

Westwood Plaza Saves Energy by Adding Controls to Ventilation System



Background

Westwood Plaza is a class "A" office building near the main UCLA campus in Los Angeles. The building includes a six level, 140,000 square foot underground parking garage with 375 parking stalls, used by the building tenants and customers visiting the local Westwood Village shopping area.

The garage is ventilated to a Los Angeles Building Code requirement of 1.5 cubic feet of air per minute per sq. ft. of enclosed area. Code requires the garage be ventilated during all occupied hours, resulting in the ventilation system running continuously. The estimated garage exhaust fan annual energy cost was \$17,900 by operating one 30 hp fan 24 hours per day 7 days per week.

The Opportunity

Exhaust fans typically run far more than required to maintain proper CO levels. Like most codes, the LA Building code allows fans to be controlled by sensors in parking garages as long as CO levels are maintained below 50 parts per million (ppm).

The building management company, CB Richard Ellis was guided by Energy Innovation Group (EIG) to determine if a CO sensor system could reduce energy costs with a fast payback.

EIG arranged for an energy analysis of the garage by AirTest Technologies, a major manufacturer of gas sensing and control systems, which indicated that energy costs could be reduced by 80% or greater by installing a CO sensor system to activate the ventilation system only as necessary to keep CO at acceptable levels.



The Project:

Based on the significant potential energy savings, Westwood Plaza commissioned EnerTech Systems Inc. to install 18 AirTest electrochemical carbon monoxide sensors. One sensor provides coverage for approximately 6000 square feet of parking area. An AirTest control panel provides control for the system. The panel monitors all 18 CO sensors and automatically activates ventilation when a target concentration of 35 ppm is measured anywhere in the garage (OSHA recommended exposure for 1 hour).

AirTest TR2000 CO Sensor and Control Panel



The Critical Technology Considerations

The accuracy of the sensor was the single most important factor, which is why electrochemical sensors, as described below, were selected over solid state sensors.

- Electrochemical sensors have good accuracy at the low levels (35 ppm or less) typically required in garages, which translates to better control and optimum energy savings.
- Electrochemical sensors are specific to only CO, meaning they cannot be fooled or contaminated by other gases, or by changes in humidity and temperature.
- Electrochemical sensors have a natural linear output that can easily be integrated into control strategies, i.e. variable speed drives.



- The AirTest TR2000 is used by building operators who value performance, reliability and ease of use over initial cost. The low profile sensors unobtrusively blend into the garage environment.
- The sensor requires replacement every 5 years at a cost of about \$60 each. A technician can perform an annual calibration check or adjustment of a sensor in about 15 minutes.

Summary

Robert Martinez, the building engineer, estimates fan run time has been reduced from 24 hours to about 45 minutes per day - over 90% reduction in fan run time with estimated savings of \$17,000 annually and a simple payback of 18 months.

At the same time, wear and tear on the fans is reduced, increasing exhaust fan life and decreasing maintenance requirements.

Summary of AirTest CO System Performance

General		
Parking Area	140,000	sq ft
Parking Spaces	375	
Parking Levels	6	
Ventilation Fan	30	hp
Operating Hours	24/7	
Energy		
Energy Cost	\$0.0914	/kwh
Before Annual kWh	195,433	
Before Annual Cost	\$17,863	
After Est Annual kWh	9,772	
After Est Annual Cost	\$893	
Annual Savings kWh	185,661	
Annual Savings	\$16,969	
Economics		
Project Cost	\$ 25,600	
Simple Payback	1.50	years

About Energy Innovation Group LLC

Energy Innovation Group (EIG) assists smaller product development companies with innovative energy-saving technologies to get their products into the marketplace mainstream.

EIG then guides companies, trade associations, cities, and property management companies on a national level to identify opportunities and take full advantage of these technologies.

