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Case Study – Carrier University Training Center

EDUCATION / HEALTH CARE / LODGING / GOVERNMENT / OFFICE BUILDING / RETAIL / SPECIAL

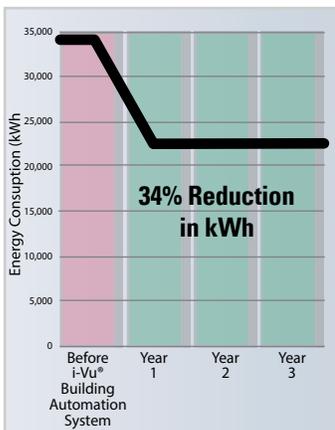


i-Vu® Building Automation System Delivers State of the Art Comfort and Efficiency at Carrier University Training Center

OBJECTIVES

The William Bynum Education Center was built in 1974 and is home to Carrier University. The facility houses classrooms and hands-on laboratories for heating, ventilation and air conditioning (HVAC) students which distinguish Carrier as an industry leader. Carrier University also provides accredited training for NATE (North American Technician Excellence) certification as well as Institute for Sustainability Symposiums on climate leadership topics. Three original 25-ton outdoor condensing units and air terminals were used to provide cooling at the facility. The condensing units and air terminals were in good condition but their controls did not provide the energy efficiency, comfort conditions and remote system access now available. Carrier drew on its own pool of experts to design the upgrade to the system with the twin goals of state of the art occupant comfort and maximal energy efficiency.

Average Monthly Energy Consumption Fell from 34,426 kWh to 22,706 kWh.



SOLUTION

Due to the reliability and longevity of Carrier equipment, and in the spirit of sustainable use of resources, Carrier engineers were able to design an upgrade that incorporated much of the existing equipment. The upgrade also featured the addition of the i-Vu® Building Automation System, a digital controls network and user interface that permits easy access, monitoring and adjustment of the Carrier University HVAC system from any web-enabled location. These upgrades, including the addition of temperature and CO₂ sensors in each classroom and office, have enabled the existing split system to create a positive-pressure indoor environment with ventilation precisely controlled for occupancy, while reducing energy demand by one-third.

The Carrier University system upgrade, which featured the addition of the i-Vu® Building Automation System, reduced annual energy consumption by an average of 34 percent.



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“This precise level of control was achieved in tandem with a 34 percent reduction in kWh, a savings well in keeping with the Carrier tradition of leadership in energy performance.”

Brian Lynch, Manager,
Carrier University

SYNOPSIS

The William Bynum Education Center is a 19,500ft² single-story building that is home to Carrier University. The facility houses classrooms and hands-on laboratories for heating, ventilation and air conditioning (HVAC) students, who participate in the rigorous ongoing education that marks Carrier as an industry leader. Carrier University also provides accredited training for NATE (North American Technician Excellence) certification as well as Institute for Sustainability Symposiums on climate leadership topics. The lab provides commercial and residential HVAC products that students learn to maintain and repair. The facility, built in 1974, also houses offices for trainers and support staff, as well as a production studio where classes are prepared for web-based delivery to remote classrooms. In addition to the permanent presence of staff members, hundreds of Carrier University students pass through the facility each year.

Carrier University utilized two HVAC systems, including a constant volume system for the open lab area and a variable air volume system for the classrooms and offices. Three original 25-ton Carrier condensing units were used to provide cooling, while the air system consisted of air terminals. After many years of reliable service, the Carrier condensing units and air terminals were still in good condition but the system lacked a cutting edge building automation system to provide maximal efficiency and occupant comfort. Spring and fall — which in the Northeastern U.S. are characterized by fluctuations of temperature and therefore varying heating and cooling needs — posed a particular challenge to the original system. After evaluating the efficiency of existing equipment, Carrier drew on its own pool of experts to design the upgrade to the system to attain the twin goals of state of the art occupant comfort and maximal energy efficiency.

Cooling-only air terminals were installed in each classroom trunk line to provide pressure-independent, digital control of air volume supplied to each space. The existing control system was replaced with the i-Vu[®] Building Automation System for easy access, monitoring and adjustment from any web-enabled location. Fan-powered series boxes were also installed in the office area to provide supplemental heat. Inverters were added to both supply and return fans.

These enhancements, plus the addition of temperature and CO₂ sensors in each classroom and office, have enabled the modified system to provide a positive-pressure indoor environment with ventilation precisely controlled for occupancy. Demand controlled ventilation (DCV) is also utilized to optimize energy usage. These modifications have enabled the system to meet cooling demand with only two of the three original condensing units.

Brian Lynch, Manager, Carrier University, said, “The renovations at Carrier University have optimized indoor air quality and occupant comfort in every season of the year. We have considerable variation in demand across the offices, classrooms and laboratory, but with the upgraded system, all spaces have the right temperature, the right pressure and the right mix of air, no matter what the time of day or level of occupancy. And this precise level of control was achieved in tandem with a 34 percent reduction in kWh, a savings well in keeping with the Carrier tradition of leadership in energy performance. In addition, the i-Vu Building Automation System provides trend information that alerts facilities staff to potential problems before they result in energy inefficiency.”

The upgrade also served the educational mission of Carrier University, enabling the building to become a living laboratory as students of Carrier University participated in this hands-on learning experience in systems enhancement and building automation upgrades.

Project Summary

Location: Syracuse, NY

Project Type: Retrofit

Building Size: 19,500ft²

Built: 1974

Building Usage: Education

Objectives: Improve occupant comfort, including appropriate ventilation; reduce energy consumption

Equipment: 38A split system; 35E single-duct terminal units; 45 series mixing boxes

Controls: i-Vu[®] Plus Building Automation System; i-Vu Open Link; BACview handheld interface; programmable controllers; VAV duct controllers; SPT Standard, Plus and Pro sensors

Major Decision Drivers: Good condition of existing split system and air distribution effectiveness of existing air terminal units; capabilities of i-Vu interface

Unique Features: Provided Carrier University students a hands-on HVAC learning experience

Installation Date: 2010