

VENTS

MAGAZINE

ABOUT VENTILATION AND MORE

No 5
July
2019



CHOOSE
YOUR COLOUR



Quiet-Disk
Red



Quiet-Disk
Vintage



Quiet-Disk
Chrome



Quiet-Disk
Gloss Aluminium

CONTENTS



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VENTS at ISH 2019: promoting energy efficiency and intelligent technology



ISH 2019, one of Europe's leading trade fairs for water and energy, was the pinnacle event of the month of March. Having a long history of participation in this grand-scale event, "Ventilation Systems" once again used this golden opportunity to showcase its products to the European public. The company's two-storey booth with a floor area just shy of 150 square metres featured both the latest designs and the products and solutions which have already earned international recognition and acclaim.

Held from 11 to 15 March in the German city of Frankfurt, the trade fair became an international meeting place for the sector attracting some 2500 companies from worldwide. With an exhibition space of over 300 000 square metres the event had plenty to offer to the visitors and exhibitors who had a chance to see the latest product offerings and solutions in ventilation as well as cutting-edge technology for energy savings and a more rational use of natural resources such as heating and air conditioning systems, and other kinds of HVAC equipment.

BLAUBERG
GROUP



airVENTS



CLASSIC DESIGN



VENTS





"Ventilation Systems" brought a host of intelligent technology to ISH-2019 sending a clear message to the industry and the consumers about its future plans

The newest products by VENTS were presented at the booth of Blauberg Group which the company is a member of. "This year's presentation is squarely focused on intelligent technology. Therefore, we brought our latest ventilation units with upgraded automatic control systems offering Wi-Fi connectivity, new operation modes, user-friendly indication, and expandability with various sensors for even more stringent air purity control. Of course, our display selection would have been incomplete without new industrial fans and the new arrivals in such an impor-



tant segment as smoke extraction. In addition to that some of the equipment was set up for live demonstration", says Elena Marianenko, brand manager of Blauberg Group.

The new arrivals featured at the event included VENTS Ace and Base decorative domestic fans. These models are offered in a wide variety of snap-on front panels to match the fans with the interior design. VENTS Quiet Mild energy-saving silent fans, another high-tech representative of the current domestic range, features motion and humidity sensors.

The range of VENTS single-room equipment also received a host of updates this





year. The company's booth featured a prototype of TwinFresh Style ventilator with a revised design of the front panel which prevents back draft and provides protection against wind gusts. The guests also had a keen interest in the TwinFresh Expert ventilator with Wi-Fi control.

To demonstrate its equipment in action, the company set up a fully complete ventilation system based on the VUT 350 VB EC A25 air handling unit and the FlexiVent air duct system. The featured air handling unit is

fans, the VENTS ICF centrifugal pulse fans and the KPR 200 MP air diffuser. These products are the last line of defence against fire as they help to divert combustion products from evacuation paths therefore ensuring safe escape of the building occupants.

The AIRVENTS air handling unit, which was also set up for live demonstration, was a true star of the show. Thanks to a flexible modular construction, these units can be configured into compact and fully complete ventilation systems to suit a wide range of project requirements. The units are fitted with air



equipped with the latest version of the automatic control system with extended functionality.

The guests also praised the company's latest industrial ventilation products, which included the TT PRO series of high-performance fans, and especially the new VENTS TT PRO 455 EC model equipped with a low-energy EC motor. The KSB K2 family of high-performance duct centrifugal fans in heat- and noise-insulated casings with an air capacity of up to 7000 m³/h was also among the products much favoured by the booth visitors.

The smoke extraction offerings were represented by the powerful VPVO axial

filters as well as plate or rotary heat exchangers.

"Besides helping to attract new clients, such large-scale trade fairs like ISH provide excellent opportunities for meeting our partners, discussing the latest trends and issues, and presenting our hottest offerings. It is no wonder that during the event days our booth bustled with lively discussions contributing to experience exchange. Each year the visitors of our booth have a chance to see new exciting products, and we are already preparing for the future events to meet and exceed our client's expectations", adds Elena Marianenko. ■

VENTS products stir a growing interest in the Middle East





At the end of November 2018 the city of Dubai hosted The Big 5, the region's largest and most influential event for the construction industry. Following the resounding success with both the visitors and exhibitors of last year's event "Ventilation System" once again presented its product offerings and technology. Gathering buyers and manufacturers of construction products from around the world, The Big 5 is a dynamically evolving exhibition platform with worldwide recognition. For many years the event has been providing a gateway for manufacturers willing to offer their products in the rapidly growing construction markets of the Middle East and North Africa. The exhibition showcases 360-degree building solutions clustered in six product sectors: MEP services, Building Interiors & Finishes, Building Envelope & Special Construction, Construction Tools & Building Materials, and Construction Technology & Innovation. The Big 5 also offers a broad educational agenda, with thematic conferences and dozens of CPD-certified workshops. This year the Vents products were showcased at the booth of the parent company Blauberg Group. The presentation included the recently announced domestic ventilation products such as the LDA Gold,

Wave, Flip, and Solid energy-efficient fans with multicoloured snap-on front panels as well as Quiet Style and Quiet Style A. The numerous guests of the booth were also presented ventilation units for smoke protection systems – the VENTS VKDV roof-mounted centrifugal fans and the VENTS VPVO medium-pressure axial fans. The company also showcased its latest product offerings including the new Ace and Base domestic fans. The most prominent feature of these products is the wide selection of decorative panels which vary in shape, colour, material, and texture. Thanks to a wide selection of the snap-on front panels the appearance of the Ace and Base fans can be easily adapted to a re-designed interior without any technical changes to the ventilation system. The Big 5 provided Vents with an excellent opportunity for showcasing its latest product offerings, but in addition to that the company was able to share information with its partners and clients in the middle-eastern region and contribute to raising public awareness of the most efficient ventilation solutions. So far each subsequent event had resulted in a larger number of business-generating contacts evidencing to a growing popularity of the VENTS products in the Middle East. ■



VENTS sets new benchmarks for the Ukrainian ventilation industry

In the middle of May this year the city of Kyiv hosted the 21st Aqua Therm Kyiv international exhibition. Due to the sheer size and the advanced concept the exhibition offered unique marketing tools for business development and provided a cost-effective platform for presenting a wide range of products including energy-efficient heating systems, ventilation, air conditioning, water supply, and renewable energy solutions as well as plumbing and swimming pool equipment. "Ventilation Systems" just could not miss such a golden opportunity to present its latest technology and products.

The company booth, which offered an insight into the future of the ventilation industry for the next few years, was among the biggest show-stoppers. The ventilation leader went far and beyond to

present its latest and greatest to exceed the expectations of both users and experts alike.

The VUT/VUE 270 V5B EC and VUT/VUE 180 P5B EC were always in the middle of the visitors' attention. Such interest is primarily due to the use of expanded polypropylene (EPP) in their casings. VENTS was the first company to offer products which benefit from this hi-tech material. EPP casings have a number of significant advantages. First and foremost, this material is extremely strong and flexible which prevents casing deformation. Due to the excellent sealing capacity of expanded polypropylene the casing construction is highly leak-proof minimising thermal losses and noise. The weight reductions achieved by using a lighter casing bring the overall weight of the air handling unit to a mere 14 kg. The







pre-cast casing elements make the unit easy to disassemble and re-assemble for simple and convenient maintenance. And last, but not least the unit can be mounted in any position (e.g. vertically, horizontally, endways or crossways) since the condensate drain pipe and the drip pan can be mounted on either side as necessary. The air handling units also feature heat exchangers for recycling extract air heat and state-of-the-art automatic control systems with Wi-Fi control.

The company never failed to surprise the visitors with its new single-room units which included the MICRA 200 E ERV WiFi, MICRA 100 ERV WiFi, and MICRA 55 as well as the TwinFresh Comfy RA-50 and Vento Expert A50-1 Pro ventilators. These modern-generation ventilation units help

to partially return the extract air heat into the treated room reducing the load on heating systems in the cold season. In addition to that single-room units are equipped with automatic control systems with extended functionality and Wi-Fi connection.

The MICRA 55, which features a high-efficiency tubular heat exchanger and two EC fans mounted inside walls, instantly grabbed the visitors' attention. This technical solution allows to radically reduce the noise in the treated room as well as physical dimensions of the unit. The compact footprint of the MICRA 55 (less than 8 cm thick and not more than 40 cm high and wide) results in outstanding installation flexibility. The unit equipped with a high-performance filtration system and a



bypass is managed from an iOS or Android application over Wi-Fi or a control panel (built-in or remote-position).

Domestic ventilation units were represented by the high-performance Quiet, Silenta and iFan units as well as the company's latest offerings- the BODO and Gloss fans. Quiet and Silenta fans are characterised with low energy consumption and minimal noise emissions. The iFan series offers a wide array of intelligent functions such as timer schedule or operation using the feedback from humidity and motion sensors. These models were presented in various decorative variants. If these fans are well-known on the market, the innovative new BODO and Gloss models are yet to be widely appreciated – and so they were by many visitors!

The BODO is an extract axial fan with an intelligent control and management system. The unit is characterised with a minimalistic rounded design to seamlessly blend in with a wide variety of interiors and the availability of sensors for air quality, humidity, temperature and motion control. The fan is managed via an iOS and Android applications over a Wi-Fi connection or using the built-in touch-sensitive buttons. The Gloss fan has a stylish face panel made from natural glass which displays the essential parameters of the indoor environment such as relative humidity and temperature. The DC motor with a multi-speed operation mode and the MixFlow impeller contribute to a silent operation without sacrificing performance.

The visitors interested in industrial and commercial ventilation equipment were presented various models and modifications of axial, centrifugal, and mixed-type fans. In particular, those included the VKMz 125, TT 125 PRO, TT Silent-M 125, VCN 100, VP 125, VKP 100 series fans and many others. The booth also featured the AirVENTS CFP series air handling units which demonstrates the company's technological advances in ventilation. These units incorporate the feedback and recommendations of leading experts of construction and installation companies which widely use VENTS climate-control equipment in completing various housing and commercial construction projects. The signature modular concept of AIR-VENTS allows assembling an optimum configuration of the air handling unit based on the specific project requirements and account for all the particular features of the ventilation chambers

to contain the units. The AIRVENTS air handling units feature state-of-the-art automatic equipment by Carel. The units can be delivered in bespoke configurations fitted with control elements as per the client's order.

Other products presented at the events included the FlexiVent system of air ducts, the wide assortment of air diffusers, the bold concept design of the Ace and Base fans which includes a large number of universal decorative panels to choose from. According to many of our clients representing specialist installation companies, the FlexiVent modular air duct system was voted the most successful development project of Vents in 2018. The demand for these products in the Ukrainian ventilation market is proven by numerous orders for air ducts and accessories placed with the company's factory. FlexiVent is a highly efficient solution for building ventilation and air conditioning systems in newly built and renovated houses. The system is perfectly matched by Plastivent plastic ducts and Spirovent galvanised steel ducts. One of the strongest advantages of the FlexiVent system is the high mounting rate achieved without using special tools which enables installation companies to reduce turnaround times while building ventilation systems and speed up project delivery. It should be noted that the FlexiVent family includes air ducts with antibacterial and antistatic coating. Antibacterial air ducts are especially resilient due to improved resistance to prolonged exposure to microbes and bacteria.

In addition to showcasing a range of equipment, VENTS had many more surprises in store. The booth visitors were allowed to test most of the equipment on display in action. Each day the company arranged raffles and fun activities such as the Twin-Fresh and Vento Expert assembly races. Curiously, it was the ladies who demonstrated fantastic performance leaving many gentlemen behind and busting many common stereotypes.

The winners were awarded with Vento Expert A50-1 Pro ventilators. The company team also ran daily giveaways among all the registered visitors of the booth. The lucky winners received modern VENTS Quiet domestic fans and various souvenirs. As luck may have it one the prizes was won by a lady by the name Ludmila who was celebrating her 75th anniversary on that truly special day. And that's no wonder since VENTS has quite a few exciting tricks up its sleeve! ■







A new coat of paint for VENTS ventilation products

As VENTS products are steadily becoming more and more popular worldwide, "Ventilation systems" is investing resources into expanding the capacity of its production facilities and upgrading their equipment. Following the recent news about the launch of a new production area at the injection moulding shop we are happy to announce the opening of a new paint shop.

Before the new paint shop took shape the company used to operate three paint areas: one automatic powder coating area and two manual paint areas with two single-operator spraying machines. Over the last two years the company's painted surface demand area grew two-fold. A substantial increase in production necessitated an expansion of paint facilities which eventually led to the launch of a new paint shop.

The new production area is fitted with a state-of-the-art automatic powder coating system by Gema. This all-round solution provides pre-treatment of surfaces, power coat application and subsequent curing in the polymerisation oven. The line will be used for coating components of the company's industrial ventilation products and single-block air handling units. The new

paint shop is expected to help boost to the total painted surface capacity up to 130 000 m² per month.

In addition to other benefits the new line enables painting of articles up to 2 m in length which account for a large part of the company's range. Compared to the existing automatic paint line the new equipment suite offers a new level of automation, a step up in capacity and performance as well as significant improvements in pre-painting treatment quality and electricity consumption. With the new system colour change-over requires only 15 to 20 minutes. The new paint area is strategically placed near the metal processing shop to facilitate and speed up transportation and handling of semi-finished articles to be painted.

The opening of the new paint shop marks an important phase in the development of "Vents". Not only will it help the company to boost the number of painted articles per unit time, but it will also bring tangible improvements in the quality of the finished products for the end customer. ■

In the picture: The head of the new paint shop Vasily Kovalenko is checking the new equipment for operational readiness.



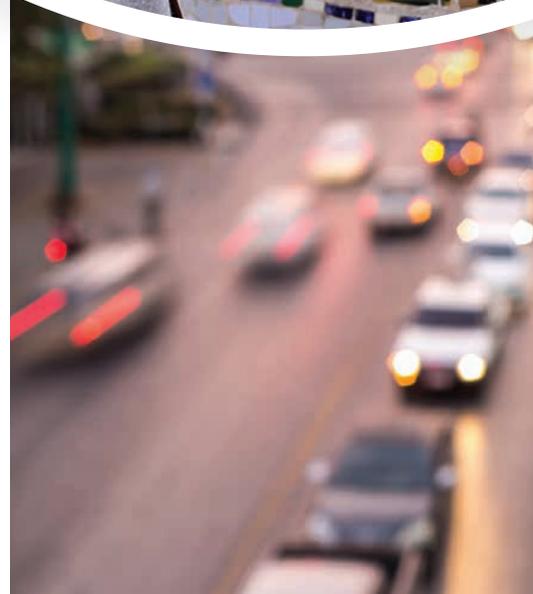
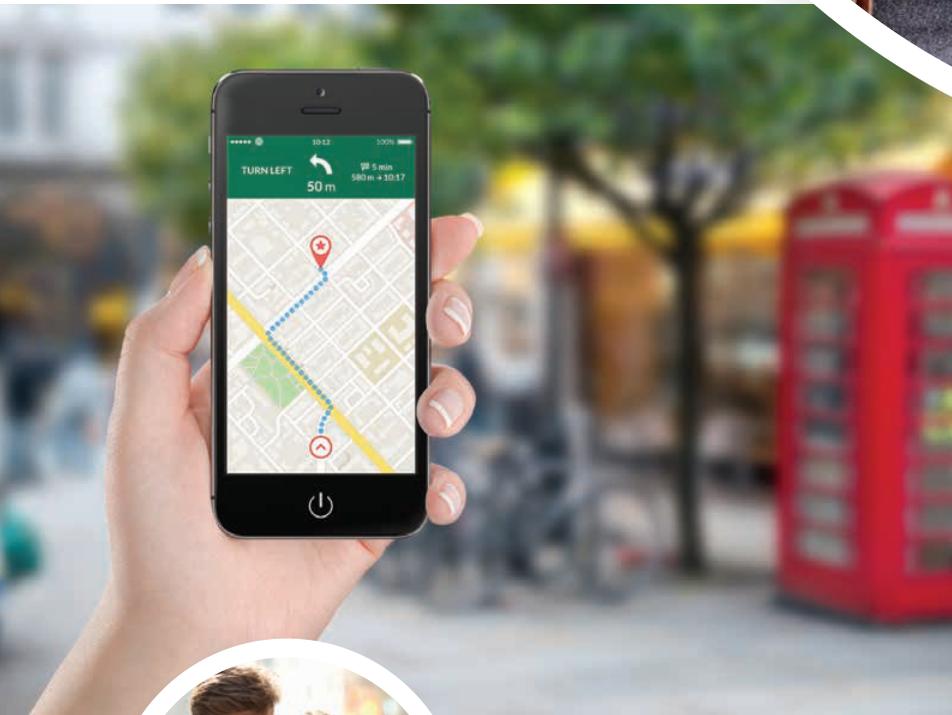
CITIES

with IQ to spare

Most people are quite used to the fact that living in the city means dealing with a host of inevitable problems. Some of them can be resolved while others, unfortunately, are beyond our powers. Just think about the so familiar waiting lines at polyclinics and state institutions. Think how much time is wasted each day in traffic. You may even have wished to be able to spend more time with your elderly family members if not for the daily chores that need to be done. However, there is hope that modern technology can help put an end to such problems once and for all. The solution is called Smart City – an urban environment which harvests the latest information and communication technology.



About 200 thousand people trade villages and towns for the city bustle in the search of new opportunities. This means that in less than 40 years two thirds of the planet's population will be living in megalopolises. If we ignore this trend and do nothing today, these agglomerations will hardly be able to cater for the diverse needs of the constantly growing population. These concerns have fuelled the global demand for optimization of various aspects of city living and the implementation of smart methods of managing natural resources, infrastructure, and information flows. The Smart City concept is designed to prepare the cities for the demands of the future.



Six in one

The Smart City project is aimed at optimizing urban processes using state-of-the-art technology. The project is intended to improve the quality of services provided to the residents, reducing the cost of resources and their consumption, and establishing efficient communication and promoting understanding among the residents for a global positive effect on the quality of life.

The Smart City concept includes six main components to ensure a balanced improvement of situation in the fundamental areas of daily living.

The first essential component of the concept is **Smart Governance** which is intended to relieve people from bureaucratic burdens. In particular, Smart Governance enables electronic voting in elections, online registration and electronic document flow, as well as streamlining a host of other procedures associated with the participation in political and social activities.

The **Smart Economy** component includes a range of initiatives to create favourable conditions for innovation and entrepreneurship and provide better opportunities for implementing creative ideas and projects, raising investor funding, running a business, or-

Barcelona is one of the smartest cities around the world



dering and receiving services as necessary, making payments etc.

Smart Living is the third aspect of the Smart City concept. It provides for widespread Wi-Fi coverage including Internet connectivity on public transit and at the waiting areas, facilitation and speeding up of information access, and implementation of modern technology to improve the quality of living – for example, smart ventilation, energy-efficient home solutions, health tracking technology etc.

The **Smart Citizen** component covers the devices and technology which people come into contact with on a daily basis. Those include electronic student cards, electron-

sequences, unauthorised rubbish dumping control etc.

And, finally, the **Smart Infrastructure** component of the Smart City concept enables smooth operation of taxi and logistics operators, real-time road traffic monitoring and providing routing information, operation of smart car parks and covers many other aspects.

Smart equals happy

While speaking at a TEDxTalk event Dr. Cheong Koon, the head of Housing and Development Board of Singapore, drew the attention of the audience to the need of spreading the Smart



According to the forecast by McKinsey & Company international consultants, about 600 smart cities will have appeared by 2020

ic passports and other documents which can be used for identification purposes and payment of goods and services (e.g. public transit fares) etc. For example, not only do electronic student cards provide free use of the transit system, access to libraries and many other possibilities for their holders, but also enable parents to track the academic progress and location of their children online.

The **Smart Environment** component includes the means and technology for environmental protection. Such technology includes environment monitoring systems, assets for alerting the public about environmental disasters and mitigating their con-

City concept as nearly half of the global population live in cities. The constant growth of today's megalopolises and the rapid ageing of their residents strains the urban infrastructure and requires more and more resources. In the presentation Dr. Cheong Koon presented her view on adopting smart technology in an urban environment using the example of Heartlands HDB town with 1 million apartments which provides accommodation for 83% of Singapore's population.

The Heartlands layout is planned in such a way so as to ensure an even distribution of air flow across the entire district grounds. Some of the buildings even have specially designed openings to enable free passage



Smart cities improve living standards, make routines less stressful and help save time

of air. Thanks to extensive town-level wind flow modelling the need for air conditioning in buildings was reduced to a minimum while balancing the air flow for the town residents to enjoy.

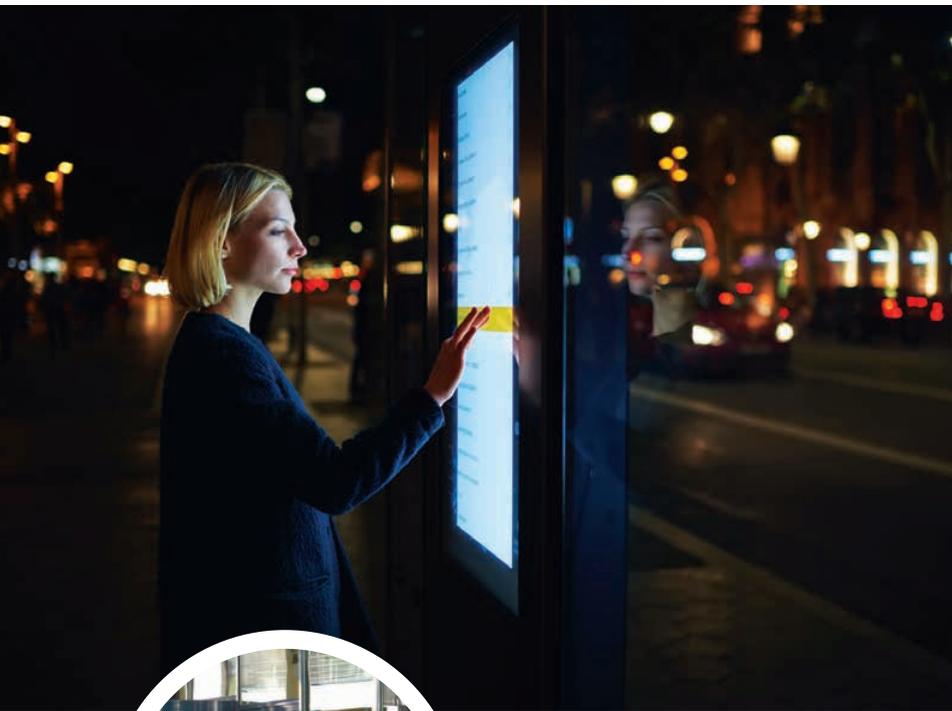
Computer simulation provides a host of insights. For example, shadow analysis helps to understand how shadows move from the morning till night. This helped the architects and the planners to choose the most suitable locations for parks, playgrounds and outdoor dining areas to maximise the comfort while enjoying time in the open during the whole day. The computer also provided insights into solar irradiance – i.e. how much sun actually falls on each building enabling placing solar panels on the

vibration and other vital parameters the control system can predict and avoid equipment failures.

The road network map is constantly updated with real-time traffic information. This helps the residents to avoid congestions and get to their destinations faster.

Those who use public transit benefit from the convenience of a single contactless pass. A smartphone application lets you know how crowded each bus is before you board it. If necessary, the application suggests using other means of transport or a change in the itinerary.

Residential care homes are equipped with sensors which track movements of the elderly and the state of their health. If the sen-



buildings which get a lot of sunshine and putting greeneries on the ones which only receive it in moderation.

All the buildings are equipped with temperature, humidity, and air direction sensors. The acquired data is then collected on the central data server and analysed to optimize the operation of the town subsystems.

Building hallways are equipped with motion-controlled lighting systems. Being sensitive to presence and motion, they are capable of detecting direction and gradually increasing light intensity in the part of the hallway where the person is moving.

At night the system activates and tests the lifts. Thanks to an array of sensors tracking



Songdo International Business District in South Korea is expected to reach full completion in 2020



sors pick up changes in patterns or abnormal health parameters which may hint at an emergency, the system immediately alerts the healthcare facility and the relatives.

Growing smarter

Besides Singapore various components of the Smart City concept are being successfully implemented in many other cities worldwide. For example, the streets of Barcelona are lit up with energy-saving LED lamps activated by motion detectors. This helped reduce energy consumption by 30%. Rain and moisture sensors in the city parks are used to automatically adjust the intensity for watering the grass and other vegetation.

Intelligent rubbish containers are emptied only when full once the operators receive an alert from a sensor-equipped system. Smart car parks provide drivers with current vacancy information to maximise their occupancy and reduce traffic, while the waiting public transit users are provided with real-time information about the next available ride from GPS-equipped vehicles. While you wait, you can charge a mobile gadget via free USB ports at the stops or use free Wi-Fi connectivity to surf the Internet.

Songdo International Business District in South Korea has numerous co-working spaces with video conferencing facilities. This is where about a third of all local public servants do their work in a diverse variety



A smart city has to be environmentally friendly, safe, energy-efficient, and empowering as well as provide a maximum level of daily life comfort



Governance, infrastructure management, and economy are among the top priority areas for the application of smart solutions



of professional areas. Since the co-working spaces are located across the entire city, the workers can save time and perform their duties without commuting all the way to their permanent offices. The central pneumatic waste disposal system eliminates the need for garbage pick-up by special vehicles. Seoul Healthcare service uses remotely controlled medical equipment and mobile devices to provide consultations for city residents and remotely check the state of health of senior citizens and people with disabilities.

The Swiss capital Geneva operates a municipal fleet of zero-emission electric buses built by TOSA. Before making a trip each

bus charges at the terminus for 5 minutes and needs a 20-second charge-up at every fourth stop on the itinerary.

The city of Seattle implemented the Rain Watch project in collaboration with University of Washington. RainWatch was designed to provide the City and region with real-time guidance regarding heavy rain to improve the safety of the local residents and infrastructure. The city of Seattle adopted the ShotSpotter program which involved equipping 800 law-enforcement officers with special body cameras featuring shot detection technology. In the event of a nearby street shooting the city residents are provided with automatic alerts

via their mobile phones so they could stay out of harm's way.

The last century was marked by a quantum leap in technology. Even 20 years ago half of the technology we use on a daily basis would seem like something straight out of a science fiction film. Every innovative solution we adopt brings the future one step closer and makes the changes inevitable. The Smart City concept is, perhaps, one of the most prominent examples of what a synergy of modern technology can do to improve the well-being and comfort across the board helping people live happy and meaningful lives today. ■

*air*VENTS

AirVENTS air handling units

AirVENTS air handling units is a complex ventilation solution to create a fully compact and packaged ventilation system with air capacity from 1500 up to 128 000 m³/h.

These air handling units ensure the supply air filtering and heating as well as removal of the exhaust air. Modularity is the basic privilege of AirVENTS system, thanks to which the functional sections of the unit can be connected in any configurations in compliance with specific operating conditions.

Application of the AirVENTS air handling units varies from the office and bank premises, concert and cinema halls, gyms and swimming pools to the hotels, residential premises, industrial workshops, stocks and supermarkets etc.



Smart ventilation from VENTS

High technology has become so ubiquitous that it has somewhat lost its wow effect. We have come to rely on it in our daily living for much greater convenience and comfort than ever before. Smartphones, tablet PCs, digital television and high-speed connectivity, smart washing machines, vacuum cleaners, heaters and climatic systems have become commonplace and nothing out of the ordinary. However, few people actually expect a ventilation system – not to mention a domestic fan – to offer intelligent functions and come equipped with advanced automatic control features.

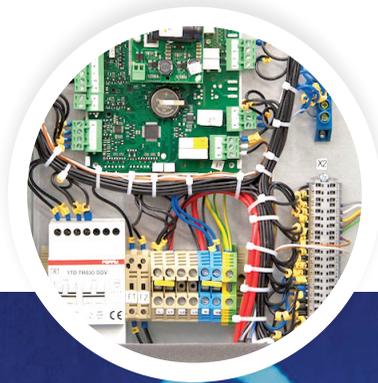




Many current products by VENTS are built with sophisticated electronics enabling changing operating patterns on the fly in response to variations of the ambient parameters or remote control of the ventilation equipment from remote control units or wireless mobile devices. The product range of the company's ventilation equipment includes a wide variety of intelligent solutions for domestic (houses and apartments), commercial, and industrial applications.

The domestic segment of VENTS portfolio includes a variety of solutions for arranging proper ventilation in a space and maintaining the desired air parameters automatical-

ly. If you are looking for control flexibility using a smartphone or a tablet PC, look no further than VENTS iFan family of intelligent fans and the new iFan WiFi model in particular. This fan has the functionality and the operation modes that few other intelligent domestic fans have to offer – in particular, its capabilities include continuous ventilation, timer-controlled activation and deactivation, automatic intermittent ventilation and operation controlled by temperature or humidity sensor feedback. You can manually set a desired humidity level to be maintained by the fan enable the intelligent humidity control mode and let the device automatically adjust the hu-





The smart functions of iFan are accessible via a touch-sensitive multifunctional control panel and a remote control unit. The operation modes of the iFan WiFi units can also be selected from a dedicated application installed on an Android/iOS smartphone or a tablet PC.

midity level in the treated room for maximum occupant comfort. The iFan Move and iFan Move WiFi models can also use motion sensor feedback.

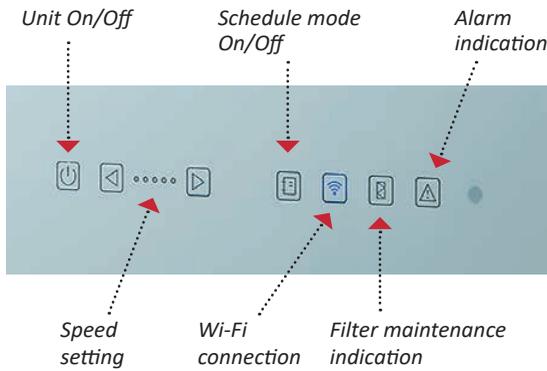
The Micra and TwinFresh series single-room air handling units also pack a host of intelligent features for your home. These devices are built to ensure effective supply and exhaust ventilation offering the benefits of heat recovery and air filtration. Thanks to the built-in automatic control electronics the TwinFresh Expert RW-30 V.2 model can be integrated into a home system. The air handling units can be managed using a smartphone or a tablet from a home Wi-Fi network or just anywhere in the world, or can be integrated into a single network for synchronous operation. The air handling unit operation can be adjusted as necessary using the control panel on the casing.

The MICRA 100 WiFi and MICRA 200 ERV WiFi take this one step further offering wireless control from the mobile application over a Wi-Fi connection. The user can set the necessary air flow, monitor filter contamination and unit health, and set the timer or create a weekly schedule. In addition

to that the unit modifications with a booster heater are capable of raising the supply air temperature which is quite welcome during the winter. You can also skip the smartphone and access the operating settings via the control panel on the casing or use the remote control unit.

The VUT and VUTR series air handling units and the DVUT single-room units are at the top of the line in terms of intelligent functionality and features. Depending on the model, the settings are made with the help of Carel, A14, A19 and A21 control systems. The exact scope of functions also depends on the configuration of a particular piece of equipment. The most notable intelligent functions include control over a Wi-Fi connection (for air handling units featuring A21 automatic suite), operation by humidity, temperature, and CO2 sensor feedback, joint operation with a fire alarm system, air pre-heating and booster heating, damper and bypass control, indication of system alarms and filter condition, and seamless integration into smart home systems.

While catering for a different market segment, AirVENTS modular air handling units



The MICRA 100 WiFi air handling units are controlled from a wall-mounted touch-sensitive control panel, a remote control unit and the mobile application installed on an Android/iOS smartphone or tablet PC.

also belong to the intelligent family of VENTS units. Depending on the particular model the automatic control modules of AirVENTS are responsible for energizing the equipment components, protecting all the circuits from short circuiting and overloads, indication of the current state, alarms and filter condition, control over the water coil or electric heater, blowing of the electric heating coils, pre-heating of the water coils during the winter, control over the liquid chiller or the compressor-condenser unit (CCU) mixing shunt, heat exchanger protection against freezing, air damper actuator control, continuous control of the rotary heat exchanger

wheel by means of a frequency converter, daily or weekly timer operation, ventilation system shutdown on a signal from the fire alarm system signal, and last, but not least, fan performance adjustment. The system is fitted with outdoor and supply air temperature sensors, water coil freeze protection sensors as well as CO₂ and humidity sensors.

New, smart, and functional

Until recently intelligent ventilation equipment by VENTS used to rely on the A11, A14, A19 and Carel (A17, A18) configurable controllers. These controllers ena-



bled fine-tuning ventilation equipment parameters to meet the user's needs and maintain them automatically. Despite a solid reputation gained around the world, these automatic control systems lack in the wireless department as remote control over the Internet is becoming a must-have in modern ventilation equipment. To upgrade the functionality of the currently used control systems and bring the products in line with the market expectations of today, "Ventilation Systems" created A21 – its own proprietary electronic control system.

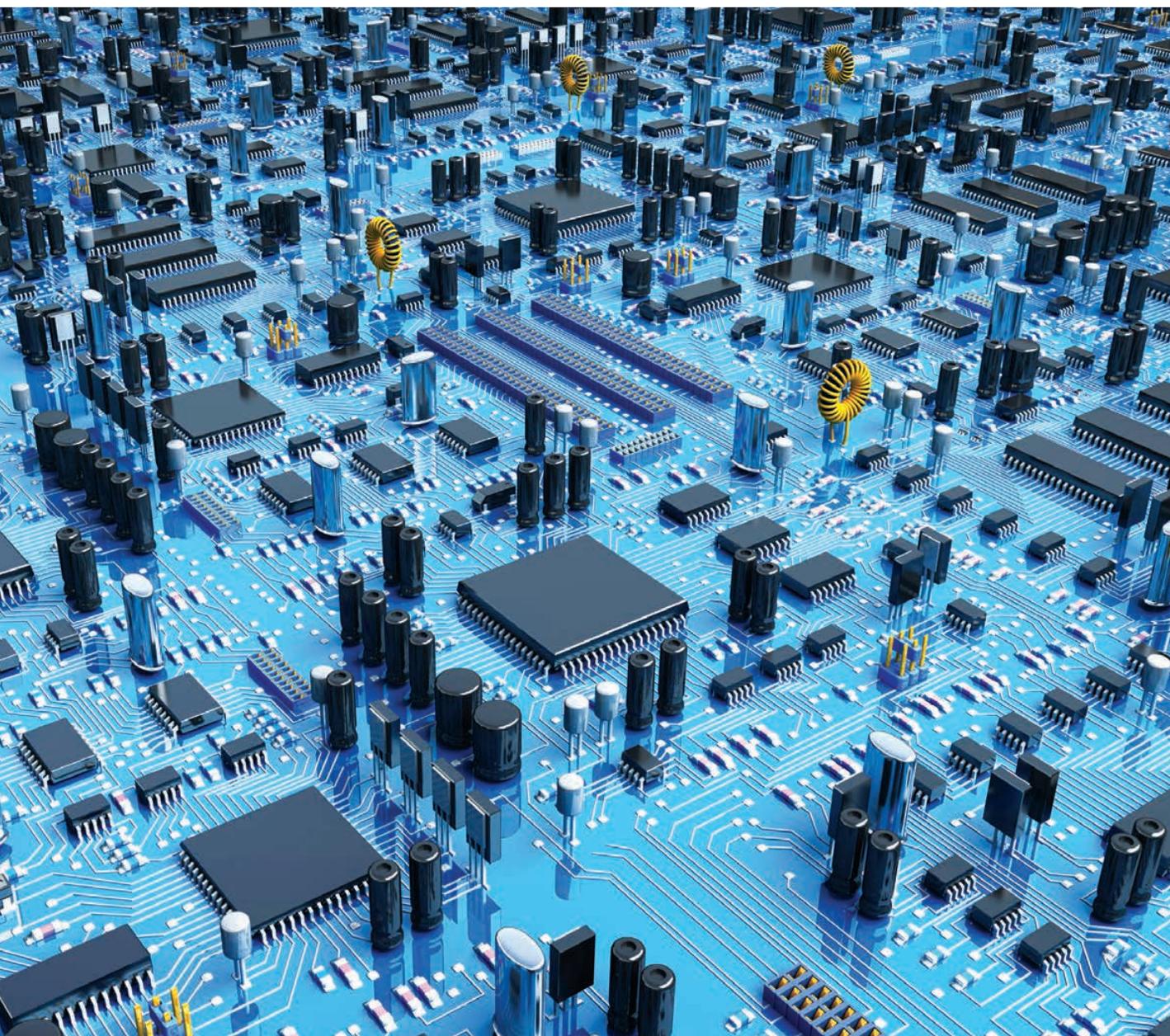
Unlike other control systems the A21 has a much wider range of functionality. As more

and more users expect ventilation units to have Wi-Fi control, we made sure they get it. Ventilation units use a wireless channel to connect to a smartphone or a tablet PC running a Vents AHU mobile application, which provides access to advanced settings, or to A22 or A25 wall-mounted control panels.

To control the unit from anywhere in the world, all you have to do is connect it to a wireless network and synchronise with Vents Cloud Server. The cloud server also enables the company engineers to access unit data to periodically evaluate its health, troubleshoot malfunctions and remedy them.



The new A21 control system marks a big milestone in automating the operation of VENTS ventilation equipment





The new A21 control system enables precise control of air quality parameters

The new automatic control system marks a new level of automation of ventilation equipment by VENTS. The units feature a timer which controls unit activation and deactivation, as well as a user-programmable weekly schedule. The weekly schedule enables setting the air handling unit speed, operation hours, and the temperature threshold for their activation. The settings can be applied to every day, an entire week, weekdays or weekends. With the A21 automatic control system you can choose among the four basic operating modes: ventilation, heating, cooling or auto (in this mode the unit automatically provides air heating or cooling as necessary). You can use the

seekbar for stepless selection or choose one of the pre-sets.

The A21 automatic control system allows high-precision air quality control including humidity level, CO2 content, concentration of volatile organic compounds (VOC) such as cigarette smoke and household vapours as well as the content of ultra-fine particles (PM2.5) such as allergens and particulate matter. To enable the air quality control functions, the A21 control systems must be fitted with the optional CO2, VOC and PM2.5 sensors to complement the standard humidity sensor built into the system.

The new automatic control system is compatible with building management systems

Vents AHU mobile application lets you control VENTS ventilation units over a local Wi-Fi connection or an Internet connection from most anywhere using your smartphone or tablet PC.





A14
control panel



A22 WiFi
control panel

The VUT/VUE 270 V5B EC A21 feature built-in automatic control systems. These units are managed from A22 wall-mounted control panel, the A22 WiFi wireless wall-mounted control panel or via Vents AHU application installed on a smartphone or a tablet PC. The VUT/VUE 270 V5B EC A14 units feature built-in automatic control systems and A14 wall-mounted touch-sensitive control panels. VUT/VUE 270 V5 EC A2 units come equipped with R-1/010 speed controller.



(BMS) commonly known as 'smart home'. The automatic control system connects to other electronic devices over an RS-485 serial data link using the Modbus open communications protocol. The RS-485 data link supports up to 16 simultaneous air handling unit and up to 16 simultaneous control panel connections.

The A21 control system offers improved malfunction identification accuracy with error code and description displayed in the mobile application interface or on the A25 control panel screen. The system also has a special timer for observing filter replacement intervals. In units equipped with a pressure switch the filter replacement signal depends on the current state of filter contamination.

The A21 system controls the implementation of freeze protection protocols. The three freeze protection methods include periodic shutdown of the supply fan, opening the bypass and activation of the electric pre-heater. The bypass also provides air cooling during the warm season.

A special engineering menu enables setting the operation parameters which are

not available from the basic menu and are not accessible via other control systems. The engineering menu, which is recommended for experts only, extends the system capabilities even further. In particular, this menu contains pre-set values for the basic speeds (1, 2, and 3), advanced temperature settings and those of the external sensors, the data reset feature and much more. The engineering menu also enables the Fireplace mode in which the speed of the supply and the exhaust fans is adjusted individually. This function provides improved fire safety by cutting out the supply of air which may sustain combustion and boosting the exhaust fan speed for more effective smoke extraction thus preventing a potential fire.

Besides making every use of the technical capabilities of the equipment, modern ventilation requires comprehensive implementation of high-tech control system components. While creating an intelligent control package based on the A21 proprietary automatic control system VENTS aimed for strategic improvements in simplicity, functionality and user friendliness. ■

Two steps of air exchange with VENTS VK DUO

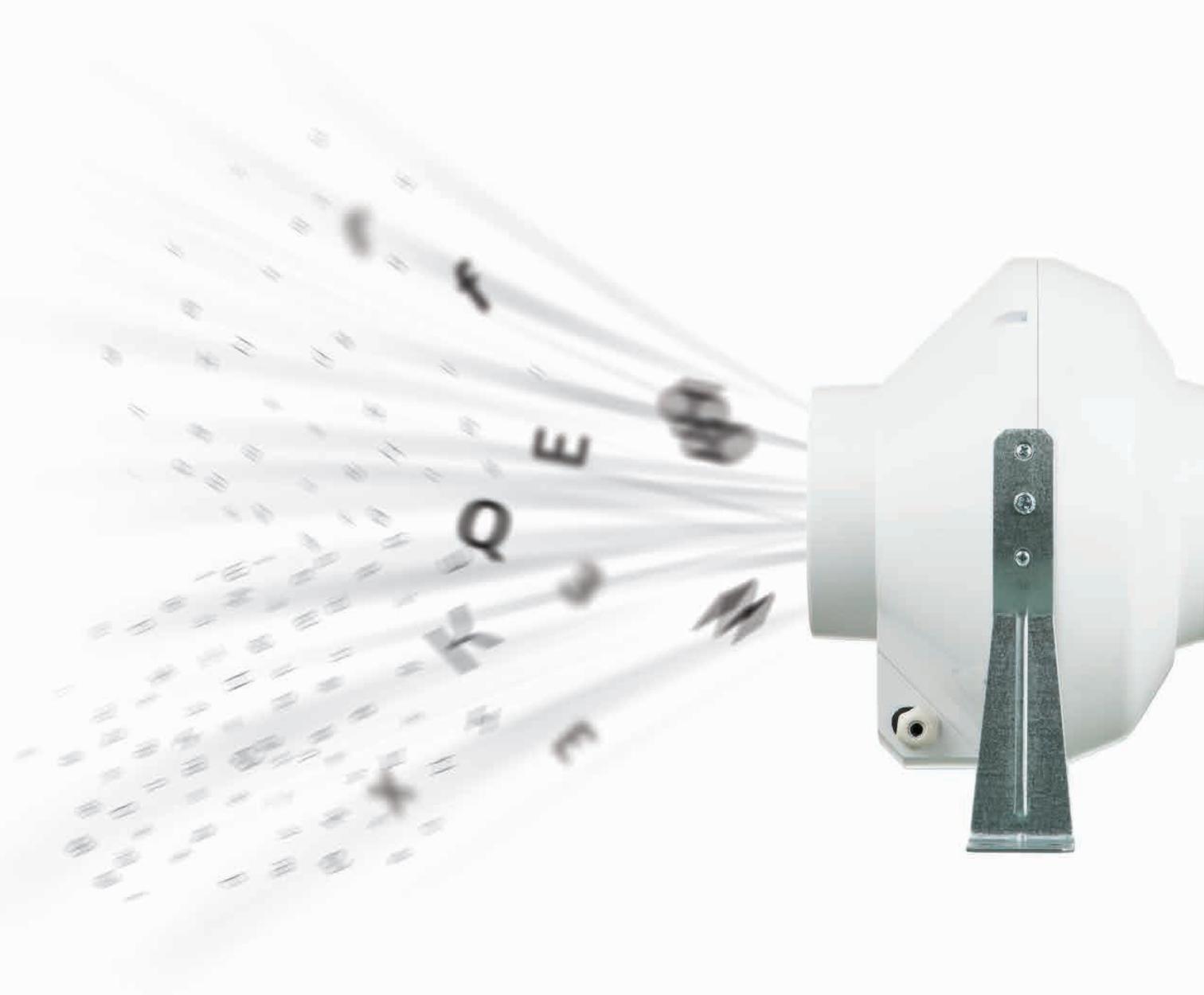


«Ventilation systems» has recently introduced the VENTS VK DUO series of supply and exhaust fans for round air ducts. The new units with an air flow of up to 1700 m³/h are intended for supply and exhaust ventilation systems of commercial spaces, offices and other types of spaces. Depending on the customer's needs the fans can be used for both air supply and air extraction duty.

The VK DUO fans are equipped with asynchronous electric motors with external rotor and dynamically balanced centrifugal impellers. The VK series benefits from two-speed motors which enable changing the fan speed depending on specific operating conditions to avoid wasting energy. This feature helped reduce the overall power consumption of VK DUO fans compared to the VK model. The operating speed is set in steps using a P2-10 controller.

Thanks to a plastic casing VENTS VK DUO fans offer excellent corrosion resistance and are ideally suited for high-humidity applications. The series also includes various modifications with an electronic thermostat to control the fan operation depending on changes in temperature. The series includes VK DUO configurations with a temperature sensor positioned on the fan casing or to be placed in the ventilation duct. This option may become especially useful for green houses or other similar environments as the fan responds to temperature changes around the fan or in the duct by altering the impeller rotation speed. The automatic control eliminates the need for human intervention to maintain the necessary air temperature in the treated room. There is a wide selection of standard sizes ranging from 100 to 315 mm.

VENTS VK DUO fans provide an optimum solution to meet various supply and exhaust ventilation needs. With its simple and flexible installation, a large number of options, and a two-speed motor the fan is built to deliver maximum convenience for its end users.





The principal mission of every manager is to maximize the company's operation effectiveness and, respectively, its earnings. This, however, is easier said than done as the traditional methods no longer work as expected to respond to fierce competition and a constantly evolving marketplace. This forces companies to reconsider their understanding of modern production seeking new solutions and opportunities. And, as you know, where there is will, there is a way. Introducing the lean production concept – a unique tool for every company allowing a significant and quantifiable growth over record times.



The lean production approach to factory management focuses on eliminating all types of waste whilst ensuring quality and increasing the value of products. "What waste? The company has been running like a Swiss clock for years making profit!", as some managers might rebuff. However, things start to look different if you step away and look at a different angle. If you only consider the interests of the company, waste may result from workmanship defects, wasted primary materials, or equipment left to idle or rendered inoperable by an incompetent operator. However, if you shift the focus toward the consumer, the situation starts to look a whole lot different, and waste acquires a much broader meaning. From the customer's perspective everything that creates no value lands in the waste category. Does the customer need the product to be left to wait between production steps or carried a large distance from one shop to

another? No, not really. Does the customer need the products they might actually pay for with their money to undergo extra steps in production just because the designers of the product or the process did not care much about efficiency? Absolutely not! This is not to mention shuffling paper around, waiting for raw materials and components to arrive, interruptions in the equipment operation and sloppy workers turning a blind eye to defects. All this creates waste which accumulates and adds to the price of the final product charged to the end consumer. From the perspective of lean production, which puts the customers' interests first, all production processes either create value or they do not. Therefore, the primary goal is to identify and eliminate actions which consume resources, but fail to add value. If an operation can be performed faster, cheaper and with higher quality, why not make it happen today?



A win-win-win situation

So what exactly does lean production achieve? In a nutshell, the implementation of lean production concept helps reduce the costs of ensuring product quality, improve management process transparency, raise customer satisfaction with the company's products, reduce the use of resources, and ensure better engagement of the company employees into the production process and boost their motivation.

Lean production is a win-win-win for the customers, the factory, and the employees. Elimination of waste costs results in offering customers a product of highest possible quality at a minimum price. A comprehensive optimization of all the production processes and abandonment of inefficient and unnecessary actions further the creation of an ideal product as perceived by the customer offering a lasting competitive advan-

tage. Profound engagement of each worker in the production processes also brings a host of benefits such as improving working conditions and providing opportunities for initiative as optimizations ideas coming from within teams now have a potential for award-based implementation.

The types of waste

Waste can take various forms. The lean production methodology recognizes eight types of waste:

- Overproduction;
- Waste from time spent waiting for materials, parts, components, or necessary information;
- Waste from unnecessary movement of materials (e.g. caused by inefficient layout of equipment of shops);
- Extra processing related to product or process design flaws;

- Waste resulting from excess inventory and processes causing them;
- Wasted time and effort caused by unnecessary movement of people in production;
- Waste resulting from defective products;
- Non-utilised employee talent.

Reducing each type of waste to a minimum has a synergistic effect on costs used and time spend to create a truly valuable product.

VENTS: employees come first

For many years "Ventilation systems" has successfully been implementing a lean production concept at its factory, which was aptly named Vents Production System or VPS for short. The approach provides a variety of tools for boosting efficiency in such crucial areas as product quality, production cycle duration, occupational safety, team



The primary goal of lean production is to identify and eliminate actions which consume resources, but fail to add value

environment, and cost cutting. A concerted effort applied in all these areas translated into better sales and higher revenues not to mention customer satisfaction.

The VPS concept is based on two founding principles: respect to the employees, the customers, and the community, and commitment to sustainable growth. Thinking that Lean Production is not more than a tool kit is quite a misconception. Studying the tools is not enough to learn how to use them. We started by studying the best practices of lean production and applying them in our context. This brought a number of exciting insights which helped us understand the true potential of using specific tools at our company. We have now taken a step further on the path of transformation by engaging employees at all levels of our organisation stimulating and supporting changes of both habits and the general outlook.

Within a traditional approach to organising production the managers primarily focus on the deliverables, then pay attention to the client's needs and the business processes and only once those have been taken care of do they finally address the employees' needs. The corporate philosophy of VENTS is focused on providing inspiration for the employees who develop and improve business processes from within ultimately leading to customer satisfaction. Recognition of human potential is the foundation of our company's sustainable development.

Tools for growing the business

The practical application of lean production tools at "Ventilation systems" is best illustrated with an example from biology.



A living organism is built from myriads of cells which work together for the common goal. VENTS, too, contains a multitude of cell-like units which enable producing quality goods, maintaining effective business processes and providing excellent service to our customers. That being said, every cell is provided with several key tools, and each one of them is just as important as the others.

The first of the vital tools used by the cells is the 5S (Sort, Set in Order, Shine, Standardize, and Sustain) management system. The system is intended to optimize productivity through maintaining an orderly workplace and using visual cues to achieve more consistent operational results. This visually-oriented system helps to make the operational space more efficient and manageable, promote high standards of corporate culture, improve labour efficiency, and save time.

Flow mapping, the second tool, means learning to visualize the work flow and the transitions from one step to another, define the losses which restrict free flow and eliminate them using the suitable approaches and methods.

The third tool is the so-called 'standard approach'. This tool provides an effective step-by-step algorithm for performing various procedures presented in an easy-to-understand visual form. This helps understand how many steps each particular process includes and how much time each one takes. The standard approach also helps to minimize the time required for the induction of new employees and their adaptation to the workplace.

The fourth tool is the pull system which basically means that the production at a unit or a shop only begins upon receiving a request for parts or components from the downstream unit or shop. This is somewhat

similar to a supermarket where the merchandisers are automatically alerted on a need-to-basis about the goods lifted off the shelves by the customers. Our company uses different variations of the pull system: some processes connect production cells into a single collaboration while others relate products to customer needs.

And, finally, the most important tool – visual management. All the techniques and elements in a cell must be visualized for easy understanding. We utilise a system which enables prompt identification and addressing any arising issues. Visualization is a key concept which paves way for improvements and provides the foundation for each cell.

The above five elements enable the creation of effective production, administrative, and functional processes which spread through the entire corporate structure of VENTS. ■

Smart *meets stylish*

VENTS Style Duo two-speed fan

If the functionality, energy efficiency, intelligent control and stylish design are at the top of our expectations from a domestic fan, you should definitely consider the innovative VENTS Style Duo exhaust fan. Characterised with an air capacity of up to 90 m³/h, the fan is intended for bathrooms, showers, kitchens, and other domestic spaces.

The new fan is packed with exciting features. Its performance comes from a two-speed energy-efficient motor on ball bearings built to keep your electricity bills low. The two-speed functionality enables the motor to change the operation pattern according to the ambient conditions switching to the low-power mode whenever possible. A special mixed-type aerodynamic impeller pro-

file helps achieve an excellent balance of high air capacity and low noise. The outlet pipes of VENTS Style Duo fan have flow guide vanes which reduce turbulence, increase air pressure, and further contribute to noise control. Thanks to a contemporary design the fan can provide an aesthetically pleasing addition to a variety of interiors. The fan also has distinctive feature – a thermal actuator which ensures a smooth opening and closing of the face panel and prevents back drafts. The internal components of VENTS Style Duo are feature moisture protection making the unit ideally suitable for bathroom ventilation duty. The electronic components of the fan are protected with special water-tight seals for reliable operation in humid conditions. ■







All-out performance in a compact package

VENTS VUT/VUE 250 W/H Mini

Introducing a new product from VENTS - the VUT/VUE 250 W/H Mini series heat recovery air handling units that will be duly appreciated by ventilation professionals and consumers alike. The units provide an air capacity of up to 250 m³/h and are offered in a compact casing with noise and thermal insulation, which is available with vertical and horizontal pipe connections.

The new models retain the best features of the outgoing VUT/VUE W/H Mini generation. These complete air handling units provide supply of filtered fresh air into the treated room and heat recovery whilst extracting stale air. The new features include improved casing construction for even better protection and sealing, both left-hand and right-hand installation options and a dedicated

compartment for a supplementary supply air filter.

The VUT 250 W/H units are equipped with heat exchangers made from aluminium plates. The VUE 250 W/H Mini units, however, feature enthalpy heat exchangers with a polymerized cellulose core. While aluminium heat exchangers are only capable of recovering thermal energy, the enthalpy devices also help maintain an optimum humidity level. The built-in G4 supply and exhaust filters ensure a high degree of air purity. The unit can be upgraded with a supplementary F7 supply air filter for even better filtration.

Many potential buyers will surely appreciate the low noise levels of VUT/VUE 250 W/H units, which results from extensive soundproofing of the casings. ■





A double tap for *your energy bill*

VENTS Quiet Mild Duo two-speed fan

Introducing yet another new arrival from VENTS- the Quiet Mild Duo two-speed exhaust fan with an air capacity of up to 170 m³/h. The unit is designed for periodic or continuous ventilation of bathrooms, showers, kitchens, and other domestic spaces. The fan is powered by a two-speed energy-efficient motor on ball bearings with a minimum power input of 4 W. The low-speed mode can be used for continuous ventilation due minimum power consumption. The high-speed mode is intended for periodic ventilation to extract large amounts of air as quickly as possible. In addition to that the fan is characterised with a low noise signature.

The Quiet Mild Duo series includes a number of variants for a comprehensive automation of your home. In particular, the series includes models with a deactivation timer and an interval timer to control switching between active and standby states. The Quiet Mild Duo series also includes a modification with an indoor humidity sensor.

The new fans also bring a wide selection of stylish colour options. You can select from Chrome, Vintage, Gloss Aluminium, Black Sapphire, and Red. This choice of colours helps to find a model that would ideally blend in with a particular interior design. ■







Occupant comfort *made easy*

EASY RL7-50-17 single-room ventilator

The range of single-room ventilation solutions from VENTS has recently been updated with EASY RL7-50-17 single-room heat recovery ventilator. The new unit, which offers an air capacity of up to 50 m³/h, is intended for maintaining continuous air exchange in flats, houses, hotels, and other domestic and public spaces. The extract air heat energy is recovered by means of a high-tech ceramic heat capacitor built into the device. A cellular core offers a large air contact patch and is characterised with outstanding heat-conducting and accumulation properties. Two built-in filters with G3 combined efficiency are responsible for cleaning

the supply and exhaust air streams from impurities. In addition to retaining dust and insects which fresh outdoor air may contain, the filters protect the internal components from clogging.

The supply and exhaust functions of EASY RL-50-17 units are enabled by a reversible fan powered by a 12 V DC motor. Thanks to DC technology the fan consumes minimum power. The fan motor has built-in thermal protection against overheating and ball bearings for a long service life.

The units are controlled by means of a wall-mounted panel or a remote control unit. ■



MICRA 100 WiFi is intended for single-room ventilation of public and commercial spaces, flats, and houses. It is a simple yet effective ventilation solution for newly erected and renovated spaces which does not require dedicated air ducting.

Oxygen for your child genius

VENTS MICRA 100 WiFi

*Single-room heat recovery
air handling unit*



- Fresh air
- Energy efficiency
- Compact footprint

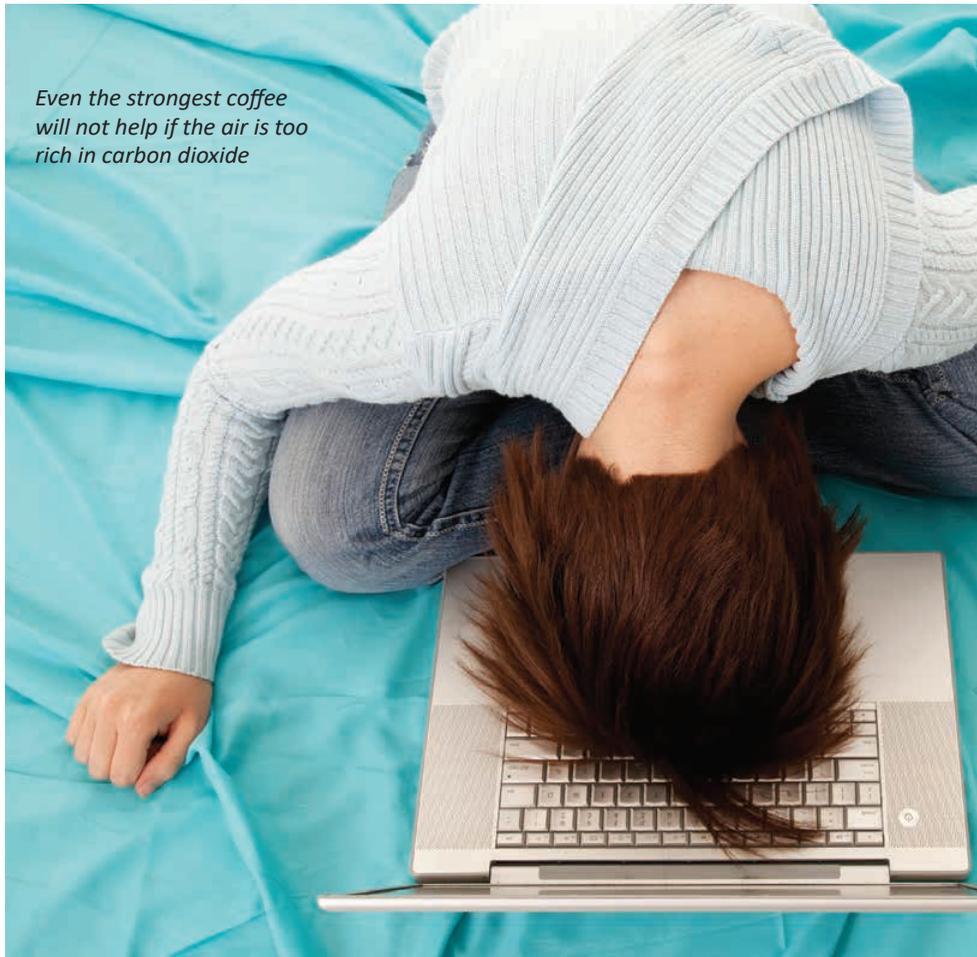
- Versatility
- Ease of installation
- Low noise

Keeping tabs on CO₂





Every person wants to eat healthy food, drink clean water and breathe fresh air. And while healthy food and clean water are not too difficult to get, fresh air is becoming harder and harder to find. There is no telling how clean the air in your flat or office space is without measuring the content of carbon dioxide (CO₂). It is the carbon dioxide concentration that directly affects the state of every person's health and well-being. Still, there is a way to keep track of this invisible substance. "Ventilation systems" engineers developed a family of CO₂ sensors to be used in conjunction with VENTS equipment to control carbon dioxide concentrations in the air and automatically maintain a comfortable breathing environment in the treated room.



*Even the strongest coffee
will not help if the air is too
rich in carbon dioxide*



**VENTS offers
ventilation equipment
which runs automatically
using feedback
from carbon dioxide
sensors**

Most of the time modern people stay in the confined spaces of flats, offices, shops, and shopping centres instead of spending time outdoors enjoying fresh air and its most vital component, oxygen. At the same time people do their best to insulate their spaces in order to minimise heat losses during the cold season and prevent outdoor noise and pollutants from entering the room.

While in theory there is no harm to that, well-insulated spaces with insufficient ventilation have just one persistent problem: as soon as you put a breathing human inside, the oxygen in the air starts to drop being replaced by CO₂. This has an immediate adverse effect on the occupant well-being. As a rule, the body responds in a very predictable way with the feeling of tiredness and drowsiness, reduced brain activity, headaches, and even fainting. People with respiratory diseases are especially sensitive to oxygen deficiency and excessive concentrations of carbon dioxide. Continuous body exposure to high CO₂ concentrations can lead to acidosis which, in turn, may cause

poor absorption of useful chemicals and minerals such as manganese, calcium, potassium, and sodium.

The situation gets even more serious when children's health is affected. The development of Internet technology and proliferation of all kinds of digital gadgets cause the young people of today to spend more and more time indoors, which puts their bodies to physical limits due to oxygen starvation and the exposure to excess carbon dioxide.

If this does not sound convincing enough, here are some numbers. The optimum CO₂ concentration in the air of a closed space is considered to be <600 ppm. Once this level is exceeded, some people tend to notice a drop in air quality. A carbon dioxide concentration within the 800–1000 ppm range is immediately noticeable to every person in the room.

Fortunately, the ventilation industry and "Ventilation Systems" offer numerous solutions for creating a comfortable breathing environment in closed spaces. Moreover, the latest products developed



by our company allow building 'smart' ventilation systems which respond to changes in ambient conditions. Ventilation devices running automatically by receiving feedback from motion and humidity sensors have long become mainstream. However, VENTS decided to take one step further and equipped its products with special sensors which help track carbon dioxide concentrations.

Carbon dioxide guardians

The product portfolio of VENTS includes two series of carbon dioxide sensors: **VENTS CO2** and **DPWQ40200**. The sensors are intended to monitor CO₂ content in the treated room and send out an alert once it reaches critical levels. The devices are used in conjunction with industrial fans, single-room air handling units and supply and exhaust ventilation units. If carbon dioxide concentration exceeds the maximum permissible level, the sensors send a control signal to the ventilation unit to auto-

matically increase the amount of fresh air supply. Besides being able to maintain a comfortable breathing environment these sensors contribute to power savings as the fan activates or speeds up only when necessary.

The **DPWQ40200** sensor measures carbon dioxide content in the air within a 0–2000 ppm range. It relies on a non-dispersive infrared gas analyser (NDIR) to define the CO₂ level. The unit has two analogue outputs (0–10 V and 4–20 mA) for connection to enable smooth control of the connected ventilation equipment speed. With this type of control air flow changes proportionally to the carbon dioxide level. **DPWQ40200** is intended for fans driven by EC motors. Other types of electric motors require adding a frequency converter with a 0...10 V input.

The **VENTS CO2** series of carbon dioxide sensors includes two modifications: **CO2-1** and **CO2-2**. The CO2-1 is equipped with six carbon dioxide lights and the fan control button which cycles between the fan operating modes (On/Off/CO₂ level control). The button provides manual ventilation control when CO₂ control is not required.

The CO2-2 modification has no light indication or manual On/Off button as the sensor provides continuous air quality control. This modification is intended for spaces requiring continuous ventilation equipment operation such as kindergartens, schools, hospitals and other high-occupancy spaces.

The VENTS CO2 series sensors are provided with a relay discrete output and an analogue 0...10 V one, which are physically separate. The discrete output is used to automatically switch the ventilation equipment to a pre-set speed upon reaching an abnormal level of CO₂ in the treated room. The analogue output provides smooth regulation of the fan speed in which case the air flow changes proportionally to the carbon dioxide level. The other use case requires fans with EC motors or other motor types with the addition of a frequency controller with a 0...10 V input. The availability of both the discrete and analogue outputs ensures connectivity with an extremely wide range of ventilation system.

The addition of carbon dioxide sensors to the company's product range provides VENTS customers with yet another reliable tool for air quality control. Adding CO₂ sensors to ventilation systems offers multiple benefits including power economy and automatic balancing of air composition making them quite indispensable for indoor ventilation. ■



VENTS CO2-1 sensor ■



VENTS CO2-2 sensor ■



VENTS
DPWQ40200 sensor ■

Oxygen and phytoncides and where to find them

As you know, a simple walk in the forest or in the mountains has a positive effect on human well-being. However, very few people realize that forest and mountain air in fact has many more benefits bordering on the supernatural. Regular visits to such places is a reliable method of boosting immunity, helping your body combat diseases, toning up your entire body and reaching inner harmony.





Dealing with environmental pollution is inevitable while living in a megalopolis. People have grown so accustomed to breathing dusty air filled with exhaust fumes and rubbish odours that they nearly forgot what really clean air feels and smells like. Braving the city jungle or spending long hours in the confines of office spaces people deprive themselves from breathing fresh air which contributes to stress, diseases and deflates our good spirits. The high level of carbon monoxide in city air causes rapid tiredness, slows down mental activity, causes respiratory malfunctions and may

even cause a blackout. The presence of carbon monoxide is just the tip of the iceberg as city air may contain dozens of other hazardous pollutants. Is there a silver bullet, you might ask? Yes, there definitely is! And you even know it very well.

Forest fragrance

As you may have guessed, the solution comes from plants. A thick forest fills the air with ozone and efficiently cleans it from dust and hazardous admixtures. One hectare of mixed forest absorbs about 200 kg of carbon dioxide a day



while producing a comparable amount of oxygen. In a world where the air is filled with exhaust smoke, hazardous emissions and poisonous substances breathing forest air is indeed a miracle cure for the human body.

Forest air ions help us freshen up, shake off the stress and generally feel better. But wait, there is even more! Regular outings to the forest boost immunity, stimulate our metabolism, blood circulation and appetite, rejuvenate the cells in the body and tone it up. While breathing forest air our body absorbs a large amount of oxygen which, in turn, stimulates brain activity.

All trees produce phytoncides in varied concentrations depending on the exact species. Phytoncides are biologically active substances which prevent or inhibit the growth of bacteria, protozoans and microscopic fungi. Phytoncides are extremely good for human health. For example, fir phytoncides kill *Bordetella pertussis*, pine phytoncides kill *Bacillus Kochii*, the causative agent of tuberculosis, and *Escherichia coli*, and birch and poplar phytoncides kill *Staphylococcus aureus*.

It is coniferous forest that has the most beneficial effect on the human body. According to research, the air in a coniferous forest, especially pine or cedar coppice, is near-sterile. This is due to the fact that it contains only 200–300 bacterial cells per square metre. One hectare of pine forest releases about 5 kg of volatile phytoncides a day. A comparable area of juniper forest releases up to 30 kg of phytoncides significantly reducing the bacterial population in the air. This is why people with various forms of upper respiratory tract

and lung disorders will feel the best in a coniferous forest. The people living in Taiwan, South Korea, and Japan have long been using a special therapeutic method commonly referred to as 'forest baths'. It is quite straightforward: to restore a good state of physical and mental health people spend time in forests breathing phytoncide-rich air.

Mountain air

Besides breathtaking landscapes the mountains have crystal-clear air which helps restore health and emotional well-being. There are a number of reasons why mountain air feels fresh and pure. The first and the most obvious one is the absence of factories due to poor accessibility. Consequently, mountain air is free from carbon dioxide and industrial emissions, poisonous vapours and other hazardous products of industrial facilities. Some might reasonably object that even mountains have roads used by cars which emit exhaust smoke and dust. And this is where altitude, the second reason, comes into play. Hazardous admixtures are generally heavier than air causing them to accumulate below as they succumb to gravity. It is pure air that remains higher up. The third reason is a minimum population of microorganisms. This is due to the fact the solar radiation is much stronger at high altitude killing most of the microbes and bacteria which would otherwise hang in the air. The sun also ionizes air and saturates it with ozone. Ultraviolet radiation causes oxygen and nitrogen air molecules to break up into free ions while the former parts of diatomic oxygen molecules form



One hectare of mixed forest absorbs about 200 kg of carbon dioxide a day producing a comparable amount of oxygen





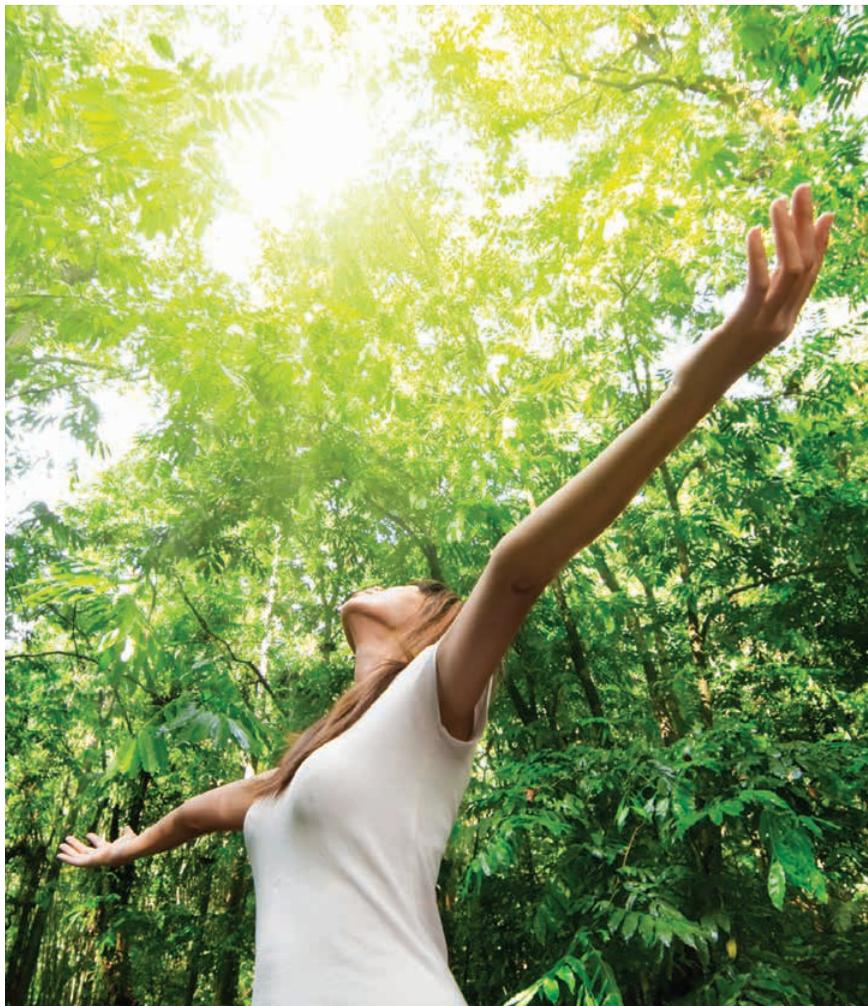
Regular outings to a forest boost immunity, stimulate our metabolism, blood circulation and appetite, rejuvenate the cells in the body and tone it up

triatomic ones turning into ozone which adds freshness to the air. Compared to the lowlands oxygen concentration in the mountains is significantly lower. A lack of oxygen sends our body into overdrive as the heart starts to pump more blood and send it to the lungs. This is why some athletes train at high altitude: if you stay competitive in rarefied conditions, you can certainly win down below. Exercise in the mountains helps improve our physical condition by improving oxygen transport in the blood stream and alteration of vital processes at the molecular level. This results in a drop in the partial oxygen pressure in the blood and tissue oxygen tension causing the body to employ its adaptation mechanisms. Physiological benefits include improved endurance and stamina, weight loss, improvement of general physical state and faster rehabilitation after traumas and illnesses.

Interestingly, compared to people living in valleys most highlanders live considerably longer. For example, the life expectancy of monks living in monasteries on mount Athos is 10 years longer compared to the average in other parts of Greece. There are also hunza people living in the Himalayas in the north of India. The hunza people live in a geographically isolated region. Their average life expectancy reaches 120 years, and they hardly ever get sick. And, of course, there is the proverbial longevity of people living in Tibet and the Caucasus that we all know about.

A magic pill with a catch

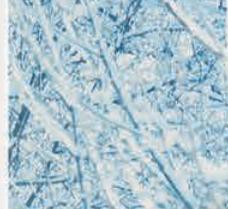
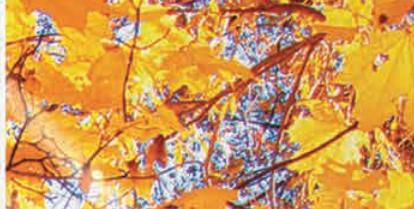
Forest and mountain air is well-known for its beneficial effect both on physical and mental health. Still, there is something important you should know. Before you make a dash for the forest or the mountains, slow down and consider some preparation.



After living in a big city and spending most of the time in closed spaces while taking a walk every once in a lifetime, a forest or a mountain adventure may cause dizziness or even a blackout if you aren't careful. This is caused by the exposure to large amounts of fresh air flowing into the lungs causing a rapid boost of oxygenation. But fear not: a few outings into a forest or just a park will suffice to mitigate these unpleasant effects. A coniferous forest known for its wonder-like effect due to high concentrations of phytoncides may harm people with cardiovascular conditions. Spending a long time in a coniferous forest, especially on a hot day, may cause people with heart conditions or hypertension to get a migraine, ringing in the ears, respiratory obstruction or even heartache. In this case walking in a mixed or deciduous forest would be a much better idea.

The mountains can be even more treacherous to the unprepared. While low oxygen concentrations typical of moderate altitude have known beneficial health effects, conquering more serious heights would require substantial preparation. Rarefied air may cause oxygen starvation called hypoxia. The negative effects of hypoxia begin with blackouts. If the gravity or duration of hypoxia exceeds the adaptive capabilities of the body, organ or tissue, transformations become irreversible. It is the nervous system, the myocardium, and the kidney and liver tissue that are most sensitive to oxygen starvation. In extreme cases hypoxia can be lethal. Even experienced mountaineers and rock-climbers have to train for several months before ascending to high altitude. People without background experience in sports may require years of training before attempting the same.

Although the modern world has become a lot safer than before, some perils remain invisible in the air – the most essential necessity of life. While embracing the urban lifestyle the humanity drifts away from the nature, which still has a lot to offer those who want to live a long and healthy life. Forests and mountains are some of nature's most precious gifts. The people of Ukraine are fortunate to be able to reach the Carpathians without leaving the country. Isn't this a marvellous opportunity for enjoying both mountain and forest air on the same trip? Still, you should always remember that even useful and pleasant activities can lead to disastrous consequences if approached without caution and moderation. Since it is your health that is at stake, make sure to take good care of it. Go out to a forest, climb a mountain or, if that is not possible, just go to a nearby park to enjoy fresh air, but always stay safe. ■



Comfortable breathing environment all year round

VENTS MICRA 200 ERV WiFi

The new compact energy-saving air handling unit is intended for single-room ventilation of public and commercial spaces, flats, and houses. The maximum air capacity of the unit is 200 m³/h. The installation does not require laying an air duct system or any costly building and installation works which excludes any tampering with the structural elements of the building and altering the interior.



A woman with long brown hair is lying on a wicker lounge chair. She is wearing a black one-piece swimsuit with a high collar. Her eyes are closed, and her right hand is resting on her forehead. The background shows a swimming pool with blue water and a tiled edge. The lighting is warm and golden, suggesting late afternoon or early morning.

*"A marvelous and
underrated thing, air. How
true it was that we never
appreciate things until
we must do without them"*

Jeff Lindsay



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