

# Incubation

## CO<sub>2</sub> and O<sub>2</sub>/CO<sub>2</sub> Incubators

Providing an ideally controlled environment  
for various cell cultures



MCO-20AIC



MCO-19AIC



MCO-18AC



MCO-5M



MCO-19M



MCO-80IC



# New and Exciting Possibilities for Biomedical Research



Panasonic, well known throughout the world for its high-quality biomedical equipment, now introduces a wide variety of cell culture incubators utilizing advanced technology for unprecedented temperature and CO<sub>2</sub> (and O<sub>2</sub> for some models) control in processing various cell cultures.

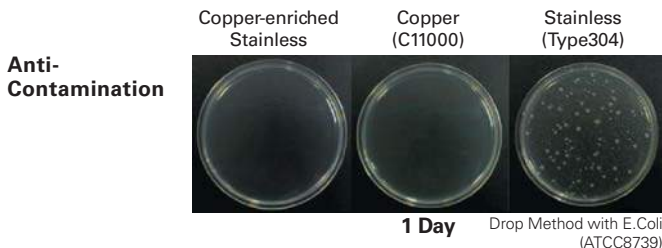
In order to prevent contamination, the ultimate enemy of laboratories, Panasonic incubators employ an exclusive inCu saFe (copper enriched stainless steel) interior chamber, SafeCell UV (Ultraviolet) lamp system and industry-first H<sub>2</sub>O<sub>2</sub> (Hydrogen Peroxide) decontamination system.

**Preventive Contamination Control & Decontamination System**

Contamination is the worst enemy of cell culture. Panasonic's solution to the problem is Preventive Contamination Control powered by Exclusive inCu saFe copper-alloyed stainless steel interior and patented SafeCell UV sterilization system that significantly reduce the risk of contamination while cell culture protocols are in process.

**inCu saFe**  
inCu saFe copper-enriched stainless steel is Panasonic proprietary solution against contamination that combines the bacteria-killing property of copper with the corrosion resistance of stainless steel.

**Copper-enriched Stainless Steel Kills Mycoplasma**  
Panasonic is proud to announce that InCu saFe, the copper-enriched stainless steel used in the interior of its CO<sub>2</sub> and O<sub>2</sub>/CO<sub>2</sub> incubators, kills mycoplasma. Mycoplasma is one of the most common causes of contamination found in cell culture and the source can often be traced back to contaminated laboratory apparatus. The inCu saFe walls and shelves inside Panasonic CO<sub>2</sub> and O<sub>2</sub>/CO<sub>2</sub> incubators eliminate mycoplasma and significantly reduce the risk of contamination without emptying the incubator.

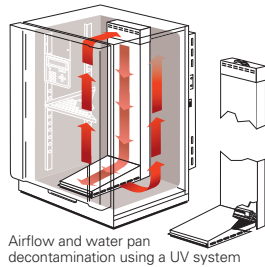


**Bacteria killing rate after 24 hrs\*** (Drop Method)

Species	Stainless (Type304)	Copper Alloy Stainless
Escherichia coli (ATCC8739)	0%	99.928%
Escherichia coli (IFO3301)	0%	99.847%
Staphylococcus aureus (ATCC6538P)	0%	99.998%
Bacillus subtilis (ATCC6633)	0%	99.997%

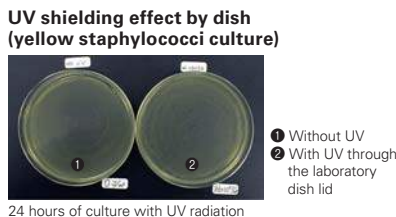
(N=3) \*Bacteria killing rate=(1-Test Sample Colony No./Control Colony No.) x 100

**SafeCell UV**  
SafeCell UV system with programmable ultraviolet lamp, isolated from cell cultures, sterilizes chamber air and water in the humidifying pan to maintain contamination-free conditions within the chamber.



**Completely Safe for Cell Culture**

- Ozone-free UV lamp
- UV shielded from culture area by the tray cover of humidifying pan.
- UV shielding by laboratory dishes and flaskets (Laboratory dishes and flaskets are made of polystyrol with thickness of 50 mm, shielding UV 100%. (Photos below show the lid of the laboratory dish shielding UV without preventing proliferation of culture.)



**UV effect on circulating air in chamber**

Time	Colony number
30 minutes after door opening (without UV)	11
2 minutes after UV radiation	0
5 minutes after UV radiation	0

\*Bacteria not detected after 2 minutes of UV radiation.

**H<sub>2</sub>O<sub>2</sub> Rapid, Effective and Safe H<sub>2</sub>O<sub>2</sub> decontamination Cycle with minimum downtime**

Industry-first, Panasonic unique high-speed decontamination system utilizing vaporized H<sub>2</sub>O<sub>2</sub> offers time-saving and documented chamber decontamination with complete safety.

- Whole decontamination process takes less than three hours saving valuable time. For example, if the decontamination cycle is started at 9 am, the unit will be ready for use in the afternoon.
- All interior components are decontaminated in situ. No need for time-consuming removal and autoclaving.
- After decontamination H<sub>2</sub>O<sub>2</sub> vapor is decomposed to harmless water and oxygen by UV light.
- Outer door is automatically locked during the decontamination cycle by the electric interlock system to ensure operator safety.
- Unlike a high heat decontamination incubator, Panasonic's unique H<sub>2</sub>O<sub>2</sub> decontamination cycle does not emit high heat. Therefore, when two MCO-19AIC are stacked, one incubator can be decontaminated without affecting the temperature in the other.

**H<sub>2</sub>O<sub>2</sub> Decontamination Process\***

**Preparation**

**Preparation**

- Remove all interior components
- Clean the chamber
- Reposition the interior components to the specified positions for in situ decontamination

**H<sub>2</sub>O<sub>2</sub> set up**

- Pour a bottle of Panasonic H<sub>2</sub>O<sub>2</sub> reagent into the H<sub>2</sub>O<sub>2</sub> vapor generator
- Position the H<sub>2</sub>O<sub>2</sub> vapor generator in the chamber

**Decontamination**

The H<sub>2</sub>O<sub>2</sub> decontamination cycle is monitored for safety and cycle status. A physical interlock and neutralization sequence assures total decontamination and operator safety.

**1. Start Cycle:**

When the H<sub>2</sub>O<sub>2</sub> button is pressed a confirming message prompts the user to proceed with the decontamination cycle or cancel. The outer door is automatically locked.

**2. H<sub>2</sub>O<sub>2</sub> Vapor Cycle:**

Once the door locks automatically, the cycle starts. The flashing H<sub>2</sub>O<sub>2</sub> display confirms the process and counts down remaining H<sub>2</sub>O<sub>2</sub> vaporization time.

**130 mins**

**3. UV Resolution:**

The H<sub>2</sub>O<sub>2</sub> vapor generator automatically completes after a 7 minute cycle. UV lamp comes ON. The flashing UV Resolve display counts down remaining time in the UV cycle as H<sub>2</sub>O<sub>2</sub> is reduced to water and trace oxygen.

**4. Cycle Complete:**

When the cycle is complete the door lock releases automatically. The H<sub>2</sub>O<sub>2</sub> vapor generator and cable can be disconnected and removed and all interior components restored to their normal position.

**Finish**

- Wipe out the chamber.
- Reposition the interior components to their normal positions.

**Start/Resume culture**

Decontamination started at 9 am enables cultures to be started or resumed by the afternoon.

\* The decontamination time shown above is a guide. Actual process time may differ depending on chamber cleaning time and set-up time.

- Decontamination requires Panasonic exclusive H<sub>2</sub>O<sub>2</sub> reagent
- During decontamination, the door is locked by the electric interlock to prevent inadvertent opening.
- Above decontamination process is done by using standard interior items. Additional shelves and dishes may impair the effect of decontamination.



## Environmental Improvement with High Precision

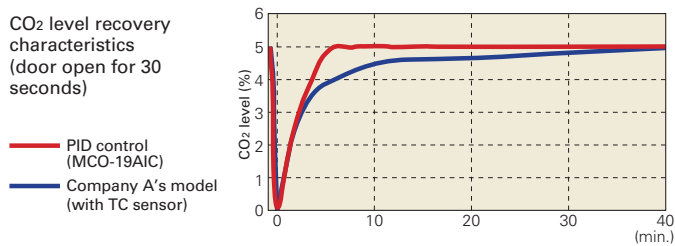
### Faster CO<sub>2</sub> Level Recovery (MCO-19AIC/19M)

Fast recovery of the CO<sub>2</sub> level is due to the effective combination of an infrared CO<sub>2</sub> sensor and PID (Proportional, Integrated and Differential) control. This incubator offers a long-awaited performance level with a more stable CO<sub>2</sub> environment to reliably function for heavy usage situations that require frequent door openings.

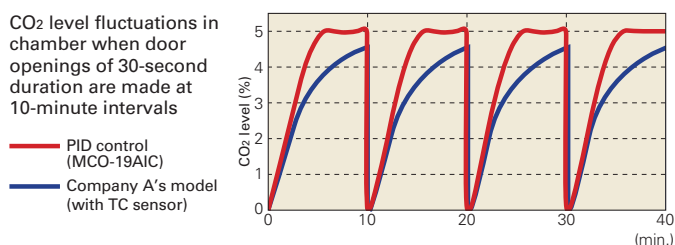
Panasonic's Infrared CO<sub>2</sub> sensor is not affected by changes in temperature or humidity. It utilizes a ceramic heater instead of flashing bulbs or chopper motors. The long reliable life of our sensor is achieved by not using any mechanical or moving parts.

Maintaining uniform CO<sub>2</sub> levels is assured even with frequent incubator door openings.

CO<sub>2</sub> level recovery characteristics (door open for 30 seconds)



CO<sub>2</sub> level fluctuations in chamber when door openings of 30-second duration are made at 10-minute intervals



### Improved Temperature Stability with D.H.A. System

(Except MCO-175/80IC)



Direct Heat and Air Jacket Heating System  
U.S. Patent 5519188

The patented Direct Heat and Air Jacket™ conditioning system precisely regulates temperature through three independent heating zones under microprocessor PID control. Uniform temperatures are further enhanced by gentle fan circulation.

- The main heater provides precise temperature control.
- The bottom heater warms the distilled water and controls chamber humidity.
- The outer door heater prevents condensation on the inner door and facilitates quick temperature recovery after door openings.

## Easy Maintenance

### Auto Calibration (MCO-18AC/20AIC)

The microprocessor will automatically "Zero" the incubator using room air as a reference. This feature will maintain an accurate CO<sub>2</sub> control without worrying about CO<sub>2</sub> drift. (Dual IR sensor system used in MCO-19AIC/19M requires no zero calibration.)

### Automatic Setup

By turning on the power and simply entering the temperature and CO<sub>2</sub> setpoints into the unit you can walk away while the microprocessor takes over. The unit will attain setpoint and adjust itself to your required parameters.

### Rounded Corners

The interior chamber is constructed of Copper Alloy stainless steel with rounded corners. All plenums, shelves, brackets and standard humidity pan are removable without the use of tools. These design features provide an interior that is easily cleaned to reduce chances of contamination.

## For Superior Usability

### Field-reversible Door

The reversible door allows right or left opening depending on the installation space and how other peripheral equipment are positioned. Each corner of the door has a special grip for easier opening.

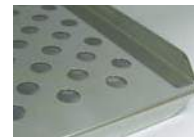


MCO-19AIC

### Shelves Provide Easier Access to Culture Containers

(MCO-18AC/19AIC/20AIC/19M)

Much more convenience has been obtained by slanting downward the bending direction of the front of the shelves. As a result, putting in and taking out culture containers like dishes and micro plates have become extremely easy.



### Water Level Sensor

The humidity pan has an optical water level sensor to warn of a low water level.



### Automatic CO<sub>2</sub> Cylinder Switchover System (option)

This system automatically switches from the primary to secondary gas cylinder when a CO<sub>2</sub> gas level drop in the chamber is detected. The in-use gas cylinder is confirmed on the control panel.

### Inner Door and Gasket

The inner design is critical to successful contamination control technique. The inner gasket body forms an effective thermal transition between the ambient air and warm, humidified incubator atmosphere, minimizing condensation and eliminating moisture traps which can harbor contaminants.



MCO-19M

### Stackable Design Takes Up Less Space

By simply using the fixing metal supplied as a standard accessory, two\*<sup>1</sup> or three\*<sup>2</sup> units can be stacked according to available space and usage. This configuration is also cost-effective.

\*<sup>1</sup> MCO-5AC/18AC/19AIC/20AIC/175/5M/19M

\*<sup>2</sup> MCO-5AC/5M



MCO-19AIC

MCO-5AC

**CO<sub>2</sub> Incubator with Water Jacketed System for Stable Temperature Environment**

**Water Jacketed System**

The large size MCO-175 model incorporates a water jacketed system which takes advantage of the heat retention characteristics of water. Because there is no sudden temperature change or loss of temperature during power failure, a stable temperature environment is ensured.

**PID control plus chamber direct sensing system maintains a high-precision temperature environment.**

Through the combination of a PID (Proportional, Integrated and Differential) control system for ultra-precise temperature control and a cabinet-air sensing system which accurately monitors inside temperature, this model exhibits exceptional precision within ±0.1 degree of the preset temperature. For the temperature sensor, a durable, ultra-precise PT sensor (Pt 100W) is used.

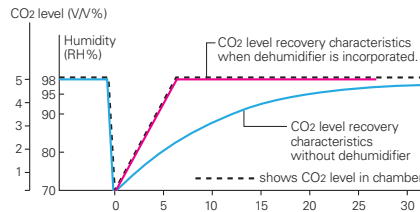
**Automatic stop mechanism for fan motor and CO<sub>2</sub> valve**

With this mechanism, the fan motor and CO<sub>2</sub> valve are automatically stopped when the door is opened. This prevents air flow from the chamber and prevents air contamination due to the mixing of air.

**Automatic control door heater**

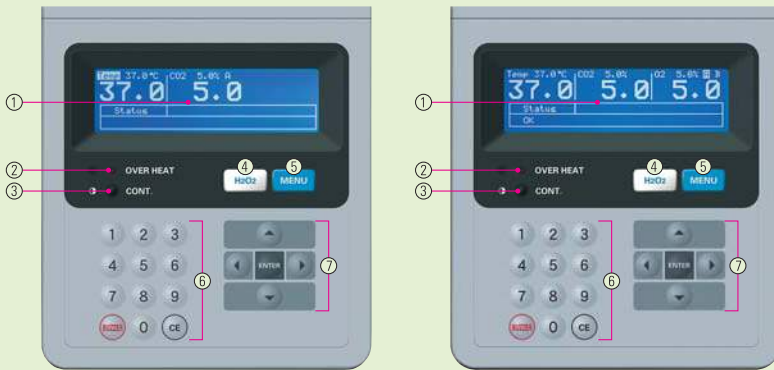
The inside door incorporates a door heater that is interlocked with the temperature adjuster for automatic control. This prevents temperature differences between the chamber and the inner door, thereby preventing dew condensation on the inner door.

**Thorough pursuit of high-precision cultivation**



**CO<sub>2</sub> level recovery characteristics**  
(initial value of chamber: 37°C, 99% RH, 5% CO<sub>2</sub> level)  
(Ambient condition: 20°C, 70% RH)  
*A compact electronic dehumidifier plus a thermal conductivity CO<sub>2</sub> sensor produces a high-precision CO<sub>2</sub> environment*

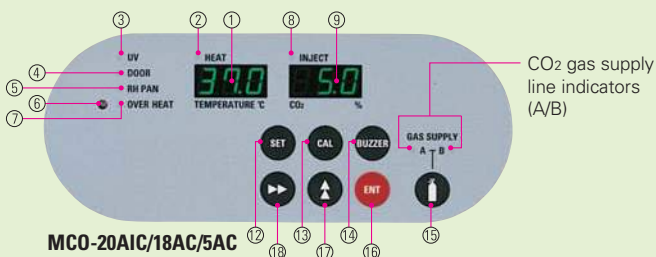
**Control Panels**



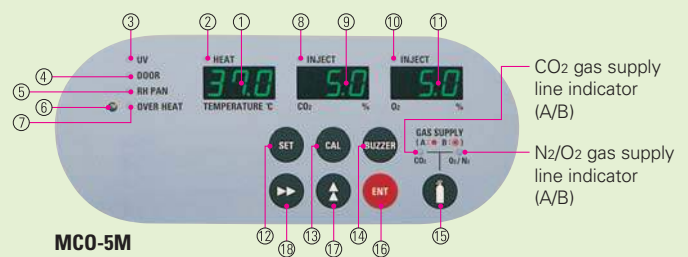
MCO-19AIC

MCO-19M

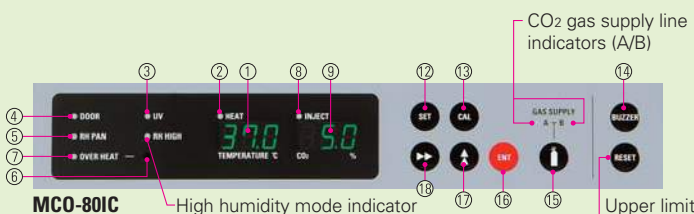
- ① Digital alphanumeric LCD display.  
Message display  
Pop-up menu
- ② Overheat indicator
- ③ Display contrast adjustment
- ④ H<sub>2</sub>O<sub>2</sub> decontamination sequence start key
- ⑤ Menu call button
- ⑥ Positive feedback tactile input buttons
- ⑦ Positive feedback tactile entry and function keys



MCO-20AIC/18AC/5AC



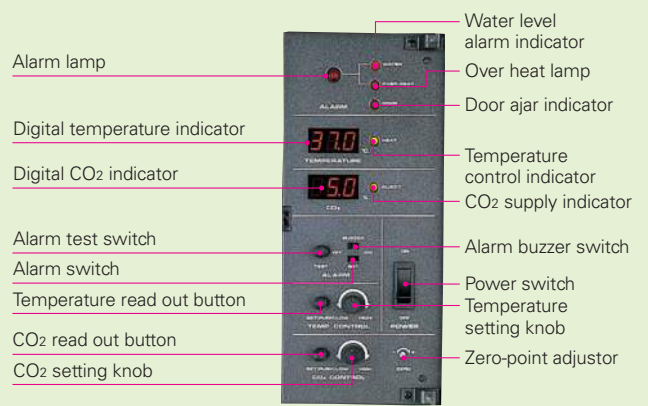
MCO-5M



MCO-80IC

- ① Digital temperature indicator
- ② Heater lamp
- ③ UV indicator
- ④ Door lamp
- ⑤ Water level alarm lamp
- ⑥ Upper limit regulator
- ⑦ Over heat lamp
- ⑧ CO<sub>2</sub> inject lamp
- ⑨ Digital CO<sub>2</sub> density indicator
- ⑩ O<sub>2</sub> inject lamp
- ⑪ Digital O<sub>2</sub> density indicator
- ⑫ Set key
- ⑬ Calibration key
- ⑭ Alarm buzzer stop key
- ⑮ Gas supply line switching key\*
- ⑯ Enter key
- ⑰ Numeric shift key
- ⑱ Digital shift key

\*When a changeover accessory is installed.



MCO-175

## MCO-20AIC

### Large capacity, full-function

- Continuous contamination control with inCu saFe interior and SafeCell UV technologies
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Precise CO<sub>2</sub> control and immediate recovery with infrared sensor.
- Double stackable
- Field-reversible door

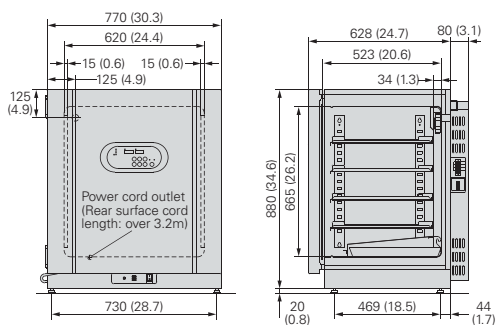


CO<sub>2</sub> level: **0 — 20%**

Temperature: Ambient temp. **+5°C — 50°C**

Interior volume: **215L (7.6 cu.ft.)**

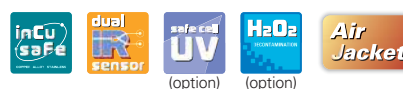
#### Dimensions [Unit : mm (inch)]



## MCO-19AIC

### Most complete solution

- Continuous contamination control with inCu saFe interior and SafeCell UV (option) technologies.
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Precise CO<sub>2</sub> control and immediate recovery with new dual infrared sensor.
- Panasonic unique H<sub>2</sub>O<sub>2</sub> Decontamination System
- LCD Graphical Controller/Display, Door Mounted
- Double stackable
- Field-reversible door

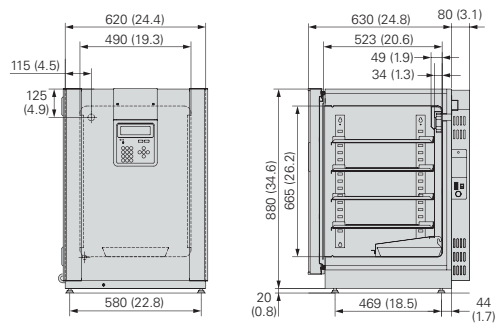


CO<sub>2</sub> level: **0 — 20%**

Temperature: Ambient temp. **+5°C — 50°C**

Interior volume: **170L (6.0 cu.ft.)**

#### Dimensions [Unit : mm (inch)]



## MCO-18AC

### Accurate & Reliable

- Continuous contamination control with inCu saFe interior and SafeCell UV (option) technologies
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Double stackable
- Field-reversible door

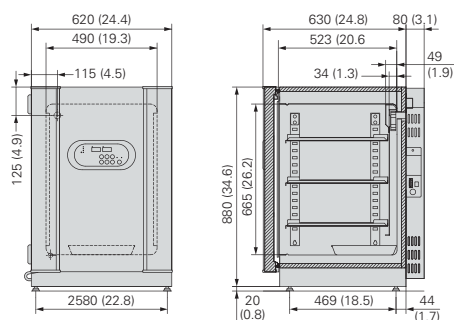


CO<sub>2</sub> level: **0 — 20%**

Temperature: Ambient temp. **+5°C — 50°C**

Interior volume: **170L (6.0 cu.ft.)**

#### Dimensions [Unit : mm (inch)]



## MCO-5AC

### Personal type

- Continuous contamination control with inCu saFe interior and SafeCell UV (option) technologies.
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Accurate CO<sub>2</sub> control & recovery characteristics
- Compact, triple stackable
- Field-reversible door

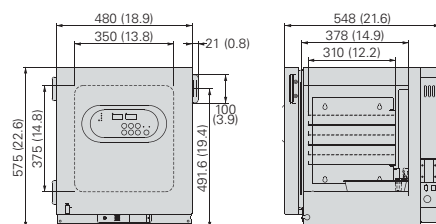


CO<sub>2</sub> level: **0 — 20%**

Temperature: Ambient temp. **+5°C — 50°C**

Interior volume: **49 L (1.7 cu.ft.)**

#### Dimensions [Unit : mm (inch)]



## MCO-80IC

### Reach-in design

- Continuous contamination control with inCu saFe interior and SafeCell UV (option) technologies.
- Large capacity cabinet allows flexibility in usage.
- Full view, double paned glass door allows easy observation of cultured samples.
- Forced air surrounding chamber allows uniform temperature distribution with no temperature gradients.
- Precise CO<sub>2</sub> control and immediate recovery with infrared sensor.
- Unique door heater system prevents condensation.
- Cabinet can accommodate a roller bottle apparatus.

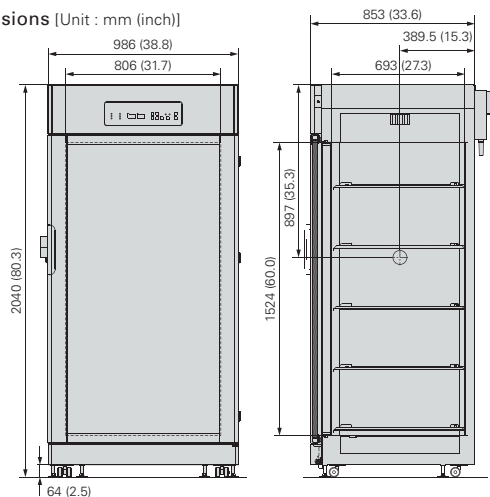


CO<sub>2</sub> level: **0 — 20%**

Temperature: Ambient temp. **+5°C — 50°C**

Interior volume: **851 L (30.1 cu.ft.)**

Dimensions [Unit : mm (inch)]



## MCO-175

### Water jacket type

- Water jacket heating system
- Accurate temperature and CO<sub>2</sub> control & recovery characteristics
- Double stackable



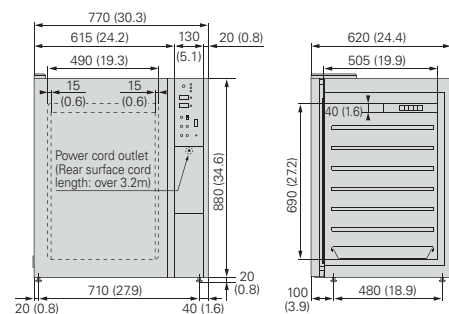
**Water Jacket**

CO<sub>2</sub> level: **0 — 20%**

Temperature: Ambient temp. **+5°C — 50°C**

Interior volume: **170L (6.0 cu.ft.)**

Dimensions [Unit : mm (inch)]





## MCO-19M

### Most sophisticated solution

- Continuous contamination control with inCu saFe interior and SafeCell UV (option) technologies.
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Precise CO<sub>2</sub> control and immediate recovery with new dual infrared sensor.
- LCD Graphical Controller/Display, Door Mounted
- Easy-to-access double inner door system
- Double stackable
- Field-reversible door

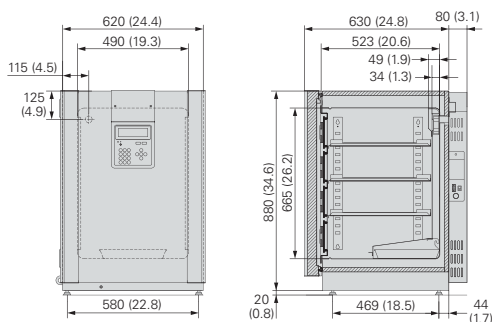


CO<sub>2</sub> level: **0 – 20%** O<sub>2</sub> level: **1 – 18%, 22–80%**

Temperature: Ambient temp. **+5°C – 50°C**

Interior volume: **170 L (6.0 cu.ft.)**

#### Dimensions [Unit : mm (inch)]



## MCO-5M

### Personal type

- Continuous contamination control with inCu saFe interior and SafeCell UV (option) technologies
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Preventive contamination control
- Compact design
- Triple stackable
- Field-reversible door

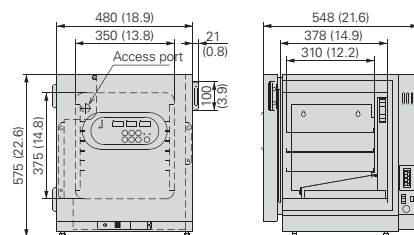


CO<sub>2</sub> level: **0 – 20%** O<sub>2</sub> level: **1 – 18%, 22–80%**

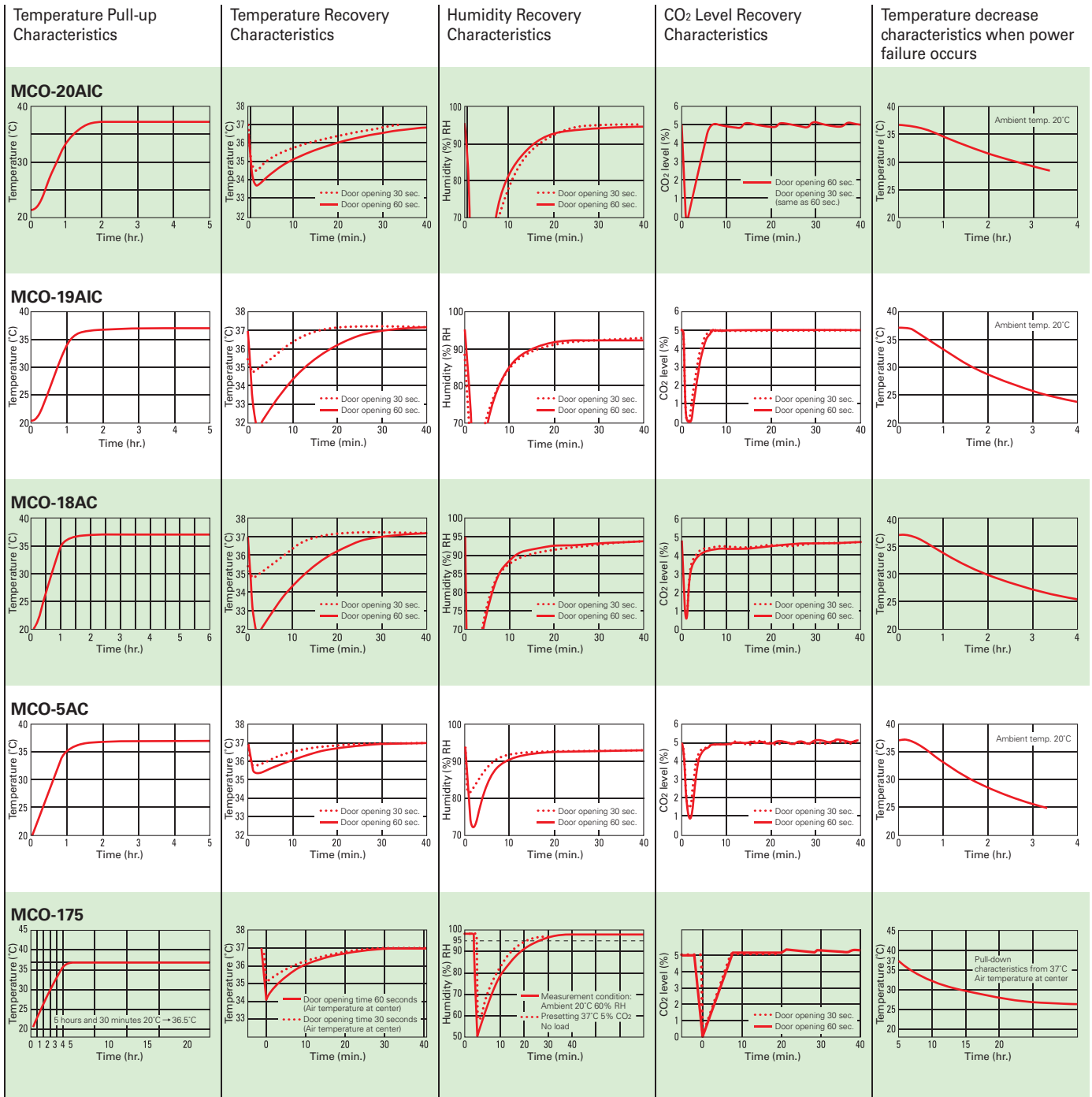
Temperature: Ambient temp. **+5°C – 50°C**

Interior volume: **49 L (1.7 cu.ft.)**

#### Dimensions [Unit : mm (inch)]



CO<sub>2</sub> Incubators



Optional Accessories

2 different models can be stacked\* according to usage.

\*Stacking kit (optional metal tool and spacer) are required. For more details, see tables on the right.



Stacking example  
Top (MCO-19-AIC)  
Bottom (MCO-20AIC)

Stacking Kits

Lower unit	Upper unit	MCO-175	MCO-18AC/19AIC/19M	MCO-20AIC	MCO-5AC/5M
MCO-175	MCO-175SB-PW	MCO-18SB-PW	(Standard)*1	—	—
MCO-18AC/19AIC/19M	—	—	—	(Standard)*2	—
MCO-20AIC	—	MCO-21SB-PW	—	—	—
MCO-5AC/5M	—	—	—	—	(Standard)

\*1: 0.5 kit is included and fixed under rear cover of MCO-18AC/19AIC/19M.  
\*2: 0.5 kit is included and fixed under rear cover of MCO-20AIC.

Panasonic DAQ Systems

Monitoring Features

Integrated remote monitoring system for Panasonic biomedical products (optional)

Panasonic Data Acquisition Software MTR-5000-PW

This software is fully compatible with MCO-5AC, 18AC, 19AIC, 20AIC, 80IC, 5M and 19M. It allows data transfer between these models and a PC.

Ethernet (LAN) Interface MTR-L03-PW or Interface board MTR-480-PW

Exclusive option for Panasonic biomedical products RS232C and RS485, for easy installation



Roller base  
MCO-20RB-PW



inCu saFe  
shelf and brackets  
MCO-46ST



Half tray  
MCO-25ST-PW



CO<sub>2</sub> gas pressure  
regulator  
MCO-100L-PW

Equipping an MCO-100L per unit is recommended.

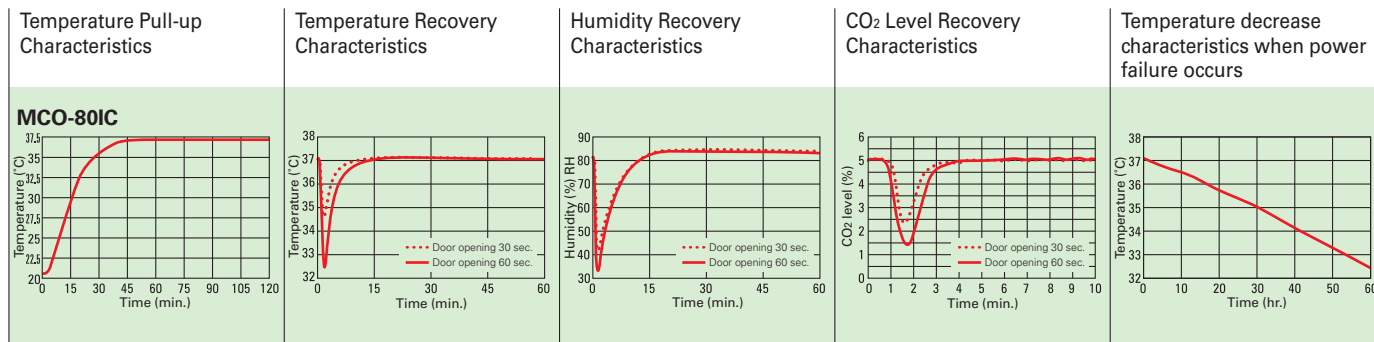


Stand  
MKD-300T

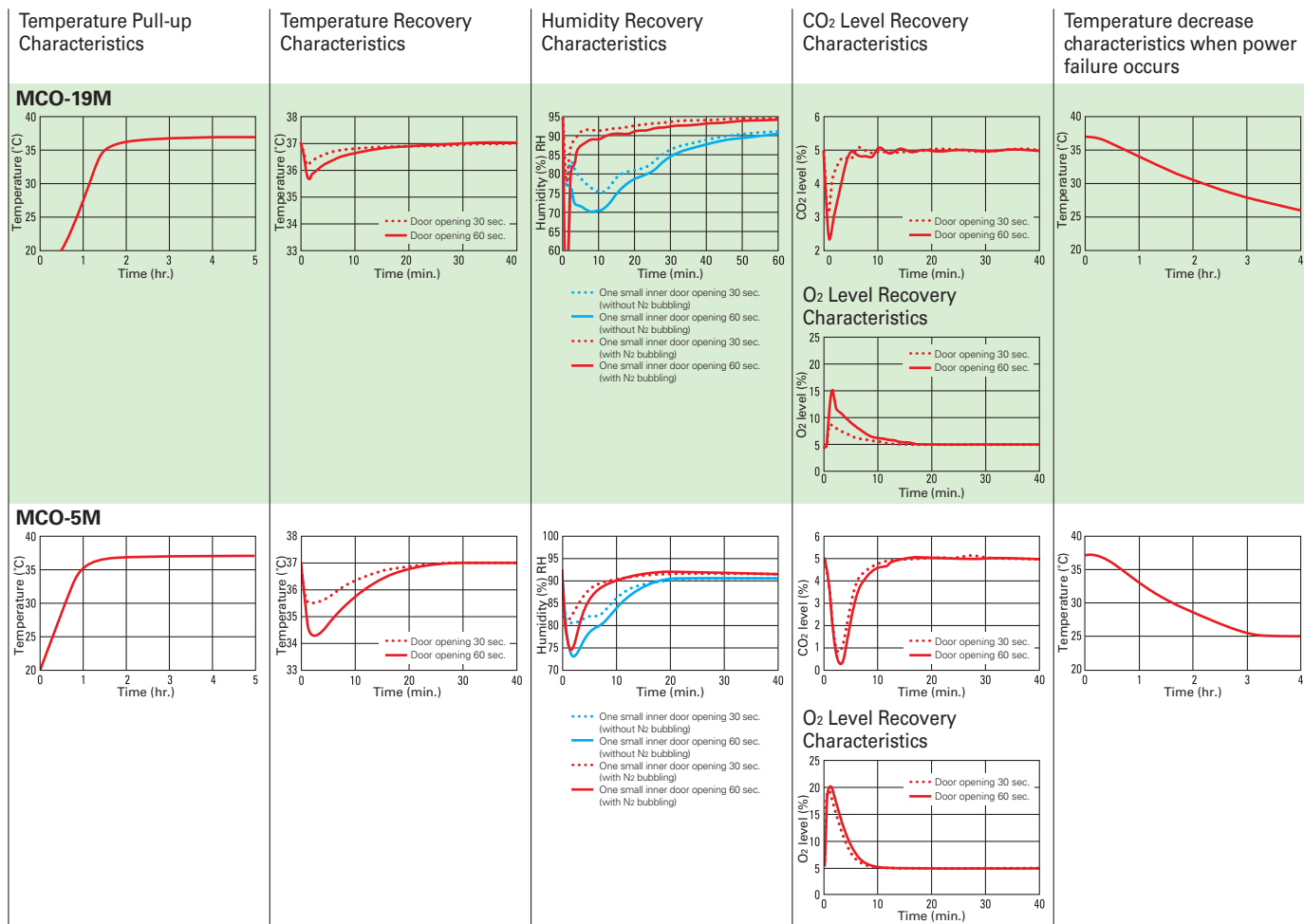


Stackable stand  
for 2 units  
MKD-150T

## Reach-in CO<sub>2</sub> Incubator



## O<sub>2</sub>/CO<sub>2</sub> Incubators



	MCO-175	MCO-18AC	MCO-19AIC/19M	MCO-20AIC	MCO-5AC/5M	MCO-80IC
Roller base	—	—	MCO-18RB-PW	MCO-20RB-PW	MCO-5RB-PW	—
Individual small door	(Standard)	—	(Standard for 19M)	MCO-20ID-PW	—	MCO-80ID-PW
Extra shelf and brackets	MCO-46ST	—	MCO-47ST-PW	MCO-58ST-PW	MCO-30ST-PW	MCO-80ST-PW
Half tray	—	MCO-25ST-PW		MCO-35ST-PW	—	—
CO <sub>2</sub> /N <sub>2</sub> pressure regulator	—	MCO-100L-PW				—
Water preservative agent	MCO-100C	—	—	—	—	—
Recorder (CO <sub>2</sub> & Temp.)	MCO-101TR*1	—	—	—	—	—
Panasonic DAQ system	—	MTR-5000-PW/MTR-L03-PW or MTR-480-PW				—
Automatic CO <sub>2</sub> Cylinder Changeover System	—	—	MCO-21GC-PW	—	MCO-5GC-PW	MCO-80GC-PW
Semi-automatic one point Gas Calibration kit	—	—	MCO-SG-PW	—	—	—
UV system kit	—	MCO-18UVS3-PE*2/PK*3	MCO-19UVS-PE*2/PK*3	—	MCO-19UVS-PE*2/PK*3	MCO-80UVS-PE*2/PK*3
UV lamp replacement kit	—	—	MCO-20UV-PW			—
4-20mA Interface	—	—	—	MCO-420MA-PW		—
Stand	MKD-300T	—	MCO-50T-PW	MKD-300T	—	—
Stackable stand for 2 units	MKD-200T-PW	—	MKD-150T/200T-PW	MKD-200T-PW		—
Roller bottle mounting kit	—	—	—	—	—	MCO-80RBS-PW
Automated water supply system kit	—	—	—	—	—	MCO-80AS-PW
Exclusive H <sub>2</sub> O <sub>2</sub> Decontamination kit	—	—	MCO-HL-PE*2	—	—	—
H <sub>2</sub> O <sub>2</sub> Vapor Generator	—	—	MCO-HP-PW	—	—	—
Exclusive H <sub>2</sub> O <sub>2</sub> Decontamination Reagent	—	—	MCO-H2O2-PE*2/PV*4	—	—	—

\*1 Chart paper: RP-CO, Pen: Cartridge \*2 EU only [230V, 50Hz (CE)] \*3 Korea only [220V, 60Hz] \*4 Except for EU countries

# Specifications

Model No.	CO <sub>2</sub> Incubators						O <sub>2</sub> /CO <sub>2</sub> Incubators		
	MCO-20AIC	MCO-19AIC	MCO-5AC	MCO-18AC	MCO-175	MCO-80IC	MCO-19M	MCO-5M	
<b>Exterior dimensions (W x D x H)</b>	770 x 708 x 900 (mm) 30.3 x 27.9 x 35.4 (inch)	620 x 710 x 900 (mm) 24.4 x 27.9 x 35.4 (inch)	480 x 548 x 575 (mm) 18.9 x 21.6 x 22.6 (inch)	620 x 710 x 900 (mm) 24.4 x 27.9 x 35.4 (inch)	770 x 620 x 900 (mm) 30.3 x 24.4 x 35.4 (inch)	986 x 853 x 2040 (mm) 38.8 x 33.6 x 80.3 (inch)	620 x 710 x 900 (mm) 24.4 x 27.9 x 35.4 (inch)	480 x 548 x 575 (mm) 18.9 x 21.6 x 22.6 (inch)	
<b>Interior dimensions (W x D x H)</b>	620 x 523 x 665 (mm) 24.4 x 20.6 x 26.2 (inch)	490 x 523 x 665 (mm) 19.3 x 20.6 x 26.2 (inch)	350 x 378 x 375 (mm) 13.8 x 14.9 x 14.8 (inch)	490 x 523 x 665 (mm) 19.3 x 20.6 x 26.2 (inch)	490 x 505 x 690 (mm) 19.3 x 19.9 x 27.2 (inch)	806 x 693 x 1524 (mm) 31.7 x 27.3 x 60.0 (inch)	490 x 523 x 665 (mm) 19.3 x 20.6 x 26.2 (inch)	350 x 378 x 375 (mm) 13.8 x 14.9 x 14.8 (inch)	
<b>Interior volume</b>	215 L / 7.6 cu.ft.	170 L / 6.0 cu.ft.	49 L / 1.7 cu.ft.	170 L / 6.0 cu.ft.	170 L / 6.0 cu.ft.	851L / 30.1 cu.ft.	170 L / 6.0 cu.ft.	49 L / 1.7 cu.ft.	
<b>Net weight</b>	106 kg / 234 lbs.	93 kg / 205 lbs.	49 kg / 108 lbs.	92 kg / 203 lbs.	108 kg / 238 lbs.	275 kg / 606 lbs.	94 kg / 207 lbs.	50 kg / 110 lbs.	
<b>Medical purposes</b>	Culture of cell tissue, organs, embryos								
<b>Temperature</b>	<b>Heating method</b>	Direct Heat & Air Jacket (DHA)				Water Jacket	Heater with fan air circulation, Cross shelf laminar air flow	Direct Heat & Air Jacket (DHA)	
	<b>Temp. control system</b>	Microprocessor PID							
	<b>Temp. range</b>	5°C above ambient temperature to +50°C (Ambient temperature: 5°C to 35°C)							
	<b>Temp. uniformity</b>	±0.25°C*				±0.2°C*	±0.5°C*	±0.25°C*	
	<b>Temp. controllability</b>	±0.1°C*							
<b>CO<sub>2</sub></b>	<b>CO<sub>2</sub> control system</b>	On-Off control	Microprocessor PID	On-Off control			Microprocessor PID		
	<b>CO<sub>2</sub> sensor</b>	Infrared	Dual Infrared	Thermal conductivity			Infrared	Dual Infrared	Thermal conductivity
	<b>CO<sub>2</sub> range</b>	0 to 20%							
	<b>CO<sub>2</sub> controllability</b>	±0.15%*							
<b>O<sub>2</sub></b>	<b>O<sub>2</sub> control system</b>							Microprocessor PID	
	<b>O<sub>2</sub> sensor</b>							Zirconia	
	<b>O<sub>2</sub> range</b>							1 to 18%, 22 to 80%	
	<b>O<sub>2</sub> controllability</b>							±0.2%*	
<b>Humidity</b>	<b>Humidifying system</b>	Natural vaporization with water in humidity pan					*Normal mode: Natural evaporation with humidifying water High humidity mode: heated evaporation with humidifying water	Natural vaporization with water in humidity pan	
	<b>Chamber humidity</b>	95 ±5% RH					Normal mode: Over 80%RH High humidity mode: Over 90%RH	95 ±5% RH	
<b>Shelves</b>	<b>Shelf dimensions (W x D x H)</b>	580 x 450 x 12 (mm) 22.8 x 17.7 x 0.5 (inch)	450 x 450 x 12 (mm) 17.7 x 17.7 x 0.5 (inch)	310 x 310 x 12 (mm) 12.2 x 12.2 x 0.5 (inch)	450 x 450 x 12 (mm) 17.7 x 17.7 x 0.5 (inch)	450 x 450 x 12 (mm) 17.7 x 17.7 x 0.5 (inch)	776 x 659 x 10 (mm) 30.6 x 25.9 x 0.4 (inch)	450 x 450 x 12 (mm) 17.7 x 17.7 x 0.5 (inch)	310 x 310 x 12 (mm) 12.2 x 12.2 x 0.5 (inch)
	<b>Shelf material</b>	Copper-enriched stainless steel					Copper alloy stainless steel	Copper-enriched stainless steel	
	<b>Maximum load</b>	5 kg / 11 lbs. per shelf	7 kg / 15.4 lbs. per shelf	4 kg / 8.8 lbs. per shelf	7 kg / 15.4 lbs. per shelf		30 kg / 66.1 lbs. per shelf	7 kg / 15.4 lbs. per shelf	4 kg / 8.8 lbs. per shelf
	<b>Shelves</b>	5 Standard, 15 Max.	4 Standard, 15 Max.	3 Standard, 6 Max.	3 Standard, 15 Max.	6 Standard, 19 Max.	5 (standard)	3 Standard, 15 Max.	3 Standard, 6 Max.
<b>Contamination control</b>	<b>Interior surface</b>	Copper-enriched Stainless Steel				Stainless Steel	Copper-enriched stainless steel (except humidifying pan)	Copper-enriched Stainless Steel	
	<b>UV lamp (ozone-free)</b>	Standard	Option	Option	Option	—	Option	Option	
	<b>H<sub>2</sub>O<sub>2</sub> decontamination cycle</b>	—	Option	—	—	—	—	Option	—
<b>Water level sensor</b>	Optical type					—	Thermal type	Optical type	
<b>Access port</b>	30mm (1.2") diameter					40mm (1.6") diameter, Two locations, each on both sides		30mm (1.2") diameter	
<b>Air filter</b>	0.3µm, Efficiency: 99.97% (for CO <sub>2</sub> )								
<b>Alarm system</b>	<ul style="list-style-type: none"> <li>High/low temperature</li> <li>CO<sub>2</sub> density</li> <li>Door ajar</li> <li>Water level</li> <li>Independent overheat protection</li> </ul>	<ul style="list-style-type: none"> <li>High/low temperature</li> <li>CO<sub>2</sub> density</li> <li>Door ajar</li> <li>UV lamp failure</li> <li>Water level</li> <li>Independent overheat protection</li> </ul>	<ul style="list-style-type: none"> <li>High/low temperature</li> <li>CO<sub>2</sub> density</li> <li>Door ajar</li> <li>Water level</li> <li>Independent overheat protection</li> <li>Power failure</li> </ul>	<ul style="list-style-type: none"> <li>High/low temperature</li> <li>CO<sub>2</sub> density</li> <li>Door ajar</li> <li>Water level</li> <li>Independent overheat protection</li> </ul>	<ul style="list-style-type: none"> <li>High/low temperature</li> <li>CO<sub>2</sub>/O<sub>2</sub> density</li> <li>Door ajar</li> <li>UV lamp failure</li> <li>Water level</li> <li>Independent overheat protection</li> </ul>				
<b>Remote alarm contacts</b>	30V DC, 2A allowable								

## Voltage specification by destination

Representative destination	Voltage	MCO-20AIC-PE	MCO-19AIC-PE	MCO-5AC-PE	MCO-18AC-PE	MCO-175-PE	MCO-80IC-PE	MCO-19M-PE	MCO-5M-PE
Europe	230V, 50Hz (CE)								
Korea	220V, 60Hz	MCO-20AIC-PK	MCO-19AIC-PK	MCO-5AC-PK	MCO-18AC-PK	—	MCO-80IC-PK	MCO-19M-PK	MCO-5M-PK
Thailand	220V, 50Hz	MCO-20AIC-PB	MCO-19AIC-PB	MCO-5AC-PB	MCO-18AC-PB	—	—	MCO-19M-PB	MCO-5M-PB
Taiwan	110V/220V, 60Hz	MCO-20AIC-PT	MCO-19AIC-PT	MCO-5AC-PT	MCO-18AC-PT	—	—	MCO-19M-PT	MCO-5M-PT

### \* Conditions

Ambient temperature: 25°C, Temperature setting: 37°C, CO<sub>2</sub> level setting: 5%, no load

Caution: For using the equipment at altitudes higher than 1,000m, the standard outer glass door must be replaced with a specific glass door. Please consult your Panasonic sales representative or agent for more information and to arrange airfreighting if required. Use of equipment in the chamber will require AC power from an external outlet. Panasonic guarantees the product under certain warranty conditions. Panasonic in no way shall be responsible for any loss of content or damage to content.

• Appearance and specifications are subject to change without notice.



Panasonic Healthcare Co., Ltd., Gunma Factory is certified for:  
**Quality management system: ISO9001**  
**Medical devices quality management system: ISO13485**



Panasonic Healthcare Co., Ltd., Gunma Factory is certified for:  
**Environmental management system: ISO14001**

DISTRIBUTED BY:

# Panasonic®

<http://biomedical.sanyo.com/>