

VENTILATION AND RENOVATION PROJECTS

Good indoor air for older houses



VALLOX
HOME *of* FRESH AIR

MODERNISATION OF VENTILATION IS AN IMPORTANT PART OF A RENOVATION PROJECT

Effective ventilation protects the health of the house and its residents – and makes life more comfortable. Modernisation of ventilation is an important part of a renovation project. Almost half of the heating energy consumption in older houses is attributable to ventilation. Therefore, the energy performance of a ventilation system plays a major role.

Why high quality ventilation is important:

- Cooking, dish washing, showering, sauna bathing and breathing generate moisture and unpleasant smells that are removed by ventilation.
- A low oxygen content causes headache and fatigue. Efficient ventilation ensures adequately low carbon dioxide levels.
- Emissions from building and interior decoration materials are removed from the indoor air.

Efficient ventilation protects against moisture

During seven hours of sleep, two people produce roughly 7.5–8 decilitres of moisture and 150–200 litres of carbon dioxide through sweating and breathing. They also heat the indoor air by around 250–300 W/hour.

If the humidity level of indoor air becomes too high, humidity condenses on windows or the structures of the cold exterior wall. Damp structures provide a breeding ground for microbes and mould fungi, which will eventually damage the structures. At a

relative humidity of over 80%, nearly all types of mycelia thrive at normal room temperature.

Efficient ventilation removes the carbon dioxide and moisture load as well as smells, taking them directly out of the house.

Aiming for high-quality indoor air and energy savings

The most common reasons for ventilation renovation are inadequate ventilation efficiency and a need for energy savings. When an old house is renovated by installing additional insulation or replacing the windows, the airtightness of the house increases and air leaks decrease. This means that natural ventilation is no longer efficient enough to ensure a high quality of the indoor air.

Mechanical extract air ventilation wastes energy, as air heated by the heating system is blown out. Energy savings can also be achieved by replacing an old ventilation or air heating unit with a new one with a more efficient heat recovery.

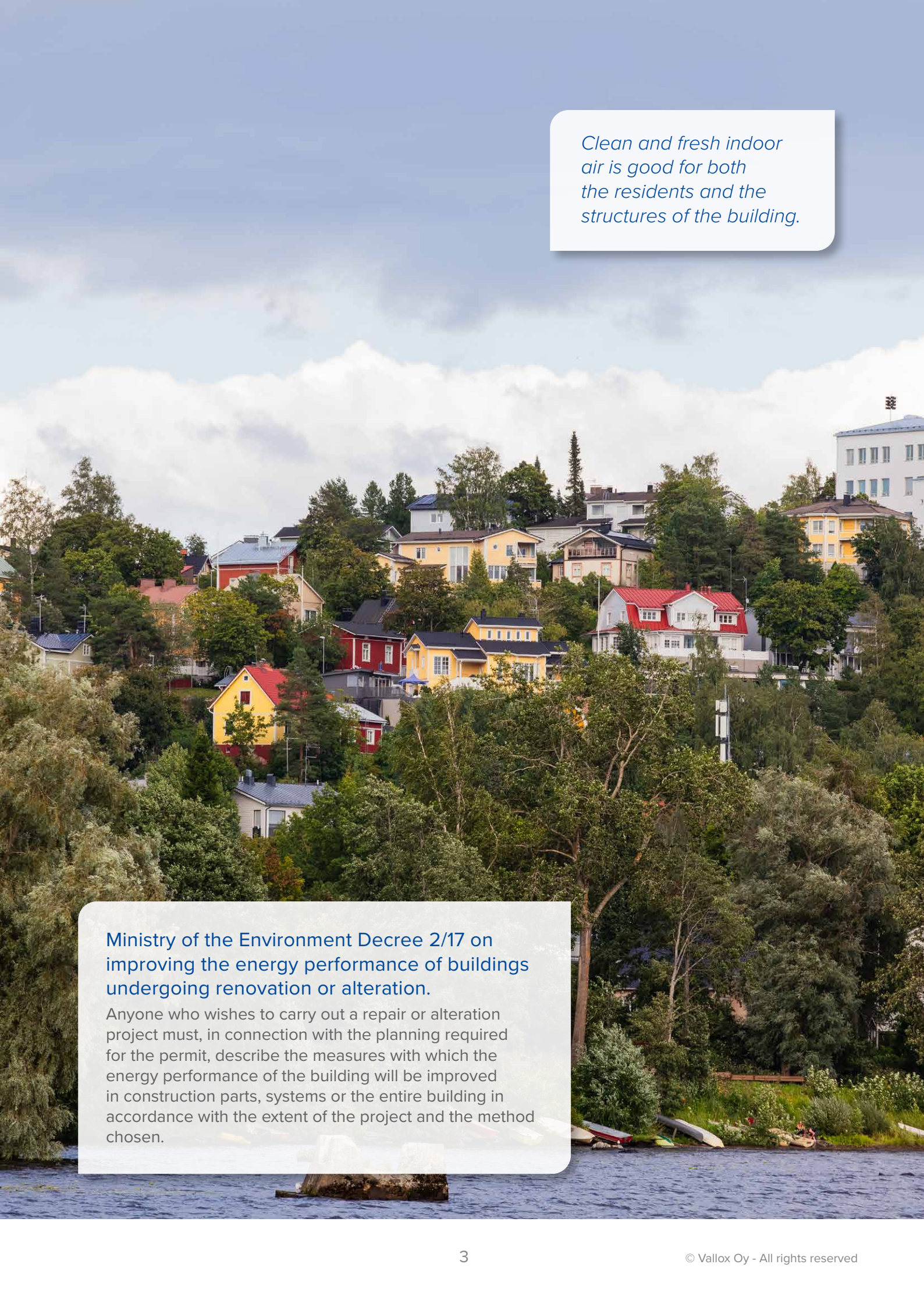
At the same time, advanced automation means more ease of use. The MyVallox ventilation units equipped with humidity and carbon dioxide sensors automatically adjust the efficiency of the ventilation in accordance with the air quality. They always introduce fresh and clean filtered air into living areas, heated to a suitable temperature with the heat contained in extract air.

Ventilation does not get easier than that!



Today's living habits generate a considerable moisture load in the room air. A high moisture level provides excellent growth conditions for mould and microbes.

During the heating season, the recommended relative humidity of indoor air is 30–45%. At higher humidity levels, excess amounts of moisture condense in the structures, which causes mould growth in the structures.



Clean and fresh indoor air is good for both the residents and the structures of the building.

Ministry of the Environment Decree 2/17 on improving the energy performance of buildings undergoing renovation or alteration.

Anyone who wishes to carry out a repair or alteration project must, in connection with the planning required for the permit, describe the measures with which the energy performance of the building will be improved in construction parts, systems or the entire building in accordance with the extent of the project and the method chosen.

FROM NATURAL TO MECHANICAL VENTILATION



The traditional building method ensured good indoor air quality through natural ventilation, which is based on pressure differences caused by height and temperature differences as well as the wind. Thanks to the pressure difference, stuffy air and moisture exited through the flues, and fresh replacement air leaked into the home through window chinks or specific air inlets built for replacement air.

Previously, the moisture load indoors was much lower as people showered and washed clothes less frequently, laundry was dried outdoors and toilet and washing facilities could be located in outbuildings.

The renovation of a house often improves its energy performance. A renovation of the heating system, additional insulation or window replacement improve the airtightness of the building and reduce air leaks.

Why is it that the old ventilation system is not adequate?

Homes that are renovated with modern methods are so airtight that natural ventilation is no longer enough to ensure a high quality of indoor air. The modern way of living, such as sometimes showering several times a day as well as washing clothes and drying them indoors, causes a high moisture load inside the home. The vapour barrier and tight windows do not let fresh air in or moisture out.

Therefore, it is particularly important to also modernise the ventilation system, so that it enables achieving the energy performance goals of the renovation project. Energy savings must not be achieved at the cost of the quality of indoor air or the health of the structures. Inadequate ventilation causes moisture damage to the structures and makes them susceptible to mould growth.

Fresh indoor air, energy-efficiently

The most energy-efficient method is to replace natural ventilation with a mechanical supply/extract ventilation system equipped with heat recovery, so that supply air is led into the home filtered and heated in a controlled manner.

A ventilation renovation helps to achieve considerable energy savings. The highly efficient heat recovery and fans that consume only a little electricity keep the energy consumption low. Supply air heated with heat recovered from the extract air is, in fact, free heat energy!

In addition to an improved energy performance, the comfort of living improves: the indoor air remains fresh, the heated supply air does not cause a draught, and the automation of the ventilation unit boosts the ventilation according to the need.

Mechanical ventilation requires a duct system

Installing ventilation ducts in an existing house often requires thorough planning to minimise the amount of work and supplies required. The diameter of the Vallox BlueSky ventilation duct is only 75 mm, which means that it can often be hidden in the structures even without extra enclosures. One person can easily handle the lightweight plastic pipe, and it can be installed without drilling and riveting. The pipes are cut with manual tools to suitable lengths and installed in place. The installation takes much less time when compared to traditional sheet metal ducts.

How do the BlueSky ducts differ from traditional ducts?

Compared with the traditional ventilation duct, the duct size of Vallox BlueSky is different: In the traditional ventilation duct system installed in a detached house, air usually travels along a single 160 or 200 mm wide duct until the

airflow and the diameter of the ducts is reduced after duct and valve branches.

In the Vallox BlueSky system, air is only led as far as the air distribution box by using a wide sheet metal duct. From the air distribution box, a flexible 75 mm duct leaves for each valve. For valves exceeding 8 dm³/s, it is recommended that two parallel ducts be installed. Use of one and two ducts makes the measuring of airflows easier, and this is one of the most highly-rated features of Vallox BlueSky. Therefore, the ventilation plan should be prepared by using BlueSky to get the most out of it.

Placement and insulation of ventilation ducts

The Vallox BlueSky ventilation duct can be hidden in the structures (intermediate walls or intermediate floors), cast concrete or a suspended ceiling, or it can be installed in the corner of the room and made invisible with enclosures.

When supply and extract air ducts are installed indoors (inside of the vapour barrier), there is no need for thermal insulation. The outdoor and exhaust air ducts must be insulated with 19 mm closed cell insulation inside the vapour barrier and with 50 mm wool outside the vapour barrier (no vapour-tight surface).

If Vallox BlueSky ducts are installed in the roof space, they should be installed immediately outside the vapour barrier, inside the insulation material. In this way, the ducts do not need any extra insulation in addition to the roof insulation. Otherwise, adequate insulation must be ensured. Always follow the orders of the local building authorities.

Fresh air should be taken in from the shadier side of the house, so that the sun will not heat the supply air in the hottest summer months.

Exhaust air can be led out through the roof or, in many cases, be blown out through the wall-mounted Vallox Out/in Vario air blow-out and intake device. The same device can be used for the intake of outdoor air to the unit.

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In renovation projects, Vallox BlueSky pipes can be installed in the structures of the intermediate floor or intermediate walls (photo on the left), or they can be installed in the room against the wall and ceiling, for instance, and hidden inside enclosures (photos below).



Location of the ventilation unit

It is recommended to place the ventilation unit near drains, into which condensing water can easily be led. A power socket is also needed to plug in the unit.

It is best to choose a place where the running sounds of the unit do not disturb the residents. The MyVallox ventilation units are silent, but when mounted on the other side of the bedroom wall, for example, the sounds resonating in the structure may

disturb light sleepers. A technical space, storage room or basement is the best place for the unit.

When considering the suitable place for the unit, remember that, ideally, the ducts of the ventilation system are made as short as possible. This minimises the energy consumption and sound level of the fans. Even though the duct itself is not expensive, insulations and their installation mean extra costs.

MyVALLOX

In MyVallox ventilation units, the ventilation is mainly controlled automatically by humidity and carbon dioxide sensors integrated into the ventilation unit.



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In addition, ventilation can be controlled with a control panel mounted on the wall and remotely via a free cloud service.



Enough free space must be left in front of the unit for maintenance, such as replacing the filters and removing the heat recovery cell for washing. At this site, a laundry tower fits under the ventilation unit.



EXAMPLE

What do you need to switch to mechanical ventilation?



A ventilation unit with a suitable air volume, e.g., Vallox 99 MV



BlueSky duct, an air distribution box and other duct system components



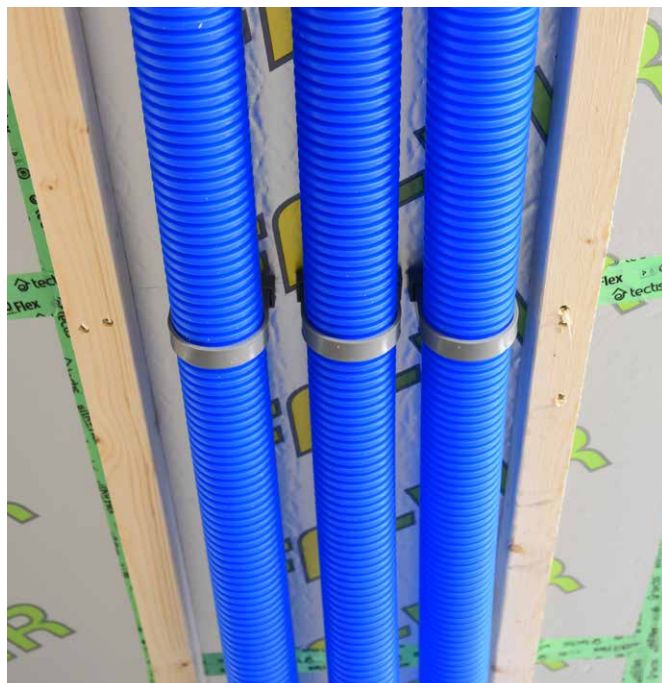
A wall-mounted air blow-out and intake device, plus supply and extract air valves in the rooms



Other possible supplies, such as a silencer.

VALLOX BLUESKY DUCT SYSTEM

VALLOX
BlueSky



Vallox BlueSky is a flexible, sound-dampening and hygienic ventilation duct system.

Thanks to its small size and flexibility, the duct can be installed in confined or otherwise challenging spaces. All components can be joined with handy quick couplings.

Quick installation and a low need for duct components makes the Vallox BlueSky duct affordable for both new construction and renovations.

Compact

- outer diameter only 75 mm
- the entire system can be installed in heated premises without large enclosures

Hygienic and easy to clean

- smooth, antistatic, and anti-bacterial inner surface

Airtight structure and low rate of pressure loss

- low energy consumption of the fan

Quick to install

- flexible duct
- easy-to-use quick coupling – no drilling or riveting needed
- the duct can be extended with quick couplings – less material waste
- easy to install inside construction components during erection of the building frame, similar to electrical installations and the sewage system
- no additional insulation is normally needed when installed inside blown wool insulation

Watch a video of the installation of a BlueSky duct system:
www.vallox.com/en/reference/the-installation-of-the-ventilation-duct-system-is-easy/





MECHANICAL VENTILATION INSTALLED IN A 1950S HOUSE

MyVALLOX
99 MV

The windows, entrance doors, kitchen and sauna facilities of the 1950s house were renovated. A combined fireplace room and exercise room was built in the basement. As the renovation considerably increased the airtightness of the building, natural ventilation was replaced with a mechanical supply and extract system.

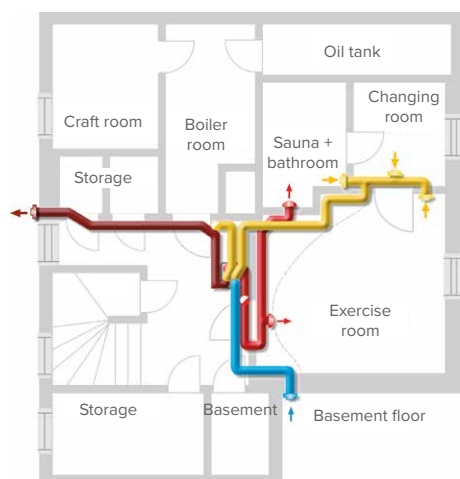
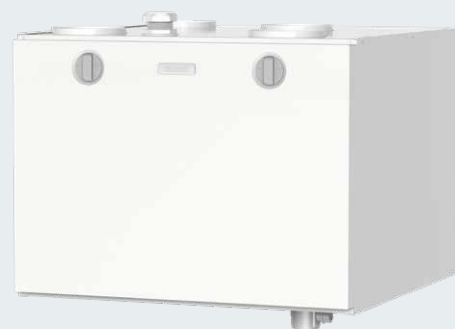
Transverse ventilation ducts were placed almost completely in the basement. The living areas required only vertical ducts and a few short horizontal ducts that were easily made invisible with the help of enclosures. Exhaust air is blown out through the blow-out unit mounted on the basement wall.

Vallox 99 MV was chosen as the ventilation unit, mounted near the sauna facilities in the basement.

The unit has integrated humidity and carbon dioxide sensors that the unit uses to automatically adjust the efficiency of ventilation according to the humidity of air and the number of people in the home.

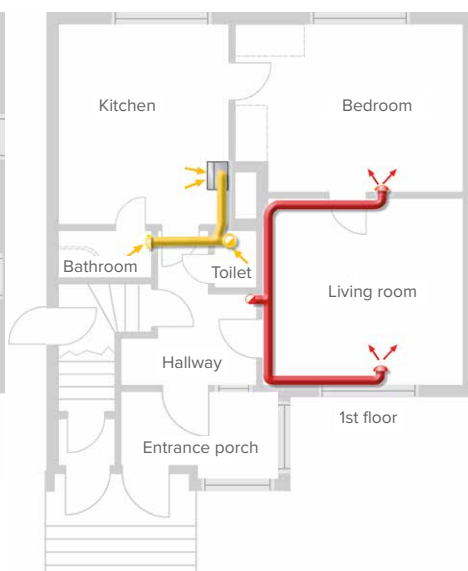
In addition, the residents control the ventilation with the control panel located in the living area on the first floor. The unit was also connected to the cloud service for remote control with a phone, for instance.

A silencer was mounted on top of the ventilation unit to minimise the sounds of the ventilation.

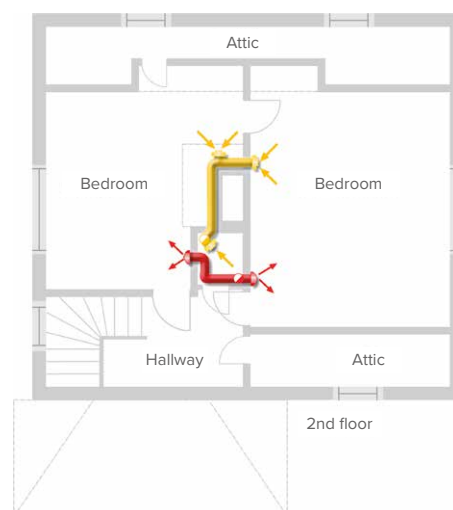


Fresh air is taken in through the outer wall of the basement, from the shady side of the house. Blow-out air is blown out from the other side of the house.

Supply air is blown into the sauna and exercise room. Air is also extracted from these rooms. In addition, air is extracted from the changing room.



On the first floor, extract air valves were installed in the bathroom, kitchen and toilet room. Supply air comes into the bedroom and living room.



On the second floor, both extract and supply air valves were installed in both bedrooms. In addition, there is an extract valve in the toilet room.

HOW TO GET STARTED TO REPLACE NATURAL VENTILATION WITH A MECHANICAL VENTILATION SYSTEM?

1. Survey the situation

- Ask a professional specialising in ventilation plans to survey the situation on site. It probably won't take very long for the professional to see what can and cannot be done in your house and what is recommendable.

2. Preparation of a ventilation plan

- After the survey, a ventilation system designer prepares a ventilation plan. It includes specifying the appropriate air volume for each room, etc.
- After specifying the air volumes, it is time to choose a ventilation unit of the right size as well as the other supplies, such as the air distribution system and other accessories.
- The ventilation plan should always be prepared by a professional, but you may construct the duct system yourself.

3. Construction and insulation of the duct system, installation of the ventilation unit and accessories, and other possible construction work

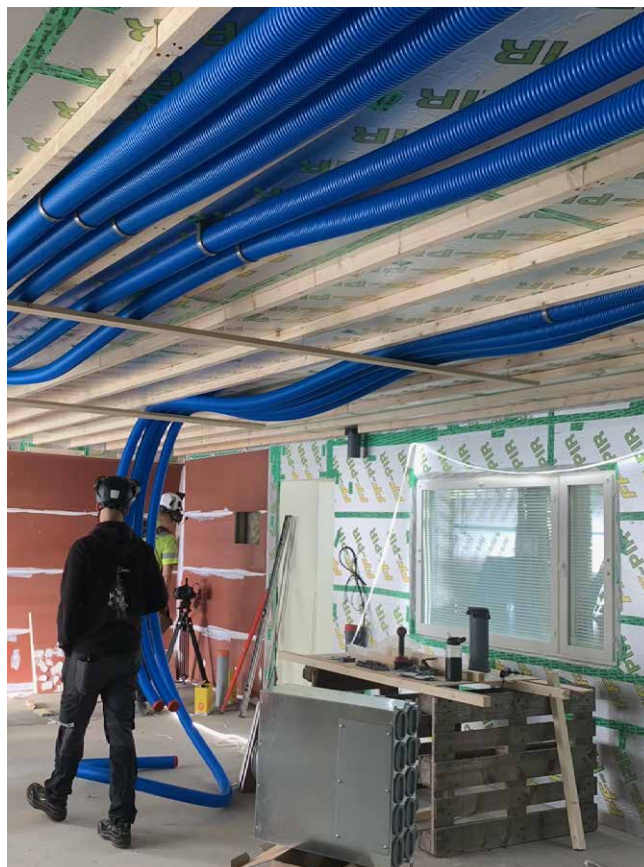
- In a house being renovated, it is easy to construct the ventilation duct system by using the Vallox BlueSky pipe. It is considerably faster to install when compared to traditional sheet metal ducts.
- Drains and a power socket are needed in the vicinity of the ventilation unit. Only a competent professional may carry out electrical installations and connections.
- When installing a ventilation unit, it is advisable to use aids, such as lifting equipment, for the handling of the heavy unit.
- Remember to inform the designer already at the beginning of the project about your plans to use Vallox BlueSky and, for instance, the outer wall-mounted Vallox Out/in vario wall blow-out and air intake device, so that this can be taken into account in the plan.
- Remember that any other construction work, such as duct enclosures and insulations, take time and involve costs. Therefore, the placing of the ducts should be carefully considered before their installation.

4. Air volume measurement and valve adjustment

- During the setup of the ventilation system, the air volumes must be measured and the valves must be adjusted correctly, so that the ventilation system will work as planned.
- The measurement and adjustment of air volumes must always be carried out by a professional using appropriate measuring instruments.

5. Enjoy fresh and clean indoor air, heated with the heat recovered from extract air!

- Do not forget regular maintenance of the system. For instance, replace the filters of the ventilation unit at least twice a year and wash the heat recovery cell approximately every two years.



When natural ventilation is replaced with a mechanical ventilation system in a detached house, it is advisable to utilise the skills and competence of professionals to avoid mistakes. You may carry out some work phases yourself, such as the installation of the Vallox BlueSky ducts, as long as you follow the ventilation plan.

WALL-MOUNTED AIR BLOW-OUT IN RENOVATION PROJECTS

Air blown out from the ventilation unit is traditionally led above the roof. In multi-storey houses, air is often blown out through the apartment wall to save flue space. In detached and terraced houses, this so-called wall-mounted air blow-out provides many advantages.

Efficient heat recovery cools exhaust air

In winter, the ventilation unit uses heat energy recovered from the extract air to heat the supply air. The temperature of the air blown out decreases along with the increased efficiency of the heat recovery.

This must be kept in mind when an old ventilation unit is replaced with a new one equipped with more efficient heat recovery. With units manufactured at the turn of the millennium, the exhaust air temperature did not drop much below +5 degrees Celsius, while the temperature of the exhaust air blown from the new efficient units may even be below -10 degrees Celsius.

Therefore, the exhaust air duct of new ventilation units must be insulated with condensate insulation with equal efficiency as the outdoor air duct where the exhaust air duct runs in a warm space inside of the vapour barrier. When replacing the ventilation unit, it is usually easy to install condensate insulation when the exhaust air duct runs from top of the unit to the cold attic and out. On the other hand, if the exhaust air duct runs to the roof through upper floors, condensate insulation must be installed up to the vapour barrier of the top floor. In this case, structures must often be opened, and space for condensate insulation is required around the duct.

If it is difficult to insulate a duct running in the structures, it may be easier to find a new route for the exhaust air duct. In this case, wall-mounted air blow-out may be the easiest solution: the exhaust air duct is installed next to the outdoor air duct, and a wall-mounted air blow-out device is mounted on the outer wall for these two ducts. The device is used for blowing out the exhaust

air and taking in fresh air for the unit.

When is wall-mounted air blow-out feasible?

The plot, other buildings or the building itself may limit the use of a wall-mounted air blow-out device. The use of wall-mounted air blow-out may also be subject to local instructions. Contact the local building control authorities for more information. According to the instructions of talotekniikkainfo.fi, the minimum distance of a wall-mounted air blow-out device from the neighbouring plot is 4 metres and the minimum distance from the opposite wall or building is 15 metres. In addition, the device must not be placed in an inset or immediately under eaves or other overhangs. More information can be found at Talotekniikkainfo and in the installation instructions of wall-mounted air blow-out devices.

If a wall-mounted air blow-out device is mounted near a patio, for instance, it may be necessary to equip the ducts leading out of the device with silencers to prevent disturbing noise.

The wall-mounted air blow-out and intake device Vallox Out/in Vario is suitable for renovation projects when you want to lead exhaust air out through the wall. The same device can take in outdoor air for the unit, and the components can be installed separately, if necessary.



VALLOX OUT/IN VARIO

WALL-MOUNTED AIR BLOW-OUT AND INTAKE DEVICE



Vallox Out/in Vario is a wall-mounted air blow-out and intake device suitable for new buildings and renovation projects alike.

Patented structure - reduced pressure loss!

- the air blow-out and intake device enables a multi-step adjustment of the blow-out speed, which reduces pressure loss
- good water separation ability, not susceptible to freezing
- easy and quick to install, does not require maintenance

Available in four colours

- white, black, grey, brick

New opportunities for construction planning

- components can be placed separately, even in different parts of the house
- the handedness of the device is easy to change



FROM EXTRACT AIR VENTILATION TO CONTROLLED SUPPLY/EXTRACT VENTILATION



In Finland, there are hundreds of thousands of detached and terraced houses and holiday homes that use mechanical ventilation with a house extraction fan or roof fan.

In terraced houses in particular, the so-called house extraction fan was still a common ventilation method at the turn of the millennium, as it was so affordable. The house extraction fan is like a cooker hood, except that extract air ducts from the toilet room and wet areas are connected to it.

This means that the same device took care of mechanical extract air ventilation and cooking smell removal. The supply air often came in only through window chinks.

When these systems were constructed, not much attention was paid to energy performance. Mechanical extract air ventilation consumes a lot of energy, as heat is not recovered from the extracted air and the heated air is blown out.

House extraction fan replaced with an energy-saving heat recovery unit

The most efficient method to substantially reduce the amount of energy consumed to heat the home is to replace extract air ventilation with a controlled supply/extract ventilation system equipped with heat recovery.

This means that the supply air led into the rooms is filtered and heated in a controlled manner.

A supply/extract ventilation system requires supply air ducts

Replacing extract air ventilation with a supply/extract ventilation system means more ventilation ducts. New ducts are needed for supplying outdoor air to the ventilation unit and supplying air from the unit to the bedrooms and living room. It is advisable to also install a supply air duct in the sauna to make sauna bathing more enjoyable.

The outdoor air duct can be led to the ventilation unit through the attic or inside the home within an enclosure above the fixtures. When installed in the attic, thermal insulation is needed around the duct, and when installed indoors, the duct must be insulated with closed cell condensate insulation.

The flexible Vallox BlueSky ventilation duct is excellent for supply air ducts. It is easy to install and make invisible with enclosures.

MyVALLOX
51 MV



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Ventilation unit for the kitchen

The choice of ventilation unit depends on the air volumes required. If extract air ducts are already led to the kitchen, it is a natural location for the ventilation unit. The Vallox 51K MV ventilation unit is suitable for smaller homes. It is installed above the cooker top and it includes a cooker hood. The house extraction fan above the cooker top is replaced with the ventilation unit. The existing extract air ducts are connected to the ventilation unit, and exhaust air is led into the old duct leading to the roof.

A ventilation unit equipped with heat recovery always requires drains. The condensing water pipe can be led from the ventilation unit to the water seal of the kitchen sink or into a floor drain if there is one nearby.



Sound-dampening increases the comfort of living

House extraction fans were not usually equipped with silencers. Installing a ventilation unit provides a good opportunity for improving sound-dampening. The supply air ducts need a silencer to prevent the sound of the unit from being heard in the bedrooms. As the fresh air valves in the exterior walls are no longer needed, they can be blocked, which also improves sound dampening in the external envelope.

It is also advisable to install a silencer in the old extract air duct to prevent noise in the wet areas and sauna, also when the ventilation is running at a higher efficiency.



The ventilation unit needs supply, extract, outdoor and exhaust air ducts. If extract air ducts required by the house extraction fan are already led to the kitchen, it is a natural place for the ventilation unit.

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The ventilation ducts can be hidden inside enclosures, and it is possible to install lights on the enclosures, for instance. Thanks to the seamless installation and the filtered and heated supply air, the ventilation renovation is noticeable only by the improved indoor air quality and the considerably lower heating bill.



Replacing the old house extraction fan with a Vallox Duct Fan

If you do not want to replace the ventilation system with a mechanical supply/extract ventilation system equipped with heat recovery, or if this is not possible, you can replace the old house extraction fan with a combination of a Vallox Duct Fan and a connected cooker hood of your liking. In this case, the cooker hood controls the duct fan's EC fan.

The duct fan can also be installed without the cooker hood, for instance, in the ceiling structures of the shower room to serve as an extract fan. In this case, cooking smells can be removed from the kitchen with an activated carbon fan.

REPLACING THE OLD VENTILATION UNIT INCREASES ENERGY-EFFICIENCY AND EASE OF USE



Vallox 125 MV is often the answer to the need to replace an old ventilation unit with a new, more energy-efficient unit with as little alteration work as possible.

The installation of mechanical ventilation with heat recovery became popular in single-family houses in the 1980s.

The heat recovery efficiency of older ventilation units, such as the MUH Ilmava, Vallox Digit and Vallox 75/95 models, is only about 50%, while the efficiency of a new modern ventilation unit can be even over 80%. Today's Vallox ventilation units heat the supply air to +17°C almost throughout the year by using only the thermal energy contained in the extract air.

In addition, the fans of the new ventilation units consume considerably less energy when compared to the old fans.

A more efficient heat recovery cell cannot be installed in an old ventilation unit, because they are

larger than the old heat recovery cells. Neither can AC fans be replaced with more energy-efficient EC fans.

In many detached and terraced houses, replacing the old ventilation unit with a new one is becoming a necessity simply because of their energy performance.

The ventilation unit is often placed on top of a boiler or laundry tower. This means that there is not much extra vertical space for installation or duct alteration work.

Vallox took this into account in the design of the new Vallox 125 MV ventilation unit. The width and height of the unit and the different duct outlets of the models enable easy and simple ventilation renovation.

Vallox 125 MV replaces dozens of old ventilation unit models

The Vallox 125 MV ventilation unit comes in several models, with the duct outlet being the only difference between them. They either fit directly in place of the old unit or require only minor changes in the duct.

For instance, the once popular MUH Ilmava, Vallox Digit, Vallox Digit SE, Vallox 75, Vallox 95 and Vallox 121 models as well as other manufacturers' models, such as Iito 440 and Onnline 130, can be replaced directly. Altogether, there are dozens of units that can be replaced.

The letter in the name of the unit (e.g., Vallox 125A MV) indicates the model, that is, the order and locations of the duct outlets.



THE OLD VALLOX DIGIT SE STEPPED ASIDE TO GIVE WAY TO A NEW VENTILATION UNIT

At our model site, the old Vallox Digit SE ventilation unit was replaced by a Vallox 125C MV. Its duct outlets match the duct outlets of Digit SE exactly.

The Vallox Digit SE already had 20 years of excellent service behind it. A couple of fans, one damper motor and one carbon dioxide sensor had been replaced over the decades, and the unit was still performing its basic service well. However, the house owners wanted to replace the unit with a more modern and energy-efficient one.

MyVALLOX
125 MV



An improved energy performance was evident at once, as the electricity consumption of the fans dropped significantly. At the Away mode airflow, the fans of the Vallox 125 MV consume only about 25 per cent of the electricity consumed by the old Digit SE, and even at normal operating speeds the difference is roughly 50 per cent.

The remote control option and integrated air quality sensors featured by Vallox 125 make the ventilation even more convenient than before. For example, the unit boosts the ventilation automatically, while this previously had to be performed manually by using the control panel.

Check which Vallox 125 MV model can replace your old unit & watch a video on replacing the unit
www.vallox.com/en/vallox-125-mv/



Vallox Digit SE was replaced with the Vallox125 C model. When the duct outlets of the new unit are similar to those of the old one, replacement of the ventilation unit is quick and easy.



WHAT SHOULD BE CONSIDERED IN REPLACING AND CHOOSING A VENTILATION UNIT?

Ensure adequate air volumes

You may use the air volumes of the old unit as a starting point, but you should also check a few things:

- Were the air volumes of the old unit correctly designed? For instance, in the 1980s, the unit and/or ducts could be undersized, particularly with respect to today's needs.
- Have extensions been built to the house or have wet rooms been added, so that the air volumes of the old unit are no longer adequate?
- Keep in mind that if only the ventilation unit is replaced, there is no obligation to fulfil the current air volume guidelines. If work subject to a building license is carried out in connection with the renovation, it is possible that the ventilation system must also meet the current requirements.
- To determine the suitable air volumes, it is advisable to use the services of a ventilation professional. Remember that a professional must readjust the air volumes also after the replacement of the ventilation unit.

Improve the insulation and sound attenuation of the ducts if necessary

When replacing the unit, it is advisable to check the insulation of the duct system:

- Remember that the exhaust air duct must have condensate insulation over the entire length inside the vapour barrier.
- If the exhaust air duct is difficult to insulate, a wall-mounted air blow-out is worth considering.

You should also consider whether sound-dampening should be improved:

- If the sound from the valves is disturbing, replacing the unit will not solve the problem. Instead, silencers should be installed in the ducts.
- With respect to sounds in the installation space, new units, such as the different Vallox 125 MV models, are quieter than many older units.

Check the duct outlets and the dimensions of the frame of the unit.

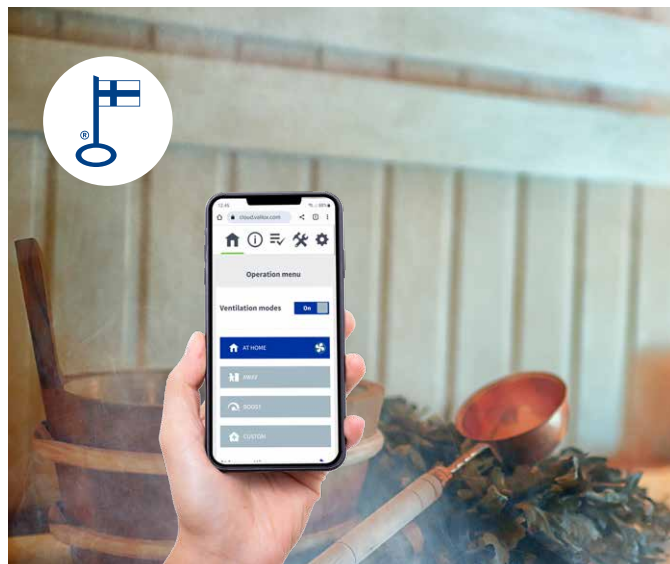
- Check the handedness of the unit, the number of duct outlets as well as the diameter and locations of the ducts in the unit's duct outlet or ceiling part.
- The external dimensions of the new unit may differ from those of the old one. Ensure that there is enough room for installation.
- Check whether the vertical space allows the use of a ceiling mounting plate that makes the installation easier.

If you are replacing your old unit with Vallox 125 MV, also remember the following:

- The Vallox 125 MV unit has no water circulation post-heating radiator, as modern heat recovery cells heat the supply air efficiently enough, so that post-heating is not needed except during the coldest hours of the year.
- The Vallox 125 MV unit also does not have a pre-heating/cooling radiator to be connected to the geothermal heat collection circuit (cf. Digit 2 MLV), but it can be used to control a separate Vallox MLV duct radiator.
- If a so-called circulating air duct has been connected to an old ventilation unit (from above the fireplace, for instance), it must be plugged or connected to the supply air duct.
- MyVallox Touch control panel is included in the delivery of the Vallox 125 MV unit. A NOMAK cable must be installed between the control panel and the unit.
- The Vallox 125 MV unit can also be controlled with a cooker hood (Vallox X-Line PTXP MC, Vallox X-Line PTXPA MC or Vallox Delico PTD EC), in which case air exits the cooker hood through the ventilation unit. In connection with the replacement of the ventilation unit, it is also possible to install a separate cooker hood that will remove cooking smells more efficiently directly out of the house. In this case, a general extraction valve must be installed in the kitchen.

THE MYVALLOX PRODUCT RANGE

INCLUDES A SUITABLE UNIT FOR EVERY HOME



- The units in the MyVallox range have different air volumes, but their features are largely the same. The product range includes a suitable unit for every home.
- The MyVallox ventilation unit always introduces filtered, fresh and clean, easy-to-breathe air into living areas. The air is heated to a suitable temperature with the heat contained in extract air.
- The plate heat exchanger does not mix impurities of the extract air with the fresh air coming from outside.

- The integrated humidity and carbon dioxide sensors boost the ventilation automatically according to the need. Excess moisture and carbon dioxide resulting from normal living are removed by ventilation.
- Thanks to the automation and high annual efficiency, the MyVallox ventilation units are very energy-efficient.
- The unit can be connected to house automation by using a Modbus or KNX connection.

Good ventilation keeps the indoor air fresh to breathe and ensures the wellbeing of the structures of the house.

- More information on indoor air quality can be found in the free MyVallox Cloud service, which enables controlling ventilation anytime and anywhere through an internet connection.
- MyVallox ventilation units are designed and manufactured in the Loimaa factory in Southwest Finland, with over 50 years of experience.

MyVALLOX



REPLACING AN OLD AIR HEATING UNIT WITH VALLOX AITO KOTILÄMPÖ



In the late 1970s and early 1980s, air heating was a relatively common heating system in Finnish detached houses.



VALLOX
Aito Kotilämpö

The air heating system has only one liquid radiator located inside the air heating unit. The circulating air fan sucks indoor air from the vicinity of the unit and blows the circulated air, which has been warmed up by the radiator, into the rooms through grilles below the windows. The Valmet Kotilämpö system included a ventilation part equipped with heat recovery, very advanced at the time. Hot air removed from wetrooms was used to heat the fresh air taken from outside, after which it was distributed throughout the home in circulating air.

The house in our example had a Valmet Kotilämpö C-1000 unit, installed in 1970. When the owner of the house heard that Vallox Oy, Valmet's successor in the business, is manufacturing the new Aito Kotilämpö air heating unit, they decided to replace the old unit that had served for nearly forty years.

The renovation project began with demolition work

As with most renovations, the project consisted of more than simply replacing the old unit. Some of the additional work involved modernising the 1970s HVAC installations to meet today's standards, and some of it was carpenter's work to make the entrance hall more spacious.

At first, the old air heating unit was unplugged, water connections were disconnected, and pipes were emptied by using a water vacuum cleaner. The old ventilation unit was moved outdoors during the first day of the renovation. The air heating ducts were video inspected and were found to be in no need of cleaning – thanks to the regular changing of filters.

The original water pipes leading to the air heating unit were replaced all the way from the heat distribution room. At the same time, it was found out

that there was no drain for condensing water. The heat recovery efficiency of the old air heating units was modest and the amount of condensing water was, therefore, very small - and the little amount that was generated evaporated into the circulating air at the heating radiator. The heat recovery cell of the new Vallox Aito Kotilämpö unit is so efficient that the amount of condensing water is much higher. As there was no floor drain near the unit, a condensing water pump was installed next to the unit.

Condensate insulation was installed on the outdoor and exhaust air ducts

The old outdoor air and exhaust air ducts had not been insulated in the conduits between the floors. In the attic, they only had sheet wool insulation. The traces found on the outdoor air duct indicate that it has leaked condensing water into the upstairs room wall at some point. The outdoor and exhaust air ducts were both insulated all the way to the attic with closed cell insulation as the exhaust air is colder than before because of the efficient heat recovery.

Installation of the new air heating unit

The new unit was lifted in place on the second day of the renovation project. The installation itself was easy, as the Vallox Aito Kotilämpö could be fitted directly on top of the distribution box of the old unit.

The size and location of outdoor, exhaust, and extract air ducts are not the same in air heating units dating back to different eras. In such a case, the order of the ducts needs to be altered to fit the new unit. The most important duct, the circulating air duct, is in the front section of the unit in both the Vallox Aito Kotilämpö and the old Valmet Kotilämpö unit.

The old Valmet Kotilämpö had been installed with a fixed connection to the mains, and it was controlled with the cooker hood. Power sockets were now needed for the air heating unit, condensing water pump and router, which enables connecting the new air heating unit to the MyVallox Cloud service.

Airflow adjustment is essential

To ensure that the heating and ventilation work in the desired manner, the airflows of the unit had to be adjusted. If the adjustment of ventilation is neglected, this may create a harmful over- or underpressure.

The speed of the circulating air fan of the heating part was adjusted according to the heat requirement of the house and the supply and extract airflows of the ventilation part according to the need of ventilation. The measuring tubes of the unit enable precise and quick adjustment.

Ease of use and automation

The residents of the house are happy with the multiple features of their new Vallox Aito Kotilämpö that were not found in the old unit dating back to the 1970s.

Ventilation and heating are controlled with MyVallox Control, using the At home, Away and Boost modes. The control panel features a week clock, so it is possible to set times when the indoor temperature is to be decreased. Thanks to the integrated humidity sensor, ventilation is boosted automatically during showers and reduced once the premises have dried. The carbon dioxide sensor boosts the ventilation when there are more people at home. Heat recovery bypass in summer is also automatic. The maintenance reminder reminds the user of the need to change the filters, which is important but easy to forget. The cloud service enables controlling and monitoring the unit e.g., by using a mobile phone.

The energy consumption is also reduced significantly, as the new air heating unit has DC fans, which consume half the amount of electricity, and more efficient heat recovery than the old one.



The galvanized surfaces of the interior of the old air heating unit (left) had become coarse and tarnished over the years. The new air heating unit (right) is completely painted, helping to keep the unit clean. Filters are also better today. The ventilation part features the latest technology in the industry.

REPLACING THE EXTRACT AIR PUMP IN SEPARATE HEATING AND AIR HANDLING UNITS



Mika Airaksela's detached house in Espoo required more energy for heating than was necessary. The old extraction heat pump had reached the end of its technical lifespan, in addition to which it was too small for the 176 square metre house.

Owing to this under-dimensioning, the unit was on constantly in very cold weather and also used electricity to supplement the heating. It was time to start thinking about replacing the system in order to cut down the energy consumption.

Airaksela decided to replace the old extraction air pump with an air-to-water heat pump by Viessmann and the Vallox 110 MV ventilation unit. With the new combination, the heating and ventilation of the building are implemented cost-effectively.

The efficiency of the old unit was only around 30%, whilst the efficiency of the new system is

around 90%. The figures show that it was about time both the heating and the ventilation systems were upgraded.

In addition to energy savings, Airaksela appreciates good, effective, and reliable ventilation, which contributes to the comfort of living.

The indoor air is probably the most important aspect of housing, and it can only be achieved through controlled mechanical ventilation. The filtering of the supply air is very important and the filters of the Vallox units are very effective. They do not let pollen inside the apartment in the spring.

The decision to choose Vallox was easy to make

Airaksela did not select a Vallox ventilation unit at random. Airaksela, who was working as the CEO of the construction firm Arkta Reponen, was familiar with the offering and the options of

building technology through his work. He considers Vallox ventilation products to be the best in the market as regards their energy consumption and other features.

– When I was working for Arkta, we purchased roughly 300 apartment-specific ventilation units each year, and Vallox was our sole partner for many years. This is due to the fact that Vallox units are, simply, the best in the world.

MyVALLOX

110 MV



It was for this reason that a professional in the construction industry also chose a Vallox ventilation system for his own home. The features that Airaksela appreciates in the Vallox units include energy-efficiency, controlling, and integrated automatics. The integrated carbon dioxide and humidity sensors of the Vallox units boost the ventilation automatically based on the need, which contributes to flexible and care-free apartment-specific ventilation.

– The units can be taken into use immediately after their installation. In addition, the remote control displays the situation of the ventilation at any time. In addition, history data is always saved when the unit is used remotely.

Reduction in consumption saves energy

Before the renovation, Airaksela's detached house consumed roughly 24,000–25,000 kWh of energy - all electricity included. The energy-efficiency of the new system is based on the excellent annual efficiency of the ventilation and the COP value (Coefficient Of Performance) of the air-to-water heat pump. The COP value indicates how efficiently the consumed electricity is transformed into heating energy. The annual efficiency of the ventilation, on the other hand, tells how much heat the heat recovery system can recover from the extract air in order to heat the supply air on average throughout the year. On the basis of Airaksela's estimation, the energy renovation reduces the consumption by half.

I wanted a more sensible and cost-efficient solution and, because I have also studied energy matters also as part of my work, this was the best solution. Thanks to a good efficiency ratio, the units can produce all the heat and water we need.

Watch a video of the energy renovation of Airaksela's house: www.vallox.com/en/reference/energy-savings-through-a-heating-and-ventilation-system-renovation/



Before



After

LEFT – BEFORE:

The initial situation before the energy renovation. The old extraction air pump was removed to make room for the new heating and ventilation system.

RIGHT – AFTER:

The old extraction heat pump, located in the technical space, was replaced with a Vallox 110 MV ventilation unit. At this point, the work to install condensing insulation on the outdoor and exhaust air ducts is still ongoing. The air-to-water heat pump was mounted on the adjacent wall.

VALLOX DELICO

OUT OF LOVE FOR COOKING

VALLOX
Delico



With the steam collection part pushed in, the white Vallox Delico hood merges seamlessly with the white kitchen cabinets. The sliding steam collection part is pulled out for use.

Efficient cooking smell removal should be taken into account already at the planning stage of a kitchen renovation project. The dirty and greasy air generated during cooking must be removed before it can spread into the room air. In addition to the extract air flow, the efficiency of cooking smell removal depends on the distance between the cooker hood or fan and the source of the smell and, particularly, the form and volume of the smell collection part.

Therefore, you should choose a hood with a large smell collection part and place the hood as instructed in the manual.

User manuals often instruct to place the cooker fan or hood at a 500 mm distance from the cooker top. If the cooker hood is placed at a shorter distance than

specified in the requirements, the grease possibly accumulated in the hood may be set on fire by the heat of the cooker top. In addition, if installed too low, the hood disturbs the visibility of the cooker top and it is also difficult to use larger cookware on the cooker top. If installed too high, the removal of cooking smells is impaired.

Elegant Finnish cooker hood range

Vallox Delico is a Finnish hood range that combines subdued Scandinavian design and the efficient removal of cooking smells.

The Vallox Delico range also includes a black option to match dark-coloured kitchen cabinets. Both the black and the white hood are available in two widths, 500 mm and 600 mm.

Vallox Delico cooker hoods are designed to be integrated with kitchen cabinets. The efficient hoods merge elegantly into the kitchen design when not used for cooking. The smoothly sliding steam collection part is robust and of high quality.

The hood is easy to control with the illuminated intuitive touch buttons. The glass front panel is easy to keep clean and the guard function enhances safety. The motorised damper with timer functions makes daily use easier. The LED light provides an even and non-glaring working light to the cooker top.



FRESH SUMMER HOME FIREPROOF AND ENERGY-EFFICIENT



The ventilation needs of a holiday home are similar to those of any other residential building: the impurities and humidity originating from everyday life and house structures must be led out.

Expanding the summer cottage, improving its airtightness or converting it for all-season living often requires ventilation renovation.

The need for ventilation in the holiday home is particularly important in situations such as sauna bathing, when a small space is exposed to a high moisture load.

In a small cottage kitchen, or in a holiday home with the kitchen

integrated with the living area, the importance of smell and moisture removal is further emphasised.

Also in the holiday home, the bedrooms must be supplied with an adequate amount of fresh, filtered and (in winter) heated air throughout the night, to ensure a refreshing night's sleep and fresh air in the morning.

A good ventilation unit does not generate underpressure that disturbs the draught in the fireplace. The fireplace switch of the unit makes lighting the fireplace easier, even if the fireplace has not been used for a long time.



The summer cottage built in the 1970s was thoroughly renovated to meet today's standards. The airtightness of the cottage

structures increased, and the need emerged to also modernise the ventilation.

Vallox 51K MV with an integrated cooker hood was chosen as the ventilation unit for the cottage. The natural place of the unit was on top of the cooker in the kitchen. The small cottage kitchen is adjacent to the living room, which is why efficient removal of cooking smells and moisture is important. The metal structure makes Vallox 51K MV a fire safe ventilation solution for kitchen installations.

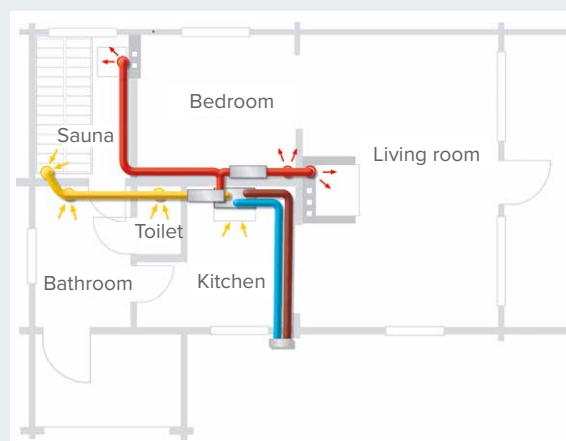
The owners of the cottage are particularly happy about the ease of ventilation. The humidity sensor of the ventilation unit recognises

increased humidity levels in the air after sauna bathing and cooking and automatically boosts the ventilation, until the moisture level returns to normal.

When the cottage is left unoccupied, the ventilation is set to a low efficiency, i.e., set to the Away mode. Ventilation should not be completely switched off even when the holiday home is unoccupied: temperature variation generates moisture that must be removed to prevent it from condensing in textiles and structures, causing damage.*

Soon after the renovation was completed, the owners already noticed that the energy consumption was kept in control by the efficient heat recovery of the

ventilation unit and the DC fans that consume little energy. The Vallox 51K MV fans can be operated in the Away mode for a couple of months at the same amount of energy that is consumed by heating an electric sauna once. In addition, passing the extract air from the cooker hood through a heat recovery cell improves the ventilation unit's energy-efficiency.



*The summer cottage must not be left unheated

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