



Capital Park Plaza maximizes savings with turnkey service solutions.

Daikin Chillers Improve Energy Efficiency by 20 Percent

ISSUE:

Energy-saving operation and reliability topped the list for owners of an apartment complex when replacing chillers. At nearly 20 years old, the four screw chillers serving the Capitol Park Plaza and Twins in southwest Washington, D.C., were near failure and no longer providing redundancy. Owners were renovating 648 apartments contained in the three buildings at the 1960s-built complex.

Capitol Park owners did their homework and vetted HVAC solutions from two chiller manufacturers. "When looking at capital improvements, my goal is to try to maximize return through savings," said Brian Wilson, owner with Capitol Park Apartments LP in Middleburg, VA. "I needed research. In looking at who did what, it became clear Daikin had our solution with its magnetic bearing technology."

SOLUTION:

"We met the owner through one of our partners who is a lighting specialist. Through our area representative, we offered a complimentary in-depth energy study of the buildings," said Sean O'Brien, district service manager with Daikin.

O'Brien credits the work of Panda Aumpansub, P.E., a Daikin representative and energy performance engineer in Columbia, MD, in conducting the analysis. "Panda's study gave owners an accurate view of the energy consumption and load requirements at Capitol Park Plaza with a lifecycle cost analysis on the proposed replacement equipment," O'Brien said. Owners also moved forward with other energy-related improvements such as lighting retrofits.

As an owner, Wilson appreciated touring the Daikin factory in Staunton, VA. "The entire Daikin organization is first class and it was validating to see the production of the chillers. Daikin has far and away the best technology, but also probably is the best organized group of people I've ever worked with," he said.



NAME:

Capital Park Plaza and Twins Apartments

LOCATION:

Washington, D.C., USA



FACILITY SIZE:

610,200 ft²



ISSUE:

Replace chillers that could no longer provide redundancy with new energy efficient water-cooled chiller systems



SOLUTION:

- (4) 250-ton Daikin Magnitude® dual-compressor magnetic bearing chillers
- (5) Daikin Vision® air handlers

SOLUTION (CONTINUED):

Wilson was impressed with the digitally controlled magnetic bearing system on the chiller compressors which reduce maintenance costs. He also knew the variable frequency drives (VFDs) on the chiller's dual compressors would contribute to significant energy savings over standard centrifugal chillers.

"The two Magnitude chillers in the Plaza building, for example, can communicate with each other. This means that only one compressor on each of the chillers needs to be operated," said John Frye, Daikin sales representative. "The system can also easily be adjusted to meet the reduced demands of unoccupied spaces in the apartments during the day because of the VFDs."

Daikin Service provided installation and start-up of the chillers and air handlers and installation was staged across the three buildings. Challenges occurred with limited access to locate the new chillers in the lower-level mechanical room which required disassembly of the chillers prior to installation, including draining of the refrigerant system. "It was a lot of work and our highly skilled installation crew did a great job to see the project through," Frye said.

"We also had new power feeders installed to the buildings from the main breakers, which required additional underground wiring. This was a full electrical upgrade from the chillers to the main switchgear," he noted.

Daikin's turnkey solution included a complementary subscription to energy management software that allows owners to remotely monitor the performance of their buildings at Capitol Park.



Limited access to a lower-level mechanical room facilitated carefully planned coordination to overcome a challenging installation.

OUTCOME:

The Daikin chillers, air handlers, lighting replacements, and other energy improvements show the Capitol Park complex is 15 to 20 percent more efficient than similar buildings across the U.S. "I think everybody has seen the improvement on the consistency of comfort. Before, in really hot months, on the higher levels of the buildings, the old chillers couldn't cool enough. We don't have that problem anymore with the Daikin chillers," states Wilson.

Wilson frequently monitors electrical usage of the entire complex through the energy management software portal and values the access to actual consumption which allows him to audit bills from the electrical utility. "The ability to manage your costs on a real-time basis is quite significant and it's really helpful from an environmental standpoint to see how you stack up against the rest of the country," he said, noting the new Daikin chillers have reduced cooling consumption by about 10 percent over the former chillers.

The energy efficient chillers have contributed to impressive energy savings. Calculations by the energy management software reveal consumption savings of 550,160.39 kWh, reflecting electric utility cost savings of \$53,430.63—the carbon equivalent of taking about 81 cars off the road. Owners expect even greater savings once an upgrade is made to a cooling tower. Based on the kWh savings of new HVAC equipment, owners received a \$62,000 rebate from the District of Columbia Sustainable Energy Utility (DCSEU), which further accelerates the owners' return on investment in the new chillers.



Daikin Magnitude chillers maximize return through energy savings.

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— Brian Wilson, Owner, Capital Park Apartments LP