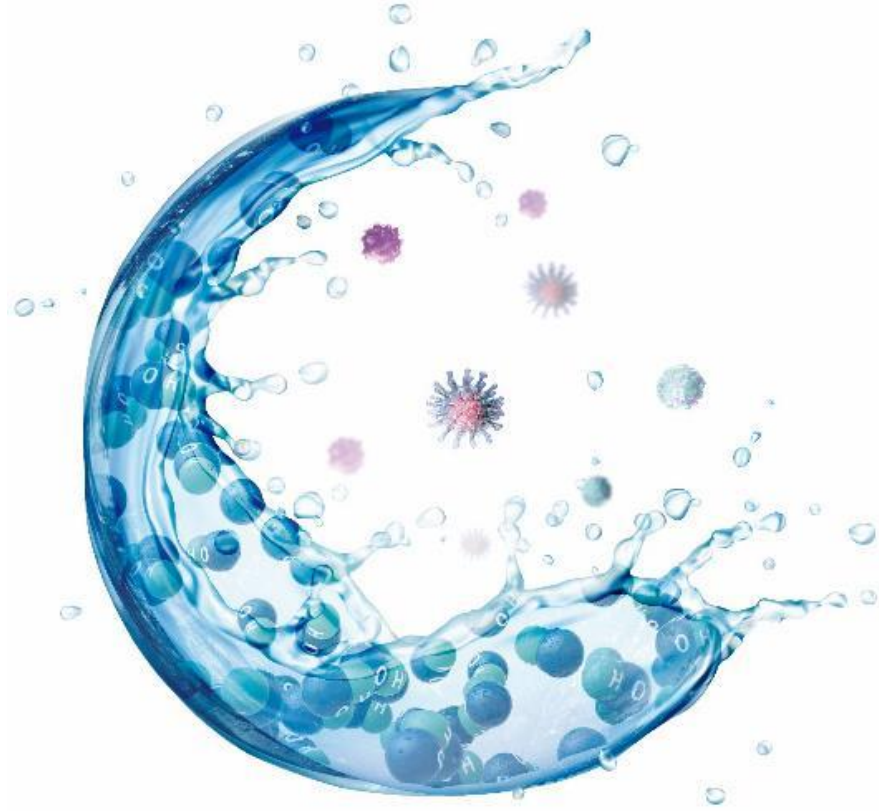


The logo for nanoeX, featuring a blue circular icon with a white dot inside, followed by the text "nanoeX" in a blue, sans-serif font. The "X" is stylized with a sharp, angular design.



Panasonic

Origin of study

Water has the characteristic of dissolving odor components.



Applying this characteristic to air purification

1997 Research on "air purification" in living space was commenced

2001 Research on nanoe™ (Hydroxyl Radicals Contained in Water) generation technology was commenced

House dust

Allergy

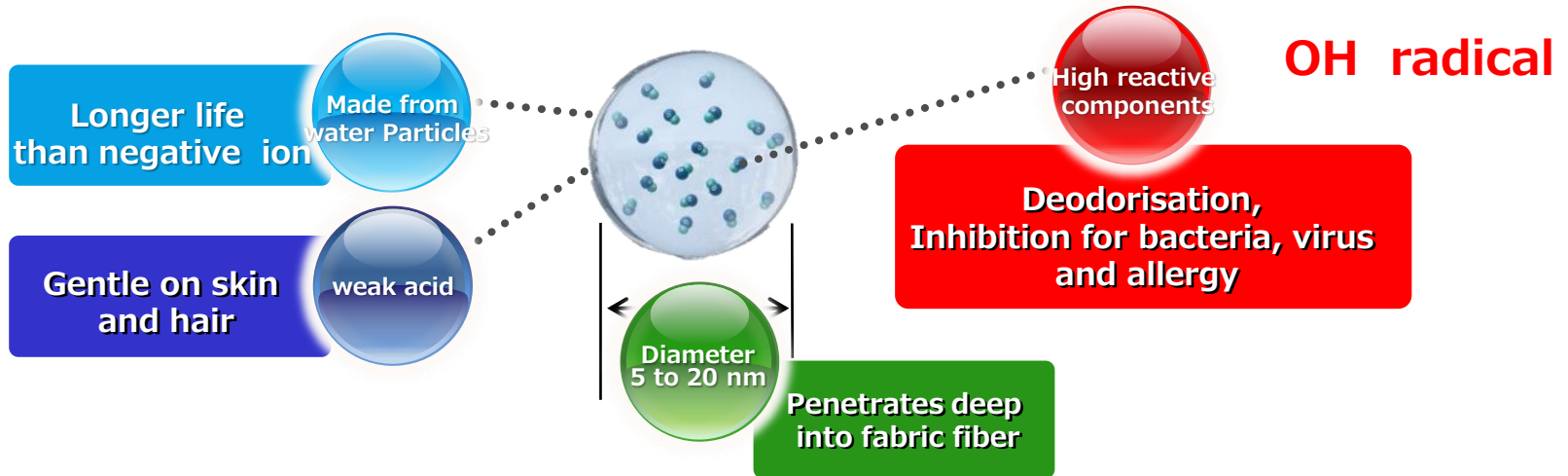


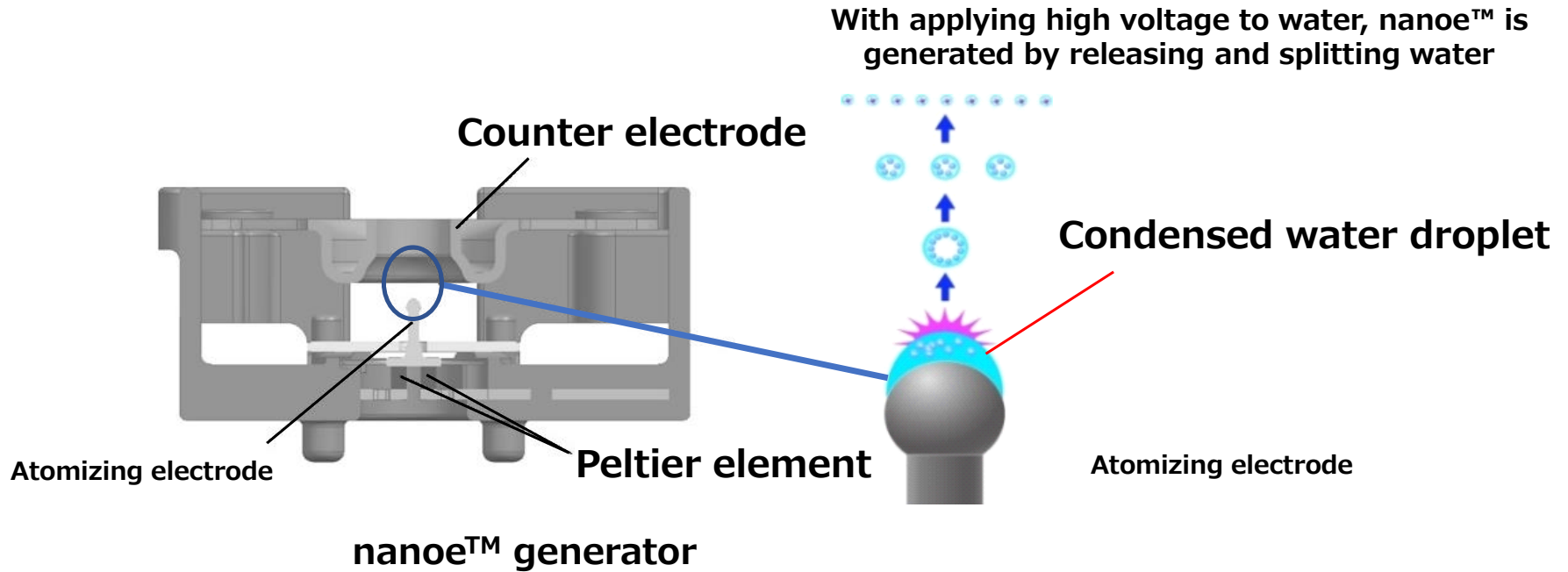
Matsushita Electric Works Co. Ltd, Comfortability Science Laboratory

Properties of nanoe™

Produced by applying high voltage to water condensed from the air

Nano-sized clean ions





Automatic generation of nano-sized particulate water

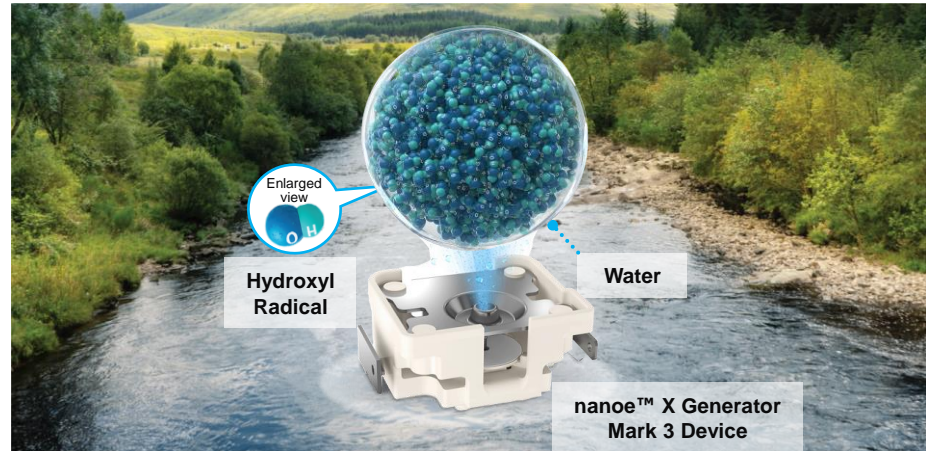
nanoe™ X: Technology Offering the Benefits of Hydroxyl Radicals

nanoe™ X technology generates nature's detergent-like hydroxyl radicals to help create better air quality.

The Power of Hydroxyl Radicals

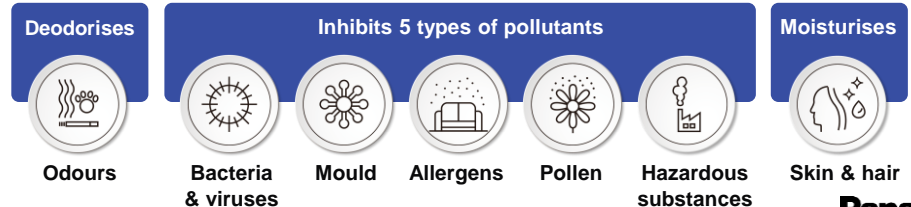
Known as nature's detergent, hydroxyl radicals (also known as OH radicals) are natural reactive molecules looking to react with other elements such as hydrogen. This reaction enables hydroxyl radicals to inhibit the growth of pollutants.

Panasonic's nanoe™ X technology brings these benefits to purify surfaces and indoor environment of your home so you can enjoy a pleasant and comfortable living space.



7 Effects nanoe™ X

Other than to inhibits viruses, nanoe™ X deodorises, inhibits bacteria, mould, allergens, pollen and hazardous substances, as well as moisturising the whole room for smoother skin and hair.

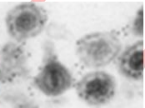
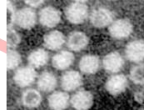
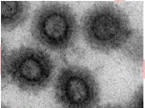





Verification of effectiveness against SARS-CoV-2 has been enhanced

For the four viruses selected on the basis of viral clearance studies for pharmaceuticals (Guidelines ICHQ 5A, CPMP/BMP/269/95, Iyakushin No. 329), GLP-compliant comparative test of nanoe™ (Hydroxyl Radicals Contained in Water) with and without exposure

Testing Laboratory: Charles River Biopharmaceutical Services GmbH (Germany) Verifying Agency complying with GLP (Good Laboratory Practice)

		Envelope	
		With	Without
Gene	DNA	 <p>Large (120-220nm) Pseudorabies virus 仮性狂犬病ウイルス (PRV) 6hr 99.9% inhibition</p>	 <p>Small (20nm) Porcine parvovirus 6hr 99.7% inhibition</p>
	RNA	 <p>Medium (80-110nm) Murine leukemia virus マウス白血病ウイルス (MuLV) 6hr 99.9% inhibition</p>	 <p>Small (22-30nm) Encephalomyocarditis virus 脳心筋炎ウイルス (EMC) 6hr 99.9% inhibition</p>

● Viral clearance test

Classify virus characteristics as physicochemical resistance

- Envelope or not
- Genes, size, etc.

By verifying the effect on four types of viruses that have a combination of these characteristics, we can estimate the effect on **“highly resistant viruses and unknown viruses*”**.
(Released in January 2012)

※Viruses within the scope of existing studies and knowledge

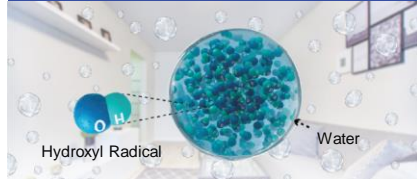
Demonstrated effectiveness
against a wide range of biologically distinct viruses (announced in January 2012)

Uniqueness of nanoe™ X



With its uniqueness, nanoe™ X able to perform excellent effectiveness on inhibits airborne & adhered pollutants, reduces odours and moisturise skin & hair.

Huge Quantity



nanoe™ X produces 48 trillion hydroxyl radicals per second*. Large amounts of hydroxyl radicals contained in nanoe™ X lead to outstanding effects in inhibiting pollutants.

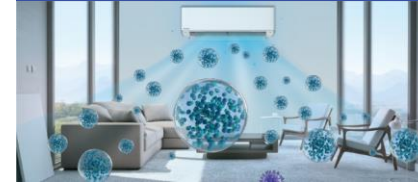
*nanoe X Generator Mark 3

Longer Lifespan



nanoe™ X technology creates hydroxyl radical contained in water, enhancing their lifespan from less than a second to more than 600 seconds (10 mins) to spread across long distances.

Fills Space Actively



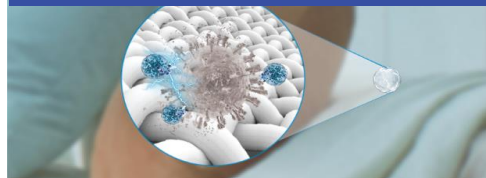
nanoe™ X actively fills the entire room and goes beyond the filter to inhibit adhered and airborne pollutants.

Maintenance-Free



No maintenance, no replacement required. nanoe™ X is a filter-free solution using a titanium-made atomised electrode that does not require maintenance.

Effective on Fabrics and Surfaces



Sized smaller than a steam droplet, nanoe™ X penetrates deeply into cloth fabrics to inhibit and deodorise effectively.

Safe to Use



The safety of nanoe™ X has been tested in labs and institutions.

1 48 Trillion Hydroxyl Radicals Generated

The amount of hydroxyl radicals generated increased 100 times, compared to original nanoe™.

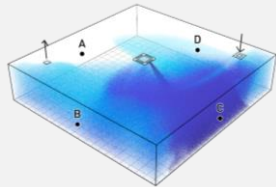
■ Simulation with a room size of: 112 m²



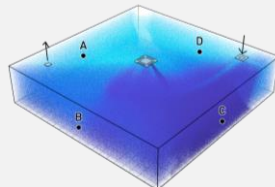
Conditions of the simulation: Inspection model: 4-way cassette/Room size: 112 m²/ Room height: 2.4 m/Position of IDU: Centre of space

Generator Mark 3

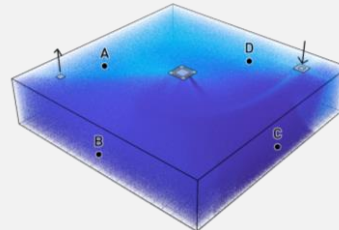
nanoe™ X diffuse into the space in a short time to quickly reach the effective concentration level.



2 minutes later

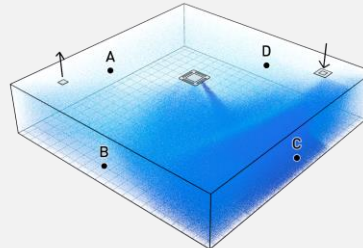
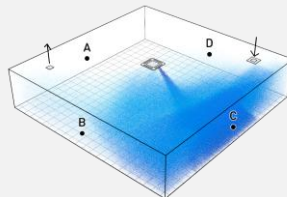
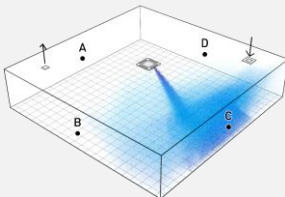


5 minutes later



10 minutes later

Generator Mark 2

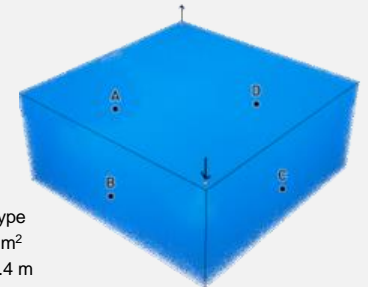


2 Higher Concentration, Even in Large Spaces

Greater effectiveness even in large spaces of more than 100 m².

The nanoe™ X concentration level can be achieved as in actual tests in a 24 m² room, which is the standard concentration level for various effectiveness claims. (space average concentration).

Concentration in a space equivalent to 24 m² with a nanoe™ X Generator Mark 2.



Wall-mounted type
Room size : 30 m²
Room height : 2.4 m
Position of IDU: Center of wall

Evolved Discharge System

Dramatically Increased Release of Hydroxyl Radicals

Higher Concentration of nanoe™ X in the Space

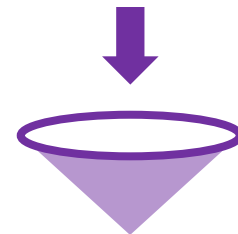
Faster nanoe™ X Effects

	nanoe™	nanoe™ X Generator Mark 1	nanoe™ X Generator Mark 2	nanoe™ X Generator Mark 3
Hydroxyl radicals				
	<p style="text-align: center;">10x times 20x times 100x times</p>			
	0.48 Trillion* hydroxyl radicals/sec	4.8 Trillion* hydroxyl radicals/sec	9.6 Trillion* hydroxyl radicals/sec	48 Trillion* hydroxyl radicals/sec
Device status		 Electrostatic atomisation Multi-leader discharge		 Electrostatic atomisation Circular discharge

Differences in discharge systems

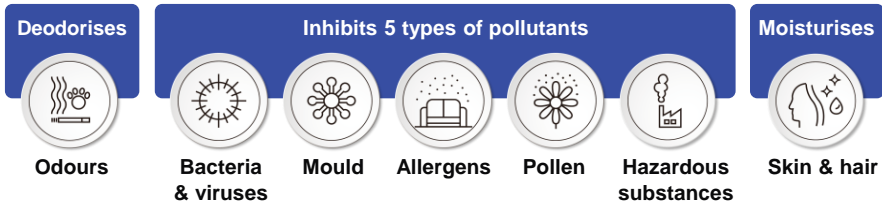


Changed from 4-point discharge to circular discharge



* Measured using the ESR method (amount of hydroxyl radicals immediately after release from the generator. (Source: Panasonic internal research)

nanoe™ X further enhanced; seven effects help address customer concerns



Consumer Concerns*1

- No.1 Virus/ Bacteria**
- No.2 Dust*2**
- No.3 Deodorisation**

Pollutant	nanoe™ X Generator Mark 2 Results	nanoe™ X Generator Mark 3 Results	Experimental Space Size
Viruses	1) Inhibited 99% in 8 hours	2) Inhibited 98% in 4 hours 4 hours shorter	Mark 2: Approx. 24 m ³ Mark 3: Approx. 139 m ³
Bacteria	3) Inhibited 99.91% in 8 hours	4) Inhibited 99.91% in 8 hours	Approx. 24 m ³
PM2.5 Hazardous substances	5) Inhibited 99% in 16 hours	6) Inhibited 99% in 12 hours 4 hours shorter	Approx. 24 m ³
Odours (Ageing odours)	7) Reduced by 1.8 levels in 60 mins	8) Reduced by 1.8 levels in 30 mins 30 mins shorter	Approx. 230 m ³
Pollen	9) Inhibited 99% in 12 hours	10) Inhibited 99% in 3 hours 9 hours shorter	Approx. 24 m ³

*1 Online survey, Period: Nov. 26th - Dec. 6th, 2021, Area: Vietnam (HCMC and Hanoi) n=415, Malaysia (nationwide) n=430, Philippines (nationwide) n=432

*2 Textile waste from clothing, etc., dead mites/mite faeces, pet hair, pollen, cigarette smoke, mould, bacteria, and various other substances

Focus on indoor air quality concerns in major ASEAN countries

➔ Suggest the solutions based on the 7 effects of nanoe™ X

Consumer Concerns Related to IAQ

No.1

**Virus/
Bacteria**



No.2

Dust



No.3

**Deodorisation/
Mould**

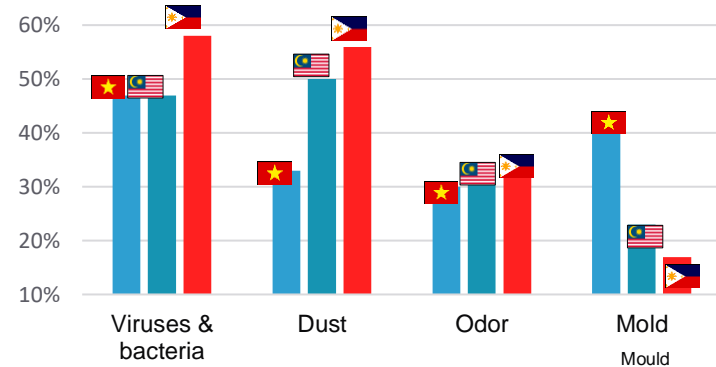


■ NPS Survey Report

“A new Wi-Fi-related function to inform about air quality is highly expected due to concerns about indoor air pollution with dust/viruses/mould, especially for Vietnam and Malaysia.”

Air concerns (1st-3rd choices)

No.1: Viruses & Bacteria No.2: Dust No.3: Odour No.4: Mould



Online survey, Period: Nov. 26th - Dec. 6th , 2021, Area :Vietnam (HCMC and Hanoi) n=415, Malaysia (nationwide) n=430, Philippines (nationwide) n=432

Focus on management issues from each industrial category
➔ Suggest solutions from the viewpoint of Indoor Air Quality

Office

Issue: How to realise sustainable office



Office Facility
Manager

We don't want only to have a comfortable office, we want a sustainable office. We have tried several products for cleaning; 95% of the products were not sustainable or used chemicals. It will kill the bacteria, but it will also kill my furniture after a month of use.

Veterinary clinic

Issue: Trouble between pets



Veterinary
clinic, Owner

Animals have a highly refined sense of smell, dogs for example are up to 100,000 times more sensitive to smells than humans, and that makes them particularly responsive to odours left by other animals.

Supermarket

Issue: Keeping areas where food/
drinks are handled clean



Super-
Market
Stock manager

We have a certain smell because of our products anyways, when you go to an organic store, it has the smell of nature, and people enjoy it. So we use only organic cleaning products without chemicals, we use them for store cleaning.

Restaurant

Issue: Improving reputation
among customers



Restaurant,
Owner

The cleanliness of the restaurant was paramount to the appearance of the entrance and surroundings. However, it was found that guests were most interested in the cleanliness of the crockery used and the odour of the restaurant.

nanoe™ X technology provides solutions to the challenges of the future state and management of facilities.

Office

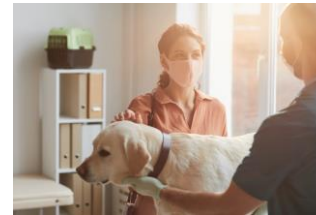


Sustainable office design

Co-working establishment of spaces

High-quality air improves comfort and productivity

Veterinary clinic



Deodorisation of pet odour is essential

Diffusers are stressful for odour-sensitive animals

Also stress-free deodorisation for animals

Supermarket



Longer in-store stays and increased customer traffic due to the COVID-19 pandemic

Naturally improved air quality ideal for food-serving spaces

Restaurant



Guests are very sensitive to odours inside restaurants

Owners are less concerned about odour in the shop

24-hour air conditioning control and deodorisation with Comfort Cloud



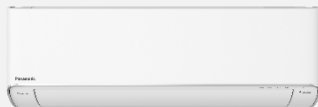
Panasonic Comfort Cloud App

nanoe™ X and nanoe™ Product Lineup

ROOM AIR CONDITIONER

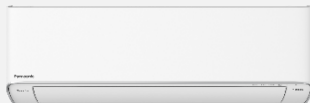
X-Premium Inverter Single Split Type

CS/CU-XU9XKQ (1.0HP) CS/CU-XU12XKQ (1.5HP)
CS/CU-XU18XKQ (2.0HP) CS/CU-XU24XKQ (2.5HP)



Deluxe Inverter Single Split Type

CS/CU-XPU9WKQ (1.0HP) CS/CU-XPU12WKQ (1.5HP)
CS/CU-XPU18WKQ (2.0HP) CS/CU-XPU24WKQ (2.5HP)



Premium Inverter Window Type

CW-XU1021VPH (1.0HP) CW-XU1221VPH (1.5HP)
CW-XU1821EPH (2.0HP) CW-XU2421EPH (2.5HP)



COMMERCIAL AIR CONDITIONER

4-Way Ceiling Cassette

S-18PU3QA U-18PRH1Q6, S-21PU3QA U-21PRH1Q6,
S-24PU3QA U-24PRH1Q6, S-34PU3QA U-34PRH1Q6,
S-43PU3QA U-43PRH1Q6, S-48PU3QA U-48PRH1Q6,
S-3448PU3QA U-43PRH1Q9, S-3448PU3QA
U-48PRH1Q9



Adaptive Ducted

S-1821PF3Q U-18PRH1Q6 U-21PR1Q6,
S-2430PF3Q U-24PRH1Q6 U-30PR1Q6,
S-3448PF3Q U-34PRH1Q6 U-43PR1Q6
U-48PR1Q6



Ceiling Mounted / Exposed

S-18PT3QA U-18PRH1Q6, S-21PT3QA U-21PRH1Q6,
S-24PT3QA U-24PRH1Q6, S-34PT3QA U-34PRH1Q6,
S-43PT3QA U-43PRH1Q6, S-48PT3QA U-48PRH1Q6,
S-3448PT3QA U-43PRH1Q9, S-3448PT3QA U-
48PRH1Q9



Floor Standing

S-24PB3Q6 U-24PRB1Q6,
S-34PB3Q6 U-34PSB3Q6,
S-43PB3Q6 U-43PSB3Q6,
S-48PB3Q6 U-48PSB3Q6



AIR PURIFIER

Air Purifier
F-PXM35ASP



Air Purifier
F-PXT50AKP



Air Purifier
F-PXM55ANP



CEILING MOUNT NANOE X GENERATOR

Air E
FV-15CSD1



PORTABLE NANOE X GENERATOR

Portable nanoe X
Generator
F-GPT01A-K
F-GPT01A-R



BEAUTY PRODUCTS

Premium Hair Dryer
with nanoe™ and
Double Mineral Ions
EH-NA98-K605



1200W nanoe™
Hair Dryer – Light
& Compact
EH-NA27



Dual-Voltage
nanoe™ Hair
Straightener
EH-HS99



Hair Dryer with
nanoe™ and
Platinum Ion
EH-NA45



Facial Ionic
Steamer
EH-SA31



Nanoe Website



[nanoe™ X | Air Conditioner | Panasonic Philippines](http://www.panasonic.com/ph/nanoe)

www.panasonic.com/ph/nanoe



[Evidence | Verification | All about nanoe™ X | nanoe™ X | Air Conditioner | Panasonic Philippines](http://www.panasonic.com/ph/nanoe/all/verification/evidence)

www.panasonic.com/ph/nanoe/all/verification/evidence

