LOCAL VENTILATION SYSTEM WITH HEAT RECOVERY

MIKrovent®

Breathe fresh air

IMPROVE YOUR QUALITY OF LIVING

MIKrovent® is an innovative local ventilation system with a high degree of heat recovery that is a result of Slovenian knowledge and in-house development by the producer of builders' joinery, MIK Celje. MIKrovent® **will constantly deliver fresh air into your home** with a 100% air exchange when the windows are closed, while also maintaining **up to 95% of the heat during ventilation of your home.** In the winter, your home **will not cool down despite the ventilation,** while it will **not heat up** in the summer. This allows the user **to achieve greater energy savings** when heating or cooling their premises. The devices meet the highest ventilation standards EN 308 and EN 16798-1:2020, the new European classroom ventilation standard, and they are the only devices on the market that operate at **temperatures down to –25°C**.

ZEICHEN DER QUALITÄT IN BAU 2018 Reg. Nr. 175

Lokale MIKrovent-Belüftungssysteme 30/60/120

ZEICHEN DER QUALITÄT IN BAU 2020 Reg. Nr. 179

Moderner Einbau von MIKrovent-Belüftungssystemen in Neubauten und Renovierungen

ZEICHEN DER QUALITÄT IN BAU 2022 Reg. Nr. 183

Alle Lokale MIKrovent-Belüftungssysteme mit Wärmewiedergewinnung

Gospodarska zbornica Slovenije

Chamber of Commerce and Industry of Slovenia

A silver award for innovation

MIK® CELJE

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All about the problems of modern living indoors and solutions at **airlessera.com**

Why do we ventilate?

- We want to improve the quality of living and create the most energy-efficient buildings in Slovenia.
- Indoor air is **5-6 x more polluted** than outside air. A well-ventilated room **is important for our well-being and concentration**. It is a basic condition for **healthy living**.
- Modern construction has created **sick building syndrome** with an unsuitable living environment that does not comply with the new European standards for indoor air quality. MIKrovent ventilation systems meet the latest standards and keep the **CO_2 level below the limit of 950 ppm**. Without ventilation, the CO_2 value indicator moves beyond 4000 ppm, which in the long term leads to **a number of diseases such as stroke**, **heart disease**, **lung cancer**, **chronic respiratory diseases** and **respiratory infections including pneumonia**, while in the short term, it is reflected in **malaise**, **fatigue** and **considerably reduces cognitive capabilities**.
- **96% of households are facing at least one issue** connected to the quality of the indoor air. According to the World Health Organization (WHO), **7 million people die each year from exposure to contaminated particles such as black carbon, which penetrates deep into the lungs**.

How do we ventilate?

- In a healthy and economic way.
- With a high recuperation rate – **up to 95%** at 75% of the system's capacity.
- By continuously monitoring the **air quality** via **smart sensors** that are wirelessly connected to the ventilation device.
- With the latest MIKrovent **two-pipe local ventilation systems**, which enable Smart cloud management and are developed and manufactured in Slovenia.

Why choose MIK?

MIK Celje company is active in the field of **creating a healthy living environment**. We strive to ensure **better quality air**. Our aim **is to protect the health of children and adults**, ensure **healthy living** and **prevent the creation of sick houses**, **apartments**, **schools**, **hospitals** and **retirement homes for the elderly.** We want to help you keep your home and business premises healthy and sustainable.

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What do we offer and **why** choose MIKrovent®?

All in one place

- We offer the entire range in a single place: windows, blinds, facades, front, garage and fire-resistant doors and **ventilation**.
- All solutions with details.
- One provider – one guarantee.
- Comprehensive service from consultation to installation and after-sales services.

Smart MIKrovent

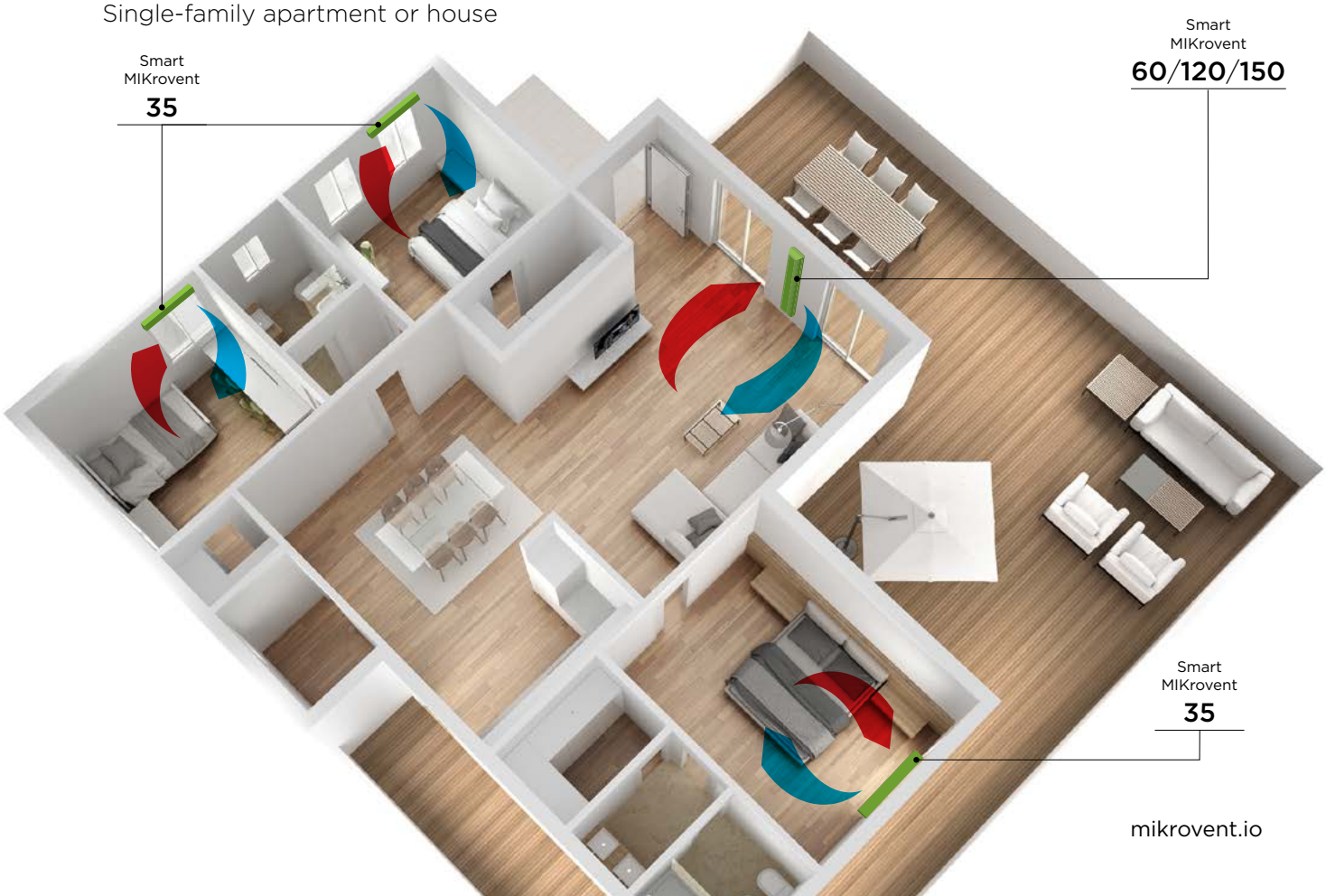
- **It provides fresh and healthy air** even when we are not in the room.
- The possibility of remote control and monitoring in the cloud and the 24/7/365 monitoring of indoor air.
- A simple and efficient option to set up a weekly program.
- A user-friendly experience.

What kind of ventilation system do you need to stay healthy indoors?

Modern man spends **more than 90% of his time indoors**, and because indoor air is often more "dirty" than outdoor air due to **sick house syndrome**, it is very important today to ventilate healthily with ventilation systems that filter dirty air. An adult exhales an average of 0.75m³ of air per hour. **For quality and healthy stay in the room**, **15 to 20 times more air is needed than exhaled air**, so we **need 11 to 15m³/h of fresh air** per adult and **not the volume of the room**, as stated by some ventilation systems providers.
Two-pipe ventilation systems are systems with exhaust and supply pipes that do not mix exhaust and incoming air and **always supply and exchange 100 percent of fresh air**. **Fresh air, full of ions from the outside**, is cleaned through F7 filters, which remove up to 97% of all 2.5 PM particles and thus ensure your healthy stay indoors.

The placement of Smart MIKrovent® systems in residential spaces

Single-family apartment or house



Smart MIKrovent® **35**

Smart MIKrovent® **35** is the first device of the **Smart MIKrovent®** local ventilation systems. Thanks to its minimalist form, it is intended for the ventilation of individual rooms in **homes**, **smaller offices**, **hotel rooms** and **rooms in retirement homes**. With a maximum airflow of **up to 35m³/h**, it is intended for the ventilation of rooms of **up to 35m²**. It is suitable for ventilating a room where **two** or **three** people are staying at the same time.
With the correct placement of several devices, the ventilation area can be significantly increased.

Smart MIKrovent®		**35** Home
Airflow [m³/h]		**12–35**
Heat recovery [%]		**up to 87**
Noise [dB]		up to 35
Filters	built-in	ePM 2,5 (F7) and ePM 10 (G4)
	optional	ePM 1 (H10 and H13)
Sensors*	built-in	Temperature and humidity.
	optional	CO, CO_2, VOC, radon.
Controls		Smart device, WiFi, sensor station.
Possible installation		Horizontally/vertically on the wall or in a window extension of any window manufacturer.

* Temperature and humidity sensors are installed as standard, the rest are optionally installed in an additional sensor station.

Smart MIKrovent® **60** and **120**

Smart MIKrovent® **60** is intended for the ventilation of larger, **multifunctional living spaces**, **hotel rooms** and **offices** in schools, **hospitals**, **nurseries** and **retirement** homes with a size of **up to 60m²**. It is suitable for ventilating a room occupied from **3** to **5 people** at the same time.

Smart MIKrovent® **120** is intended for the ventilation of larger rooms occupied by **a larger number of people** (**schools**, **nurseries**, **casinos**, **dining rooms**, **halls**, **meeting rooms**, **waiting rooms** etc.) with sizes of **up to 120m²**. It is suitable for ventilating a room occupied from **eight** to **ten people** at the same time.

Smart MIKrovent®		**60** Office	**120** Professional
Airflow [m³/h]		**20–60**	**60–120**
Heat recovery [%]		**up to 95**	**up to 90**
Noise [dB]		up to 37	up to 40
Filters	built-in	ePM 2,5 (F7) and ePM 10 (G4)	
	optional	ePM 1 (H10 and H13)	
Sensors*	built-in	Temperature and humidity.	
	optional	CO, CO_2, VOC, radon.	
Controls		Smart device, WiFi, sensor station.	
Possible installation		Vertically on the wall.	

* Temperature and humidity sensors are installed as standard, the rest are optionally installed in an additional sensor station.

For healthy and quality living with new windows that airtight your living spaces, you need the MIKrovent ventilation system.

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Smart MIKrovent® **150**

Smart MIKrovent® **150** ventilation systems is suitable for larger rooms where more people are staying (**schools**, **kindergartens**, **casinos**, **dining rooms**, **halls**, **meeting rooms**, **waiting rooms**, etc.), **up to 150m²** in size. It is suitable for ventilation of a room in which **10** to **12 people** stay at the same time.

Smart MIKrovent®		**150**
Airflow [m³/h]		**up to 150**
Heat recovery [%]		**up to 86**
Noise [dB]		up to 36
Filters	built-in	ePM 2.5 (F7)/ePM 1 (H13) ePM 10 (G4)
Sensors*	built-in	Temperature and humidity.
	optional	CO, CO_2, VOC, Radon.
Controls		Touch Panel on the device, remote control, WiFi, Sens Box (MLX).
Possible installation		Under the wall.

* Temperature and humidity sensors are installed as standard, the rest are optionally installed in an additional sensor station.

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Smart MIKrovent® **350**, **500** and **800**

Smart MIKrovent® **350**, **500,** and **800** ventilation systems are suitable for ventilation of **larger business premises**. With MIKrovent, you can prevent the spread of diseases, **bacteria,** and **viruses**, such as the new coronavirus, in all major public places, such as **kindergartens**, **schools**, **hospitals**, **nursing homes,** and **shopping malls**. It is suitable for ventilation of a room in which **30 to 50 people** stay at the same time.

The smart touch control screen
It is wall mounted and has an LCD touch screen. With it, you can control and monitor all ventilation parameters.

Smart MIKrovent®		350	500	800
Airflow [m³/h]		**up to 350**	**up to 500**	**up to 800**
Heat recovery [%]		**up to 82**	**up to 84**	**up to 82**
Noise [dB]		up to 37	up to 39	up to 42
Filters	built-in	ePM 2,5 (F7/F9) ePM 10 (G4)		
	optional	ePM 1 (H10 and H13)		
Sensors*	built-in	Temperature and humidity.		
	optional	CO, CO_2, VOC, radon.		
Controls		Control panel, WiFi, sensor station.		
Possible installation		Under the ceiling.		

* Temperature and humidity sensors are installed as standard, the rest are optionally installed in an additional sensor station.

The placement of Smart MIKrovent devices in multifunctional spaces

MIKrovent in the classrooms of the Celje Grammar school - Center, Celje, Slovenia.

Over the years, **our customers have recognised the benefits and advantages** of using MIKrovent ventilation systems in their homes. At MIK Celje, we therefore transferred the knowledge and mindset that we have continuously developed over the years with the help of loyal customers, to our line of MIKrovent ventilation systems, and thereby also into larger areas intended for public institutions and larger companies, while trying to provide benefits to the users, owners and society at large.

Benefits for **users**

1. **Improving the quality of fresh air,** which will **reduce the amount of harmful particles** in the room.
2. **Improving the air quality in basement and semi-basement spaces**, which are **contaminated with dangerous radon gas**. According to the Statistical Office of the Republic of Slovenia (SORS), between 2009 and 2019, **an average of 140 people have died per year due to radon poisoning in Slovenia** compared to **an average of 120 people who have died in traffic accidents**.
3. **As a protection against external noise intrusion,** a closed window can stop the intrusion of external noise of up to 41 decibels. The same applies to the MIKrovent ventilation system, which also stops the intrusion of external noise of up to 41 decibels.
4. **Concern for the health of the users** due to the need to provide good-quality indoor air and quality living. During the periods when various diseases, influenza and viral infections are spreading more commonly, ventilation is essential as it **reduces the amount of aerosols in the air**, which are carriers of viral diseases in **97%** of cases.
5. **24/7/365 air quality monitoring** according to the following parameters: radon, CO_2, humidity, temperature, VOC (organic compounds) and pressure.

Simply wave to learn the radon levels
and breathe easily with the **Airthings** device colour codes.

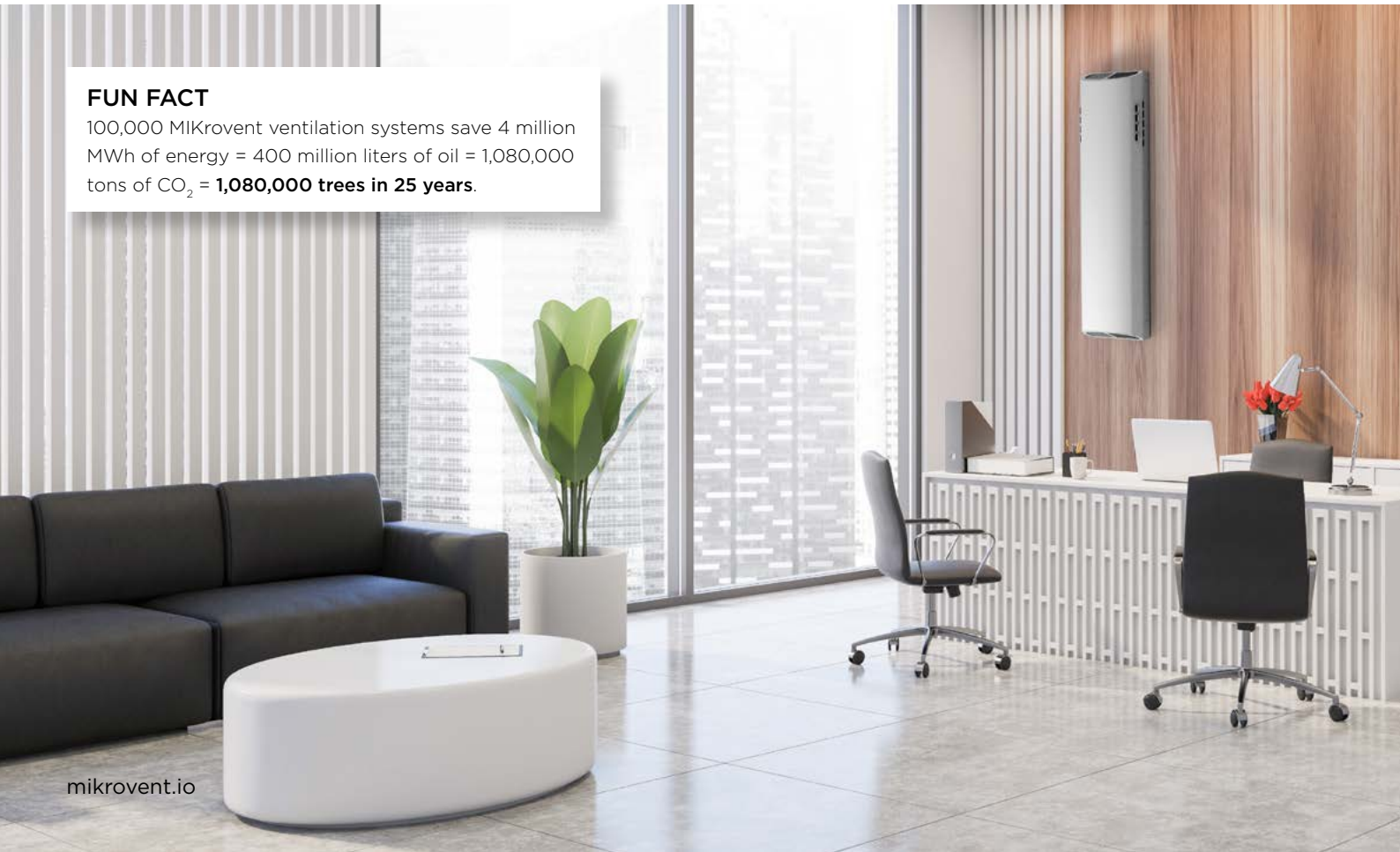
6. **Visual monitoring of the air quality using a room sensor**, programmed to meet the latest European air quality standard for classrooms, **EN 16798-1:2020,** which states that the ppm ventilation rate should not exceed 950 ppm.
7. **Automated operation,** with the option of manual control ensures undisturbed and care-free living. **This eliminates the need to open the windows for 5 minutes every 20–30 minutes.**
8. **The intrusion of** outside cold/hot **air** and **drafts** are prevented.
9. **The intrusion of pollen** and insects during the summer and smog in the winter is prevented.

Benefits for **facility owners**

1. **Lower facility management costs**, which means 35 to 45% lower energy consumption. **Lower energy consumption** than when using central ventilation systems, which use 1/3 of the energy needed for operation only to distribute air through the room.
2. **100 % fresh air** due to the MIKrovent two-pipe local ventilation system, which blows the fresh air into the room and extracts the dirty air separately. Outdated central ventilation systems supply only 1/3 fresh air into the room.
3. **Lower system maintenance costs compared to the costs of central ventilation systems,** due to savings by eliminating the need to clean the air ducts with dry ice on an annual basis.
4. **Built-in top-quality elements.**
5. **Turnkey solution,** from design, sales consulting, monitoring and after-sales services.

Benefits for **the country**

1. **Reduced carbon footprint of the society and consequently lower EU taxes**, care for the environment, nature and other.
2. **Lower energy consumption** – increased energy self-sufficiency.
3. **Less sick leave due to "taking care of a sick child" – 100% paid by the state and very costly.**
4. **Higher productivity** in companies and public institutions.
5. With the comprehensive and high-quality renovation of old buildings, **we can reduce costs, prevent the creation of sick houses (there are one in three such houses in the EU) and create zero-energy and sustainable buildings.**



DID YOU KNOW?
That droplets are larger (>50 µm) and heavier, therefor they remain in the air for a maximum of 10 to 15 seconds before they fall to the ground due to gravity, while aerosols are smaller (<5 µm) and can remain suspended in the air for hours and hours and are carriers of viruses and bacteria!

Why do we need to ensure high-quality ventilation?

A SILENT KILLER - We usually don't notice air pollution but it can be deadly.

29% OF DEATHS DUE TO **LUNG CANCER**

24% OF DEATHS DUE **TO STROKE**

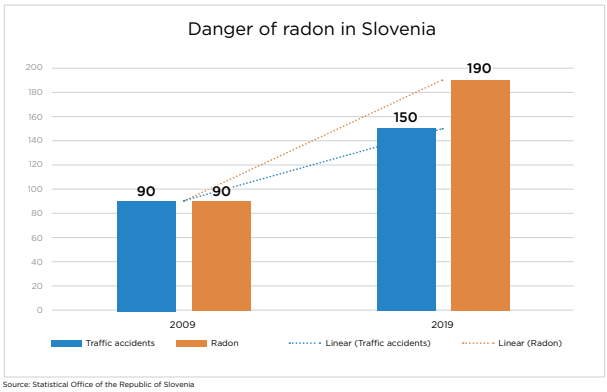
25% OF DEATHS DUE **TO HEART DISEASE**

43% OF DEATHS DUE **LUNG DISEASES**

WHO research, 2018

AEROSOLS – The World Health Organization (WHO), as well as other experts, agree that on the basis of scientific evidence, in as many as 97% of cases, **Covid-19** and other respiratory viruses **are transmitted through the air with aerosols.** Aerosols are the carriers of all viruses and bacteria in the air.

While increased CO_2 concentrations might not be very harmful for the human health, the consequences of CO_2 increase are significantly more worrisome and problematic. Therefore, when we talk about an increased level of ppm, it means **a larger amount of aerosols in the air, which are the carriers of all viral and bacterial infections, such as Covid-19** in the air. We know that acute respiratory infections occur throughout the year, but the rate of occurrence starts to grow notably **during the autumn and spring when children return to nurseries and schools**. With the **MIKrovent** local ventilation system, we can offer a solution that **keeps the CO_2 concentration level below the permitted/critical limit of 950 ppm**, which **reduces the possibility of viral infection transmission to only 1–3 %**, as has been demonstrated by the WHO's data.



Source: Statistical Office of the Republic of Slovenia

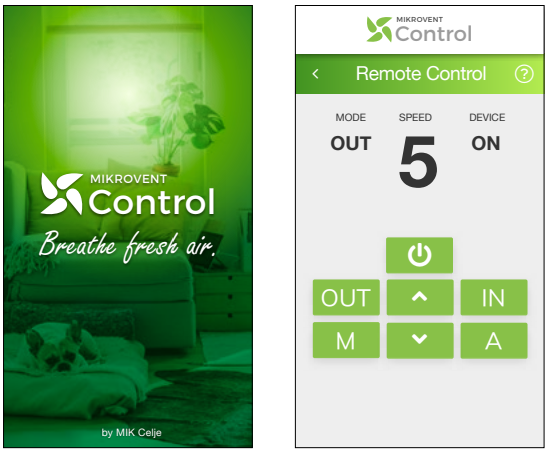
RADON – We usually don't notice air pollution but it can be deadly and this applies to radon gas as well. The World Health Organization (WHO) states the worrying fact that a high concentration of radon gas in buildings **is the second-largest cause of lung cancer** and other **invisible killers**, such as: **strokes**, **heart disease**, **cancer and** others. Radon is a colorless, odorless and tasteless natural radioactive gas produced by the decay of uranium. In open spaces, radon does not pose a threat because it mixes with the air, while its concentration rises sharply indoors and can start to endanger human health. **The highest concentrations of radon are found on the basement and ground floor levels. In Europe and the USA, the permitted radon concentration levels range from 50 to 150 Bq/m³, while in Slovenia,** the regulatory limit is set to **300 Bq/m³**, but in some Slovenian schools, **radon concentrations as high as 2100 Bq/m³** have been recorded. The Statistical Office of the Republic of Slovenia notified that between 2009 and 2019 **an average of 140 people have died due to radon poisoning in Slovenia each year**, which exceeds the car accident-related deaths by 20 persons per year on average. **A MIKrovent ventilation system in combination with the AirThings radon sensor ensures that dangerous levels of radon are eliminated from the air.**

Average value of Radon in areas in Slovenia.
Source: dr. Damijan Škrk from the Administration of the Republic of Slovenia for Radiation Protection.

AIRTHINGS WAVE PLUS

Device for measuring indoor air quality.

Complete indoor air quality control with 6 sensors: radon, CO_2, humidity, temperature, VOC (organic compounds) and pressure.



MIKrovent® Control

Remote control for MIKrovent® local ventilation devices.

What makes MIKrovent® *the leader among the ventilation systems?*

- It ventilates each room separately.
- A two-pipe system that prevents the spread of air and thus viruses, bacteria, allergens and dust from one room to the other.
- It maintains the quality of indoor air and thereby CO_2 concentrations below the 950 ppm level.
- Maximum flexibility.
- Lower power consumption and loss.
- It will not only be useful during the Covid-19 epidemic, but also in the event of any other aerogenic respiratory infections in the future.
- Development + consulting + sales + installation + service + warranty = provided by the MIKrovent team

MIKrovent Academy
more about ventilation and healthy living at
https://mikrovent.io/en/mikrovent-academy/

Airless Era
Presentation of the challenges of modern living at
https://airlessera.com/

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