



VENTMATE: Smarter Ventilation

A better way to resolve stuffy, unhealthy, or thermally uncomfortable working spaces

Our mission: we create healthy and comfortable spaces to live, work, and play.

PureLiving innovates in the design and manufacture of advanced sustainable ventilation, filtration and sterilization solutions for the built environment.

We help you to create healthy, sustainable and more productive indoor spaces

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Why is Ventilation Getting So Much Attention?

Ensuring proper ventilation with outside air or equivalent air changes can help reduce the concentration of airborne contaminants, including viruses, indoors.

We spend almost 90% of our time indoors. In developed countries, food and waterborne disease have largely been eliminated through a combination of research, legislation, and infrastructure funding. We should give the same priority to achieving clean, pathogen-free air in public and private spaces

However, bringing in more outdoor air comes with an energy cost and that is at odds with climate goals. Buildings consume 40% of global energy, and are thus a major contributor to global warming.

A smart, on demand system is needed that balances the need for better indoor air quality, energy use and can be quickly deployed into existing building infrastructure.



Typical Office Challenges

Lack of sufficient ventilation causes poor indoor air quality



Insufficient
Ventilation of
Base Building



Outdoor
and Indoor Particulate
Pollution



Thermal
Discomfort



Airborne Transmitted
Viruses and Bacteria



Chemicals and
Odors



Meeting Energy
Reduction Targets



No Air
Movement



Meeting Green
Building Standards

Obstacles to Improving Ventilation

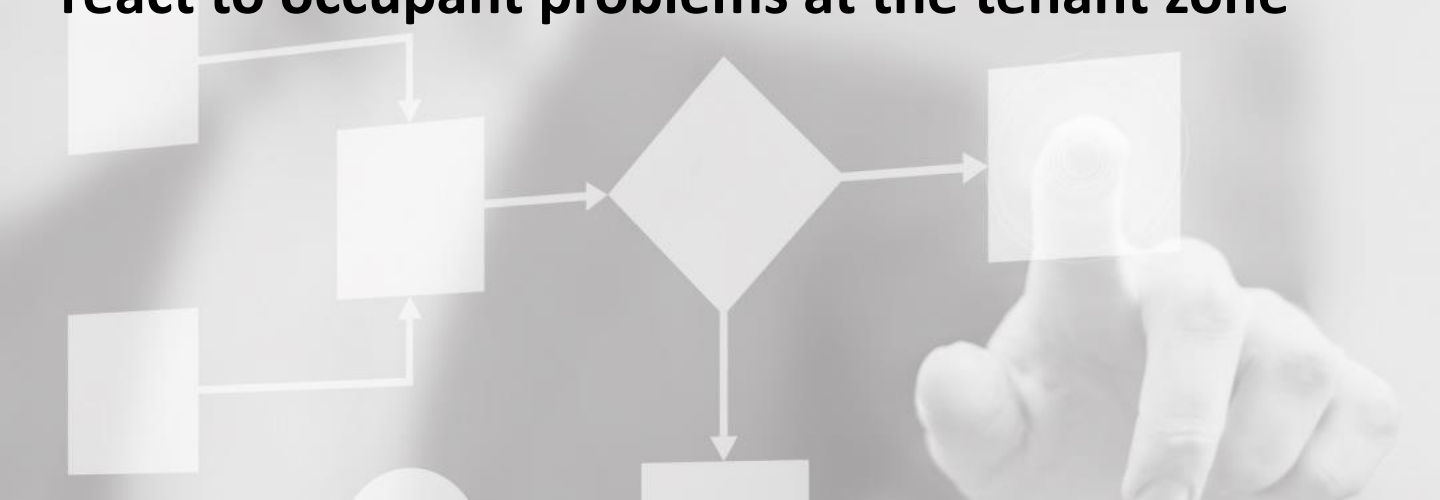
Technical difficulties in upgrading HVAC



As a tenant, control over infrastructure



Adaptive ability for buildings to identify and react to occupant problems at the tenant zone



About Smart Ventilation

Smart Ventilation improves indoor air quality automatically, allowing people to carry on their day to day achieving the business' goals.

It is common to find poor air quality indoors caused by the lack of ventilation and filtration resulting in higher CO₂ and unpleasant odours.

Combined with the need for more ventilation and effective air changes to reduce virus transmission potential, Ventmate was developed to provide a cost effective, smart and easy to install ventilation solution.

The Ventmate is a modular retrofit solution that can be quickly installed.

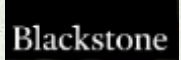
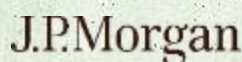
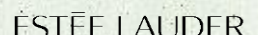
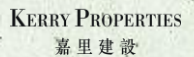
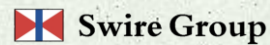
Sensors embedded in the Ventmate monitor the indoor air quality intelligently and allocates filtered air on demand to the most needed spaces.

Air is passed through a four-phase filter system to remove, PM2.5, TVOC's, bacteria and viruses.

Ventmate Smart Ventilation automatically turns on/off based on the real time demand, optimizing operations to save energy.



Our Clients



Why Choose VENTMATE?

Advantages for Designers



Contributes towards sustainability and carbon reduction targets

Helps to achieve latest Building Regulations and funding criteria



Enhances your energy and carbon saving credentials

Ventilation that minimizes or eliminates fan usage and refrigerants*, and has no compressors



Helps to meet certifications, e.g WELL

Design and operating parameters ensures compliance with key criteria including thermal comfort, indoor air quality, cold draught, and acoustic requirements



Easy to integrate

Various configurations and wide range provide optional heating and cooling too

Advantages for Building Owners



Contributes towards sustainability and carbon reduction targets

Helps to achieve latest Building Regulations and funding criteria



Low running costs

An intelligent control system that monitors conditions to optimize operation and minimize running costs



Fast payback

Low operational costs with easy servicing, maintenance and a long service life give an impressive payback and releases capital for other projects



Realtime Data Monitoring

Assures system efficiency and air quality throughout lifetime

Advantages for Contractors



Enhances your energy and carbon saving credentials

Low energy and low carbon ventilation that minimizes energy usage



Easy preparation

A 5A single phase mains supply (depending on model) is all that is required simplifying preparation for our installation team



Easy to install and plug

No complicated ducting minimizes time on site and simplifies project delivery.



Robust

Powder coated steel frame

Advantages for Facility Managers



Healthy and productive environment

Continuous CO₂, indoor and outdoor air temperature monitoring ensures a supply of fresh air as required



Easy to use

Smart control systems with sensors provides no-touch operation



Quiet and no noise disruption

Minimum mechanical operation together with acoustic panels keeps maximum daytime sound level below 35dB



Thermal comfort

Improved ventilation adjust temperature and increase thermal comfort to occupants and no draught



Key Features

- Creates positive pressure to prevent pollution from outdoor, overcome building envelope leakage
- Delivers consistent performance guaranteed to meet high target standards of PM2.5 reduction with pressurization and recirculating filtration.
- Automatic operation based on real-time air quality readings
- Control options: local on-demand/schedule control, building BMS via BACnet or Modbus
- HVAC independent & modular. Can be installed and operate completely independently of building HVAC
- Trusted performance with national and international 3rd party reputable qualification and certification
- Whisper quiet: meets acoustic test standards
- Total Care Maintenance--5-year warranty with Total Care service purchased.



Improve
Ventilation



Improve
Filtration



Reduce Virus
Transmission Risk



Reduce VOCs

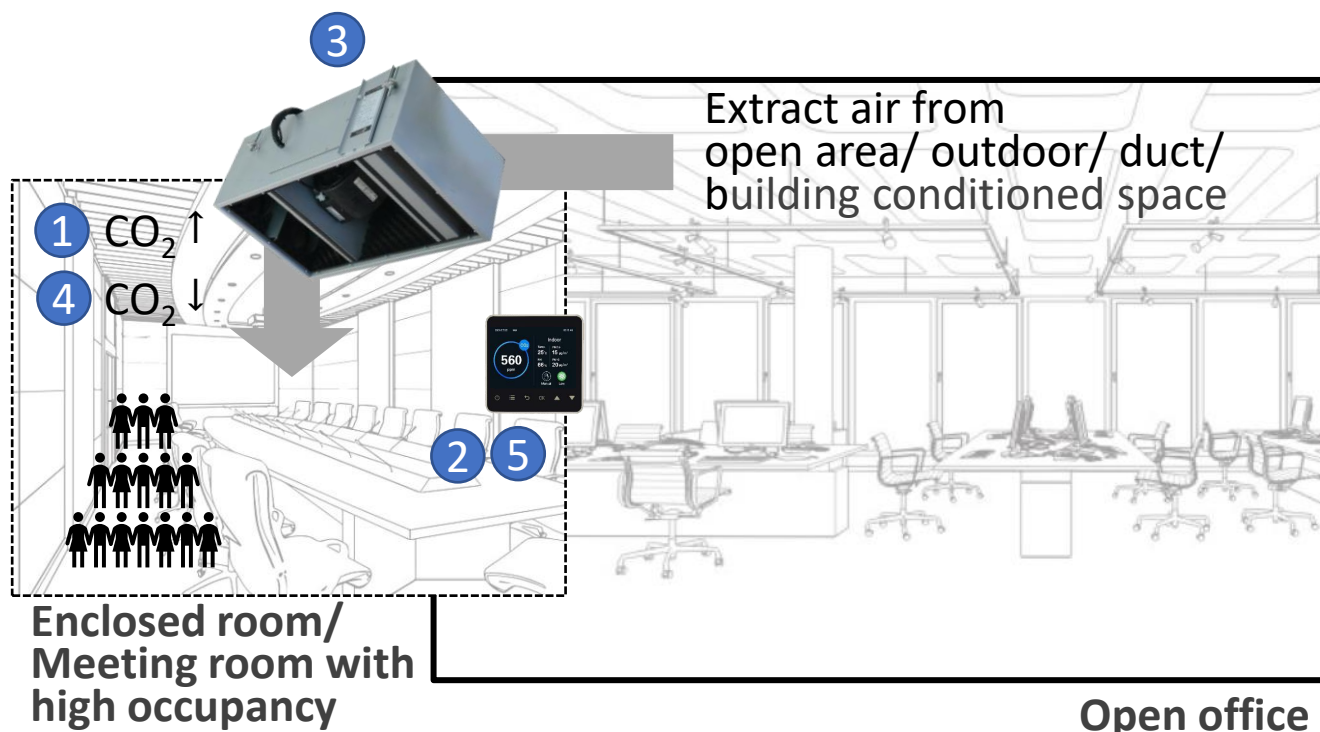


RoHS



CB

VENTMATE – How Does it Work?



1. High occupancy leads to high CO₂

2. Sensors in panel detect unhealthy conditions

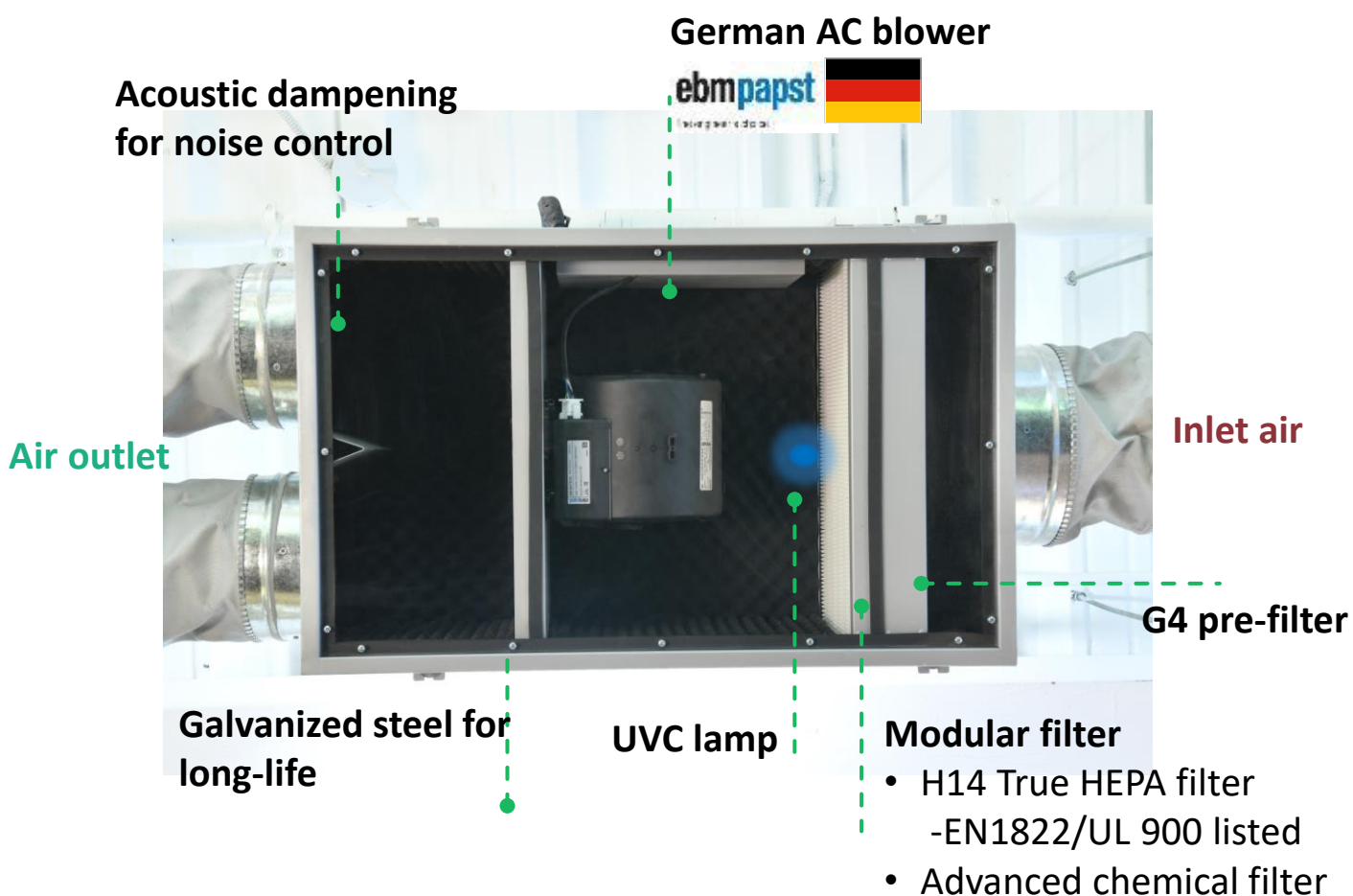
3. Ventmate turns on to ventilate, drawing from areas with fresher air – open areas, outdoors, fresh air ducts.

4. Positive pressure is generated, creating extremely purified zone

5. Sensors continue to operate Ventmate as needed and displays air quality, leading to occupant peace of mind

VENTMATE Components

Ventmate is an **innovative**, **quiet**, and **smart** in-ceiling unit which senses poor quality air and **automatically** delivers **on-demand** ventilation into indoor space, making your space more comfortable and productive.



Automation Module



Maintenance tracking system

Touch panel

CO₂, PM2.5, PM10, temperature, humidity sensors

Alternatives Comparison



Open windows (Natural ventilation)



- Introduces outdoor pollution
- Thermal discomfort
- Windows not always available

Exhaust Fan



- No filtration
- No smart control
- Noisy and noise transmission
- Limited fan speed

Portable air purification



- Recirculates air only, does not introduce fresh air

ERV (Energy Recovery Ventilator)

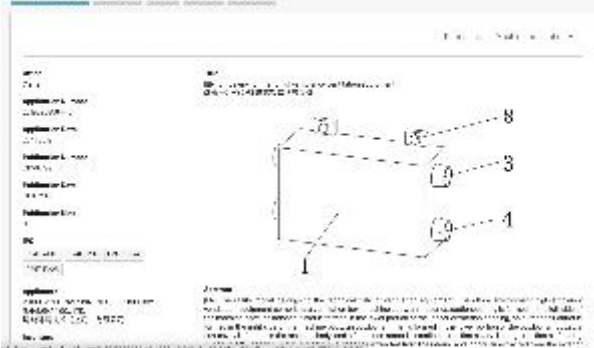


- Noisy
- No positive pressure
- Complicated installation
- Larger size
- No smart control

Base building HVAC upgrade

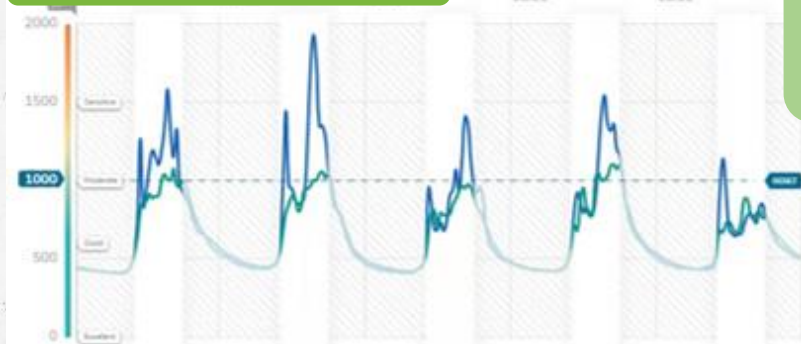


- Doesn't address microzones (central system)
- No authorization of renovation for tenant space
- Large scale investment needed



PM2.5 & CO₂ & TVOC Reduction

CO₂



CO₂ typically reduced 40-60% resulting in improved productivity and comfort

- Meeting room with Ventmate
- Meeting room without Ventmate

PM2.5



Typically 99% reduction of PM2.5 levels

- Outdoor
- Meeting room without Ventmate

TVOC



TVOC reduces by 80%

Thermal comfort

Without Ventmate



With Ventmate

Smart On-Demand Adaptive Control

Ventmate senses poor quality air and automatically delivers **on-demand** ventilation

- Controls of on/off, speed, schedule and automatic mode.
- Setup and automatically control based on PM2.5, CO₂
- Use as monitor of CO₂, PM2.5, PM10, temperature and RH
- Flexible control: local (no networking), tenant level BMS (cloud), or building BMS (JCI, Honeywell, etc)



Convenient



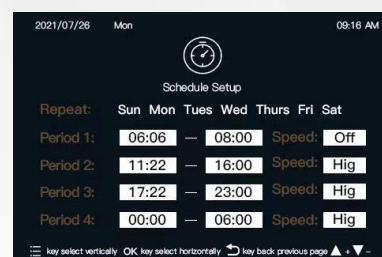
Energy Saving



Automation



Auto Setting



Schedule Setting



Filter Life Time Setting

Modular Filtration Scheme

Particulate Removal

-H14 true HEPA

- High Efficiency Particulate Air

99.97% of particulates 0.3 microns or larger.

- Viral filtration

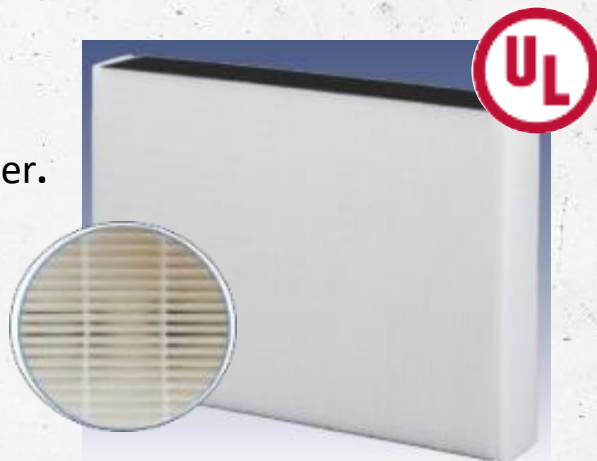
99.992% efficiency based ASTM F2101-19

- UL900 listed HEPA filter

with UL code R40437

- No Ozone generation

- No arcing noise



Certificate of filter viral removal efficiency

CERTIFICATE OF FILTER VIRAL REMOVAL EFFICIENCY



Under contract with enVerid Systems, Inc, LMS Technologies tested a sample Pure-Qi Large filter for viral removal efficiency.

Testing was done based on ASTM F2101 - 19, Standard Test Method for Evaluating the Bacterial Filtration Efficiency (BFE) of Medical Face Mask Materials, using a Biological Aerosol of *Staphylococcus aureus*. This method was modified to utilize MS-2 bacteriophage (ATTC 15597-B1) as the challenge organism, a surrogate for SARS-CoV-2.

The sample filter was tested at 500 cfm. The viral filtration efficiency for the test filter was 99.992%.

Al Vatine
President
LMS Technologies, Inc.
6423 Cecilia Circle
Bloomington, MN 55439
U.S.A.

CERTIFICATE OF COMPLIANCE

Certificate Number: UL-US-2013566-1
Report Reference: R40437-20210108
Date: 29-Mar-2021

Issued to: Pureliving Indoor Environmental Solutions Limited
Jiaochun 753, Building C, 3rd FL, 753 Yuyuan Road,
Changning District Shanghai
China 200050

This is to certify that representative samples of AJZV - Filter Units, Air
See Addendum Page for Product Designation(s).

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 900, 8th Ed., Issue Date: 2015-04-21

Additional information: See the UL Online Certifications Directory at <https://us.ulprospector.com> for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



Modular Filtration Scheme



Chemical Removal -PCCN Filter

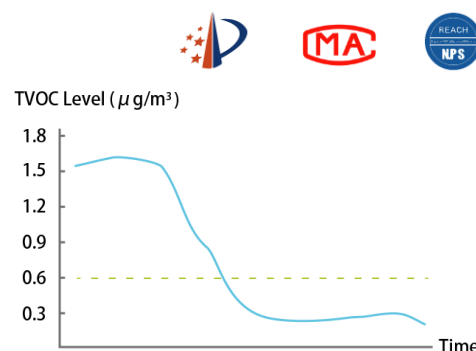
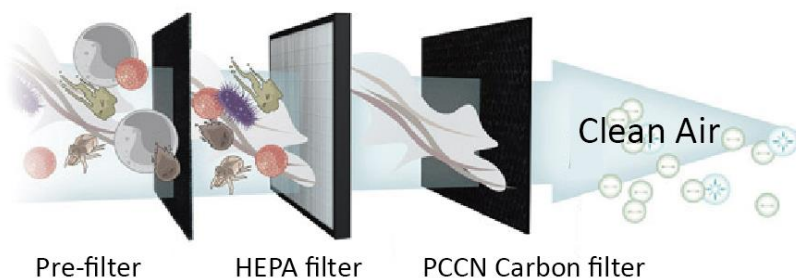
- **Advanced activated carbon filter**

Reduce TVOC & harmful chemicals

- **Nano-carbon design**

Traps VOC's inside the cell structure preventing off gassing

- **Optional post-construction**



Anti-viral UVC Lamp

- Destroys bacteria and virus cells trapped on the filter
- Sterilization rate over 99%
- Ozone free



Pure-Qi with UV unit is being displayed at NHS Infection Prevention & Control Conference in the UK on 26-27 April 2022

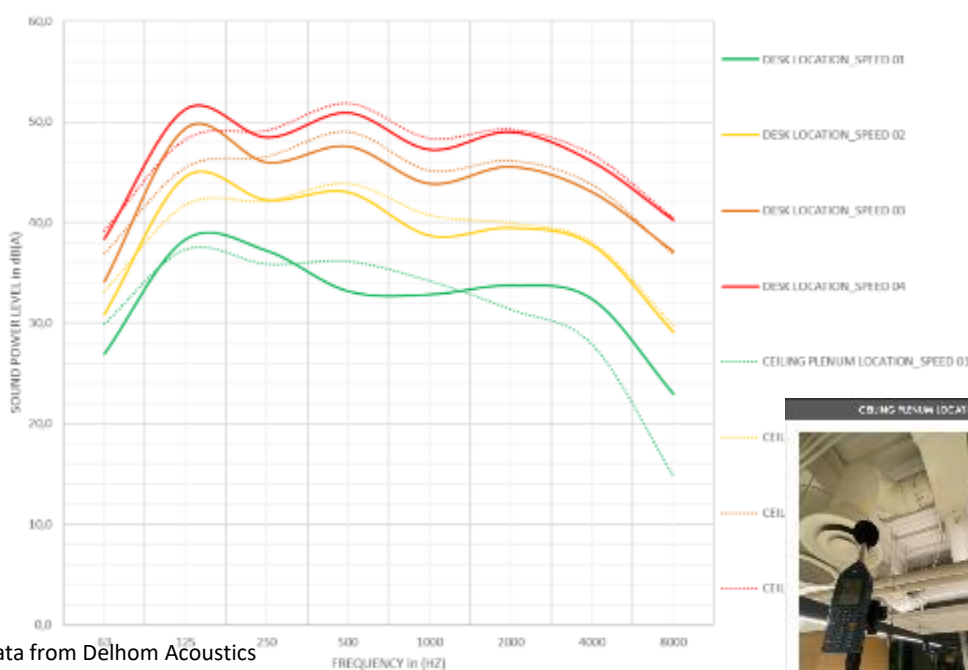


Ultra-Low Noise

Installed with silencer, the Ventmate meets the most rigorous requirements for WELL and LEED acoustic certification



ESTIMATED SOUND POWER LEVEL OF PURE-Q1



Data from Delhom Acoustics

All criterions definition and calculations are based on the guidance of ISO standards, in particular:

ISO 16032: Measurement of sound pressure level from service equipment in buildings

ISO 3382 series : Measurement of room acoustic parameters

ISO 3744 : Acoustics — Determination of sound power levels of noise sources using sound pressure

— Engineering methods for an essentially free field over a reflecting plane

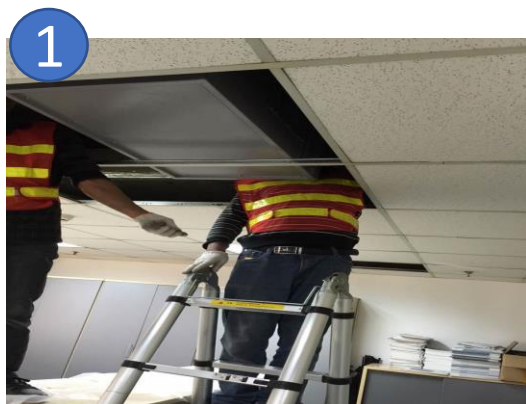
ISO 3743 : Acoustics — Determination of sound power levels of noise sources using sound pressure

— Engineering methods for small, movable sources in reverberant fields



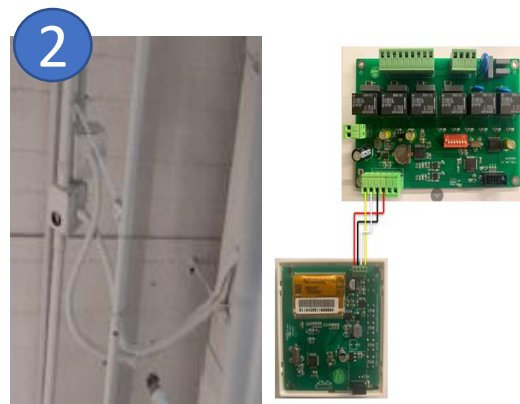
Easy Installation

The Ventmate is easily installed and completely independent of the central building HVAC system



1

Open ceiling and install Ventmate into false ceiling



2

Connect electrical and network cables



3

Install silencer



4

Install filters



5

Install Diffusers



6

Mount the Control Panel

A single Ventmate can typically be installed in about 4 hours

Flexible Configuration

Unlike other systems, Ventmate can provide fresh air without needing to penetrate the building façade.

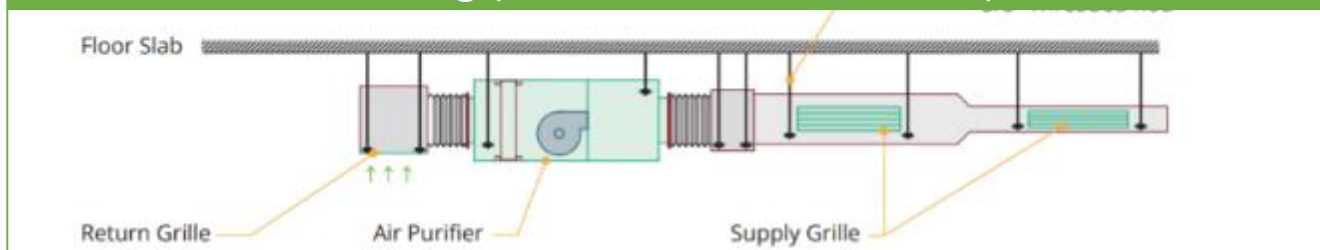


1. Through windows/outdoor

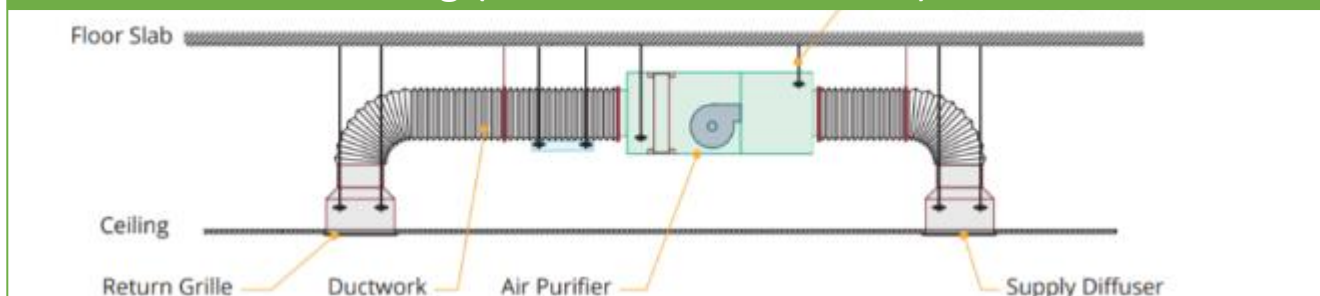
2. From fresh air ducts

3. From open area

Below the ceiling (Unconcealed installation) side view



In the ceiling (Concealed installation) side view



High Potential Applications

Meetings

- Where the most important decisions are made



Classrooms

- Learning requires fresh air and comfort



Staff areas

- For comfort and control of disease transmission



Case Study

Wellington College



Industry
Education

Year of installation
2020

Location
Tianjin, China

Coverage
35,000sqm.

Solution
Create high-functioning classrooms with the Ventmate

Background:

International school plan to upgrade their PM2.5 air filtration system to meet the target performance, it has been offered many solutions but cannot balance the filtration and ventilation.

Expectation:

1. $PM_{2.5} < 25 \mu g/m^3$, $CO_2 < 1000 \text{ ppm}$
2. Automatic control and continuous monitoring
3. Meet WELL standard

Benefits of solutions proposed by PureLiving:

1. Ensure to meet WHO standard target for PM2.5
2. On-demand ventilation into classrooms
3. Carbon filters is also available as an option to reduce VOCs
4. Low cost and simple installation
5. Modular, quiet in ceiling, out of sight
6. Smart control and automatic operation





Before installation:
Peak CO₂: 3,866ppm
Average CO₂: 2,582ppm



After installation:
Peak CO₂: 1,200ppm
Average CO₂: 795ppm

Average CO₂ reduced by 63%
Peak CO₂ reduced by 69%
Achieves WELL standard

Trial classroom has been monitored for 3 months and showed the CO₂ is within ASHRAE guideline, while PM2.5 level meets the target of WHO standard at 25ug/m³ where the system provides 94.7% protection rate

Ventmate is now being implemented for the entire campus

Case Study



SIEMENS

Industry

Electronics/ Industrial

Year of installation

2022

Location

Beijing, China

Coverage

1,500sqm

20 meeting rooms

Solution

Create productivity meeting room with Ventmate

- Ventmate blowing rate: 935m³/
- Fresh air from FA duct

Background:

PureLiving manages the indoor air quality monitoring and filtration for all Siemens facilities in China. Siemens reported chronic stuffiness complaints in training rooms in its Beijing headquarters office.

Goals:

1. Keep CO₂ <800ppm
2. Minimal cost
3. Minimal impact on operations

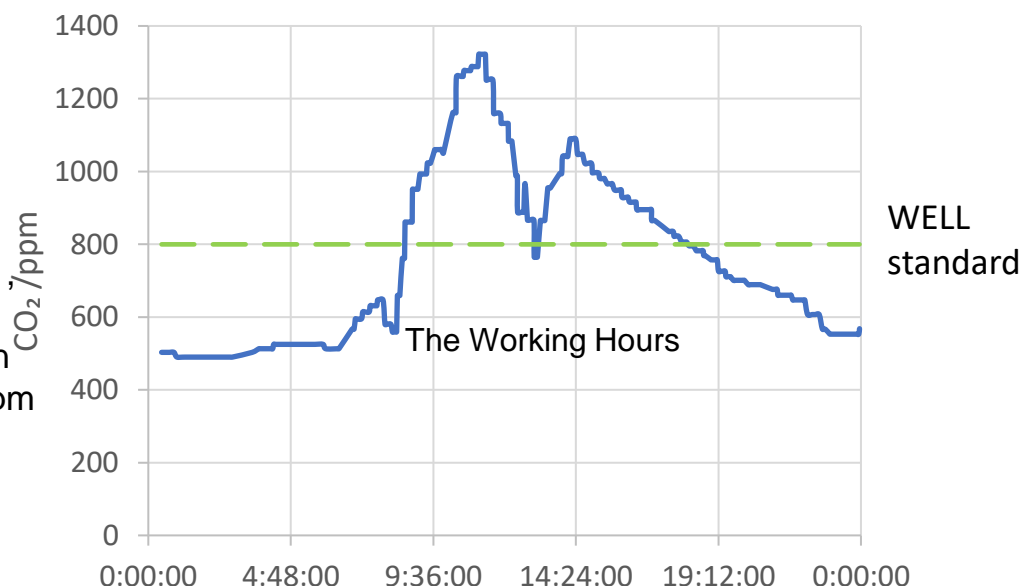
Benefits:

1. CO₂ weekly average maintained at 550ppm
2. Keeps ventilation of indoor air and improve productivity



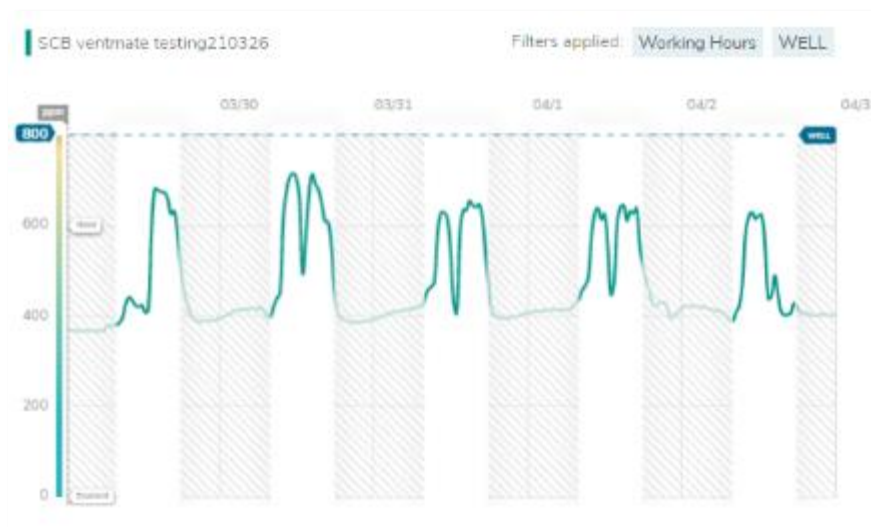
Before

- The peak on Saturday, Nov. 11, 2020, CO₂ was 1322ppm, with an average of 979ppm



After

- CO₂ remained below 800ppm (weekly average: 551ppm) from March 29 to April 2, 2021, during the high occupancy period of the conference room.



Average CO₂ reduced by 45%
Peak CO₂ has reduced by 50%
Achieves WELL standard

Ventmate solution was replicated
to all remaining training and
boardrooms in facility

Technical Details



L×W×H	Airflow (CFM)	ESP (in. w.c.)	Noise (dB)	Weight (lbs)	Voltage	Frequency	MOCP (amps)	Without UVC		With UVC	
								MCA (amps)	Power (W)	MCA (amps)	Power (W)
32" × 20" × 13"	500	0.28	51	60	120V	60 Hz	15	3.75	295	3.75	309
	300		41						160		174



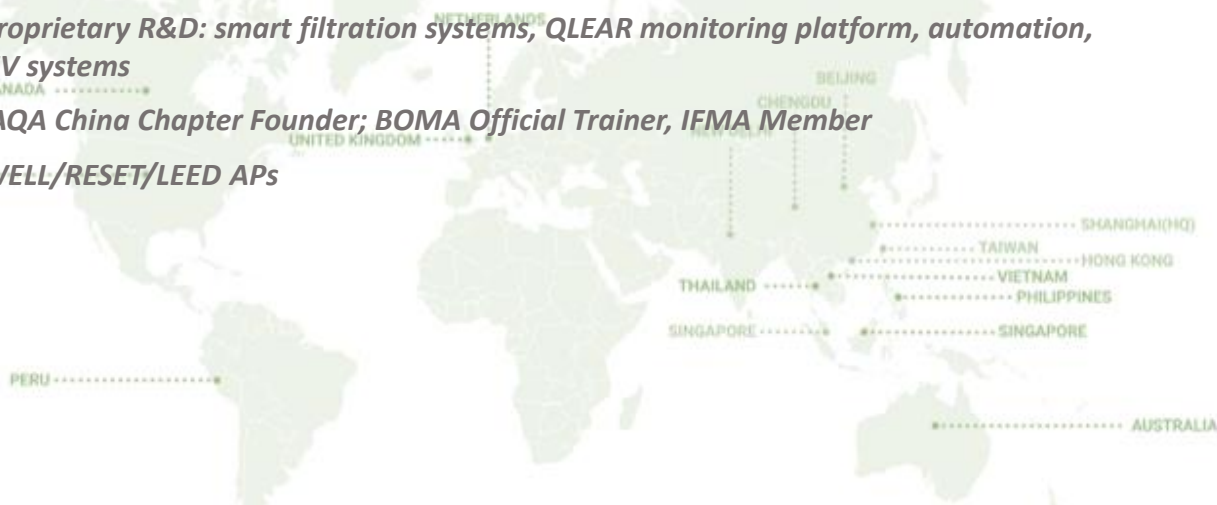
Automation Control Panel

Size:	86×86×40mm
Installation hole spacing	60mm(Standard)
Terminal block:	Maximum 2.5 mm ² Wire
Rated voltage:	AC220V 50Hz
Standby power:	≤2.0W
Control power:	≤200W
Output interface:	Speed 2 fan
Temperature display range:	0℃——99℃
CO ₂ display range:	350ppm——2000ppm
PM2.5 display range:	1ug/m ³ ——999ug/m ³

About PureLiving

PureLiving is a global company focused on creating safer, healthier indoor environments to support businesses

- *Global premier indoor environmental quality consulting and engineering company founded 2010 in Aisa*
- *Turnkey approach: Assess, Design, and Implement Solutions and Monitoring*
- *Proprietary R&D: smart filtration systems, QLEAR monitoring platform, automation, UV systems*
- *IAQA China Chapter Founder; BOMA Official Trainer, IFMA Member*
- *WELL/RESET/LEED APs*



WHO WE ARE

We are consultants, engineers, IOT professionals and project managers who are passionate about creating healthier indoor environments

WHAT WE DO

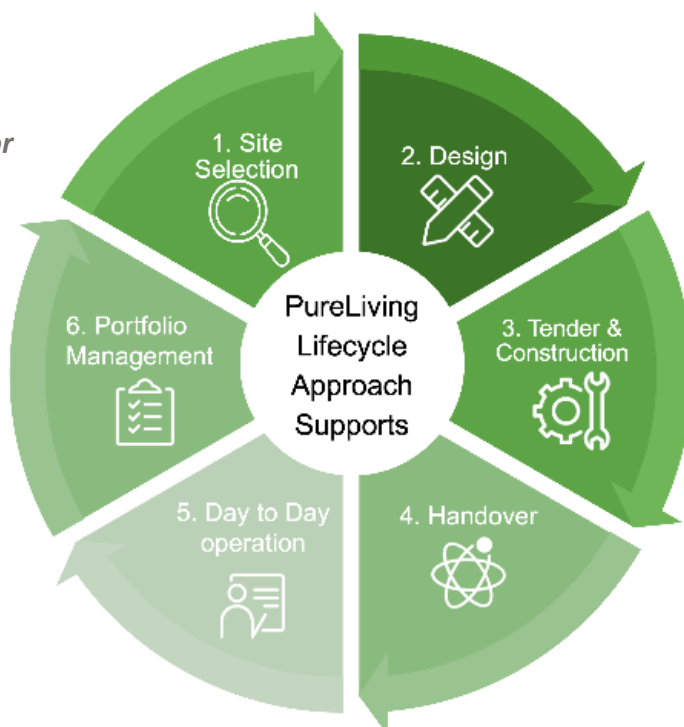
PureLiving delivers projects that perform. For stakeholders, this means realized value and an ROI. For end users, the result are healthier indoor environments which are proven to be happier and more productive places of work and leisure

WHY WE DO IT

Our purpose is to make people and spaces healthier, happier, and more productive

HOW WE DO IT

We enable clients, and partners to deliver projects which meet their goals and needs through integrating technology, services and systems at every stage of the project lifecycle





ABOUT US

PureLiving is a leading global indoor environmental consultancy and engineering firm, providing turnkey assessment, system implementation, and monitoring. We are advisor to over 30 schools worldwide, 40% of the Fortune 100 and have completed over 9,000 projects.

Find out more at:

www.purelivingglobal.com

Contact us at:

solutions@purelivingglobal.com

**Engineering
CLEAN
Environments**

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