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Energy recovery helps condo towers solve humidity, energy concerns



A new HVAC system with energy recovery technology was able to help the 40-year-old Seagate Towers in Florida save more than \$11,000 in annual energy costs and eliminate condensation on grills and registers.

The Seagate Towers in Delray Beach, FL, is a twin-tower condominium complex built in 1970, offering unobstructed views of the Atlantic Ocean. While the property has been going strong for the past 40 years, the same could not be said for its HVAC system.

In 2011, Seagate Towers Condominium Association manager Jon Branson and his facilities management team decided that it was time to replace the original heating and cooling units in both buildings with modern, energy-efficient systems. Along with increased efficiency, the other primary goal of the upgrade was to improve upon the inadequate humidity control provided by the 41-year-old water source heat pump ventilation systems.

The original design exhausted air through the roof and sent fresh makeup air to the corridors of each building, which was then drawn into the living spaces by bathroom and kitchen fans through undercut doors. The system routinely struggled to dehumidify the makeup air, especially in summer.

The solution

With an eye toward both efficiency and comfort, Branson and his team chose to incorporate energy recovery wheels into the replacement unit specification for each building. Energy recovery wheels recycle energy from building exhaust air to pre-cool and dehumidify fresh air prior to that air being treated by an HVAC unit.

The condominium association hired Thompson Youngross Engineering Consultants (TYEC) of Delray Beach to design the replacement HVAC systems. Dan Thompson of TYEC recommended Airxchange energy recovery wheels based on previous experiences designing systems for oceanfront buildings. While most energy recovery wheels remove a high percentage of moisture from incoming air when used in warm and humid locations, the Airxchange stainless steel wheel and patented polymer energy transfer media is ideal for corrosion resistance in challenging environmental conditions.

Four 12.5-ton packaged rooftop units and four integrated Airxchange energy recovery wheels were specified for the renovation. Each Airxchange wheel provides an additional 9 tons of capacity to each rooftop unit. The new system utilizes the original exhaust and supply ducts that run along the elevator shaft of each building.

The exhaust airstream of each building now provides on-site energy to be recycled by the Airxchange wheels, reducing the demand for energy by the new HVAC units. With the upgraded HVAC systems in place, aided to a large degree by the output of the four Airxchange wheels, Seagate Towers reduced total mechanical equipment load (and associated operating costs) by 36 tons.

Energy savings

Though savings may vary based on the application, the installation costs for Airxchange wheels are often largely offset by the downsized, lower cost heating and cooling units allowed by the increased system efficiency.

The renovation ultimately helped Seagate Towers win the battle against humidity. Indoor air comfort improved noticeably after the new systems were installed and balanced.

“The new units have done an excellent job of providing fresh outside air with better humidity control than we had previously,” said Branson. “We used to get sweating on the grills and registers, and that no longer occurs.”

In addition to living in a dryer, cleaner, and more comfortable environment, the owners of the individual condominium units were also treated to noticeable cost savings.

“Unit owners tell me that their individual unit electric bills have dropped since the new system was installed,” added Dave Slovak, a former HVAC contractor who currently works on the Seagate Towers facilities management team.

With the work completed, Seagate Towers is seeing an estimated annual energy savings of \$11,296. The annual HVAC savings comes in at \$54,000.

Seagate Towers was also rewarded for its work by the local utility. A commercial rebate was provided by Florida Power and Light (FPL) based on the lower electricity usage allowed by the new HVAC systems. These types of rebates are offered by FPL, along with many other utility companies throughout the country, as an incentive for customers to lower demand.