

NES Garage DCV Case Study: Cityline Sunnyvale Garage

Patent-pending system limiting power (kW) consumption to less than 2.7% of full-load capacity

The Property

Cityline Sunnyvale is a newly created, mixed-use neighborhood in the heart of Silicon Valley. Previously known as Sunnyvale Town Center, the project resides within walking distance of Sunnyvale’s downtown train station and historic Murphy Avenue retail district. The development possesses two enclosed garages: One on Taaffe Street; the other on Murphy Avenue. This case study focuses on the Murphy Avenue facility, a multi-level facility totaling 230,000 square feet which accommodates approximately 1,000 vehicles.



Cityline Sunnyvale

The Savings Opportunity

The mechanical ventilation system at the Murphy Avenue Garage is powered by three, 10-horsepower (HP) and four, 5-HP exhaust-fan motors, each of which runs continuously (24/7). With no means of control in place, the mechanical ventilation system consumes more than 281,400-kilowatt hours (kWh) per year, with a correlating peak kilowatt (kW) demand greater than 32 kW. The property’s utility rate is \$0.17/kWh, including fees and taxes. Factoring for fan runtimes (24/7) and total HP, the annual cost to ventilate the garage (again, with no means of control) amounts to more than \$47,800 – not including future utility rate increases.

The NES Solution

NES deployed its Digital TR 8025 Series system at the Murphy Avenue Garage. The system includes 48 BACnet-communicating, carbon monoxide (CO) sensors mounted throughout three levels of the garage, plus a total of seven (7) Danfoss VLT® variable frequency drives (VFDs) to control the garage’s exhaust-fan motors. The NES system controls the rate of ventilation based on carbon monoxide (CO) concentrations at any given juncture, with the sensors providing instantaneous feedback to the NES controller, which then relays speed commands — via the VFDs — to the garage’s fan motors, increasing and decreasing their speeds in proportion to CO readings.

This approach, when deployed in conjunction with proprietary NES sequencing logic, routinely captures kWh and peak kW demand savings in the range of 95% to 97% and sometimes higher.

The Results

Consumption	Without Controls	With NES System	\$ Savings	% Savings
Total kWh	281,410	7,598	273,812	97.3%
Total Cost @ \$0.17/kWh	\$47,840	\$1,292	\$46,548	97.3%
Total kW Demand	32.12	0.87	31.26	97.3%

Since commissioning the NES garage DCV system in December 2019, real-time data logging of kW consumption – a capability of NES controllers – shows it to be limiting the garage fan motors’ combined kWh consumption to less than 7,600 kWh/year. The cutback in consumption of 273,800-plus kWh a year represents a **97.3% savings**. So, too, does peak kW demand being reduced by more than 31 kW/year – all while the garage’s sizeable ventilation system runs continuously.

As a result, property management’s energy bill for ventilating the Cityline Sunnyvale Murphy Avenue Garage is reduced from \$47,800 a year (or \$4,000 a month) to roughly \$1,300 per year – or just \$108 a month.

About Nagle Energy Solutions (NES)

Nagle Energy Solutions, LLC (www.nagle-energy.com) designs, distributes and commissions its innovative, patented, demand-control ventilation (DCV) system for commercial garages. The NES product line of controllers is designed to provide optimum functionality and system features, including scalability – custom designed according to customer requirements – and an “open” communications platform which comports with many BMS and/or EMS communication protocols. Our sales and service capabilities extend nationally.

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