The centerpiece of Flagler College is the grand Ponce de Léon Hall, a former luxury resort hotel now listed on the National Register of Historic Places.

CASE STUDY

Higher Education

Facility at a glance

Name
Kenan Hall, Flagler College

Location
St. Augustine, FL USA

Facility size
50,000 ft² facility

Issue
Maintain the quiet atmosphere while trying to reduce energy costs.

Solution
Daikin 150-ton Magnitude®, magnetic bearing compressor chiller

Daikin Chiller Technology Improves Climate for Learning at Flagler College

As part of a recent renovation at Flagler College in St. Augustine, an innovative new air conditioning chiller was installed in Kenan Hall, the main academic building of the campus. Because this 50,000-square foot building houses classrooms, lecture halls, and faculty offices, it was important to maintain the quiet atmosphere while trying to reduce energy costs.

Flagler College is located on 19 acres, the centerpiece of which is the grand Ponce de Léon Hall, a former luxury resort hotel now listed on the National Register of Historic Places. Phase I of the renovation included replacing an old inefficient chiller in portions of the building originally constructed in 1888. A new Daikin 150-ton Magnitude, magnetic bearing compressor chiller was installed to deliver both energy savings and ultra-quiet operation.

"This is the first Magnitude chiller to be installed in northeast Florida and only the second in the entire state," said Clarke Story of Brooks Air Systems, the Daikin representative firm in Jacksonville. "It was installed a few weeks ago but the quiet sound level was immediately noticeable. The Magnitude centrifugal compressor chiller was installed next to an older screw compressor chiller and the new chiller is dramatically quieter than the other machine. In fact, when the Daikin Magnitude chiller is running, the pumps in the mechanical room are louder than the chiller."

The magnetic bearings of the Magnitude compressor eliminate the metal-to-metal contact noise of conventional bearings. And the direct drive design means inherently quieter operation because there is no gear noise. The overall result is sound pressure ratings for the Magnitude chiller as low as 77 dBA per ARI Standard 575.

In addition to the quiet operation, the Magnitude chiller provides high energy efficiency with part load performance as low as 0.375 kW per ton by eliminating the high friction losses of typical centrifugal compressors. Variable frequency drives and digital controls further improve efficiency through the entire operating range.

Frank Riggle, owner's representative for construction on the project, confirmed the energy savings that he has seen. "The Daikin chiller uses very little power draw. I check the unit's touch-screen control panel power screen everyday and the most the unit has drawn so far was 40 amps on an 80-degree day."

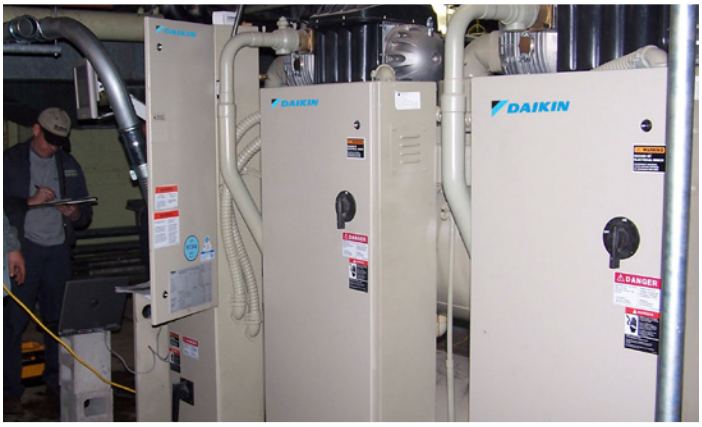
How much energy savings does the college anticipate? "Using the Daikin Energy Analyzer™ analysis program, we were able to project annual energy savings of $25,000 a year compared to the air-cooled reciprocating chiller that the Magnitude chiller replaced," Story said. "In the first 20 years of operation, that would mean more than $500,000 in savings. Considering that chillers typically operate 30 years or more, the college's energy savings could be even more significant over the life of the chiller."

The quiet operation of the chiller was an added bonus to the energy savings, according to David Hardesty of W. W. Gay Mechanical, Inc., the mechanical contractor for the project. "The first priority for the college was saving electrical energy costs. The second priority was longevity for the chiller itself and for the refrigerant in the chiller. The Daikin chiller is a positive pressure machine using R-134a refrigerant, which has no phaseout schedule. In addition, the Magnitude chiller is oil-free so the college has less service and maintenance costs, as well as less toxic waste from oil changes to dispose of."

The magnetic bearings of the Magnitude chiller's compressor eliminate bearing lubrication and the need for oil heaters, oil coolers, oil pumps and oil pumping. Eliminating the oil support system results in increased chiller reliability and lower maintenance costs than a negative pressure centrifugal chiller would have.

Hardesty has taken several customers to see and hear the Magnitude chiller operating in Kenan Hall. "Customers from schools, government buildings and commercial offices have all been impressed by the chiller," he said, "As a result, we've been able to value engineer several other projects. Between the maintenance savings and the energy savings, the Daikin Magnitude chiller is a good investment."

Riggle says, "The college is pleased so far with the performance of the Magnitude chiller. We look forward to seeing how it performs in the heat of a Florida summer. Overall we anticipate a quick payback. We've even advised W.W. Gay that we want another Daikin Magnitude chiller for Phase II of the renovation."



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