELF) is EBTRON’s economical measurement solution for round ducts between 4 and 16 inches in diameter. Ideal for most small duct airflow measurement and volumetric airflow tracking applications. Low flow performance, temperature capability and connectivity options makes this a better choice than traditional differential pressure averaging arrays, rings and crosses.

Typical Applications

- ◆ High Performance CV/VAV Terminal Box Measurement
- ◆ Small Duct Outdoor Air Delivery Monitoring
- ◆ Small Duct Airflow Tracking
- ◆ Hospital Pressurization
- ◆ Laboratory Pressurization

Benefits

- ◆ Improve Terminal Box Performance with Turndown
- ◆ Comply with ASHRAE Standards
- ◆ Satisfy LEED Prerequisites and Credits
- ◆ Provide Acceptable IAQ
- ◆ Save Energy
- ◆ Reduce Liability
- ◆ Improve Performance

Product Highlights

- ◆ Accurate & Repeatable
- ◆ Low Airflow Capability
- ◆ Long-term Stability
- ◆ Unsurpassed Quality
- ◆ Easy to Install
- ◆ Very Cost Effective High-performance Solution

General

Probe and Sensor Node Configurations

- 1 probe x 1 sensor node/probe (4 inch [101.6 mm] probe)
- 1 probe x 2 sensor nodes/probe (5 to 16 inch [127.0 to 406.4 mm] probes)

Installed Airflow Accuracy¹

Typically better than $\pm 3\%$ of reading

Sensor Node Averaging Method

- Airflow:** Independent arithmetic average
- Temperature:** Independent velocity weighted average

Listings

UL (EF-A1000-T): 60730-1; UL 60730-2-9 (HVAC Controls)

Environmental Limits

Temperature:

- Probes 0 to 2,000 fpm** [0 to 10.16 m/s]:
-20 to 120 °F [-28.9 to 48.9 °C]
- Probes 0 to 3,000 fpm** [0 to 15.24 m/s]:
0 to 120 °F [-17.8 to 48.9 °C]
- Transmitter:** -20 to 120 °F [-28.9 to 48.9 °C]

Humidity: (non-condensing)

- Probes:** 0 to 100%
- Transmitter:** 5 to 95%

Individual Sensing Nodes

Sensing Node Sensors

- Self-heated sensor:** Precision, hermetically sealed, bead-in-glass thermistor probe
- Temperature sensor:** Precision, hermetically sealed, bead-in-glass thermistor probe

Sensing Node Housing

- Material:** Glass-filled Polypropylene (Kynar[®] with /SS option)
- Sensor Potting Materials:** Waterproof marine epoxy

Sensing Node Internal Wiring

Type: Kynar[®] coated copper

Airflow Measurement

- Accuracy:** $\pm 3\%$ of reading to volumetric airflow standards (includes transmitter uncertainty)
- Calibrated Range:** 0 to 3,000 fpm [0 to 15.24 m/s]
- Calibration Points:** 7

Temperature Measurement

- Accuracy:** $\pm 0.15^\circ\text{F}$ [0.08 °C] to NIST-traceable temperature standards (includes transmitter uncertainty)
- Calibrated Range:** -20 to 120 °F [-28.9 to 48.9 °C]
- Calibration Points:** 3

Sensor Probe Assembly

Tube

Material: Mill finish 6063 aluminum (316 stainless steel with /SS option)

Mounting Brackets

Material: 304 stainless steel

Mounting Options & Size Limits

Insertion: 4, 5, 6, 7, 8, 9, 10, 12, 14, & 16 inch round [101.6, 127.0, 152.4, 177.8, 203.2, 228.6, 254.0, 304.8, 355.6 & 406.4 mm]

Integral Transmitter

Power Requirement: 24 VAC (22.8 to 26.4 under load) @5V-A

User Interface: DIP switch

B.A.S. Connectivity Options

EF-A1000 Transmitter: One field selectable (0-10/2-10 VDC* or 0-5/1-5 VDC* - specify at time of order), scalable and protected analog output signal (AO1=airflow)

EF-A1001 Transmitter: Two field selectable (0-10/2-10 VDC* or 0-5/1-5 VDC* - specify at time of order), scalable and protected analog output signals (AO1=airflow, AO2 = temperature)

* The VDC output circuit of the EF-A1000 transmitter can drive the input circuit of devices designed to measure 4-wire current loops with a resistive load ≥ 250 ohms.

EF-N1000 Transmitter: One field selectable (BACnet MS/TP or Modbus RTU) and non-isolated RS-485 network connection - Individual sensor node airflow rates and temperatures are available via the network (provide individual 24 VAC transformers at each EF-N1000 transmitter for applications requiring isolated RS-485)

System Status Alarm

Type: Sensor diagnostic system trouble indication

Visual Indication: Yes, LED on circuit board

Network Indication: Yes (EF-N1000 only)

¹ Installed airflow accuracy is the actual system accuracy expected and includes sampling uncertainty of the sensor probes when installation meets or exceeds placement guidelines.