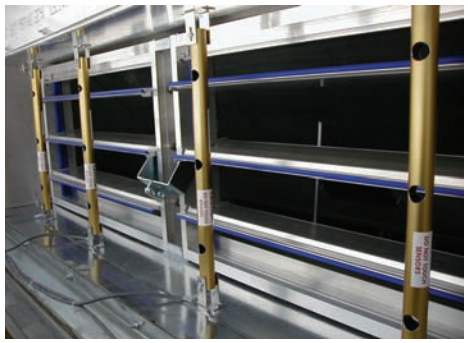
Provide Adequate Outside Air:

- Directly measure and control minimum outside airflow rates and meet the requirements of **ASHRAE 62.1-2004** and the **International Mechanical Code**.
- Thermal dispersion technology is **calibrated from still air** and your best choice when measuring the low airflow rates associated with outside air intakes.
- Mounts upstream of the intake damper.
- Insertion, internal or standoff mounting options **simplify selection** and **installation**.
- **Integrate with your demand controlled ventilation strategy** to "clamp" airflow rates between minimum and maximum levels.



- **Reduce** your **IAQ liability** and **increase** occupant **satisfaction, productivity and health**.

EBTRON
Thermal Dispersion Airflow Measurement

1663 Hwy. 701 S., Loris SC 29569 • Toll Free: 800.2*EBTRON* (232.8766) • Fax: 843.756.1838 • Internet: *EBTRON*.com

Control intake flow rates to assure acceptable indoor air quality.

Accurate measurement is the key to success.

The Problem

Owners and Engineers should focus on the largest source of documented IAQ problems. Literature suggests that over 50% of all IAQ problems are related to ventilation. Therefore, a successful strategy to improve IAQ must address ventilation.

Not all sources can be eliminated. People only contribute to a fraction of the overall pollution generated in a building. Standard 62.1-2004 no longer specifies ventilation only in CFM/person. A fixed building component now addresses contaminants not associated with the occupants or their activities.

Contaminants cannot be reduced to acceptable levels without dilution (outside air). Directly monitoring and controlling outside air is the best way to assure proper dilution levels are maintained within a building.

Outside air is required to dilute contaminants generated within a building. Those contaminants are the result of both the occupants and the building itself.

Providing too much outside air during minimum intake mode is costly since it wastes energy. Too little results in unacceptable air quality.

How much outside air should you provide?

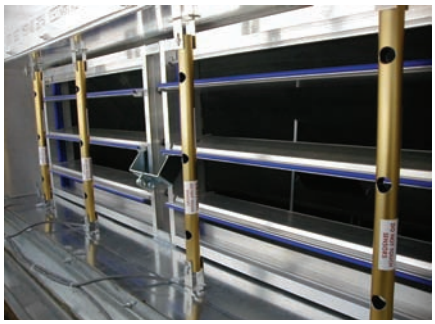
Although there is considerable debate about the quantity of outside air required for acceptable occupant health and productivity, ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality is generally accepted as the authoritative document in the United States and Canada. The 2004 Standard, updated in 2006 by addendum, specifies outside airflow rates as a combination of occupancy and building floor area.

Regardless of the type of air system your building has, outside air must be provided. External factors such as wind and stack pressure can have a dramatic affect on uncontrolled outside air intakes. VAV systems have the added factor of mixed air plenum pressure variations that also have a dramatic affect on intake rates. The latter, is currently addressed by ASHRAE Standard 62.1. Unfortunately, the Standard does not address wind and stack pressure which influences all systems.

The Solution

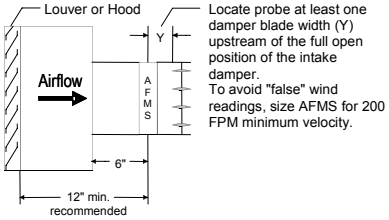
Install an *EBTRON* airflow measuring device directly in the outside air intake of ALL air handling systems that are installed to provide outside air to the occupant breathing zones.

EBTRON manufactures a complete line of airflow measuring devices specifically designed and tested for installation in outside air intakes. Your local representative or our in-house application specialists can help you design a system that assures proper dilution ventilation into your building.



Minimum Placement

Consult factory if minimum placement cannot be achieved.



CONSTANT OCCUPANCY SPACES: Use design conditions to set a fixed outside air rate at the AHU in accordance with the Ventilation Rate Procedure and use an outside airflow station to maintain that level.

EXTREMELY VARIABLE OCCUPANCY SPACES: Use occupancy counters, schedules, etc. with accurate airflow measurement (including accurate zone measurement on VAV systems) to reset the outside air setpoint dynamically.

Traditional CO_2 Demand Controlled Ventilation (DCV) is risky since numerous assumptions including respiration rate, sensor accuracy and placement and the transient nature of the technique result in serious ventilation rate errors. In addition, a fixed CO_2 setpoint used in most DCV strategies can predict a fixed ventilation rate per person at best. Unless occupancy is extremely variable, there is little to gain by using CO_2-DCV with the new requirements of ASHRAE 62.1-2004. For example, changing the population density from 7 to 5 people per 1,000 sq.ft. will only reduce the outside air required from 85 to 75 CFM. Is CO_2 DCV really worth the risk?

Although *EBTRON* is not a proponent of CO_2 DCV due to its inherent errors, the Company does recognize the need for some type of demand controlled technique on extremely variable occupancy spaces. CO_2 DCV cannot assure compliance with ASHRAE Standard 62.1. DCV may also result in pressurization problems on some systems if the intake rate is reduced below exhaust levels. In addition, CO_2 DCV has a tendency to under ventilate when the population decreases and over ventilate when the population is near design. In the absence of a direct method for monitoring the actual occupancy of a space, consider the following improvement to traditional CO_2 DCV:

Single Occupancy Zone: (note, some designers using CO_2 DCV treat multiple occupancy zones as a single zone). Establish the minimum and maximum outside air ventilation rates required. Generally, the minimum rate will not be less than 40% of design due to space generated contaminants. Install an airflow measuring station in the outside air intake. Use the CO_2 level to reset the outside air intake setpoint between the minimum and maximum levels. This technique is more stable than direct reset to CO_2 levels, saves energy when the building is fully occupied and minimizes risk at lower population levels.

Multiple Occupancy Zones: Use the guidelines established for a single occupancy zone. In addition, install an airflow measuring device in the supply air to each occupancy zone. Also install a CO_2 sensor in each zone. Use the airflow measuring devices and the CO_2 sensors to estimate the population of the critical zones. Determine the outside air setpoint using the guidelines of ASHRAE Standard 62.1 (you are basically using the multi-space equation dynamically at actual, not design, conditions).