

# Vantage Energy Solutions

## Ensuring Environmental Integrity

Your facility management team works hard to avoid unnecessary energy consumption and save money by investing in both infrastructure and employees. When they have the tools to manage every cubic foot of conditioned air, your facilities will use less energy, reduce the carbon footprint and lead the way toward sustainability.

Phoenix Controls Vantage Energy Solutions help reduce consumption for a wide variety of complex facilities that can be tailored to energy program goals—whether for wet chemistry with fume hoods, life science with vivariums, healthcare with operating rooms, or R&D with cleanrooms.

Many of our solutions qualify for financial incentives that lower up-front costs. Payback begins immediately with lower energy consumption and reduced utility costs.



## Reaching Operational Goals

It's no secret that research buildings are by far the highest net energy consumers per square foot on any campus. The national average cost to condition and move one cubic foot per minute (CFM) of air in a 100 percent exhaust system ranges from \$6 to \$15 annually.

- At the Broad Institute, moving 300,000 CFM annually translated to a yearly cost of \$2.4 million.
- HVAC systems at Arizona State University's Biodesign Institute accounted for nearly 74 percent of the lab's utility costs.
- UPenn Chemistry Laboratories (Chem 73) conditioned and exhausted more than 280,000 CFM at all times. At \$10 per CFM per year, ventilation at Chem 73 had an annual expense of nearly \$3 million.

With Vantage Energy Solutions energy costs were reduced by up to 50% (depending on infrastructure).

## Consider This

Everything in a building takes energy. Energy was consumed to create the building materials. Energy is consumed to maintain the completed structure. Facility upgrades and change overs are energy consumers too. One way or another, all of these turn into facility costs and even affect LEED points during evaluation.

When Methodist Hospital (Indiana) switched to Phoenix Controls variable airflow control, it was a retrofit that had to work within the existing ductwork. Unlike other airflow devices that use sensors, Phoenix Controls valves meter airflow and get to the desired position quickly. They also have a much larger turndown range to help lower air change rates in the OR when unoccupied. This was a significant energy saver.

## Savings With Airflow Control

Variable Air Volume (VAV) ventilation is the quickest and easiest way to reduce energy consumption.

With the Vantage airflow control solution, Phoenix Controls venturi valves are fully compatible with lab, healthcare, and life science applications—easy to integrate, easy to configure, and designed to reduce energy consumption.



### High Airflow Turndown Ratio

Effective VAV starts with a venturi valve that supports a high turndown ratio, allowing you to lower air change rates more effectively during unoccupied times and take advantage of ANSI's current Z9.5 fume hood minimum exhaust ventilation flow guidelines.

### Lower Pressure Performance

Phoenix Controls venturi valves provide accurate, reliable airflow control at 0.3 inches w.c. at any flow within their specified range—this enables implementation of strategies such as fan static reset to assist in achieving energy reduction goals.

### Shut-off Capability

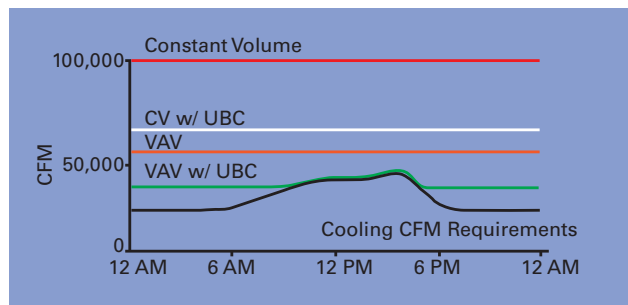
When a space is unoccupied, or during hibernation modes for a fume hood, complete shut-off means conditioned air isn't vented needlessly, but room pressurization and safety are always maintained.

## Usage Based Controls®

Usage Based Controls (UBC® controls) incorporate the Zone Presence Sensor® (also known as ZPS® sensor), sash sensors and the Sentry Fume Hood Display (FHD). These products work together to sense when an operator is at a fume hood and change airflow accordingly between occupied (in-use) and unoccupied (idle) settings, maintaining safety in the workplace.

UBC controls are localized at the fume hood and can be remotely monitored by the building management system. This allows the safety group to monitor sash compliance of closing the fume hood sash when no one is at the fume hood. Good sash compliance not only provides a higher degree of safety but will also reduce exhaust flows and avoid higher energy consumption.

When UBC is combined with a VAV control system and good sash management it is possible to realize up to an 80% energy savings without compromising operator safety.



The ZPS sensor signals adjustments to fume hood exhaust valves, maintaining safety and volumetric offset. The sensor can also be used as a compliance device, monitoring both the position of a fume hood sash and presence of someone at the hood, enhancing energy efficiency and safety.

A ZPS sensor used with a Sentry Fume Hood Display can reduce energy use by up to 40%.



## Fume Hood Display (FHD)

The Fume Hood Display is an interactive device used with the Vantage valve controller that provides user feedback to promote good sash management for reducing wasted airflow at the fume hood with localized monitoring and commands.

## Demand-Based Ventilation

Demand-Based Ventilation monitors indoor air quality and air exchange, adjusting the air change rate based on occupancy or air quality. Once-through conditioned airflow is minimized, which lowers energy consumption. Phoenix Controls can build this into an airflow system in two ways:

### Indoor Air Quality (IAQ) Monitoring

When indoor air meets quality standards, IAQ Monitoring can reduce the air change rate, re-circulate a portion of exhaust air, or both, and still ensure safety is maintained. If contamination is detected in a vivarium, for example, recirculation is shut off within a second after a command has been received, and airflow is returned to 100% outside air. If a spill is detected, exhaust air is increased until air quality returns to safe conditions or is manually overridden.

### Fan Static Reset (FSR)

Using a pressure transducer in the ductwork that continuously sends data to the building management system (BMS), ventilation fans are kept at the lowest speed that still maintains the static pressure required for the targeted airflow.

## System Management Anywhere

Even an automated BMS doesn't always provide the monitoring data you need. With the Vantage solution, web-based dashboards fill the information gap.

Dashboards control and monitor Phoenix Controls equipment as well as third-party airflow control systems, sensors, and monitors on the BACnet® network. Data is presented in tables, gauges, graphs, or rankings based on configurable filters.

Dashboards can be customized for energy programs and facilities with site-specific default dashboards, and still have the capability for users to create their own custom dashboards.

For example, for a fume hood application, this new technology helps to identify poor fume hood usage, specifically sash opening percent, occupancy status, hood flow, hood override operation, and hood flow waste.



*This example of a hood usage trend graph from Phoenix Controls Supervisor dashboard shows hood flow, wasted flow, and sash open percent as well as occupancy of the hood.*

## Total Control Solutions: Don't Settle for "Good Enough"

From monitoring a lab's air change rates for occupancy to monitoring exhaust usage based on sash heights, it is imperative to have a solution that provides accurate airflow control and actionable data to increase efficiency in sensitive environments.

An energy solution that combines products can make operations easier for facility managers and can identify the cause behind energy waste and potentially unsafe conditions. While safety is always the number one concern in critical spaces, quality and efficiency don't need to be compromised to sustain it.

## Energy Conservation Results

### University of Pennsylvania

Replaced constant volume (CV) operation with VAV in its Chemistry Building 73 laboratories, reducing the facilities airflow from 280,000 CFM to 100,000 CFM. UPenn is saving \$1,800,000 a year.

### Arizona State University

The Biodesign Institute upgraded from CV to VAV and UBC controls, reducing average air changes in the vivariums from 20 to 10 times per hour, and in the general lab areas from 12 to 4 while occupied. The 66 hoods upgraded with UBC controls contributed to over \$200,000 in annual savings and a 30% reduction in their carbon footprint.

Further details or case studies about these project examples are available from your local Phoenix Controls representative or at [www.phoenixcontrols.com](http://www.phoenixcontrols.com)

### Stanford University

Realized a 46% reduction in energy consumption by replacing CV with VAV, adding Zone Presence Sensors at the fume hoods, and installing direct digital control and IAQ systems in its Stauffer I Laboratory.

### McGill University

The Otto Maass Chemistry Building reduced energy consumption by 59%, saving \$1,300,000 annually, as a result of a comprehensive retrofit strategy that employed VAV fume hoods with Zone Presence Sensors for airflow reduction, diversity, and compliance management.

For over 30 years, Phoenix Controls valves have been trusted to ensure the integrity of critical environments. More than 1,000,000 Phoenix Controls valves installed worldwide make a difference every day; creating a safer, more sustainable workplace and healthier planet.

- Phoenix Controls high-performance airflow controls drive energy efficiency across all platforms. Valves and peripherals are engineered to enable demand-based ventilation, usage based control, high turndown ratios, and reduced air changes.
- With Vantage Energy Solutions, you can interactively monitor critical spaces, react immediately to changing conditions, and gather facility data to create a usable management resource now and in the future.



For additional information and a listing of our global offices, please visit our web site at [www.phoenixcontrols.com](http://www.phoenixcontrols.com) or call (800) 340-0007.

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