

BIDIRECTIONAL BLEED AIRFLOW SENSORS

PART 1 GENERAL

- 1.01 SECTION INCLUDES
 - A. Related Sections
 - B. References
 - C. Submittals
 - D. Qualifications
 - E. System Responsibility
 - F. Warranty
 - G. Delivery, Storage, and Handling
- 1.02 RELATED SECTIONS
 - A. Section 15952 – Controls and Instrumentation
 - B. Section 16180 – Equipment Wiring Systems
- 1.03 REFERENCES
 - A. UL 873 – Temperature and Airflow Indicating Equipment
- 1.04 SUBMITTALS
 - A. Submit product data sheets, installation, operation and maintenance documents.
- 1.05 QUALIFICATIONS
 - A. Manufacturer: The Company manufacturing the products specified in this section shall have a minimum of five years experience producing products of this type.
- 1.06 SYSTEM RESPONSIBILITY
 - A. The contractor shall be responsible for any and all costs associated with any and all changes resulting from the use of a supplier other than the listed acceptable manufacturer.
- 1.07 WARRANTY
 - A. Provide a manufacturer's parts warranty for 36 months from the date of unit shipment.
- 1.08 DELIVERY, STORAGE, AND HANDLING
 - A. All handling and storage procedures shall be per manufacturer's recommendations.
 - B. Devices shall be kept clean and dry, protected from weather and construction traffic.

PART 2 PRODUCTS

- 2.01 SECTION INCLUDES
 - A. Products Included in this Section
 - B. Acceptable Manufacturers
 - C. Bidirectional Bleed Airflow Sensors
- 2.02 PRODUCTS INCLUDED IN THIS SECTION
 - A. Bidirectional bleed airflow sensors
- 2.03 ACCEPTABLE MANUFACTURERS
 - A. EBTRON, Inc. Model GTx116-B Bleed Sensor (basis of design)
 - 1. Alternatives requesting acceptance as "equals" less than 60 days prior to bid date or products submitted in non-conformance with the requirements of this specification will not be considered.
 - 2. For any product to be considered for substitution a written section-by-section detailed exceptions/compliance document shall be submitted to the Engineer before any approval will be considered.
- 2.04 BIDIRECTIONAL BLEED AIRFLOW SENSORS
 - A. Provide bidirectional bleed airflow sensors where indicated on the plans.
 - B. Each measuring device shall consist of one to four sensor assemblies and a single microprocessor-based transmitter. Multiple sensor assemblies shall be equally weighted and averaged by the transmitter prior to output.
 - C. Sensor Assembly
 - 1. Each sensor assembly shall be manufactured of a U.L. listed engineered thermoplastic.
 - 2. Each sensor assembly shall utilize three hermetically sealed, bead-in-glass thermistor probes to determine airflow rate, direction, and ambient temperature. Devices that use "chip" type thermistors are unacceptable. Pressure sensors are unacceptable.
 - 3. Each sensor assembly shall be connected to 1/2 inch NPT male pipe fittings, adapters or pipe as indicated on the plans to measure bleed airflow or dynamic pressure between spaces or across fixed orifices.

3. Each sensor assembly shall have an integral, U.L. listed, plenum rated cable and terminal plug for connection to a remotely mounted transmitter. All terminal plug interconnecting pins shall be gold plated.
 4. The operating airflow range shall be +/- 3,000 FPM unless otherwise indicated on the plans.
 5. Each sensor assembly shall be calibrated at a minimum of 10 airflow rates and have an accuracy of +/-2% of reading over the entire operating airflow range. Each sensor assembly shall be calibrated to standards that are traceable to the National Institute of Standards and Technology (NIST).
 6. The operating temperature range for the sensor assembly shall be -20° F to 160° F. The operating humidity range for the sensor assembly shall be 0-99% RH (non-condensing).
 7. Each temperature sensor shall be calibrated at a minimum of 3 temperatures and have an accuracy of +/-0.15° F over the entire operating temperature range. Each temperature sensor shall be calibrated to standards that are traceable to the National Institute of Standards and Technology (NIST).
 8. Each sensor assembly shall not require matching to the transmitter in the field.
- D. Transmitters
1. The transmitter shall have an LCD display capable of displaying airflow or dynamic pressure and temperature. Airflow shall be field configurable to be displayed as a velocity or a volumetric rate.
 2. The transmitter shall be capable of displaying the individual airflow and temperature readings of each sensor on the LCD display.
 3. The transmitter shall operate on 24 VAC. The transmitter shall not require an isolated power source.
 4. The operating temperature range for the transmitter shall be -20° F to 120° F. The transmitter shall be protected from weather and water.
 5. The transmitter shall be capable of communicating with the host controls using one of the following interface options:
 - a. Linear analog output signal: Field selectable, fuse protected and isolated, 0-10VDC and 4-20mA (4-wire)
 - b. RS-485: Field selectable BACnet-MS/TP, ModBus-RTU and Johnson Controls N2 Bus
 - c. 10 Base-T Ethernet: Field selectable BACnet Ethernet, BACnet-IP, ModBus-TCP and TCP/IP
 - d. LonWorks Free Topology
- E. The measuring device shall be UL listed as an entire assembly.
- F. The manufacturer's authorized representative shall review and approve placement and operating airflow rates for each measurement location indicated on the plans. A written report shall be submitted to the consulting mechanical engineer if any measurement locations do not meet the manufacturer's placement requirements.

PART 3 EXECUTION

3.01 SECTION INCLUDES

- A. Installation
- B. Adjusting

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions at the locations indicated on the plans. A written report shall be submitted to the consulting mechanical engineer if any discrepancies are found.

3.03 ADJUSTING

- A. Devices shall not be adjusted without approval from the consulting mechanical engineer.