Carbon dioxide measurement as a means of ventilation control

M. P. Lyons* looks at the advantages and techniques of relating ventilation rates to varying needs.

The University of Kent at Canterbury's Corwnalls Lecture Theatre.

Diagrammatic layout of a typical Building Breathaliser system in a cinema.

Air is notionally assessed for the purposes of determining heating and cooling loads, it cannot be generated into account the volume of space occupied by people. Ventilation rates solely based on empirical data can thus account for 70% of the heated or cooled air inefficiently. Much effort is applied by energy managers who further to justifiable schemes such as simple draught proofing and to a considerable extent, even in small buildings, there is a substantial amount of ventilation in the form of fresh air which is not required to provide fresh air to keep people comfortable.

To summarise, building ventilation and control of energy wastage is attributable to three main causes:

1. The population of a building may be variable. Actual ventilation may vary and be on average, well below the design requirement. Hourly, weekly and even seasonal changes in occupancy are not accounted for.

2. Buildings with a 'fixed' occupancy, air quality takes some time to deteriorate and change. Time is a factor length of this period can vary and again, cannot be accurately controlled.

3. Although infiltration of fresh air is notable, the air quality of a building can be controlled by various methods, such as air conditioning, heating, and ventilation systems. These systems are designed to maintain a consistent level of ventilation and to reduce the concentration of carbon dioxide (CO₂) and other pollutants in the building. The CO₂ level is a good indicator of indoor air quality, as high levels can indicate inadequate ventilation.

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