



CASE STUDY

Office Building

Facility at a glance

Name

823 Congress office building

Location

Austin, TX USA

Facility size

15-story Class A office building

Issue

First floor tenant, Austin Museum of Art

Solution

A 425-ton Daikin Model WSC single compressor centrifugal chiller

Following the chiller room modernizations recommended by Daikin Service, the 823 Congress building in downtown Austin saved 188,300 kWh in annual electrical usage and received a sizable rebate from the local utility.

Austin office building sees Texas-sized savings thanks to Daikin Service and chiller plant modernization

Quiet operation and energy efficiency topped the list of requirements for replacing an aging chiller in the prominent 823 Congress office building in Austin, Texas. The local Daikin Service team aided the building's owners by not only providing the equipment, but also by performing building analysis and project management to help meet the customer's requirements in true turnkey fashion.

The 823 Congress building is located at Ninth Street and Congress Avenue, in the heart of downtown Austin and only a few blocks from the Texas state capitol. The 15-story Class A office building is owned and managed by Austin-based T. Stacy & Associates. Tenants in the building include the Austin Museum of Art which occupies about two-thirds of the first floor.

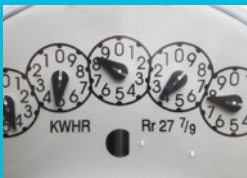
"Our challenge was to find a chiller that could run efficiently at 100 percent without affecting the noise level in the museum space. The main chiller needs to run a lot of overtime because the museum is open six days a week, however, because the museum houses many temperature-sensitive materials the system needs to operate 24/7," said Jack Beverly, director of engineering with T. Stacy & Associates, "Noise is also a significant concern because the building's central plant is located beneath the museum in a subbasement."

Although the existing chiller was well maintained through 25-years of operation, the chilled water tubes were failing as the unit neared the end of its expected life cycle, according to Beverly. He realized that replacing the old chiller with a unit of modern technology would greatly improve both energy efficiency and reliability. So T. Stacy & Associates turned to Daikin Service who recommended a 425-ton Daikin Model WSC single compressor centrifugal chiller after an analysis of the building's HVAC system. That analysis also identified additional improvements that could be made to pumps and piping to provide even more energy savings.

The team from T. Stacy & Associates worked together with Daikin Service to properly plan the replacement project so that the tenants would not experience any loss of cooling. Even though the building is used virtually on a 24/7 basis. "We retrofitted the piping without interrupting building service," said a representative from the local Daikin Service office.

The equipment exchange was challenging because of limited access to the mechanical room through a floor opening on the first floor of the building from the alleyway, requiring a rigging forklift. The old chiller and its piping were dismantled and removed, then the new chiller was put in place with minor field modifications. The equipment exchange was timed for November, 2007 so that the system could utilize an existing backup chiller to provide any necessary cooling.

Energy Savings Summary



Electrical usage saved
188,300 kWh per year

Utility rebate
\$16,775 from Austin Energy

The entire project included the installation of the Daikin centrifugal chiller, with variable frequency drive, along with two new condenser pumps and two new evaporator pumps, all which contribute to the system energy savings. Beverly noted that Daikin worked closely with Bay & Associates, the consulting engineering firm on the project, to design and correctly size the new chiller and pumps for optimum efficiency and performance.

Randy Garner, construction manager with T. Stacy & Associates in Austin credits the experience of the Daikin Service team to the success of the new system. "Their early involvement made the engineering of the project a lot easier."



The new Daikin centrifugal chiller arrives partially disassembled for installation in the ground floor of the 823 Congress building.

Rising above the competition

The engineering due-diligence by Bay & Associates included a value comparison of chillers from not only Daikin but also two other manufacturers. The project team visited local office buildings to observe the noise level all three chillers types. "We performed a full noise analysis, running the chillers at their loudest. "The Daikin chiller was the quietest of the machines at 100 percent load," Beverly said.

In addition to low noise, Garner said that the unit caused very little vibration of the column structure above it. He estimates the cost of the Daikin chiller, with its superior energy rating and quiet performance, came in at least 30 percent less than comparable models from other manufacturers. "Daikin was excellent to work with. Even if the other manufacturers produced the same chillers at the same price, we'd still go with Daikin because of the service and the noise factor."

Once the purchase order was issued, the project team visited the Daikin chiller manufacturing plant in Staunton, Virginia to witness their unit being run-tested at their specific operating conditions.

The BACnet® communications module of the Daikin chiller allowed for easy integration with the Alerton building automation system installed at the 823 Congress building.

An important aspect of the chiller replacement was the safety upgrade of the chiller plant room. Daikin Service worked closely with the owner, local municipal authorities and Bay & Associates to make the mechanical room compliant with the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 15 titled Safety Standard for Refrigeration Systems.

In line with other ASHRAE Standards, the HFC-134a refrigerant used by the Daikin centrifugal chiller is rated A1 (best) by ASHRAE Standard 34 (lower toxicity, no flame propagation). HFC-134a refrigerant also has no ozone depletion potential and no phaseout schedule.

Ongoing savings

Beverly reports the new Daikin chiller and updated HVAC system allow T. Stacy & Associates to save approximately 188,300 kWh of electrical usage per year at 823 Congress. "The efficiency rating of this Daikin Model WSC chiller was the highest among its competitors," he said. Added incentive came from a rebate totaling \$16,775 from Austin Energy based on the kilowatt per ton savings of the unit.

After several months with the new system operating, T. Stacy & Associates look forward to continued energy savings, quieter operation and peace of mind. "Daikin's level of service was outstanding," Beverly says. "As a real estate developer and property management company, T. Stacy & Associates will definitely consider Daikin equipment for our future building needs, including the upcoming construction of one of the tallest office buildings in Texas."