AIR-IQ2 AIRFLOW MEASUREMENT SOLUTION

BENEFITS
• Save energy
• Improve indoor air quality
• Satisfy ASHRAE® Standards 62.1, 189.1 & 90.1
• Meet LEED prerequisite for VAV Systems

APPLICATIONS
• Outdoor air intakes
• Floor-to-floor airflow tracking for building pressurization
• Unducted return or exhaust airflow control

GIVE US THIS:
• Opening size
• Mounting application
• Access requirements for probes

GET THIS:
• Optimal probe sensor density
• Ideal probe placement
• Appropriate sleeve style

TWO PREMIER MANUFACTURERS, ONE EXCEPTIONAL PRODUCT
QUALITY & RELIABILITY

TAMCO® and EBTRON® are known for unsurpassed quality and reliability. This partnership joins the two premier manufacturers and brings together their respective fields of expertise to create a single, premium package that is easy to specify, purchase and install.

TURNKEY SOLUTION

This TAMCO/EBTRON solution combines a premium airflow measuring station with a quality airfoil damper in a laboratory-tested assembly that takes the guesswork out of airflow measurement.

The unique inlet design reduces turbulence and pressure losses associated with standard sheet metal, sleeved construction. The AIR-IQ2 package is ideal for:

• Monitoring and/or control of outdoor air intake flow rates.
• Return airflow measurement on floor-to-floor systems for airflow tracking and floor pressurization control.
• Return airflow measurement of unducted returns to air handling units.
• Exhaust airflow measurement at intakes to exhaust fans.

FLEXIBILITY

The TAMCO/EBTRON AIR-IQ2 package combines EBTRON’s top-of-the line Gold Series P+ sensor density airflow measurement technology with TAMCO Series 2100 and 2900 dampers, providing unprecedented flexibility in airflow measurement and control. Packages are available for salt spray environments and unlike competitive devices, the AIR-IQ2 installed performance is not dependent on the airflow rate or damper position.

ACCURACY AND STABILITY

EBTRON's field-proven thermal dispersion technology ensures accurate and repeatable airflow measurement over the entire range of airflow rates and temperatures required by today's high-performance buildings. Up to sixteen individual sensor nodes are factory-calibrated at sixteen airflow rates between 0 and 5,000 FPM to NIST traceable standards in EBTRON’s state-of-the-art calibration facility.

EBTRON is the only manufacturer that uses highly stable bead-in-glass thermistors at each sensor node. Sensor probes are combined with a high-performance, microprocessor-based transmitter, to provide accurate percent of reading measurements. This complete system interfaces with your building automation system (BAS) without the need for additional transmitters or transducers. EBTRON airflow sensors do not require periodic calibration or adjustment in most HVAC environments.

MAINTENANCE-FREE PERFORMANCE

TAMCO’s aluminum damper construction provides a prolonged and rust-free operational life. All damper components are designed to provide optimal and completely maintenance-free performance. TAMCO’s slip-proof linkage components keep blades aligned as per factory adjustment. The hexagon design feature of the linkage and pivot elements allows for flat-on-flat press fits, eliminating play and wear. TAMCO’s Dual Bearing System eliminates action between metal-to-metal and metal-to-plastic riding surfaces. Bearings never require additional lubrication and have a service life of 20 years plus.
AIRFLOW/Temperature Measurement Device Features

- EBTRON’s reliable Thermal Dispersion technology is field-proven, with hundreds of thousands of devices installed since 1984.
- Precision bead-in-glass thermistors result in long-term stability and drift-free operation.
- Thermistors are potted using a waterproof epoxy and can survive direct exposure to water and atmospheric acids.
- Sensor probes are provided with durable, FEP-jacketed, plenum-rated cables, which can be exposed to UV and ultra-cold temperatures.
- NIST traceable calibration results in accurate and verifiable measurement.
- Each sensor node (up to 16 per transmitter) is computer-calibrated at 16 airflow rates, to ensure 2% of reading sensor accuracy over the entire operating range.
- Modified Log Tchebycheff sensor placement improves measurement accuracy.
- Transmitters are available with a wide range of connectivity options, including analog, BACnet, Modbus and Lon.
- Each transmitter is provided with a Bluetooth low-energy interface for Android or iOS devices that allow real-time airflow and temperature monitoring, and near instantaneous airflow and temperature traverses. The transmitters capture, save or e-mail all airflow/temperature data, transmitter settings and diagnostics information. The application is free of charge.
- The transmitter can be configured for high/low airflow alarming for applications requiring fault notification.
- The airflow measurement device is UL® and FCC Part 15 listed.

DAMPER AND SLEEVE FEATURES

- The AIR-IQ2 unit can be assembled with either a TAMCO Series 2100 or Series 2900 damper.
- The SW - Salt Water Resistance Option is available for both damper Series listed above, as well as for the AIR-IQ2 sleeve and flare.
- Aluminum construction contributes to a prolonged and rust-free operational life.
- Aerodynamic, radius entry flare improves accuracy and stability in non-ducted and plenum applications.
- TAMCO’s engineered damper and sleeve, combined with EBTRON’s high sensor density probes do not require field-calibration or adjustment when installed in accordance with published guidelines.

TAMCO/EBTRON AIR-IQ2 AVAILABLE SIZES / PROBE DENSITY CHARTS

Depending on installation accessibility requirements, probes can be provided in parallel-to or perpendicular-to damper blades mounting configurations. In addition, probes can be mounted internally within the sleeve or inserted through the side of the sleeve. This information should be provided at the time a quote is requested.
**AIR-IQ2 GENERAL MECHANICAL OVERVIEW**

Typical single- and two-section horizontal dampers are illustrated below. Vertical damper blade configurations are also available. For series-specific damper options and details, refer to the individual series specifications and data sheets available at www.tamcodampers.com. Complete EBTRON Gold Series GTx116-P+ details are available at www.EBTRON.com.

**AIR-IQ2 TYPICAL SINGLE SECTION HORIZONTAL BLADE DAMPER**

**FLANGED-TO-DUCT INSTALL TYPE**

Provide adequate clearance for actuator motor and mounting selected. For TAMCO actuator installation options, refer to Motor Mounting Methods at the following link: http://www.tamco.ca/inGdeCD_motorMnt.php

**INSTALLED-IN-DUCT INSTALL TYPE**

**SINGLE-SECTION FLANGED-TO-DUCT INSTALL TYPE**

MINIMUM DAMPER SIZE:
Probes parallel to blade: 12”w x 8”h; Probes perpendicular to blade: 8”w x 12”h

MAXIMUM SECTION SIZE:
60”w x 60”h or 48”w x 72”h

*(Limiting the section width to 48” allows height maximum to increase to 72”)*

MAXIMUM SECTION AREA:
25 ft.²

**NOTES:**

\[ A \times B = \text{Always the opening dimensions} \]

\[ \text{Width} = A: \text{Always the dimension parallel to the blades} \]

\[ \text{Height} = B: \text{Always the dimension perpendicular to the blades} \]

**INSTALLED-IN-DUCT INSTALL TYPE**

**SINGLE-SECTION INSTALLED-IN-DUCT INSTALL TYPE**

MINIMUM DAMPER SIZE:
Probes parallel to blade: 15.5”w x 10.5”h; Probes perpendicular to blade: 10.5”w x 15.5”h

MAXIMUM SECTION SIZE:
60”w x 60”h or 48”w x 72”h

*(Limiting section width to 48” allows height maximum to increase to 72”)*

MAXIMUM SECTION AREA:
25 ft.²

**AIR-IQ2 TYPICAL TWO-SECTION HORIZONTAL BLADE DAMPER**

**INSTALLED-IN-DUCT AND FLANGED-TO-DUCT INSTALL TYPES**

Jumpers will always be on the face of damper, downstream from the louver.

**TWO-SECTION FLANGED-TO-DUCT INSTALL TYPE**

MINIMUM DAMPER SIZE:
Probes parallel to blade: over 60”w x 8”h; Probes perpendicular to blade: 8’w x over 60’h

**TWO-SECTION INSTALLED-IN-DUCT INSTALL TYPE**

MINIMUM DAMPER SIZE:
Probes parallel to blade: over 60”w x 10.5”h; Probes perpendicular to blade: 10.5”w x over 60’h

MAXIMUM DAMPER SIZE:
For maximum sizes, see tables titled: **AIR-IQ2 AVAILABLE SIZES / SENSOR PROBE DENSITY CHARTS**

MAXIMUM SECTION AREA:
40 ft.²
### TAMCO Damper Assembly

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<td>TAMCO’s slip-proof, maintenance-free linkage system</td>
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<td>A-2</td>
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### TAMCO Sleeve and Flare

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<td>TAMCO’s 1” curved flare</td>
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### EBTRON Airflow Measurement Probes

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<td>C-2</td>
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### EBTRON Digital Transmitter

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<td>D-5</td>
<td>GTL116: Lonworks Free Topology</td>
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* AO2 can be assigned to temperature, airflow alarm or system status alarm.
GUIDE SPECIFICATION | CONTROL DAMPER WITH INTEGRAL AIRFLOW MEASURING DEVICE

Provide an integral airflow/temperature measurement control damper package. Package shall not require any additional duct work or sleeve, when installed in accordance with manufacturer’s specified placement guidelines.

**Manufacturer and Model:**
TAMCO/EBTRON Series 2100 AIR-IQ2 or Series 2900 AIR-IQ2

**Damper and Sleeve Assembly:**
- Provide one or more damper sections for each location indicated on the plans. Damper section(s) shall be integral to sleeve assembly.
- Provide a factory-assembled, extruded aluminum (6063T5) sleeve, not less than .080” (2.03 mm) thick for each damper section. The sleeve length in the direction of airflow, including damper frame, shall be 13.5” (343 mm) for all applications. The sleeve shall include a 1” (25.4 mm) radius aluminum entry flare, not less than .060” (1.52 mm) thick. Provide an additional 7” (178 mm) between the downstream edge of an intake louver and the leading edge of the sleeve for outside air intake applications that are close-coupled to intake louver.
- Provide extruded aluminum (6063T5) damper frame(s), not less than .080” (2.03 mm) thick and 4” (102 mm) deep. Frame to be assembled using mounting fasteners. Welded frames shall not be acceptable.
- Provide extruded aluminum (6063T5) damper blade profiles. Blade seals shall be extruded silicone. Frame seals shall be extruded silicone. Seals shall be mechanically fastened to prevent shrinkage and movement over the life of the damper. Adhesive or clip-on type blade seals will not be approved.
- Bearings shall be a dual bearing system composed of a Celcon inner bearing, fixed around a 7/16” (11.1 mm) aluminum hexagon blade pivot pin, rotating within a polycarbonate outer bearing inserted in the frame. Single axle bearing, rotating in an extruded or punched hole shall not be acceptable.
- Hexagonal control shaft shall be 7/16” (11.1 mm). It shall have an adjustable length and shall be an integral part of the blade axle. A field-applied control shaft shall not be acceptable.
- Linkage hardware shall be installed in the frame side and constructed of aluminum and corrosion resistant, zinc-plated steel, complete with cup-point trunnion screws for a slip-proof grip.
- Dampers shall be AMCA rated for Leakage Class 1A at 1 in w.g. (0.25 kPa) static pressure differential. Standard air leakage data to be certified under the AMCA Certified Ratings Program.
- Dampers shall be available with either opposed blade action or parallel blade action and shall be custom made to required size, with blade stops not exceeding 1¼” (31.7 mm) in height.
- Dampers shall be designed for operation in temperatures ranging between -40 °F (-40 °C) and 212 °F (100 °C). Note that the temperature range for the airflow measuring device differs.

**Integral airflow measuring device:**
- Provide one thermal dispersion airflow/temperature measuring device (ATMD) for each location. Differential pressure based devices, including pitot tubes or pitot arrays and devices measuring the pressure drop across a louver, damper or obstruction are not acceptable.
- Each ATMD shall consist of one or more sensor probes and a single, remote mounted transmitter.
- Each sensor probe shall consist of one or more sensor nodes mounted in an anodized aluminum tube.
- Each sensor node shall consist of two hermetically sealed bead-in-glass thermistors. Chip thermistors of any type or packaging are not acceptable.
- Thermistors shall be potted in an engineering thermoplastic assembly using water-proof, marine epoxy and shall not be damaged by moisture, direct contact with water or exposure to atmospheric acids. Provide a copy of an independent test report upon request that demonstrates compliance with this requirement.
- Each sensing node shall be individually wind tunnel calibrated at 16 points to NIST traceable airflow standards. Provide a copy of the NIST calibration report upon request.
- Signal processing circuitry on or in the sensor probe is not acceptable.
- Each sensor probe shall be provided with a UL listed, FEP jacketed, plenum rated cable(s) between sensor probes and the remote transmitter.
- The ATMD shall be capable of measuring airflow rates over the full range of 0 to 5,000 FPM (25.4 m/s) between -20 °F (-28.9 °C) and 160 °F (71.1 °C).
- Each sensing node shall have a temperature accuracy of +/-0.15 °F (0.08 °C).
- Each sensing node shall have a calibrated airflow accuracy of +/- 2% of reading.
- The transmitter shall be microprocessor-based and powered by 24 VAC/DC, be over-voltage and over-current protected, and have a watchdog circuit to provide continuous operation after power failures and/or brown-outs.
- All integrated circuits shall be industrial rated.
- All electrical plugs, receptacles and circuit board interconnects shall be gold-plated.
- The power requirement for the ATMD shall not exceed 22 V-A.
- The transmitter shall determine the average airflow rate and temperature of each sensor node.
- Provide with one of the following output options:
  - Two analog outputs and one RS-485 BACnet/Modbus network connection, or
  - Two analog outputs and one Ethernet BACnet/Modbus connection, or
  - Two analog outputs and one proprietary wireless connection to EBTRON “Commissioner” based devices, or
  - One RS-485 BACnet/Modbus network connection and one Ethernet BACnet/Modbus network connection, or
  - One Lonworks Free Topology network connection, or
  - One thumb drive data logger (no output).
- All analog output signals and network connections shall be isolated.
- Provide a Bluetooth, low-energy interface card, to interface with Android or iOS devices.
- Provide free Android® or iOS® software that allows real-time airflow and temperature monitoring and airflow and temperature traverses. Software shall capture, save or e-mail airflow/temperature data, transmitter settings and diagnostics information.
- BACnet® shall be BTL® listed.
- The ATMD shall be UL/CUL873 listed
- The ATMD shall be CE marked for European shipments
- The ATMD shall be FCC Part 15 listed

For additional information regarding TAMCO dampers, refer to:
- Series 2100 & 2900 Submittal Documents

For additional information regarding EBTRON airflow measuring devices, visit EBTRON.com