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SEMCO

OCEAN TOWERS
HAMMOCK BEACH RESORT
CASE STUDY

THE "PINNACLE" OF DEHUMIDIFICATION, VENTILATION & ENERGY RECOVERY
OCEAN TOWERS AT HAMMOCK BEACH RESORT, PALM COAST, FLORIDA

There are two schools of thought when it comes to selecting mechanical equipment for coastal properties: (1) Minimize your investment; it's going to have to be replaced in a few years anyway, and (2) Invest in the best; it will save you money in the long run. Luckily, when it came to selecting equipment for the luxurious Ocean Towers at Hammock Beach Resort in Palm Coast Florida, owner and engineer were on the same page—they wanted the best.

This included resort Vice President Daniel J. Baker, P.E., Ginn Property Management, LLC, and the engineers at MECA Inc., the firm responsible for designing the mechanical system for a new north and south tower at the resort.

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>
> - DANIEL BAKER, VICE PRESIDENT OF HAMMOCK BEACH

All parties wanted equipment that would provide guests with uncompromised comfort and superb indoor air quality. They also wanted a high efficiency system that could withstand the harsh and humid coastal environment while meeting (or exceeding) Florida's strict guidelines requiring positive pressurization and outside air. Unwilling to compromise any of these goals, they turned to FläktGroup® SEMCO®.

"We wanted the best of the best," said Daniel Baker, former civil and environmental engineer and now acting Vice President of the Hammock Beach Resort. "The SEMCO selection was part of that decision."

Five Pinnacle® Energy Recovery Units (ERUs), each with packaged DX units, were chosen to provide 100% outdoor air ventilation to the corridors and common areas of the two unit towers. The role of these ERUs was to provide dehumidified outdoor air to these spaces at a neutral temperature of approximately 66-67°F (dry bulb). This centralized system enabled MECA engineers to "decouple" the building's latent load from the sensible load, which was handled by individual water source heat pumps in each unit. As a result, the heat pumps operate at a lower capacity, which is more efficient, and will ultimately last longer.

FRESH, DRY AIR

Early on, MECA engineers committed to continuous rather than intermittent bathroom exhaust for the new towers. Since Florida code requires buildings to be positively pressurized, intermittent exhaust (though considered by some to save energy) inevitably leads to control issues as the amount of outdoor air continuously varies and conventional systems typically are designed with constant flow as the building controls are not as complex for most multi-tenant building applications. Furthermore, designed correctly, continuous exhaust can actually reduce the overall cfm being forced through a system, which reduces fan energy as well as the energy required to condition supply air. Best of all, with the SEMCO units in place, Ocean Towers recovers most of the energy from this continuous exhaust.

HOW IT WORKS

Each of the five Pinnacle® units specified for Ocean Towers includes a total energy wheel, a supply side cooling coil, a passive dehumidification wheel, and a return air-heating coil. Outdoor air enters the unit and passes through the total energy wheel, which is then preconditioned using the collected exhaust from the units' bathrooms. The cooling coil and passive dehumidification wheel then work in concert to further treat the supply air to produce the desired set point

temperature at much reduced humidity level. This second wheel relies on a larger amount of desiccant material to remove moisture. It also rotates at a very slow speed to transfer as much moisture as possible from the supply air stream to the exhaust air stream. The driving force of the Passive Dehumidification Wheel is the differential in relative humidities. The cooling coil leaving air condition is saturated and cannot hold any more moisture, while the return is conditioned air at 50% relative humidity and therefore by volume can hold more moisture. This differential provides the means for moving moisture from the saturated supply (post coil) to the dryer space air being exhausted. The heating coil is used to further temper the air to the desired discharge temperature – primarily during the heating season.

Supply air is controlled to maintain a constant positive pressure throughout the condominium space to offset the continuous vacuum assisted exhaust in all of the unit bathrooms.

VENTILATED TO LAST

Guests may not be aware of it, and owners may not fully appreciate it, but the end result is a system that provides 100% outside air at a comfortable humidity level without the typical energy penalty. And while owners and guests enjoy the quiet comfort of their individual heat pumps, this centralized ventilation system is likely increasing the lifespan of associated equipment, including the heat pumps themselves which operate less due to the semi-conditioned air being supplied by the SEMCO units.

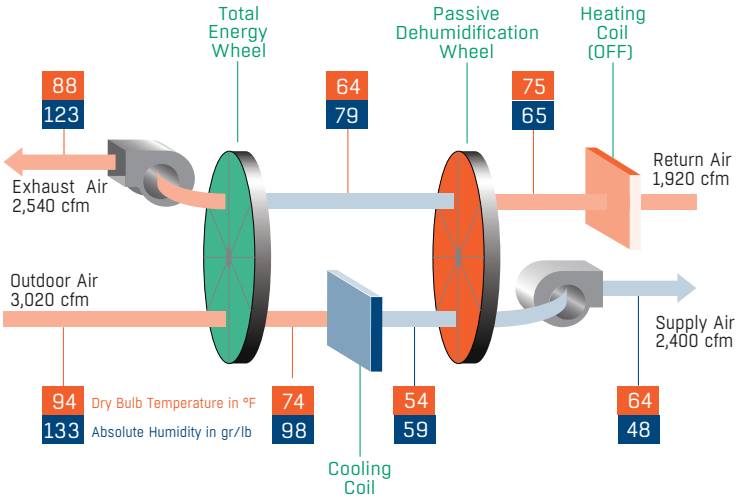

Figure 1: Schematic of the cooling season sequence

It is a fiscally and environmentally responsible design, not only because of its efficiency, but because it inherently reduces the potential for mold, which is a major concern for any multi-family property, particularly in semi tropical areas like Florida.

"From our point of view we always want to do everything we can to minimize the potential for mold. We knew if we kept these spaces dry and under positive pressure we would do that," said Damon Ditch, Mechanical Engineer for MECA, Inc.

Providing pre-conditioned air at a suppressed dew point is much easier on equipment, explained Tom Rice, the DWP Sales Director for SEMCO.

"Space devices don't have to work as hard to meet the sensible load," said Mr. Rice. "This also means less water build up on interior devices which reduces the threat of rust. In fact, moisture control can arguably extend the life of mechanical equipment across the board – even ductwork which is known to leak and cause ceiling damage."

All this considered, the Pinnacle® units serve many more purposes than just energy recovery ventilation. They help keep operational expenses down for owners and may even delay parts and equipment replacement. It's food for thought for any multi-unit property owner who understands the critical relationship between proper ventilation and moisture control.

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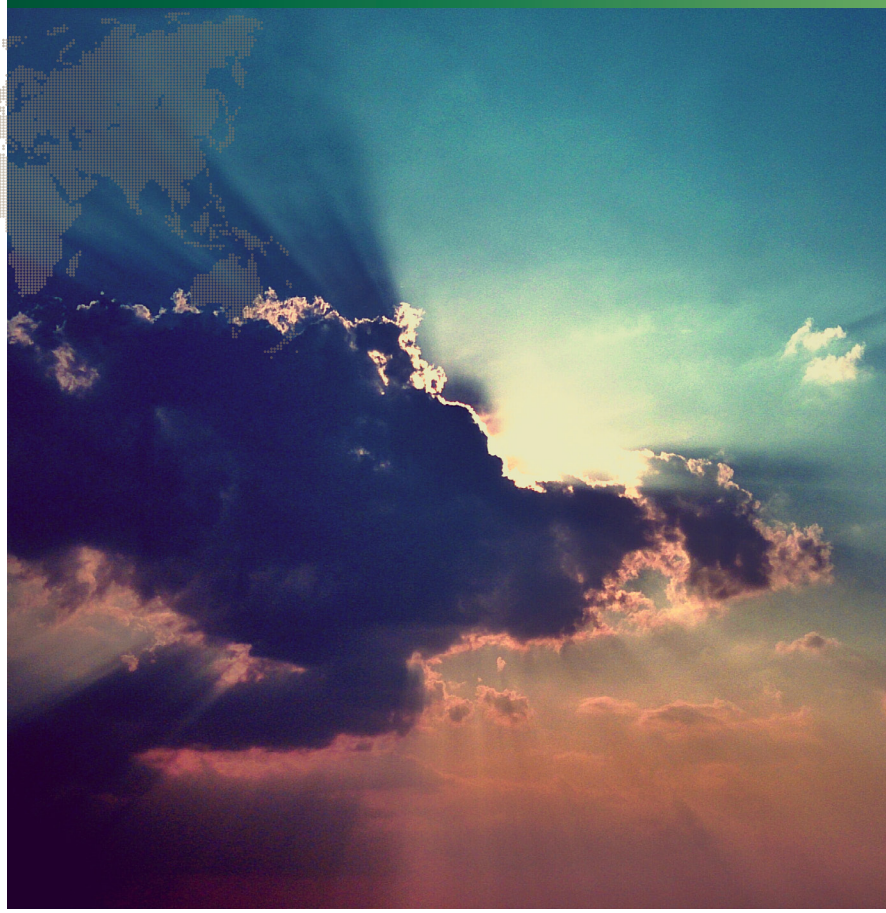

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Our constant aim is to provide systems that precisely deliver the best indoor air quality and performance, as well as maximize energy efficiency.

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