

Energy Conscious Blueprint



Commercial Kitchen Variable Volume Exhaust Hoods

CL&P and UI can help you save energy, money and the environment. It's our "energy-efficiency ethic." Let us help you manage your energy costs and protect the environment.

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Commercial Kitchen Exhaust Hoods

Commercial kitchen exhaust hoods remove and contain grease, smoke and volatile organic compounds from the surrounding air to prevent fire and health hazards. All commercial kitchens have significant amounts of idle cooking time when equipment is not fully utilized. Standard kitchen exhaust hoods use enormous amounts of energy because they operate at a high constant rate and require large amounts of replacement air to cool/heat the kitchen.

What are Variable Volume Commercial Kitchen Exhaust Hoods?

Variable Volume Commercial Kitchen Exhaust Hoods are energy efficient because they control exhaust and make-up air fan speeds according to usage. The fan speeds are controlled by two sensors installed inside the kitchen hood—an Optical Sensor and Temperature Sensor. Upon detecting smoke, vapors or excessive heat inside the hood, control signals are sent to a microprocessor to operate the fans at full speed until all contaminants or high heat conditions are removed. These controls operate the exhaust fans and make-up air unit according to fluctuating usage, which results in reduce energy consumption and increased savings to commercial kitchen operators.

How can my business benefit?

CL&P's Energy Conscious Blueprint programs provide energy incentives to help offset the difference in installed costs between standard and more energy-efficient equipment installations.

The use of Variable Volume Commercial Kitchen Exhaust Hoods in commercial kitchen, schools, hospitals, and restaurants results in 10% to 50% energy savings compared to standard exhaust hood installations.

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Case Study: Dining Facility

CL&P's Conservation and Load Management Department recently worked with a major university on energy-saving improvements for a 70,000 square foot dining facility. Twelve kitchen exhaust hoods were installed with Variable Frequency Drives (VFD) to update the facility's kitchen hood ventilation system. A VFD controls the speed of the exhaust fans via smoke and temperature control within each kitchen hood. The exhaust hoods are now interconnected with the facility's heating and air conditioning systems to provide the required make-up air. The projected electrical energy savings for this facility are 126,244 kWh annually. The university received \$83,900 as an incentive payment for installing the energy-efficiency measures.

Dining Facility Savings*	
Demand kW Savings	30 kW
Total Fan Savings	100,739 kWh
Total Cooling Savings (Make-Up Air)	25,506 kWh
Total Annual Savings	126,244 kWh
Lifetime Savings	1,893,663 kWh

*The calculations above do not account for additional heating savings for make-up air.

Present Code Considerations

A variance may be required from local and State code officials for the installation of a Variable Volume Commercial Kitchen Exhaust Hood. Currently Connecticut State codes reference NFPA 96 1998 Edition, Section 5-2.1 for kitchen hood ventilation. This edition states that the minimum duct velocity shall not be less than 1,500 square feet per minute. The new NFPA 96 2001 Edition, Section 8.2.1.1 with revised errata 96-01-01 states a new minimum duct velocity of 500 feet per minute.



www.CTSavesEnergy.org

Connecticut's Energy Efficiency Programs are funded by the Conservation Charge on customer electric bills.