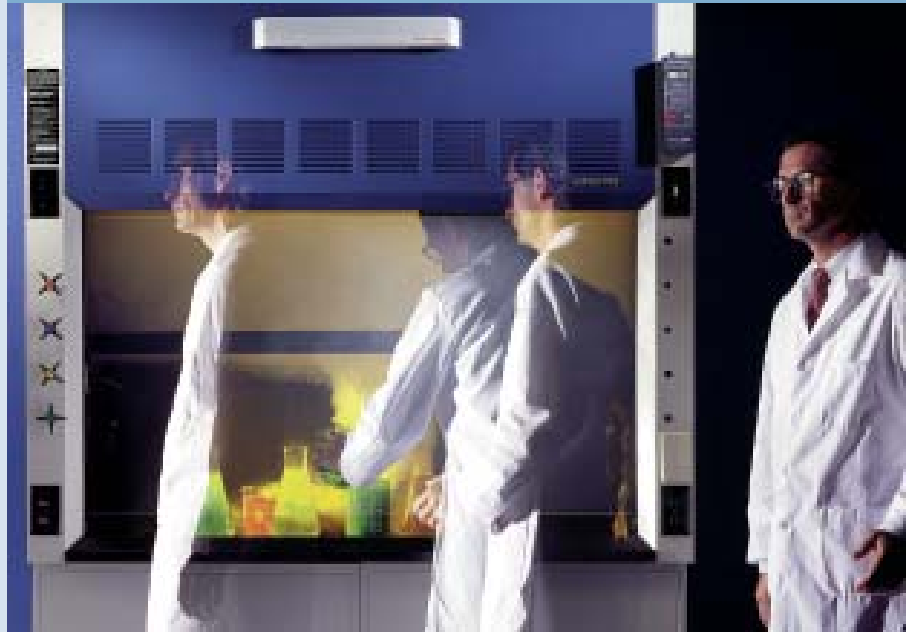


USAGE BASED CONTROLS®

For new construction or renovation projects, Usage Based Controls (UBC®) from Phoenix Controls Corporation can increase the capacity and maintain the safe operation of laboratory research facilities. UBC allows designers to confidently apply the concept of diversity—sizing mechanical equipment for maximum probable loads instead of maximum possible loads.

Innovation at Work



Examples of successful UBC applications include:

University of Richmond

Richmond, Virginia

Type of lab: Chemistry

Challenge: Increase the number of fume hoods from 40 to 60 while maintaining the net lab square footage. Eliminate odor and pressurization problems.

Solution: Expand the lab, fitting all fume hoods with the Zone Presence Sensor® (ZPS®). No additional air handling capacity was required.

Integration partner: Staefa

Result: Total exhaust has never exceeded 28,000 cfm—a 50% flow reduction compared to a constant volume system. Energy cost savings are \$72,000 annually, with no re-balancing costs in three years of operation. Odor and pressurization problems have been eliminated.

Rhône Poulenc

Raleigh, North Carolina

Type of lab: Veterinary pharmaceutical

Challenge: Staying within budget, provide a better alternative to simply manifolded 127 constant volume fume hoods in a lab retrofit.

Solution: Install a Zone Presence Sensor on each constant volume fume hood.

Integration partner: Honeywell

Result: \$100,000 yearly energy savings with UBC versus the cost of operating a constant volume system.

Alcorn State University

Lorman, Mississippi

Type of lab: Chemistry

Challenge: Energy efficient design

Solution: Taking a diversity factor of 80%, the mechanical equipment (chiller) was sized for 12,600 cfm instead of the 15,750 cfm required for a constant volume system.

Result: First cost savings and energy savings with UBC represented less than one-year payback.

Brigham Young University

Provo, Utah

Type of lab: Research and teaching

Challenge: Aside from low energy and operating costs, it was very important that the system be easy to maintain. Minimize the number and size of stacks on the roof to aesthetically blend the building with the rest of the campus.

Solution: Install variable air volume controls with Zone Presence Sensors to reduce energy costs. Incorporate a heat recovery system into the exhaust configuration, and raise the water temperature to 48 degrees instead of 42-43 degrees. Manifold the fume hood exhaust system to address the aesthetic issues and simplify system maintenance.

Result: Electrical, heating and cooling costs were \$369,126 for the first year compared to CV estimates of \$520,000. The university realized a payback on the equipment in less than 8 months.

Connecticut College

New London, Connecticut

Type of lab: Research and teaching

Challenge: Renovate a laboratory built in the 1950s into a state-of-the-art facility meeting current safety standards. All work had to be completed over the summer break.

Solution: Install 24 fume hoods with variable air volume controls including Zone Presence Sensors to maximize energy efficiency. Applying a diversity design, the mechanical system was designed to 26,000 cfm versus the 40,000 cfm required of a constant volume system.

Integration Partner: Landis & Staefa

Result: Capital costs were reduced by \$50,000 and after one full year of operation, at 36.5% diversity, supply capacity significantly exceeded demand.

Milliken Research

Spartanburg, North Carolina

Type of lab: Chemistry

Challenge: Increase the number of fume hoods from 23 to 46 using the existing mechanical system. Minimize any downtime during installation.

Solution: Apply 50% diversity and fit all fume hoods with the Zone Presence Sensors to guarantee lower flows when not in use.

Result: Owner did not have to construct a new facility. Operations continued during installation with minimum disturbance, and work was completed in three months.

Wright State University

Dayton, Ohio

Type of lab: Science building

Challenge: Meet undergraduate programming requirement of 24 fume hoods—an increase of 20%. Air balance report showed building negative in excess of 30,000 cfm. No funds were available to provide additional make-up air.

Solution: Add four fume hoods with Zone Presence Sensors, retrofit original 20 fume hoods with ZPS.

Integration partner: Johnson Controls

Result: Installation of UBC reduced the building negative to 15,000 cfm—even with the additional fume hoods. A second floor retrofit is scheduled to bring the building into balance.

University of California

Irvine, California

Type of lab: Organic chemistry

Challenge: Add three fume hoods to a lab with five CV fume hoods with individual fans operating at capacity. Work had to be completed in three months and it was a criteria that all the organic chemists remain in one building.

Solution: Convert existing fume hoods to VAV with Zone Presence Sensors. Add three new VAV fume hoods to a manifold using the five existing fans.

Result: UBC satisfied the need to provide one fume hood per researcher, using the existing mechanical system.

Allelix Biopharmaceuticals

Canada

Type of lab: Medicinal chemistry

Challenge: Use existing laboratory space, fit eight six-foot fume hoods into 2,040 square feet. Design was further constrained by low level ducts passing through the room, claiming 20% of ceiling area.

Solution: Depart from past practice of using constant volume airflow control by installing a VAV system. Applying 54% diversity with UBC reduced the required airflow from 13,000 cfm to 7,000 cfm.

Integration partner: Johnson Controls

Result: Saved \$48,000 on the first cost of the HVAC system, generating annual energy savings of \$30,320 compared to a constant volume system.

Ethyl Corporation

Sauget, Illinois

Type of lab: Testing for industrial additives.

Challenge: Add 18 new fume hoods and improve safety, indoor air quality and energy efficiency.

Solution: Renovate the lab, installing a central VAV exhaust system and fume hood controls with the Zone Presence Sensor.

Integration partner: Andover Controls

Result: Reduction in required supply air from 32,000 cfm to 14,600. Initial required steam heating capacity reduced by 54%. Use of a glycol heat recovery system reduced the initial size of the primary cooling system by 20 tons of refrigeration.

Honeywell

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For additional information and a listing of our global offices, please visit our Web site at www.phoenixcontrols.com or call (800) 340-0007.

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