

Ventilation Controls Save Energy and Reduce Emissions in Commercial Spaces

Overcooling and overheating a building wastes money. These conditions occur when too much or not enough outside air is delivered to the respective space. In either case, proper CO₂-based ventilation control can eliminate this problem by bringing in the right amount of outside air to maintain the indoor environment, saving energy and reducing emissions.

Typically, ventilation systems are designed to deliver outside air based on the specific usage of a space as recommended in ASHRAE Standards 62.1 & 62.2. This works great as long as the building is always filled to capacity. When the building is not fully occupied, money and energy are wasted by conditioning outside air that is not needed and consequentially, adding to the building green house gas emissions. For example, when doors or windows are open in a retail space or cinema, you are ventilating with outside air. This introduction of outside air can influence CO₂ levels within the respective space.

Using Amphenol Advanced Sensors' CO₂-based ventilation control, the air is continually monitored so when the doors open and close, the influx of outside air is taken into account, eliminating the need for the air conditioning system to bring air in mechanically.

Using Amphenol Advanced Sensors' CO₂ sensors in conjunction with the HVAC control system (BAS), the CO₂ levels within the space will be maintained at an optimum level to ensure that the space is not over- or under-ventilated as conditions such as occupancy levels change or if doors or windows are open. This is known as demand-controlled ventilation (DCV). The requirements for DCV are outlined in ASHRAE Standard 90.1. DCV prevents the HVAC system from unnecessarily mechanically tempering additional outside air to introduce into the space.



How Much Does it Save?

Using Amphenol Advanced Sensors' Telaire CO₂ sensors and the local utility energy rates, you can estimate the expected energy savings when using demand-controlled ventilation (DCV).

The annual energy savings in a typical retail store across the nation are shown in Table 1. Savings calculation is based on a 10,000 ft² retail space occupied for 18 hours per day, seven days per week. Estimated savings can increase or decrease as the store size increases or decreases and/or the occupancy periods change.

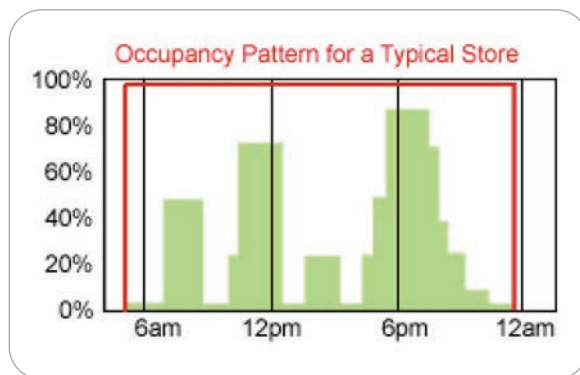
Based on these savings, the CO₂ sensors should pay for themselves within a few months while reducing the customer's utility costs and CO₂ emissions.

Estimated Annual Savings		
Location	Total \$	\$/sqft
Miami, FL	25,500.00	2.55
Baltimore, MD	16,300.00	1.63
Boston, MA	30,100.00	3.01
Chicago, Il	29,200.00	2.92
St Louis, MO	27,900.00	2.79
Houston, TX	20,300.00	2.03
Los Angeles, CA	9,700.00	0.97
Portland, OR	18,600.00	1.86
Toronto, Ont	36,500.00	3.25

Telaire CO₂ Sensors and Ventulator™ Program/Ventilation Control in Commercial Spaces

How Does it Work?

Demand-Controlled Ventilation (DCV) will adjust the outside air dampers as required based on the measured CO₂ levels within the respective space to maintain the proper ventilation rate (as per ASHRAE Standard 62.1 & 62.2). The graph below shows a typical occupancy pattern for a typical retail space or supermarket. With DCV, the amount of outside air being delivered to the respective space will follow the occupancy pattern. As occupancy increases or decreases throughout the day, the CO₂ sensor will continuously provide input to the HVAC control system allowing the BAS to adjust the amount of outdoor air entering the store accordingly. Most ventilation systems operate based on maximum occupancy.



Reduce Costs and Save Energy

Telaire has a complete line of low-cost carbon dioxide sensors that use patented infrared sensing technology and come with a lifetime calibration warranty (conditions apply). Telaire offers single-channel and dual-channel sensors, as well as CO₂ sensors for harsh environments. Telaire can meet your needs with multiple OEM CO₂ modules or wall-mount and duct-mount transmitters with both analog and digital output configurations. Telaire can provide the BAS with the needed data to properly adjust the outside air dampers to ensure that your HVAC system is operating as efficiently as possible, while giving your customers the assurance that they are being exposed to quality indoor air.

Amphenol
Advanced Sensors

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