

Why buy Air-to-Air ERV? Pocket Guide



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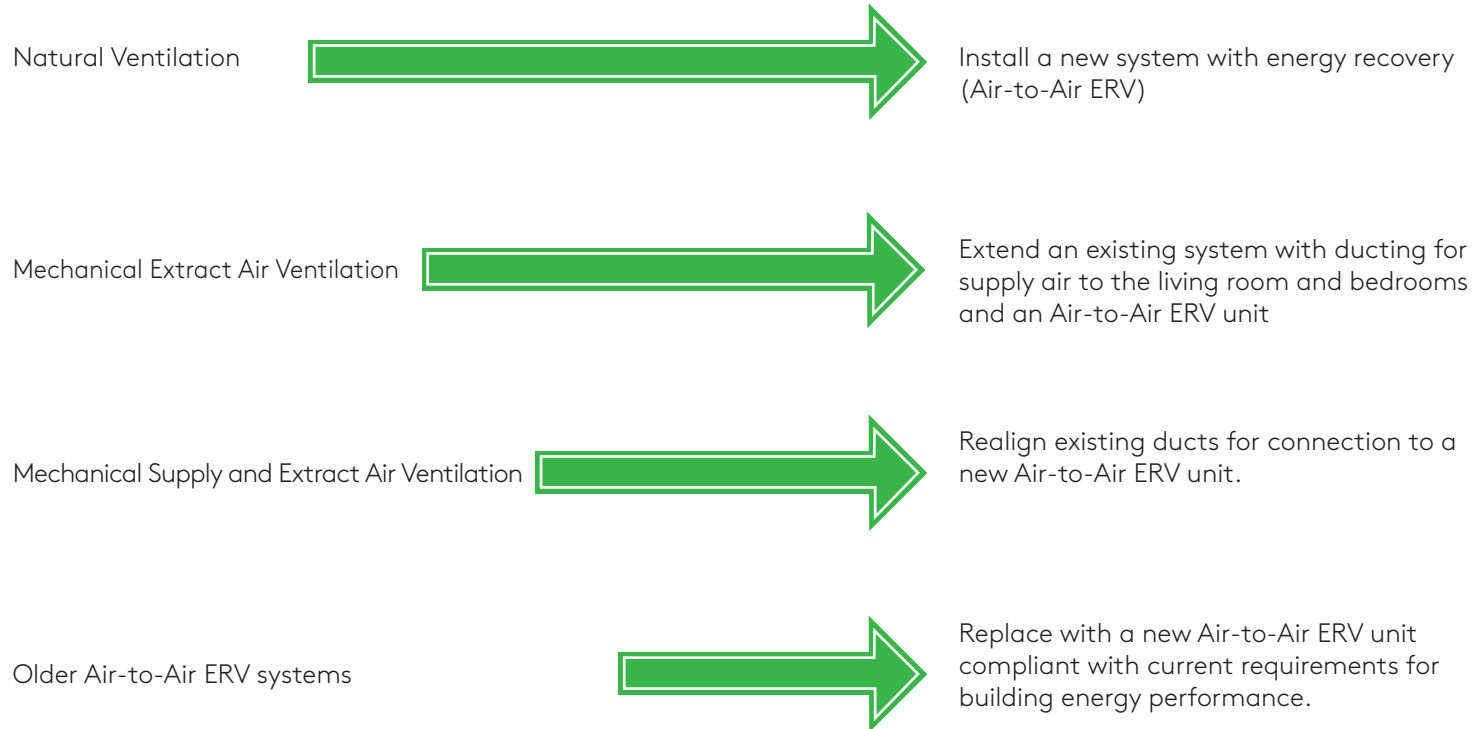
Introduction

The aim of this pocket guide is to outline the benefits of air-to-air energy recovery ventilation to guide your choice of the ideal system for your newbuild, retrofit or upgrade installation.

There are three types of ventilation systems:

- Natural Ventilation (the norm in homes pre-dating 1960)
- Mechanical Extract Air Ventilation (common in homes from the 1960s until 2012 when the EU Energy-Efficiency Directive (2012/27/EU) was implemented in national law)
- Mechanical Supply and Extract Air without Energy Recovery (less common owing to the high operating costs)
- Mechanical Supply and Extract Air with Energy Recovery ("Air-to-Air ERV") (adopted from the late 1970s and currently the most energy-efficient ventilation system available)

What are the options for my current installation?



Common problems with older ventilation systems

Homes pre-dating 1960 with Natural

Ventilation only

- Homes with Natural Ventilation are those with a chimney and fireplace/stove or oil-fired heating. The fireplace heats the chimney and creates a draught in the ventilation ducts sited in the chimney. This creates negative pressure in the building, so that fresh air leaks in through cracks and any vents in the external walls.
- Home-owners typically replace wood or oil burning with a heat pump and replace draughty windows with air-tight windows with energy panes.
- The effect of these structural changes mean that the natural ventilation is disabled.
- In this situation, there is a high risk of black mould proliferation in the attic, mildew and other damp-related problems. There is also the risk that the damage caused will not be covered by home insurance because of the structural changes that have eliminated the natural ventilation.
- In addition, older residences have often been retroactively insulated and made more airtight, with new energy-efficient windows, which all prevent fresh air from entering and replacing stale air, which then radically impairs ventilation efficiency.

Homes from the 1960s-70s with

Ventilation

- In the Nordic region, for example, these tend to be single-storey homes with horizontal rectangular metal ducts in the attic, connected to a stack on top of the roof.
- As in the case of older homes with chimneys, the principle is that the heat inside the home causes air in the ducts to rise.
- This mechanism was not ideal even when the home was new, and with ageing duct insulation, the air inside the ducts becomes so cold that the natural ventilation switches direction and now starts to cool the home. This is most noticeable in cold weather when it becomes difficult to raise the temperature of interiors such as the lavatory, laundry/scullery and kitchen.
- Moreover, the modern occupants of older homes are tending to use their home differently to when it was originally built. People nowadays do more washing, showering and spend more time indoors than in the past. All of this increases the moisture load of the indoor air, and the result is moulds and other damp-related problems.

Common problems with mechanical ventilation systems

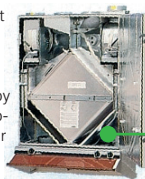

Homes with mechanical ventilation

- Provided that the fans in the system are kept running and are in working order, and fresh air vents exist and are open, then air exchange will be sound and effective. These homes seldom have problems with damp or mould damage.
- However, it can be difficult to ensure fresh air supply to the bedrooms, especially if the bedroom doors are shut and thus prevent fresh air from flowing into the room. The symptoms are stale odour and 'stuffiness', poor-quality sleep and headaches as a result of elevated CO2 content.
- Homeowners will often shut the fresh air vents and reduce fan rotation in an attempt to cut their energy bill. They do so because this type of ventilation system offers no energy recovery advantage at all, and the home is electrically heated. The result is a significant reduction in comfort.
- It is not uncommon for an average bungalow with only a mechanical extract-air ventilation system to rack up high annual energy bills because the setup is rapidly expelling heated air without reusing it.

Homes with older Air-to-Air ERV, 1980-1992

- In this era, energy prices shoot up, and homeowners are soon looking to cut costs. Construction principles are modernised and ERV (energy recovery ventilation) systems become more focal.
- These systems are now at least 25 years old, worn out and need to be modernised. The technology has advanced enormously so that today, the cost of running a residential ventilation system can be halved by replacing an old air-to-air ERV system with a state-of-the-art new version.
- Fortunately, replacing an older air-to-air ERV system does not entail major upheaval. Our modern air-to-air ERV systems are specifically designed to replace older models, which not only saves installation time, but also minimises the need for major structural alterations.

Swegon CASA R2 Comfort replaces BACHO ACF

BACHO ACF	Swegon CASA R2 Comfort with cooker hood
	

Bear in mind that the extract air from the kitchen will need to be implemented by means of a separate extract air diffuser when you convert to a rotary heat exchanger.

Fit

- Dimensions
- Air flow
- Duct siting

Converting to CASA R2

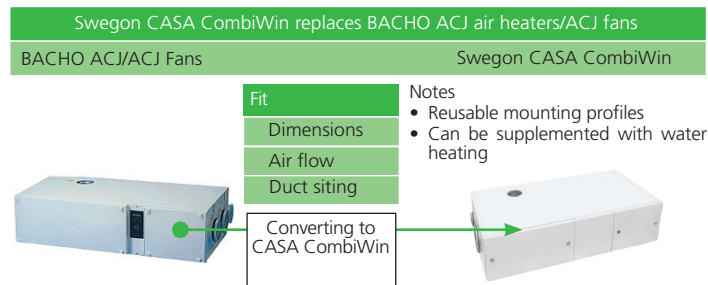
Notes

- 30 mm deeper
- Larger duct diameter

Homes with air heating

Home with air heating 1980-1992

- This type of home was popular in the era. On the whole, homeowners appreciate the features and the comfort of the air heating technology, and not least the low running costs.
- But these systems are at least 25 years old now and need to be updated. Replacing an air heater system with water heating in the form of radiators or installing a heat pump is no easy project. It is costly to install in terms of money, time and disruption because it requires restructuring of the ventilation system as well.
- For these types of projects, Swegon has developed replacement products, which, depending on the model, in many cases, replace the old unit with no need for structural alterations.



Is my home air quality sound?

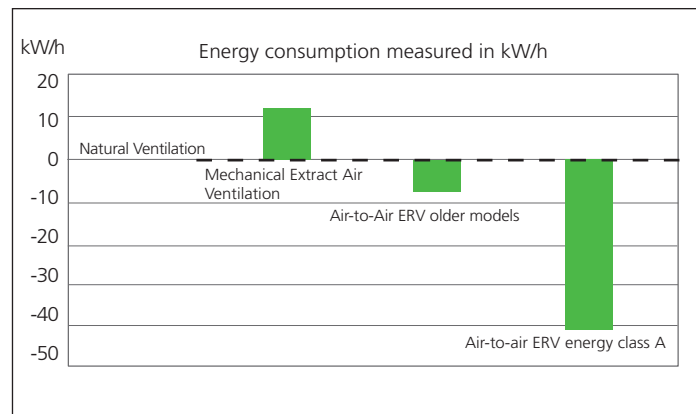
- Dew on the windows – tells you that air exchange is inadequate
- Condensation on the bathroom mirror – poor ventilation in the bathroom
- Morning headaches – tells you that the bedroom is not receiving enough fresh air
- If you cough more indoors – a sign of unhealthy air quality
- Irritated eyes and sniffles – may be a sign of mould in structural elements
- Problems with odour and stale air
- Ever tested for radon?



The above are examples of residential air-quality concerns. They are all directly linked to the ventilation system's capacity to remove moisture, odour and pollutants from living spaces and its capacity to supply new, fresh air. One thing we often hear is that people in homes with air-to-air ERV ventilation couldn't imagine life without it. Why? Because an air-to-air ERV system offers an excellent indoor climate and exceptional comfort.

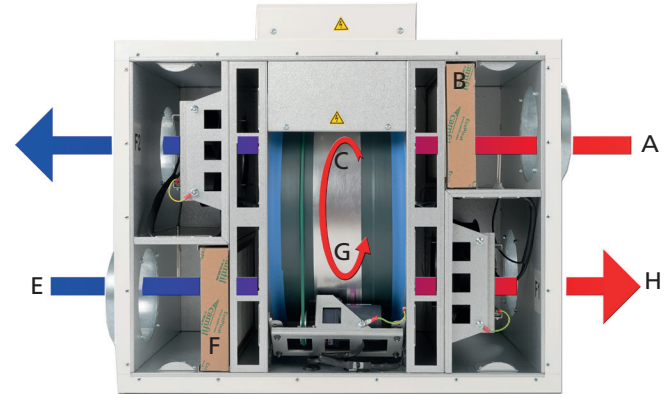
How much can I save?

- The example on the right shows energy consumption (kWh) relative to square-metres of living space. Where Natural Ventilation (NV) is taken to be zero (0) due to the fact that the natural ventilation is virtually non-existent.
- With an energy class A air-to-air ERV unit, the saving is 40 kWh/m² per annum. For a 160 m² home with natural (non-mechanical) ventilation, the annual saving from installing an energy class A air-to-air unit amounts to 6,400 kWh annually according to the calculation model based on the Ecodesign Directive.
- The comparison is based on a temperate Northern European climate. Going even further north, the saving from air-to-air ERV is even greater.
- An energy class A air-to-air unit means a unit with consistently energy-efficient construction and demand-controlled ventilation. Where the air change in the home is controlled by sensors which increase and decrease the air change rate depending on the number of occupants and air quality.



What is an Air-to-Air ERV system?

- The heart of an air-to-air ERV system is the ventilation unit.
- Air is extracted via ventilation ducts from spaces in the building where the air is stale and has a high moisture content, such as in bathrooms, utility rooms and kitchens.
- The hot air (A) is filtered (B) and passes the rotary heat exchanger (C), which stores the energy.
- Cold, fresh outdoor air (E) is filtered (F) and conducted via the heat exchanger (G), where the energy is transferred and the air is heated (H).
- The fresh, filtered air is then returned to the home via bedrooms and living rooms where we spend most of our time.

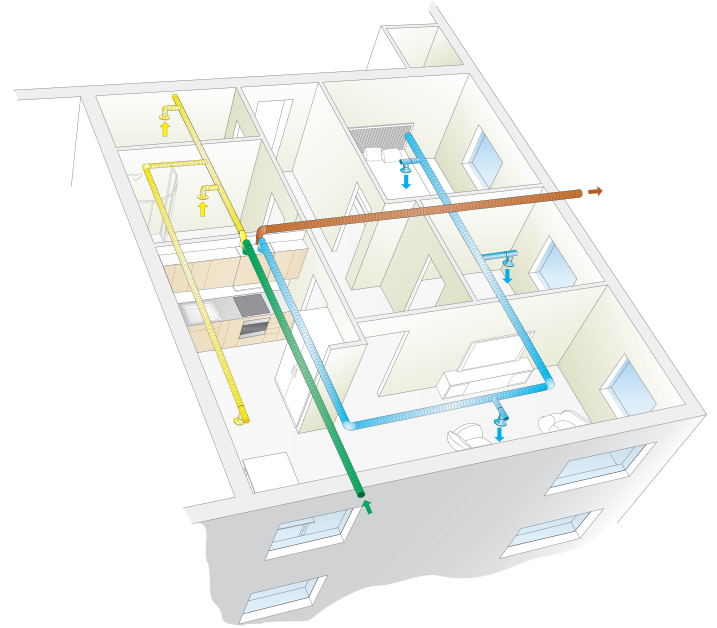


As much as 86% of the energy in the extract air is recovered for heating the supply air to a comfortable temperature in homes, and results in an energy-efficient, comfortable and healthier indoor climate.

- Energy-efficient
- Comfortable
- Healthier

What does this entail for my home?

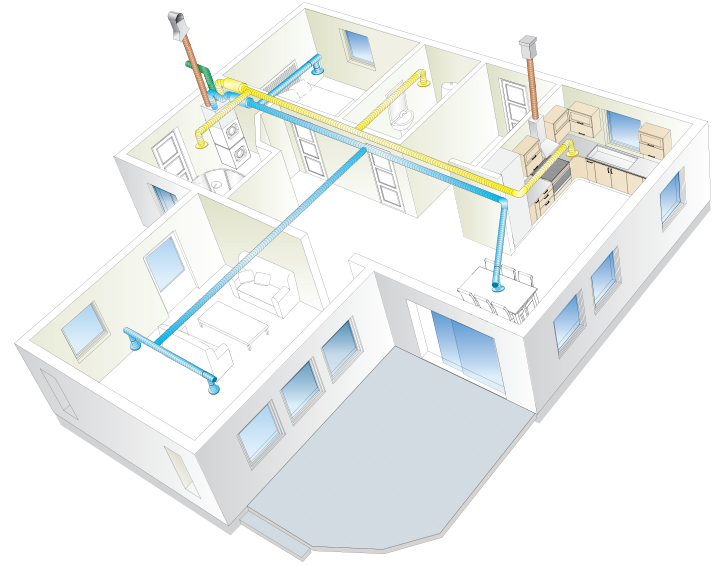
- Air-to-Air ERV system installation is not usually done as a DIY project. However, if you know what you're doing, a well-functioning installation requires advanced equipment for air-flow adjustment. We recommend consulting your nearest Authorised Swegon CASA Installer (ASCI). Visit our website at www.swegonhomesolutions.se for contact details of your local ASCI.
- There are bound to be some factors to consider before you go ahead with an installation.
- The level of comfort required, and whether you want reheating in the unit?
- Do you have a ground source heat pump? If so, you also have the option of connecting free cooling to the ventilation system.
- Where to site the air-to-air ERV unit?
- Ducting in the attic or through casings?



Consider the installation as a long-term investment which increases the value of your property and serves you well for many years. With more and more homeowners installing Air-to-Air ERV, the comfort demand for the next generation is also increasing.

Siting of the unit

- Swegon CASA has the most comprehensive air-to-air ERV range on the market. This means that we can offer the ideal model to match your requirements and preferences.
- The units are available for wall mounting, attic installation or spice-rack assembly, in 15 different models to cater for anything from a small studio flat to a large mansion.



Radon

- Did you know that radon is the second-most common cause of lung cancer after smoking? The Nordic countries, for example, have some of the highest indoor radon levels in the world. What can be done about radon?
- The first step is to test for radon gas in your home. This is usually done in winter, and radon gas test kits can be purchased over the internet.
- The usual way of eliminating radon is to install an air-to-air ERV system to ensure that all rooms are ventilated and that the hazardous gas is transported out of the home. Since the air-to-air ERV system's outbound air flow is balanced with the air flow inside the home, you will also be preventing penetration of new radon gas through cracks and gaps in the foundations.
- But be sure to consult an expert for professional assistance with radon elimination. Learn more about radon gas in our radon brochure, available to download from our website.



Swegon's local presence

- We impose strict requirements on Authorised Swegon CASA Installers (ASCI). They complete training modules in order to gain the latest expertise concerning products, add-on options, and how to configure installed units for optimum performance
- Our ASCIs will assist you with your installation every step of the way, and will be available near you to assist in future too with servicing or monitoring of your installation.
- Bear in mind that some national tax authorities offer a tax break of up to 30% on the labour costs of home improvement repairs, alterations and upgrades.
- Visit our website at www.swegon.se for details of how to contact your nearest ASCI.



10-year warranty



As a Swedish consumer or private housing cooperative, you have the option of taking out a 10-year extended consumer/cooperative warranty. For further information, contact your nearest Authorised Swegon Casa Installer (ASCI).

Swegon Home Solutions

With more than 400,000 ventilation units produced, Swegon is the leading supplier within ventilation system design and quality.



Swegon 