ZONE VENTILATION

PRINCIPLE

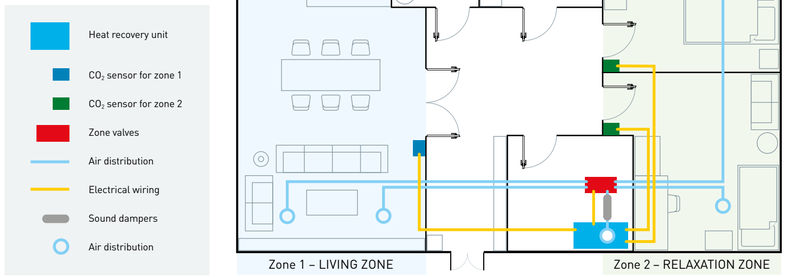
Controlled ventilation with heat recovery supplies energy efficient and ballanced distribution of fresh air and removal of waste air. The amont of the air exchanged depends only on the power of the fans in the heat recovery unit.

The goal of zone ventilation is to direct the air to where it is most needed using the zone valves.

Zone ventilation takes care of primarily the spaces that are occupied. In its simplest form, the flow of air is switched between two zones to the supply and exhaust of the air. It allows us to use smaller ventilation units even for relatively large spaces, which leads to lower investment and operation costs.

	ZONE VENTILATION FOR SUPPLY OF AIR	ZONE VENTILATION FOR AIR EXHAUST
Zone1	Living zone: Living room, den.	Kitchen
Zone2	Relaxation zone: Bedrooms, children's rooms.	Sanitary facilities: WC, bathrooms, washing room
Principle	Both of the zones are equipped with their own CO_2 sensors. Information on the air quality from both of the sensors influences the setting of the airflow into each of the zones as well as the unit's behaviour. During the day the living zone is more intensively ventilated and during the night the bedrooms.	For most of the time the air is removed from the sanitary facility zone. If there is a need to ventilate the kitchen, the exhaust is redirected to this zone, for example, by pressing a button located in the kitchen. If it is necessary to ventilate the bathroom and the kitchen at the same time, both of the branches are opened and the unit increases its performance to the maximum.

Simplified zone ventilation diagram for supply of air of controlled CO_2 sensors



Control

It is common for a flat to be divided into only two zones, though it is possible to work with more zones. The valves, which influence the flow into the individual zones, are controlled either by CO_2 sensors or by time settings. The directing of the air is not 100% to one or the other zone, but with a configurable distribution ratio. Thanks to this none of the zones will be totally unventilated.

Benefits

The following is achieved by to targeted ventilation and a lower airflow rate (by up to 40% compared to the non-zone concept):

- Decrease of initial investment, space savings and simplification of instalment thanks to the possibility to install a heat recovery unit one size smaller.
- Fulfilment of hygienic standards
- Lower consumption on fans by approximately 50%.
- Later replacement of filters (due to slower clogging)
- Increase of quality of interior microclimate
- Easier maintenance of natural humidity level

CONTROL AND MANAGEMENT OF UNIT

LOCAL CONTROL	
Analogue Control	The unit is controlled manually over an **analogue wall control unit** with the possibility of nine levels of ventilation intensity.
	The unit may not be concurrently controlled over a local network or remotely.
Indirect Control through Local Control Network	Control through the **MyWAFE web application** using the user's devices, e.g. smartphone, computer.
	Logging in through a local network is assumed.
	The unit can be controlled not only by the user's actions (a weekly program in addition to manual control), but also automatically through a CO_2 sensor.
Direct Control over local network	The user controls the unit using a 5" touchscreen on the **WAFE Airtouch panel**, which has the same controls and graphics as the Local Control web environment.
	The panel is connected by a cable to the control unit and also gets its power in this manner.

REMOTE CONTROL	
Ethernet connection	The most common way to control the recovery unit outside of the house.
	The control environment is identical to Local Control.
Sigfox IOT network	Primarily provides information about the unit, temperatures, sensors, the state of the unit, alarms, etc. WAFE 200 E is capable of communicating to the outside regardless of an Ethernet connection.
	The remote overview is once again provided through the **MyWAFE web application**.
Ready for connection to smart home with BMS module	A unit equipped in this manner can be classified as a "smart home system" and, thanks to the ModBUS protocol, the unit can be controlled by external commands.
	Thanks to ModBUS, the unit can also be monitored and the measured values can be displayed using a visual environment of the parent smart home system.

Analogue wall control unit

MyWAFE web application

WAFE Airtouch panel

As part of the administration of the unit (with the exception of the analogue wall control unit), the modes (operation mode, fireplace ventilation, circulation, boost, night mode) can be changed as required by the user. For more on modes see our product section at **www.wafe.eu**.

PARTNER PROJECTS

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W-EN-2019-2

WAFE 200 E

APARTMENT BUILDING SOLUTION

SPECIALISTS IN HEAT RECOVERY

BENEFITS OF WAFE 200 E

CONTROL AND MANAGEMENT OF UNIT
LOCAL AND REMOTE CONTROL OPTIONS.

MOISTURE RECOVERY
THE OPTIMUM HUMIDITY IS MAINTAINED THANKS TO INNOVATIVE ENTHALPY EXCHANGER TECHNOLOGY.

LOW INVESTMENT COSTS
NO OTHER EXPENSIVE ACCESSORIES HAVE TO BE ACQUIRED FOR THE UNIT.

WAFE 200 E

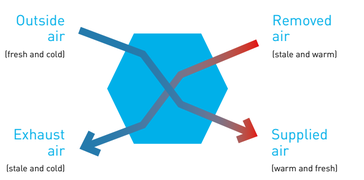
Controlled ventilation with heat recovery is a growing trend and will become a basic building block for low-energy construction starting from 2020. The new direction also brings with it fears of complicated solutions. The developer usually resolves how to reconcile the demands of the future flat users, who prefer a simple and silent device, with his own interests for an inexpensive solution that takes up as little space as possible.

The WAFE 200 E heat recovery unit, which is prepared for the independent ventilation of the individual flats, can fulfil all of this. Thanks to this, the user can fully influence the performance of the ventilation regardless of other flats. The ideal shape of the unit assumes a hidden installation, which does not disrupt the interior design. At the same time, it significantly decreases the external noise of the device. The greatest benefit, however, is the use of the enthalpy recovery exchanger.

TECHNOLOGY COMPARISON

Regular heat recovery units primarily resolve the transmission of heat from waste air to fresh air. The small thermal efficiency results in a low temperature at the outlet (decreased comfort) or the necessity of energy-intensive additional heating. Other units with high thermal efficiency may suffer from condensate frost in the exchanger when the outside temperatures reach below 0. Under such conditions electric preheating of the incoming air needs to be used causing higher electricity consumption. Heat recovery units need to be connected to a condensate drain as well. The humidity condensation happening in the exchanger has a negative effect on the quality of the interior environment, because of excessive drying of air. Thanks to WAFE 200 E´s special enthalpy exchanger technology, these disadvantages are eliminated.

PRINCIPLE OF HEAT RECOVERY



ENTHALPY EXCHANGER

A special technology combining the advantages of the high thermal efficiency of a counterflow exchanger with the ability to recover humidity from condensate, which would otherwise be drained away from the unit. The humidity is redistributed through the exchanger's permeable membrane. The construction of the membrane only permits simple water molecules to pass through. Odours, viruses and impurities remain on the side of the exhaust air. An indirect, though welcome effect is that WAFE 200 E is devoid of a condensate drain.

That significantly simplifies the construction preparation and the possibility of horizontal and vertical installation. The heat resistance of the exchanger only requires very low-power preheating to be activated at a temperature of -7 °C and bellow. The main task of the heat recovery unit is to supply an abundance of fresh air regardless of the temperature outside. Some manufacturers of units without preheating decrease the flow of fresh air at low temperatures, which may be contrary to hygienic requirements.

LOW OPERATING COSTS
EXTENDED SERVICE LIFE OF FILTERS, LOW CONSUMPTION OF FANS, HIGH EFFICIENCY OF EXCHANGER.

AUTONOMOUS OPERATION
OF THE UNIT CAN BE MANAGED THROUGH CO_2 SENSOR OR SUPERORDINATE REGULATION (SMART HOME SYSTEM).

PLACEMENT VERSATILITY
THE UNIT CAN BE INSTALLED ON THE WALL OR CEILING IN THE BUILDING'S TECHNICAL SPACES, WHICH PERMITS THE MINIMUM USE OF SPACE.

OBJECTIONS TO HEAT RECOVERY ANSWERED

THE MOST COMMON OBJECTIONS TO HEAT RECOVERY IN APARTMENT BUILDINGS	THE SOLUTION WITH WAFE 200E
It is too complicated during construction Complications and delays can arise due to a lack of experience with the installation of heat recovery units and distribution systems.	The risk during construction is covered by a quality design WAFE can arrange the actual design itself, as well as a professionally-trained installation company.
The customer will not appreciate heat recovery Heat recovery increases the cost of the project. But the customer will not be willing to pay a higher purchase price for the flat.	Heat recovery is a growing trend and is becoming commonplace Distribution systems are not expensive – they are worthwhile even in projects where only some apartments are equipped with it. Customers are already recognising the advantages of heat recovery. In a few years flats and houses without it will have a significantly lower value.
Customers will be afraid of limitations while using the unit The unit will be loud and the customers will not be able to open their windows.	The WAFE unit does not limit customers at all The design and installation of WAFE was developed with a maximum emphasis on silence. Noiselessness is achieved through a quality unit with a quality distribution system. The ventilation of the heat recovery unit is quieter than the noise from the street.
Air inlets and outlets disturb the architecture Centralised systems have large distribution systems, while decentralised systems require access on the façade.	The WAFE solution cleverly combines centralised and decentralised elements The centralised air inlet and outlet maintains architectural purity, while the decentralised placement of the units brings efficiency.
It will be difficult to fulfil the fire, hygienic and construction standards Divided fire spaces, quality of the supplied air, static load.	WAFE prepared its system on the basis of a discussion with all the interested parties (architects, designers, hygienists, developers) Our solution satisfies fire, construction and hygienic standards and does not limit the architect or the designer during the design phase.
Service of the units complicates facility management Maintenance costs will be a complication for customers and heat recovery will be a source of complaints.	Maintenance is simple and has an element of individual responsibility The units are autonomous and announce their status to the facility manager remotely, while the owner of the flat only replaces filters.

ZONE VENTILATION
LOWERS INITIAL INVESTMENT AND OPERATING EXPENSES, LEADS TO FULFILMENT OF HYGIENIC STANDARDS.

ADVANTAGES OF THE INSTALLATION

Main advantages for the customer

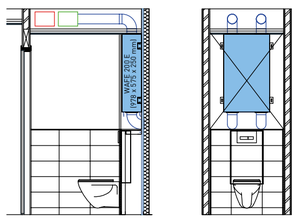
- There is always fresh air in the flat, regardless of the weather, noise or smog outside.
- Thanks to the replacement of stale air with fresh air, the users will sleep well in the flat without having to open the windows. Plus they will not be bothered by noise from the street.
- A natural humidity is maintained in the flat, lowering health risk.
- The flat will keep a higher value over time containing a technology that is becoming a market standard.
- There are lower heating expenses compared to the situation where the users regularly let fresh air in through the windows in the winter.
- The lower environmental burden of the flat is also interesting for customers.
- The technology can be part of a "smart home" concept.

Construction and operation advantages

- The unit is located in the flat – thus the owner or the lessor bears the responsibility for its operation and expenses.
- Easy maintenance due to the autonomous operations, consisting solely in the replacement of filters.
- Thanks to the central air inlet and outlet, façade and fire valves are not necessary. This simultaneously extends the lifetime of the local filters.
- The solution corresponds to fire and hygienic standards, while not significantly influencing the design of the building or its statics.
- Thanks to the minimum noise and other parameters of the ventilation system, it is not necessary to introduce further measures to decrease noise and dust in the building.
- Indirect summer by-pass – running only a single fan enables the cooling of the interior spaces.

INSTALLATION OF WAFE 200 E

Variation 1 – Vertical installation



Variation 2 – Horizontal installation