

Garage DCV System Case Study: 475 Sansome Street, San Francisco

NES FG-20 Digital System Delivers Impressive Results – 96.5% kWh and Peak kW Demand Savings

The Property

Located in the heart of San Francisco’s Financial District, 475 Sansome Street is a prestigious, 21-story, class A office property hosting a diverse mix of local and national companies. The property possesses a small, commercial garage, a portion of which is below grade, thereby requiring mechanical ventilation.

City Park (www.cityparksf.com) manages garage services for the property, and it is responsible for the utility charges generated in the course of normal business operations.

As much as two thirds (2/3) of a garage’s monthly / annual utility bill can be attributed to ventilation costs when parking operators run their garage fans according to established code requirements, i.e., during building-occupied hours. Recognizing Nagle Energy Solutions’ (NES) strong track record with its innovative – and proprietary – demand-control ventilation (DCV) system, City Park retained us to retrofit the 475 Sansome Street garage ventilation system.

The Savings Opportunity

By industry standards, the energy and cost savings opportunity at 475 Sansome was not substantial. That said, margins are thin for parking management companies, underscoring an emphasis on making every dollar count.

The below-grade level measures roughly 10,000 square feet, with one (1), 7.5-horsepower (HP) supply fan motor and one (1) 10-HP exhaust motor in operation 15 hours per day, Monday thru Friday.

Power (kW) measurements by NES showed the combined HP and runtimes of the two (2) garage fan motors — equating to 3,911 hours per year, per fan motor — resulted in 59,704 kWh being consumed annually, with a correlating peak-period demand of 15.27 kW. With an electric utility rate of \$0.1483/kWh, City Park’s cost to ventilate the below-grade portion of the garage amounted to \$8,854 annually.

The property was constructed when the maximum ventilation rate for commercial garages (as set by the International Mechanical Code) was 1.5 cubic feet per minute (cfm) per square foot. Today, due to catalytic converter technology, it’s half that – .75 cfm per square foot. Consequently, as it’s originally designed, even with a relatively small energy consumption footprint, 475 Sansome’s garage ventilation system drew twice as much power as necessary.

The NES System Solution & Results

In December 2014, NES installed our FG-20 digital, demand-control ventilation (DCV) system for commercial garages. The NES FG-20 is designed to serve as a “stand-alone” system, but it can be readily scaled to comport with building management systems with BACnet® and Modbus® communication protocols, delivering a high degree of functionality and value-added features, including Internet accessibility.



475 Sansome Street, San Francisco

The NES digital garage DCV system reduced both kWh consumption and peak kW demand 96.5%

Energy Use	Pre Installation	Post Installation	\$ Savings	% Savings
Total kWh	59,704	2,118	57,587	96.5%
Total Cost @ \$0.1483/kWh	\$ 8,854	\$ 314	\$ 8,540	96.5%
Total kW Demand	15.27	0.54	14.73	96.5%

Post-installation data logging of kW consumption showed the NES FG-20 garage DCV system reduced the garage fan motors’ combined kWh consumption by more than 57,500 kWh a year – a 96.5% savings.

Peak kW demand was reduced by 14.73 kW, which also equates to a 96.5% savings.

System Functionality & Benefits

275 Sansome Street's garage ventilation system was not controlled by a building management system (BMS), so City Park and property management agreed to install the NES FG-20 system in its "stand-alone" form.

The FG-20 comes standard with a 9" Android display providing HTML graphic capabilities (its mounted in the controller cover). The Android display enables City Park managers and the property's chief engineer and his staff to set and manage the system's operational parameters at the controller, with real-time views of system component performance, e.g., VFD and motor speeds, individual CO sensor readings, milliamp continuity, etc.

275 Sansome Street Retrofit Financial Summary	
Discount Rate	5.00%
Inflation Rate (2.4% over last 10 years)	2.49%
Annual Savings	\$ 8,540
Cost of Project	\$ 22,147
Payback Period In Months	31
NPV net of investment	\$ 83,973
Minimum cash inflow	\$ 105,955

In addition to immediately reducing its operating costs and thereby increasing its profit margins at the site, City Park received an incentive / rebate from Pacific Gas & Electric (PG&E) of approximately \$6,000 for the energy savings obtained by the NES system. After rebate, the system pays for itself in just 31 months.

Additionally, the net present value (NPV) on an installation cost of \$22,150 is roughly \$84,000. The minimum cash inflow the NES DCV system will generate based on the energy savings it will capture throughout its 15-year lifespan amounts to approximately \$105,600.

About Nagle Energy Solutions (NES)

Nagle Energy Solutions, LLC (www.nagle-energy.com) is a manufacturer, distributor and installer of an innovative demand-control ventilation (DCV) system for commercial garages that reduces energy consumption by an average of 93% – with quantifiable savings as high as 97% achieved – all while leaving your garage fan motors running.

Our sales and service capabilities extend nationally and internationally.

NES digital controllers and peripherals are scalable and conform to several building management system (BMS) and energy management system (EMS) communication platforms, as well as monitor / report on energy consumption/savings.

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