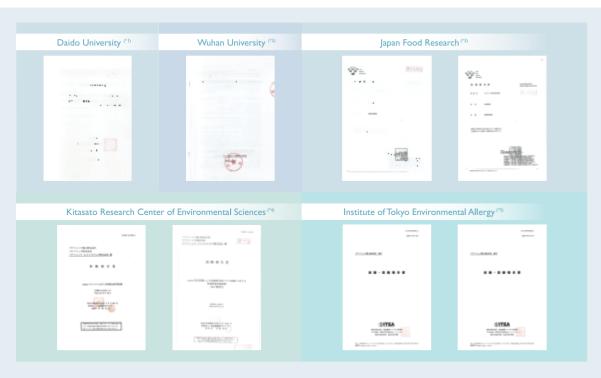
### The effects of nanoe<sup>™</sup> have been proven through experiment tests conducted by various universities or laboratories



- \*I Test Laboratory : Daido University Test Subject : Pet Odor Test Methodology : Exposed to charge water particles for I week in pet shop Test Result : 85.6% is deodorized for airborne odor and 74.3% is inhibited for adhering odor
- \*2 Test Laboratory: Wuhan University: Test Subject: Influenza virus HIN1, H3N2: Test Methodology: Exposed to charge water particles for 12 hours in 30cu.m. space Test Result : 99% is inhibited
- \*3 Test Laboratory : Japan Food Research Laboratory: Test Subject : Enterohemorrhagic Escherichia coli (O 157:H7): Test Methodology : expose for 1 hour in 45L test box Test Result: 99.9% is inhibited Report No.: 208120880-001
- Test Subject: Methicillin-resistant Staphylococcus aureus (MRSA) Test Methodology: expose for 1 hour in 45L test box Test Result: 99.9% is inhibited Report
- \*4 Test Laboratory: Kitasato Research Center of Environmental Sciences-Test Subject: Influenza virus (H1N1 subtype)·Test Methodology: Exposed to charge water particles in Icu.m. test space for 2 hours by TCID50 (50% tissue culture infectious dose) Test Result: 99.9% is inhibited Report No.: 21\_0084\_1
- Test Subject: Staphylococcus aureus bacterium Test Methodology: Exposed to charge water particles in 10cu.m. test space for 4 hours Test Result: 99% is inhibited Report No.: 21 0142 \*5 Test Laboratory : Institute of Tokyo Environmental Allergy (ITEA) · Test Subject : Can f I (allergy derived from dogs) · Test Methodology : Exposed to charge
- water particles in 45L test box by ELISA method Test Result : 99% is inhibited after I hour Report No.: IIM-RPTAPR047 I Test Subject : Fel d I (allergy derived from cats) Test Methodology : Exposed to charge water particles in 45L test box by ELISA method Test Result : 98% is inhibited after 2 hour Report No.: IIM-RPTAPR051 I

#### Disclaimer

- I. Please note that products incorporating nanoe™ technology are not to be used for medical treatment.
- 2. nanoe™ is not intended to prevent infectious disease.
  - The technology has been found to be effective in suppressing a number and variety of harmful airborne and adhering substances, including viruses (e.g. HINI), bacteria (e.g. E.coli), mold fungi and allergens.
- For further information and details on test items and conditions please visit Panasonic HP as follows:
- http://panasonic.net/technology/nanoe/experiment.html
- However, nanoe™ does not create an aseptic environment, nor does it guarantee prevention of infection.
- 3. The information provided herewith is true and accurate as of time of publication. The manufacture, sale and specifications of products may be subject to change.
- 4. Data supplied regarding the effectiveness of nanoe™ have been obtained through experiments under special conditions using devices which generate electrostatic atomized water, and have not been tested through commercial products with the devices incorporated in them.
- 5. The actual effects may vary depending upon the specific condition of the room, etc.

### **Panasonic**

- Specifications are subject to change without prior notice
- Actual colors may vary slightly from shown





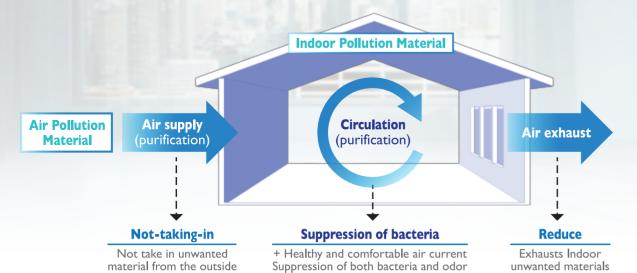




# Panasonic IAQ (Indoor Air Quality) Concept



- Water I.2kg/person-day I.2L\*2
- Food: 1.3kg/person-day\*3
- \*I "Air and human from a physiological view point-" 1999 by UCHIYAMA Iwao (The Institute of Public Health of Japan).
- \*2 "Heat stroke environmental health manual (2009)" from Department of Environment of Japan.
- \*3 "Basic data sheet of agriculture forestry and fisheries, Statistics regarding the food self-sufficiency rate" from Ministry of Agriculture, Forestry and Fisheries of Japan.



# Air Purifier

# Panasonic Air Purifier Concept

Keeps out particulate matters and allergens from you and children with advance features

Active Attack

R• nance

### Smart Sensing

- Haze Mode
- Human Activity Sensor
- Light Sensor

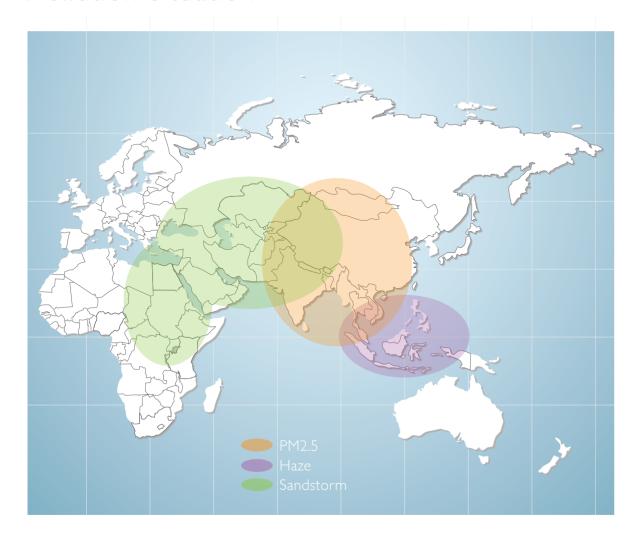
HEPA Composite Filter







# Pollution Situation



#### PM2.5

An annual average concentration of 10µg/m3 is the long-term guideline value for PM2.5 set by the World Health Organization (WHO). As for latest information, more than 80% of people living in urban areas that monitor air pollution are exposed to air quality levels that exceed the WHO limits.

#### Haze

In recent years, large scale smoky haze, usually measures hundreds of kilometres across, occurred frequently. It has spread to various countries in South East Asia causing a significant deterioration in air quality. Both Pollutants Standards Index (PSI) and Air Pollutants Index (API) are used to measure air quality. On both indices, a reading above 100 is classified as unhealthy while above 300 is hazardous.

### Sandstorm

Massive sandstorm blanketed China and Middle East in past few years. Sand and dust carried by strong winds caused poor visibility and people suffered breathing problems across the countries.

# Pollutants Around You in Daily Life



**VOC**: Volatile Organic Compounds

# Powerfully Removes Particulate Matters by Integration of Capture, Sensing and Collection







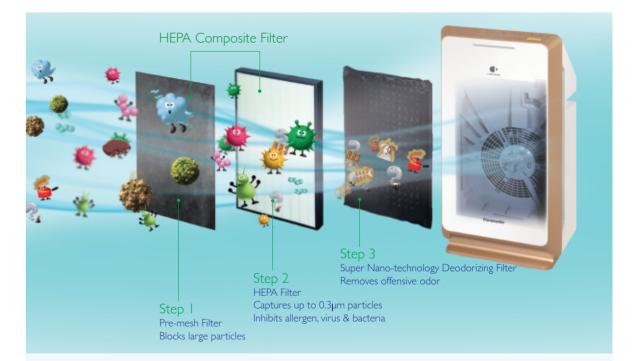
### HEPA Composite Filter

Maintains a clean space by removing 0.3µm particles up to 99.97% (14)



Certification and "Seal of Approval" endorsed by the British Allergy Foundation approves that Panasonic Air Purifiers has significantly reduced allergen content.

eal of Approval





Super alleru-buster can inhibit certain kinds of allergen up to 99% by surrounding and restraining the allergens with the phenolic polymer. \*1



Green Tea Catechin can inhibit certain kinds of virus up to 99% by surrounding the viruses with the Catechin.  $^{\circ 2}$ 



Anti-bacteria Enzyme prevents the reproduction of bacteria and molds in order to ensure clean environment. \*3

- (\*1) Test Laboratory: Osaka Municipal Technical Research Institute of Japan / Test Methodology: Measure reduction level of tick allergen by Enzyme-linked Immuno Sorbent Assay / Inhibiting Method: Contact with Super alleru-buster / Test Subject: Allergens captured by filter (tick, pollen) / Test Result: 99% or more is inhibited (Report no. 2127)
- (\*2) Test Laboratory: Kitasato Research Centre of Environmental Sciences / Test Methodology: Inhibit rate of virus by Plaque method / Inhibiting Method: contact with Catechin / Test Subject: Virus captured by filter / Test Result: 99% or more is inhibited (Report no. 15-0115)
- (\*3) Test Laboratory: Japan Food Research Laboratory / Testing Methodology: Testing of anti-mold function of the filter, using the Harrow method (Report no. 207060074-002)
- (\*4) Removal performance of filter only. The performance for whole house would be different

Haze Mode
Fan speed is adjusted to remove the pollutants efficiently when corresponding particles are detected.



### Haze indicator is "Light On"

As Haze mode is switched on, the air purifier will run at maximun speed and the louver will move to corresponding angle until the indicator light turns off. Afterward, the purifier will change to previous speed automatically.

### Haze indicator is "Light Off"

As Haze mode is switched on, the air purifier will run at maximun speed and the louver will move to corresponding angle for I minute. Then the purifier will change to previous speed automatically.





suction inlet



Usually, various types of pollutants appear at different positions between the ceiling and the floor in the room. In response, the 3D circulation airflow is divided into two mode -"Side Airflow" and "Front Airflow" to remove pollutants accordingly.

House Dust Catcher





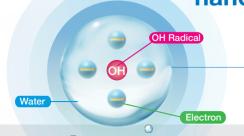


Experiments have proven the benefits of nanoe™ generated with the nanoe device by cutting-edge nano-technology.

What is nanoe™?



nano-technology + electric = nanoe



nanoe™ wrapped in water molecule

A nanoe  $^{TM}$  is a fine (5 to 20 nm) and weakly acidic water particle with a reactive substance and an electric charge.



**nanoe™** is water-wrapped capsule with plentiful OH radicals.

Its effectiveness of bacteria removal<sup>#1</sup> depends on the number of OH radical<sup>#2</sup>, which is generated at the rate of 480 billion per second.

- #1 Bacteria: the effect resulted in 25cu.m. enclosed test space for 4 hours, not at actual usage space. (\*1)
  - Virus: the effect resulted in I cu.m. enclosed test box for 2 hours, not at actual usage space (\*2)
- #2 Based on the ESR test methodology, applicable in the air purifier launched after Sep 2011

A nanoe<sup>TM</sup> device can release radicals in water molecules which increase the effectiveness of bacteria and odor removal. Since nanoe<sup>TM</sup> is generated from moisture in the air, it will not wear out the device. Thus, periodical replacement of device is not necessary.

### Characteristics of nanoe™

### Long Life

6 times longer lifespan than normal ion

nanoe™ contains moisture around 1,000 times more than minus ion. Being wrapped in water molecules, it has a longer lifespan and is able to retain its effectiveness even after traveling for a long distance.

## Comparison of distribution after 5 minutes





• nanoe

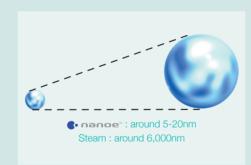
nanoe™ spread to every corner after 5 minutes

normal ion

lons decay before spreading throughout the room

### Microscopic Scale

Only one-billionth of the volume size of a steam pacticle



nanoe™ is much smaller than steam that can deeply penetrate into cloth fabrics to restrain dirt.

### Water-originated

nanoe $^{\text{m}}$  comes from condensed moisture in the air that water replenishment for nanoe $^{\text{m}}$  generation is not required.



Conditions for generating nanoe™

- Room Temperature : around 5~35°C (Dew Point Temp. : around 2°C or over)
- Room Humidity: around 30~85%



Allergens (such as pollen, mite droppings and corpses) are enclosed and inhibited.



**6• nance**can penetrate deeply inside the fabrics

## OH radical possesses the characteristics of removing hydrogen from viruses, bacteria, odors and allergens. Therefore, the more the OH radical, the higher the effectiveness of the anti-virus power.

nanoe<sup>™</sup> captures the virus

OH radical takes away hydrogen (H) from virus

The radical turns into water to inhibit the virus

OH+H=H2

Virus

Virus

Water

- (\*I) [Airborne Bacteria] Test Laboratory: Kitasato Research Centre of Environmental Sciences Test Methodology: Exposed to charge water particles for 4 hours in 25 cu.m. test room Test Result: 99% is inhibited Report No.: 24\_0301\_I
- (\*2) [Adhering Virus] Test Laboratory: Kitasato Research Centre of Environmental Sciences Test Methodology: Exposed to charge water particles for 2 hours in 1 cu.m. by TCID50 (50% tissue culture infectious dose) Test Result: 99.9% is inhibited Report No.: 21\_0084\_1

### Safety test of nanoe<sup>™</sup> has been conducted

Purpose	Test Name	Testing Institute
Effect on Chromosomes	In Vitro Mammalian Chromosome Aberration Test	Japan Bioassay Research Center#3
Effect on Respiratory System	Repeated Dose 28-day Oral Toxicity Study in Rodents	Life Science Laboratories, Ltd.#4

- #3 Japan Bioassay Research Center is a test facility compliant with GLP (\*3) (Good Laboratory Practice)
- #4 Life Science Laboratories, Ltd. is a registered institute of the Network of Organizations Investigating Accident Causes (\*4)
- (\*3) GLP is a practice intended to promote the quality and validity of test data used for determining the safety of chemicals and chemical products. Test facilities are assessed for compliance with GLP to ensure the reliability of their test data.
- (\*4) The Network of Organizations Investigating Accident Causes is a network administered by National Institute of Technology and Evaluation under the Ministry of Economy, Trade and Industry.

<sup>\* 1</sup>nm (nanometer) = one billionth of meter



### Merits of nance 3 Main Features



### Anti-virus / bacteria

Inhibits 99.9% viruses (HINI)(\*1) and (H5NI)(\*2) and 99.99% bacteria (E. Coli O 157, MRSA)(\*3)







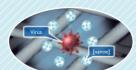
After 4 hours (6 hours for Swine-origin Influence A)



Influenza Virus (HINI, H5NI) 99.9% inhibited



Escharichia Coli (E.coli O157, MRSA) 99.99% inhibited



Surround virus and bacteria Inhibit virus and bacteria

(\*I) HINI (Swine-origin Influenza A)

- Test Methodology: Exposed for 6 hours in 45L test box
- Test result: 99% is inhibited after 6 hours
- (\*2) H5N1 (Avian Influenza A)
  - Test Methodology: Exposed for 4 hours in 45L test box
  - Test result: 99.9% is inhibited after 4 hours
- (\*3) Escherichia Coli (O157:H7, MRSA)
  - Test Methodology: Exposed for I hour in 45L test box
  - Test result: 99.9% is inhibited

#### Growth of mold can be inhibited with nanoe™ (\*4)

Deodorization



















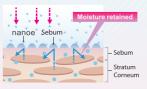
Skin Hydration Helps keep the moisture back to the skin



### With nanoe™

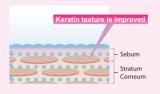
After 30 minutes

nange™ attaches on the sebum forming a membrance on the skin to prevent the loss of moisture



#### After 28 days

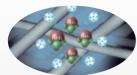
Skin is hydrated, thus improving the keratin texture and keeps the skin fresh and moisturized

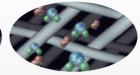




### Stachybotrys Penicillium

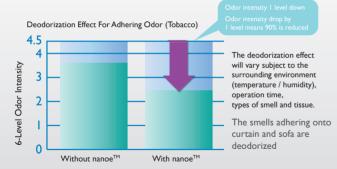
Reduces 90% odor (tobacco smell) after 2 hours





Strike odor particles

Decompose & remove odor



#### 6-Level Odor Intensity Indication

5 Very Strong smell

4 Strong smell

Easily appreciable

Weak that just able to recongnize

Weak that barely able to smell

Odorless

Test Laboratory: Panasonic Corporation Analysis Center

Test Methodology: Verifying with 6-level odor intensity indication in 23cu.m. test chamber

Deodorization Method: nanoe™ emit

Test Subject: Adhering Tobacco Smell Test Result: 1.2 level of odor intensity is

Report No.: BAA33-130125-D01

decreased after 2 hours

### nance Lets You Live With Pets Healthfully

Various tests have proven nanoe™ can improve the living environment and health condition of pets.

Joint verification with Azabu University for inhibiting allergens from pets(\*5)

# Effect resulted from the test for I hour at 45L enclosed container, not [Jointly verified] Graduate School of Veterinary Science, Azabu University

Joint verification with Daido University for inhibiting adhering odor in pet shop(\*6)

[Jointly verified] Odor Research Center, Graduate School of Informatics, Daido University

Joint verification with Tokyo University of Agriculture and Technology about health condition for skin and hairs of dog(\*7)

[Jointly verified] Faculty of Agriculture, Tokyo University of Agriculture and Technology



13

(\*4) [Cladosporium] Test Laboratory, Panasonic Corporation Analysis Center • Test Methodology, Exposed to charge water particles in 45L test box for 4 hours • Test Result: 99,% is inhibited • Report No.: 202.110801IN-01, [Cladosporium] Test Laboratory, Japan Food Research Laboratories • Test Methodology, Exposed to charge water particles in 22cu.m. test space for 1 hour • Test Result: 99,% is inhibited • Report No.: 205061541-001, [Sacrlybotry] Test Laboratory, Rispasto Research Center of Environmental Sciences • Test Methodology, Exposed to charge water particles in 45L test box for 8 hours • Test Result: 99,% is inhibited • Report No.: 22, 0465. 2, [Pencillium] Test Laboratory, Japan Food Research Laboratories • Test Methodology, Exposed to charge water particles in 45L test box for 4 hours • Test Result: 99,% is inhibited • Report No.: I1038080001-01, [Eurotimal Test Laboratory, Rispasto Research Center of Environmental Sciences • Test Methodology, Exposed to charge water particles in 45L test box for 8 hours • Test Result: 99,% is inhibited • Report No.: I10380001-01, [Eurotimal Test Laboratory, Rispasto Research Center of Environmental Sciences • Test Methodology, Exposed to charge water particles in 45L test box for 8 hours • Test Result: 99,% is inhibited • Report No.: 22, 0455, [Fusarium] Test Laboratory, Rispasto Research Lab

(\*5) Test Laboratory: TTEA \*Test Subject: Can f 1 (allergy derived from dogs), Fel d 1 (allergy derived from cats) \*Test Methodology: Exposed to charge water particles in 45L test box by ELISA method \*Test Result: (Can f 1) 99% is inhibited after 1 hour, [Fel d 1) 98% is inhibited after 2 hour (\*6) Test Laboratory: Caldo University of Agriculture and Technology: Exposed to charge water particles for 1 week in pet shop \*Test Result: 85.6% is deodorized for airborne oder and 74.3% is inhibited for adhering odor (\*7) Test Laboratory: Tolsyo University of Agriculture and Technology: Test Subject: Health condition for skin / hairs of dog \*Test Methodology: Observe the decrease of allergic symptom of the dog and air purifier is continuously operated for 4 weeks in pet owner house \*Test Result: Allergic reaction is reduced during the test period of 4 weeks in pet owner house \*Test Result: Allergic reaction is reduced during the test period of 4 weeks in pet owner house \*Test Result: Allergic reaction is reduced during the test period of 4 weeks in pet owner house \*Test Result: Allergic reaction is reduced during the test period of 4 weeks in pet owner.

## 5. Energy Saving

# Eco operation mode runs only when necessary



Pollution level varies according to your daily activities. You need to change the speed manually or automatically by sensors in order to clean the polluted environment effectively.

ECONAVI is an intelligent technology that can monitor your daily activities and memorize the timeline of the pollution level. It then controls the operation of the product before pollution spreads throughout the house.



### Mechanism of ECONAVI

Checking for Pollutants by odor sensor & house dust sensor

Search

Patrol operation

Detecting pollutants at the interval of 10 minutes per hour under Medium speed operation

Learning Pollution Pattern
Studying the pollution timeline and intensity

Learn

Learning operation

Memorizing pollution pattern in the house and automatically develop operation pattern, that can minimize the pollution before it spreads throughout the house.

The air purifier switches to higher notch automatically before pollutants spread around

Speed/Wattage

Fight Sensor Monitor

Light Sensor Monitor

6AM 8AM 10AM 12PM 6PM 8PM 10PM 12AM 4AM

PREPARATION OUT CONVERSATION SLEEP
BREAKFAST LUNCH DINNER

Dust SCATTER start SCATTER start

Odor COOKING start COOKING start

## Antiallergen

# Panasonic Air Purifiers are proven to be capable of reducing allergen content significantly

Some surveys indicate that the allergy rates are increasing throughout the world that around 30% of people are suffering from different extent of influences in their lives. Panasonic Air Purifier has been endorsed by the British Allergy Foundation approving their allergen removal capability that would improve their quality of life of this group of people.







### What is an allergen? What is allergy?

An allergen is any substance that triggers an allergic reaction when absorbed into the body. Allergens range widely in type and description, from pollen to dead mites and pet dandruff.

Allergy is an over-reaction of our body against allergen by our immune system that originally acts as protective function for our body, such as, Allergic Rhinitis, Bronchial Asthma and Atopy Dermatitis.

Allergy is an over-reaction of our body to substances, resuiting in immune responses that cause symptoms in person.



- Eye Irritation
- Bloodshot
- Runny nose
- Nasal congestion

Allergy	Causes and Symptom
Allergic Rhinitis	House dusts, mites, pollens attached to mucous membrane cause runny nose, nasal congestion, sneezing, eye irritation and bloodshot.
Bronchial Asthma	It is developed from allergies that are caused by mites, house dusts and pollen, etc.
Atopy Dermatitis	It is a skin reaction mainly with rash and itchiness that is caused by some stimulus.

# Product Lineup of Panasonic Air Purifier









the sensors, the front panel will be opened according to the pollution level for effective inhale.

As pollens, dusts and large particles are detected, the front panel will slide forward and upward to maximum opening at the bottom for powerful lower suction.



Spot Air Mode

In case of quickly cleaning of air for specific area is required, such as removal of tobacco smell. 'Spot Air Mode' would be used. With this mode, the upper louver will stay at the position you preferred while speed is preset at Hi-Med notch.





Achieves energy saving with optimized operation by auto sensor technology The light sensor detects the indoor brightness and automatically adjust the brightness of control panel indicators and clean sign, as well as air volume.



	]		
Top Panel LED	Full Li	ghting	Semi Lighting
Front Indication	Full Lighting	Semi Lighting	OFF
Air Volume (*)	Normal Auto	Auto (1 r	ank down)







3D Circulation Airflow





Light Sensor



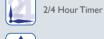








PM2.5 Indicator



Digital Humidity Indicator



Filter Replace Indicator



Super Nano-technology





Large Particle Pre-filter





Spot Air Mode





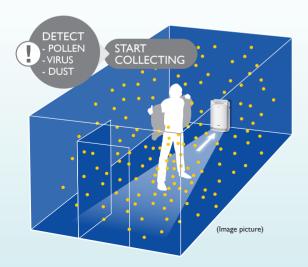
House Dust Catcher

Wall Mount Available

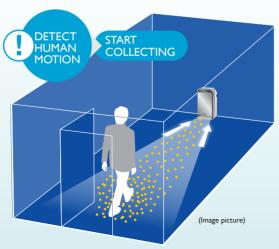
Remote Control

Composite Air Filter

With the sensor, pollutants are collected before they spread around by sensing human motion.



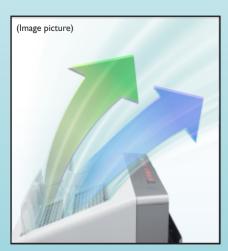
Without Human Activity Sensor







2 ways of airflow are used to suppress the diffusion of airflow for pollutant collecting.



Diffusion of pollutants is suppressed by 2-way airflow



The product will operate in low speed with display off or dimmed for 8 hours and then turn off automatically, that let you enjoy a comfortable sleep.



The caster can be locked to avoid the product is moved unintentionally.



#### **HUMIDIFYING AIR PURIFIER**

#### STANDARD AIR PURIFIER







		White		Gold			Silver		
Model	F-VXK70 52 (560)		F-PXM55A			F-PXL45			
Applicable Area [m² (ft²)]				41 (441)			52 (560)		
nanoe Purification	<b>C•</b> nanoe™			• nano	e <sup>™</sup>	<b>C</b> • nanoe™			
Air Purifying	High Medium Low		High Medium Low		Low	High Medium Low			
Air Volume [m³/min]	6.7	2.7	1.1	5.3	2.0	0.9	4.5	2.3	1.0
Power Consumption [W]	66	П	6	49	П	7	42	13	6.5
Noise [dB(A)]	54	33	8	52	32	18	52	39	22
Air Purifying & Humidifying									
Humidifying Capacity [ml/h]	700	400	250						
Air Volume [m³/min]	6.3	3.1	1.9						
Power Consumption [W]	58	15	10						
Noise [dB(A)]	53	36	25						
HEPA Filter		•			•		•		
Large Particle Pre-filter	(*2)		_						
Filter Replace Indicator / Filter Life Check		•			•			•	
MotorType		DC		DC			DC		
3D Circulation Airflow		•				•			
Twin Airflow Louver	- (ECONAV)		·		- CONAVI				
Mega Catcher			-						
House Dust Catcher									
ECONAVI			ECONAVI						
A Auto Mode			(°1)						
PM2.5 Mode									
Haze Mode	-		● (*I)		-				
Sandstorm Mode	-		● (*1)			<del>-</del>			
Sleep Mode (8 hours)		•		•			-		
Spot Air Mode		•							
Sensor	Dirt / Odor / Humidity  ●		Dirt / Odor –			Dirt / Odor –			
Human Activity Sensor									
Light Sensor		•		•			•		
Clean Sign				•			•		
PM2.5 Indicator	- - • • • • 3.5		- - - - • •			•			
Remote Control									
Humidity Indicator					-				
Humidity Setting						-			
Child Lock						•			
Seamless Drive					-				
Tank Capacity [L]									
I Tank Stand	•		-		-				
Caster Lock	•				-				
Dimension (HxWxD) [mm]	636 x 398 x 265 10.2 F-ZXKP70Z <sup>(□)</sup> ,F-ZXKP90Z <sup>(□)</sup> F-ZXFD70Z F-ZXKE90Z		580 × 300 × 205		404 x 516 x 221 5.9 F-ZXLP45Z F-ZXLD45Z				
₩ Weight [kg]			5.8 F-ZXMP55Z F-ZXHD555Z –						
Composite Air Filter									
Deodorizing Filter									
Humidifying Filter									
Large Particle Pre-filter		F-ZXKA90Z <sup>(*2)</sup>					_		

(\*1) Respective mode function will be available for different countries (\*2) Large particle pre-filter is only for Middle East and Indonesia (\*3) For F-VXK70A only (\*4) For F-VXK70M only