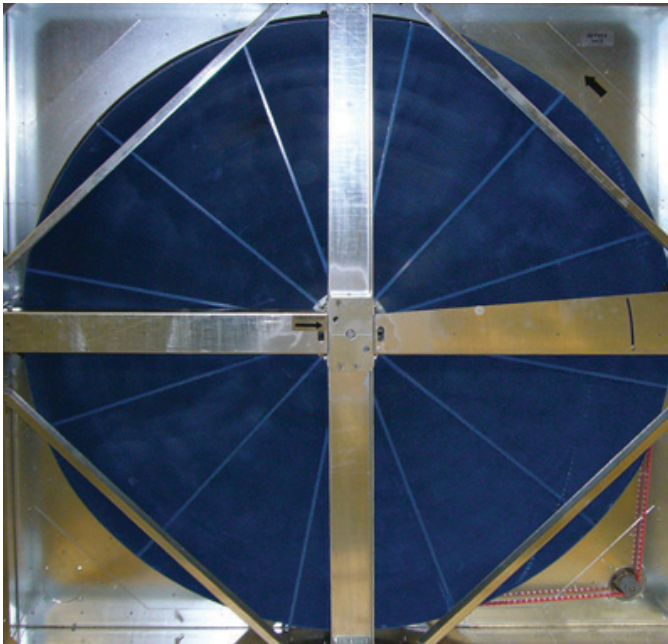




Optional Energy Recovery Wheels For McQuay Vision™ Air Handler Systems



What are Energy Recovery Wheels?

McQuay energy recovery wheels (see figure above) offer a cost-effective and efficient method of recovering exhaust energy and reducing energy cost while meeting the ventilation requirements of ASHRAE Standard 62.1-1999.

What Are the Benefits?

Energy Savings

- Recovers 70-75% of both sensible and latent energy.
- Provides twice as much summer energy recovery as sensible only alternatives such as plate frame heat exchangers and run-around loops.
- Winter humidification energy costs may be reduced up to 66%.
- Winter latent energy recovery lowers the dew point of exhaust air compared to sensible only alternative. It also reduces frost problems.

- Increases air conditioning capacity by approximately 25% if minimum outdoor air design is 33%. As an example, a 75-ton unit with energy recovery provides about 90-tons of cooling capacity. Cost savings on HVAC components may offset the additional cost of energy recovery.

Fulfills ASHRAE Requirements

- ASHRAE 90.1-2007 usually requires energy recovery if design requires more than 5000 total cfm and more than 70% minimum outdoor air.
- McQuay's energy recovery effectiveness exceeds ASHRAE 90.1-2007 requirements.

Enhances Indoor Air Quality (IAQ)

- Helps provide a healthy and comfortable indoor environment.
- A purge option is available to help prevent cross-contamination of return air to the supply air stream.

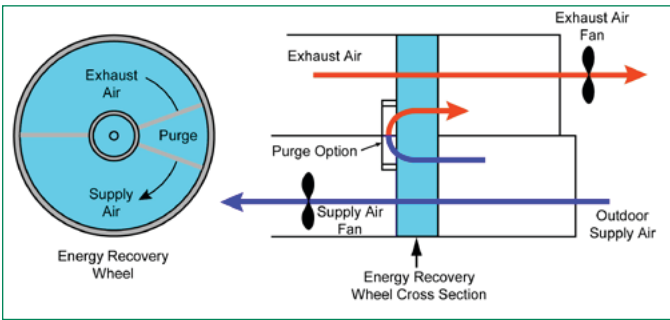
Factory Installed

- Includes wheel, exhaust fan with VFD, pre-filters, and economizer applications. Optional bypass dampers available.
- Eliminates field-coordination and leakage problems associated with field-installation.

Stacked and Side-by-Side Arrangements

- The side-by-side arrangement will allow a configuration traditionally only offered by custom manufacturers with the price point of a standard Vision™ energy recovery unit.
- The side-by-side arrangement will often fit an energy recovery unit into spaces with height restrictions relative to the standard stacked arrangement.
- Easy access to both supply and return air streams since both are on the ground.

How Does Energy Recovery Work?



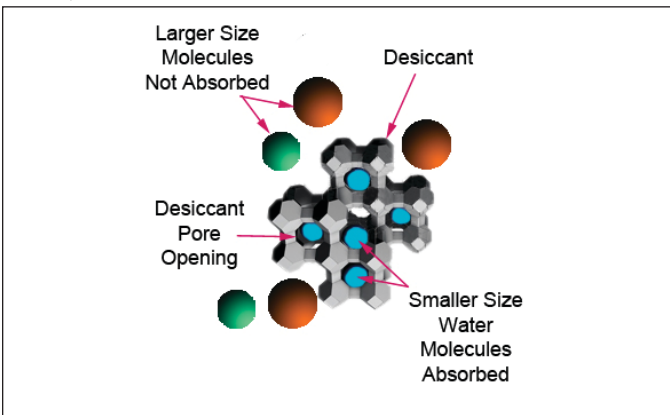
In the figure above, the wheel (aluminum or synthetic) provides energy recovery by drawing outside air across half of the wheel while drawing exhaust air across the other half. This allows for both heat and moisture to be captured and transferred from one airstream to another as the wheel rotates.

During summer conditions with humid outside supply air, the rotating wheel captures heat and moisture from the supply airstream and transfers it to the exhaust airstream.

During winter conditions with humid indoor exhaust air, the rotating wheel captures heat and moisture from the exhaust air and transfers it to the supply airstream.

How is Latent Energy (Moisture) Transferred Between Airstreams?

Depending on conditions, as the energy recovery wheel rotates, latent energy (moisture) can be absorbed and trapped in one airstream and exhausted to the other via a desiccant substance that is attached to the wheel (see figure below).



McQuay International offers three desiccant wheel types:

- **3-A molecular sieve** - contains precise and uniform 3-Angstrom pores.
- **4-A molecular sieve** - contains precise and uniform 4-Angstrom pores.
- **Silica gel** - contains various pore sizes, from tiny to quite large.

Only molecules smaller than a pore size are absorbed.

The closer desiccant pore size is to the size of a water molecule (see table below), the fewer unwanted molecules transfer between airstreams.

Table 1 - Molecular Size of Various Compounds

Compound	Molecule Size (in Angstroms)
Hydrogen	2.4
Water, oxygen, carbon monoxide	2.8
Nitrogen	3
Amonia	3.6
Ethylene	4.2
Propane	4.9
Iso C22	5.6
Toluene	6.7
Methaxylene	7.1
Tri-ethylamine	8.4

Note: Most compounds are larger than water molecules/2.8-Angstroms

Conclusion

- McQuay offers several cost-effective and efficient energy recovery wheel options that recover exhaust energy and moisture, lower energy costs, improve indoor air quality, and increase occupant comfort levels.
- McQuay offers more energy recovery wheel options than the competition. Depending on your requirements, a McQuay sales engineer can help you select the optimal energy recovery solution.