

AAONNAIRE

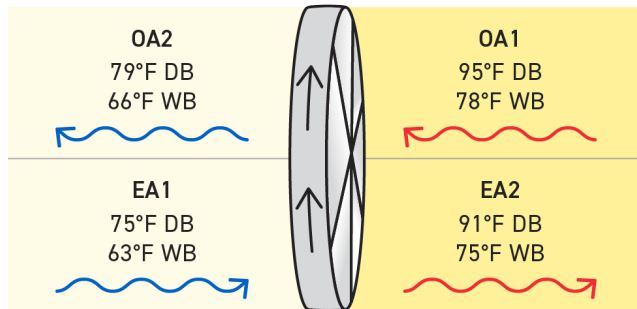
Energy Recovery



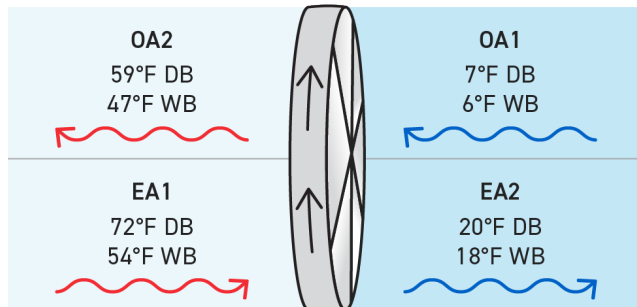
The market demand for environmentally responsible heating, ventilating, and air conditioning (HVAC) systems is rapidly growing. One effective approach to meet this demand is through **energy recovery**, which reduces the load imposed on HVAC equipment. This reduction leads to **lower energy consumption** and **building operating costs** while maintaining a safe, healthy environment for occupants.

AAON provides various opportunities to incorporate energy recovery into our units to accommodate a wide range of applications and needs. These include both wheel and cross-flow fixed plate configurations as well as options that can be specified to meet your unique application needs.

SUMMER CONDITIONS



WINTER CONDITIONS



What is Energy Recovery?

Energy recovery is the process of transferring energy from an airstream at a high temperature and/or humidity to one at a low temperature and/or humidity.

Energy can be recovered in its sensible (temperature only) form, latent (moisture) form, or a combination of both.

Energy Savings

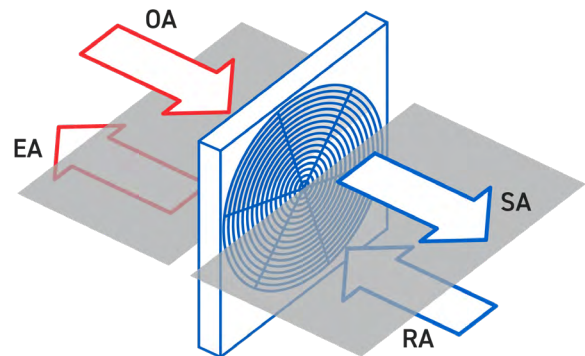
By recovering energy from the return/exhaust air, significantly less energy is required to cool or heat the outdoor air supplied to the building depending on the season. For a single unit, these energy savings can **reduce operating costs by thousands of dollars per year**.

The illustration to the left shows how a wheel reclaims energy, reducing the temperature and humidity of the outdoor air in the cooling season and increasing the temperature and humidity in the heating season.

Humidity Control

Humidity directly affects the comfort and health of occupants within the conditioned space. Excessively high humidity can lead to mold and bacteria growth, increasing the risk of respiratory issues. Low humidity can lead to compromised immunity and extended virus exposure.

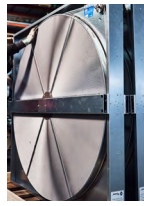
Energy recovery is designed to transfer both heat and moisture, helping to manage humidity levels, especially during peak design conditions. In the summer, when outdoor humidity is high, energy recovery dehumidifies the outdoor air. During the winter, when the outdoor air is dry, energy recovery humidifies the incoming outdoor air.



Wheels

AAON offers both aluminum and engineered polymer energy recovery wheel materials. Aluminum wheels can be selected as total enthalpy wheels, while polymer wheels can be selected as sensible only or total enthalpy. The polymer wheels have a segmented design that allows for easy removal from the unit for external cleaning and replacement.

With similar price points, energy recovery wheel media selections can be made based on desired performance, climate type, and application. The specific design application must be considered when deciding between the wheel types.



ALUMINUM

Aluminum wheels, known for their excellent thermal conductivity, allow for **more effective heat exchange**. This makes them an ideal choice for hot, dry climates where the concern for corrosion resistance is minimized while still maximizing heat transfer through the wheel.



POLYMER

Polymer wheels are designed to **transfer both temperature and humidity**, making them a great choice for applications where moisture content is high, such as coastal environments. They eliminate concerns about corrosion on the wheel, although they do introduce a higher pressure drop, which can increase fan energy consumption.



AAONAIRE Energy Recovery

AAON offers energy recovery as a selectable option in our packaged rooftop units and air handling units.

AAONAIRE Sensible Energy Recovery Wheel

AAONAIRE sensible energy recovery wheels provide a thermal exchange only between the air exiting the building and the outdoor air brought in. These are also known as heat recovery ventilators or heat wheels. Their monolithic design offers increased surface area and low air pressure drops. These wheels are **ideal for environments where outdoor air humidity is lower than the indoor air** most of the time, such as swimming pools and locker rooms.

AAONAIRE Total Energy Recovery Wheel

AAONAIRE total energy recovery wheels recover temperature and moisture. These are also known as energy recovery ventilators or energy recovery wheels. AAON's polymer total energy recovery wheels utilize a **flexible engineered polymer embedded with desiccant** making it easy to clean, less vulnerable to damage, and corrosion resistant, which is particularly important in **seacoast applications**. The aluminum wheels utilize a 3A molecular sieve desiccant for minimal cross contamination as well as exchanging latent heat. These wheels are **most suitable for applications focused on comfort air conditioning**, such as schools, offices, and residences.

AAONAIRE High Efficiency Polymer Energy Recovery Wheel

AAONAIRE high efficiency polymer energy recovery wheels deliver **higher effectiveness with lower airside pressure drops**, maximizing energy efficiency for the wheel. Constructed from a **blue UV-resistant polymer media** with fully removable segments, they provide the same easy-clean maintenance benefits as our standard polymer wheels with enhanced durability. Meeting **ASHRAE 90.1-2025** requirements, these new high efficiency polymer wheels set a benchmark for advanced, reliable energy-recovery performance.

AAON UNIT CAPACITY WITH AND WITHOUT ENERGY RECOVERY WHEEL

Nominal Tonnage	AAON Cabinet	Capacity (MBH) with Energy Recovery Wheel	Capacity (MBH) without Energy Recovery Wheel
4	RQ	59	46
8	RN A	115	88
13	RN B	189	150
20	RN C	320	245
50	RN D	617	477
120	RN E	1574	1231
200	RZ	2602	2170



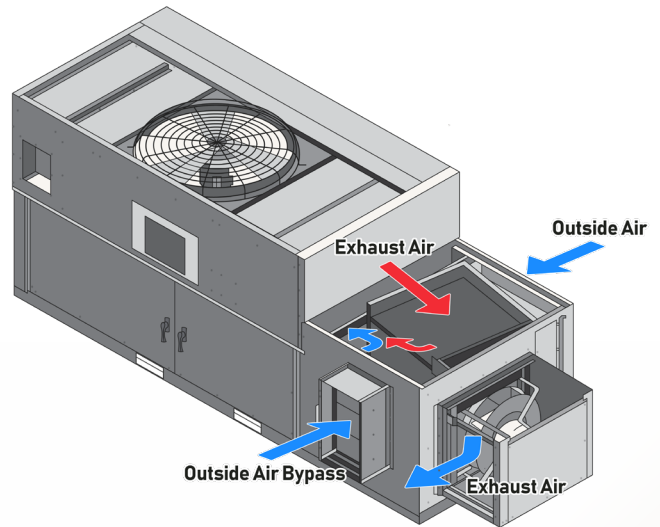
AAON Energy Recovery wheels use preheat to prevent freezing of both the wheel and economizer.

Cross-Flow Fixed Total Energy Recovery Plate

AAON's cross-flow fixed energy recovery plates are available as an option on the RQ series and RN series packaged rooftop unit up to 70 tons. These plates, like energy recovery wheels, save heating, cooling, humidification, and dehumidification costs by **pre-conditioning the outdoor air**. The fixed total energy recovery plates have no moving parts and can improve indoor air quality by **eliminating cross contamination**. However, fixed plate energy recovery can be **less effective at energy transfer when compared to wheels**, resulting in overall lower efficiency. Additionally, plates have a higher pressure drop, leading to increased energy usage by the fans to maintain airflow.

Industry Standards Conformity

AAONAIRES energy recovery wheels and plates are certified under the **AHRI 1060 program**, which establishes the performance rating of air-to-air energy recovery ventilators. Software embedded in ECat provides **certified performance for all configurable AAONAIRES energy recovery wheels**. This ensures that all available wheels can be rated at the design conditions for each unit.



AAONAIRES energy recovery offers significant energy savings and enhanced indoor air quality. By recycling energy from exhaust air streams, these systems reduce HVAC equipment costs and improve humidity control.

With AAONAIRES, you have the **flexibility to choose the best energy recovery solution for your needs**. Our systems include both rotary energy recovery wheels and cross-flow fixed energy recovery plates. The wheels are designed for high transfer effectiveness and come in sensible heat (HRVs) and total heat (ERVs) options. Meanwhile, our fixed energy recovery plates offer a durable, no-moving-parts alternative that also pre-conditions ventilation air, and reduces operating costs.

Take the next step towards superior indoor air quality and energy efficiency.
Contact your local AAON rep today.

