

NES DCV System Case Study: Main Street Cupertino Loft Residences Garage

Patent-pending System Limiting power (kW) Consumption to Less than 2.8% of Full-load Capacity

The Property

Developed by Sand Hill Property Company, Main Street Cupertino Lofts is part of a newly created, mixed-use neighborhood in the heart of Silicon Valley known as Main Street Cupertino (www.mainstreetcupertino.com). Main Street Lofts is the second location in the Main Street Cupertino development at which NES has installed its patent-pending garage ventilation controls technology. In the summer of 2015, during the first phase of Main Street Cupertino construction efforts, NES installed its digital system in the development’s primary garage, where it continues to capture a 97% energy savings.



Main Street Cupertino Residence Lofts

Construction of the Loft residence building took place during the second phase of the Main Street development’s buildout. The property includes a two-level, below-grade, 92,000 square foot garage, at which NES installed and commissioned its system in February 2018.

The Savings Opportunity

The mechanical ventilation system for the Lofts garage is powered by two exhaust fan-motor units possessing a combined 47.5 horsepower (HP): one 40-HP fan motor and one 7.5-HP fan motor, each powering respective centrifugal fan units. According to California code, the garage ventilation system must run 24/7 in a subterranean garage with people residing above it. With no means of control in place and running 24/7, the garage-fan motor units would consume slightly more than 333,200-kilowatt hours (kWh) per year, with a correlating peak kilowatt (kW) demand greater than 38 kW. The property’s utility rate is \$0.205/kWh, so after factoring for fan runtimes and total HP, the annual cost to ventilate the garage with no means of control amounts to more than \$68,300 – not including future utility rate increases.

The NES Solution

NES deployed its Digital TR Series demand-control ventilation (DCV) system in the Main Street Cupertino Lofts garage. The system included 23 BACnet-communicating, carbon monoxide (CO) sensors mounted throughout both levels of the garage. The sensors provide instantaneous feedback to the NES controller, which then relays speed commands via Danfoss VLT® variable frequency drives (VFDs) to the garage’s exhaust-fan motors, increasing and decreasing motor speeds based on CO concentrations at a given time. This approach, when deployed with the proprietary and patent-pending NES control logic, routinely captures kWh and peak kW demand savings in the range of 95% – and, in the case of the Main Street Lofts garage, greater.

The Results

Since the time of commissioning, real-time data logging of kW consumption – a capability of our TR Series of controllers – shows the NES garage DCV system is limiting the garage fan motors’ combined kWh consumption to just 9,200 kWh/year, providing a savings of roughly 324,000 kWh a year. That represents a **97.2% savings**. Peak kW demand is being reduced by 37 kW/year, which also equates to a **97.2% savings** – all while the property’s large garage ventilation fans run continuously (24/7).

Consumption	Without NES Controls	With NES TR System	Savings	% Savings
Total kWh Consumption	333,262	9,220	324,042	97.2%
Total Cost @ \$0.2050/kWh	\$ 68,319	\$ 1,890	\$ 66,429	97.2%
Total kW Demand	38.04	1.05	36.99	97.2%

As a result, property management’s energy bill for ventilating the Main Street Cupertino Loft Residence garage is reduced from \$68,300 a year (or \$5,700 a month) to just \$1,900 per year, i.e., \$150 a month.

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 95% – with quantifiable savings as high as 97% achieved – all while leaving your garage fan motors running. Our sales and service capabilities extend nationally.



The NES TR 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.

Moreover, NES TR controllers integrate a web server that enables building owners / managers to conduct system status checks and adjust operational parameters – from anywhere in the world.

The NES system further distinguishes itself by its ability to interface with variable frequency drive (VFD) technology to track real-time energy consumption / savings – a valuable tool in today’s energy conscious environment.

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