

Panasonic

Life Science
Life Sciences

Cell Culture Solutions

cellIQ™ CO₂ & Multigas Incubator
CytoGROW Optimal, Compact & ReachIn Series

us.panasonic-healthcare.com



Discovery powered by
precision™

Discover
pr



ry powered by ecision™

Discovery starts with a dream. A dream to know who we are. A dream to better our lives... Behind every great discovery, there's the technology that made it all possible.

Introduction

Offer your cells and priceless samples the advantage of first class incubation technology with Panasonic incubators. Our reputation is built on superior technology, high performance, and uniform environment even with multiple door openings. Panasonic incubators meet the toughest quality standards for performance, ergonomics, and return on investment.

We are proud to provide your samples with the ultimate and the most advanced technology, helping cutting-edge research in critical fields like medicine, life sciences, pharmaceuticals, biotechnology, general industrial, chemical, and scientific use.

Cell Culture Incubators

Optimum cell growth
World class design

Ideal simulated *in vivo* conditions
Exceptional cell culture conditions

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InCu-saFe® Technology



Direct Heat & Air Jacket System



Sterisonic® H₂O₂ Decontamination



LabAlert™ Monitoring Systems

What to look for in an ideal incubator?

Consistent Environment

Stable CO₂, O₂, humidity, and temperature levels within the chamber

Quick CO₂ Recovery methods

Fast recovery of the interior conditions after each door opening

Contamination Control

Optimal cell growth and convenient decontamination of the incubator chamber

Uniformity in Temperature and Humidity

Ideal simulated *in vivo* conditions within the chamber

Consistent and Accurate CO₂/O₂ supply

Maintaining consistent supply of essential components, leading to stable environment



INNOVATION TIMELINE

Incubators continue to evolve from basic laboratory equipment to sophisticated and precise environment for cell culturing. Panasonic continues to be on the forefront of such advancements with multiple innovations that were first-in-class within this field.



1969

The first incubator launched.



1984

Water jacketed CO₂ incubator, MCO-165



2000

Introduction of inCu-saFe® Active Background contamination control in CO₂ incubators



2002

Introduction of SafeCell UV (revolutionary UV decontamination in CO₂ incubators)



2009

Introduction of cellIQ™ CO₂ & Multigas Series, with Sterisonic® H₂O₂ Decontamination



2014

Introduction of the cellIQ™ CO₂ incubator with Touch Screen.

Which incubator is best for you?



cellIQ™ CO₂ Incubators

CO₂ Incubators | 5.8 cu.ft.

KM-CC17RH2A



KM-CC17RU2A

OPTIONAL



Next Generation CO₂ Incubators

New CO₂ incubator design with touchscreen control panel delivers exceptional ease of use, effortless cleaning and maintenance, and outstanding performance with multi-level contamination control.

cellIQ™ Multigas Incubators

Multigas Incubators | 6.0 cu.ft.

MCO-19MUVH-PA



MCO-19MUV-PA



MCO-19M-PA



High performance solution for all cell culture applications

The cellIQ™ Multigas is the industry's most complete cell culture incubator for highly regulated applications like stem cell research, regenerative medicine, and *in vitro* fertilization (IVF).

With a range of CO₂ and multi-gas incubators, Panasonic has the right technology to meet every application, setting, and budget.



CytoGROW Optimal Series

CO₂ Incubators | 6.0 & 7.6 cu.ft.

KM-CC17T0A



KM-CC17TU0A



MCO-20AIC-PA



Economical with precise controls and contamination resistance

CytoGrow Optimal Incubators are ideal for clinical, microbiological, and research applications.



CytoGROW Compact Series

CO₂ & Multigas Incubators | 1.7 cu.ft.

KM-CC5T0A



OPTIONAL



MCO-5M-PA



OPTIONAL



Precise controls with space saving design allows up to 3 models to be stacked

CytoGrow Compact incubators are ideal for IVF and hypoxic applications due to accurate *in vitro* simulation of the *in vivo* environment.



CytoGROW ReachIn

CO₂ Incubators | 30.1 cu.ft.

MCO-80AIC-PA



OPTIONAL



Greater capacity with consistent environment

CytoGROW ReachIn CO₂ incubator has the flexibility to grow a wide variety of cells while providing a precise and repeatable temperature, humidity, and CO₂ environment.

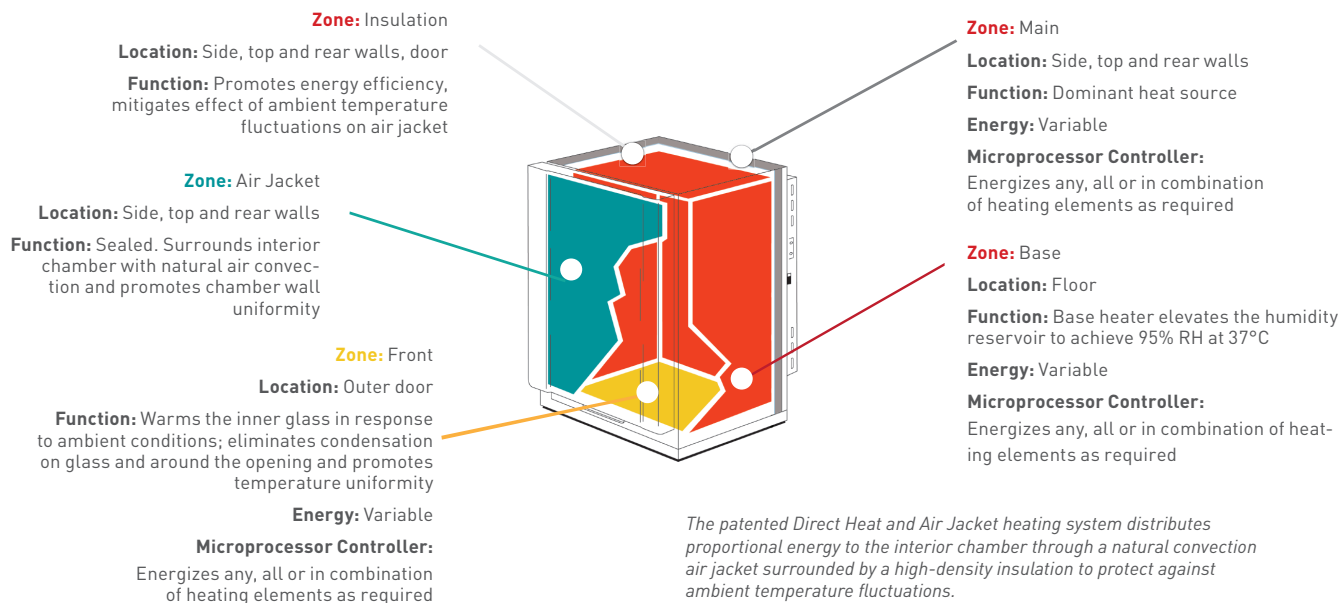
Consistent & Uniform Environment



Direct Heat and Air Jacket System Technology

AVAILABLE IN ALL MODELS EXCEPT CYTOGROW REACHIN

The patented Direct Heat and Air Jacket heating system surrounds the inner walls with a natural convection airflow. This airflow converts to radiant wall heat, through thermal conduction, to achieve accurate, uniform, and highly responsive temperature control within the chamber.



Fastest CO₂ Recovery with Dual Detector IR2 Sensor Technology

CELLIQ™ CO₂ INCUBATOR, CELLIQ™ MULTIGAS INCUBATOR

The Panasonic single beam, dual detector infrared (IR2) CO₂ sensor offers unprecedented control, accuracy, and stability. The IR2 Sensors provide ultra-fast recovery without overshoot and accurate CO₂ averages during periods of frequent incubator access with multiple door openings.

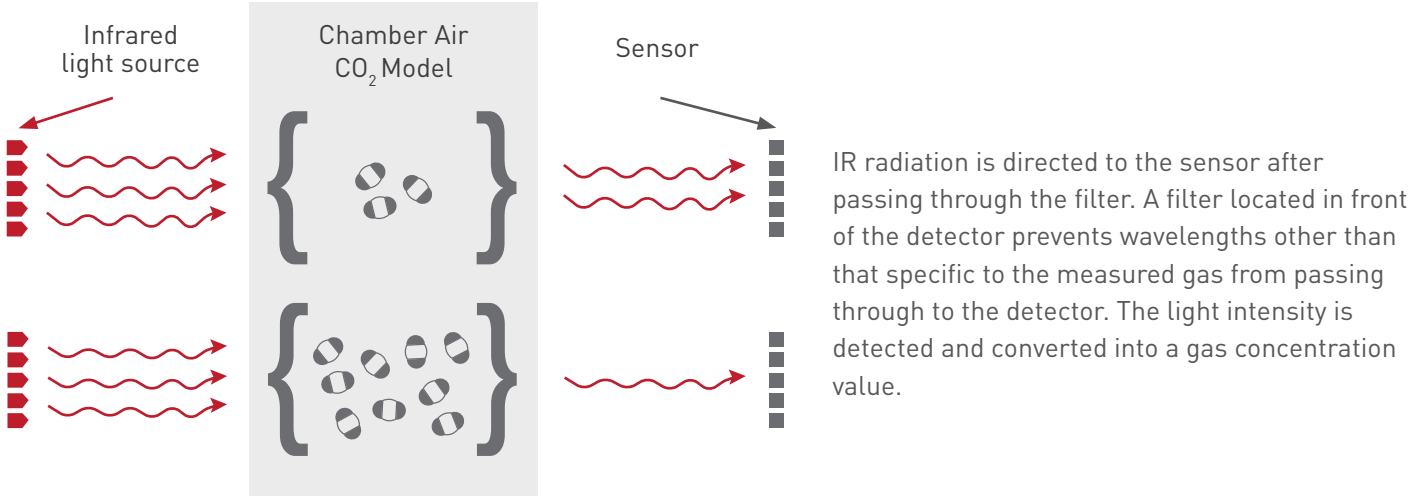


The Panasonic single beam, dual detector infrared CO₂ system offers unprecedented control, accuracy, and stability.



Dual detector IR2 sensor – How does it work?

Every IR sensor relies on the principal that gas will absorb light at a specific frequency. In the case of CO₂, it will absorb light at 4.3µm, which is in the infra-red band of the light spectrum.

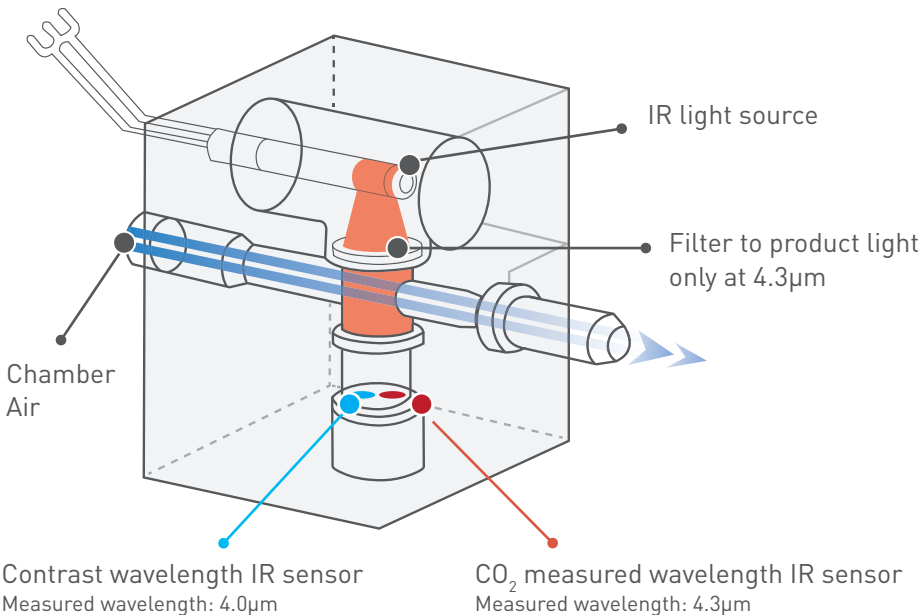


If CO₂ levels are high, fewer number of IR rays pass through | If CO₂ levels are low, more IR rays pass through.

How is it different from other IR sensors?

All IR sensors need a method to calibrate the sensor periodically because light sources will drift over time and the output of the light at the desired frequency will change. This will affect the readings on the sensor so periodic readjustments are needed.

The dual detector IR2 sensor uses the same principle, but with a faster and easier process for calibration that requires no moving parts.

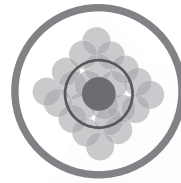
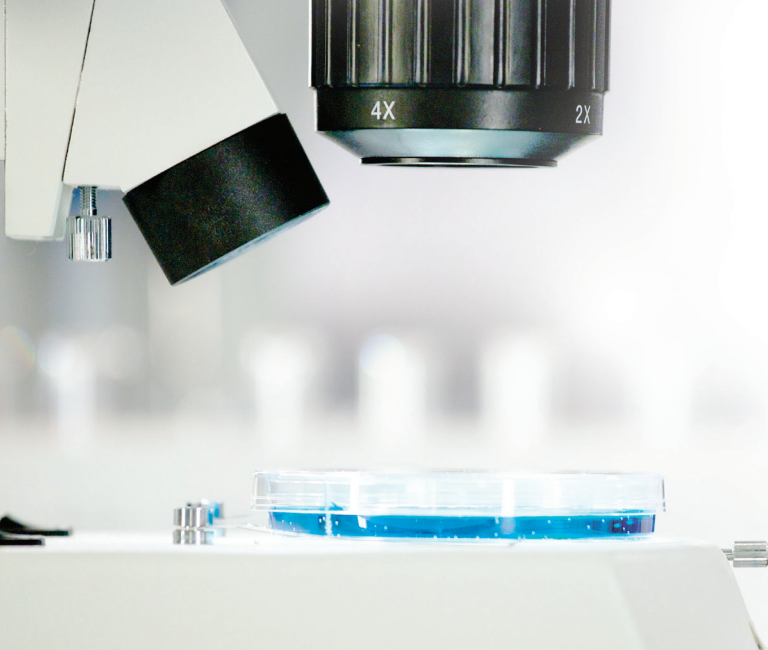


Single IR Sensor

The calibration is performed at regular time intervals using a separate pump, which draws in the air for a reference point and a secondary pump to circulate the chamber air through the sensor.

Panasonic Dual Detector IR Sensor

Difference in CO₂ levels do not have any effect on the second (reference) sensor absorbing light at 4.0 µm. Therefore, the calibration of the CO₂ sensor can be instantly optimized using the reading from the reference source, giving timely and accurate readings without need of any pumps.



Optimum O₂ Levels for Multigas Incubators with Zirconia O₂ Sensors

AVAILABLE IN ALL MULTIGAS MODELS

Panasonic Multigas Incubators offer a non-depleting design for precise O₂ control with fast response to door openings. The maintenance-free zirconia solid-state sensor has a **high degree of precision**, a **long service life**, and **does not require fine adjustment**. Through accurate determination of the chamber O₂ level the microprocessor injects either nitrogen gas or oxygen as required.

Proactive Contamination Control



InCu-saFe® Technology

AVAILABLE IN ALL MODELS

The copper-enriched stainless steel alloy interior surface (inCu-saFe®) eliminates contamination sources and mitigates the effect of airborne contaminants introduced through normal use.

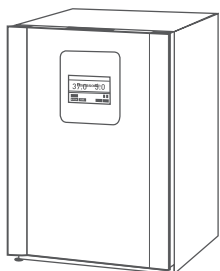
- Selected to provide natural germicidal protection without rust or corrosion, inCu-saFe® expresses a natural germicidal attribute to inhibit the growth of molds, fungi, mycoplasma, and bacteria.
- When components are removed, all interior surfaces are exposed for conventional wipe down.

Mycoplasma Survival Results

| 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 | ✓ | ✓ | ✗ | ✗ |

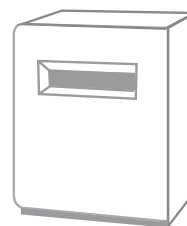
Chart summarizes test results with four strains of mycoplasma. Results demonstrate how Panasonic inCu-saFe® copper enriched stainless steel alloy offers germicidal properties of conventional C1100 copper while maintaining both corrosion-proof and discoloration-resistant properties of conventional Type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

Mycoplasma were chosen for this study because they are the smallest organisms that are most responsible for contamination in a laboratory. Traditional methods of contamination control, such as heat or HEPA filters, do not prevent mycoplasma growth.



InCu-saFe® INTERIORS

- InCu-saFe® fights off surface contamination and **does not corrode** like solid copper surfaces
- Easier visibility** with better looking interior
- Standard feature with Panasonic Incubators at **no additional cost**



PURE COPPER INTERIORS

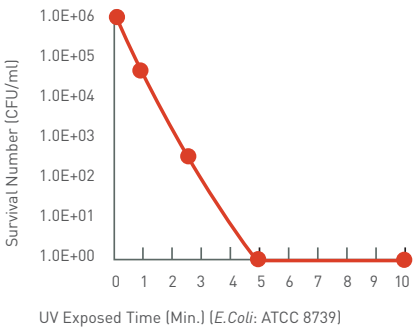
- Will corrode over time (humid environment turns it into green cupric oxide, which may prove to be lethal to cells)
- Contamination difficult to detect due to less visibility
- More expensive and difficult to maintain



SafeCell UV Technology

CELL/Q™ CO₂ INCUBATOR, CELL/Q™ MULTIGAS (MCO-19MUV-PA, MCO-19M-UVH-PA), CYTOGROW OPTIMAL (KM-CC17U0A, MCO-20AIC-PA) CYTOGROW COMPACT (OPTIONAL IN KM-CC5T0A, MCO-5M-PA), CYTOGROW REACHIN (OPTIONAL MCO-80IC-PA)

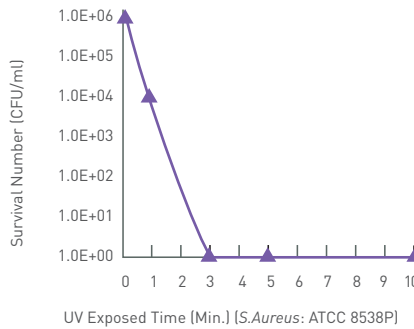
Patented SafeCell UV technology uses a programmable ultraviolet lamp that sterilizes air and humidity water pan without affecting the cell cultures. SafeCell UV inhibits the growth of mycoplasma, bacteria, molds, spores, viruses, yeasts and fungi without costly HEPA filter air scrubbers, which accumulate contaminants in the filter media. HEPA filters are also ineffective on particles less than 0.3 microns.



E. coli Survival Graph

Results, 48 Hours, *E. coli*

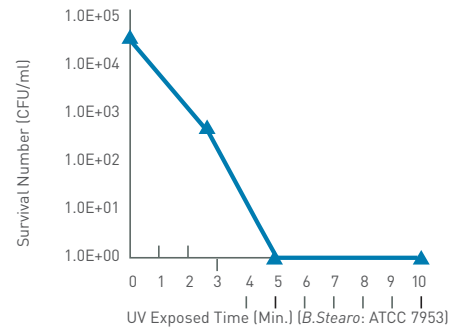
3 x 10⁹ cells, 3 liters = 1 x 10⁶ ml Culture plate array shows 48 hour 37°C cultures of humidity pan water with *E. coli* bacteria [Source ATCC8739] following exposure to SafeCell UV light for 0, 1, 3 and 5 minutes.



S. aureus Survival Graph

Results, 48 Hours, *S. aureus*

3 x 10⁹ cells, 3 liters = 1 x 10⁶ ml Culture plate array shows 48 hour 37°C cultures of humidity pan water with *S. aureus* bacteria [Source ATCC6538P] following exposure to SafeCell UV light for 0, 1, 3 and 5 minutes.



B. stearotherophilus Survival Graph

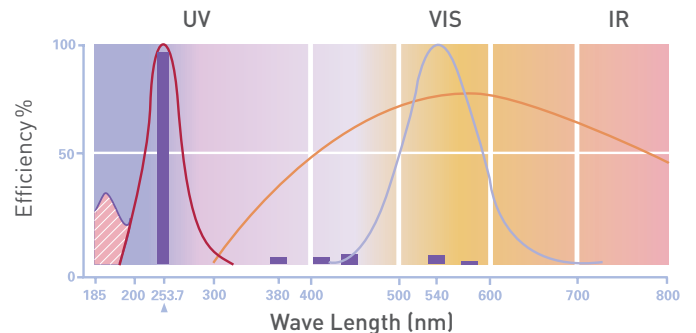
Results, 24 Hours, *B. stearotherophilus*

5 x 10⁷ cells, 2 liters = 2.5 x 10⁶ ml Culture plate array shows 24 hour 55°C cultures of humidity pan water with *B. stearotherophilus* bacteria [Source IF013737, equivalent to ATCC7953] following exposure to SafeCell UV light for 0, 1, 3 and 5 minutes.

SafeCell UV's anti-germicidal effects in comparison to High Heat decontamination process for competitor brand.

| METHOD | UV | HIGH HEAT | |
|--|-----------|-----------------|----------------|
| | Panasonic | Brand F (140°C) | Brand H (90°C) |
| TEST RESULTS, MAXIMUM LOG REDUCTION | | | |
| BACTERIA | >4.5 | >4.5 | >4.5 |
| YEAST | >2.9 | >2.9 | >2.9 |
| MOLD | >2.7 | >2.7 | >2.7 |
| DECONTAMINATION OPTIONS | | | |
| OVERNIGHT | ✓ | ✓ | ✓ |
| ACTIVE BACKGROUND CONTAMINATION CONTROL | ✓ | ✗ | ✗ |

Unlike typical germicidal lamps, the long-life SafeCell UV lamp is designed to deliver straight line performance at 253.7nm for maximum germicidal efficiency and long life span.

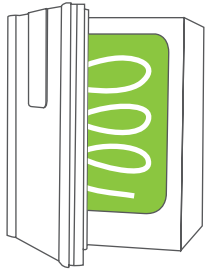


The SafeCell UV lamp is a highly effective, ozone-free contamination control technique.

■ Panasonic Lamp ▨ Ozone Release ■ Germicidal Effect ■ Eye Sensitivity ■ Sunlight

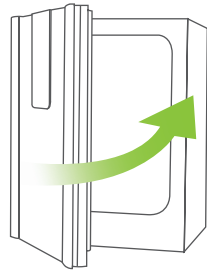
SafeCell UV – Versatile Program Cycles for Optimum Usability

Unlike typical germicidal lamps, the long-life SafeCell UV lamp is designed to deliver straight line performance at 253.7nm for maximum germicidal efficiency and long life.



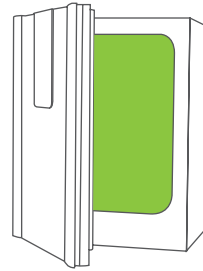
After H₂O₂ Vaporization

The UV lamp automatically cycles ON for up to 90 minutes following the ten minute H₂O₂ vapor cycle, reducing the H₂O₂ to water droplets. These droplets automatically condense onto the interior floor for easy wipe-up.



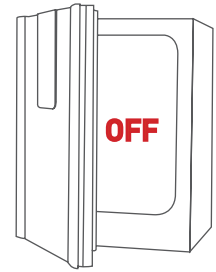
After Door Openings

The UV lamp automatically turns ON for 5 minutes after the door is closed, which decontaminates incoming external air.



24 Hour UV Decontamination

This feature is useful for overnight decontamination, before first use, between patient protocols, or following total chamber cleaning after maintenance or service.



OFF

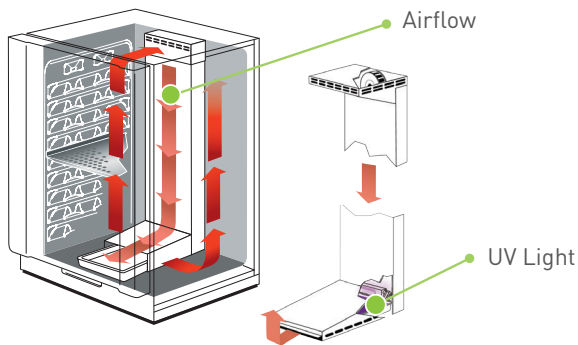
If UV protection is not desired, SafeCell UV lamp can be turned OFF through the touch panel control.



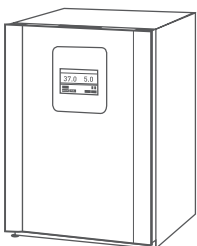
Active Background Contamination Control

CELL/Q™ CO₂ INUBATOR , CELL/Q™ MULTIGAS INUBATOR (MCO-19MUV-PA, MCO-19M-UVH-PA), CYTOGROW OPTIMAL (KM-CC17U0A, MCO-20AIC-PA) CYTOGROW COMPACT (OPTIONAL IN KM-CC5T0A, MCO-5M-PA), CYTOGROW REACHIN (OPTIONAL MCO-80IC-PA)

Together with the passive resistance of InCu-saFe® (copper-enriched stainless steel technology) and SafeCell UV Technology (decontamination control airborne contaminants *in situ*) forms an effective Active Background Contamination Control unique to the Panasonic incubator. As the cell culture process take place in the incubator chamber, the work of germicidal protection from airborne organisms continues unabated without costly downtime or harm to the cultured cells. This contamination control extends to thermophilic organisms.

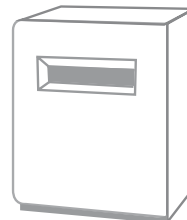


During normal day-to-day operations, when cells are incubated within the chamber, the UV lamp is visibly isolated from the cell culture chamber by a plenum cover over the humidity pan. Humidified air and surface water, in the humidity pan, is decontaminated without damaging the cells.



ACTIVE BACKGROUND CONTAMINATION CONTROL

- No additional stress on incubator components like that with Heat incubators
- Continuously provides germicidal protection without any costly downtime
- The position of the UV lamp, inCu-saFe® interiors and the relationship between the UV lamp, plenum, humidity reservoir and airflow system is integral to the performance of the Panasonic incubator for giving optimum continuous protection



TRADITIONAL CONTAMINATION CONTROL METHODS

- Every heat cycle adds to the incubator component stress, takes a long time to complete, requires all of the components to be removed and does not guarantee complete decontamination from organisms like thermophilic bacteria
- HEPA filters will not work on contaminants below 0.3 microns - this includes viral and bacterial contaminants like mycoplasmas
- HEPA filters used in biological safety cabinets are tested for leaks and certified whereas, the disposable filters used in the incubators are not guaranteed to be leak proof

Reactive Contamination Control



Sterisonic® H₂O₂ Decontamination Technology

CELL/Q™ CO₂ INCUBATOR (KM-CC17RH2), CELL/Q™ MULTIGAS (MCO-19M-UVH-PA)

Unlike conventional incubators, Panasonic incubators permit use of the H₂O₂ process *in situ* with complete safety, zero impact on the surrounding lab environment, and shorter downtime.

For GMP and regulated environments, a minor contamination can prove to be a major constraint for completing an important research protocol. In such environments, where time and money are extremely imperative to overall success of research projects, contamination leads to significant loss of valuable resources (cells, culture vessels, media and sera etc.) as well as wasted effort spent developing cultures and setting up experiments.

Major contaminants found in Laboratory environment include

- easy to detect - bacteria, molds and yeast
- difficult to detect – viruses and mycoplasma

(11 - 15% of cell culture samples have been found to be contaminated with mycoplasma according to the studies conducted by FDA)

Most common form of cell culture contaminant: **15% in US.**

Smallest free living organism (0.2-0.3µm). Approximately 180 different species exist.

Mycoplasma Contamination

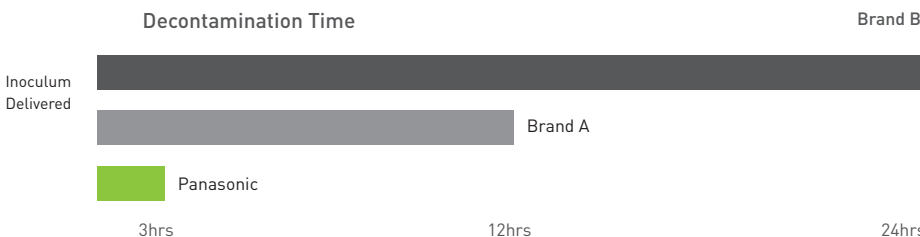
No Cell wall – cannot be seen under phase contrast microscopy.

Effects virtually every aspect of cell behavior and growth, even gene expression.

Increased decontamination efficiency and efficacy

An independent study was conducted to evaluate the effectiveness of H₂O₂ decontamination against high heat decontamination. Five different variety of organisms were chosen for this study:

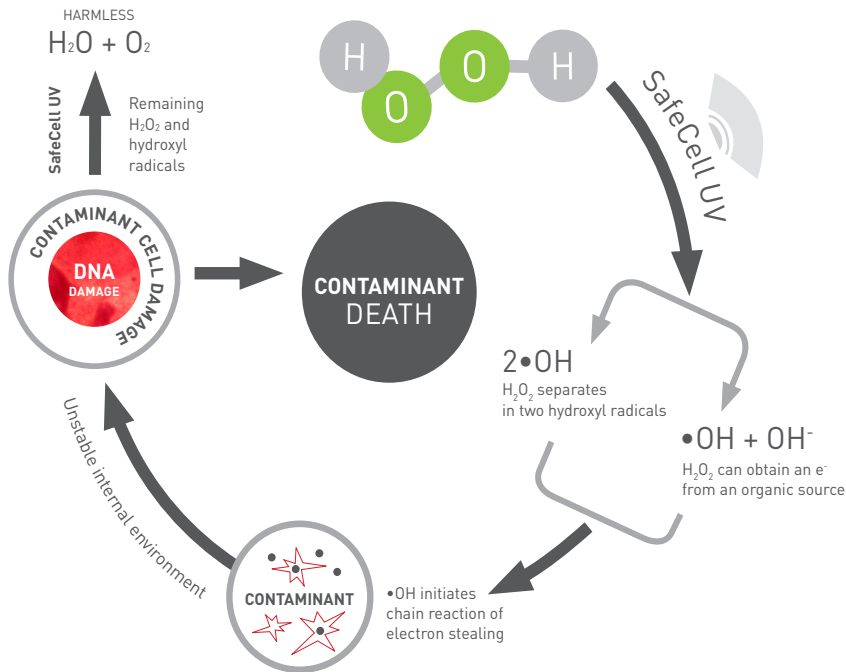
| MICROBE | TYPE | OXYGEN REQUIREMENTS | GRAM REACTION/ CELL MORPHOLOGY | PHYSIO-CHEMICAL RESISTANCE | CONTAMINATION CHARACTERISTICS |
|-------------------------------|----------|----------------------|--------------------------------|----------------------------|---|
| <i>Mycoplasma orale</i> | Bacteria | Facultative anaerobe | Gram Negative/ Micrococcal | High | Can persist without causing cell death, while altering the behavior and metabolism of the host cells. |
| <i>Staphylococcus aureus</i> | Bacteria | Facultative anaerobe | Gram Positive/ Cocci | Low | Forms biofilms that may be more difficult to kill. |
| <i>Acholeplasma laidlawii</i> | Bacteria | Facultative anaerobe | Gram Negative/ Micrococcal | Medium | Another member of Class Mollicutes that are very difficult to detect and can affect cell cultures similar to Mycoplasma orale. |
| <i>Candida albicans</i> | Fungi | Facultative anaerobe | Yeast/ Filamentous | Low | Grows as yeast as well as filamentous cells. Can form biofilms and are resistant to disinfectants. |
| <i>Bacillus subtilis</i> | Bacteria | Obligate aerobe | Gram Positive/ Rod | High | Can form endospore that can tolerate extreme environmental conditions such as high heat temperatures, extreme pH, radiation, etc. |



Result

An independent study demonstrates that Sterisonic® H₂O₂ Decontamination technology provides 100% kill rate with at least 6 log reduction of major contaminants within 3 hours, making it more efficient than conventional heat decontamination.

Sterisonic® H₂O₂ Decontamination provided 100% kill rate with at least 6 log reduction of all the tested organisms within 3 hours, making it more efficient than heat decontamination.



How does it work?

Hydrogen peroxide starts in aqueous form and is converted to vapor using high frequency ultrasonics, which accesses every point of the chamber. During this process, the blower motor remains active while the air flow travels. Following the decontamination period, the H₂O₂ is irradiated with ultraviolet light (UV). This results in the breakdown of hydrogen peroxide into •OH free radicals, as illustrated in the diagram.

Decontamination Cycle

Sterisonic H₂O₂ Decontamination Technology

STEP 1



Prep Time: 5 min

Empty contents of humidity pan. Then place pan and pan cover on shelves in chamber.

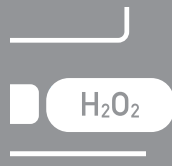
STEP 3



Resolve: 90 min

UV lamp glows for 90 minutes reducing H₂O₂ to harmless water droplets can be easily wiped with a sterile cloth.

STEP 2



Start Cycle: 30 min.

Chamber warms to 45°C (optimum H₂O₂ vaporization temperature). H₂O₂ Atomizer creates vapor, which is circulated throughout chamber by interior blower.

STEP 4



Cycle: Finish

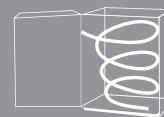
Refill the humidity pan and return humidity pan and plenum to operating position.

High Heat Decontamination



Prep Time: 15 min

Remove interior components sensitive to high heat.



Start Cycle: 90 min

Interior chamber elevates to high heat.



Decontaminate: 14 hours

Interior chamber elevates to high heat.



Finish.

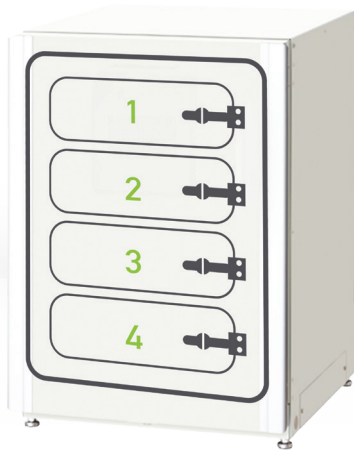
Incubator must cool from high heat temperatures to near ambient.

Accelerate Your Growth

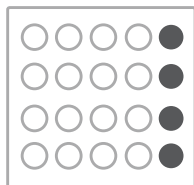
with increased capacity and customized interiors

With reversible inner and outer doors, Panasonic incubator offers the industry's most flexible installation options available.

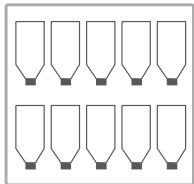
Space efficient inventory management is simplified through a system of adjustable and extendable shelves.



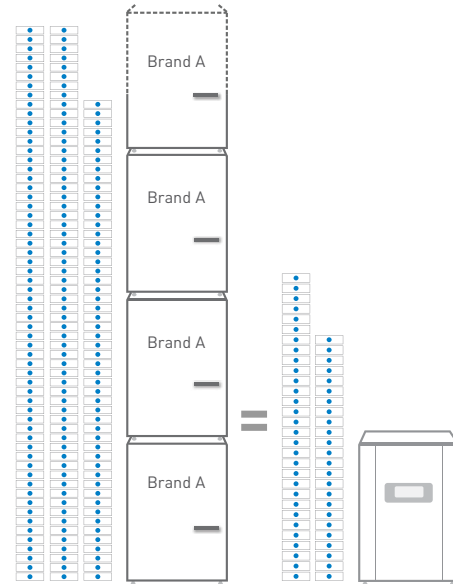
cellIQ™
CO₂ Incubator
Optional 4 inner doors



Allows for storing
5 lines of 100mm dishes.



Allows for storing
5 lines of T-75 flasks.



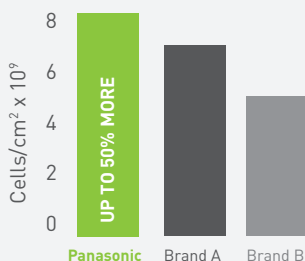
54 3-Layer
Multi-Flasks

Multiple chamber inner doors minimize loss of balanced interior atmosphere during routine door openings. *Available on selected models.*

ROI on Incubation:

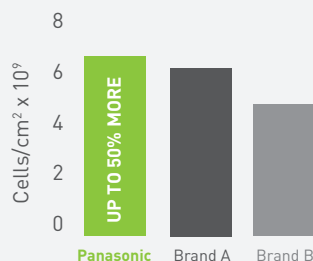
BHK-21

Total Expected Yield



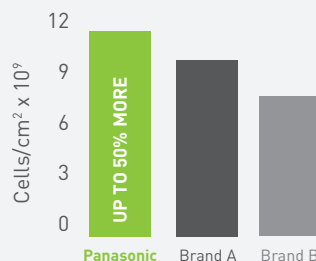
CHO-M1

Total Expected Yield



EcoPack 2-293

Total Expected Yield



• Incubator, filled to capacity with 3-layer BD Falcon™ Multi-Flasks. Based on 1 incubation cycle.

Expected yield figures based on expected yield per sq.ft. of surface area times the maximum total cell growth surface area able to fit in each incubator. "Brand A" Capacity: 6.5 cu.ft.; "Brand B" Capacity: 5.3 cu.ft.; Panasonic Sterisonic Capacity: 6.0 cu.ft.



Double Capacity in the Same Footprint

Panasonic incubators come with an improved ergonomic and stackable design offering double the capacity within the same footprint.



Incubator Monitoring - LabAlert System

OPTIONAL ON ALL MODELS

Complete your Incubation requirements with Panasonic LabAlert Monitoring solution. LabAlert makes the monitoring of your incubator easier than ever. You can keep a constant check on the temperature, humidity, CO₂ levels, O₂ Levels etc. that are being exposed to your cells – anytime, anywhere. Easy Set up, Affordable pricing, Infinite Scalability and Intuitive user interface.

For iPhone , iPad & Android devices

Access your LabAlert account from anywhere, at any time. All you need is a computer, smartphone or tablet device.

For Web

The web and app-based interfaces let you set up customizable dashboards to centrally monitor your equipment in a single view.

SIMPLE SETUP

STEP 1 - Unit

- Install Sensor to Incubator
- Plug in Probe to Sensor

STEP 2 - Receiver

- Open Incubator Access Port
- Place Probe into Incubator

STEP 3 - Cloud

- Position Probe in Chamber
- Activate Sensor

STEP 4 - You

- Sensor Communicates with Gate
- Customer Monitors Data on LabAlert



| FEATURE | ADVANTAGE | LABALERT | COMPETITORS |
|---------------|-----------|--|--|
| COST | ✔ | Economical and versatile choice - Cost decreases with the increase in units | Not economical with larger number of units |
| COMPATIBILITY | ✔ | Compatibility with multiple systems | Not compatible to other units |
| COMPLIANCE | ✔ | 21 CFR Part 11 Compliance, NAFEM data protocol, TJC standard and HACCP | Some of them are 21 CFR Part 11 compliant |
| HOSTING | ✔ | Web, App, Cloud, Standalone Software | Only web or local |
| RANGE | ✔ | WiFi - 2.4 GHz | Wired or Wireless |
| SCALABILITY | ✔ | Ability to expand infinitely for multiple units | Do not have such flexible capabilities |
| MAINTENANCE | ✔ | Preventative maintenance reminders and executive summary reports with min/max recordings | Simple summary of real time data + Historical chart data |

cellIQ™

The Next Generation of CO₂ Incubators

Models: KM-CC17RU2A/ KM-CC17RH2A

Panasonic's cellIQ™ CO₂ incubator with a touchscreen control panel delivers improved usability, rapid cleaning, and effortless maintenance, while keeping its tradition of outstanding environmental stability and precision performance.

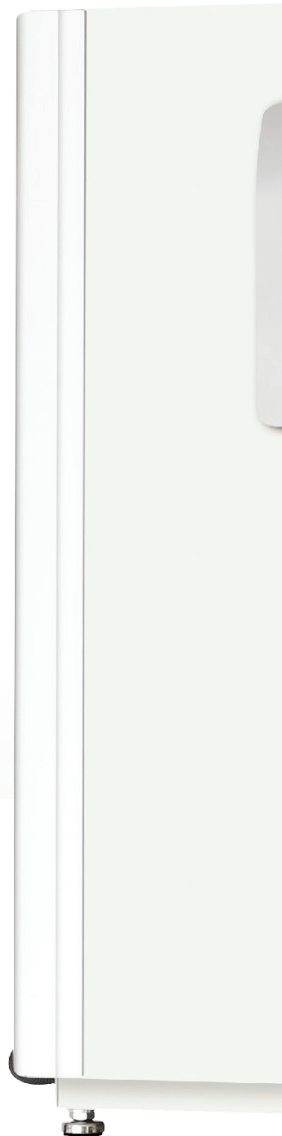
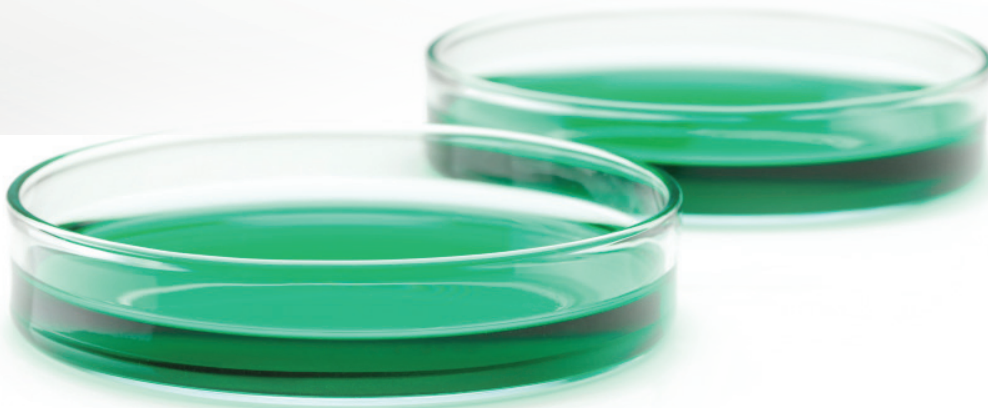


Applications

- Stem cell research
- Autologous tissue regeneration
- Genomic and proteomic expression
- Low volume media micro-plate work
- Esoteric plant and amphibian cell culture
- Hyper-sensitive and transgenic cell culture

cellIQ™ CO₂ Incubator

Optimized for high-value samples including hard-to-grow cell lines and contamination-sensitive media/reagents.





Easy Clean

cellIQ™ offers integrated shelf brackets with minimal interior component that makes it easier to clean and maintain.



Touch Screen

A color LCD touch panel delivers full control over different parameters. Control can be performed with gloved fingers.



Condensation Management System

It uses a unique antibacterial coated 'dew stick' cooled by peltier cooling technology that acts similar to a glass of cold water on a humid day. The condensed water droplets then fall back harmlessly into the humidity pan.



cellIQ™ CO₂ Incubator

PRECISION METRICS

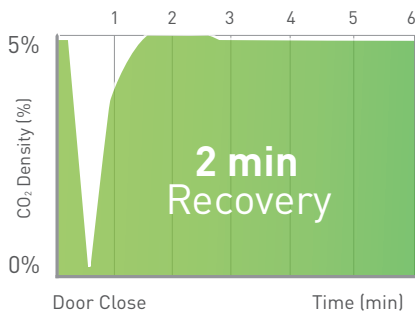
2min

CO₂ RECOVERY



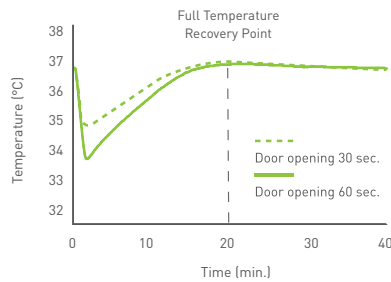
Stable pH & cellular conditions

CO₂ Recovery within 2 Minutes with Dual Detector IR2 Sensor



Stable Internal Environment

Temperature Uniformity with Direct Heat and Air Jacket System



20%

MORE CAPACITY

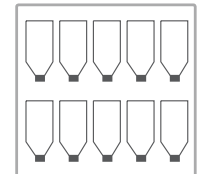
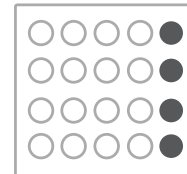


Greater yield

Shelf channels are now an integral part of the chamber, opening up more space for trays and allowing the incubator to accommodate more culture containers.

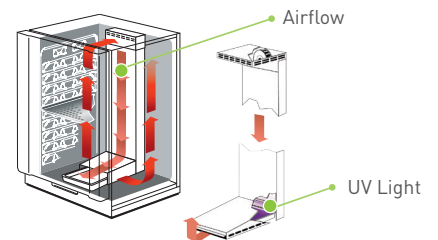
Allows for **5 lines of storage of 100mm dishes**

Allows for storing **5 lines of T-75 flasks**



Prevent Microbial Contamination

Active Background Control with inCu-saFe® and SafeCell UV



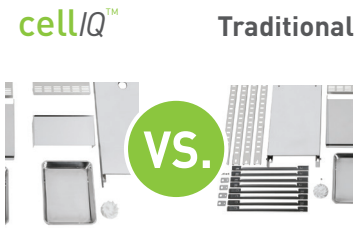
Panasonic incubators are extensively tested to meet the toughest quality standards in the world for performance, ergonomics, and cost of ownership.

80%

TIME SAVINGS

✓ Easy to maintain

CellIQ™ offers integrated shelf channels with minimal interior components that make it easier to clean and maintain.



👆 Easy to use
LCD Touch Panel Controller & USB Data Logging

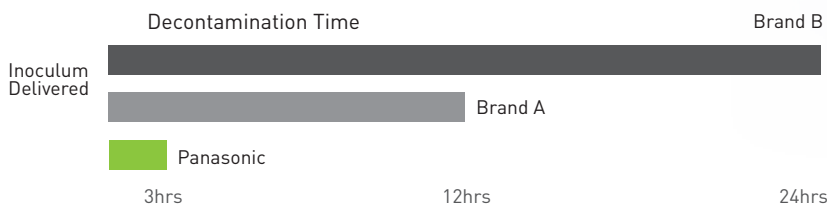
Color LCD touch panel delivers full control over different protocols. Touch panel can be controlled with gloved fingers since the touch panel has resistive coating.



8x Faster

CONTAMINATION CONTROL

🌀 With Sterisonic® H₂O₂ Decontamination Technology provides 100% contaminant kill rate





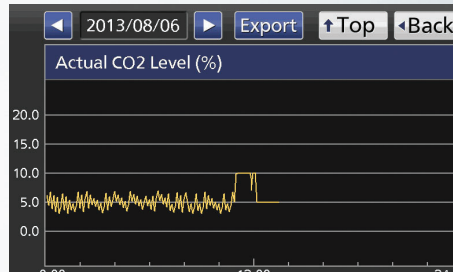
LCD Touch Panel Controller

A color LCD touch panel delivers full control over different protocols. Control can be performed with gloved fingers.



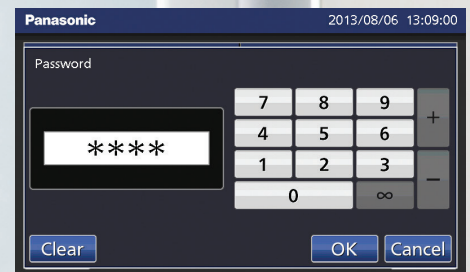
Menu Screen

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



Temperature Graphing Screen

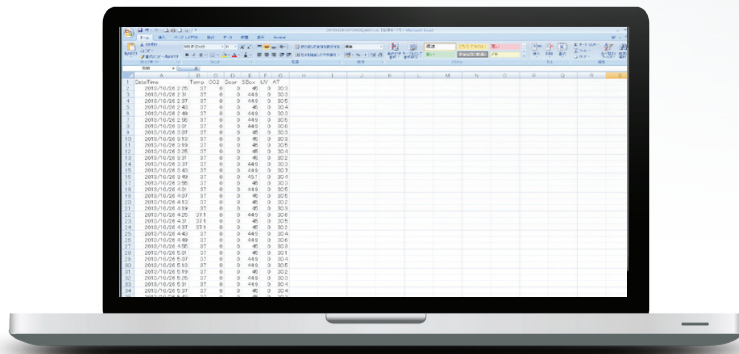
The system allows for recording the logs of the actual temperature, CO₂ levels, and the door openings of the chamber.



Maximum Security Control with Electric Lock*

cellIQ™ CO₂ Incubator with Sterisonic H₂O₂ Decontamination offers a standard feature of automatic door locking with one to six digit password protection that can be set up for releasing the lock.

*[Optional on KM-CC17RU2A Model]



USB Log Function

Standard USB port provided for convenient log data transfer to a USB memory stick and to a PC. Data log period is 1.5 months using 2-minute intervals.

Acquisition Data Parameters

- Chamber temperature
- Alarm
- CO₂ level
- CSV (Excel) file output
- Door opening/closing
- Time and date stamp



- 1 Heating indicator**
Lamp lights when the heater is energized.
- 2 Temperature Display**
- 3 Message display field:**
Alarms, errors or messages are displayed when the fault occurs.
- 4 UV Lamp condition display**
- 5 CO₂ gas injection indicator:**
The lamp lights when CO₂ gas is being injected
- 6 CO₂ gas supply indicator and select key**
- 7 USB Log Port**
- 8 H₂O₂ Decontamination Key**
- 9 The current chamber CO₂ level is displayed**
- 10 Outer door (opening / closing display)**

Decontamination Time Comparison



cell/Q™ with Sterisonic® H₂O₂ Decontamination

The unit is ready to accept cultures 3 hours after decontamination starts.

VS.



High Heat Decontamination

Maximum time required for decontamination above 150°C.



Touch Screen

A color LCD touch panel delivers full control over different protocols. Control can be performed with gloved fingers.

80% Less Time Spent Cleaning

The cell/Q™ CO₂ Incubator has less removable parts with its new interior design making it easier to clean and maintain.



Easy Clean

cell/Q™ offers integrated shelf channels with minimal interior components that make it easier to clean and maintain.



cell/Q™
CO₂ INCUBATOR

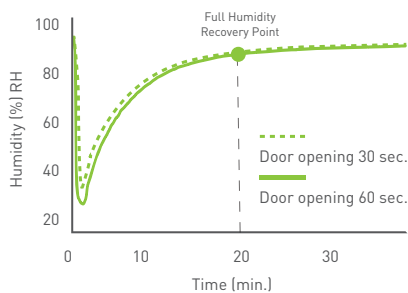
VS.

Traditional
INCUBATOR

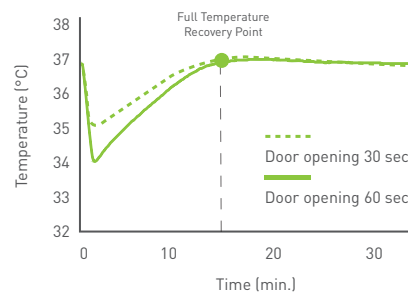


Precision Metrics

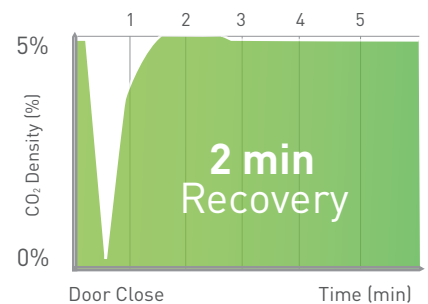
Humidity Recovery characteristic

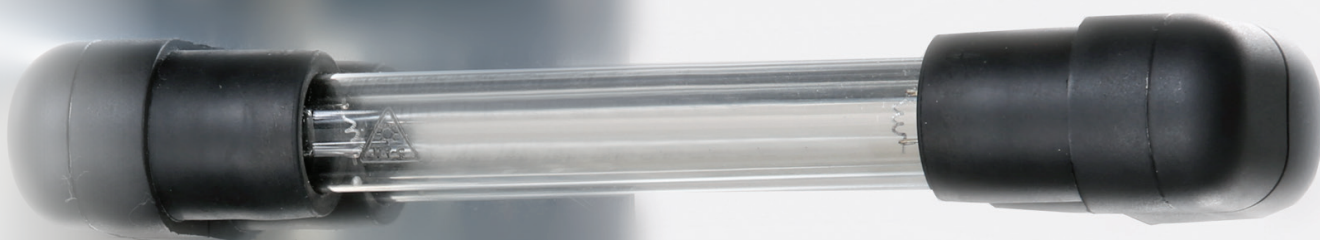


Temperature Recovery characteristics



CO₂ level recovery characteristics





SafeCell UV Decontamination

Decontamination of airborne contaminants following door opening

- The new 5000 Hour UV Lamp provides long term maintenance-free service without the production of Ozone.
- Active Background control is provided by automatically turning on the UV Lamp following door openings effectively destroying airborne contaminants in the air system while not exposing cultures.
- UV Lamp also provides easy access to an effective 24 hour chamber decontamination feature through the Touch Panel.



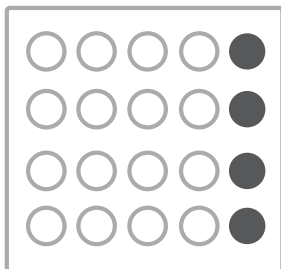
Condensation Management System

- It uses a unique antibacterial coated 'dew stick' cooled by peltier cooling technology. This acts similar to a glass of cold water on a humid day. The condensed water droplets then fall back harmlessly into the humidity pan.
- The temperature of the dew stick is controlled electronically by monitoring ambient conditions to affect the temperature of the dew stick.
- Thus, we can provide a high humidity environment without any unwanted condensation in the chamber and resulting contamination concerns.

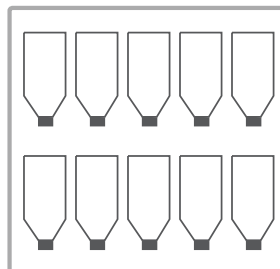


Integrated Shelf Channels

Shelf Channels are now an integral part of the chamber, opening up more space for trays, allowing storage of more cell culture containers.

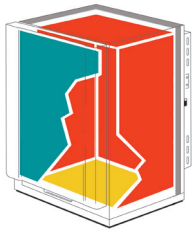


Allows for storing **5 lines of 100mm dishes.**

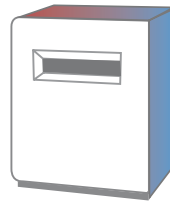


Allows for storing **5 lines of T-75 flasks.**

TEMPERATURE UNIFORMITY



Direct Heat and Air Jacket
Patented Direct Heat and Air Jacket System for improved uniformity - ± 0.25 at 37°C.

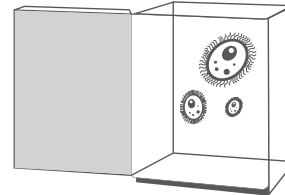


Water Jacket
Water Jacket Incubator is using an older technology and it can be a source of contamination. Water Jacket incubators are also difficult to move.

INTERIOR

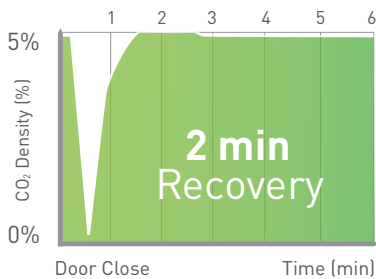


InCu-saFe® - Copper enriched stainless
fights off surface contamination and doesn't corrode like solid copper surfaces. This is a standard feature (surface) with no additional cost.



Stainless Steel does not inhibit contamination
Copper has similar germicidal properties as inCu-saFe® but is more expensive and difficult to maintain as well as it is corrosive over time.

CO₂ SENSORS



Panasonic single beam, Dual Detector Infrared (IR2) Sensors
offer full CO₂ recovery within 2 minutes, without overshoot following the door openings.



Inefficient Recovery Unwanted changes

Single Detector IR Sensor
Inefficient CO₂ recovery within the chamber. This leads to unwanted changes in the pH and consequently undesired changes in the cell culture. Other IR sensors use an incandescent light bulb with shorter life span.

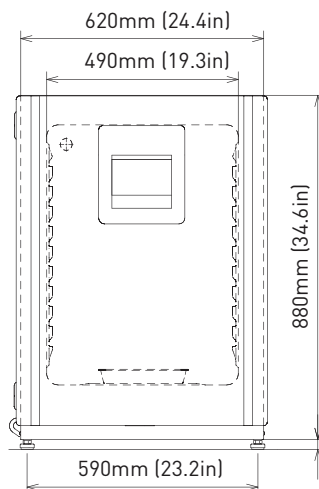
MAJOR CONTAMINATION CONTROL METHODS

- **Sterisonic® H₂O₂ Decontamination** reduces contamination within 3 hours with at least 6 log reduction and 100% kill rate.
- **SafeCell UV** along with inCu-saFe® provides active background contamination control.

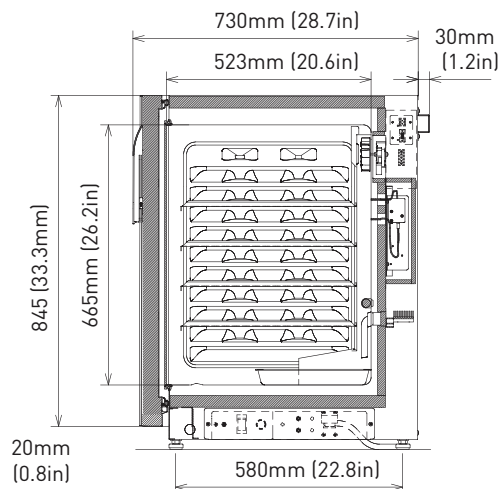
- **HEPA filters** typically will not collect all contaminants as many are below 0.3µm in size.
- **High heat decontamination** takes up to 24 hrs and does not guarantee complete sterilization of thermophilic organisms.
- **High heat decontamination** will possibly generate volatile organic compounds which can be detrimental to cell growth.

cellIQ™ CO₂ Incubator Dimensions

FRONT
(mm,in)



SIDE
(mm,in)



Specifications

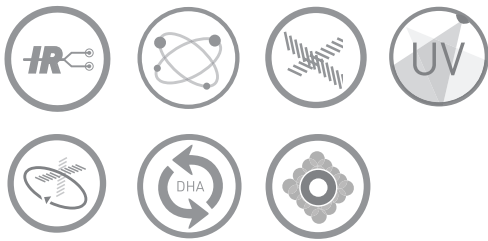
| MODEL | KM-CC17RU2A | KM-CC17RH2A |
|--|---|-------------|
| UV ACTIVE BACKGROUND CONTAMINATION CONTROL | Standard | Standard |
| TOUCH PANEL (WVGA FULL COLOR LCD) | Standard | Standard |
| USB DATA LOGGING | Standard | Standard |
| H ₂ O ₂ DECONTAMINATION SYSTEM | Optional | Standard |
| 24 HOUR UV DECONTAMINATION SYSTEM | Standard | Standard |
| SAFECELL UV SYSTEM | Standard | Standard |
| INCU-SAFE® COPPER-ENRICHED STAINLESS INTERIOR | Standard | Standard |
| SINGLE BEAM, DUAL DETECTOR IR CO ₂ SENSOR | Standard | Standard |
| DIRECT HEAT & AIR JACKET (DHA) HEATING SYSTEM | Standard | Standard |
| ENVIRONMENTAL PERFORMANCE | | |
| TEMPERATURE CONTROL RANGE | +5°C above ambient to 50°C (Ambient temperature: 5°C - 35°C) | |
| TEMPERATURE CONTROL UNIFORMITY | ±0.25°C (23°C ambient, setting: 37°C, CO ₂ : 5%, no load) | |
| CO ₂ CONTROL RANGE AND DEVIATION | 0% to 20% / ±0.15% (23°C ambient, setting 37°C, 5% CO ₂ , no load) | |
| CO ₂ SENSOR PLATFORM | Ceramic light source, single beam infrared sensor, with dual wavelength measurement for continuous auto-zero calibration | |
| CO ₂ SAMPLING, PATENT PENDING | No moving parts/no air pumps. Airflow maintained via pressure difference | |
| CO ₂ CALIBRATION | Automatic, continuous zero reference calibration. Optional semi-automatic one point gas calibration system | |
| AIRFLOW | Gentle vertical airflow, continuous with inner door closed | |
| INTERIOR HUMIDITY | 95% ±5%R.H. at 37°C by natural evaporation with humidifying pan. Adjustable | |
| CONTROL, MONITORING, ALARM | | |
| TEMPERATURE AND CO ₂ CONTROL | P.I.D. control system setpoint resolution 0.1°C, 0.1% | |
| DATA ACQUISITION | Automatic log function of temperature, CO ₂ , Door opening/closing, Alarm and CSV (Excel) file output. USB data collection | |
| COMMUNICATION | Remote alarm contacts standard. Optional LabAlert wireless monitoring system. | |
| CABINET DESIGN AND CONSTRUCTION | | |
| EXTERIOR CABINET AND DOOR | Galvanized steel with powder coat finish | |
| INTERIOR AND SHELVES | Copper-enriched stainless steel | |
| INNER DOOR | Tempered glass | |
| INSULATION | Extruded Polystyrene | |
| OUTER DOOR | Heated and field reversible | |
| ACCESS PORT | Diameter 30mm port with non-VOC silicone stoppers | |
| LEVELING FEET | 4, Adjustable | |
| ENERGY AND CO₂ UTILITIES | | |
| MAXIMUM POWER CONSUMPTION | 376W | |
| MAXIMUM HEAT DISCHARGE | 1014 BTU/hr (1070 KJ/h) | |
| CO ₂ GAS CONNECTION | 4mm to 6mm inner diameter tubing | |
| CO ₂ GAS PRESSURE | 0.03 Mpa (G) (0.3kgf/cm ² G, 4.3psiG) from two stage CO ₂ regulator | |
| DIMENSIONS, WEIGHTS, CAPACITIES | | |
| INTERIOR DIMENSIONS (W X D X H) | 490 x 523 x 665 (mm) / 19.3 x 20.6 x 26.2 (inch) | |
| EXTERIOR DIMENSIONS (W X D X H) | 620 x 710 x 900 (mm) / 24.4 x 28.0 x 35.4 (inch) | |
| VOLUME | 165 liters (5.8 cu.Ft.) | |
| SHELVES | 4 supplied as standard (Maximum 10), 470 (W) x 450 (D) x 12 (H) mm, Maximum load 7kg/shelf (15lbs) | |
| NET WEIGHT | 80kg (176 lbs) | |
| VOLTAGE | 110-120V, 60Hz | |

cellIQ™

Multigas Incubators

The industry's most complete cell culture solution for highly regulated applications or conventional incubation. Now with safe, effective and documented 3 hour *in situ* Sterisonic® H₂O₂ Decontamination for the fastest turn-around and maximum availability.

Models: MCO-19M-PA, MCO-19MUV-PA,
MCO-19MUVH-PA



Applications

- Stem cell research
- Autologous tissue regeneration
- Regenerative medicine
- *In vitro* fertilization research
- Any sensitive and hard-to-grow cell line culture

MCO-19M-PA
MCO-19MUV-PA
MCO-19MUVH-PA

Multigas
Incubators

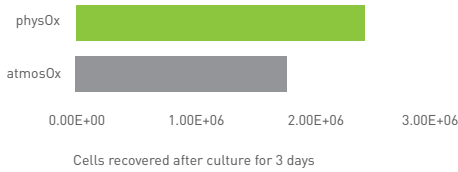
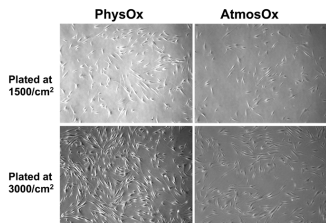




IMPORTANCE OF PHYSIOLOGICAL O₂ FOR MESENCHYMAL STEM CELLS -

Phase contrast pictures of BM-MSC show typical bipolar morphology

Total BM-MSC recovered per passage is higher at PhysOx (5%O₂) as compared to AtmosOx (20%O₂)



The Stanford Study – Growth at Physiological Oxygen provides “*in vivo*” environment for culturing Mesenchymal Stem Cells.

A study by Atkuri *et al.** involved culturing Bone Marrow derived Mesenchymal stem cells (BM-MSC) in a BD Mosaic hMSC Serum free cell culture environment at either physiological (5%) O₂ or atmospheric oxygen (20%) O₂ levels in tri-gas incubators (Panasonic Healthcare Corporation). One of the major findings was that human BM MSCs grow approximately **30-50%** faster at physiological oxygen.

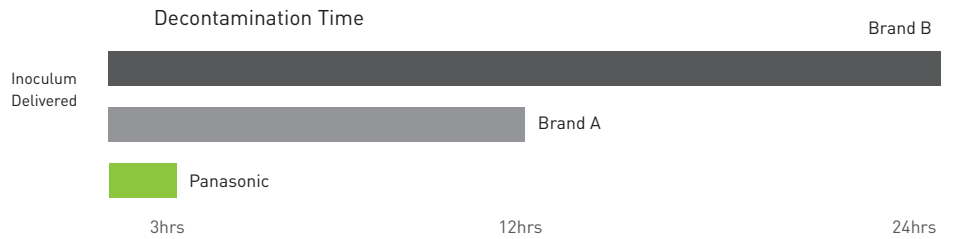
* Growth at Physiological Oxygen provides “*in vivo*” environment for culturing Mesenchymal Stem Cells

Precision Metrics

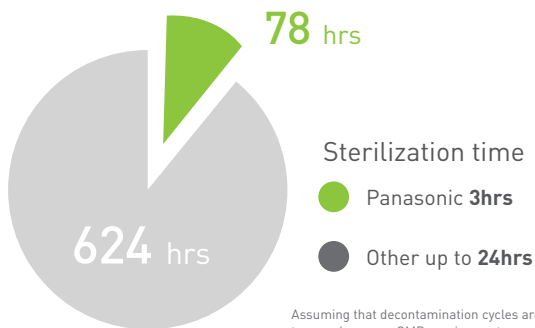
CO₂ level recovery characteristics



Sterisonic H₂O₂ Decontamination Metrics



Increased Efficiency – Time saved in a year

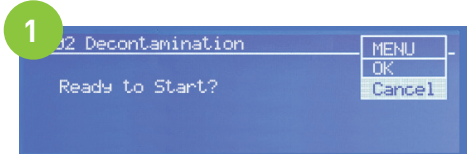


cell/Q™ Featured Decontamination Technologies

- SafeCell UV
- InCu-saFe®
- Active Background (Preventative)
- Sterisonic H₂O₂ Decontamination

Control and Monitoring

Intelligent interface through integrated LCD control with graphical display— The **cellIQ™** incubator is managed by an integrated micro-processor controller with LCD graphical display to simplify all incubator functions. Stable temperature and humidity conditions are achieved through a combination of performance systems supervised by the controller complete with alarm, programming, calibration, and diagnostic protocols.



1. Start Cycle:

When the H₂O₂ button is pressed a confirming message prompts the user to proceed with the decontamination cycle or cancel.



2. H₂O₂ Vapor Cycle:

Once the door locks automatically, the cycle starts. The flashing H₂O₂ display confirms the process and counts down remaining H₂O₂ vaporization time.

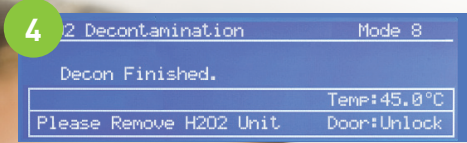


3. UV Resolution:

The H₂O₂ atomizer automatically completes after a 10 minute cycle. UV lamp comes ON. The flashing UV Resolve display counts down remaining time in the UV cycle as H₂O₂ is reduced to water and trace oxygen.

4. Cycle Complete:

Complete the door lock releases automatically. The H₂O₂ atomizer and cable can be disconnected and removed and all interior components restored to their normal position.



Message display | Digital alphanumeric LCD | Pop-up menu

Visual alarm

H₂O₂ decontamination sequence start key

Menu call button

Positive feedback tactile input buttons

Positive feedback tactile entry and function keys



The **cellIQ™** Control and information center includes an intuitive pop-up menu, high resolution LCD for inputs, outputs, and performance at a glance.



cell/Q™ – CO₂/O₂ Incubators

| MODEL | MCO-19MUVH-PA | MCO-19MUV-PA | MCO-19M-PA |
|---|--|--------------|------------|
| MAJOR OPERATING SYSTEMS | | | |
| H ₂ O ₂ DECONTAMINATION SYSTEM | Standard | Optional | Optional |
| SAFECELL UV SYSTEM | Standard | Standard | Optional |
| SINGLE BEAM, DUAL DETECTOR IR CO ₂ SENSOR | Standard | Standard | Standard |
| INCU-SAFE® COPPER ENRICHED STAINLESS STEEL INTERIOR | Standard | Standard | Standard |
| LCD GRAPHICAL CONTROLLER/DISPLAY, DOOR MOUNTED | Standard | Standard | Standard |
| DIRECT HEAT, AIR (DHA) AIR JACKET | Standard | Standard | Standard |
| DECONTAMINATION | | | |
| H ₂ O ₂ DECONTAMINATION SYSTEM | Vaporization <i>in situ</i> | Optional | Optional |
| INTERIOR UV LAMP, PROGRAMMABLE, OZONE FREE | Standard | Standard | Optional |
| COPPER ENRICHED STAINLESS STEEL INTERIOR WITH GERMICIDAL PROTECTION | Standard | Standard | Standard |
| ENVIRONMENTAL PERFORMANCE | | | |
| TEMPERATURE CONTROL RANGE | +5°C above ambient to 50°C | | |
| TEMPERATURE CONTROL UNIFORMITY DEVIATION | ±0.25°C (in 25°C ambient, setting 37°C, 5% CO ₂ , no load) | | |
| CO ₂ CONTROL RANGE AND DEVIATION | 0% to 20%, ±0.15% in 25°C ambient, setting 37°C, 5% CO ₂ , no load | | |
| CO ₂ SENSOR PLATFORM | Ceramic based, single beam, dual wavelength measurement of actual vs. contrast, with continuous auto-zero calibration. | | |
| CO ₂ CALIBRATION | Single point zero automatic; semi-automatic one point span (reference optional). | | |
| AIRFLOW | Gentle vertical airflow, continuous with inner door closed. | | |
| INTERIOR HUMIDITY | 95%RH at 37°C through evaporation via DHA heating system; reflective optical low water sensor. | | |
| CONTROL, MONITORING, ALARM | | | |
| LABALERT MONITORING | Optional | | |
| TEMPERATURE AND CO ₂ CONTROL | P.I.D., setpoint resolution 0.1% and 0.1°C | | |
| DISPLAY | Alphanumeric LCD digital display messaging. | | |
| DATA ACQUISITION | Data Acquisition Automatic log function of temperature and CO ₂ . | | |
| CABINET DESIGN AND CONSTRUCTION | | | |
| INTERIOR, SHELVES | 4, Copper-enriched stainless steel / 3, Copper-enriched stainless steel | | |
| INNER DOOR | Tempered glass / 4 separate, gasketed inner doors, tempered glass | | |
| INSULATION | Rigid foam polyurethane. | | |
| OUTER DOOR | Reversible, heated. | | |
| ACCESS PORT | Single opening with interior and exterior 1.18" (30 mm) silicone stoppers. | | |
| LEVELING FEET | 4, adjustable. | | |

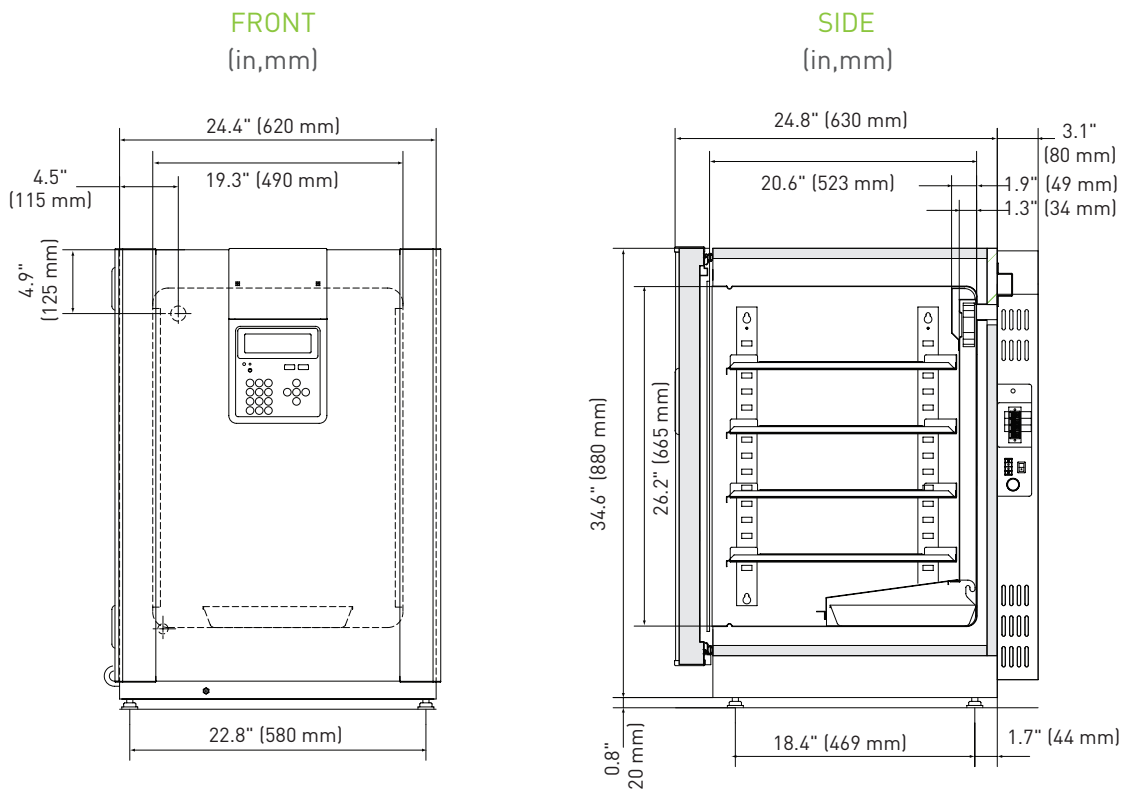
cell/Q™ –Energy, Electrical and Utilities

| MODEL | MCO-19M-PA MCO-19MUV-PA MCO-19MUVH-PA |
|---|--|
| MAXIMUM POWER CONSUMPTION | 354W |
| MAXIMUM HEAT DISCHARGE | 1062 BTU/HR |
| ELECTRICAL CONNECTION | 115V,60Hz, 1 phase, NEMA 5-15P plug provided; |
| CO ₂ GAS CONNECTION | ¼" Barb Fitting |
| CO ₂ GAS INPUT PRESSURE | Nominal 5 psi from two-stage CO ₂ regulator |
| CO ₂ GAS CYLINDER SWITCHOVER SYSTEM | Optional |
| O ₂ CONTROL SYSTEM | Microprocessor P.I.D, Zirconia Sensor |
| O ₂ RANGE AND VARIATION | 1-18%, 22-80%, ±0.2% in 25°C ambient, setting 37°C, 5% CO ₂ , 5% O ₂ , no load |
| N ₂ /O ₂ INLET CONNECT/PRESSURE | Nominal 7 psi from two-stage regulator |
| N ₂ /O ₂ SWITCHOVER SYSTEM | Standard |



cell/Q™ –Dimensions, Weights and Capacities

| MODEL | VOLUME (CU.FT.) | EXTERIOR DIMENSIONS (W X F-B X H) | INTERIOR DIMENSIONS (W X F-B X H) | SHELVES | NET WEIGHT (NOMINAL) |
|---|-----------------|---|---|---|----------------------|
| MCO-19M-PA MCO-19MUV-PA MCO-19MUVH-PA | 5.72 162 L | 24.4" x 27.9" x 35.4" 620 x 710 x 900 mm | 19.3" x 20.6" x 26.2" 490 x 523 x 665 mm | 15 max / 4 supplied std. 17.7" x 17.7" (15.4 lbs capacity) 450 x 450 mm (7 kg capacity) | 207.2 lbs 94 kg |



cell/Q™ –Series Energy, Electrical and Utilities

| MODEL | MCO-19M-PA MCO-19MUV-PA MCO-19MUVH-PA |
|---|--|
| MAXIMUM POWER CONSUMPTION | 310W |
| MAXIMUM HEAT DISCHARGE | 1062 BTU/HR |
| ELECTRICAL CONNECTION | 115V,60Hz, 1 phase, NEMA 5-15P plug provided; |
| CO ₂ GAS CONNECTION | ¼" Barb Fitting |
| CO ₂ GAS INPUT PRESSURE | Nominal 5 psi from two-stage CO ₂ regulator |
| CO ₂ GAS CYLINDER SWITCHOVER SYSTEM | Optional |
| O ₂ CONTROL SYSTEM | N/A |
| O ₂ RANGE AND VARIATION | N/A |
| N ₂ /O ₂ INLET CONNECT/PRESSURE | N/A |
| N ₂ /O ₂ SWITCHOVER SYSTEM | N/A |



cell/Q™ -Series Accessories

Panasonic Biomedical products include a broad range of accessories to meet specific application requirements. For accessories or options not listed herein, contact Panasonic or your authorized Panasonic sales representative.

| MODEL | MCO-19M-PA | MCO-19MUV-PA | MCO-19MUVH-PA |
|---|--------------------|--------------------|--------------------|
| | Catalog No. | Catalog No. | Catalog No. |
| H ₂ O ₂ DECONTAMINATION KIT | N / A | MCO-HL-PA | Built-in |
| H ₂ O ₂ VAPOR ATOMIZER | N / A | N/A | MCO-HP-PW |
| H ₂ O ₂ REAGENT (FORMULATED FOR PANASONIC CELL/Q™) | N / A | N/A | MCO-H202-PV |
| AUTOMATIC CO ₂ CYLINDER SWITCHOVER SYSTEM | MCO-216C-PW | MCO-216C-PW | MCO-216C-PW |
| GAS CALIBRATION SYSTEM, SEMI-AUTOMATIC ONE POINT CALIBRATION FUNCTION | MCO-SG-PW | MCO-SG-PW | MCO-SG-PW |
| CO ₂ CYLINDER REGULATOR, CGA FITTING 320 | MCO 100L | MCO-100L | MCO-100L |
| ROLLER BASE. FOR USE IN SINGLE OR STACKED INSTALLATIONS | MCO-18RB-PW | MCO-18RB-PW | MCO-18RB-PW |
| INCU-SAFE® SHELF AND BRACKETS. INCLUDES TWO SHELF BRACKETS. FULL SHELF | MCO-47ST-PW | MCO-47ST-PW | MCO-47ST-PW |
| INCU-SAFE® HALF TRAY SYSTEM | MCO-25ST-PW | MCO-25ST-PW | MCO-25ST-PW |
| INTEGRATED COOLING OPTION | MCO-CL | MCO-CL | MCO-CL |
| COMMUNICATIONS PORT. LOCATED AT REAR OF CHAMBER, ANALOG 4-20MA | MCO-420MA-PW | MCO-420MA-PW | MCO-420MA-PW |
| SAFECELL UV SYSTEM KIT NARROW-BANDWIDTH 253.7NM LAMP AND ASSEMBLY | MCO-19UVS-PA | Built-In | Built-In |
| N ₂ CYLINDER REGULATOR, CGA FITTING 580 (FOR LOW OXYGEN APPLICATIONS) | MCO100N | MCO100N | MCO100N |
| O ₂ CYLINDER REGULATOR, CGA FITTING 540 (FOR HIGH OXYGEN APPLICATIONS) | Y12200A540 | Y12200A540 | Y12200A540 |



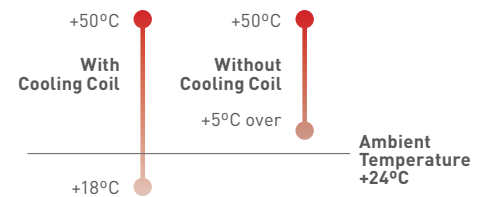
H₂O₂ Reagent (MCO-H202-PV)

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



H₂O₂ Vapor Atomizer (MCO-HP-PW)

Shown with connecting cable, standard.



Integrated Cooling Coil (MCO-CL)

Factory installed; specify when ordering. Water bath/circulator not included. Permits stable operation at ambient or below ambient temperatures.

Extends performance specifications as follows:

- Temperature Range: +18°C to +50°C, distribution $\pm 0.25^\circ\text{C}$, variation $\pm 0.1^\circ\text{C}$.
- Relative Humidity: +5°C above ambient to +50°C, 95% \pm 5%RH; 20°C to 25°C > 80%RH; 18°C > 70%RH

Includes temperature mapping results for individual unit per serial number.

CytoGROW

Optimal Series

Ideal for research and clinical microbiology, the Panasonic CytoGROW Optimal Series CO₂ incubators offers a high performance solution for mainstream cell culture applications, where precise control and contamination resistance is critical.

Models: KM-CC17T0A, KM-CC17TU0A
MCO-20AIC-PA



Applications

- Clinical microbiology
- General research
- Growth studies

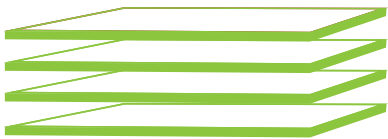
| | |
|----------------------------|----------------------------|
| MCO - 20AIC-PA | CO ₂ Incubators |
| KM- CC17T0A KM-CC17TU0A | CO ₂ Incubators |



| SYSTEM | FEATURE | COMPETITORS | PANASONIC BENEFIT |
|--|--|---------------------------------------|--|
| CONTAMINATION RESISTANCE <i>IN SITU</i> | Active Background Contamination Control with InCu-saFe® copper-enriched stainless steel interior | Stainless steel | InCu-saFe® forms integral germicidal barrier against airborne contaminants; stainless steel does not offer a similar latent protection. |
| AIR AND WATER DECONTAMINATION <i>IN SITU</i> | SafeCell UV Protection (Optional) | Not available | SafeCell UV protection located safely below the interior base destroys airborne contaminants as they pass over the humidity reservoir surface. The Panasonic combination of InCu-saFe® and SafeCell UV minimizes downtime for total cleaning when required, with the benefit of continuous, preventive contamination control during normal operation. |
| CABINET CONSTRUCTION | Ease-of-use Direct Heat and Air Jacket design | Composite direct heat or water jacket | Panasonic design is sensitive to ambient temperatures, which permits the micro-processor-controlled, multi-zone Panasonic Direct Heat and Air Jacket system to work most efficiently. Panasonic maintains maximum temperature control and uniformity from three independent heating zones on all sides. |
| CO ₂ CONTROL | IR2 Sensor (MCO- 20AIC-PA Only) | TC Sensors | Panasonic proprietary single beam, infrared (IR2) CO ₂ sensors delivers precise CO ₂ control, quick recovery following door openings and auto sampling with no moving parts |

Flexible Installation Options:

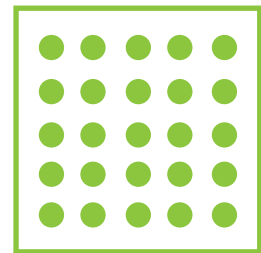
With left- or right-swing outer door, CytoGROW Optimal Series offers the industry’s most flexible installation options available in either single or dual (stacked) cabinet configurations.



Convenient space efficient inventory management is simplified through a system of adjustable, extendable shelves.



Inventory shelves and brackets are formed from copper-enriched germicidal stainless steel, removable without tools.



Shelves are perforated to permit natural vertical air convection through and around labware.



Uniform Environment:



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Temperature Uniformity

The patented Direct Heat and Air Jacket System eliminates the need for a conventional water jacket system, while achieving temperature stability, uniformity and fast recovery following door openings.

CO₂/O₂ Recovery

The automatic CO₂ control system delivers precise, reliable and repeatable CO₂ control

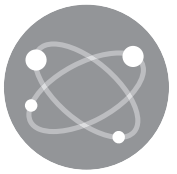
MCO-20AIC-PA has an IR sensor where as KM-CC17T0A has Panasonic designed TC sensors.

Consistent Humidity

Humidification is achieved by combined forced-air and natural evaporation method enhanced by the Direct Heat and Air Jacket system – Optical water level indicator warns when the water level reduces in the humidity pan.

STABLE AND CONSISTENT ENVIRONMENT IN THE INCUBATOR

Active Background Contamination Control:



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InCu-saFe® Interior

InCu-saFe® forms an integral germicidal barrier against airborne contaminants and helps eliminate mold, spores and other contaminating spills while providing a noncorrosive environment.

Patented SafeCell UV Protection (optional)

Located safely below the interior base destroys airborne contaminants as they pass over the humidity reservoir surface. Pathogens introduced during door openings are ultimately removed.

Active Background Contamination Control

InCu-saFe® and SafeCell UV eliminates the need for time consuming, disruptive heat decontamination. Panasonic minimizes downtime for total cleaning when required, with the benefit of continuous, preventive contamination control during normal operation.

(Available only with SafeCell UV option)



Technical Specification:

KM-CC17TU0A/KM-CC17T0A



170L
6.0 cu.ft.

EXTERIOR

24.4" x 27.9" x 35.4"
620 x 710 x 900mm

205lb
93kg

INTERIOR

19.3" x 20.6" x 26.2"
490 x 523 x 665mm

MCO-20AIC-PA



215L
7.6 cu.ft.

EXTERIOR

24.4" x 27.9" x 35.4"
620 x 710 x 900mm

205lb
93kg

INTERIOR

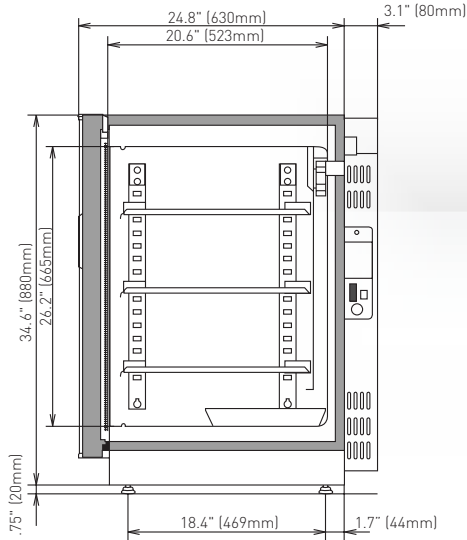
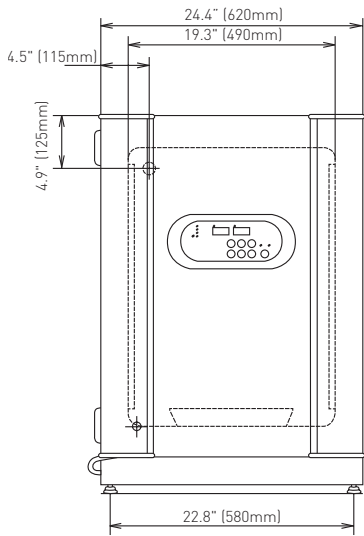
30.3" x 27.9" x 35.4"
770 x 709 x 899mm

FRONT

(in,mm)

SIDE

(in,mm)



KM-CC17TU0A /KM-CC17T0A

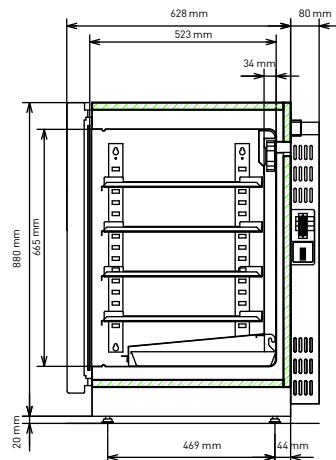
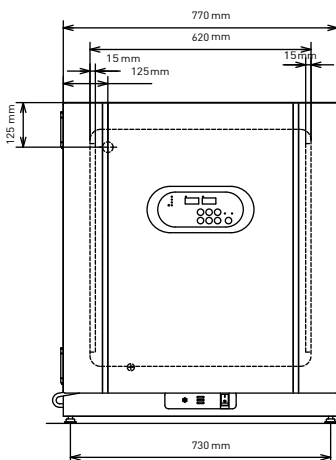


FRONT

(mm)

SIDE

(mm)



MCO-20AIC-PA



KM-CC17T0A/KM-CC17TU0A & MCO-20AIC-PA Specifications

| MODEL | MCO-20AIC-PA | KM-CC17T0A / KM-CC17TU0A |
|---|---|---|
| DIMENSIONS | | |
| INTERIOR (W X F-B X H) | 24.4" x 20.6" x 26.2" 620 x 523 x 665 mm | 19.3" x 20.6" x 26.2" 490 x 523 x 665 mm |
| EXTERIOR (W X F-B X H) | 30.3" x 27.9" x 35.4" 770 x 709 x 899 mm | 24.4" x 27.9" x 35.4" 620 x 710 x 900 mm |
| VOLUME | 7.6 cu.ft. 215 L | 6 cu.ft. 170 L |
| NET WEIGHT | 205 lbs 93 kg | 205 lbs 93 kg |
| DISPLAY | | LED digital display messaging |
| DATA ACQUISITION | Data Acquisition Automatic log function of temperature and CO ₂ . | Data Acquisition Automatic log function of temperature and CO ₂ . |
| COMMUNICATIONS | Catalog #MCO-420MA, remote alarm contacts standard. Optional 4-20mA connection. Optional PC interface, Catalog No. MTR-480 with RS232/RS485 data ports available. | Catalog #MCO-420MA, remote alarm contacts standard. Optional 4-20mA connection. Optional PC interface, Catalog No. MTR-480 with RS232/RS485 data ports available. |
| MAJOR OPERATING SYSTEMS | | |
| SAFECELL UV SYSTEM | Standard | Optional |
| CO ₂ SENSOR | IR Sensor | Thermal Conductivity, Standard |
| INCU-SAFE® COPPER ENRICHED STAINLESS STEEL INTERIOR | Standard | Standard |
| CONTROLLER/DISPLAY, DOOR MOUNTED | Microprocessor Controller Standard | Microprocessor Controller Standard |
| DIRECT HEAT AND AIR (DHA) JACKET CONSTRUCTION | Standard | Standard |
| DECONTAMINATION | | |
| INTERIOR UV LAMP, PROGRAMMABLE, O ₂ ONE FREE | Standard | Optional / 253.7 nm wave length, 4W / Standard |
| COPPER ENRICHED STAINLESS STEEL INTERIOR WITH GERMICIDAL PROTECTION | Standard | Standard, Copper-enriched stainless steel interior |
| ENERGY, ELECTRICAL & UTILITIES | N/A | N/A |
| MAXIMUM POWER CONSUMPTION | 310W | 310W |
| MAXIMUM HEAT DISCHARGE | 1062 BTU | 1116 KJ/h |
| ELECTRICAL CONNECTION | 115V,60Hz with NEMA 5-15 plug provided; requires NEMA 5-15R grounded receptacle | 115V,60Hz, 1 phase, NEMA 5-15P plug |
| CO ₂ GAS CONNECTION | 4 to 6mm inner diameter tubing | 0.25" barbed fitting |
| CO ₂ GAS INPUT PRESSURE | Nominal 4.3 PSI from two-stage CO ₂ regulator | 5 psi from two-stage CO ₂ regulator |
| CO ₂ GAS CYLINDER SWITCH-OVER SYSTEM | Optional, MCO-21GC, internal | Optional, MCO-21GC, internal |

Design Construction & Optional Accessories

| MODEL | KM-CC17T0A / KM-CC17TU0A | MCO-20AIC-PA |
|---|--|--|
| CABINET DESIGN AND CONSTRUCTION | | |
| SUPERSTRUCTURE, EXTERIOR CABINET AND DOOR | Galvanized steel exterior, baked-on enamel finish | Galvanized steel exterior, baked-on enamel finish |
| INTERIOR AND SHELVES | Copper-enriched stainless steel | Copper-enriched stainless steel |
| INNER DOOR | Tempered glass | Tempered glass |
| INSULATION | Rigid foam polyurethane | Rigid foam polyurethane |
| OUTER DOOR | Reversible, heated | Reversible, heated |
| ACCESS PORT | Single opening with interior and exterior 30mm non-VOC silicone stoppers | Single opening with interior and exterior 30mm non-VOC silicone stoppers |
| LEVELING FEET | 4, adjustable | 4, adjustable |
| CONTROL, MONITORING, ALARM | | |
| TEMPERATURE AND CO ₂ CONTROL | P.I.D, setpoint resolution 0.1% and 0.1°C | Setpoint resolution 0.1% and 0.1°C |
| DISPLAY | LED digital display messaging | LED digital display messaging |
| COMMUNICATIONS | Catalog #MCO-420MA, remote alarm contacts standard. Optional 4-20mA connection. Optional PC interface, Catalog No. MTR-480 with RS232/ | Optional 4-20mA connection, MCO-420MA; optional PC interface, MTR-480, LabAlert™ Monitoring System |
| LABALERT | Optional | Optional |
| OPTIONAL ACCESSORIES | | |
| SAFECELL UV SYSTEM KIT* NARROW-BANDWIDTH 253.7NM LAMP AND ASSEMBLY. INCLUDES WATER LEVEL SENSOR AND WATER PAN COVER. | MCO-18UVS3-PA | MCO-18UVS3-PA |
| AUTOMATIC CO ₂ CYLINDER SWITCHOVER SYSTEM* (PER CHAMBER) | MCO-21GC-PW | MCO-21GC-PW |
| CO ₂ CYLINDER REGULATOR, CGA FITTING 320 | MCO-100L | MCO-100L |
| ROLLER BASE. FOR USE IN SINGLE OR STACKED INSTALLATIONS. | MCO-18RB-PW | MCO-18RB-PW |
| INCU-SAFE® FULL SHELF AND BRACKETS. INCLUDES TWO SHELF BRACKETS. | MCO-47ST-PW | MCO-47ST-PW |
| INCU-SAFE® HALF TRAY | MCO-25ST-PW | MCO-25ST-PW |
| INTEGRATED COOLING OPTION | MCO-CL | MCO-CL |
| COMMUNICATIONS PORT. LOCATED AT REAR OF CHAMBER. CONNECTOR, CABLE AND SOFTWARE NOT SUPPLIED.* | MCO-420MA-PW | MCO-420MA-PW |

Factory installed; specify when ordering. Specification subject to change without notice.

CytoGROW

Compact Series

Panasonic CytoGROW Compact Series CO₂ and Multigas incubators offer precise CO₂ and O₂ control in a compact, space saving design allowing up to 3 models to be stacked, making them ideal for *in vitro* simulation of the *in vivo* condition in a laboratory environment.

Models: KM-CC5T0A, MCO-5M-PA



Applications

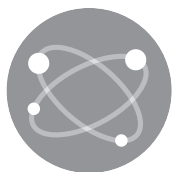
- Small size makes it ideal for triple stacking in applications in IVF and ART procedures.

P.I.D Control Sophistication

Proportional, integral and derivative infrared CO₂ control accelerates recovery and prevents overshoot.



Stable and Consistent Environment in the Incubator:



InCu-saFe® Interior

Superior contamination control with an anti-bacterial copper alloy stainless steel interior offers germicidal protection while providing a non-corrosive environment.

Zirconia O₂ Control

For Multigas CytoGROW Compact incubator, a solid zirconia oxygen sensor maintains sub-ambient O₂ levels with high degree of precision. It has a long service life and has fast response to door openings.

Consistent Humidity

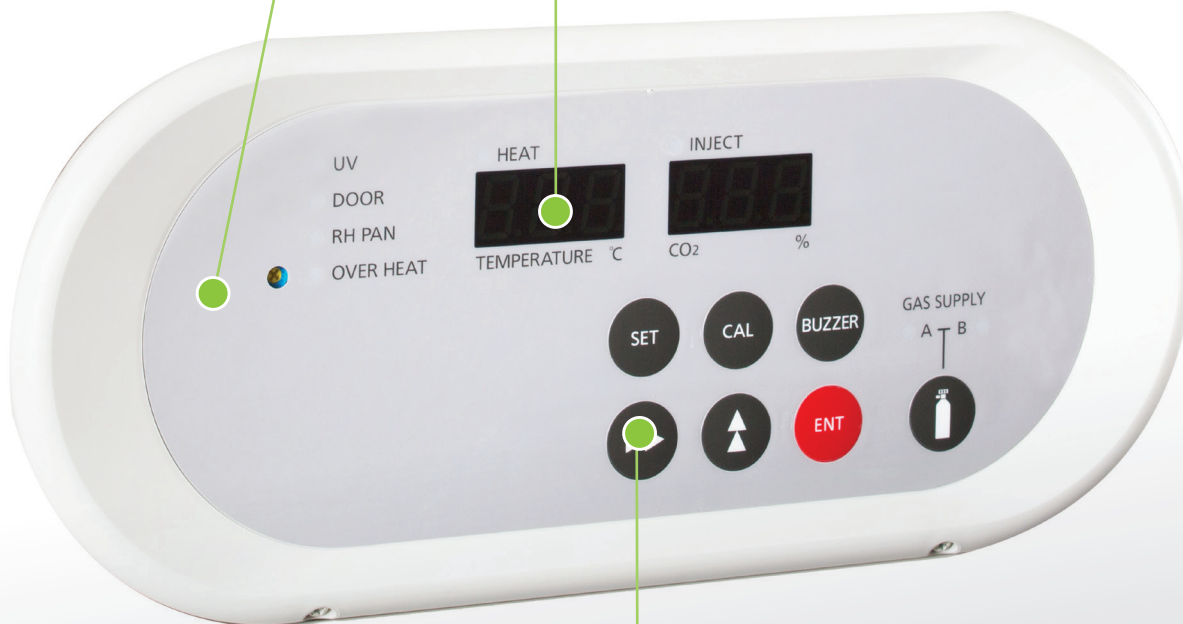
The patented Direct Heat and Air Jacket System eliminates the need for a conventional water jacket system, while achieving temperature stability, uniformity and fast recovery following door openings.

SafeCell UV

Patented SafeCell UV technology uses a programmable ultraviolet lamp that sterilizes air and humidity water pan without affecting the cell cultures (optional).

- Digital Temperature Display
- Heat ON Lamp

- Visual alarm indicator



- Positive feedback tactile entry and function keys

High Performance with optimal conditions for *in vitro* modeling

Stable temperature, humidity, and CO₂ density are achieved through a combination of performance systems supervised by a centralized microprocessor controller complete with alarm, programming, calibration and diagnostic protocols exportable to remote database.

Technical Specification:

KM-CC5T0A



49L
1.7 cu.ft.

EXTERIOR

18.9" x 21.6" x 22.4"
480 x 548 x 575mm

108lb
49kg

INTERIOR

18.9" x 14.9" x .14.8"
350 x 378 x 375mm

MCO-5M-PA



49L
1.7 cu.ft.

EXTERIOR

18.9" x 21.6" x 22.6"
480 x 548 x 575mm

108lb
49kg

INTERIOR

18.9" x 14.9" x .14.8"
350 x 378 x 375mm

| MODEL NUMBER | VOLUME (CU.FT.) | EXTERIOR DIMENSIONS (W X F-B X H) | CONTAMINATION CONTROL | CO ₂ CONTROL | O ₂ CONTROL | VOLTAGE, POWER CONNECTION |
|--------------|-----------------|---|---|-------------------------|---------------------------------------|---------------------------|
| KM-CC5T0A | 1.7 | 18.9" x 21.6" x 22.4" 480 x 548 x 568 mm | inCu-saFe® copper-enriched stainless steel interior, Optional SafeCell UV with ultraviolet light, | Thermal conductivity | — | 115V NEMA 5-15 |
| MCO-5M-PA | 49 L | 18.9" x 21.6" x 22.4" 480 x 548 x 568 mm | inCu-saFe® copper-enriched stainless steel interior, Optional SafeCell UV with ultraviolet light, | Thermal conductivity | Zirconia sensor with P.I.D/R recovery | 115V NEMA 5-15 |



CytoGROW

ReachIn Series

The MCO-80IC-PA is ideal for culturing large volumes of biological samples, performing short-term studies, and working with large volume cell culture apparatus. It includes Panasonic's exclusive incubator technologies such as inCu-saFe® interiors, UV decontamination option, infrared (IR) CO₂ sensor with P.I.D control, and features exceptionally low CO₂ gas consumption.

Models: MCO-80IC-PA



Applications

- Microbiological studies
- Plant Studies

Usability

30.1 cu.ft. Large capacity cabinet allows flexibility in usage. Cabinet will also accommodate a roller bottle apparatus, 5 bottles wide x 7 bottles high (requires mounting ramp kit).

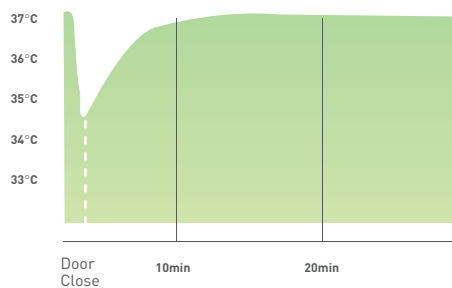


Superior CO₂ and Temperature Control:

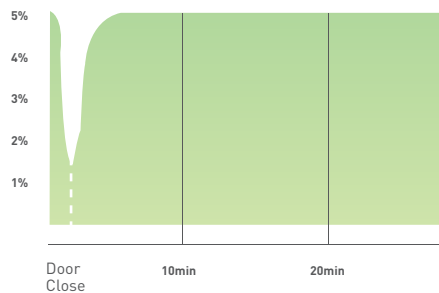
IR CO₂ sensor with P.I.D microprocessor control and forced air circulation system delivers fast CO₂ recovery characteristics. Exceptionally low CO₂ gas consumption rates, less than half of similar competitive units.

P.I.D temperature control with deviation of $\pm 0.1^{\circ}\text{C}$

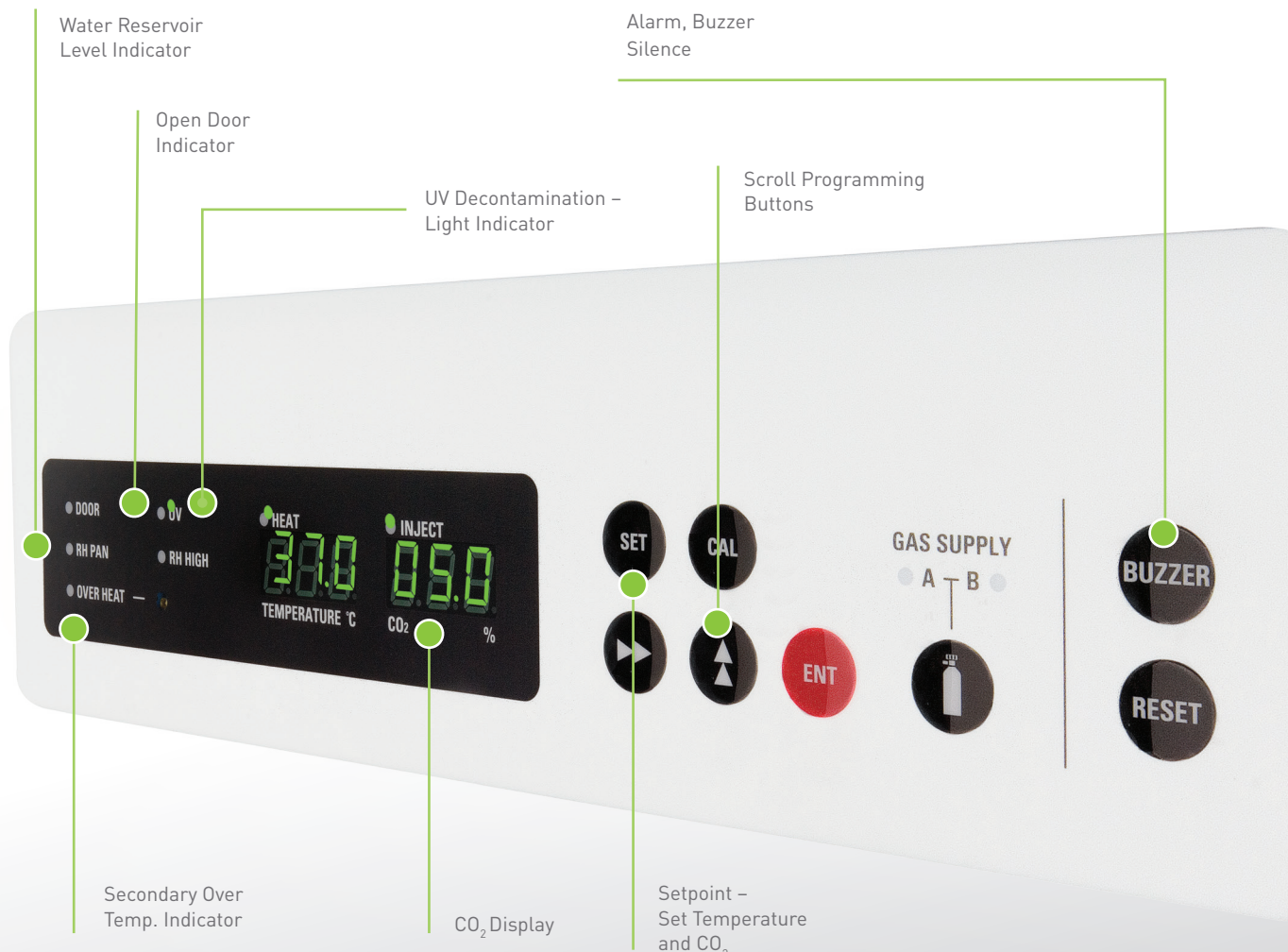
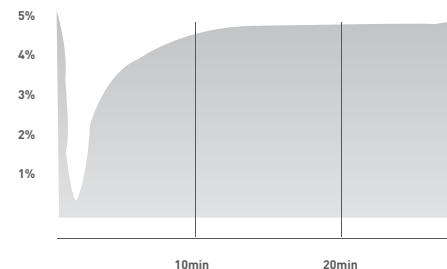
Temperature Recovery



CO₂ Recovery after 60 second door opening for the Panasonic MCO-801C-PA

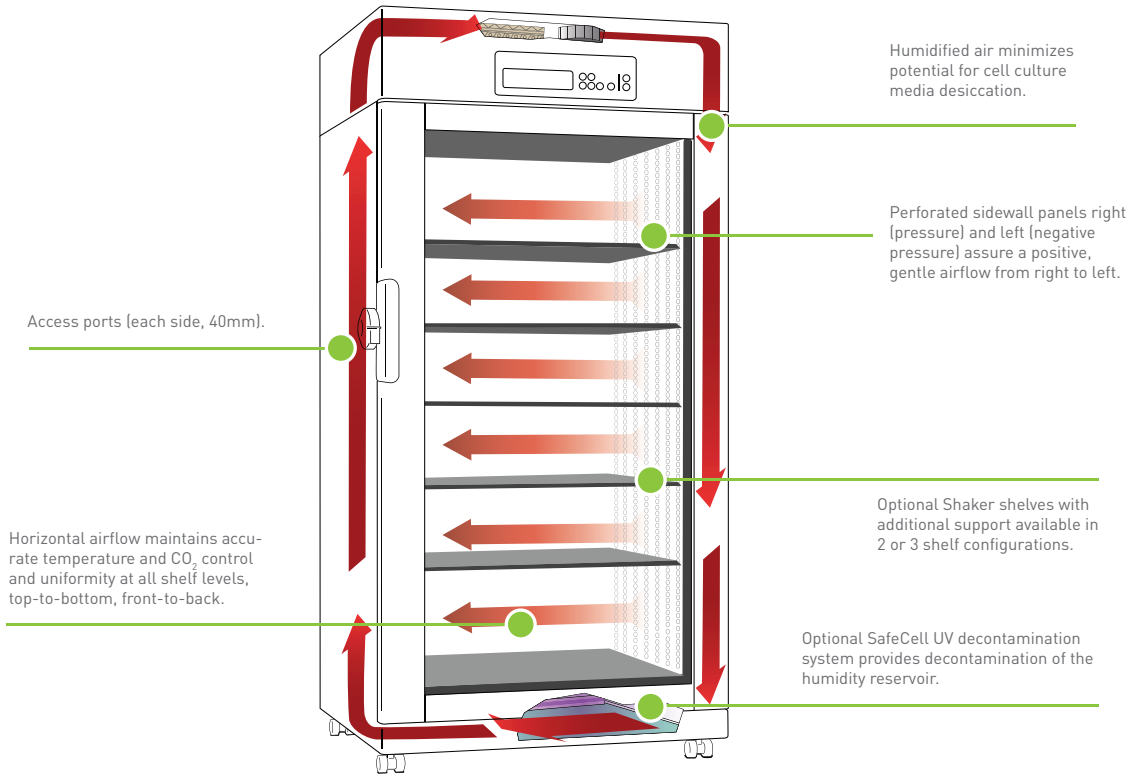


CO₂ Recovery after 60 second door opening for Competitor



Horizontal Laminar Airflow System

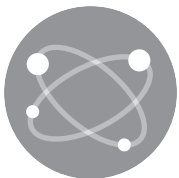
Panasonic's CytoGROW ReachIn incubator's cross shelf directed air flow system promotes optimum temperature uniformity throughout the chamber and contributes to quick temperature recovery after door openings. Utilizing Panasonic's exclusive inCu-saFe® chamber material in the perforated side plenum helps minimize contamination concerns and direct positive and negative pressure air flow



SafeCell UV protection with Humidity Selection: (optional feature)

Panasonic's patented SafeCell UV decontamination system decontaminates the humidifying water reservoir and helps in eliminating the contamination concerns due to regular door openings.

Humidity reservoir heaters are located on the outside walls of the reservoir and are not as susceptible to corrosion and scaling from water as competitive systems are. The unit can be set to both nominal (above 80% RH) and high humidity setpoints (above 90% RH).



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InCu-saFe® Interior

InCu-saFe® forms an integral germicidal barrier against airborne contaminants and helps eliminate mold, spores, and other contaminating spills while providing a noncorrosive environment.

Patented SafeCell UV Protection (optional)

Located safely below the interior base destroys airborne contaminants as they pass over the humidity reservoir surface. Pathogens introduced during door openings are ultimately removed.

OPTIMUM PROTECTION FOR LARGE CAPACITY INCUBATOR

Accessories & Technical Specification:

| OPTIONAL ACCESSORIES | |
|----------------------|---|
| MCO-80GC-PW | Built in gas automatic switcher kit |
| MCO-80RBS-PW | Roller bottle apparatus mounting ramp kit |
| MCO-80ID-PW | Inner Door Kit 5 partition doors, made with acrylic resin |
| MCO-80UVS-PA | UV sterilization of humidifying water reservoir only |
| MCO-80AS-PW | Automatic water supply system: Includes control box, water tank, water supply hose, 18L (4.8 gallon) tank |
| MCO-80ST-PW | Additional shelf |
| MCO-420MA-PW | 4 to 20 mA analog output module |
| MCO-100L | CO ₂ tank regulator |
| MCO-80IC3RSLF | Reinforced shelves for shaker use |
| LABALERT | Optional |

| DIMENSIONS | |
|---|--|
| OVERALL EXTERIOR DIMENSIONS (W X F-B X H) | 33.8" × 33.6" × 80.3" / 986 × 853 × 2040 mm |
| INTERIOR DIMENSIONS (W X F-B X H) | 31.7" × 27.3" × 60.0" / 806 × 693 × 1524 mm |
| INTERIOR VOLUME | 30.1 cu.ft / 851 L |
| SHELVING (W X F-B X H) | 30.5" × 25.9" × 0.4" / 776 × 659 × 10 mm Load Capacity: 66 lbs. / 30 kg |

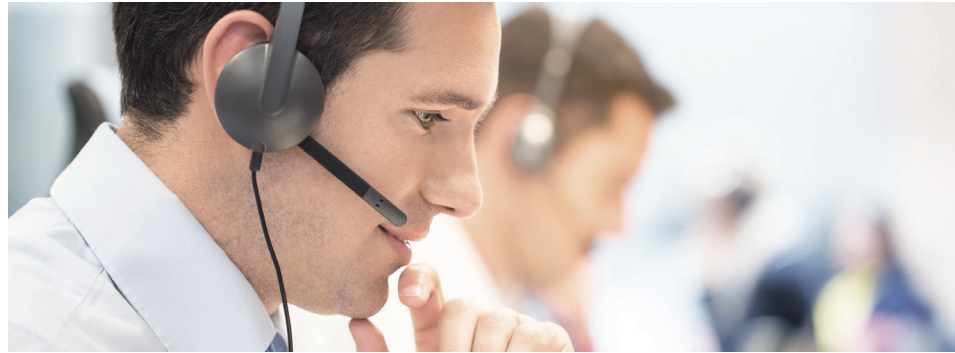
| CONSTRUCTION | |
|--|--|
| EXTERIOR CABINET | Electrogalvanized Steel (Acrylic resin baking painted finish) |
| INTERIOR CABINET | Copper Alloy Stainless Steel (expect humidifying reservoir) |
| EXTERNAL DOOR | Double Paned Glass Door with out door latch |
| SHELVING | Copper alloy Stainless Steel (5 standard) |
| NET UNIT WEIGHT | 605 lbs. / 275 kg. |
| ACCESS PORTS | 40 mm(1.57"), 2 locations (right and left sides) with silicone rubber stopper) |
| ENVIRONMENTAL PERFORMANCE | |
| TEMPERATURE CONTROL RANGE | +5°C above ambient to 50°C (in a 20°C to 35°C ambient) |
| TEMPERATURE UNIFORMITY DEVIATION | ±0.5°C (in 25°C ambient, setting 37°C, 5% CO ₂ , no load 9 point measurement) |
| TEMPERATURE FLUCTUATION MARGIN | ±0.1% (in 25°C ambient, setting 37°C, 5% CO ₂ , no load) |
| CO ₂ CONTROL RANGE | 0 to 20% ±0.15%, no load |
| CHAMBER HUMIDITY | Over 80% RH (High humidity mode: over 90% RH) |
| ENVIRONMENTAL CONTROLS | |
| HUMIDIFYING RESERVOIR | Integrated with an inner chamber (Stainless Steel, SUS304) |
| HUMIDIFYING METHOD | Heated vaporization with water in humidity pan (High humidity mode available) |
| HIGH HUMIDITY MODE | Selectable by function mode (for over 90%RH) |
| HUMIDIFYING WATER RETENTION DAYS (REFERENCE) | 15 days (Reference) (Under a condition of 25°C ambient, setting 37°C, 5% CO ₂ , no load, no door opening, 80%RH) |
| HEATING METHOD | Heater with fan air circulation, cross shelf laminar air flow |
| TEMPERATURE CONTROL SYSTEM | Microprocessor P.I.D with thermistor sensor, temperature fluctuation of +0.1°C |
| TEMPERATURE DISPLAY | Digital display (0.1°C increments) |
| WATER DRAINAGE | Drainage valve (lower side of front frame) Drainage into a tray/bottle (provided) |
| WATER FILL | Water fill located at the front side of interior bottom (optional auto-fill) |
| CO ₂ GAS CONTROL | Microprocessor P.I.D with infrared sensor (0.1% increments) |
| CO ₂ GAS INLET PRESSURE | 15 psi (0.1 MPa) |
| ELECTRICAL | |
| POWER REQUIREMENTS | 115V, 20 Amps, 60 Hz, NEMA 5-20P Plug |
| INTERIOR/EXTERIOR CONVENIENCE RECEPTACLE | Interior Duplex: Vapor Proof. 115V, 3 Amps Max. Rating - Exterior Duplex:115V, 1 Amp. Max Rating |
| ALARMS | High/Low Temperature Alarm. CO ₂ density alarm. Upper limit temperature Alarm. Door Ajar Alarm, Self Diagnostics |
| REMOTE ALARM CONTACTS | N.O. (normally open) and N.C. (normally closed) contacts included, rating DC 30v, 2A |

Professional Service and Support

We provide full product service support to maintain Panasonic standards of product safety, reliability and high performance. The combination of our multi-national network of factory-trained service professionals, detailed documentation of field performance, and high-value on the customer feedback helps us to deliver best-in-class, end-user support for our customers.

Convenience of Panasonic Product Service

- Panasonic service specialists are trained to:
 - Perform remote and on-site diagnostics
 - Repair and replace worn components
 - Offer preventative maintenance programs as per your needs and budget
- Many Panasonic Healthcare products include self-diagnostics that permit authorized service technicians to determine how and when service calls are required.
- We offer training to selected facility biomedical engineers and service staff for authorized in warranty and post-warranty repairs.



- Because our products are sold and serviced worldwide, products acquired in one country under grant or facility-sharing programs are easily supported if moved to facilities in the next city or around the world.

Validation Services

Panasonic offers a wide range of high-quality services for all our equipment. These services include on-site validation, customer validation support packages, factory acceptance testing and NIST calibration.

Choosing Panasonic as an equipment supplier and validation consultant can greatly reduce the time and cost involved with getting new equipment compliant and ready for use.

Unique Services Panasonic Offers:

- On-site consultation
- Unit specific authorized protocol documents
- Customizable testing procedures to meet customer specific requirements
- Free archiving of unexecuted testing protocols
- Unbiased testing of competitive equipment

Pre-delivery Services:

- Validation support
- Consultation
- Factory acceptance testing
- Calibration
- Temperature mapping

On-site Services:

- Installation qualification
- Operational qualification
- Performance qualification
- Calibration
- Temperature mapping

Panasonic

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