

## SUPCO's CO1000, IAQ50 and IAQ55

SUPCO offers test instruments used to monitor the most prominent parameters that make up Indoor Air Quality (IAQ). Use of these instruments may lead to a more complex test procedure to monitor some or all of the remaining factors that make up the total IAQ picture.

The **CO1000** is a first stage instrument measuring Carbon Monoxide (CO) in ambient environments from 0 to 1000 PPM. High levels of CO can be a life threatening scenario that needs immediate attention.



The **IAQ50** and **IAQ55** measure Carbon Dioxide (CO<sub>2</sub>), temperature and humidity. They are an ideal choice for fast air quality analysis. The IAQ50 is a semi-permanent, wall mounted monitor while the IAQ55 is a portable handheld meter. Both come equipped with a backlit triple display and programmable alarm thresholds.



IAQ50



IAQ55

### Carbon Monoxide (CO) Thresholds

Thresholds have been defined by ASHRAE for living areas and OSHA for the work place, expressed in parts per million (PPM)

- 0 – 1 PPM: Normal background levels.
- 8 PPM: **ASHRAE** Standard 62-1989 maximum level for living areas.
- 50 PPM: **OSHA** maximum for enclosed space 8-hour average level. \*
- 100 PPM: **OSHA** maximum exposure limit.\*
- 200 PPM: Mild headache, fatigue, nausea and dizziness.
- 800 PPM: Dizziness, nausea and convulsions; death within 2 to 3 hours.

\***U.S. Department of Labor, Occupational Safety & Health Administration (OSHA) Regulation 1917.24:** The CO content in any enclosed space shall be maintained at not more than 50 PPM (0.005%).

### Carbon Dioxide (CO<sub>2</sub>) Levels and Guidelines

The **National Institute for Occupational Safety and Health (NIOSH)** has published recommendations for non-enforced reference levels for Carbon Dioxide (CO<sub>2</sub>), expressed in parts per million (PPM).

- 250 – 350 PPM: Normal outdoor ambient concentrations
- 600 – 1000 PPM: Acceptable range for Indoor Air Quality (IAQ)
- > 1000 PPM: Unacceptable IAQ; indicates inadequate ventilation. Complaints such as headaches, fatigue, and eye/ throat irritation will be more widespread.

**ASHRAE standard 62-1989** designates 1000 PPM as the maximum acceptable level of CO<sub>2</sub> concentration in an occupied building.

**OSHA's** maximum allowable level for CO<sub>2</sub> concentration is 5000 PPM for the Time Weighted Average (TWA) over five 8-hour work days.

In other countries, the U.K. limits the maximum allowable level to 1500 PPM average for a whole school day in its **Building Bulletin 101 (BB101)**. Germany, Japan, Australia and the U.K. all use the U.S. OSHA limit of 5000 PPM for the TWA over five 8-hour work days.



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# Solving The Mysteries Of IAQ



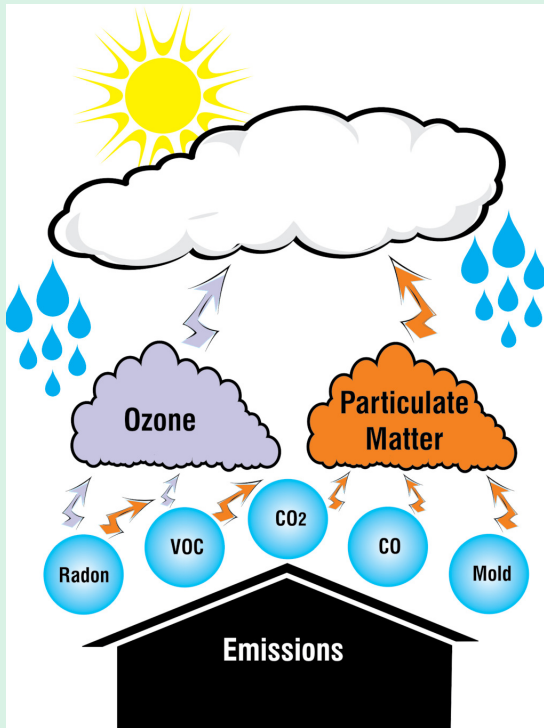
## What is IAQ?

Feeling tired? Sick? It could be due to the air you are breathing - poor Indoor Air Quality. Indoor Air Quality (IAQ) refers to the quality of the air where we live and work; office buildings...factories...your home.

A popular phrase used during the past decade is "Sick Building Syndrome", which indicates a workspace or home that has become almost uninhabitable due to severe IAQ problems.

## What Makes Up IAQ?

IAQ can be affected by many factors, including temperature, humidity, mold, ozone, radon, asbestos fibers, carbon monoxide, volatile organic compounds (VOCs) and carbon dioxide. These factors can affect us in various ways, including allergic reactions, mild to extreme discomfort and even serious health issues.

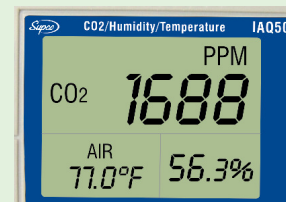


## How to Determine IAQ?

Determining IAQ can involve collecting air samples, monitoring the air space, sampling surfaces within the building and analyzing the air flow inside the building. This can involve very complex and expensive test methods carried out over a significant period of time.



The most obvious and easiest IAQ components to monitor include carbon monoxide (CO), temperature, humidity and carbon dioxide (CO<sub>2</sub>).



## How Do HVAC High Efficiency and "GREEN" Building Designs Impact IAQ?

For several decades, public buildings have been constructed for high efficiency operation of their Heating, Ventilating and Cooling (HVAC) systems. Major design concepts are built on high efficiency window systems, which require expertly designed ventilation systems. Construction methods and products have improved as well, reducing drafts from outside air. The common phrase is that today's buildings are airtight. The "GREEN" design movement in the commercial and residential HVAC industry emphasizes reducing energy consumption, while maintaining adequate IAQ. One technique used is demand controlled ventilation. This method controls the ventilation in a building dynamically, based upon the use of carbon dioxide sensors with actuators, which react to the emissions of CO<sub>2</sub> and other IAQ components from the occupants. Moisture management and humidity control may conflict with the methods to optimize energy conservation. Their management involves raising and lowering the temperature of "make up air", used in ventilation to dilute ambient indoor air. High humidity indoors promotes mold growth and contributes to respiratory problems.

