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**EB-Flow**

Series 2000

# EF-x2000-T

## OVERVIEW

Airflow Measurement with Temperature and Alarm Capability


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- Thermal Dispersion Technology
- Cost Effective Single Probe
- NIST-traceable Calibration
- *%-of-reading* Accuracy
- Airflow and Status Alarm
- Temperature Output Capability
- Analog and RS-485 Output Models
- Dry Contact Relay
- Remote Transmitter with LCD Display
- 3-year Warranty

The EF-x2000-**T** is EBTRON's top-of-the-line measurement solution for round ducts between 4 and 16 inches in diameter. Ideal for most small duct airflow measurement and volumetric airflow tracking applications. More features than the EF-x1000-T make this the best choice for all small duct measurement applications.

### 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
- Volumetric or Mass Airflow Measurement
- Long-term Stability
- "Plug-and-Play" Operation
- Intuitive User Interface
- Waterproof Sensor Assembly
- FEP Plenum Rated Cable



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# SPECIFICATIONS: EF-x2000-T

## 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 Accuracy[1]**
Typically better than ±3% of reading

**Sensor Node Averaging Method**
**Airflow:** Independent arithmetic average
**Temperature:** Independent, velocity weighted or arithmetic average

**Listings**
**UL:** 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 160 $^{0}$F [-28.9 to 71.1 $^{0}$C]
**Probes 0 to 3,000 fpm** [0 to 15.24 m/s]**:**
0 to 160 $^{0}$F [-17.8 to 71.1 $^{0}$C]
**Transmitter:** -20 to 120 $^{0}$F [-28.9 to 48.9 $^{0}$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:** ±3% of reading to NIST-traceable 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:** ±0.15$^{0}$F [0.08 $^{0}$C] to NIST-traceable temperature standards (includes transmitter uncertainty)
**Calibrated Range:** -20 to 160 $^{0}$F [-28.9 to 71.1 $^{0}$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, and 16 inch round [101.6, 127.0, 152.4, 177.8, 203.2, 228.6, 254.0, 304.8, 355.6 & 406.4 mm]

**Probe to Transmitter Cables**
**Type:** FEP jacket, plenum rated CMP/CL2P, UL/cUL listed, -67 to 392 $^{0}$F [-55 to 200 $^{0}$C], UV tolerant
**Standard Lengths:** 3, 10, 25 and 50 ft. [0.9, 3.1, 7.6 and 15.2 m]
**Connecting Plug:** 0.60" [15.24 mm] nominal diameter

## Transmitter

**Power Requirement:** 24 VAC (22.8 to 26.4 under load) @8V-A
**User Interface:** 16-character LCD display and 4 button interface

**B.A.S. Connectivity Options**
**EF-A2000 Transmitter:** Two field selectable (0-5/1-5/0-10/2-10 VDC*), scalable and protected analog output signals (AO1=airflow, AO2 = temperature or alarm)
* The VDC output circuit of the EF-A2000 transmitter can drive the input circuit of devices designed to measure 4-wire current loops with a resistive load ≥250 ohms.
**EF-N2000 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-N2000 transmitter for applications requiring isolated RS-485)

**Relay**
**Type:** Dry Contact w/ onboard jumper to drive a remote LED (R1=alarm)
**Status:** N.O. or N.C. via user setup configuration
**Rating:** 30 VDC or 24 VAC @ 3 amp. max.

**Airflow Alarm**
**Type:** Low and/or high user defined setpoint alarm
**Tolerance:** User defined % of setpoint
**Delay:** User defined
**Zero Disable:** Alarm can be disabled when the airflow rate falls below the low limit cutoff value (unoccupied periods)
**Reset Method:** Manual or automatic
**Visual Indication:** Yes, LCD display
**Network Indication:** Yes (EF-N2000 only)
**Analog Signal Indication:** Yes, on AO2 assignment (EF-A2000 only)
**Contact Closure Relay:** Yes, on R1 assignment

**System Status Alarm**
**Type:** Sensor diagnostic system trouble indication
**Visual Indication:** Yes, LCD display
**Network Indication:** Yes (EF-N2000 only)
**Analog Signal Indication:** Yes, on AO2 assignment (EF-A2000 only)
**Contact Closure Relay:** Yes, on R1 assignment

[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.



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