



IAQ-Tek

US Patent 6,450,043 B1

Outdoor Air Volume Measurement System



- Simple installation
- Operates over -40° to 120° F
- Probes require minimal straight runs of duct
- Setup Wizard
- Resistant to Contamination



Tek-Air Airflow Products

Summary

One of the most significant parameters associated with indoor air quality is the volume of fresh outdoor air being drawn into a building through the ventilation system. If indoor air quality is to be assured, the volume of outdoor air must be accurately measured so that it can be controlled.

Existing technologies for measuring airflow volume are better suited for use in supply and exhaust ductwork where filtered air, higher velocities, and straight runs exist. IAQ-Tek incorporates a measurement probe designed specifically for the low velocities and high turbulence associated with outdoor air intakes.

Outdoor Air Measurement

Whether a custom air handler installed in a penthouse or a commercial rooftop unit, air typically passes through an intake louver, modulating outdoor air damper, and into a return air mixing plenum. Usually the distance between these components is short, and the airflow very turbulent, making the use of conventional pitot and thermal measurement devices ineffective.

Complicating matters are the wide variety of intake configurations including louvers, rain hoods, and inlet screens. When it comes to outdoor air, there is never a good location to make an airflow measurement.

Setup Wizards

The IAQ-Tek includes an 80 character display and keypad with three series of preprogrammed instructions to lead setup persons through the proper routine. Instructions are specific for Temperature Control Contractor, Air Balancer and User addressing each individual requirement.

Outdoor Air Probe

The patented (#6,450,043 B1) airflow measurement probe is unlike any conventional airflow measurement device and represents a significant improvement on previous technology. Used either singly or in multiples, each probe will measure airflow accurately when located in the small space between the intake louvers and the outdoor air damper. Output is not affected by the turbulence created by the louver, or the modulating damper. The unique design of the probe makes it immune to turbulence. The combination of the size, the dimples on the front and the large chambers work to create a stable velocity pressure that is used to calculate air velocity.

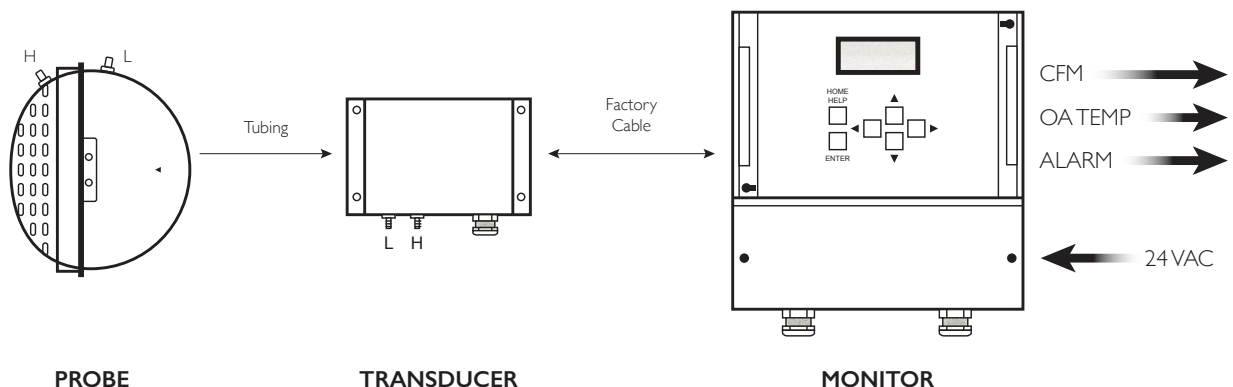
IAQ-Tek Transducer

The velocity pressure developed by the probe(s) is connected to a high accuracy differential pressure transducer assembly. The assembly includes a NEMA-4 enclosure which is suitable for mounting outdoors or in the intake plenum. The transducer assembly includes auto-zero and a temperature stabilization circuit to ensure maintenance-free operation.

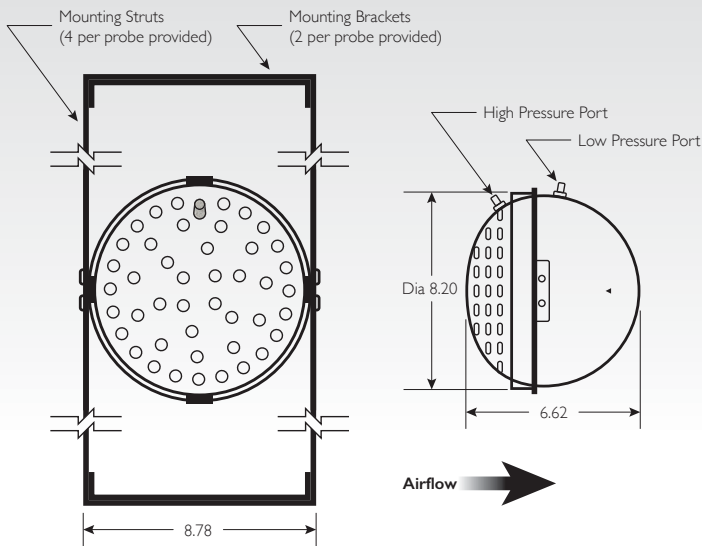
The transducer assembly also includes a thermistor which is used to compensate for changes in air inlet temperature as well as to provide the outside air temperature to the building management system.

IAQ-Tek Monitor

The IAQ-Tek Monitor is connected to the transducer assembly. The monitor accepts the incoming pressure and temperature signals. Using a unique wizard the monitor is configured to calculate the outside air volume based on the specific conditions of the installation such as altitude, area and probe flow coefficient. Two analog outputs are available for airflow and outside air temperature.



Probe Mounting and Dimensions



Single Probe Mounting

How Many Probes to Use

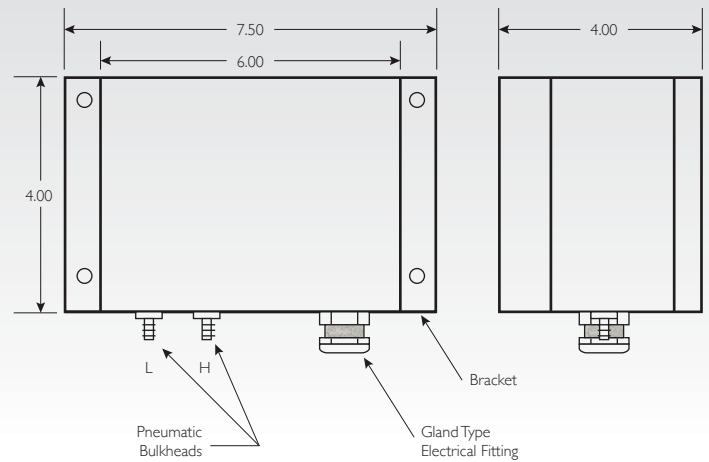
To determine the number of probes, use the chart below. Calculate the aspect ratio first by dividing the longer dimension of the width or height, by the shorter of the two. Then calculate the area in square feet by multiplying the width by height (inches), and dividing by 144 square inches to convert to square feet.

Proceed down the aspect ratio column and compare the area shown to the area calculated. When the calculated area falls between the lowest and highest area in the box, read the number of probes required in the left most column.

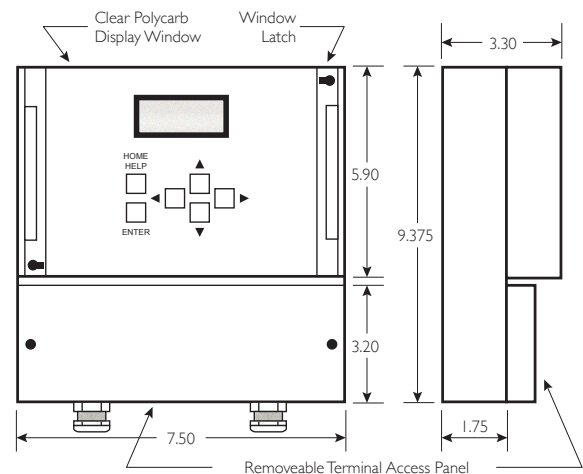
# of Probes	Aspect Ratio*		
	1 to 1.5	>1.5 to 2.5	>2.5 to 5
1	to 12 sq. ft.	to 9 sq. ft.	to 6 sq. ft.
2	>12 to 24 sq. ft.	>9 to 22 sq. ft.	>6 to 18 sq. ft.
3	×	×	>18 to 24 sq. ft.
4	>24 to 48 sq. ft.	>22 to 45 sq. ft.	>24 to 30 sq. ft.
5	×	×	>30 to 36 sq. ft.
6	>48 to 64 sq. ft.	>45 to 58 sq. ft.	>36 to 42 sq. ft.
7	×	×	>42 to 48 sq. ft.
8	>64 sq. ft.	>58 sq. ft.	>48 sq. ft.

***NOTE:** For areas >100 sq. ft. or for sizes not covered in the chart above, please consult the factory.

Transducer and Monitor Dimensional Data



Transducer Dimensions



Monitor Dimensions

Specifications

SYSTEM ACCURACY

Velocity for 200 to 1000 fpm; $\pm 5\%$ reading
0.1" transducer 75 to 200 fpm; $\pm 10\%$ reading

Higher ranges are available. Consult with your local representative.

PROBE AND TRANSDUCER

Temperature

Operating -40° to 120° F (-40° to 49° C)

Storage -40° to 150° F (-40° to 66° C)

Probe

Material: PVC/ABS

Fire rating:: UL-94-VO and UL-94-5VB

Size: 8.5" diameter; 7.5" depth

Weight: 1.5lbs.

Tubing connections: 1/4" barb fittings

Transducer

Enclosure: NEMA-4X water tight

Enclosure size: 6" W x 4.75" H x 3.5" D

Mounting footprint: 7.5" W x 4.75" H

Weight: 1.5 lbs.

Tubing connections: 1/4" barb fittings

Electrical connection: Factory provided integral cable

MONITOR

Temperature

Operating: 30 to 110°F (-1° to 43° C)

Storage: -40 to 150°F (-40° to 66° C)

Enclosure

Type: NEMA-4X water tight

Size: 9" W x 9.5" H x 3.5" D

Mounting footprint: 9.0" W x 9.5" H

Weight: 3.5 lbs.

Power

Supply voltage: 24 VAC, limits 19 to 31 VAC

Power: 25 VA

Digital Input for Fan Status Interlock

Type: Dry Contact

Analog Outputs

Type: Powered and isolated 4-20mA

Scaling: cfm: user set
temp: -30° to 120°F (-34° to 49° C)

Output load: 0-600 ohms

Digital Alarm Output

Type: dry contact, SPDT

Rating: 0.5 amps max.

State: normally energized

Display

Type: LCD, backlit

Size: 4 lines, 20 characters per line

IAQ-Tek 2000 Ordering Guide

T-IAQ2

Transducer Option

1 = 0.10"
 2 = 0.25"
 3 = 0.50"
 4 = 1.00"
 5 = 2.50"
 6 = 5.00"
 7 = 10.0"
 8 = 15.0"
 9 = 25.0"

IAQ Probe Quantity

0 = No IAQ Probes
 1-8 = (8 max. per transmitter)

Your representative is:

