



Coastal Hospital Uses Rebates and a Unique Design to Bring New Life to 40 Year old HVAC System

CASE STUDY

Energy Efficient Ventilation Design

Newburyport, Massachusetts - Anna Jaques Hospital opened as a small community medical facility in 1884. The main building was constructed at the turn of the 20th century and then greatly expanded in the mid 1970's to early 1980's time frame. As part of the HVAC design, 100% outdoor air handling systems serving the expanded facility were equipped with energy recovery wheels (also known as "enthalpy wheels") to minimize the heating and cooling costs associated with 24/7 operation.

The inclusion of energy recovery ventilation (ERV) technology in HVAC designs has proven to be a sound long term investment for many types of buildings. The lower price of downsized chillers, boilers, or packaged rooftop units often offsets the initial investment in ERV, while ongoing annual operating costs to condition the incoming outdoor air are lowered by as much as 80%.

The sheet metal cabinet enclosures on larger air handling systems frequently outlive their internal mechanical components, which are typically replaced once or even twice within the lifetime of the unit. The original energy recovery wheels at Anna Jaques reached the end of their useful life after approximately 20 years of continuous service. With no way to effectively clean or restore the wheels, and the original manufacturer no longer supporting the product, the hospital's facility maintenance staff was forced to remove the energy transfer media.

The hospital's current Senior Director of Support Services, David Fowler, recalls that the decision to remove the energy transfer media came after exploring several options. A complete overhaul of the HVAC system was not an affordable option and the replacement wheels he researched would not fit through available access points into the mechanical rooms housing the air handling units. The only solution at the time was to remove the media and abandon the benefits of the energy recovery wheels.

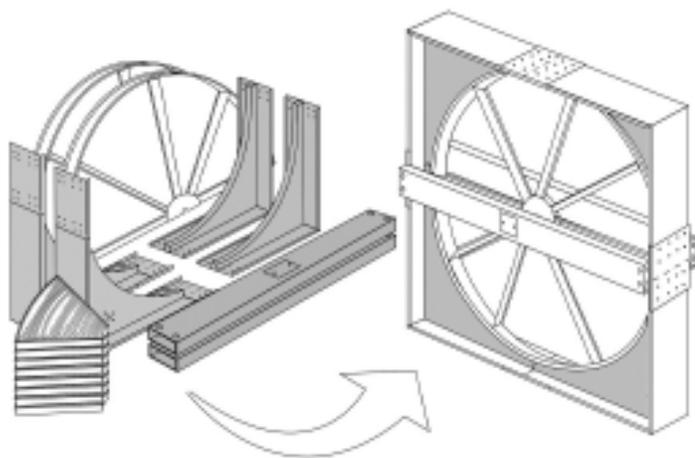


Anna Jaques Hospital is a 24-hour in-patient facility.

A Unique Solution

It was several years later that Fowler met representatives from Airxchange at a facilities management trade show and learned about a possible solution in their modular replacement wheel design.

Airxchange replacement wheels feature non-corroding polymer energy transfer media segments that can be easily removed and cleaned as necessary to ensure optimal performance for the life of the product. The lightweight segments are held in place by a rigid structural stainless steel wheel. The wheel, drive mechanism, and outboard wheel bearings are all supported by a structural galvanized steel cassette frame. Every component is designed to be assembled in the field with conventional hand tools (sockets, rivet gun, Allen wrenches). Airxchange assembles and tests the entire field replacement kit at the factory before it is shipped and assembled onsite by an Airxchange qualified technician.



No special building openings or lifts are required - all parts fit through standards doorways.

A Compelling Return on Investment

The Airxchange Replacement Energy Recovery Solutions team specified two 9-foot diameter wheels that were sized to match the performance of the original wheels. The estimated total installed costs were presented to the hospital. “Energy efficiency projects compete for funding with other projects, such as investing in IT, so our proposals must present an attractive return on investment,” says Fowler. With a pre-approved gas efficiency incentive from utility provider National Grid, plus a budget number to prepare and button-up the air handlers following assembly of the replacement wheels, Fowler was able to present a financially compelling incentive for the hospital to move forward with the project.

“Until I met with Airxchange, I was unaware of any replacement wheels that could be delivered and assembled within the tight quarters of our equipment rooms and air handlers.” — David Fowler Senior Director - Support Services Anna Jaques Hospital

Value of New Energy Recovery Wheels at Anna Jaques

Location: Newburyport, MA
 Project Date: 2015
 Project Scope: Replace Outdated Energy Recovery Wheels
 Simple Payback: 2 years

Measurement	With Working ERV Wheels*	Without Working ERV Wheels*
Total Outdoor Air (CFM)	30,000	30,000
Mechanical Load - Cooling (tons)	33	85
Mechanical Load - Heating (BTU/Hour)	1,110,252	2,711,708
Peak Demand Reduction (KW)	36.4*	0
Estimated Annual Operated Savings	\$28,610	0
Utility Rebate	\$45,384	0

*To study the impact of energy recovery wheels in any space, visit airxchange.com for a variety of simulation and design software tools.

Renewed Energy Savings

The results of the efforts by Fowler and his technical staff are two new and robust energy recovery wheels that are expected to save energy for another 20+ years. And unlike their predecessors, the new wheels are completely serviceable, with a 5-year warranty and a full compliment of available replacement parts. The unique modular design of Airxchange replacement wheels enabled Anna Jaques Hospital to once again recapture valuable energy from exhaust air, indefinitely extending the energy efficient design decisions made in the 1970’s and 1980’s.

About Airxchange

Airxchange has 35 years of extensive experience in the energy recovery industry. Our mission is to design and manufacture high quality products that perform reliably and effectively for the life of the HVAC system, reduce energy consumption, and improve indoor air quality. The addition of high-tech materials and innovative designs to a technology based on fundamental scientific principles has earned us the trust of our valued OEM customers. We will continue to innovate and support our customers to meet evolving market demands for energy recovery ventilation technology. Visit airxchange.com for more info.