KORADO®

Radon protection system

PATENTED*

Effective radon protection solution

10/2025

PATENTED*

Advantages of installing a radon protection system

The installation of a radon protection system is a key step toward healthy, safe, and energy-efficient living. It is a comprehensive solution that combines health protection, compliance with legal requirements, the use of modern technologies, and maximum user comfort. A properly designed and implemented system can effectively reduce the risks associated with radon, optimize the indoor environment, and at the same time deliver long-term savings and legal benefits.

Healthy and safe environment

Online air quality monitoring

More than 15 years of professional experience

Ventilation units with heat recovery

Unique professional know-how

Radon is an invisible risk in indoor environments

Radon is a natural radioactive gas formed by the decay of uranium in the soil. It can penetrate from the ground into buildings, where it accumulates primarily in ground-level and underground spaces. Long-term exposure to elevated concentrations of radon poses a health risk, particularly an increased risk of lung cancer. Since radon is colourless, odourless, and tasteless, its presence must be measured using specialised instruments. Values are assessed according to the so-called OAR (radon activity concentration) and the limits set by public health regulations.

Domestic and international references

Top-class professional equipment

Energy efficiency of the system

Legislative requirements and subsidies

Comfortable operation without worries

* Patented solution compliant with Czech approval legislation

What is a radon protection system and why install it?

A radon protection system is a comprehensive technical and construction solution whose main goal is to reduce the concentration of radon in the indoor environment of a building to a safe level and to ensure long-term healthy and comfortable conditions for the building's occupants.

When and why install the system?

- For new buildings, radon protection measures can be integrated already in the design phase – cost-effectively and efficiently.
- For existing buildings, the system is installed based on measurements that reveal radon concentrations exceeding the limit values.

When do we recommend a radon protection system?

- In areas with a high radon index in the soil.
- For schools, kindergartens, public buildings, and family houses.
- During renovations or changes in building use.

System advantages

- Long-term effectiveness without the need for user intervention.
- Flexible solutions adapted to the structural possibilities of the building.
- Possibility of obtaining subsidies.
- Increased market value and health quality of the building.

What do we offer?

The radon protection system is always tailored to the specific building and may include:

1. **Building diagnostics**
   - Building inspection – identification of radon entry paths, assessment of the building envelope – the system is intended only for buildings with a tight envelope.
   - Measurement of radon, air flow, and building airtightness.
2. **Construction measures**
   - Sealing of cracks and joints in the substructure.
   - Installation of radon protection measures.
   - Modification of service penetrations.
3. **Technological solutions**
   - Installation of radon probes and mechanical ventilation with heat recovery (HVAC systems).
   - Negative or positive pressure ventilation of building sections.
   - Radon units with automatic control options.
4. **System monitoring**
   - Continuous monitoring of radon concentration using probes.
   - Data collection and feedback for verifying the effectiveness of measures.
   - Option for remote supervision and system maintenance.

	Traditional measures (undercutting, insulation, ventilation)	**KORADO radon protection system**
Construction interventions	✓ Yes, necessary demolition (undercutting, sealing)	✓ Yes, to a lesser extent (only installation of air ducts)
Effectiveness	✓ Often local, limited, and dependent on execution	✓ High, verified, monitored, long-term stable
Implementation time	✓ Weeks – usually with extended operational downtime	✓ Classroom – 2 days, family house – 1 week
Effectiveness verification	⊖ None, without feedback	✓ Online monitoring 24/7, patented automatic operation
Maintenance	⊖ None, without assurance of functionality	✓ Easy maintenance, filter replacement, probe calibration
Implementation cost	⊖ Depending on the type of building and the measures implemented, usually rather expensive	✓ Price based on bill of quantities – guaranteed, usually lower than traditional measures
Additional benefits	⊖ Radon reduction only	✓ Radon and CO_2 control, heat savings

Case studies on the effectiveness of controlled ventilation in radon elimination **before and after the installation of a radon protection system**

Technical framework and required documentation

The installation of a radon protection system requires a responsible and precise approach to design. The entire process begins with an **analysis of the technical conditions of the building**, followed by the procedures below.

PREPARATION

Initial measurement value conducted by SÚRO

1 Information Gathering

- Location, building type, purpose of use.
- Design documentation, results of radon measurement.
- Results of blower door test, completed entry form.

360° camera for indoor space recording

2 Building diagnostics

- Building inspection – identification of radon entry paths, assessment of the building envelope.
- Radon measurement (AlphaGUARD, Airthings), air flow, and airtightness (Blower door test).
- Evaluation by a qualified professional (ZOZ)

Thermal camera for measuring and diagnosing the technical condition of buildings

3 Solution Design

- Construction measures: insulation, sealing.
- HVAC system with heat recovery: ductwork, zones, filtration, sensors.
- Inspection of existing HVAC: performance, noise level, efficiency measurements.
- Monitoring: radon, CO_2, TVOC, humidity probes, remote supervision.
- Operational adjustments: ventilation mode, operating rules.
- Cooperation and coordination of authorized professionals (designer, heritage conservator, etc.).

To verify the airtightness of the building, we perform tests using a professional Blower Door test measuring system

Remote laser meter for fast and accurate distance measurement indoors and outdoors

For precise measurement of air flow rate, air velocity, and volumetric flow, we use the professional TESTO 440 anemometer

Airthings with a control measurement value within the radon protection system

IMPLEMENTATION

VENTBOX
heat recovery units

Radon
probe

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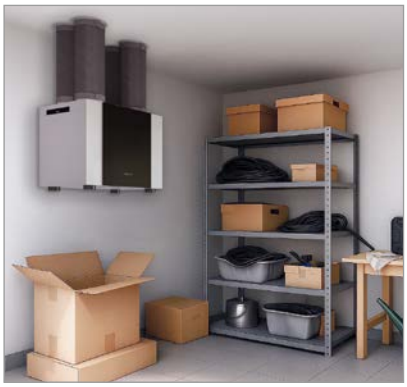
- HVAC and construction section prepared for approval processes



Subsidy application support

- Cooperation with experts (subsidies for radon protection measures, etc.).
- Consultation and administrative assistance.

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SÚRO

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Implementation process

- Coordination of professions: construction works, HVAC, electrical.
- Installation of systems: air ducts, sensors, controls.
- Commissioning, setting of overpressure mode, remote management.
- User training, operating instructions, entries in the construction log.

INSPECTION
SERVICE
MAINTENANCE

For measuring radon concentration (OAR),
we use the professional instrument AlphaGUARD

For measuring ionizing radiation,
we use the Voltcraft RM 400 device

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Inspection and verification of functionality

- System functionality tests and radon measurement after implementation.
- Evaluation of effectiveness and long-term monitoring.

Service and Maintenance

- Probe calibration, filter replacement, operational parameter checks.
- Software and data system monitoring.

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Value measured after the installation of the radon protection system conducted by SÚRO

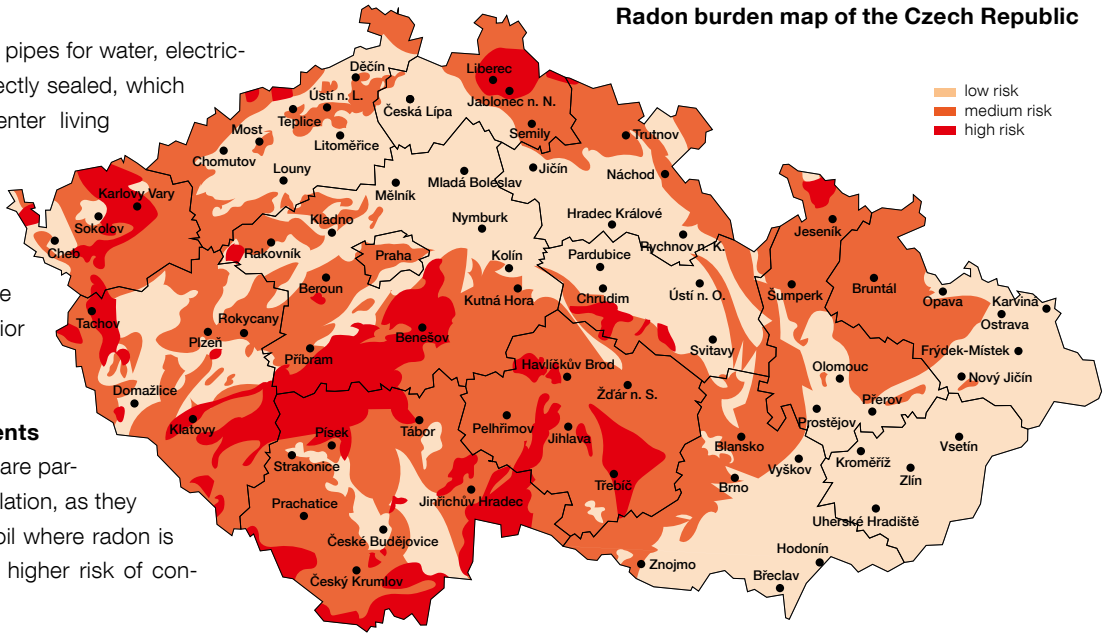
How radon enters our buildings

Gaps around pipes
Risk areas include gaps around pipes for water, electricity, or sewage that are not perfectly sealed, which can allow unwanted gas to enter living spaces.

Joints and seams
Joints between different parts of the building, such as where the foundations meet the exterior walls, are another weak point.

Covered spaces and basements
Underground parts of buildings are particularly prone to radon accumulation, as they are in direct contact with the soil where radon is naturally released, leading to a higher risk of concentration.

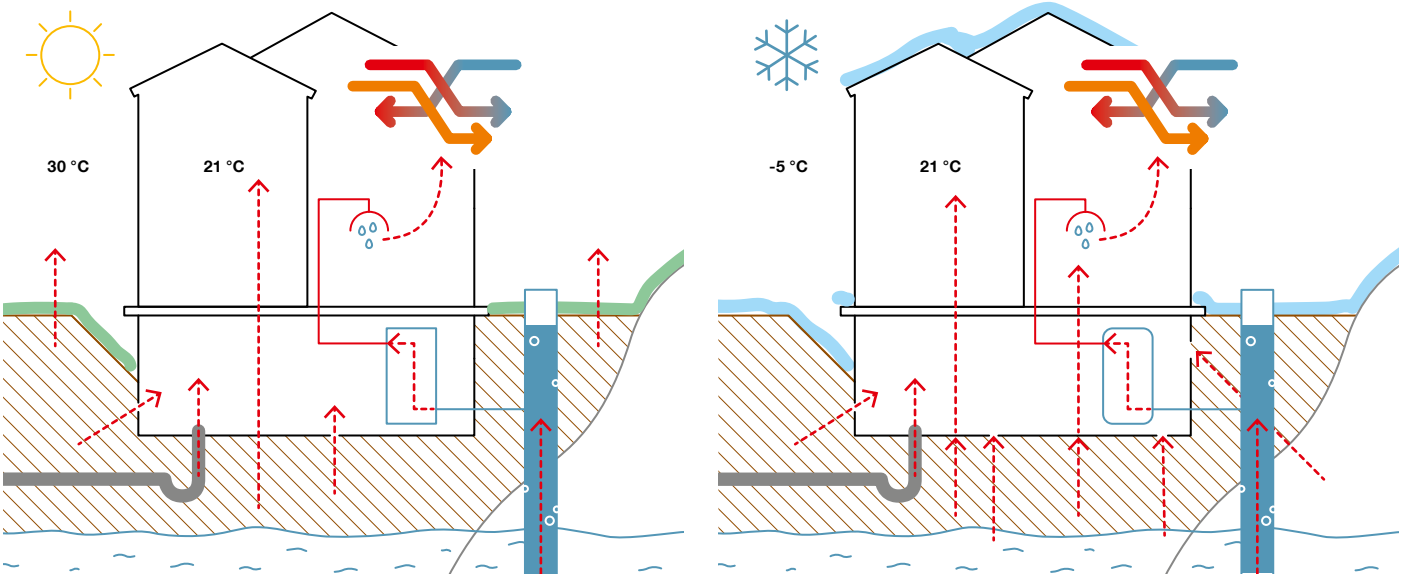
Radon burden map of the Czech Republic



Groundwater
In some areas, radon is also present in water, especially in water pumped from deep wells. When such water is used, radon is released into the air and contributes to increased indoor concentrations.

Building Materials
These are materials commonly used in older residential construction, where building materials with higher uranium content, particularly radium, were often present. This increased content may be of natural origin (e.g., granite) or of technological origin (e.g., slag, fly ash).

Radon infiltration into the house



– – – Radon infiltration and flow change throughout the year due to external factors such as snow, ice, wind, rain, or temperature. As a result, different radon levels can be measured in different seasons. A significant factor influencing radon inflow is the so-called chimney effect, in which the building actively draws radon from the ground. This effect intensifies with the increasing difference between indoor and outdoor temperatures, leading to higher negative pressure inside the building.

Health risks associated with radon

Radon is the second most common cause of lung cancer after smoking. When inhaled, radioactive particles settle in the lungs and damage lung tissue, which over time can lead to the development of cancer. Long-term exposure to high concentrations of radon can significantly increase the risk of disease.

The World Health Organization (WHO) estimates that radon is responsible for 14% of all lung cancer cases each year. In Europe, radon contributes to approximately 20,000 deaths annually from this disease.

Safe radon concentration

Radon is measured in **becquerels per cubic meter** (Bq/m³). The World Health Organization recommends keeping radon concentrations below 100 Bq/m³, as health risks begin to increase above this threshold.

For the Czech Republic, the r**eference value is set at 300 Bq/m³**. This means that if higher concentrations are measured in a household, measures should be taken to reduce the level.

Increased radon concentration

Increased concentrations of radon and carbon dioxide (CO_2) in a classroom or workplace can have several negative effects on people's health and well-being.

Health risks

Inhaling radon particles can damage lung tissue and increase the likelihood of developing respiratory diseases or lung cancer.

Mental and physical health

High radon levels may cause anxiety and stress due to health concerns, which can affect overall well-being and productivity.

When radon concentration is elevated, it is important to take measures to reduce it and ensure a healthy indoor environment.

Improving ventilation

- **Natural ventilation** – ensure that spaces are well ventilated. Opening windows and allowing air circulation can help reduce radon concentration.
- **Mechanical ventilation** – installing heat recovery systems and fans brings in fresh air and reduces CO_2 and radon levels in rooms.

Radon and VENTBOX ventilation units

- VENTBOX heat recovery ventilation units are an effective solution for ensuring a healthy environment in homes and workplaces. These units can be equipped with a radon sensor that automatically monitors indoor radon concentration.
- Thanks to this technology, the unit can continuously and promptly respond to potential hazards associated with elevated radon levels. It automatically adjusts its ventilation mode, thereby reducing the risk of radon accumulation in enclosed spaces.
- VENTBOX systems contribute to better air quality and the protection of occupants' health in every season, ensuring a safe and comfortable environment. With these systems, high-quality ventilation is possible without opening windows and losing valuable indoor heat. Thus, VENTBOX enables efficient energy consumption control, heating cost management, and ensures economical operation.

VENTBOX 150 Thin

The **VENTBOX 150 Thin** central heat recovery unit brings a revolutionary and user-friendly solution for optimizing air quality in your home. This modern unit is designed with the latest technologies and engineering advancements in mind to deliver optimal performance and comfort for apartments and smaller family houses. The features of this unit include air filtration from allergens and pollen, effective exhaust of waste air and water vapor, low energy consumption, reduction of excessive CO2 levels, and the possibility of control via a web interface. With the VENTBOX 150 Thin, you can be assured that your home will always have fresh and healthy air.

Specifications

Version	Radon
Recommended area	up to 100 m²
Installation options	wall, floor, under the ceiling
Energy class	A
Dimensions (h × w × d)	192 × 593 × 1 248 mm
Weight	20 kg
Voltage	230 V AC / 50 Hz
Electric current without preheating	0.3 A
Electric current including preheating	3.7 A
Max. input power of the unit without preheating	72 W
Max. preheating input power	1 024 W
IP coverage	30
Air flow	30–150 m³/h
Max. airflow in boost setting	200 m³/h
Displacement pressure	50–350 Pa
Acoustic energy L_{WA}	105 m³/h / 50 Pa / 46,9 dB
Heat transfer efficiency / Flow rate	78 % / 150 m³/h 83 % / 105 m³/h 88 % / 50 m³/h
Power input (without preheating) at displacement pressure 50 Pa	55 W / 150 m³/h 29 W / 105 m³/h 17 W / 50 m³/h
∅ of the connection necks	125 mm
Type of condensate drain pipe (5/4" thread)	HT DN 32 mm
Specific power consumption SPI*	0.29 W / m³/h

* at a reference airflow of 105 m³/h and available pressure of 50 Pa

Radon version

The unit combines modern heat recovery technology with advanced sensing, enabling continuous air quality monitoring and automatic operation control based on real-time values.

- The radon probe is an integral part of the unit for continuous indoor radon concentration monitoring.
- Automatic operation regulation based on measured values – the system adapts to maintain radon below safe limits without user intervention.
- Intelligent EC motors with constant airflow automatically compensate for pressure losses in the system (e.g., due to gradual filter clogging).
- Overpressure ventilation mode is designed to minimise radon infiltration from the ground into the interior.
- High efficiency of heat recovery even under variable conditions.
- Low energy consumption and quiet operation, suitable for continuous use in residential areas.
- Option for remote control and monitoring via a web interface or smart device.

Why choose the radon version?

This model not only ensures air exchange and filtration but also actively protects against the risk of long-term radon exposure, which is harmful to health and often present in areas with a high radon index. The automation of the operation and the precise radon probe provide the user with constant assurance of a safe and healthy indoor environment without the need for manual adjustments.

VENTBOX 400

The **VENTBOX 400** offers an innovative and user-friendly solution for optimizing air quality in your home. This unit has been designed with a focus on the latest technologies and engineering developments to provide optimal performance and comfort. Features of this unit include an advanced air purification system that removes allergens and pollen, efficient exhaust of waste air and water vapor, low energy consumption, and reduction of excessive CO_2 levels. The unit can be controlled via a web interface, ensuring user-friendliness and easy parameter adjustment.

Specifications

Version	Radon
Recommended area	up to 300 m²
Installation options	wall, floor
Design variants	left, right
Energy class	A+
Dimensions (h × w × d)	750 × 790 × 625 mm
Weight	32.5 kg
Voltage	230 V AC / 50 Hz
Electric current without preheating	1.3 A
Electric current including preheating	5.1 A
Max. input power of the unit without preheating	184 W
Max. preheating input power	850 W
IP coverage	30
Air flow	80–400 m³/h
Max. airflow in boost setting	400 m³/h
Displacement pressure	50–450 Pa
Acoustic energy L_{WA}	280 m³/h / 50 Pa / 46,3 dB
Heat transfer efficiency / Flow rate	84 % / 400 m³/h 87 % / 280 m³/h 92 % / 80 m³/h
Power input (without preheating) at displacement pressure 50 Pa	135 W / 400 m³/h 65 W / 280 m³/h 18 W / 80 m³/h
∅ of the connection necks	180 mm
Type of condensate drain pipe (5/4" thread)	HT DN 32 mm
Specific power consumption SPI*	0.23 W / m³/h

* at a reference airflow of 280 m³/h and available pressure of 50 Pa

Radon version

The radon version of the VENTBOX 400 ventilation unit is designed for effective indoor air quality management as well as active protection against radon in residential spaces. Thanks to its performance capacity, it is suitable for family houses and buildings up to 300 m².

- The unit uses advanced EC motors with a constant airflow function, which maintain a stable air volume and automatically compensate for pressure losses in the system – for example, when filters gradually become clogged. This ensures high operational stability, optimal efficiency, and consistent ventilation quality. At the same time, the ventilation system contributes to maintaining comfortable indoor conditions.
- The front design cover of the unit not only enhances its aesthetic appearance but also facilitates access to filters and service components.
- The equipment includes an externally placed radon probe for continuous monitoring of indoor radon concentration. Based on the current measured values, the unit automatically adjusts its operating mode to keep radon levels below the specified hygienic limits, without the need for manual user intervention.
- This automated mode of operation ensures not only the protection of occupants' health, but also long-term operational efficiency and maximum heat recovery effectiveness.

VENTBOX 800

The **VENTBOX 800** central heat recovery unit provides controlled ventilation with heat recovery and serves as an effective tool for perfect filtration of fresh supply air, which is freed from dust and various allergens within the unit. The heat recovery unit also contributes to reducing the building's energy demand. Thanks to the use of sensors, it can effectively ventilate radon, control CO_2 levels, and remove excess humidity from the house. This version is one of the most efficient ventilation devices on the market and is classified in energy class A+.

Specifications

Version	Radon
Recommended area	up to 600 m²
Installation options	wall, floor
Energy class	A+
Dimensions (h × w × d)	1 270 × 1 005 × 745 mm
Weight	112 kg
Voltage	230 V AC / 50 Hz
Electric current without preheating	1.5 A
Electric current including preheating	12 A
Max. input power of the unit without preheating	318 W
Max. preheating input power	2 550 W
IP coverage	30
Air flow	120–800 m³/h
Max. airflow in boost setting	800 m³/h
Displacement pressure	50–200 Pa
Acoustic energy L_{WA}	560 m³/h / 50 Pa / 49 dB
Heat transfer efficiency / Flow rate	82 % / 800 m³/h 82 % / 560 m³/h 81 % / 120 m³/h
Power input (without preheating) at displacement pressure 50 Pa	263 W / 800 m³/h 105 W / 560 m³/h 20 W / 120 m³/h
∅ of the connection necks	250 mm
Type of condensate drain pipe (5/4" thread)	HT DN 32 mm
Specific power consumption SPI*	0.19 W / m³/h

* at a reference airflow of 560 m³/h and available pressure of 50 Pa

Radon version

The radon version of the VENTBOX 800 ventilation unit provides a powerful and reliable solution for ensuring a healthy indoor climate and long-term protection against radon in larger residential or commercial buildings. With a capacity for areas up to 600 m², this unit offers a combination of high performance, economical operation, and intelligent control.

- At the heart of the unit are EC motors with a constant airflow function that maintain a stable amount of supply and exhaust air. These motors can automatically compensate for pressure losses in the system, for example, when filters gradually become clogged, ensuring smooth and efficient operation without loss of performance. The construction also includes frost protection, which safeguards the system in cold conditions, and an automatic bypass function that compares the outdoor and indoor air temperatures and, when necessary, activates the bypass damper to prevent unwanted heating of the supply air.
- The unit's operation can be fully controlled and monitored remotely via a web interface from a computer, smartphone, or tablet connected within the building's local network.
- The radon version is equipped with an external radon probe that enables continuous monitoring of indoor radon concentration. Based on the current measured values, the system automatically adjusts its operation to keep radon levels below the specified hygienic limits. This principle ensures not only the protection of users' health, but also stable operating parameters and high heat recovery efficiency.
- The result is a comprehensive ventilation solution that combines modern heat recovery technology with active radon protection, even under demanding operating conditions of large buildings.

VENTBOX 800 Public

The **VENTBOX 800 Public** decentralized ventilation unit features its own solution for connecting exterior air inlets, for example through a window frame. The termination of air ducts on the exterior side of the building is always carried out with an emphasis on aesthetics and functionality. The ventilation unit is equipped with an efficient heat exchanger, reducing heat losses that occur with conventional ventilation methods such as “just opening windows” or other economically and technically unsuitable ventilation approaches. It ensures a permanent reduction of CO_2 concentration and maximum elimination of outdoor odors through carbon filters, providing the comfort of clean and fresh air. Installation of the unit with an enthalpy exchanger does not require connection to a waste pipe for condensate drainage.

Specifications

Version	Radon
Recommended area	up to 600 m²
Installation options	floor
Energy class	A+
Dimensions (h × w × d)	2 050 × 1 005 × 740 mm
Weight	152 kg
Voltage	230 V AC / 50 Hz
Electric current without preheating	1.5 A
Electric current including preheating	1.5 (12) A
Max. input power of the unit without preheating	318 W
Max. preheating input power	2 550 W
IP coverage	30
Air flow	120–800 m³/h
Max. airflow in boost setting	800 m³/h
Displacement pressure	50–100 Pa
Acoustic energy L_{WA}	560 m³/h / 50 Pa / 39 dB
Heat transfer efficiency / Flow rate	82 % / 800 m³/h 82 % / 560 m³/h 81 % / 120 m³/h
Power input (without preheating) at displacement pressure 50 Pa	263 W / 800 m³/h 105 W / 560 m³/h 20 W / 120 m³/h
∅ of the connection necks	250 mm
Type of condensate drain pipe (5/4" thread)	HT DN 32 mm
Specific power consumption SPI*	0.19 W / m³/h

* at a reference airflow of 560 m³/h and available pressure of 50 Pa

Radon version

This version is intended for use in schools and educational facilities, where not only high ventilation efficiency and radon protection are important, but also quiet operation. The equipment includes a noise suppressor that effectively reduces operating noise and contributes to acoustic comfort even in classrooms and spaces with higher occupancy.

- The unit is equipped with highly efficient EC motors with a constant airflow function that automatically compensates for pressure losses in the system. For example, when filters gradually become clogged. This principle maintains a stable amount of supply and exhaust air, increases operational efficiency, and reduces energy consumption. The equipment also includes frost protection to safeguard the system at low outdoor temperatures and an automatic bypass function. Based on the comparison of outdoor and indoor air temperatures, it activates the bypass damper to prevent unwanted heating of the supply air by the exhaust air.
- The unit’s operation can be conveniently controlled and monitored remotely via a web interface from a computer, smartphone, or tablet connected to the local network.
- The radon version is additionally equipped with an external radon probe that ensures continuous monitoring of indoor radon concentration. Based on the measured values, the unit automatically adjusts its operating mode to keep radon levels below the specified hygienic limits without the need for manual intervention. This fully automated mode of operation ensures user health protection, stable operating conditions, and high heat recovery efficiency.
- The result is a device that combines cutting-edge heat recovery technology, active radon protection, and quiet operation, making it an ideal solution for schools and educational facilities.

TECHNICAL PARAMETERS

	VENTBOX 150 Thin	VENTBOX 400
Recommended area	up to 100 m²*	up to 300 m²*
Height	192 mm	750 mm (overall height including supports and aid duct bends)
Width	593 mm	790 mm
Length/depth	1 248 mm	625 mm
Weight	20 kg	32.5 kg
Weight with enthalpy heat exchanger	21.5 kg	36 kg
Electric current (including preheating)	0.3 (3.7) A	1.3 (5.1) A
Air flow	30–150 m³/h	80–400 m³/h
Maximum air flow in BOOST mode	200 m³/h	400 m³/h
Reference air flow	105 m³/h	280 m³/h
Displacement pressure (at reference flow)	50 Pa	450 Pa
Acoustic energy L_{WA} to the surroundings (at reference flow and a pressure of 50 Pa)	46.9 dB (A)	46.3 dB (A)
Heat transfer efficiency with standard heat exchanger (%/air flow)	78 %/150 m³/h; 83 %/105 m³/h; 88 %/50 m³/h	84 %/400 m³/h; 87 %/280 m³/h; 92 %/80 m³/h
Heat transfer efficiency with ent. exchanger (%/air flow)	70 %/150 m³/h; 74 %/105 m³/h; 82 %/50 m³/h	73 %/400 m³/h; 77 %/210 m³/h; 90 %/80 m³/h
Moisture transfer efficiency with ent. exchanger (%/air flow)	48 %/150 m³/h; 53 %/105 m³/h; 63 %/50 m³/h	48 %/400 m³/h; 56 %/280 m³/h; 74 %/80 m³/h
El. input without preheating at external pressure 50 Pa	55 W/150 m³/h; 29 W/105 m³/h; 17 W/50 m³/h	135 W/400 m³/h; 65 W/280 m³/h; 18 W/80 m³/h
El. input without preheating with ent. exchanger at external pressure 50 Pa	55 W/150 m³/h; 29 W/105 m³/h; 17 W/50 m³/h	128 W/400 m³/h; 63 W/280 m³/h; 18 W/80 m³/h
SPI specific energy consumption W/m³/h	0.29 W/at reference airflow and disposition pressure of 50 Pa for filtration class F7	0.23 W/at reference airflow and disposition pressure of 50 Pa for filtration class F7
Energy class standard heat exchanger	A	A+
Energy class enthalpy heat exchanger	A	A
Max. number of all sensors (CO_2/RH/RADON ...)	9	9
Connector for fire sensor or EPS connection	Yes	Yes
Automatic frost protection	Yes	Yes
Max. power without preheating	72 W	184 W
Max. preheating input power	1 024 W	850 W
Total power consumption	1 096 W	1 034 W
By-pass function (exchanger by-pass)	Yes	Yes
Shock ventilation	Yes	Yes
Weekly time mode	Yes	Yes
Measuring energy consumption	Yes	Yes
Modbus TCP/IP communication	Yes	Yes
Modbus RTU communication	Yes	Yes
Analogue input	2	2
Digital input	1	1
Diameter of the connection necks	125 mm	180 mm
Motors with constant flow function	Yes	Yes
Filter clogging indicator based on filter pressure drop	Yes	Yes
Filter clogging indicator based on time interval	Yes	Yes
Filters supply (% of particles captured in a given filter class)	F7 ePM1 70 %	F7 pollen/odor ePM1 70 % (F7 odor optional)
Filters exhaust (% of particles captured in a given filter class)	F7 ePM1 70 %	F7 pollen ePM1 70 %

values with enthalpy heat exchanger

* with regard to the total internal volume of the building

	VENTBOX 800	VENTBOX 800 Public
Recommended area	up to 600 m²*	up to 600 m²*
Height	1 270 mm	2 050 mm
Width	1 005 mm	1 005 mm
Length/depth	745 mm	740 mm
Weight	112 kg	152 kg
Weight with enthalpy heat exchanger	106.5 kg	146.5 kg
Electric current (including preheating)	1.5 (12) A	1.5 (12) A
Air flow	120–800 m³/h	120–800 m³/h
Maximum air flow in BOOST mode	800 m³/h	800 m³/h
Reference air flow	560 m³/h	560 m³/h
Displacement pressure (at reference flow)	50 Pa	50 Pa
Acoustic energy L_{WA} to the surroundings (at reference flow and a pressure of 50 Pa)	49 dB (A)	39 dB (A)
Heat transfer efficiency with standard heat exchanger (%/air flow)	82 %/800 m³/h; 82 %/560 m³/h; 81 %/120 m³/h	82 %/800 m³/h; 82 %/560 m³/h
Heat transfer efficiency with ent. exchanger (%/air flow)	76 %/800 m³/h; 78 %/560 m³/h; 84 %/120 m³/h	76 %/800 m³/h; 78 %/560 m³/h
Moisture transfer efficiency with ent. exchanger (%/air flow)	56 %/800 m³/h; 63 %/560 m³/h; 78 %/120 m³/h	56 %/800 m³/h; 63 %/560 m³/h
El. input without preheating at external pressure 50 Pa	263 W/800 m³/h; 105 W/560 m³/h; 20 W/120 m³/h	263 W/800 m³/h; 105 W/560 m³/h
El. input without preheating with ent. exchanger at external pressure 50 Pa	263 W/800 m³/h; 105 W/560 m³/h; 20 W/120 m³/h	263 W/800 m³/h; 105 W/560 m³/h
SPI specific energy consumption W/m³/h	0.19 W/at reference airflow 560 m³/h and disposition pressure of 50 Pa	0.19 W/at reference airflow 560 m³/h and disposition pressure of 50 Pa
Energy class standard heat exchanger	A+	A+
Energy class enthalpy heat exchanger	A	A
Max. number of all sensors (CO_2/RH/RADON ...)	9	9
Connector for fire sensor or EPS connection	Yes	Yes
Automatic frost protection	Yes	Yes
Max. power without preheating	318 W	318 W
Max. preheating input power	2 550 W	2 550 W
Total power consumption	2 868 W	2 868 W
By-pass function (exchanger by-pass)	Yes	Yes
Shock ventilation	Yes	Yes
Weekly time mode	Yes	Yes
Measuring energy consumption	Yes	Yes
Modbus TCP/IP communication	Yes	Yes
Modbus RTU communication	Yes	Yes
Analogue input	2	2
Digital input	1	1
Diameter of the connection necks	250 mm	250 mm
Motors with constant flow function	Yes	Yes
Filter clogging indicator based on filter pressure drop	Yes	Yes
Filter clogging indicator based on time interval	Yes	Yes
Filters supply (% of particles captured in a given filter class)	F7 ePM1 70% (F7 AC optional)	F7 ePM1 70% (F7 AC optional)
Filters exhaust (% of particles captured in a given filter class)	F7 ePM1 70%	F7 ePM1 70%

values with enthalpy heat exchanger * with regard to the total internal volume of the building

RADON PROBE AND SENSORS

Radon probe

An integral part of the radon protection system, or ventilation units with heat recovery, is the radon probe. It enables continuous monitoring of radon presence, providing users with an accurate overview of the levels of this radioactive gas in their living environment. The device is designed for continuous measurement of radon activity concentration (OAR) in enclosed spaces such as living rooms, basements, underground areas, etc.

CO_2 concentration sensor

- Measures CO_2 concentration in the range of 400–2,000 ppm.
- Suitable for bedrooms, living rooms, children's rooms.

RH humidity sensor

- Measures relative air humidity in the range of 20–95%.
- Suitable for bathrooms, laundries, wellness areas, swimming pools, etc.

TVOC concentration and formaldehyde sensor

- Measures the concentration of volatile organic compounds in the air.
- The sensor responds to the presence of CO_2, solvents, tobacco smoke, methane, benzene, etc.
- Suitable for gyms, changing rooms, offices, restaurants, kitchens, and similar spaces.

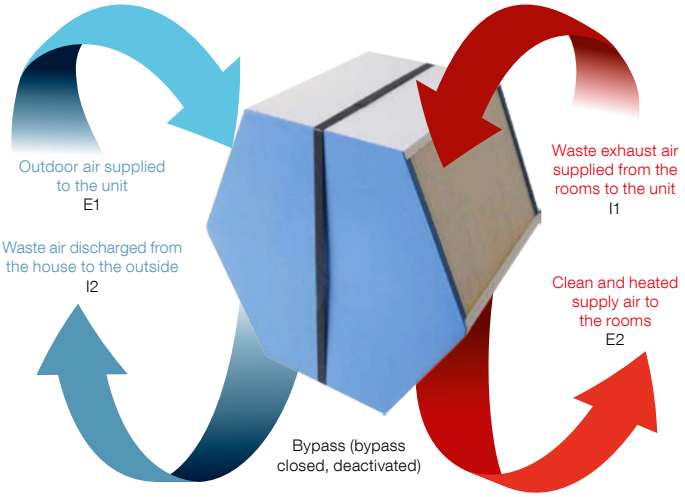
ENTHALPY COUNTERFLOW HEAT EXCHANGER

The enthalpy counterflow heat exchanger (ERV) is an optional part of the heat recovery system which, in addition to heat recovery, also allows moisture recovery, thus supporting the maintenance of optimal indoor air humidity and thus improving the user comfort of apartments and residential buildings. These systems bring many benefits, including energy efficiency, reduced heating costs, and improved indoor air quality.

Main features and benefits

- **Heat exchange** – an enthalpy heat exchanger allows heat energy to be transferred from warmer exhaust air to cooler outdoor air, thereby increasing the temperature of the air entering the building in winter. This helps to reduce heating costs because the fresh air is heated passively during the exchange.
- **Moisture exchange** – in addition to heat, the enthalpy heat exchanger allows moisture transfer. This is important for maintaining optimum humidity indoors. The moisture in the exhaust air is transferred to the supply air, which can be useful in areas with extreme climatic conditions.
- **Reduction of losses and pollution** – the enthalpy heat exchanger also serves to separate the supply and extract air, preventing the transfer of pollution, dirt and unwanted odours from the outside into the building. This improves the indoor air quality.
- **Energy savings** – operation without the need to preheat the incoming air down to –5 °C.

Working principle of the counterflow exchanger



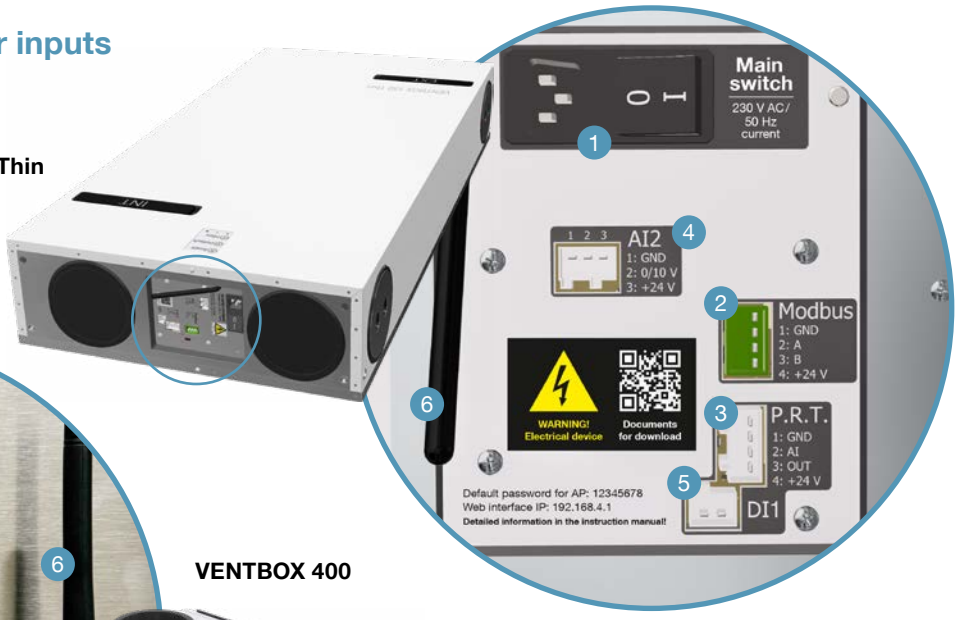
The enthalpy heat exchanger can be ordered separately or later; after a very simple installation, the entire unit is upgraded with advanced technology. By default, the unit is supplied with a counterflow heat exchanger (HRV).

ELECTRICAL CONNECTION

The VENTBOX units' electrical connection is made using a mains power cable. All connector terminals are located on the **control panel**, which is positioned between the indoor ports. The unit's main switch is also located here.

Control panel with connector inputs

VENTBOX 150 Thin



VENTBOX 400

1. Front service door used to protect the control panel
2. Fuse box with fuse FST 6.3×32 16 A/~ 230 V
3. Control panel with analogue and digital inputs
4. Modbus – connection of RH, CO_2, TVOC, Radon, P.R.T. sensors
5. P.R.T. – analogue input for connection of external ventilation output controller P.R.T.
6. AI2 – analogue input
7. DI1 – digital input for intensive extraction buttons (to the required rooms)
8. SMA connector for external Wi-Fi antenna connection
9. Antenna used for wireless communication (connection to Wi-fi network)

1. The unit's main power switch with a socket for 230 V mains cable connection and FST 5× 20 10 A/250 V fuse
2. Modbus – connection of RH, CO_2, TVOC, Radon, P.R.T. sensors
3. P.R.T. – analogue input for connection of external ventilation output controller P.R.T.
4. AI2 – analogue input
5. DI1 – digital input for intensive extraction buttons (to the required rooms)
6. Antenna used for wireless communication (connection to Wi-fi network)

VENTBOX 800

VENTBOX 800 Publilc

FILTERS

Fresh and clean air for good health
Original filters ensure a fresh and clean air supply to living rooms and significantly reduce the number of unhealthy particles.

More efficient operation reduces operating costs
With the original filters, developed specially for the specific purposes of VENTBOX ventilation units, they achieve lower energy consumption. They guarantee perfect operation and maximum energy efficiency, resulting in cost savings.

Low noise increases living comfort
Thanks to the original filters, VENTBOX heat recovery units are almost inaudible. They contribute to the already very quiet controlled ventilation operation and increase the comfort of living.

Particle sizes and filter classifications
As of 1 July 2018, the ISO 16890 filter standard is in force throughout Europe. It divides filters into four classes according to their ability to filter different sizes of particles in the air. To be classified in a particular class, a filter must capture at least 50% of the particles of a given size. The service life of the filters is always dependent on the quality of the environment in which the VENTBOX is operated. In some locations, the service life may be significantly shorter than normal (e.g. due to high dust levels). We therefore recommend paying close attention to their service. 6 months is the normal filter lifetime, while 12 months is the maximum filter lifetime. New filters can be easily ordered at **www.licon.cz** in the Heat recovery unit section.

Efficiency of filters

EN 779	ISO ePM1 bacteria, soot etc.	ISO ePM2,5 mold spores, pollen, bacteria etc.	ISO ePM10 pollen, agricultural and stone dust etc.	ISO Coarse coarse dirt – sand, fluff, fine hair, etc.
G2	–	–	–	>60 %
G3	–	–	–	>80 %
G4	–	–	–	>90 %
M5	–	–	>50 %	–
M6	–	50–65 %	>60 %	–
F7	>50 %	70–80 %	>85 %	–
F8	>80 %	>80 %	>90 %	–
F9	>80 %	>95 %	>95 %	–

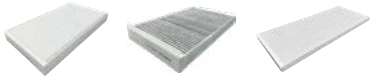
VENTBOX 150 Thin

Filters of class M5, F7

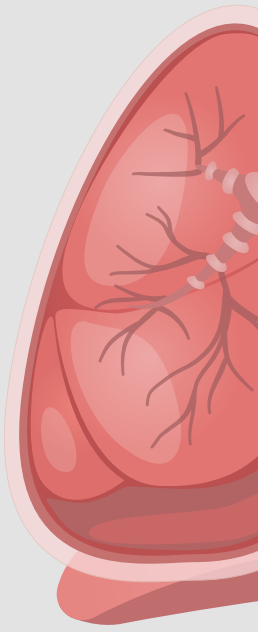
VENTBOX 400

Filters of class F7; carbon filter F7; F7 supply; carbon filter F7 supply; F7 by-pass; wire pre-filter G2

VENTBOX 800, 800 Public



Filter of class F7; carbon filter F7 supply; filter F7 by-pass

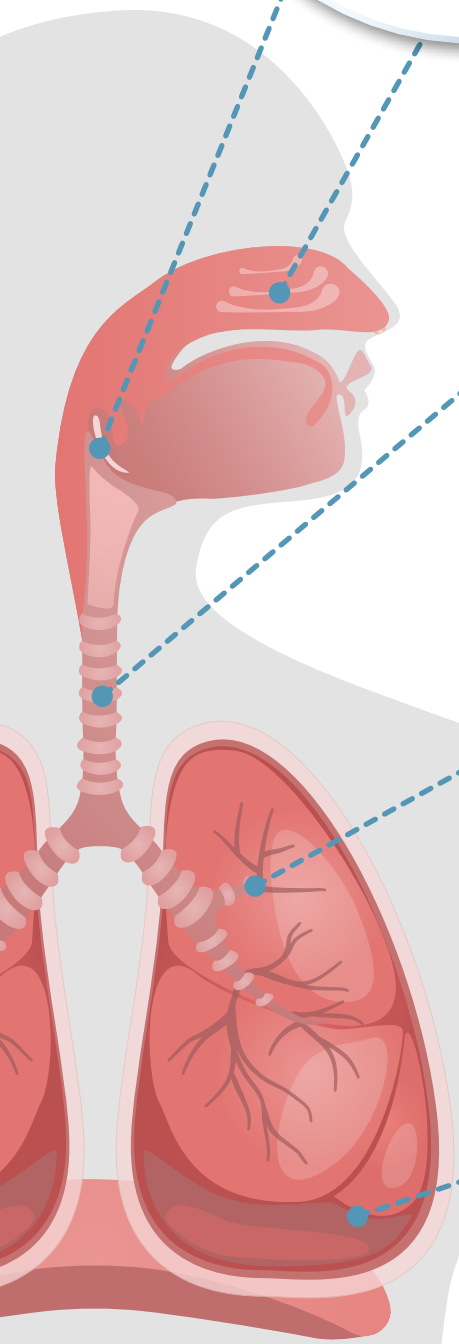


ISO Coarse
enters the nose and neck (coarse dirt)

> 10 µm sand, fluff, flying seeds, fine hair etc., most of which is already caught by filters classified in class G2. We use this filter in VENTBOX units mainly on the supply air and also to reduce clogging of the downstream filter.

ISO ePM10
enters the upper respiratory tract

≤ 10 µm pollen, stone dust, agricultural dust, etc., these particles are captured with an efficiency of 55 % by the filter with the original M5 designation. The minimum specified filter efficiency for these particles is > 50 %. With the F7 filter, they are probably captured up to 90 %.



ISO ePM2.5
penetrates into the lungs

≤ 2.5 µm mould spores, pollen, bacteria, toner powder, etc., these particles are captured by the F7 filter, probably with an efficiency of about 80 %.

ISO ePM1
enters the bloodstream

≤ 1 µm bacteria, soot, etc., these particles are captured with an efficiency of 70 % by the filter with the original F7 designation. The min. specified filter efficiency for these particles is more than 50%.

CONTROLS AND FUNCTIONS

Unit control via web interface

The home screen is used to view information, control and set up the VENTBOX 200 Thin. The middle part displays the current power of the unit; information and status icons are below, then the current values are measured by the room sensors used by the unit (provided that the sensors are connected to the heat recovery unit). The lower part contains buttons for operating and setting the heat recovery unit.

User functions that you can control

- ventilation shutdown – Standby mode (unit is not disconnected from a power supply)
- switching between automatic and manual mode (A/M)
- one-time reduction of ventilation power when leaving the building (holiday)
- short-term increase in ventilation intensity (BOOST mode)
- by-pass flap switching (summer only)
- user device settings

Control and information panel

The VENTBOX can normally be operated via the web interface, but all basic service operations can also be performed manually (by pressing the appropriate button) on the control panel located on the front of the device:

R a short press of the button **R** to perform a **reboot**, which preserves all user and service settings of the device.

D a longer press of the button (5 s) **D** to enter the **factory settings**, where the ventilation unit runs permanently at reduced power. At the same time, all user settings will be lost, including weekly program settings and network connections if previously made. The settings for the type of exchanger (ERV / HRV) and fan corrections remain unchanged. The ventilation unit goes back to AP mode including the login password set by the manufacturer.

F press the button (2 s) **F** to set the new **filter change** interval. Use this only for filter changes! **Attention** – use only when replacing filters!

Information LED

- **green** – power
  – flashing – connected to power (Standby mode)
  – lit – device in operation
- **blue** – filters – lit or flashing request for filter change
- **red** – error – must check "Error messages"

By-pass mode

By-pass mode is one of the key components of VENTBOX central heat recovery units. This mode is enabled by a by-pass flap equipped with a servo drive. In case of manual or automatic activation and based on defined temperatures in the web interface, the by-pass flap allows by-passing the heat exchanger. The air extracted from the interior is deflected by the by-pass flap, so that it does not pass through the heat exchanger, after which it is directly discharged outside the building and does not transfer thermal energy to the outdoor air brought into the unit. By-pass mode is commonly used during summer operation, especially at night when the outdoor air is naturally cooler. This allows the temperature of the interior spaces to be effectively reduced without the need for active cooling. The by-pass thus provides an effective way to ensure optimal thermal comfort in the interior during the warm summer months.

The principle of the by-pass model

In active mode, warm air from the interior is directly discharged outside without heat exchange. The heat exchanger is deactivated in this mode with the help of a by-pass flap, which prevents unwanted heating of the fresh air being supplied. Fresh cool air is blown into the interior.

Activation conditions

By-pass is activated automatically if the temperature in the interior rises above the desired value set in the web interface. Once the desired temperature in the interior is reached, the by-pass mode is deactivated and the unit switches back to the standard recovery mode. The web interface can also define the lowest possible temperature of the air supplied to the interior.

Advantages of the by-pass flap

Energy savings – reduces the need for active interior cooling in the summer.

Increased comfort – allows the use of naturally cooler outdoor air to improve the indoor climate.

ORDERING CODES

VENTBOX 150 Thin

VENTBOX	Generation		Volume flow		Design	Heat recovery unit type		Model / Type	Exchanger type	Connection option
VB	1	-	0150	-	T Thin	C centralized	-	R Radon	H standard E enthalpy	R right L left

Example of ordering code: VB1-0150-TC-RHR

VENTBOX 150 Thin first generation, with central heat recovery, standard EC fans version Radon, standard heat exchanger with right-hand side connection.

VENTBOX 400

VENTBOX	Generation		Volume flow		Design	Heat recovery unit type		Model / Type	Exchanger type	Connection option
VB	2	-	0400	-	B box	C centralized	-	R Radon	H standard E enthalpy	R right L left

Example of ordering code: VB2-0400-BC-RER

Second generation VENTBOX 400 unit, with central heat recovery, EC motors with constant flow Radon version, enthalpy counterflow heat exchanger and right-hand side connection.

VENTBOX 800

VENTBOX	Generation		Volume flow		Design	Heat recovery unit type		Model / Type	Exchanger type	Connection option
VB	1	-	0800	-	B box	C centralized	-	R Radon	H standard E enthalpy	R right

Example of ordering code: VB1-0800-BC-RHR

First generation VENTBOX 800 unit, with central heat recovery, EC constant flow motors Radon version, with standard counterflow plate heat exchanger and right-hand side connection.

VENTBOX 800 Public

VENTBOX	Generation		Volume flow		Design	Heat recovery unit type		Model / Type	Exchanger type	Connection option
VB	1	-	0800	-	P Public	D centralized	-	R Radon	H standard E enthalpy	L left

Example of ordering code: VB1-0800-PD-RHL

VENTBOX 800 Public, a first-generation unit for decentralized air distribution, EC constant flow motors Radon version, with standard counterflow plate heat exchanger and left-hand side connection.

www.radonfree.eu

member of KORADO Group

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