



CO₂ & MULTIGAS INCUBATOR SERIES

Panasonic's incubator design with touchscreen control panel delivers exceptional ease of use, effortless cleaning and maintenance as well as outstanding performance with multi level contamination control.

Models:

MCO-170AIC-PE | MCO-170AICUV-PE |
MCO-170AICUVH-PE
MCO-230AIC-PE | MCO-230AICUV-PE |
MCO-230AICUVH-PE
MCO-170M-PE | MCO-170MUV-PE |
MCO-170MUVH-PE

CO₂ & MULTIGAS INCUBATORS



CO₂ Incubators

165 litres Incubators
230 litres Incubators

MCO-170AIC-PE | MCO-170AICUV-PE | MCO-170AICUVH-PE
MCO-230AIC-PE | MCO-230AICUV-PE | MCO-230AICUVH-PE

Precisely regulated environment with time-saving decontamination and advanced LCD touch panel.

Panasonic CO₂ incubators with Panasonic's innovative technologies offer outstanding quality in performance, maximise cell culture productivity and provide optimum results and reproducibility.



Multigas Incubators

161 litres Incubators

MCO-170M-PE | MCO-170MUV-PE | MCO-170MUVH-PE

Tightly controlled physiological oxygen environment with time-saving decontamination and improved usability.

Panasonic's multigas incubators optimize mammalian cell cultures through variable O₂ control to simulate *in vivo* conditions for regenerative medicine and stem cell applications. The MCO-170M-PE helps to achieve more accurate results when culturing cells at physiological oxygen levels.



Panasonic's incubator design delivers exceptional ease of use, effortless maintenance, and outstanding performance with multi-level contamination control.

Scientific Applications

MCO-170AIC | MCO-230AIC Series

- Tissue Research
- Antibody Production
- Genomic & Proteomic Expression
- Plant & Amphibian Cell Culture
- Transfection & Transduction Procedures
- Low Volume Media Micro-plate Work

Physiological O₂ Applications

MCO-170M Series

- Stem Cell Research
- *In vitro* Fertilization
- Regenerative Medicine
- Primary Cell Culturing
- Cancer Research
- Embryo Studies

SENSITIVE CELL CULTURING

Culturing cells at physiological oxygen levels, within the MCO-170M, allows them to grow faster, live longer, and experience fewer mutations.

MCO-170AIC | MCO-230AIC | MCO-170M Series are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) for medical purposes of culturing cells, tissues, organs and embryos.



Medical Device Directive

Panasonic has become one of the first companies in our industry to introduce Medical Device certification to underline our strong commitment to product design, quality and safety.

In 2010, Panasonic was awarded certification by TÜV-Süd to manufacture blood bank refrigerators, freezers and incubators as Class IIa Medical Devices according to the directives 93/42/EEC and 2007/47/EC. At the same time our quality systems were updated to the latest ISO9001 and ISO13485 standards.

The use of refrigeration products and cell culture incubators for the preservation and cultivation of cells and tissues for human use in transfusion, regenerative medicine and cell therapy is set to expand.





CO₂ & MULTIGAS INCUBATOR SERIES



MCO-170M LCD Touch Panel

PRECISE & REGULATED ENVIRONMENT

During cell culturing, InCu-saFe[®] and SafeCell UV prevent contamination whilst the patented Direct Heat and Air Jacket System regulates the temperature and the CO₂ levels are regulated by a PID controller and Dual Infra Red Sensor.

IMPROVED USE & MAINTENANCE

A colour LCD touch panel allows full control, even with gloved hands, while a USB port as standard makes transferring data to a PC convenient. The easy to clean incubator interior features fully rounded corners and integrated shelf supports.

EFFICIENT WORKFLOWS

Conduct your lab's processes and experiments more efficiently with less incubator downtime.

SCALE-UP EXPERIMENTS

The MCO-230AIC series is ideal for projects that may require higher throughput or ancillary equipment.

TIME-SAVING DECONTAMINATION

Panasonic's high-speed decontamination system uses vapourized hydrogen peroxide and UV light to safely clean the chamber in less than 3 hours, with at least a 6 log reduction of major contaminants.

REPRODUCTION OF *IN VIVO* CONDITIONS

With a unique solid state zirconia sensor for precise oxygen control (1-18%; 22-80%), the MCO-170M is able to reproduce low oxygen concentrations found in many tissues and organs.

INTUITIVE USABILITY

Easy control and visibility of CO₂/O₂, temperature, and other internal conditions of your Panasonic CO₂/Multigas incubator series.

CONSISTENT & UNIFORM ENVIRONMENT

Models: MCO-170AIC | MCO-230AIC | MCO-170M Series

DIRECT HEAT & AIR JACKET SYSTEM



Regulates temperature through 3 independent heating zones under microprocessor PID* control. The fan's gentle circulation enhances uniformity within the chamber.

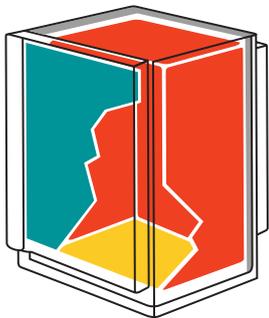
*Proportional Integral Derivative

PRECISE CO₂ CONTROL & RECOVERY



The Dual IR sensor functions on the principle that every molecule absorbs light at a specific frequency. In the case of CO₂, the molecules will absorb light at 4.3µm, which is within the infrared bandwidth of the light spectrum.

Heat Zones



- Side, top and rear walls form the dominant radiant heat source.
- The bottom heater elevates the humidity reservoir water temperature to achieve up to 95% RH at 37°C.
- The outer door heater warms the inner glass door to prevent condensation on the glass and to assure interior temperature uniformity.

Internal Conditions:

- To avoid cell culture desiccation, Panasonic's CO₂ and Multigas incubator series maintains up to 95% RH at 37°C.
- Humidification is achieved by reliable natural evaporation and gentle air circulation.

CONDENSATION MANAGEMENT

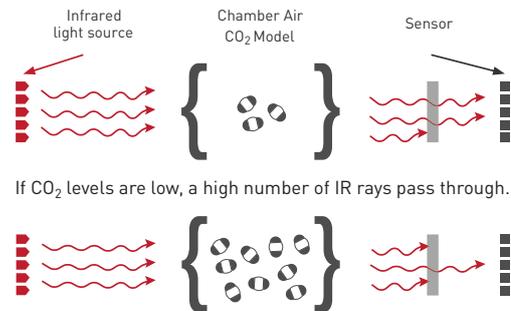
With a unique antibacterial coating the 'dew stick'- controlled by Peltier technology - condenses water vapour on its surface, which then drips into the humidifying pan, preventing unwanted condensation in the chamber and possible contamination.



MCO-170AIC Dew Stick

How does the IR sensor work?

The IR sensor measures the absorbance of light from an infrared lamp of a specific wavelength over a fixed distance. As only CO₂ absorbs light at the selected wavelength, the sensor functions independently of both temperature and humidity.



If CO₂ levels are low, a high number of IR rays pass through.

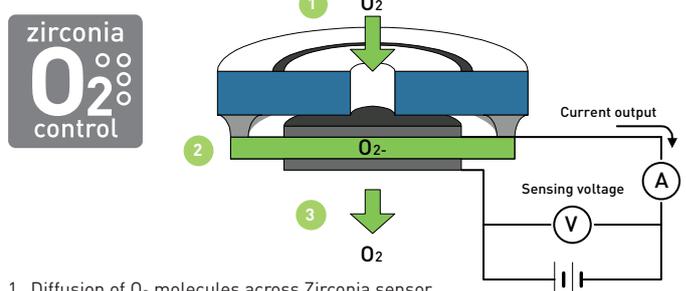
If CO₂ levels are high, a lower number of IR rays pass through.

The single-beam IR sensing system incorporates two (dual) sensors to simultaneously measure CO₂, at a wavelength of 4.3 µm and background absorption at a wavelength of 4.0 µm. This enables the controller to make constant auto-zero adjustments to ensure accurate CO₂ measurements at all times. This also eliminates the need for an auto-zero pump providing enhanced reliability and reduced vibration.

ZIRCONIA SENSOR

The more O₂ passes through the Zirconia sensor, the more electrical current is induced. This creates a signal to inject more N₂ molecules to displace O₂ molecules.

Conversion of O₂ concentration to electrical current



1. Diffusion of O₂ molecules across Zirconia sensor
2. Cathode produces electrical current as O₂ passes
3. O₂ reacts with Zirconia to produce ions

PROACTIVE CONTAMINATION CONTROL

Models: MCO-170AIC | MCO-230AIC | MCO-170M Series



InCu-saFe® TECHNOLOGY

The copper-enriched stainless steel alloy interior surfaces eliminate contamination and mitigate the effects of airborne contaminants introduced through normal use.



Due to their size and resilience Mycoplasma are often resistant to traditional methods of contamination control such as HEPA filters.

The chart below demonstrates the germicidal properties of Panasonic's copper enriched stainless steel alloy against four strains of mycoplasma.

MYCOPLASMA STRAIN	POSITIVE CONTROL	CONVENTIONAL TYPE 304 STAINLESS STEEL	PANASONIC InCu-SaFe®	CONVENTIONAL COPPER C1100
Mycoplasma Fermentans PG18	✓	✓	✗	✗
Mycoplasma Orale CH19299	✓	✓	✗	✗
Mycoplasma Arginini G230	✓	✓	✗	✗
Mycoplasma Hominis PG21	✓	✓	✗	✗

✓ means that mycoplasma strains grew on the material.

✗ means that **no** mycoplasma strains grew on the material.

Panasonic InCu-saFe® Interiors

- Fights off surface contamination.
- Does not corrode like solid copper surfaces.
- Appearance and durability of stainless steel.
- Standard feature in all Panasonic CO₂ & Multigas incubators.

Competing Incubator with Copper Interiors

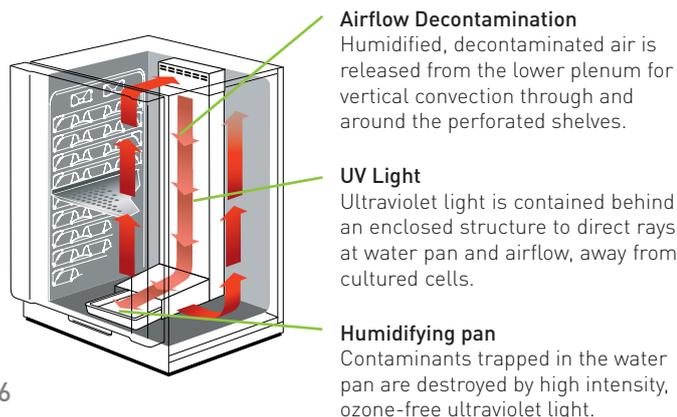
- May corrode over time.
- Humid environment may cause interior coating to turn into green cupric oxide, which may prove to be lethal to cell cultures.
- Contamination is difficult to detect due to discoloration of interior surfaces.
- Difficult to maintain and clean.



SAFECELL UV DECONTAMINATION

The programmable ultraviolet lamp, isolated from cell cultures, eliminates contaminants in the air flow and water pan without affecting cell cultures.

Airflow & Water Pan Decontamination using a UV System



Versatile Program Cycles of SafeCell UV light for Optimum Usability

24 Hour UV Decontamination

This feature can be used in the following instances:

- Prior to 1st use
- Overnight
- Between patient protocols
- Following maintenance or service
- Secondary decontamination method

After H₂O₂ Vapourization

The UV lamp automatically cycles ON for up to 90 minutes following a 10-minute H₂O₂ vapour cycle. This reduces the H₂O₂ to water, which condenses onto a cooler section of the incubator's interior floor for easy clean-up.

After Door Openings

Door closure causes UV lamp to turn ON for 10 minutes decontaminating the external air that entered the chamber.

ON/OFF

If UV protection is not desired the SafeCell UV lamp can be switched OFF.

H₂O₂ DECONTAMINATION TECHNOLOGY

Models: MCO-170AICUVH | MCO-230AICUVH | MCO-170MUVH



H₂O₂ DECONTAMINATION TECHNOLOGY

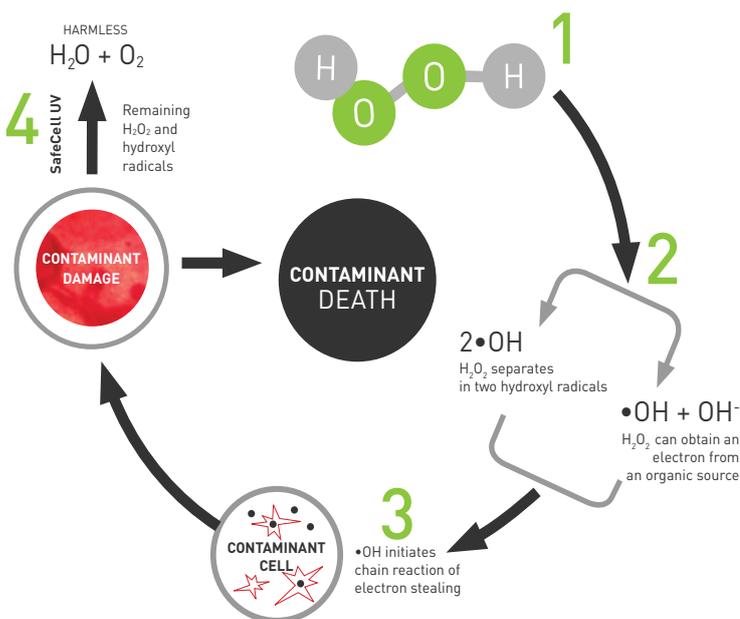
When initiated Panasonic's unique high-speed decontamination system uses vapourized H₂O₂ offering time-saving and documented chamber decontamination with complete safety



How does it work?

1. Hydrogen peroxide (aqueous) is converted to vapour using high frequency ultrasonics. During this process, the fan motor remains active, ensuring H₂O₂ vapour accesses every point of the chamber and the tubing to and from, and the inside of the CO₂ sensor.
2. The H₂O₂ vapour breaks down into hydroxyl radicals naturally.
3. The hydroxyl radicals initiate a chain reaction of electron stealing.
4. This unstable internal environment leads to death of contaminants. Remaining hydroxyl radicals and H₂O₂ are resolved to H₂O (aqueous) & O₂ (gas).

Panasonic's H₂O₂ decontamination achieves at least a 6 log reduction of major contaminants. The full decontamination process takes less than three hours.



DNA is very susceptible to oxidative damage. Since most bacteria have a single chromosome controlling all their life functions, this kind of effect can be detrimental to their normal function. Prokaryotic organisms often lack repair mechanisms to limit such damage, making them more prone to change.

DECONTAMINATION CYCLE

H₂O₂ Decontamination vs. High Heat Decontamination



STEP 1 Preparation Time: 10 - 15 minutes



1. Remove all interior components
 2. Wipe down the inside of the incubator
 3. Reposition interior components to specified locations for in situ decontamination
 4. Set up the H₂O₂ generator (MCO-HP)*
- *Optional Accessory. H₂O₂ reagent is required for this process.

STEP 2 Decontamination Time: Approx. 135 minutes



1. Press the H₂O₂ button. The chamber will warm up to 45°C for optimum results
3. H₂O₂ vapour generation starts
4. Interior fan circulates vapour
5. UV lamp reduces H₂O₂ to water and oxygen

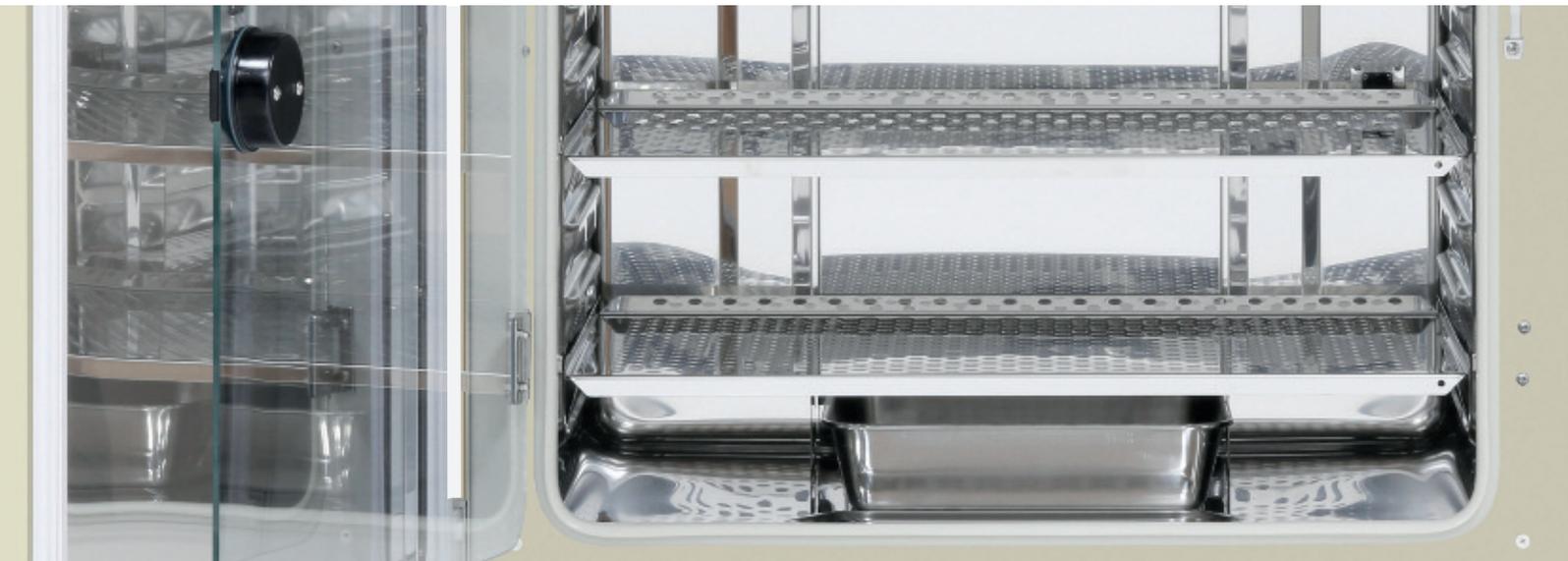
STEP 3 Finish Time: Approx. 10 minutes



1. Open chamber door
2. Wipe off remaining liquid with sterile cloth
3. Reposition interior components to normal positions

INCREASE YOUR CELL YIELD

Models: MCO-170AIC | MCO-230AIC | MCO-170M Series



INTEGRATED SHELVES

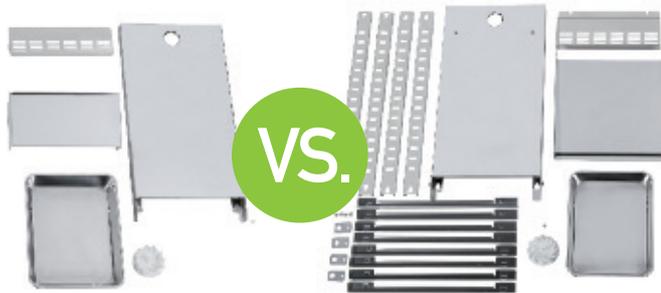
Save valuable time and reduce the risk of contamination with an easy to clean incubator interior featuring fully rounded corners and integrated shelf supports.

INCREASED CAPACITY

With new integrated shelf supports, both the Panasonic MCO-170AIC and the MCO-230AIC CO₂ incubators provide space for up to 25%* more culture vessels.

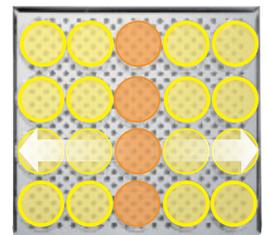
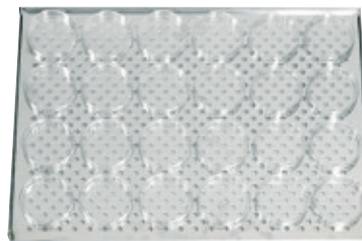
New Panasonic incubators

Traditional Incubator



MCO-230AIC Series
24 Petri Plates
(90 mm dishes)

MCO-170AIC Series,
20 Petri Plates
(90 mm dishes)



Internal Dimensions (W x D)
620 mm x 450 mm

Internal Dimensions (W x D)
475 mm x 450 mm

* compared to previous models

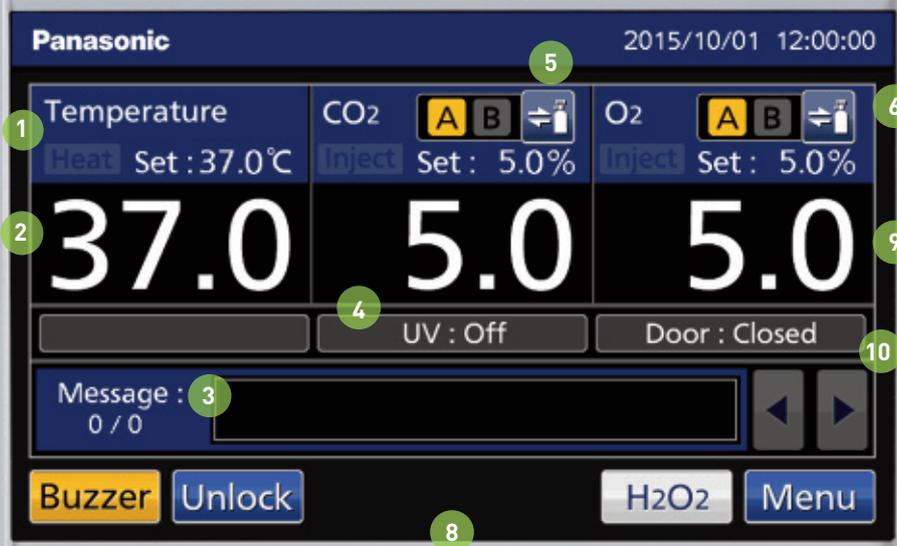
Integrated Shelves and Reversible & Separate Inner Doors



MCO-170M Series



MCO-170M Series



MCO-170M display

ADVANCED TOUCH PANEL

A color LCD touch panel delivers full control over the incubator. Control can be performed with gloved hands.



USB Port

USB Data Storage and Transfer

The standard USB port allows for convenient transfer of log data from a USB memory stick to a computer. Data is logged for approximately 1.5 months, using a 2-minute interval. (Settable range: 2~30 min.)

Electric door lock

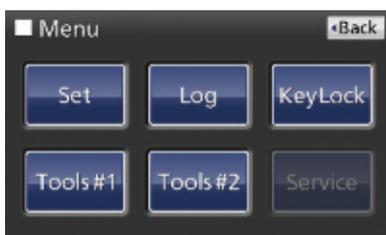
Automatic door lock is available as a standard feature for the MCO-170AICUVH/ MCO-230AICUVH and can be easily set up. Other models are compatible with the optional electric lock (MCO-170EL).

Touch Panel Legend

1. Heating indicator:
Lamp lights when the heater is energized.
2. Temperature Display:
Both set and actual temperature are displayed.
3. Message display field:
Alarms, errors or messages are displayed when a fault occurs.
4. UV Lamp condition display
5. CO₂ & O₂/N₂ gas injection indicator:
The lamp lights when CO₂ or O₂/N₂ gas is being injected
6. CO₂ & O₂/N₂ gas supply indicator and select key:
(Gas cylinder switch optional)
7. USB Log Port (Featured in photo far left.)
8. H₂O₂ Decontamination Key
9. The current chamber CO₂ /O₂ level is displayed
10. Outer door (opening / closing display)

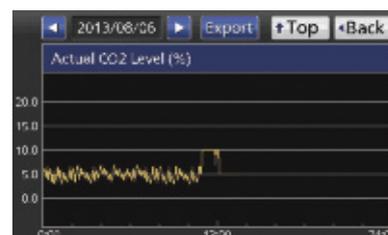
New Multi-User Lock Access (MCO-230AIC & MCO-170M Series Only)

Now available with user ID function that allows registration of up to 99 user-IDs and passwords through a master user account for better control and traceability. Detailed activity logs can be exported easily as individual CSV files.



Menu Screen

The Menu Screen allows for alarm settings, data logs and all other incubator settings.



Graphical Display

The system allows for viewing the logs of the actual temperature, CO₂ levels and the door openings of the chamber.

SPECIFICATIONS

CO ₂ incubators					
Model Number	MCO-170AIC-PE		MCO-170AICUV-PE	MCO-170AICUVH-PE	
External Dimensions (W x D x H ¹⁾	mm	620 x 730 x 900			
Internal Dimensions (W x D x H)	mm	490 x 523 x 665			
Volume	liters	165			
Net Weight	kg	80			
Performance					
Temperature Control Range & Fluctuation	°C	AT +5 ~ +50, ±0.1			
Temperature Uniformity ²⁾	°C	±0.25			
CO ₂ Control Range & Fluctuation ³⁾	%	0 ~ 20, ±0.15			
O ₂ control range & Fluctuation ⁴⁾	%	-			
Humidity Level & Fluctuation	%RH	95, ±5			
Control					
Temperature Sensor		Thermistor			
CO ₂ Sensor		Dual IR			
O ₂ Sensor		-			
Display		LCD Touch Screen			
Construction					
Exterior Material		Painted Steel (rear cover not painted)			
Interior Material		Stainless Steel Copper-Enriched Alloy			
Insulation Material		Extruded polystyrene			
Heating Method		Direct Heat & Air Jacket System			
Outer Door	qty	1			
Outer Door Lock		Optional	Optional	Standard	
Field Reversible Door		Standard			
Inner Doors	qty	1 gastight - made of tempered glass			
Shelves	qty	4 x Stainless Steel Copper-enriched Alloy			
Shelf Dimensions (W x D x H)	mm	470 x 450 x 12			
Max. Load per Shelf	kg	7			
Max. Shelf Capacity	qty	10			
Access Port	qty	1			
Access Port Position		Rear Upper Left			
Access Port Diameter	∅ mm	30			
Alarms [R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm]					
Power Failure		R			
Out of Temperature Setting		V-B-R			
High Temperature		V-B-R			
Out of CO ₂ Setting		V-B-R			
Out of O ₂ setting		-			
Door open		V-B			
Electrical and Noise Level					
Power Supply	V	230			
Frequency	Hz	50			
Noise Level ⁵⁾	dB	29			
Options					
SafeCell UV [®] System		MCO-170UVS-PE ⁶⁾	Standard	Standard	
H ₂ O ₂ Decontamination Board		MCO-170HB-PE ⁶⁾	MCO-170HB-PE ⁶⁾	Standard	
Electric Door Lock with Password		MCO-170EL-PW ⁶⁾	MCO-170EL-PW ⁶⁾	Standard	
H ₂ O ₂ Vapour Generator		MCO-HP-PW ⁶⁾			
H ₂ O ₂ Reagent, pack of 6 bottles		MCO-H202-PE			
Multiple Inner Doors		MCO-170ID-PW			
CO ₂ Gas Pressure Regulator		MCO-100L-PW			
N ₂ Gas Pressure Regulator		-			
Automatic CO ₂ Cylinder Changeover System		MCO-21GC-PW			
Semi-automatic one point Gas Calibration Kit		MCO-SG-PW			
InCu-saFe [®] Shelf		MCO-170ST-PW			
InCu-saFe [®] Half Tray System		MCO-25ST-PW			
Double Stacking Bracket*		MCO-170PS-PW			
Stacking Plate*		MCO-170SB-PW			
Roller Base		MCO-170RB-PW			
Optional communication systems ⁷⁾					
Ethernet interface (LAN)		MTR-L03-PW			
Digital interface (RS232C/RS485)		MTR-480-PW			
Analogue interface (4-20mA)		MCO-420MA-PW			

CO ₂ incubators		
MCO-230AIC-PE	MCO-230AICUV-PE	MCO-230AICUVH-PE
	770 x 730 x 905	
	643 x 523 x 700	
	230	
	90	
	AT +5 ~ +50, ±0.1	
	±0.25	
	0 ~ 20, ±0.15	
	-	
	95, ±5	
	Thermistor	
	Dual IR	
	-	
	LCD touch screen	
	Painted Steel (rear cover not painted)	
	Stainless Steel Copper-Enriched Alloy	
	Extruded polystyrene	
	Direct Heat & Air Jacket System	
	1	
Optional	Optional	Standard
	Standard	
	1 gastight - made of tempered glass	
	4 x Stainless Steel Copper-enriched Alloy	
	620 x 450 x 12	
	7	
	10	
	1	
	Rear Upper Left	
	30	
	R	
	V-B-R	
	V-B-R	
	V-B-R	
	-	
	V-B	
	230	
	50	
	25	
MCO-170UVS-PE ^{6]}	Standard	Standard
MCO-170HB-PE ^{6]}	MCO-170HB-PE ^{6]}	Standard
MCO-170EL-PW ^{6]}	MCO-170EL-PW ^{6]}	Standard
	MCO-HP-PW ^{6]}	
	MCO-H202-PE	
	-	
	MCO-100L-PW	
	-	
	MCO-21GC-PW	
	MCO-SG-PW	
	MCO-230ST-PW	
	MCO-35ST-PW	
	MCO-170PS-PW	
	MCO-230SB-PW	
	MCO-230RB-PW	
	MTR-L03-PW	
	MTR-480-PW	
	MCO-420MA-PW	

Multigas incubators		
MCO-170M-PE	MCO-170MUV-PE	MCO-170MUVH-PE
	620 x 710 x 905	
	490 x 523 x 665	
	161	
	79	
	AT +5 ~ +50, ±0.1	
	±0.25	
	0 ~ 20, ±0.15	
	1 -18 and 22 - 80, ±0.2	
	95, ±5	
	Thermistor	
	Dual IR	
	Stabilized Zirconia Sensor	
	LCD Touch Screen	
	Painted Steel (rear cover not painted)	
	Stainless Steel Copper-Enriched Alloy	
	Extruded polystyrene	
	Direct Heat & Air Jacket System	
	1	
Optional	Optional	Standard
	Standard	
	4 gastight - made of tempered glass	
	3 x Stainless Steel Copper-enriched Alloy	
	470 x 450 x 12	
	7	
	10	
	1	
	Rear Upper Left	
	30	
	R	
	V-B-R	
	V-B	
	230	
	50	
	25	
MCO-170UVS-PE ^{6]}	Standard	Standard
MCO-170HB-PE ^{6]}	MCO-170HB-PE ^{6]}	Standard
MCO-170EL-PW ^{6]}	MCO-170EL-PW ^{6]}	Standard
	MCO-HP-PW ^{6]}	
	MCO-H202-PE	
	Standard	
	MCO-100L-PW	
	MCO-100L-PW	
	MCO-21GC-PW	
	MCO-SG-PW	
	MCO-170ST-PW	
	MCO-25ST-PW	
	MCO-170PS-PW	
	MCO-170SB-PW	
	MCO-170RB-PW	
	MTR-L03-PW	
	MTR-480-PW	
	MCO-420MA-PW	

1] Exterior dimensions of main cabinet only, excluding handle and other external projections
 2,3 & 4] Ambient temperature 23°C, setting 37°C, CO₂ 5%, O₂ 5%, no load
 5] Nominal value
 6] Requires MCO-170HB-PE, MCO-170EL-PW, MCO-HP-PW and SafeCell UV option for H₂O₂ decontamination
 7] Can only be fitted with one communications interface.



- All Panasonic incubators are designed for stacking, allowing one unit to be positioned on top of another, doubling interior volume without additional floor space.
- An optional roller base is available for single and stacked installations for easier mobility.

See table below for details.

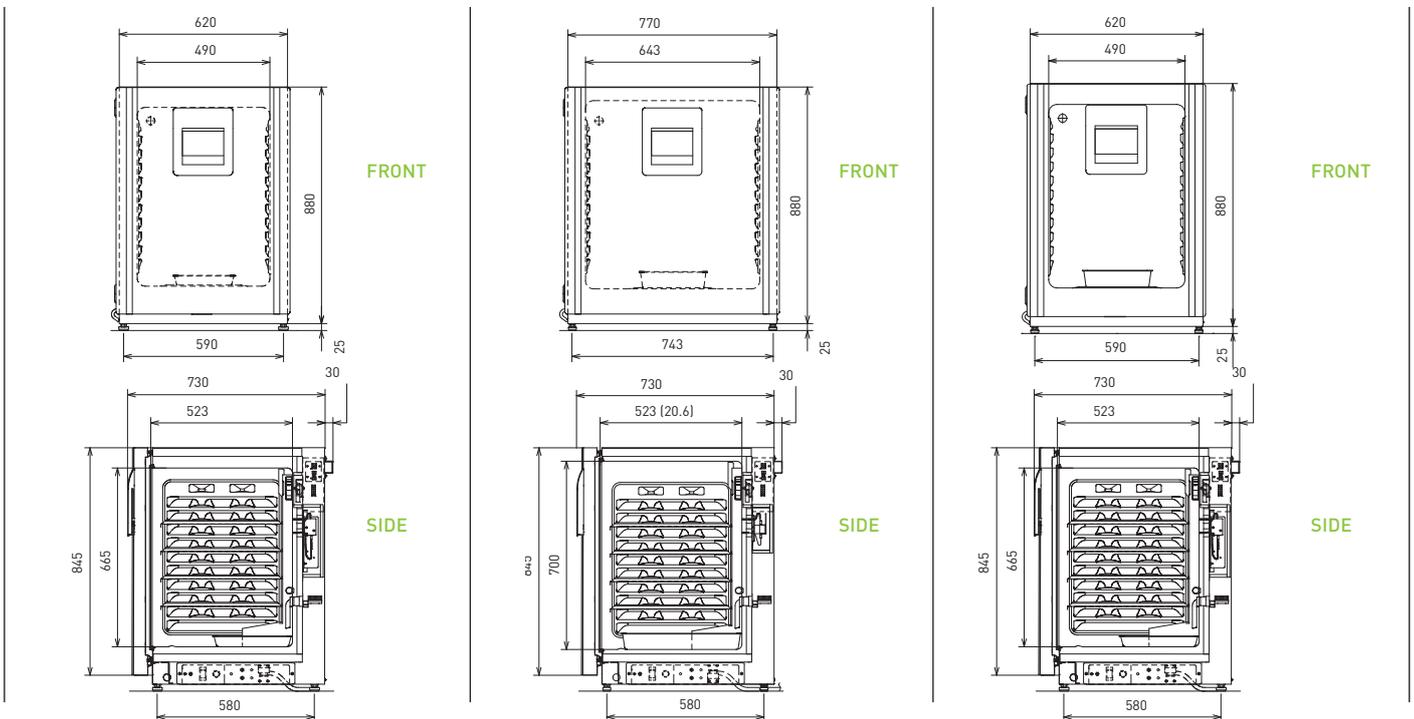
Double-Stacking Matching Table

SPACER FOR DOUBLE-STACKING		UPPER UNIT		
LOWER UNIT	MCO-170AIC-PE	MCO-170AIC-PE	MCO-230AIC-PE	MCO-170M-PE
	MCO-230AIC-PE	MCO-170PS-PW	N/A	MCO-170PS-PW
	MCO-170M-PE	MCO-230SB-PW	MCO-170PS-PW	MCO-230SB-PW
	MCO-19AIC-PE	MCO-170PS-PW	N/A	MCO-170PS-PW
	MCO-18AIC-PE	MCO-170PS-PW	N/A	MCO-170PS-PW
	MCO-20AIC-PE	MCO-170PS-PW	MCO-230SB-PW	MCO-170PS-PW
	MCO-5AC-PE	N/A	N/A	N/A
	MCO-5M-PE	N/A	N/A	N/A

NOTES:

For positioning units on a roller base, please refer to "Optional Accessories". If configuring a double-stack, make sure that the double-stacking dedicated securing hardware and spacer are used. (see "Optional Accessories".)

DIMENSIONS MCO-170AIC-PE MCO-230AIC-PE MCO-170M-PE



For more information, please visit our website:

www.biomedical.panasonic.eu