

ELF OVERVIEW

EBTRON's electronic low flow (ELF) analog output thermal dispersion airflow measurement station provides precise airflow or equivalent velocity pressure output in challenging variable air volume (VAV) and small duct applications. Flow velocities of less than 500 FPM are typical in VAV applications, while velocities of up to 3,000 FPM are typical in small duct applications. The ELF is factory calibrated from 0 to 3,000 FPM (0 to 15.24 m/s) in highly accurate wind tunnels to NIST volumetric airflow standards. The ELF produces precise (3% of reading) accuracy and reliable measurement over the entire flow range in VAV boxes and in duct applications up to 16 inches. The ELF features a calibrated probe, integral enclosure and mounting brackets for simple field installation. A convenient DIP-switch user interface allows for field selection of airflow or equivalent velocity pressure output, four full-scale measurement range options and analog outputs for interface with virtually any BAS. 0-10/2-10VDC analog output is standard; specify order code suffix /F01 for 0-5/1-5VDC output; specify order code suffix /F02 for Staefa equivalent output.

APPLICATIONS

- High accuracy airflow measurement in VAV terminal boxes and small ducts for improved temperature control and energy efficiency.
- Ideal for true demand controlled ventilation compliance with ASHRAE 62.1 and for acquisition of **LEED[®] Energy and Atmosphere** and **Indoor Environmental Quality Credits**.
- Specify in small duct systems for volumetric flow tracking and pressure control.
- Low cost, high performance airflow measurement solution for modern BAS interfaces.

SYSTEM FEATURES

- **EBTRON** Advanced Thermal Dispersion (TD) technology ensures accurate, repeatable airflow measurement from zero flow (still air).
- Factory calibrated from 0-3,000 fpm to **NIST-traceable volumetric standards** to ensure accuracy in small duct and VAV boxes.
- Superior performance compared to conventional differential pressure based pitot arrays and flow rings.
- Unique all in one sensor design with integral mounting bracket for installation in duct/plenum and VAV box applications.

ELF SPECIFICATIONS

System

Calibrated Range: 0 to 3,000 fpm [15.2 m/s]
 0 to 0.5 iWC [0-124.5 Pa]
 Typical Accuracy: ±3% of reading velocity
 Operating Temperature: Probe: 30 to 160 °F
 [-1.1 °C to 71.1 °C]
 Transmitter: -20 to 120 °F
 [-28.9 °C to 48.9 °C]
 Operating Humidity Range: .0 to 99% non-condensing;
 Transmitter must be protected from exposure to precipitation
 Power Requirements: 24 VAC (22.8-26.4 VAC) at 8VA max.

Construction/Dimensions

Enclosure Material: Durable electronic housing with removable cover
 Enclosure Rating: UL94-5VA
 Probe Material: Type 6063 aluminum alloy standard
 Type 316 stainless steel optional
 Mounting Dimensions: Four 0.188 in [4.76 mm] dia holes on integral mounting bracket
 Enclosure Dimensions: 3.355 in square x 1.357 in [85.22 mm] square x 34.47 mm
 Probe Dimensions: 0.75 in [19.05 mm] diameter available from 4 to 16 in length [101.6 to 406.4 mm]

Mounting Bracket Material: .Type 5052 aluminum alloy standard
 Type 316 stainless steel optional
 Standard Size Ranges: 4 - 10 in. [101.6 - 254 mm, in 1 inch (25.4 mm) increments;]
 12 - 16 in. [304.8 - 406.4 mm, in 2 inch (50.8 mm) increments;]
 Probes / Sensing Nodes: 1 probe/2 sensing nodes maximum
 Sensing Point Accuracy: Airflow: ±2% of reading
 Probe/Transmitter Cable: 3 ft. [0.91 m] plenum rated FEP coated cable standard

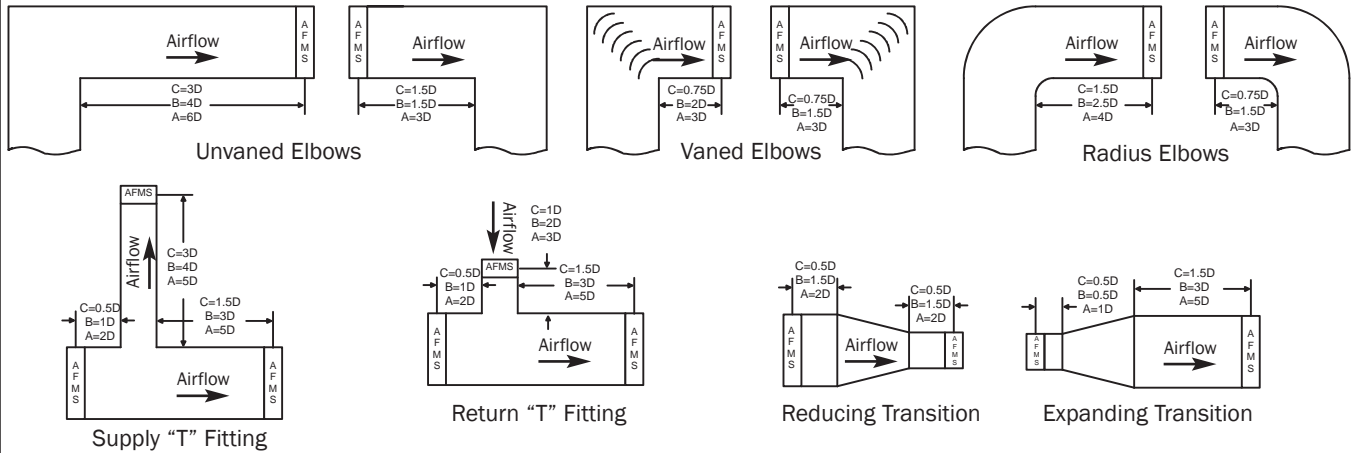
Output Interface

ELF Output: Non-isolated linear airflow or equivalent velocity pressure
 0-10/2-10VDC (standard);
 0-5/1-5VDC (model /F01)
 Staefa equivalent (model /F02)
 Output Resolution: 0.015% of full scale
 Repeatability: 0.25% of reading
 Scaling Adjustment: Airflow:
 0 to 500 FPM [0 to 2.54m/s]
 0 to 1,000 FPM [0 to 5.08m/s]
 0 to 2,000 FPM [0 to 10.16m/s]
 0 to 3,000 FPM [15.24m/s] 0 to Equivalent Velocity Pressure:
 0.05 iWC [12.45 Pa]
 0 to 0.15 iWC [37.36 Pa]
 0 to 0.25 iWC [62.27 Pa]
 0 to 0.5 iWC [124.5 Pa]

TS_ELF_R2C

ELF PROBE DUCT PLACEMENT GUIDELINES

Duct and Plenum Probe Minimum Placement Guidelines



Minimum placement at A, B or C is based upon duct diameter 'D':

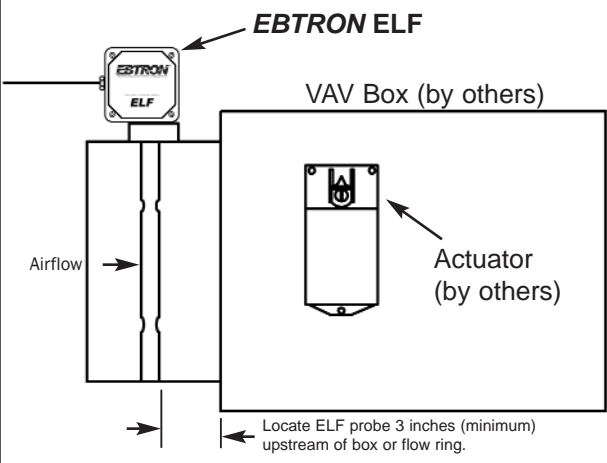
For 'D' = 4 to 12 in. (101.6 to 304.8 mm), use Minimum Placement Reference 'C'

For 'D' = >12, up to 15 in. (304.8 to 381 mm) use Minimum Placement Reference 'B'

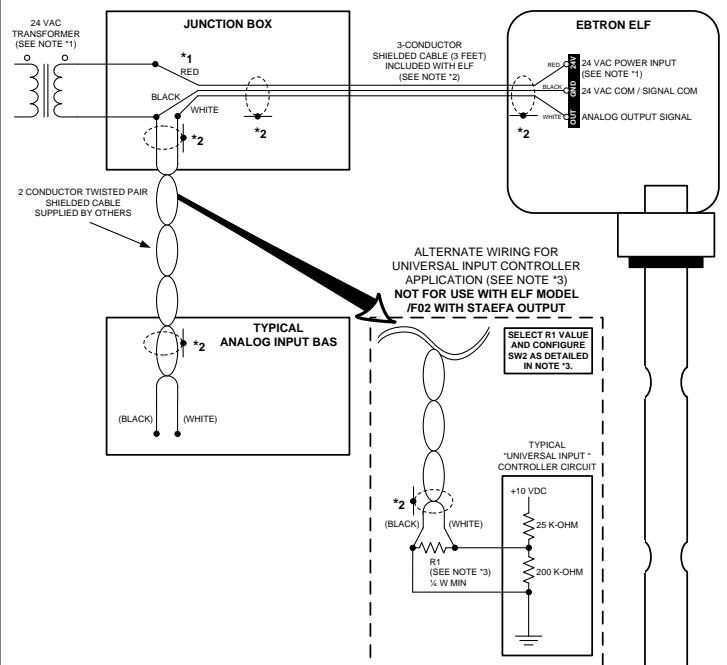
For 'D' = >15, up to 16 in. (381 to 406.4 mm) use Minimum Placement Reference 'A'

See diagram below for mounting in VAV box collars. Consult **EBTRON** for applications not indicated in the diagrams.

ELF PROBE VAV BOX INSTALLATION



TYPICAL WIRING DIAGRAM



*** NOTES:**

*1: THE 24 VAC COMMON AND ELF ANALOG OUTPUT SIGNAL COMMON ARE SHARED. THEREFORE, ON MULTIPLE ELF INSTALLATIONS ENSURE THAT ALL TRANSMITTERS ARE WIRED TO THE SAME TERMINALS ON THE 24 VAC POWER SOURCE.

*2: CONNECT CABLE DRAINS TO EARTH GROUND AT ONE END OF EACH CABLE ONLY.

*3: FOR STANDARD ELF AND MODELS WITH /F01 SUFFIX AND UNIVERSAL INPUT CONTROLLER APPLICATIONS WITH PULL-UP RESISTORS, RESISTOR R1 MUST BE CONNECTED ACROSS THE CONTROLLER'S ANALOG INPUTS AS SHOWN. R1 VALUE IS AS FOLLOWS:

FOR STANDARD ELF SET SW2 ON (FOR 2-10VDC OUTPUT), AND SELECT R1=500 OHMS.
FOR ELF WITH MODEL SUFFIX /F01 SET SW2 ON (FOR 1-5VDC OUTPUT) AND SELECT R1=250 OHMS.

ELF PROBE DIMENSIONS

