

Thermal wheel

Concept

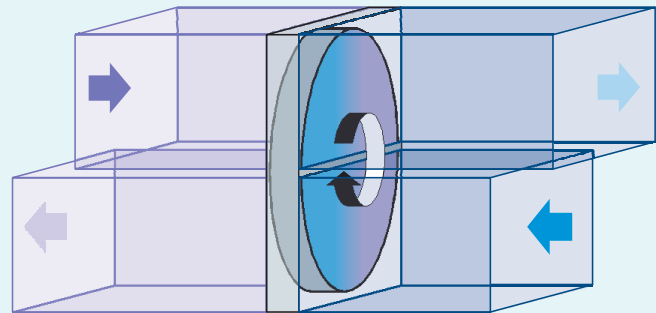
A thermal wheel is used to recover the heat contained in building exhaust air. The recovered energy can be reused to preheat fresh air in winter.

This is an air-to-air circular heat exchanger integrated into the design of a ventilation system. The wheel is manufactured so that half of its surface comes into contact with the air to be exhausted, the other half with the fresh air that to be heated.

A thermal wheel can be designed to recover either heat alone, called "sensible heat," or heat and moisture, known as "latent heat." A thermal wheel is made of a steel sheet coil. To recover heat and moisture, the interior of the wheel must have an additional coating of silica gel polymer. The silica gel absorbs the vapour, but it has to be heated in order to release the vapour later. The silica gel can be reactivated by a gas burner or by heated air.

A thermal wheel can take on impressive proportions in industrial applications.

Its diameter can exceed 10 feet and its weight can easily become an issue when the equipment has to be located on top of a structure. Because of its advantages, the thermal wheel is frequently built into rooftop units sold commercially or integrated into fresh air make-up units.



Advantages

- High performance energy saving, with 50% and 85% recovery efficiency, depending on conditions of use.
- Reduction of ventilation and humidification costs.
- Very widespread use for industrial ventilation.

Selection criteria

- High energy costs.
- Major ventilation needs.
- Major humidification needs.
- Major pressure loss through the exchange (the thermal wheel). This pressure loss must be made up by the fan.
- The technology must be able to be integrated into the ventilation system design.
- Cleanliness of stale air. The presence of dust or contaminants in the air exhaust can have an impact on the thermal wheel's maintenance frequency, cleaning and life cycle.

List of manufacturers

Here is a non-exhaustive list of manufacturers. All major manufacturers of rooftop ventilation units, such as:

- Aaon
- Bousquet
- Carrier
- Engineered Air
- Lennox
- McQuay
- Trane

Energy Efficiency Financial Assistance*

Technology eligible for the Feasibility Studies and Implementation of Energy Efficiency Measures Grants, according to defined criteria. See energir.com for more details. The assistance is subject to a calculation of energy savings by the engineer of the customer requesting the assistance.

Applications

Wherever a large quantity of fresh air is required and where the systems operate several hours a week.

- Office buildings
- Healthcare buildings
- Multi-unit rental buildings
- Industries

Installation standards

Must comply with the installation gas codes CAN/CSA-B149.3 in force and the manufacturer's recommendations.

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* Certain conditions apply. The financial assistance is subject to change without prior notice.

These data are provided for guidance only. This Information Sheet is for general use and must not be considered advice. Please ask for assistance on the questions that concern you and do not rely only on the text in this Information Sheet.

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