Panasonic

COMPLETE AIR

MANAGEMENT SYSTEM

https://www.panasonic.com/global/consumer/clean/qafl.html

SECOND EDITION

CONCEPT BOOK

Second edition: May 2021

QUALITY AIR FOR LIFE

COMPLETE AIR
MANAGEMENT SYSTEM

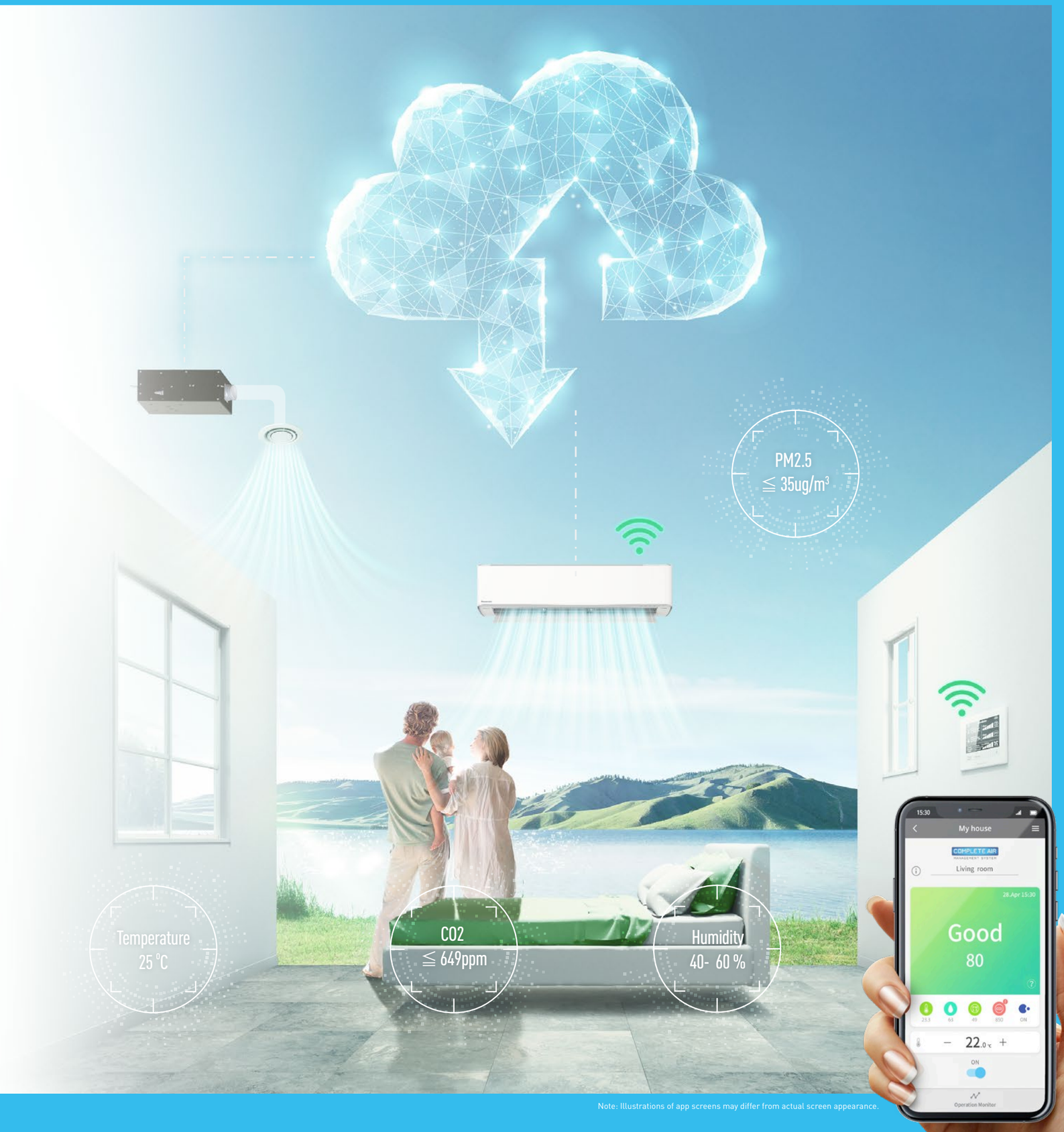
Fresh Air Management

Full-Auto Algorithm

User-Friendly Control

Energy Saving

The Complete Air Management System controls your indoor environment automatically, sensing the presence of people and their activities and helping keep everyone comfortable.



Note: Illustrations of app screens may differ from actual screen appearance.

Inside the home what air needs to be clean for us to live healthy lives?

We spend more time in the bedroom than in any other room.
Keeping contaminants out and maintaining clean air at a comfortable temperature and humidity can help us sleep well.
A comfortable living environment contributes to healthy living.

We spend the most time in the **Bedroom**

Invisible issues with indoor air environments

Even though you can't see it, the air in your home and other indoor environments can easily get dirty. Polluted air flows in unnoticed from the outside, and chemicals are emitted by building materials and furniture. Also, CO_2 concentration rises as people breathe, while the humidity level increases as perspiration evaporates. All these factors will gradually make the room less comfortable.

Three key elements for maintaining air quality in any indoor environment

Humidity · Dryness · Cold · Hot

1. Control temperature and humidity.

Air conditioning

CO · CO_2 · Humidity · VOCs · Stale air

2. Exhaust contaminated indoor air and filter contaminants out of outdoor air then bring it in.

Ventilation

Bacteria and Viruses · Perspiration odour · Odours · Pollen · Mould · PM 2.5

3. Inhibit particulate matter, allergens, mould, viruses and odours to make spaces more comfortable.

nanoe™ X technology

Remote control wireless LAN-connectable air conditioners and ventilation from anywhere via smartphone apps.

Comfort Cloud

Issue

Even if you turn on the air conditioner on a warm evening, if the humidity is high, you may be uncomfortable and wake up in the middle of the night.

Cooling & Humidity

Issue

If there are small children in the family, it's important to inhibit allergens, mould, and unpleasant odours in the bedroom.

Allergens & Odours

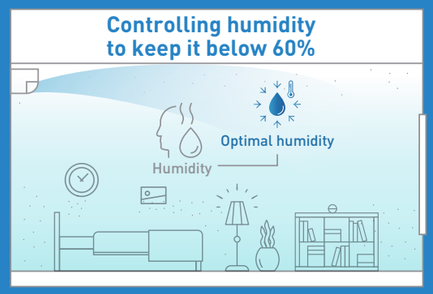
Solutions

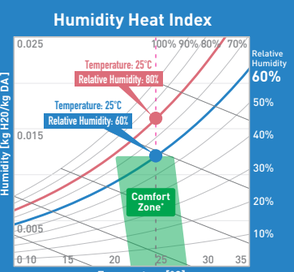
Air conditioning

Using dry mode, you can enjoy a comfortable sleep even on a humid night.

Air conditioner

Equipped with temperature and humidity sensors



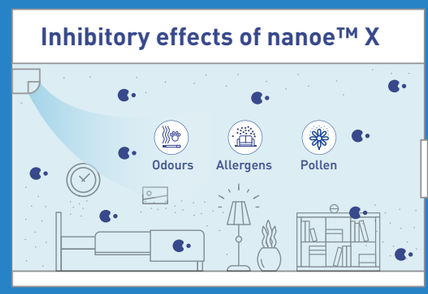


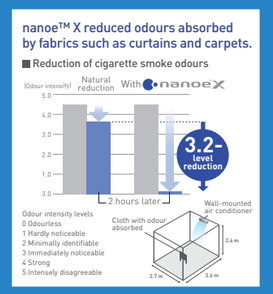
Solutions

nanoe™ X technology

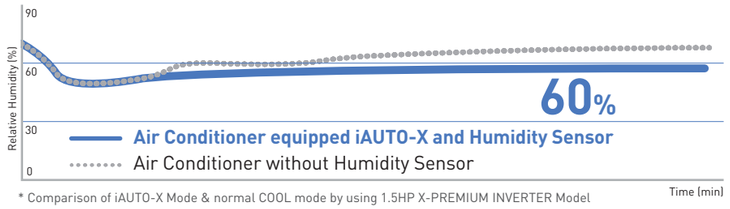
nanoe™ X technology is effective against allergens and unpleasant odours in the bedroom.

Air conditioner





Operation of an air conditioner equipped with humidity sensors



* Comparison of iAUTO-X Mode & normal COOL mode by using 1.5HP X-PREMIUM INVERTER Model

iAUTO-X Mode: iAUTO-X Mode, Outside temperature : 35°C/24°C / Remote setting temperature : 25°C, with Fan Speed: Auto / Horizontal Airflow direction : Auto / Vertical Airflow direction : Straight
Normal Cool Mode: Cool Mode, Outside temperature : 35°C/24°C / Remote setting temperature : 25°C, with Fan Speed: High / Horizontal Airflow direction : Middle / Vertical Airflow direction : Straight
Average Room RH is measured every 1 hour up to 4th hour (under stable condition). At Panasonic Amenity Room [size:16.6m²] The effect differs according to conditions in installation and usage.

When relative humidity is high even though the temperature is low, the risk of heat stroke may increase. The humidity sensor constantly monitors and adjusts relative humidity levels to below 60% for an optimal sleeping environment, so you can enjoy better sleep thanks to comfortable cooling.

Cold air blows out strongly on start-up for rapid cooling, keeping the room at a comfortable temperature.

When the room reaches the set temperature, the airflow automatically switches to ceiling airflow so that cold air doesn't hit the body directly and occupants don't get too cold even when the air conditioner is operated for a long time.

Humidity in the room is automatically controlled so it remains stable and comfortable at bedtime.

Shower cooling

Once the room is sufficiently cool, the air conditioner automatically switches to ceiling airflow, so even if it operates for a long time the room doesn't get too cold.

Air conditioner with nanoe™ X technology

Panasonic's unique nanoe™ X technology is very effective against various pollutants. It inhibits bacteria and viruses, molds, allergens, pollen, and other hazardous substances, deodorises, and has a moisturizing effect on hair and skin. nanoe™ X technology makes the air quality in your environment better.

Additional verification of inhibition of major allergens*

Hope for the creation of more comfortable spaces for those who have problems with asthma or atopic dermatitis

We have experimental results that show nanoe™ X is capable of inhibiting allergens, such as pollen and dust mites. It is important to take precautions against the allergens that we inadvertently inhale in our daily lives. As nanoe™ X is effective in inhibiting invisible allergens, we can expect it will create a cleaner environment. As the safety of nanoe™ X has also been verified, nanoe™ X gives peace of mind to families with small children.**

* Experimental results show that nanoe™ X is effective in inhibiting the growth of the following types of mould commonly found in homes: Cladosporium, Aspergillus, Penicillium, Alternaria, Fusarium, Eurotium, Mucor, and Stachybotrys.
** The above indications and statements are made in reference to available information.

Professor Masahiro Sakaguchi
Laboratory of Veterinary Microbiology I,
School of Veterinary Medicine, Azabu University

Testing organisation: Panasonic Product Analysis Center. Test method: Electrophoresis in an approximately 23 m³-sized test room. Inhibition method: nanoe™ released. Target substances: Dermatophagoides pteronyssinus, Dermatophagoides farina, Cedar, Cypress, Orchard grass, Ragweed, Alnus japonica, Japanese white birch, Artemisia, Olive, Juniper, Casuarina, Miscanthus, Timothy grass, Humulus japonicus, Alternaria, Aspergillus, Candida, Malassezia, Cockroach, Moth, Dog (dander), Cat (dander)). Test result: inhibitory effect verified in 24 hours.

Issue

PM 2.5 coming in the window and dust from the bedding is a concern.

PM 2.5 & Dust

Outdoors & indoors

Issue

When the bedroom door is closed, CO_2 concentrations are rising, a concern.

CO_2

Indoors

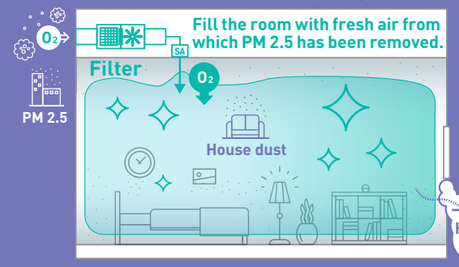
Solutions

Ventilation

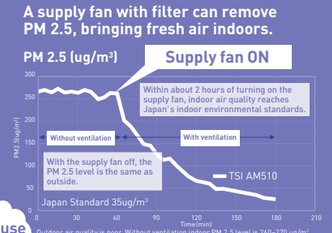
Bring in fresh air with a filter-equipped supply fan to maintain a comfortable indoor environment.

Ventilation fan

Prevent the entry of hazardous substances contained in outdoor air, expelling house dust.



A supply fan with filter can remove PM 2.5, bringing fresh air indoors.

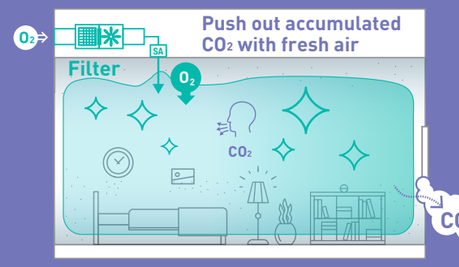


Solutions

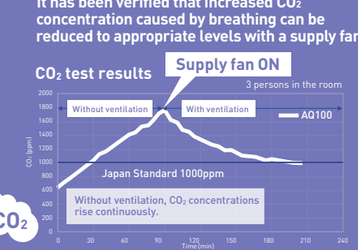
Ventilation

Sensors detect rising CO_2 concentration. Fresh air is supplied, controlling CO_2 concentration.

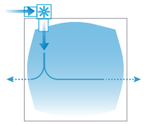
Ventilation fan



It has been verified that increased CO_2 concentration caused by breathing can be reduced to appropriate levels with a supply fan.



Ceiling-mounted supply fan



Air is supplied with a fan, while exhaust occurs naturally.

Energy saving

With a DC motor, performance is improved, and more precise airflow control is achieved.

Space saving

Thanks to a height of just 206mm, installation space is minimised.

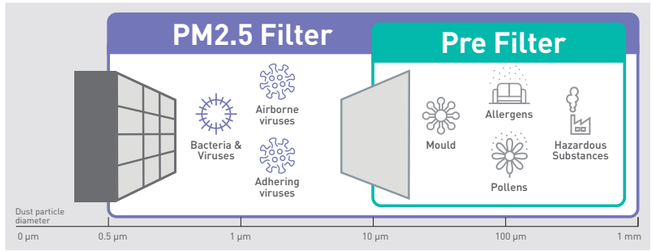
Installation case

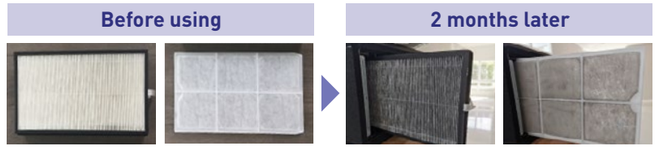
Baccas in Setia Ecohill 2 built by SP Setia (Malaysia)

PM 2.5 removal Up to 95%

A filter removes PM 2.5 to ensure that only fresh, clean air can enter the room.

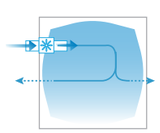
Note: Chinese market model tested





In a test conducted in Bangkok, Thailand, atmospheric contamination was caught by a filter.

Wall-mounted supply fan



Air is supplied with a fan, while exhaust occurs naturally.

Ease of installation

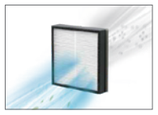
・Installation and filter change are easy.

Equipped with a PM 2.5 filter

A filter removes PM 2.5 to ensure that only fresh, clean air can enter the room.

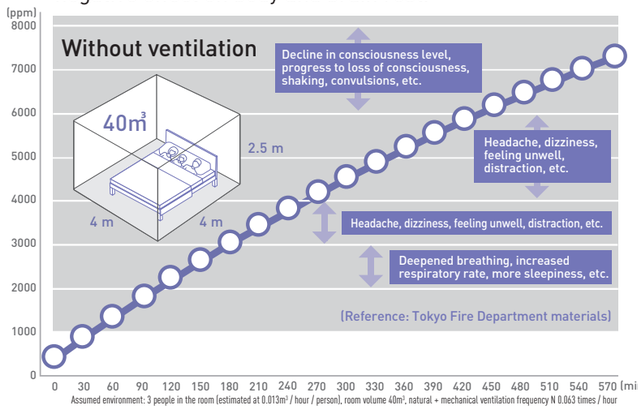
PM 2.5 removal Up to 98%

Note: Chinese market model tested



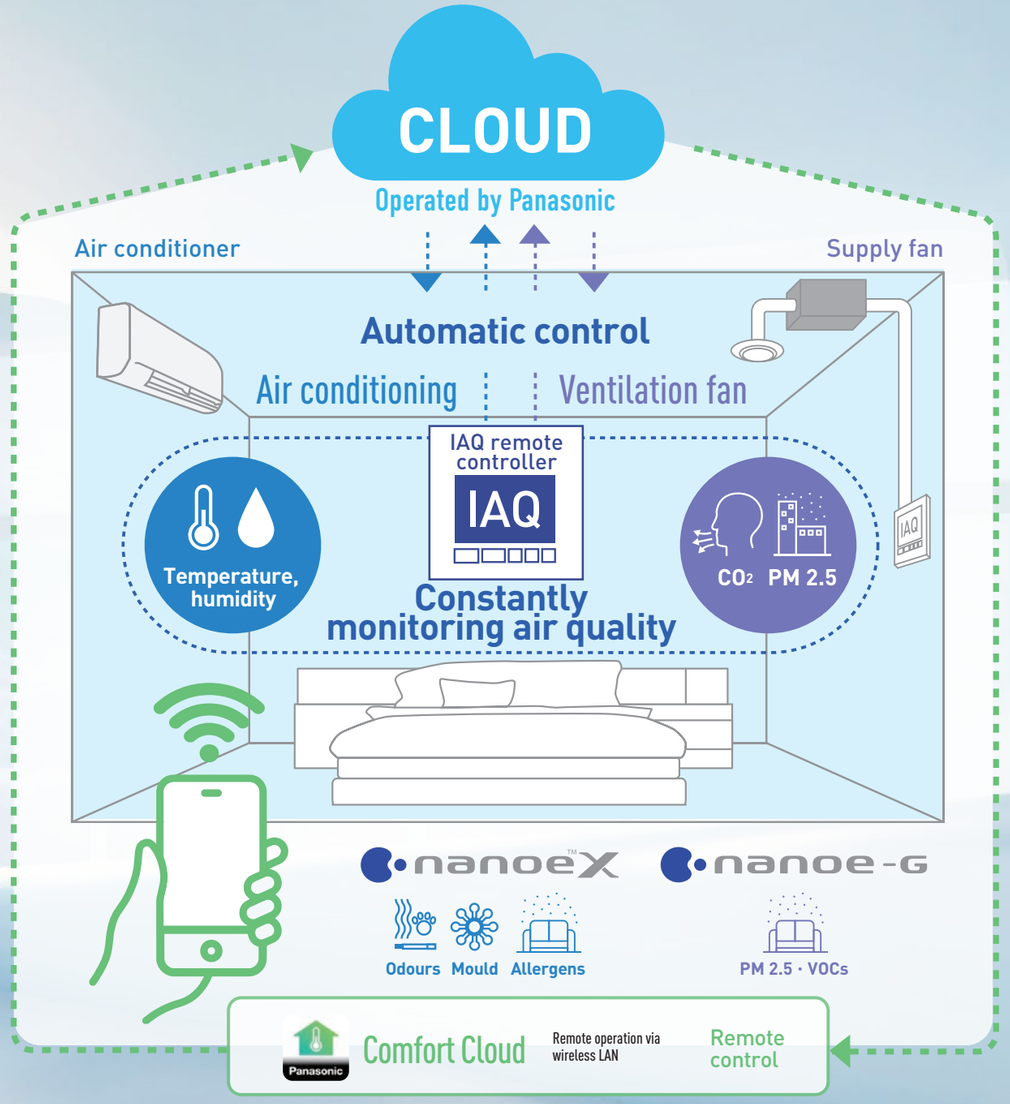
CO_2 concentration rise simulation

If you sleep in a closed room without ventilation, it is expected that the CO_2 concentration will be about seven times the standard value by morning. This can have a negative effect on body and brain rest.

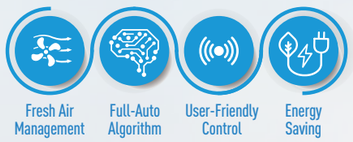


Note: Complete Air Management System is applicable to only FV-01NAP1.

COMPLETE AIR
MANAGEMENT SYSTEM



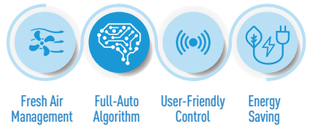
Four features of the Complete Air Management System



Fresh Air Management	Quickly inhibits airborne contaminants to maintain air quality
Full-Auto Algorithm	Automatically controls and constantly monitors
User-Friendly Control	Allows easy control of your system
Energy Saving	Minimises operational load on the air conditioning

Full-Auto Algorithm

Automatically controls and constantly monitors

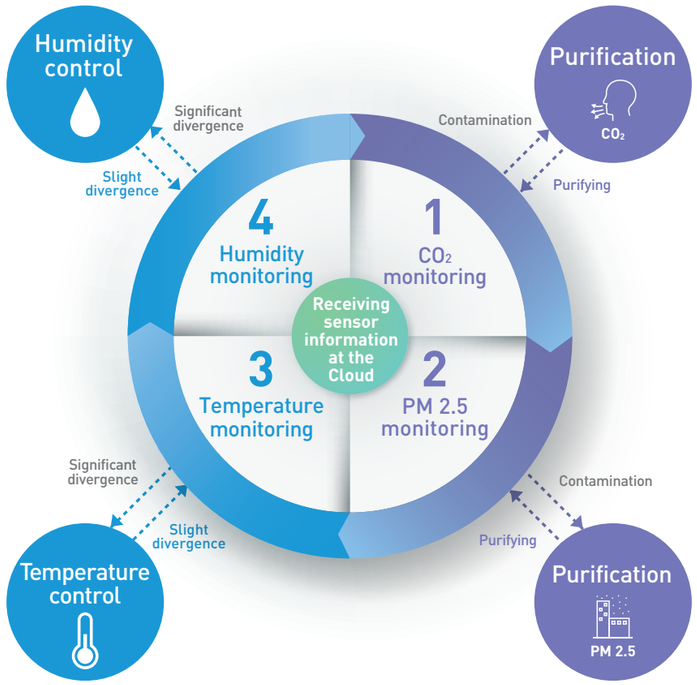


Sensing air quality

Flow of sensing

Constant monitoring of air quality with IAQ sensors, automatically controlling heating & cooling and airflow.

Note: After initialization, sensing proceeds in this order: temperature, humidity, CO_2, then PM 2.5.



Rapid heating and cooling and air purification is possible.

HOT

To make cooling efficient, ventilation air volume is set to OFF until temperature goes down.

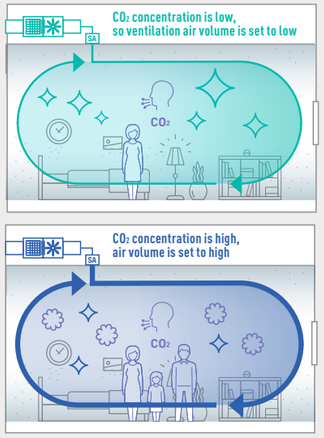
PRODUCT	Conventional operation (Auto mode)	COMPLETE AIR MANAGEMENT SYSTEM
AC	MAX	MAX
IAQ	MAX	Low/OFF

DIRTY

When PM 2.5 or CO_2 level is high, Complete Air Management System works to adjust air volume to purify. When ventilation air volume is high, air conditioning air volume is also high to maintain temperature.

PRODUCT	Conventional operation (Auto mode)	COMPLETE AIR MANAGEMENT SYSTEM
AC	Low/OFF	MAX
IAQ	MAX	MAX

Ventilation air volume can be set to match CO_2 concentration



IAQ remote controller

Visualising fresh air, enjoy safe and secure air quality.

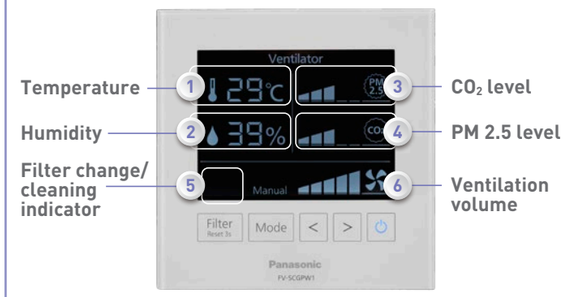
IAQ information visualised

- 4 sensors (temperature, humidity, PM 2.5, CO_2)
- Precise air volume control at 5 levels
- Remote control from anywhere via smartphone apps

Panasonic Comfort Cloud

Sensing and control

- Based on IAQ information, ventilation is automatically controlled.
- Ventilation volume regulated based on CO_2 levels detected by sensing.



Energy Saving

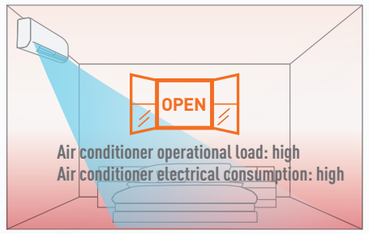
Minimises operational load on the air conditioning

Fresh Air Management · Full-Auto Algorithm · User-Friendly Control · Energy Saving

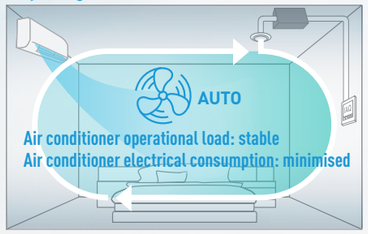
Bringing fresh air into your environment is important because it can introduce oxygen and expel CO_2 and PM 2.5 maintaining clean indoor air quality. With a ventilation fan, you can bring in the fresh air required and minimise operational load on the air conditioning.

However, the fresh air outside is hot in summer and cold in winter...

If you ventilate by opening the windows, a lot of heat from the outside air will enter.

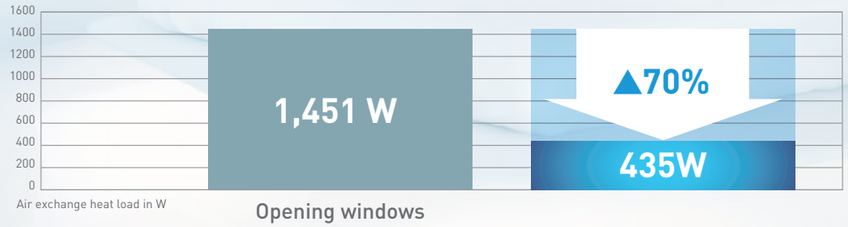


If you ventilate with a supply fan to bring in fresh air, you regulate the volume of air that enters.



With the Complete Air Management System, fresh air is introduced as required depending on the indoor CO_2 concentration level, and air conditioner operational load is minimised.

Simulation of heat load by means of ventilation



Opening windows

OPEN

Ventilate twice an hour for 5 minutes.

Energy Saving

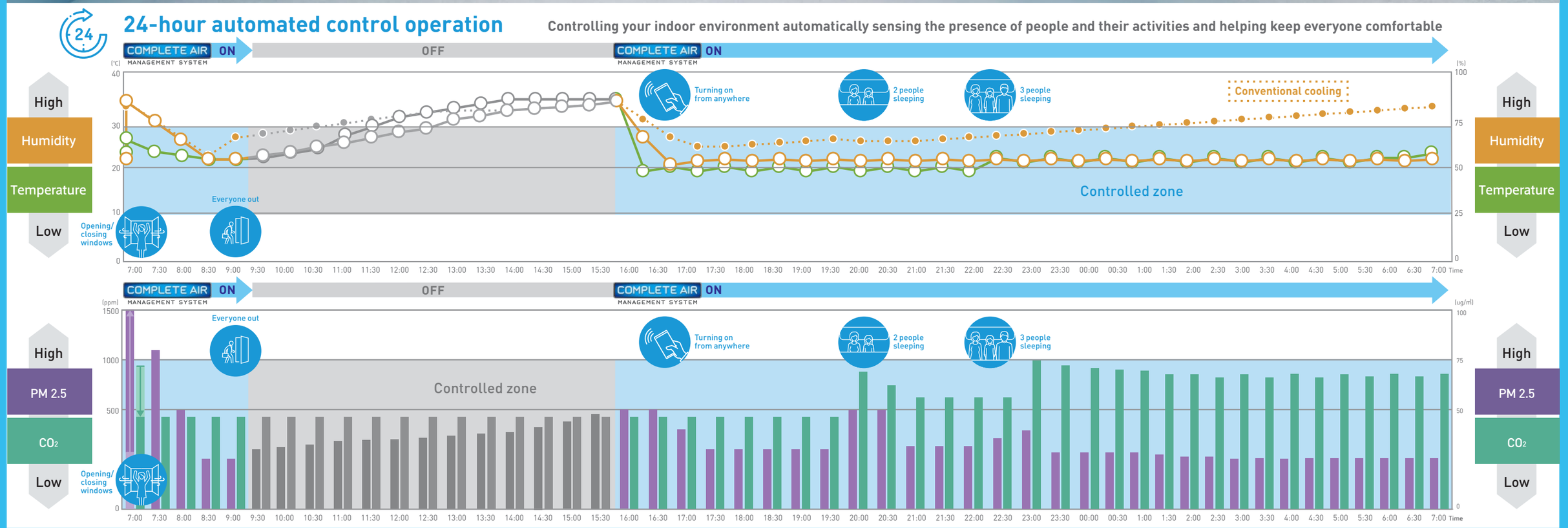
COMPLETE AIR MANAGEMENT SYSTEM

Poor	Best

Comparison of average per-hour operation in a 40m² space with 4 people inside, outside temperature 30°C and humidity 70%, inside temperature 20°C, and humidity 50%

24-hour automated control operation

Controlling your indoor environment automatically sensing the presence of people and their activities and helping keep everyone comfortable

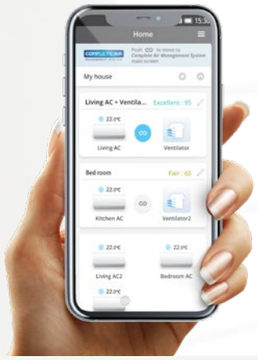


Note: XU series room air conditioner as compared to PU series product or, in Vietnam, QU series product.

User-Friendly Control

Allows easy control of your system

Fresh Air Management · Full-Auto Algorithm · User-Friendly Control · Energy Saving



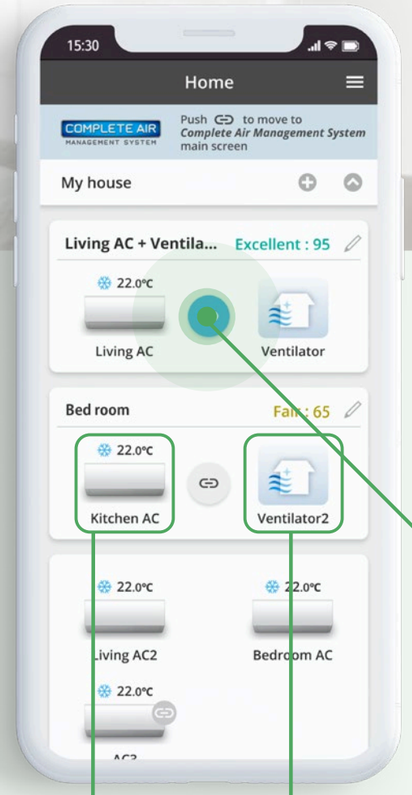
Panasonic **Comfort Cloud**

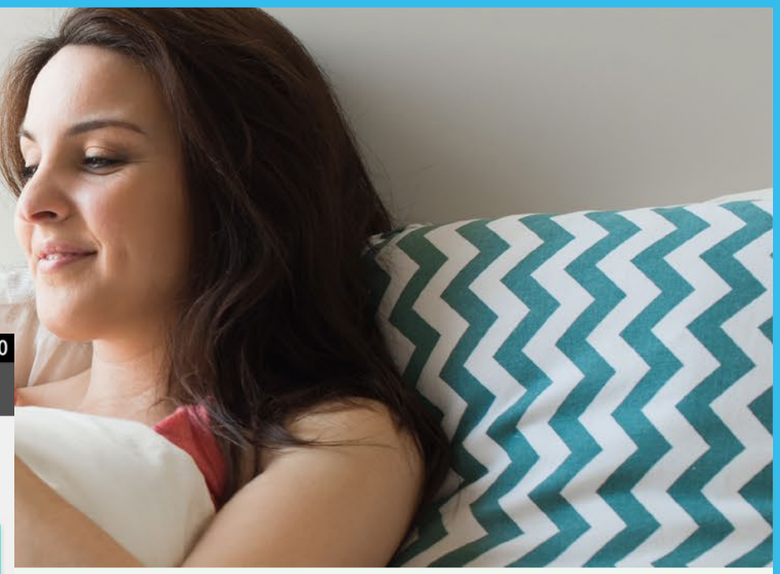
Ease of operation

With Panasonic's Comfort Cloud app,
the system can easily be controlled remotely.

Simple device registration

Easy 3-step pairing of air conditioners and ventilation fans

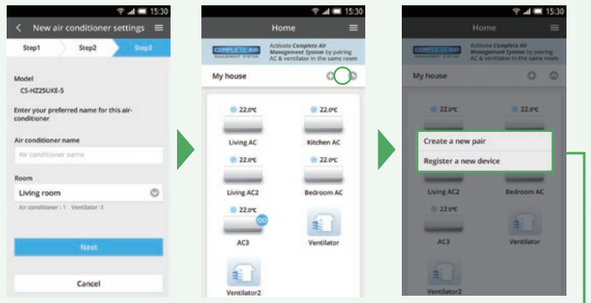




Home screen

- Device registration is simple.
- Add units for each room.
- Easily pair air conditioners and supply fans.

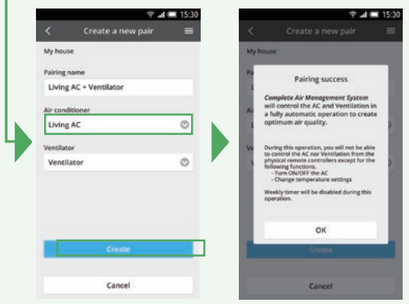
Registration and pairing of air conditioners and ventilation fans is simple.



Initial registration
- Register each device.
- Set pairing name as you like.

Pairing setup
- New pairing
- New device registration

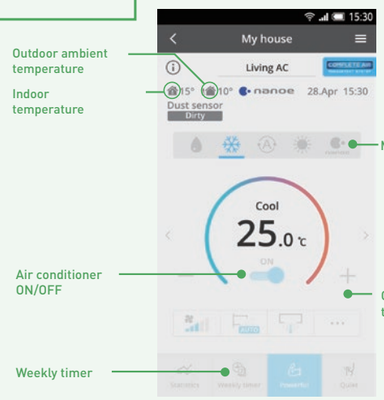
Device status
- View list of connectable devices.
- Tap the + mark to register the device in the Complete Air Management System.



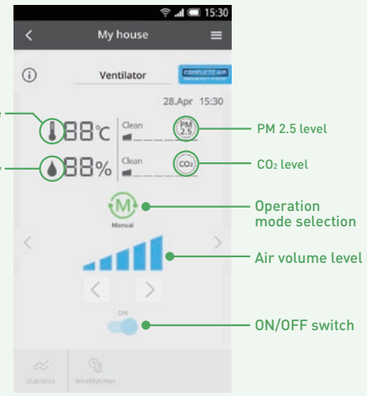
Pairing
- Pair supply fans and air conditioners.
- Choose a pairing name.

Pairing complete

Air conditioner control home screen

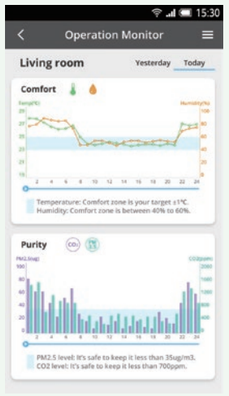


Supply fan home screen



Operation monitor

- Yesterday and today's IAQ sensed every hour
- Check whether air quality is optimal.



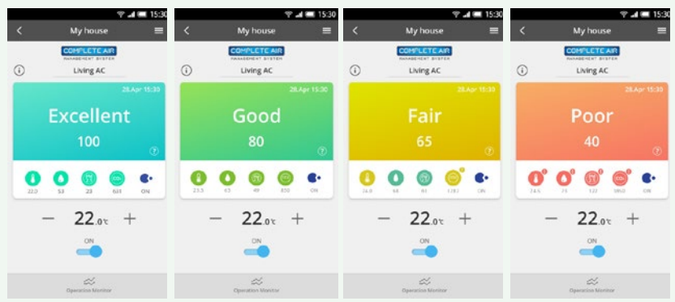
Note: During system operation, direct device control functions are limited.

Complete Air Management System home screen

- IAQ remote controller shows air quality in each room in four levels.
- 4 elements of air quality–temperature, humidity, PM 2.5 and CO_2 levels–are evaluated on a 100-point scale
- The system can be turned on or off and the temperature setting can be changed.
- Status is updated every 5 minutes, so you can check current air quality anytime.

Grade	Overall evaluation
Excellent	All excellent status (100 points)
Good	Total of 4 elements 71–99 points
Fair	Total of 4 elements 56–70 points
Poor	Total of 4 elements under 55 points

Example air quality condition displays



Note: Illustrations of app screens may differ from actual screen appearance.

Fresh Air Management

Quickly inhibits airborne contaminants to maintain air quality

Fresh Air Management · Full-Auto Algorithm · User-Friendly Control · Energy Saving

Complete Air Management System solutions for bedrooms

Here's how the Complete Air Management System operates throughout the day in the bedrooms of a 3-person family.
Average outdoor temperature: 32°C / Average outdoor humidity: 88%

7:00-8:30 Waking up

In the morning, windows are opened to let air in

Poor 40

24.5 | 73 | 122 | 1850 | ON

Unoccupied
(everyone has gotten up and moved to the living room)

Excellent 100

22.2 | 53 | 23 | 634 | ON

Remote operation

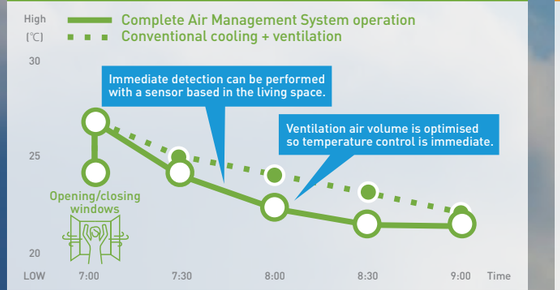
Cooling setting: 22°C
nanoe™ X nanoe™ G

Supply fan
IAQ sensor: sensing quality of indoor air

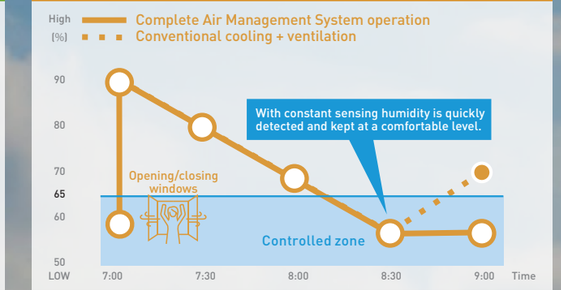
Issue Polluted air from outside flows inside.

Solutions
- Temperature and humidity are controlled immediately, or comfort when you're dressing or doing make-up.
- Ventilation air volume is optimized to quickly remove PM 2.5. In addition, PM 2.5 is inhibited by nanoe™ G.

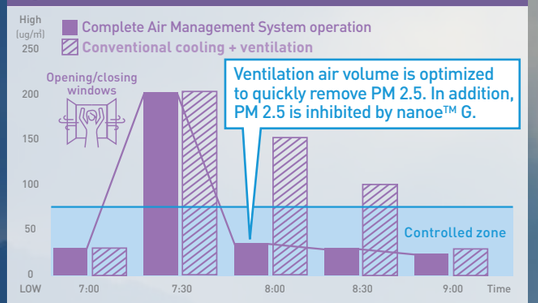
Temperature



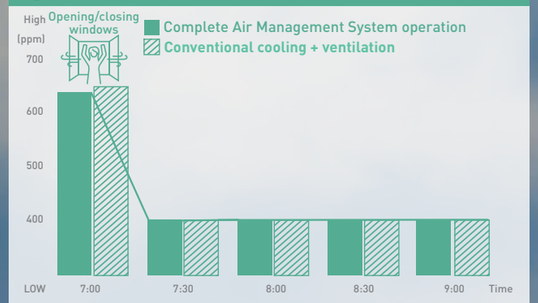
Humidity



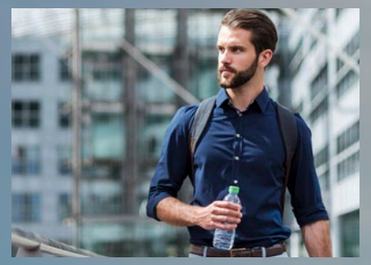
PM 2.5



CO_2



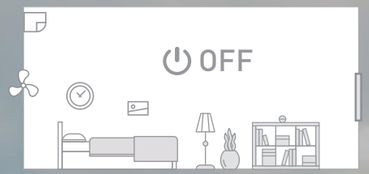
9:00-15:30 When everyone is out



Windows are closed and air conditioning devices are turned off before everyone goes off

Excellent 100

22.2 | 53 | 23 | 634 | OFF



Unoccupied
(everyone at work or school)

Poor 40

24.5 | 73 | 122 | 1850 | OFF

Remote operation

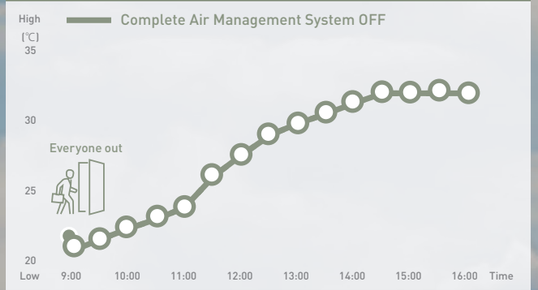
nanoe™ X nanoe™ G

Supply fan

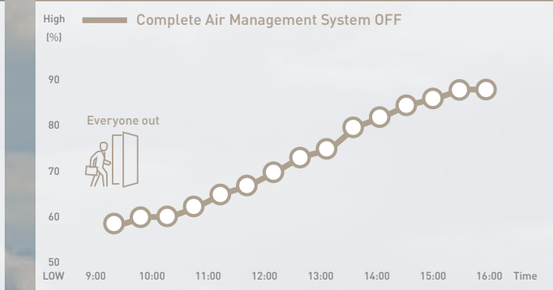
Issue Unclean air flows in from outdoors.

Solutions
- The condition of the air in your home can be monitored from anywhere, for reassurance.
- Devices can be turned on and off with the app, so forgetting to turn the system off is not a problem.

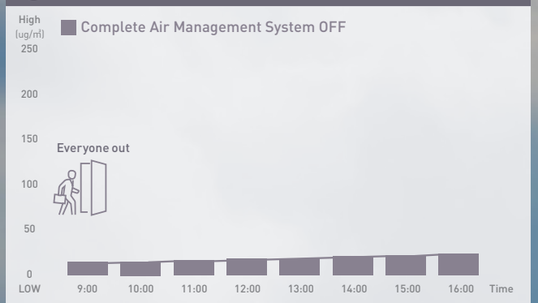
Temperature



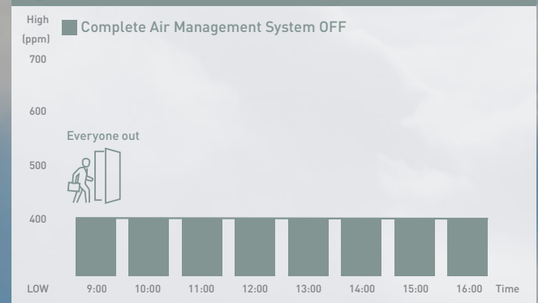
Humidity



PM 2.5



CO_2



Note: XU series room air conditioner as compared to PU series product or, in Vietnam, QU series product.

Fresh Air Management

Quickly inhibits airborne contaminants to maintain air quality

Fresh Air Management · Full-Auto Algorithm · User-Friendly Control · Energy Saving

Complete Air Management System solutions for bedrooms

Here's how the Complete Air Management System operates throughout the day in the bedrooms of a 3-person family.
Average outdoor temperature: 32°C / Average outdoor humidity: 88%

16:00-18:30
When everyone is out

Poor 40

24.5 | 73 | 122 | 1850 | ON

Excellent 100

22.2 | 53 | 23 | 634 | ON

Remote operation

Cooling setting 22°C
nanoe™ X nanoe™ G

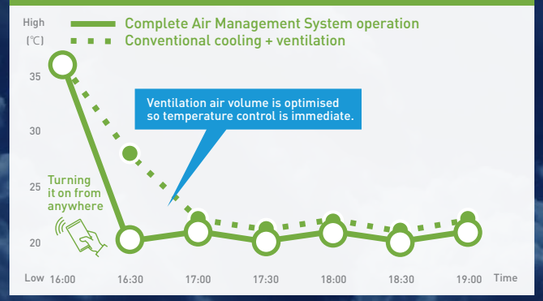
Supply fan
IAQ sensors: sensing air quality

Bedroom air conditioner can be turned on from anywhere.

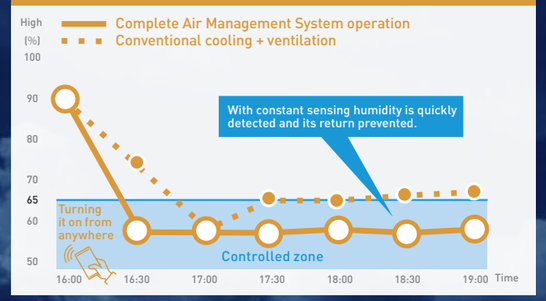
Issue While everyone is out, temperature and humidity rise and indoor air quality deteriorates.

Solutions
- The system can easily be turned on from anywhere, so that the air conditioner and supply fan automatically begin linked operation.
- Before everyone comes home, air quality can be controlled to maintain optimal conditions.

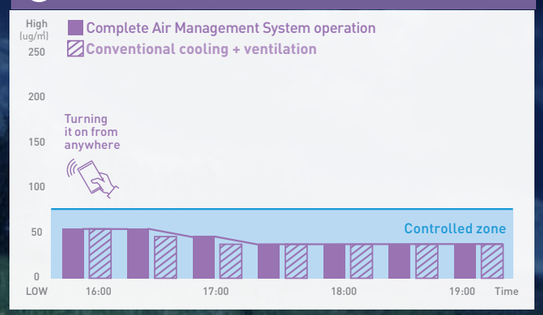
Temperature



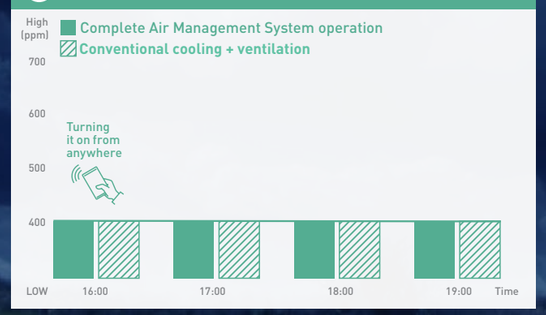
Humidity



PM 2.5



CO_2



19:00-7:00
While sleeping

Fair 65

22 | 62 | 50 | 1000 | ON

Good 80

23.3 | 63 | 49 | 850 | ON

Remote operation

Cooling setting 22°C, 24°C (until 22:30) (23:00 onward)
nanoe™ X nanoe™ G

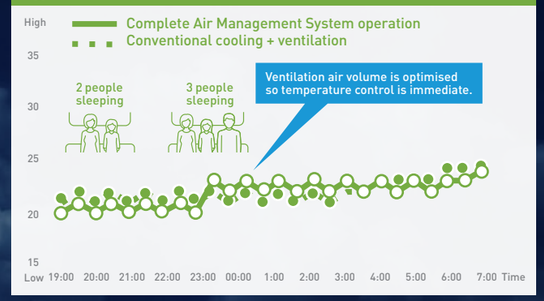
Supply fan
IAQ sensors: sensing air quality

Even on a humid night, three family members are enjoying their sleep.

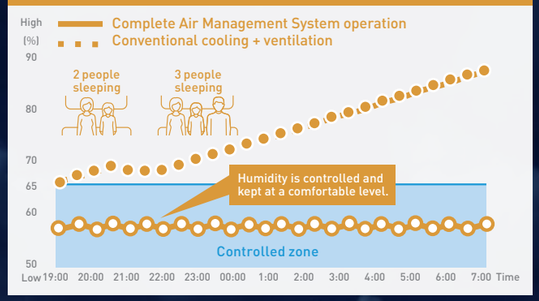
Issue As more people are at home CO_2 concentrations rise and humidity can become uncomfortable.

Solutions Prevents rise in humidity when the set temperature is reached to prevent sleepless nights.

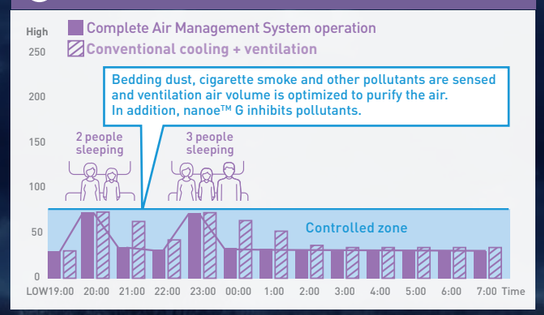
Temperature



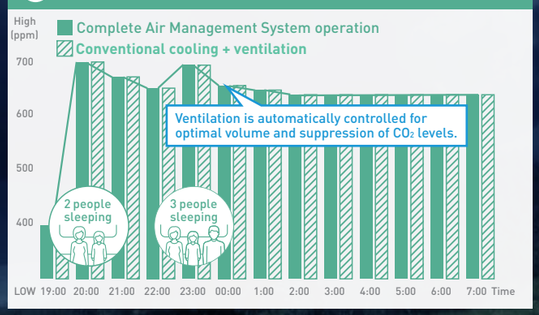
Humidity



PM 2.5



CO_2



Note: XU series room air conditioner as compared to PU series product or, in Vietnam, QU series product.

Comfort Cloud

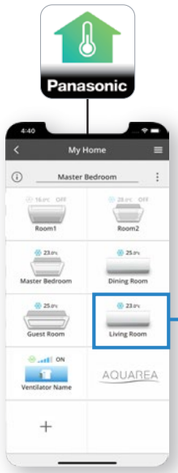
Individual devices can also easily be controlled via Comfort Cloud.

Remote control wireless LAN-connectable air conditioners from anywhere via smartphone apps.

- Basic operation (ON/OFF, airflow switching, etc.)
- Power monitoring
- Multiple-user settings
- Troubleshooting alert notifications

With the Comfort Cloud app and air conditioners and supply fans with IAQ remote controller connected to a wireless LAN, you can monitor and control from anywhere with a smartphone. This solution is ideal for one system, one site, or multiple locations. The capacity to connect via the network to the Cloud makes it an ideal solution for both home and commercial applications.

Air conditioners equipped with Wi-Fi



Air conditioners

Operation

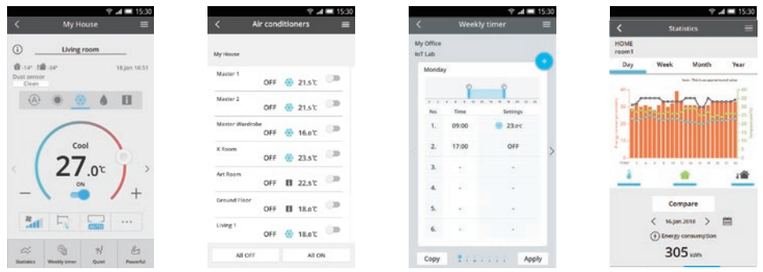
ON/Off
Temperature setting, mode switch, etc.

Group Status
Switch on/off all at once.

Weekly timer setting

Statistics

Estimated energy consumption (Year/Month/Week/Day)



Supply fan + IAQ remote controller

Supply fan + IAQ remote controller

Operation

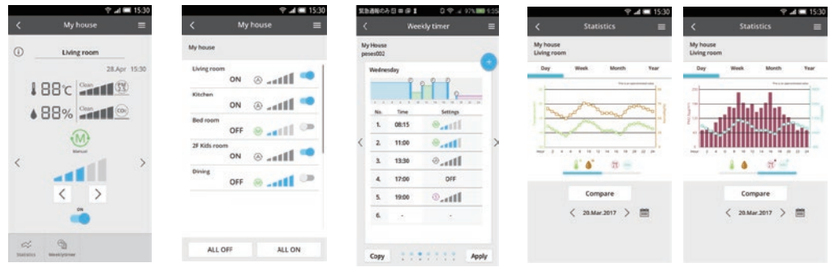
ON/OFF
Mode switch
Air volume switch

Group status
switch on/off all at once.

Weekly timer setting

Statistics

Temperature, humidity
CO_2, PM 2.5
(Year/Month/Week/Day)



nanoe™ X Stay safer indoors with 24-hour nanoe™ X air protection

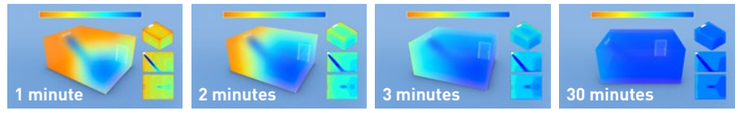
+ Fan mode

Only 25 w/h
Note: Varies by model

nanoe™ X mode operates on low energy consumption and requires no maintenance since the nanoe™ X device is made of titanium.

nanoe™ X concentration simulation

nanoe™ X was tested in a 54 m³ (4 m x 5 m x 2.7 m) room for a duration of 30 mins. The bluer the colour, the more effective it is. Featuring a long lifespan and huge volumes of hydroxyl radicals contained in water, nanoe™ X can provide widespread coverage, especially in large spaces of 54 m³ or more, inhibiting airborne and surface pollutants throughout the area.



1/4 of the room is filled | 1/2 of the room is filled | 3/4 of the room is filled | Entire room is filled

IAQ remote controller

Visualising fresh air, enjoy safe and secure air quality.

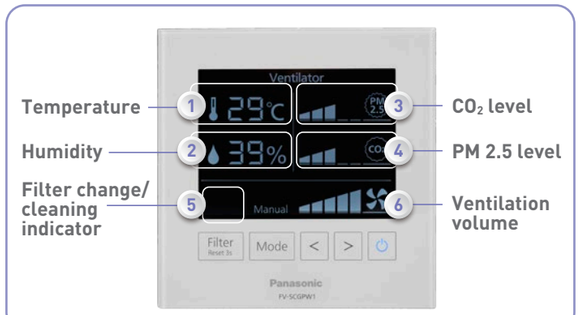
IAQ information visualised

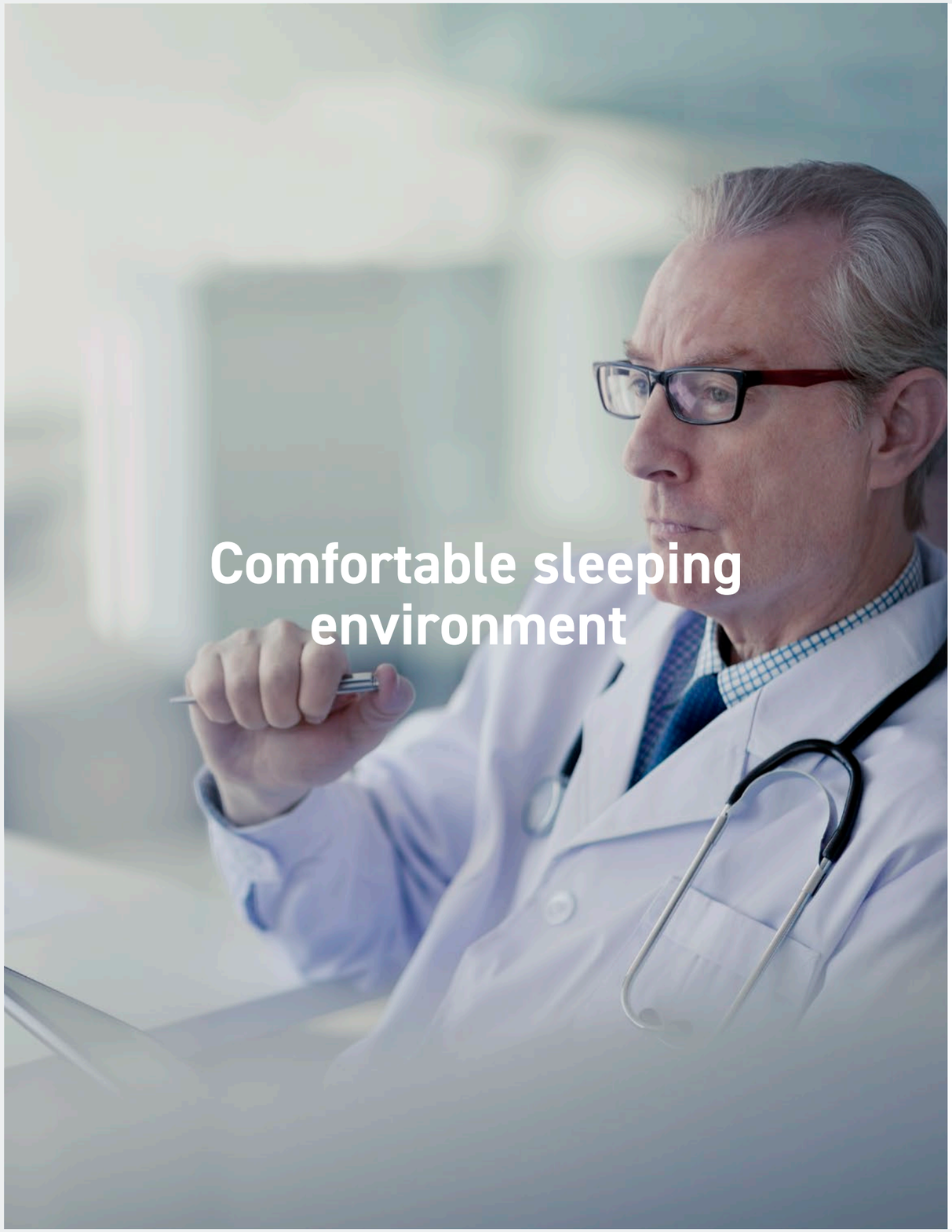
- 4 sensors (temperature, humidity, PM 2.5, CO_2)
- Precise air volume control at 5 levels
- Remote control from anywhere via smartphone apps

Panasonic Comfort Cloud

Sensing and control

- Based on IAQ information, ventilation is automatically controlled.
- Ventilation volume regulated based on CO_2 levels detected by sensing.





Benefits of air conditioner humidity control for sleeping environments demonstrated

Test overview

- Tested device: Room air conditioner equipped with nanoe™ X (CS / CU-X229C)
- Test space: Two approximately 25m² rooms
- Test subjects: 6 men and 6 women, a total of 12 people aged 30-69
- Testing organization: TTC Co., Ltd.
- Test supervision: Dr. Shuichiro Shirakawa, Japan Sleep Assessment & Research Institute, Inc.
- Evaluation: A combination of quantitative objective evaluation and human-perceived subjective evaluation of night-time sleep quality using a test device, with and without humidity control, using a double-blind method to eliminate the placebo effect.
- Demonstration: Feeling of refreshment upon waking, fatigue relief and improved work efficiency attributable to improved sleep quality with heating and cooling control and with nanoe™ X control, airflow control, humidity control or CO_2 concentration control.

Humidity control is critical in creating a comfortable sleeping environment.

When humidity in the room is close to 80%, perspiration does not evaporate easily, and body temperature cannot be adjusted properly, which makes it difficult to fall asleep and makes you feel uncomfortable when you wake up. Controlling the humidity at 40–60% is important for a good night's sleep. Air conditioner humidity control was shown to improve sensations of alertness, motivation, mood, calmness, and appetite upon waking. Humidity control is essential for restful sleep.

Supervised by

Director, Japan Sleep Assessment & Research Institute, Inc.; Medical Doctor

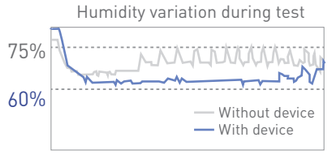
Dr. Shuichiro Shirakawa

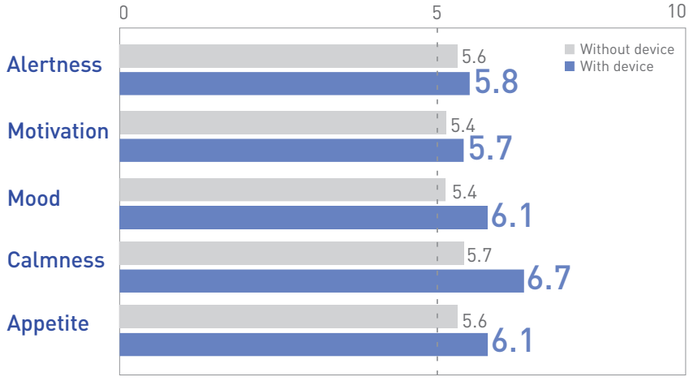
Director, Japan Sleep Assessment & Research Institute, Inc., and Visiting Professor at the Edogawa University Sleep Research Institute, Dr. Shirakawa is the Chairman of the Japan Organization for Better Sleep, and has seen his work as a pioneer of sleep research published in a range of media. Dr. Shirakawa has published books including Sleep Reading for Business Persons (Wedge), Sleep Deficits (Asahi Shimbun Publications), The Scientifically Correct and Fastest Way to Eliminate Life-Shortening Sleep Deficits (SHODENSHA Publishing), etc.

Evaluation of the impact of air conditioner humidity control on sleep

Conclusion

When the humidity was controlled while the subjects were sleeping, improvement was seen in the results of the questionnaire, in which 5 sensations upon waking were ranked on a 10-point scale.





Note: Visual is for illustration purposes.