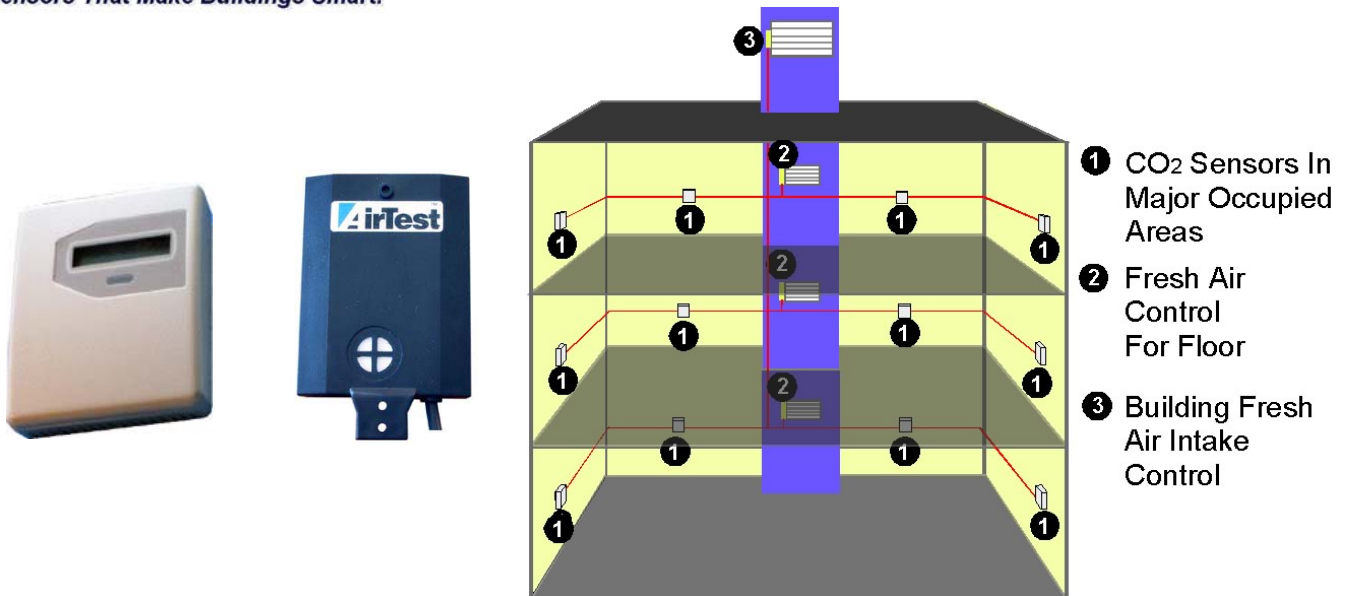


## CO<sub>2</sub> BASED OUTSIDE AIR VENTILATION SYSTEMS



### Match Outside Air Ventilation to Occupancy to Eliminate Cost of Over-Ventilation

Buildings generally set a fixed level of outside air ventilation based on maximum design occupancy. Because buildings are not usually occupied at maximum design level, this results in over-ventilation. A CO<sub>2</sub> (carbon dioxide) sensing system uses real time CO<sub>2</sub> measurements, and adjusts air delivery to ensure ventilation meets actual occupancy needs to virtually eliminate the cost of over-ventilation.

#### Benefits of Real-Time Ventilation

- ✓ As occupancy levels vary during the day, air delivery is adjusted to provide only for the real-time occupancy needs, further reducing over-ventilation.
- ✓ CO<sub>2</sub> based ventilation control eliminates the over-ventilation condition found in most buildings.
- ✓ Excess pre-conditioned air in low occupancy areas is transferred to further reduce outside air needs.
- ✓ Ventilation control system and humidity sensing can integrate with economizers for maximum savings.

#### How the System Operates

- ✓ CO<sub>2</sub> sensors are installed in major occupied spaces to provide the real-time information needed to deliver outside air, based on people in the space.
- ✓ If one fresh air supply feeds many zones, control is based on the highest level measured in all zones.
- ✓ A base ventilation level is set to assure sufficient fresh air when occupancy is low.
- ✓ This approach can be easily integrated with existing pneumatic or digital building control systems.

## Is Your Building A Candidate?

No-cost assessments of buildings are provided to determine the economic value of upgrading to CO<sub>2</sub> control. This assessment includes current ventilation levels, efficiency of your current ventilation system, economics of CO<sub>2</sub> control for your building, and economizer opportunities. Rebates are also identified that may reduce the cost of installation.

## How The System Works

**Principle:** The key is to sense CO<sub>2</sub> in all major occupied zones of a building and to have a control system, based on actual CO<sub>2</sub> levels, that ensures all spaces are provided code required ventilation. The system works well with constant or variable airflow systems.

**Central Air Delivery System:** With a limited number of air intakes serving multiple floors, sensors are placed in major occupied spaces (4 to 6 sensors per floor). Outside air is regulated based on the highest level measured in zones served by the air intake.

**Floor Air Delivery Systems:** If fresh air is delivered to a mechanical room serving an entire floor, sensors placed in each major occupied zone provide feedback to control outside air delivery based on the greatest need for ventilation of all the zones on the floor.

**VAV Control of Ventilation And Temperature:** Any modern software based Variable Air Volume control system can be upgraded to provide zone base control of ventilation using CO<sub>2</sub> and temperature.

**Ventilation Control with Packaged System:** Rooftop package systems serving one or more zones are upgraded to integrate CO<sub>2</sub> control. Many systems are already CO<sub>2</sub> ready for ventilation control.

## CO<sub>2</sub> Sensor Specifications

### General

**CO<sub>2</sub> Detection Method:** Gold Plated Non-Dispersive Infrared Optical Sensor with Automatic Baseline Correction for Self-Calibration. Diffusion Sampling.

**Certification:** CE, EMC89/336/EEC, CA Energy Commission, ISO-9001 Certified Manufacturer

**Transmitter Rated Life:** 15 years

**Operating Conditions:** 32 to 122° F (0 to 50°C), 0 to 95% RH

**Storage Conditions:** -40 to 158° F (-40 to 70° C)

### Performance

**CO<sub>2</sub> Measurement Range:** 0-2000 ppm (factory set),

**Optical Sampling Path Length:** 4.7" (12 cm)

**CO<sub>2</sub> Accuracy:** +/- 1% of measurement range + 5% of measured value.

**Calibration:** Self Calibrating, Calibration Not Required

**Response Time:** T<sub>90</sub> = <2 minutes (diffusion)

### Power

**Input:** 18-30 VAC, 50-60 hz (half-wave rectified)

**Average Power Consumption:** ≤ 3 Watts average

### Outputs

**Linear Analog Output:** 0 to 10 VDC R<sub>OUT</sub> < 100 ohm

**Wiring Access:** Wall: remove front panel of transmitter to access wiring terminals and mounting plate.

Duct: 12" cable with 3-wire connection.



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