Water and heat recovery ventilator.

Theory

Two critical issues of heat recovery ventilation are energy efficiency and Indoor Air Quality (IAQ).

In a warm space a stabile phase of water efficiently prevents heat transfer. It fixes impurities of air and it is ideal for growth ground of microbes.

The phase of water is formed for example when there is a board of metal or glass between warm and cool air. Moisture of air condensates on the surface of the board. Due to temperature difference between cool and warm air, the dew point is formed.

Conventionally

These problems are typical for conventional type of heat recovery ventilators. Their annual thermal efficiency is low, 30 percent.

airAC EnthalpyRecoveryVentilator

Moisture is not permanently on the surface of airAC EnthalpyRecoveryVentilator (EnthalpyRV). Contrary condensation film cyclically condensates and evaporates. Therefore airAC unit takes advantage of latent heat. This is also reason why impurities of air do not fixed on the cell. The cell is not a space for microbes. Due to these unique features airAC´s annual thermal efficiency is the best of 76 percent, and IAQ is the best according to the official comparison of VTT. Water does not generate inside of the unit. Because it does not need drain, the installation position is free. When the cells are self-cleaning, and the unit does not need filter to operate, maintenance cost is low, which enables reasonable life-circle cost. airAC is ideal for ESCO.

Due to air never is completely dry, trials using dry air only are useless. Cross flow units use this kind of testing to be able to show high thermal efficiency. But this never takes place in practice. Moisture is poison for them. Contrary airAC takes advantage of it. On the other hand airAC does not use huge amount of energy to rotate heavy metal wheel like so called rotary wheel does. Instead airAC rotates generous ultra light valve, which is multipatented. The valve prevents pressure changes and water generation in a cell optimising enthalpy recovery and latent heat.