Panasonic

CO_2 / Multigas Cell Culture Incubators

Panasonic... the new name for SANYO

MCO-19AIC / MCO-19M

A secure environment for delicate cells

Securing samples, changing lives

The industry's most complete cell culture solution for research, clinical and regulated applications.

Now with safe, effective and documented three-hour in situ H_2O_2 decontamination option for fastest turn- around and maximum availability.

Ideal for Regulated or Sensitive Applications

Advanced performance and design allows the MCO-19AIC and MCO-19M to be used with confidence in high-value cell protocols among hard-to-grow cell lines, cells highly sensitive to contamination, ultra-sensitive media and reagents, or protocols that require a strict isolation and decontamination between processes.

These include:

- **Stem cell research**
- **Autologous tissue regeneration & regenerative medicine**
- **In vitro fertilization**
- **Genomic and proteomic expression**
- **Esoteric plant and amphibian cell culture**
- **Hypersensitive and transgenic cell culture**
- **Low media volume microplate work**

Decontamination

The unique H_2O_2 decontamination option limits downtime to less than three hours when total chamber decontamination with verification is desired. All interior components and gas sampling loops are decontaminated in situ. There is no need to remove or replace critical components.

Active Background Contamination Control fights contamination while cell culture protocols are in process. The patented SafeCell UV treats interior airflow to destroy airborne and humidity pan contaminants.

Exclusive InCu saFe® copper-enriched stainless steel interior surfaces assure constant germicidal protection.

Control and Monitoring

- The control and information centre features a multi-function LCD with intuitive pop-up menu for straight-forward programming of set-points, alarms and controller functions. The LCD displays set-points, actual performance and incubator status at-a-glance.
- Precise PID control logic provides stable CO_2, O_2, temperature and humidity conditions.
- Multi-point data logging offers push-button graphical display. An optional PC interface permits remote transmission for GMP/GLP protocols as required.

Model	MCO-19AIC(UV)	MCO-19AIC	MCO-19M
Major Operating Systems			
H_2O_2 Decontamination System	Optional	Optional (also requires SafeCell UV)	Optional (also requires SafeCell UV)
SafeCell UV System	Standard	Optional	Optional
InCu saFe® Copper Enriched Stainless Steel Interior	Standard	Standard	Standard
Single Beam, Dual Detector IR CO_2 Sensor	Standard	Standard	Standard
Direct Heat & Air Jacket (DHA) Heating System	Standard	Standard	Standard
LCD Graphical Controller/Display, Door Mounted	Standard	Standard	Standard

CO_2 and O_2 Control

Panasonic proprietary singlebeam, dual detector infrared CO_2 sensor delivers precise CO_2 control, quick recovery following door openings and auto sampling with no moving parts. Along with a zirconia O_2 sensor for the MCO-19M, a PID control is used for fast O_2 level control.

- Continuous auto-zero calibration is standard.
- An optional semi-automatic, one-point span calibration system is available. (See Options)

Temperature and Humidity Control

- The patented Direct Heat and Air Jacket conditioning system precisely regulates temperature through multiple heating zones under microprocessor control.
- The humidity pan is easy to fill, easy to clean and the automatic optical sensor advises of low water level.

Cabinet Design

- The 170 litre capacity incubator is stackable with field-reversible doors.
- Interior components and adjustable shelves are configured for easy access.
- The MCO-19M has a newly-designed middle door with Small Doors as standard.

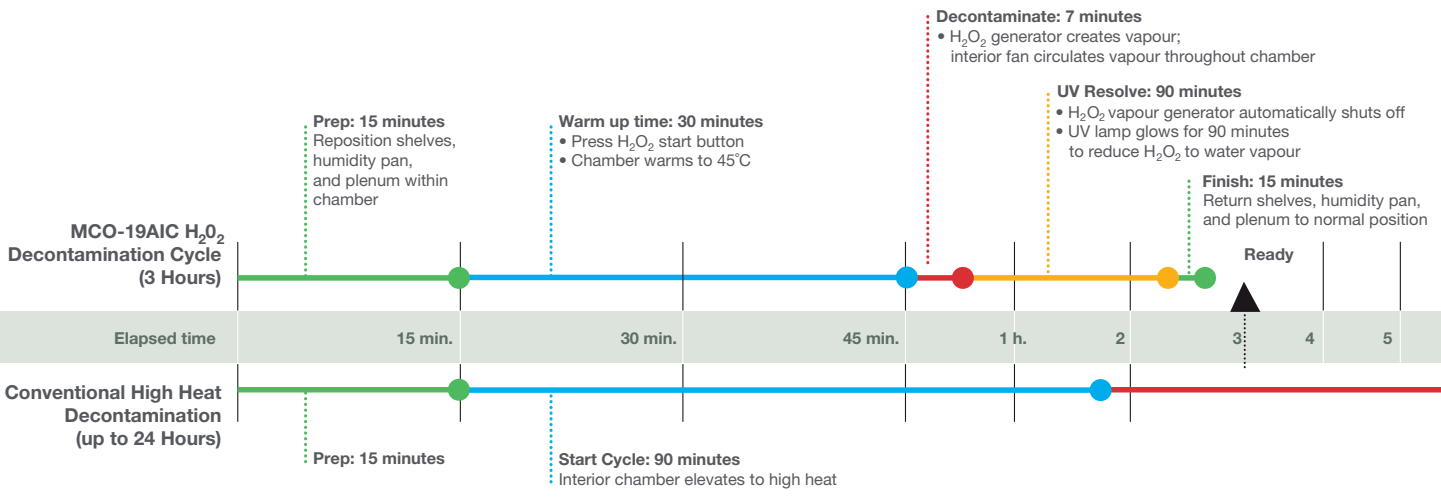
Decontamination

Continuous Active Background Contamination Control fights contamination while cell culture protocols are in process without downtime or compromise to the incubator's performance. The patented SafeCell UV treats interior airflow to destroy airborne and humidity pan contaminants and InCu saFe® copper-enriched stainless steel interior surfaces assure constant germicidal protection. When total chamber decontamination with verification is required, the unique H_2O_2 decontamination option limits downtime to less than three hours.

Hydrogen Peroxide Vapour Decontamination
The use of low temperature H_2O_2 sterilisation in biological safety cabinets and barrier isolators is a popular alternative to ethylene oxide (EtO) as a safer, more efficient decontamination method. H_2O_2 has long been widely used in the pharmaceutical industry and in aerospace research. H_2O_2 is used to sterilise satellites and interplanetary exploration probes.

The MCO-19 Design Permits Safe and Effective H_2O_2 Decontamination
Unlike conventional incubators, the unique design features of the MCO-19AIC permit the safe use of H_2O_2 decontamination in situ with zero impact on adjacent equipment or the environment, and relative speed to return the incubator to service.

- The H_2O_2 decontamination process functions with the patented Panasonic SafeCell UV system. Following a seven minute H_2O_2 vaporization, circulation and dwell cycle, the vaporization is stopped and the SafeCell UV lamp turned ON for 90 minutes.
- When exposed to UV light the H_2O_2 vapour breaks down into water vapour and oxygen. Throughout the entire cycle the MCO-19AIC airflow system continues to gently circulate interior air assuring 100% vapour contact with all interior surfaces and ultimately breaking down the H_2O_2 vapour as it passes over the UV lamp.
- The location of the interior sample ports of the single beam, dual detector IR CO_2 sensor creates a slight Venturi flow through the sensor permitting total decontamination of the CO_2 system at the same time.
- Shape and placement of interior components such as shelves, shelf brackets, plenum covers and the humidity tray permit the components to remain inside the MCO-19AIC during the decontamination process, conveniently by passing the need for a separate autoclave cycle.
- Once the cycle is complete, the door locking system is released; the door can be opened, interior components repositioned and the incubator is returned to service.
- The H_2O_2 decontamination cycle is monitored for safety and cycle status. A physical door interlock and H_2O_2 neutralization sequence assures total decontamination and operator safety.



Incubator configured for decontamination sequence.
Interior components are reoriented for in situ decontamination. The H_2O_2 generator is placed on the rear floor. The incubator fan gently circulates vapourized H_2O_2 during the vaporization phase, decontaminating all interior surfaces. Following the vaporization cycle the UV lamp reduces H_2O_2 to trace decontaminated water. Incubator configured for decontamination. Generator receptacle is built-in and capped when not in use.

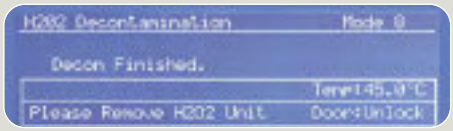
Decontamination Cycle

The H_2O_2 decontamination cycle is monitored for safety and cycle status. A physical interlock and neutralization sequence assures total decontamination and operator safety.

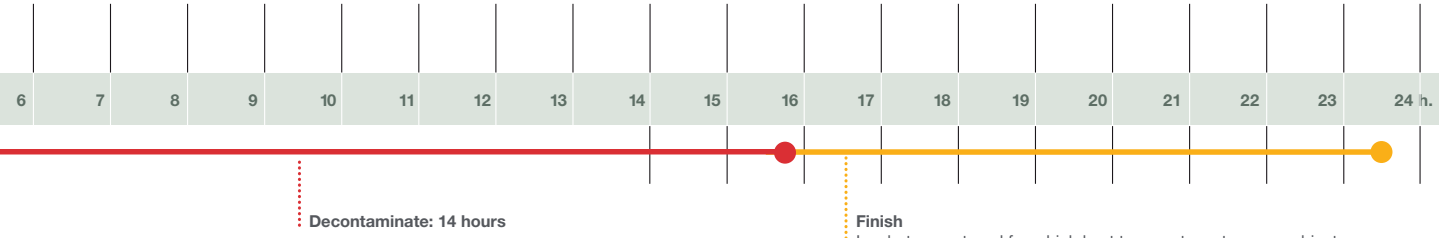
1. Start Cycle: When the H_2O_2 button is pressed a confirming message prompts the user to proceed with the decontamination cycle or cancel.

2. H_2O_2 Vapour Cycle: Once the door locks automatically, the cycle starts. The flashing H_2O_2 display confirms the process and counts down remaining H_2O_2 vaporization time.

3. UV Resolution: The H_2O_2 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_2O_2 is reduced to water and trace oxygen.



4. Cycle Complete: When the cycle is complete the door lock releases automatically. The H_2O_2 generator and cable can be disconnected and removed and all interior components restored to their normal position.



Decontaminate: 14 hours

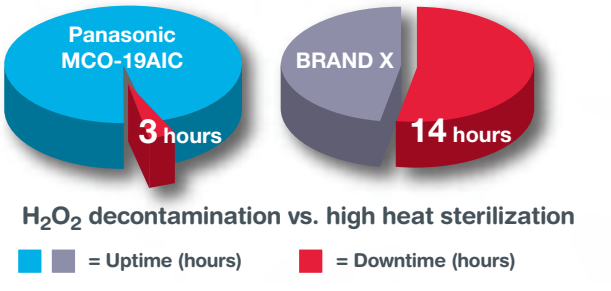
Finish
Incubator must cool from high heat temperatures to near ambient.

H_2O_2 and Ultraviolet Light: The Fastest Combination

A secure environment for delicate cells

The H_2O_2 decontamination process permits quick turn-around of the cell culture incubator from process to process where a complete decontamination is required. Applications include in vitro fertilization, tissue regeneration and other highly specific protocols subject to intense scrutiny or regulation.

The H_2O_2 incubator decontamination system in vitro is an extension of the Panasonic Active Background Contamination Control technique introduced by Panasonic in 2001. Now part of the MCO-19 incubator series, the cell culture CO_2 incubator employs an isolated narrow-bandwidth ultraviolet (UV) light to destroy airborne contaminants in the incubator chamber, as well as water-borne organisms in the humidity water reservoir. Integrated with copper-enriched interior surfaces and components which inhibit the growth of organisms without surface discoloration, the Panasonic incubator offers an optimum cell culture environment which protects cultures in vitro, and minimizes frequent chamber cleaning and downtime.



MCO-19AIC and MCO-19M Performance and Availability Delivers Best Value

The documented 3 hour *in situ* H_2O_2 sequence puts the fully decontaminated MCO-19 incubator series available and ready for use quicker than any other incubator worldwide.

	Panasonic MCO-19AIC / 19M	High Heat Models	Panasonic Benefit
Speed	Minimal planning required. Entire process can be completed in lessthan three hours.	Significant downtime expected. Process can take up to 24 hours from start to finish.	The H_2O_2 system allows decontamination anytime and permits frequent decontamination with validation for high value GMP protocols.
Construction	No special requirements for materials such as metal surfaces, gaskets, outlets, sensors or other interior components.	Requires high-efficiency insulation and gaskets to withstand cyclical decontamination procedures.	Panasonic components are not subjected to stress beyond typical operating conditions.
Convenience	All interior components remain inside the incubator to be decontaminated concurrently with the interior surfaces.	Interior components must be removed and sent to an autoclave for decontamination	The H_2O_2 system reduces preparation time and labor for decontamination process; returns incubator to service faster.
Adjacency	No effect on adjacent incubators or other laboratory appliances, instrumentation or equipment.	Adjacent incubator chamber must be vacated or carefully monitored for temperature increases during high heat cycle.	No need to vacate adjacent incubator or other equipment above, below or aside the MCO-19 series incubators during the decontamination process.
CO_2 / O_2 Sensor	Remains inside chamber. Sensor sampling system is completely decontaminated during cycle.	The CO_2 sensor, HEPA filters and other components must be removed prior to the process, and thoroughly decontaminated or replaced prior to reassembly.	The MCO-19 series CO_2 and optional O_2 sensors use no moving parts and require no recalibration following the decontamination process.
***In Situ* Protection**	Active Background Contamination Control remains in operation, continuously scouring the incubator of airborne and waterborne pathogens that can cause contamination or crosscontamination among cultures.	Heat decontamination offers no passive benefits to protect cell cultures in situ.	The MCO-19 series incubators continue to mitigate contamination during normal operation.

Active Background Contamination Control

Panasonic's Active Background Contamination Control combines narrow bandwidth, ozone-free ultraviolet light and InCu saFe® copper-enriched stainless steel alloy interior to fight contamination whilst the incubator remains in use. The MCO-19AIC is ideal for critical applications where continuous contamination control is essential to cell viability. The incubator offers significant economic benefits by minimising interruptions for decontamination, by improving cell culture growth and expression under stable, repeatable conditions, and by minimising the potential for product loss.

SafeCell UV System

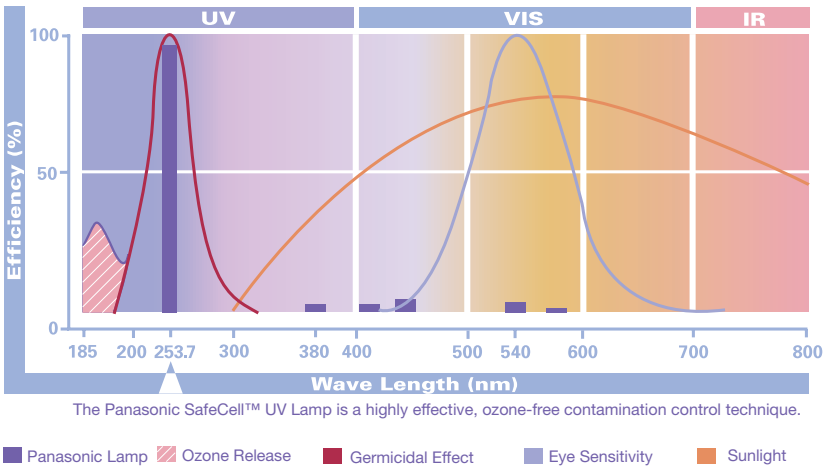
SafeCell UV includes a programmable ultraviolet lamp that decontaminates conditioned air and humidity reservoir water to prevent contamination without affecting cell cultures in vitro.

- SafeCell UV inhibits the growth of mycoplasma, bacteria, molds, spores, yeasts and fungi without costly HEPA filters which accumulate contaminants in the chamber air.
- Positioned at the base of the plenum an isolated beam of high intensity, ozone-free ultraviolet light destroys contaminants, away from active cell cultures.
- Airborne contaminants are eliminated by an automatic UV cycle that automatically turns ON for a specified period after each door opening. Contaminants trapped within the distilled water pan are also destroyed by ultraviolet.
- Sterile, humidified air is released from the lower plenum for vertical convection through and around the perforated shelves. Interior air motion is suspended when the door is opened, minimizing movement of room air contaminants into the chamber.
- The SafeCell UV lamp cycle is factory set for normal use, and can be re-programmed as desired. Program parameters for the H_2O_2 decontamination cycle are non-adjustable for operator safety.

InCu saFe® Construction for Germicidal Protection

Panasonic's exclusive InCu saFe® copper-enriched stainless steel alloy interior surfaces, plenum and shelving eliminate contamination sources and mitigate the effect of airborne contaminates introduced through normal use.

- Selected to provide passive germicidal protection without rust or corrosion, InCu saFe® expresses a natural germicidal effect inhibiting the growth of molds, fungi, mycoplasma and bacteria.
- All interior components, including the air management plenum, shelf supports, and humidity pan and fan assembly are easily removable without tools if required. When components are removed, all interior surfaces are exposed for conventional wipe down.
- Large curve corners and electro-polished surfaces are easy to clean.
- During the H_2O_2 decontamination cycle interior components can be repositioned within the chamber for in situ decontamination.
- An access port (with dual, non-VOC silicone stoppers) accommodates probes or instrumentation leads as required for specialized cell culture protocols.



The Panasonic SafeCell™ UV Lamp is a highly effective, ozone-free contamination control technique.

Mycoplasma Survival Results

Chart summarises test results with four strains of mycoplasma. Results demonstrate how Panasonic InCu saFe® copper-enriched stainless steel alloy offers germicidal properties of conventional C1100 copper while maintaining both corrosion-proof and discoloration-resistant properties of conventional Type 304 stainless steel. Detailed test results are available from Panasonic.

Intelligent Control Interface with Integrated LCD Display

The MCO-19 series incubators are managed by an integrated microprocessor controller with graphical LCD to simplify all incubator functions. The PID controller supervises the incubator's advanced systems to provide stable CO_2, O_2, temperature and humidity conditions complete with alarm, programming, calibration and diagnostic protocols.

- A multi-function, high resolution LCD displays set-points, actual performance and incubator status at-a-glance.
- An intuitive Pop-up menu and function keys provide straight-forward programming of set-points, alarms and controller functions.
- Standard parameters are factory-set for quick start-up, and all parameters can be changed as required.
- Multi-point data logging offers a graphical display of selected performance history.
- Logged parameters can be exported to remote databases, off-site alarm or data capture systems through optional communication boards for GMP/GLP compliance monitoring as required. (See Options)
- A remote alarm terminal mounted at the rear of the incubator can be connected to an external alarm system.
- The control panel is centre mounted in the outer door for easy access and viewing.

Mycoplasma Strain	Positive Control	Conventional Type 304 Stainless Steel	Panasonic InCu®saFe	Conventional Copper C1100
Mycoplasma fermentans PG18	YES	YES	NO	NO
Mycoplasma orale CH19299				
Mycoplasma arginini G230				
Mycoplasma hominis PG21				

Precise Control of Culture Environment

The MCO-19AIC and MCO-19M offer the most stable cell culture environment with outstanding control and recovery performance of temperature, CO_2 and O_2 concentration.

Dual Wavelength Infrared CO_2 Control System

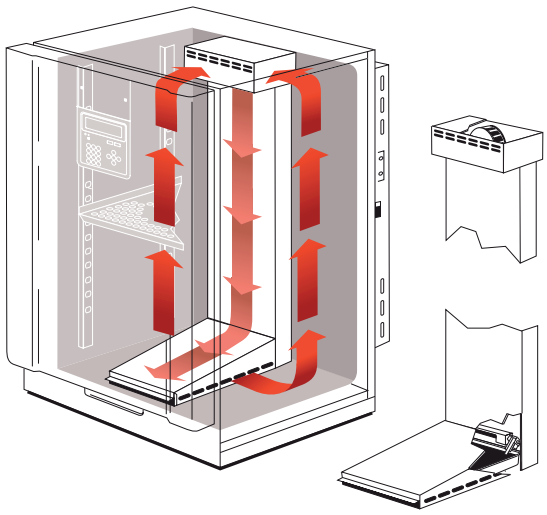
The Panasonic single beam, dual detector infrared CO_2 sensing system offers unprecedented control accuracy and stability by simultaneously measuring sample and reference wavelengths for continuous auto-zero calibration. The ceramic-based sensor is unaffected by moderate changes in temperature and relative humidity and is linked to the sophisticated P.I.D. microprocessor controller. Benefits include ultra-fast recovery without overshoot for optimum CO_2 control during periods of frequent incubator door openings.

- No moving parts for reliable operation.
- Sensor remains in situ during H_2O_2 and background UV decontamination.
- Set and actual CO_2 levels are displayed on the LCD display.
- An optional semi-automatic, one-point span calibration system is available. (See Options)
- A CO_2 sample port mounted on the incubator front also permits convenient confirmation of chamber CO_2 density.
- An optional automatic CO_2 cylinder switchover system is available. (See Options)

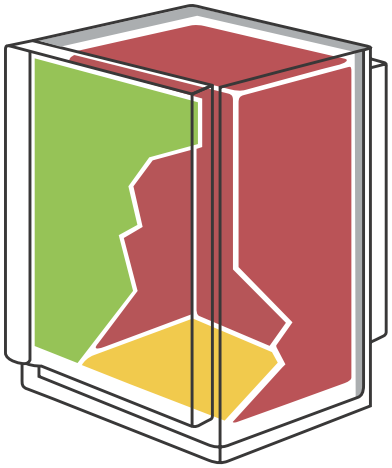
MCO-19M O_2 Control System

In addition to precise CO_2 control, the MCO-19M Series incubator delivers exceptional O_2 control in support of cell culture processes which require below- or above ambient oxygen levels.

- A zirconia oxygen sensor maintains sub-ambient O_2 levels from 1% to 18%. Additionally, enriched O_2 levels from 22% to 80% are enabled with proper safety precautions.
- Concurrently the MCO-19M permits a CO_2 range of 0% to 20% via the Dual Wavelength Infrared sensor.
- Nitrogen gas bubbler accelerates recovery of chamber humidity levels following door openings.
- An electronic P.I.D. control maintains accurate temperature and gas set points over the entire system range.
- The MCO-19M includes an automatic gas switchover system that changes from the primary to a secondary gas cylinder for either oxygen or nitrogen; an optional second gas switchover system is available for CO_2.



Direct Heat and Air Jacket Heating System



Direct Heat and Air Jacket Heating System

The patented Direct Heat and Air Jacket provides precise and uniform temperature control. Uniform temperatures are further enhanced by gentle fan circulation.

The direct heating provides highly responsive temperature control in response to door openings and the surrounding air jacket ensures uniform heating of the incubator eliminating 'cold-spots' and preventing condensation.

- The microprocessor provides PID control of the three independent heating sources surrounding the chamber; 1) side, top and rear wall heaters, 2) chamber base heater, 3) outer door heater.
- The independent outer door heater warms the inner glass door in response to ambient conditions to prevent condensation and promote temperature uniformity.
- The Air Jacket is surrounded by high density foam insulation to protect against ambient temperature fluctuations.

Elevated Humidity, Low Water Level Warning

To avoid cell culture desiccation, the MCO-19AIC maintains 95% RH at 37°C.

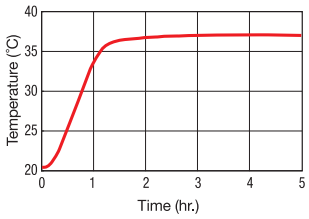
- Humidification is achieved by reliable natural evaporation and forced-air circulation. The system is enhanced by the Direct Heat and Air Jacket base heater, and protected by an optical water level indicator to warn of low water in the humidity pan.
- The humidity pan removes easily for regular cleaning and refilling.
- When filled the pan slides into place and the optical sensor automatically returns to position. The SafeCell UV lamp destroys contaminants introduced during the process.
- For the H_2O_2 in situ decontamination cycle the humidity pan is repositioned against the chamber wall to eliminate the need for separate autoclaving.

Zone	Location	Function	Energy	Microprocessor Controller
Main (Red)	Side, top and rear walls	Principal heat source	Variable	Energizes any, all or a combination of heating elements as required
Base (Yellow)	Floor	Base heater warms the humidity reservoir to achieve 95%RH at 37°C	Variable	
Front (Green)	Outer door	Warms the inner glass in response to ambient conditions; prevents condensation on glass door and promotes temperature uniformity	Variable	
Air Jacket (White)	Side, top and rear walls	Sealed, surrounds interior chamber with natural air convection	--	--
Insulation (Grey)	Side, top, floor, rear walls and door	Promotes energy efficiency, reduces effect of ambient temperature fluctuations on air jacket	--	--

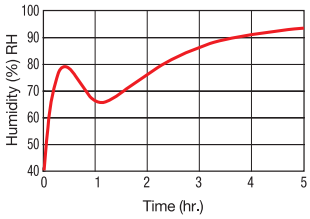
Specifications

Performance MCO-19AIC

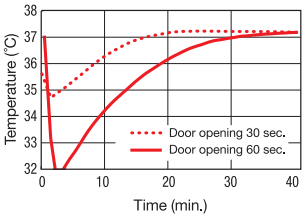
Temperature Pull-up Characteristics



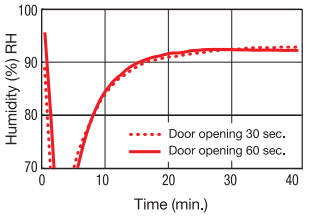
Humidity Pull-up Characteristics



Temperature Recovery Characteristics

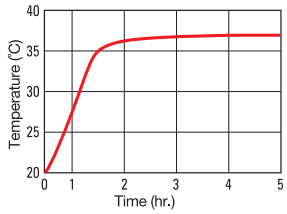


Humidity Recovery Characteristics

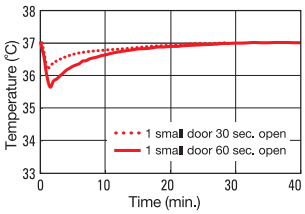


Performance MCO-19M

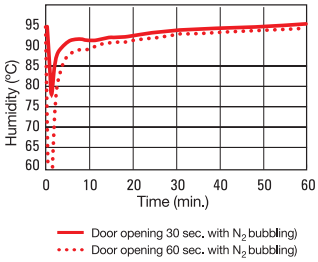
Temperature Pull-up Characteristics



Temperature Recovery Characteristics

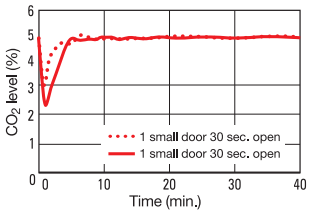


Humidity Recovery Characteristics



CO_2 density Recovery Characteristics

AT: 20°C SV: 37°C
CO_2 setting 5%(0.03MPa)
O_2 setting: 5%(0.05MPa)
No load



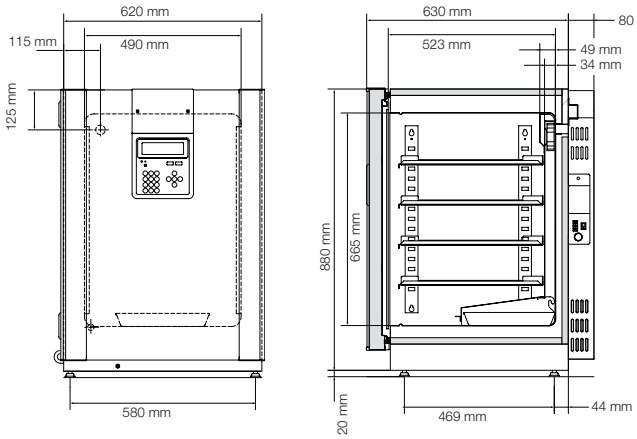
Medical Device Directive

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.

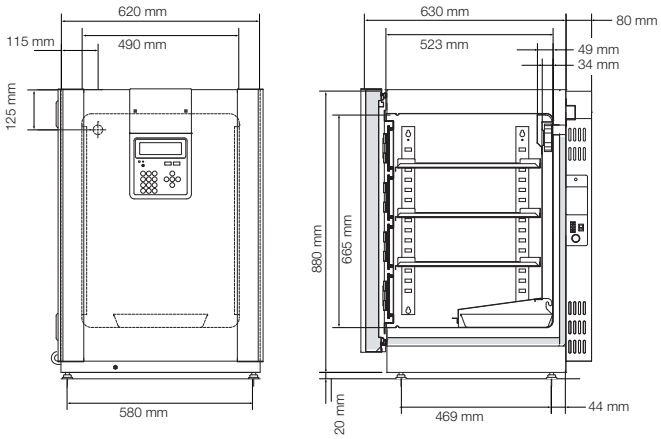
The use of cell culture incubators for the preservation and cultivation of cells and tissues for human use in transfusion, regenerative medicine and cell therapy is set to expand.

In anticipation of these developing technologies and possible changes in the regulatory landscape, Panasonic began to introduce Medical Device certified products in 2011. One of the first models to be certified include the MCO-19AIC.

Dimensions MCO-19AIC

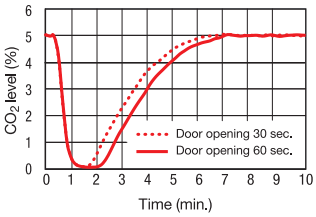


Dimensions MCO-19M

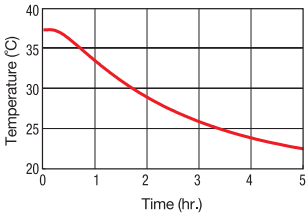


CE 0123 The MCO-19AIC is certified as Class IIa Medical Devices (93/42/EEC and 2007/47/EC). (For EU countries only)

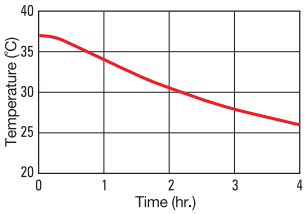
CO_2 Level Recovery Characteristics



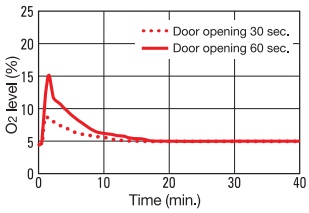
Temperature decrease characteristics when power failure occurs



Temperature decrease characteristics when power failure occurs



O_2 Level Recovery Characteristics



Newly-designed Middle Door with Small Doors (standard equipment) for the MCO-19M

Utilizing “Middle Door” with 4 small doors attached, and a full door opening is not needed for removing cell cultures.

- “Middle Door” can open/close by itself.
- “Middle Door” is reversible like the outer door.

Ergonomic and Practical Design

Stackable

- The MCO-19AIC and MCO-19M 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 stacked installations for easier mobility. (see Options)

Field Reversible Door

- The reversible inner and outer doors allow right or left opening depending on user preference, installation space and how other adjacent equipment is positioned.
- The outer door includes a universal finger grip at each side.
- The outer door features a magnetic gasket designed to eliminate ambient air shear across the glass inner door and prevent condensation.
- The inner door gasket provides an effective barrier between the ambient air and the warm, humidified incubator atmosphere preventing condensation and eliminating moisture traps which can harbour contaminants.
- A door ajar alarm provides an audible and visual warning if the outer door is left open.

Control Panel

- The door-mounted control panel permits easy setting and viewing of parameters.

Shelves and Sample Management

- Convenient, space efficient inventory management is simplified through a system of adjustable, extendable perforated shelves.
- Shelves and brackets are formed from InCu saFe® copper-enriched stainless steel alloy and can remain inside the incubator during the H_2O_2 decontamination cycle or autoclaved separately if desired.
- Shelves are perforated to permit vertical airflow through and around labware.
- Shelf brackets are formed with an exaggerated angle to minimize surface contact with flat shelves*. Brackets slip easily into vertical supports that attach to interior chamber walls with clearance sufficient to permit proper air circulation.

* Patent pending

Specifications

GROUP	CO_2 Incubator		Multigas Incubator
Characteristics PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm	• DHA Direct Heat & Air Jacket System for optimal temperature stability • Preventative contamination control with InCu saFe® • 3 minutes CO_2 recovery time • Field reversible doors		• Exceptional CO_2 and O_2 recovery times • Preventative contamination control • Optional SafeCell UV system • FDA clearance for IFV use
			
Model	**MCO-19AICUV-PE**	**MCO-19AIC-PE**	**MCO-19M-PE**
Major Operating Systems			
H2O2 Decontamination System	Optional	Optional (also requires SafeCell UV)	Optional (also requires SafeCell UV)
SafeCell UV System	Standard	Optional	Optional
InCu saFe® Copper Enriched Stainless Steel Interior	Standard	Standard	Standard
Single Beam, Dual Detector IR CO_2 Sensor	Standard	Standard	Standard
Zirconia O_2 sensor	-	-	Standard
Direct Heat & Air Jacket (DHA) Heating System	Standard	Standard	Standard
LCD Graphical Controller/Display, Door Mounted	Standard	Standard	Standard
Environmental Performance			
Temperature Control Range	+5°C above ambient to 50°C (in a 5°C to 35°C ambient)		
Temperature Fluctuation[1)]	±0.1°C		
Temperature Uniformity[1)]	±0.25°C		
CO_2 Control Range	0 to 20%		
CO_2 Fluctuation[1)]	±0.15%		±0.2%
CO_2 Sensor System	Ceramic based, single beam Infrared sensor, with dual wavelength measurement for continuous auto-zero calibration		
CO_2 Calibration	Automatic, continuous zero reference calibration, optional semi-automatic one point Gas Calibration Kit		
CO_2 & O_2 Sampling (Patent Pending)	No moving parts; airflow passes over in/out ports to sustain Venturi effect, continuous sampling		
O_2 Control Range	-	-	1% to 18%, 22% to 80%
O_2 Fluctuation[1)]	-	-	±0.2%
Chamber humidity	95%RH at 37°C by natural evaporation with humidifying pan with reflective optical low water sensor		
Airflow	Gentle vertical airflow, continuous with inner door closed		
Control, Monitoring, Alarms			
Temperature, CO_2 and O_2 Control	P.I.D control system, set-point resolution 0.1°C, 0.1% CO_2		P.I.D control system, set-point resolution 0.1°C, 0.1% CO2, 0.1% O_2
Display	Alphanumeric LCD digital display		
Data Acquisition	Automatic log function of temperature and CO_2.		Automatic log function of temperature, CO_2 and O_2.
Communications	Remote alarm contact standard, optional 4-20mA connection, optional RS232/RS485/LAN data ports		
Alarms	Automatic set temperature alarm, automatic set CO2 & O2 density alarm (for MCO-19M), upper limit temperature alarm, door alarm, low humidifying water alarm, UV lamp failure alarm (for UV equipped model only)		
Cabinet Design and Construction			
Exterior Cabinet and Door	Galvanized steel exterior, baked-on enamel finish		
Interior and Shelves	Stainless Steel Copper alloyed		
Inner Door	Tempered glass		Stainless Steel Frame with 4 small Tempered Glass Doors
Insulation	Rigid foam polyurethane		
Access Port	Single 30 mm ID port with non-VOC silicone stoppers		
Leveling Feet	Adjustable		
Energy, Electrical, Utilities			
Maximum Power Consumption	310W		314W
Supply voltage	220-240V 50Hz		
CO_2 Gas inlet connection / pressure	4 to 6 mm inner diameter tubing / Nominal 0.3 bar from two-stage CO_2 regulator		
O_2 Gas inlet connection / pressure	-		4 to 6 mm inner diameter tubing / Nominal 0.5 bar from two-stage O_2 regulator Low oxygen (1% O_2) setting injection: 1 bar also available
Dimensions, Weight, Capacity			
Interior Dimensions	490 x 523 x 665 mm (W x D x H)		
Exterior Dimensions	620 x 710 x 900 mm (W x D x H)		
Volume	170 litres		
Shelves	4 supplied as standard (Maximum 15), 450 x 450 mm, maximum load 7kg/shelf		3 supplied as standard (Maximum 15), 450 x 450 mm, maximum load 7kg/shelf
Nett weight	93kg		94kg

notes:
[1)] Ambient temperature: 25°C, setting: 37°C, CO2: 5%, no load, (MCO-19M O2: 5%)

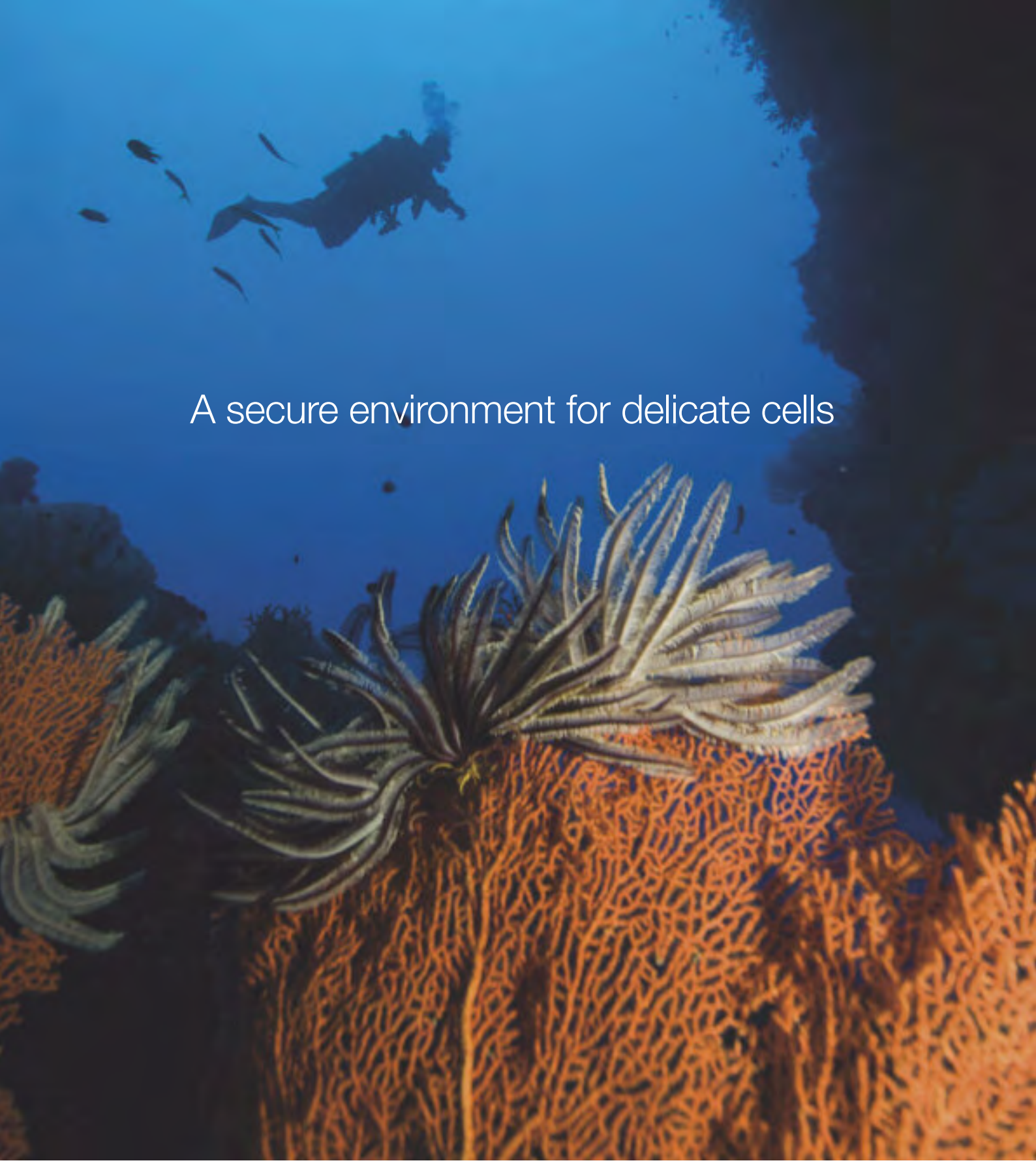
Model	MCO-19AIC(UV)	MCO-19AIC	MCO-19M
Decontamination Options			
H_2O_2 Decontamination Kit	MCO-HL	MCO-HL[1)]	MCO-HL[1)]
H_2O_2 Vapour Generator (Requires MCO-HL)	MCO-HP	MCO-HP[1)]	MCO-HP[1)]
H_2O_2 Reagent, pack of 6 bottles, each pre-measured bottle is sufficient for a complete H_2O_2 decontamination cycle (specially formulated for MCO-19AIC)	MCO-H2O2	MCO-H2O2[1)]	MCO-H2O2[1)]
SafeCell UV System Kit narrow-bandwidth 253.7nm lamp and assembly	Built-in	MCO-19UVS	MCO-19UVS
Common Options			
Small inner doors (4)kit	MCO-19ID	MCO-19ID	MCO-19ID
Automatic CO_2 Cylinder Changeover System	MCO-21GC	MCO-21GC	MCO-21GC
CO_2 gas pressure regulator			MCO-100L
Semi-automatic one point Gas Calibration Kit	MCO-SG	MCO-SG	MCO-SG
Roller Base, for use in single or stacked installations	MCO-18RB	MCO-18RB	MCO-18RB
InCu saFe® Shelf and Brackets	MCO-47ST	MCO-47ST	MCO-47ST
InCu saFe® Half Tray System	MCO-25ST	MCO-25ST	MCO-25ST
Communication interfaces[2)]			
Communication Terminal (RS-232C/RS485)	MTR-480	MTR-480	MTR-480
Communication Terminal (LAN)	MTR-L03	MTR-L03	
Communication Terminal (Analog 4-20 mA)	MCO-420MA	MCO-420MA	

[1)] Also Requires SafeCell UV kit

[2)] Can only be fitted with one communications terminal

Panasonic H_2O_2 solution is specially formulated for optimal use with the MCO-HP Vapour Generator. Each pre-measured bottle is sufficient for a complete H_2O_2 sterilization sequence. Unit of issue: six per carton. **MCO-H2O2**

H_2O_2 Vapour Generator.
MCO-HP
Shown with connecting cable, standard.



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