

TAMCO EBTRON

AIR-IQ AIR FLOW MEASUREMENT SOLUTION



AIR-IQ SMART-SOLUTION

GIVE US THIS:

- Opening size
- Damper series
- Mounting application
- Access requirements for probes

GET THIS:

- ✓ Optimal probe sensor density
- ✓ Ideal probe placement
- ✓ Appropriate sleeve style

BENEFITS

- Satisfy ASHRAE® 62.1, 189.1 & 90.1
- Obtain LEED® points
- Satisfy LEED® prerequisites and credits
- Save energy
- Reduce maintenance costs

APPLICATIONS

- Outside air intakes
- Floor return airflow tracking
- AHU return & bypass flow measurement

**TWO PREMIER MANUFACTURERS
ONE EXCEPTIONAL PRODUCT**

**AIR-IQ PACKAGE COMPATIBLE WITH
MULTIPLE DAMPER SERIES**



DEPENDABLE
Plug & Play Smart Sensors

Repeatable
ACCURATE

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.

TURN-KEY SOLUTION

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

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

- Direct measurement of outside airflow rates.
- Return airflow measurement on floor-to-floor systems for building pressurization.
- Return airflow measurement, directly on an air handler.
- AHU return & bypass flow measurement

FLEXIBILITY

The TAMCO/EBTRON AIR-IQ package combines EBTRON's Gold Series GTx116e-PC, high-performance airflow measurement technology with any TAMCO Series damper, providing unprecedented flexibility in airflow control. Whether the application is intake, exhaust, severe cold, or salt spray, there is a TAMCO/EBTRON AIR-IQ solution.

ACCURACY & REPEATABILITY

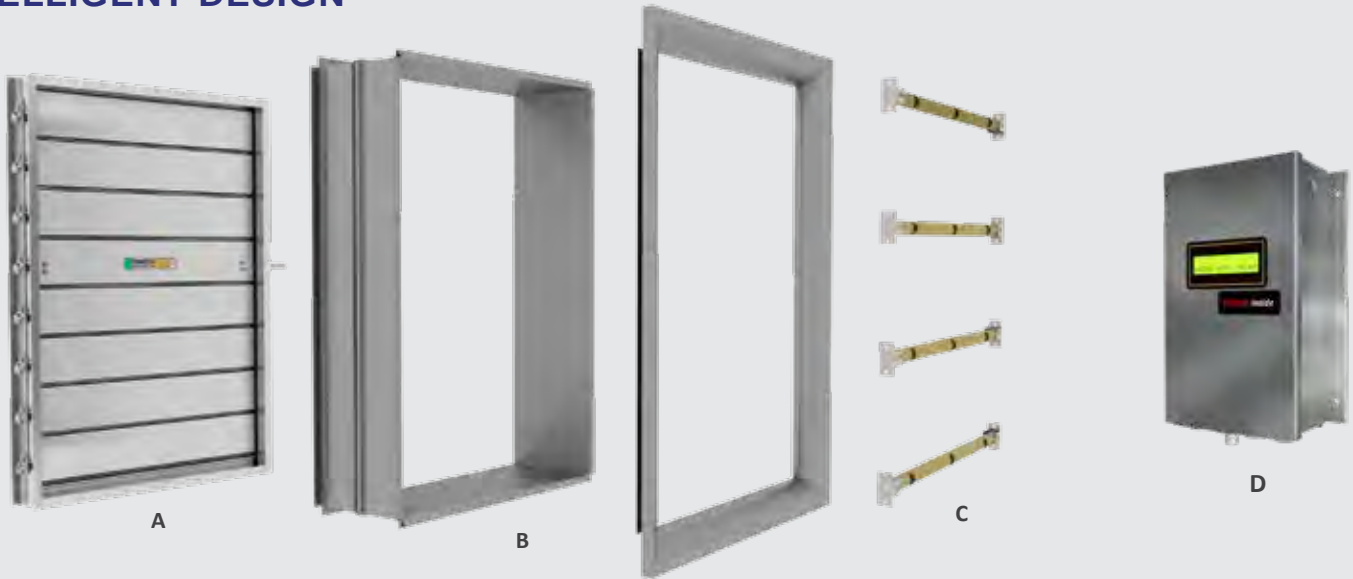
EBTRON's field-proven thermal dispersion technology ensures accurate and repeatable airflow measurement over the entire range of airflow rates and temperatures required by today's high-performance buildings. Up to 16 individual sensor nodes are factory calibrated at sixteen airflow rates between 0 and 2,000 FPM to NIST traceable standards in EBTRON's state-of-the-art calibration facility.

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.

EBTRON's thermal dispersion technology uses stable bead-in-glass thermistor probes and a high-performance, microprocessor-based transmitter. Performance is percent of reading and no additional transmitters or transducers are required to interface with your building automation system (BAS). Over 30 years of experience go into every airflow measuring device. EBTRON airflow sensors do not require periodic calibration or adjustment in most HVAC environments.

INTELLIGENT DESIGN



A TAMCO Damper Assembly

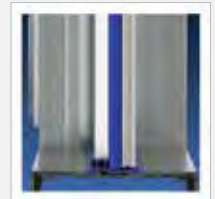
- A-1 TAMCO's dependable Dual Bearing System
- A-2 TAMCO's slip-proof, maintenance-free linkage system
- A-3 TAMCO's low-leakage blade and frame seals



A-1



A-2



A-3

B TAMCO Sleeve and Flare

- B-1 TAMCO's all-aluminum extrusion sleeve
- B-2 TAMCO's 3" curved flare



B-1



B-2

C EBTRON Airflow Measurement Probes

- C-1 Stable bead-in-glass thermistors
- C-2 FEP plenum-rated cable with gold-plated connector pins
- C-3 Optional Humidity Sensor (Available with probes that exceed 18" in length.)



C-1



C-2



C-3

D EBTRON Digital Transmitter

- D-1 GTA116e: Three field-selectable (0-5/0-10 VDC or 4-20mA), scalable and isolated analog output signals
- D-2 GTC116e*: One additional field-selectable (BACnet MS/TP or Modbus RTU) and isolated RS-485 network connection
- D-3 GTM116e*: One additional isolated Ethernet (simultaneously supported BACnet Ethernet or BACnet IP, Modbus TCP and TCP/IP) network connection
- D-4 GTF116e*: One additional isolated Lonworks Free Topology network connection
- D-5 GTU116e*: One additional USB connection for thumb drive data-logging of sensor node airflow rates and temperatures



D-1



D-2



D-3



D-4



D-5

*AO2 can be assigned to temperature, airflow alarm or system status alarm.

*Optional items.

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.
- Calibrated to NIST traceable standards.
- 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.
- The standard transmitter is provided with three isolated analog output signals for airflow, temperature or alarm, and humidity, enthalpy or dewpoint (if the humidity option is provided).
- Additional network capability for RS-485 (BACnet/Modbus), Ethernet (BACnet/Modbus), or Lon is available as an option. A “thumb-drive” datalogger can be provided in lieu of a network option.
- The AMD has a built-in high/low airflow alarm with a user defined setpoint and tolerance.
- Each AMD is UL/cUL listed, CE marked, BTL listed (BACnet devices only), FCC-Part 15 compliant and RoHS2 compliant.

DAMPER AND SLEEVE FEATURES

- The AIR-IQ unit can be assembled with any of the following Series of TAMCO dampers: 1000 / 1500 / 2100 / 2900 /9000 / 9000 SC / 9000 BF / 9000 ECT.
- The SW – Salt Water Resistance Option is available for the damper Series listed above, as well as for the AIR-IQ 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-IQ 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.

		PROBES MOUNTED PARALLEL TO BLADES																		
		Number of Probes / Number of Sensors per Probe																		
		WIDTH = DIMENSION A																		
		12	14	16	18	20	22	24	30	36	42	48	54	60	66	72	84	96	108	120
HEIGHT = DIMENSION B	8	1/2	1/2	1/2	1/2	1/3	1/3	1/3	1/4	1/4	1/6	1/6	1/6	1/6	1/6	1/6	1/8	1/8	1/8	1/8
	10	1/2	1/2	1/3	1/4	1/3	1/3	1/3	1/4	1/5	1/6	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8
	12	1/2	1/2	1/3	1/4	1/3	1/3	1/3	1/4	1/5	1/6	1/6	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
	14	2/2	2/2	2/2	2/2	2/2	2/3	2/3	2/3	2/3	2/4	2/4	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/6
	16	2/2	2/2	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/4	2/4	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/6
	18	2/2	2/2	2/2	2/3	2/3	2/3	2/3	2/3	2/4	2/4	2/4	1/8	1/8	2/6	2/6	2/6	2/6	2/8	2/8
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	22	2/2	3/2	2/3	2/3	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/6	2/6	2/6	2/6	2/8	2/8	2/8	2/8
	24	2/2	3/2	2/3	2/3	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/6	2/6	2/6	2/6	2/8	2/8	2/8	2/8
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	36	3/2	3/2	3/2	4/2	4/2	4/2	3/3	2/4	2/5	2/6	2/6	2/7	2/8	2/8	2/8	2/8	2/8	2/8	2/8
	42	3/2	4/2	4/2	4/2	4/2	4/2	4/2	3/4	3/4	3/4	2/7	2/8	4/4	2/8	2/8	2/8	2/8	2/8	2/8
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66	4/2	4/2	4/2	3/4	4/3	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	NA	
72	4/2	4/2	4/2	3/4	4/3	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	NA	NA	

		PROBES MOUNTED PERPENDICULAR TO BLADES																					
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		WIDTH = DIMENSION A																					
		8	10	12	14	16	18	20	22	24	30	36	42	48	54	60	66	72	84	96	108	120	
HEIGHT = DIMENSION B	12	1/2	1/2	1/2	2/2	2/2	2/2	2/2	2/2	2/2	3/2	3/2	3/2	3/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2	
	14	1/2	1/2	1/2	2/2	2/2	2/2	2/2	3/2	3/2	3/2	3/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2	4/2	
	16	1/2	1/3	1/3	2/2	2/2	2/2	2/3	2/3	2/3	3/2	3/2	3/2	4/2	4/2	4/2	4/2	4/2	4/2	4/3	4/3	4/3	
	18	1/2	1/4	1/4	2/2	2/2	2/3	2/3	2/3	2/3	3/2	4/2	4/2	4/2	4/2	4/2	4/3	4/3	4/3	4/3	4/3	4/4	4/4
	20	1/3	1/3	1/3	2/2	2/3	2/3	2/3	2/3	2/3	3/3	4/2	4/2	4/2	4/2	4/3	4/3	4/3	4/3	4/3	4/3	4/3	4/3
	22	1/3	1/3	1/3	2/3	2/3	2/3	2/3	2/3	2/3	3/3	4/2	4/2	4/2	4/3	4/3	4/3	4/3	4/3	4/3	4/3	4/3	4/3
	24	1/3	1/3	1/3	2/3	2/3	2/3	2/3	2/3	2/3	3/3	3/3	4/2	4/2	4/3	4/3	4/3	4/3	4/3	4/3	4/3	4/3	4/3
	30	1/4	1/4	1/4	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/4	3/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
	36	1/4	1/5	1/5	2/3	2/3	2/4	2/4	2/4	2/4	2/4	2/5	3/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
	42	1/6	1/6	1/6	2/4	2/4	2/4	2/4	2/4	2/4	2/6	2/6	3/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
	48	1/6	1/6	1/6	2/4	2/4	2/4	2/4	2/4	2/4	2/6	2/6	2/7	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
	54	1/6	1/6	1/8	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/7	2/8	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA
60	1/6	1/8	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/6	2/7	2/8	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	
66	1/6	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/6	2/8	2/8	2/8	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	
72	1/6	1/8	1/8	1/8	1/8	2/6	2/6	2/6	2/6	2/8	2/8	2/8	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	

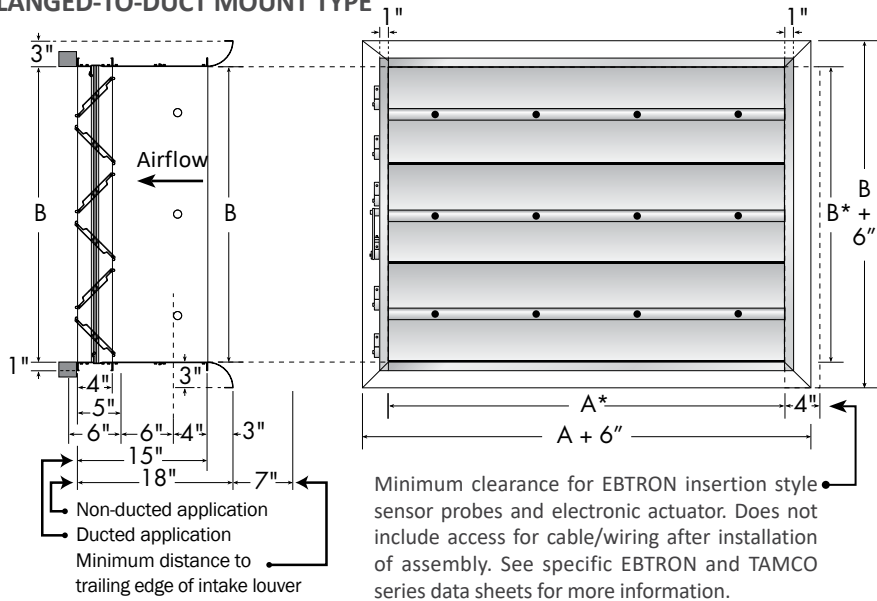
One Damper Section
 Two Damper Sections

AIR-IQ 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 GTX116e-PC Air Flow Transmitter options and details are available at www.EBTRON.com.

AIR-IQ TYPICAL SINGLE SECTION HORIZONTAL BLADE DAMPER

FLANGED-TO-DUCT MOUNT TYPE



SINGLE SECTION

FLANGED-TO-DUCT MOUNT 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".)

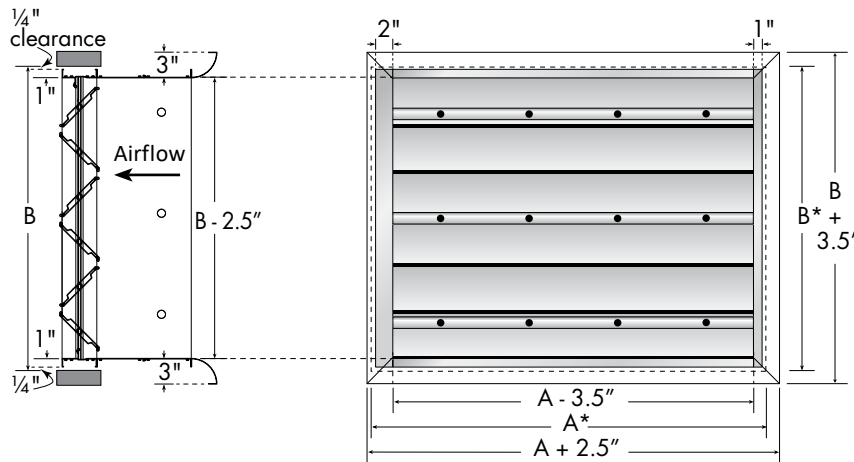
MAXIMUM SECTION AREA:

25 ft.²

*NOTES:

A x B = Always the opening dimensions
Width = A: Always the dimension parallel to the blades
Height = B: Always the dimension perpendicular to the blades

INSTALLED-IN-DUCT MOUNT TYPE



SINGLE SECTION

INSTALLED-IN-DUCT MOUNT 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 to increase to 72".)

MAXIMUM SECTION AREA:

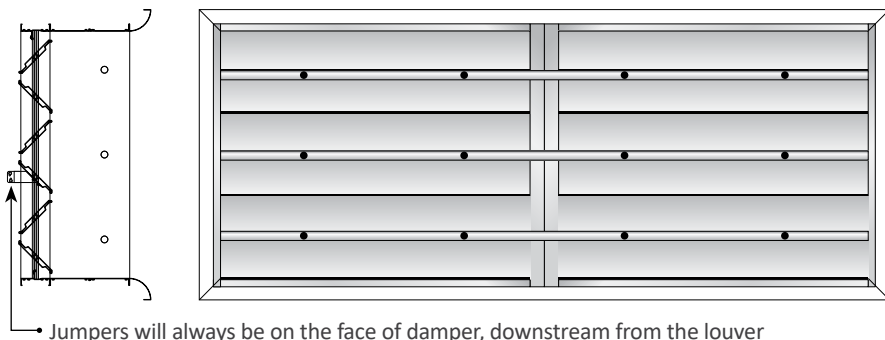
25 ft.²

*NOTES:

A x B = Always the opening dimensions
Width = A: Always the dimension parallel to the blades
Height = B: Always the dimension perpendicular to the blades

AIR-IQ TYPICAL TWO-SECTION HORIZONTAL BLADE DAMPER

INSTALLED-IN-DUCT AND FLANGED-TO-DUCT MOUNT TYPES



Contact TAMCO Customer Service for information regarding sleeve sizes and finished outside flare dimensions for two-section assemblies.

TWO-SECTION

FLANGED-TO-DUCT MOUNT 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 MOUNT 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 table titled:
AIR-IQ AVAILABLE SIZES / SENSOR PROBE SUITE CONFIGURATION

MAXIMUM SECTION AREA:

40 ft.²

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 [insert appropriate TAMCO damper series] AIR-IQ

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" thick for each damper section. Sleeve depth, including damper frame, shall be 15" for ducted applications and 18" for non-ducted applications. Non-ducted applications shall include a 3" radius aluminum entry flare. Provide an additional 7" (10" for ducted applications) 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 louvers.
- Provide extruded aluminum (6063T5) damper frames, not less than .080" thick and 4" deep.
- Provide extruded aluminum (6063T5) damper blade profiles. Blade seals shall be extruded EPDM or silicone (dependant upon damper Series selected). Frame seals shall be extruded silicone. Seals shall be secured in an integral slot within the aluminum extrusions.
- Bearings shall be composed of a Celcon inner bearing fixed to a 7/16" aluminum hexagon blade pin, rotating within a polycarbonate outer bearing inserted in the frame, resulting in no metal-to-metal or metal-to-plastic contact.
- 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.
- Damper air leakage shall not exceed 3 cfm/ft² against 1" w.g. differential static pressure.
- Dampers shall be available with either opposed blade action or parallel blade action and made to size without blanking off free area.
- Dampers shall be designed for operation in temperatures ranging between -72° F and 212° F.
- (For Thermally Insulated or Salt Water Resistance Dampers refer to additional information listing below.)

Integral airflow measuring device:

- Each AMD shall use the principal of thermal dispersion. Differential pressure-based and vortex shedding devices are not acceptable.
- Each sensor node shall consist of two hermetically sealed bead-in-glass thermistors. Devices using indirectly heated thermistors to determine the airflow rate are not acceptable. Devices using chip thermistors of any type or packaging are not acceptable.
- Thermistors shall not be damaged by moisture, direct contact with water or exposure to atmospheric acids. Provide a copy of an independent laboratory report to verify compliance with this requirement.

- Transmitters shall be mounted in a location protected from moisture, rain and snow with an ambient temperature between -20 and 120 °F (-28.9 to 48.9 °C) and a humidity range between 5 and 95% RH (non-condensing). Provide a weatherproof enclosure and mount away from direct sunlight when outdoor mounting is required.
- Probes shall be "plug and play", not require matching to the transmitter, and be provided with an FEP jacketed, plenum rated cable and connector plug. Connector plug and receptacle pins shall be gold plated. 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.
- Each sensor node shall be individually wind-tunnel calibrated to NIST traceable airflow standards and have an accuracy of ±2% of reading over the entire operating range. Provide a copy of the NIST calibration report for the reference standard used to calibrate the production tunnels used to calibrate individual sensor nodes. Devices claiming AMCA certification are not acceptable.
- The installed airflow accuracy shall be better than ±5% of reading on between 0 and 2,000 fpm (0 to 10.16 m/s) over a temperature range of -20 to 160 °F (-28.9 to 71.1 °C) and a humidity range between 0 and 100% RH (non-condensing).
- Provide the velocity-weighted temperature of the airstream with an accuracy of ±0.15 °F (0.08 °C).
- Provide an integral humidity sensor capable of determining the velocity-weighted humidity, velocity-weighted enthalpy, or dewpoint of the airstream with an accuracy of ±2% of reading between 20 and 80% RH and better than ±4% of reading at all other % RH.
- Provide low and high airflow alarms with a user defined setpoint and tolerance.
- Provide a transmitter with three field-selectable (0-5/0-10 VDC or 4-20mA), scalable, and isolated signals (AO1=Airflow, AO2=Temperature or Alarm, AO3=when /H option is provided). Optional % RH enthalpy or dewpoint also offered. Available optional outputs are:
 - > One isolated RS-485, field-selectable (BACnet MS/TP or Modbus RTU) network connection, or
 - > One isolated Ethernet, field-selectable (BACnet Ethernet, BACnet IP, Modbus TCP or TCP/IP) network connection, or
 - > One isolated Lonworks Free Topology network connection, or
 - > One USB Flash Drive (Thumb drive) memory device for logging average and individual airflow rates, temperatures, and psychrometric measurements at user specified time intervals.
- Provide a 16-character by two-line, backlit, alpha-numeric LCD.
- Provide a Bluetooth, low-energy interface and free Android® or iOS® software that allows real-time airflow, temperature and humidity monitoring, airflow and temperature traverses, and transmitter setup parameters and diagnostic functions.
- Each AMD shall be powered by 24 VAC @ 20 V-A max.
- Each AMD shall UL/cUL listed, CE marked, BTL listed (BACnet devices only), FCC-Part 15 compliant and RoHS2 compliant.

For additional information regarding TAMCO dampers, refer to:

- Series 1000, 1500, 9000, 9000 BF Specification Sheets
- Series 1000, 1500 Pressure Drop Charts
- Series 9000, 9000 BF Pressure Drop Charts
- Series 1000, 1500 Free Area Charts
- Series 9000, 9000 BF Free Area Charts

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