



Enhance your cell growth with an intelligent CO<sub>2</sub> incubator designed for precise temperature and CO<sub>2</sub> control, efficient cleaning and rapid decontamination.



MCO-170AIC

MCO-230AIC



MCO-170AICUVH  
MCO-230AICUV\*

MCO-170AICUV  
MCO-170AICUVH  
MCO-230AICUV

\*Optional MCO-170HB/MCO-170EL installation required.

# Next Generation Incubators for Optimum Cell Culture

Panasonic's CO<sub>2</sub> incubators with touchscreen control panels deliver superior usability, rapid cleaning, and effortless maintenance while keeping the tradition of outstanding environmental stability and precise performance.



## Grow results, not bacteria!

### MCO-170AIC/MCO-230AIC Incubators

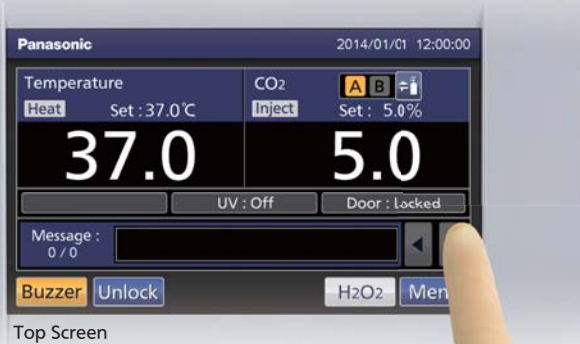
Optimized for high-value samples including hard-to-grow and contamination-sensitive media/reagents.

#### Applications:

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

## Easy Use & Easy Maintenance

# Integrated Tray Catches minimize cleaning time while LCD Panel enhances operation



Responds to gloved finger action.



### LCD Touch Panel Controller

A WVGA color LCD touch panel delivers full control over different protocols. Control can be performed with gloved fingers as the controller is equipped with a resistive touchscreen.

### USB Memory Data Transfer

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

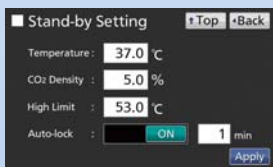


Log screen example (CO<sub>2</sub> level)

**Note:** It is impossible to use a USB memory device which is password-protected.

## Security

Automatic door lock (electric lock) can be set on the MCO-170AICUVH (standard equipped) and other models equipped with the optional electric lock (MCO-170EL).



MCO-170AIC



MCO-230AIC

The Auto-Lock set up screen



Password input window

\*For MCO-170AIC, a password is required to unlock the Auto-Lock when the Key Lock is set.

## Integrated Tray Catches

Tray catches are integral parts of the chamber, opening up more space for trays, allowing the incubator to accommodate more culture containers. (Comparison with MCO-20AIC/MCO-19AIC)



MCO-170AIC's/  
MCO-230AIC's interior  
components



MCO-170AIC's/MCO-230AIC's  
tray catches  
(integral part of the chamber)

### MCO-170AIC's Tray Internal dimensions

475(W) x 450(D)mm



Up to 20 ø100mm dishes (92mm) can be arrayed (5 horizontally x 4 vertically)  
\*In-house comparison

16 dishes (MCO-19AIC)  
→ 20 dishes (MCO-170AIC)

### MCO-230AIC's Tray Internal dimensions

620(W) x 450(D)mm



Up to 24 ø100mm dishes (92mm) can be arrayed (6 horizontally x 4 vertically)  
\*In-house comparison

20 dishes (MCO-20AIC)  
→ 24 dishes (MCO-230AIC)

## Optimal Humidity Control

Stable humidity control not influenced by environmental conditions and frequent incubator door openings.



Japan and US patents pending

- Control Panel with single-user Key Lock (MCO-170AIC/MCO-230AIC)
- Addition of user ID function for better traceability (able to register up to 99 user-IDs and passwords) (MCO-230AIC)



- Multiple detailed activity logs exported to individual CSV files.

MCO-230AIC NO.1						Unlock_User
Date	Time	Temp	CO2	Door		
2015/3/16	11:13:38	37	37	0 Door Open		
2015/3/16	11:13:42	37	0	Door Close		
2015/3/16	11:32:10	37	0	Door Open	Aa001	
2015/3/16	11:32:25	37	0	Door Close		
2015/3/16	13:40:56	37	0	Door Open	Bb002	
2015/3/16	13:41:09	36.9	0	Door Close		
2015/3/16	13:50:01	36.9	0	Door Open	Cc003	
2015/3/16	13:51:19	35.6	0	Door Close		
2015/3/16	13:52:40	37	0	Door Open	aa001	

User Access log

# Design & Technology



## inCu saFe Construction for Germicidal Protection

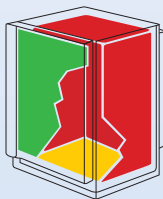
- Panasonic offers exclusive use of inCu saFe copper-enriched stainless steel alloy interior surfaces within a technical design created to eliminate contamination sources and to mitigate the effect of airborne contaminants introduced through normal use.
- Chart summarizes test results with four strains 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 stainless steel 304.

Mycoplasma Stain	Positive Control	Conventional Stainless Steel 304	Panasonic inCu saFe	Conventional Copper C1100
Mycoplasma fermentans PG18	YES	YES	NO	NO
Mycoplasma orale CH19299				
Mycoplasma arginini G230				
Mycoplasma hominis PG21				

\*YES\* mycoplasma strains grew on the material.  
 \*NO\* no mycoplasma strain grew on the material.

## Accurate Temperature Control

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



Direct Heat and Air Jacket Conditioning System

- To avoid cell culture desiccation, the MCO-170AIC/MCO-230AIC maintains up to 90% RH at 37° C.
- Humidification is achieved by reliable natural evaporation and forced-air circulation.

\*Proportional Integral Derivative

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



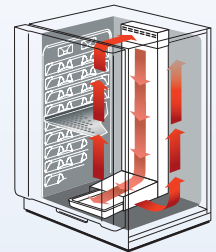
## Precise CO<sub>2</sub> Control

- Panasonic proprietary single beam dual detector infrared CO<sub>2</sub> system offers unprecedented control accuracy and stability by simultaneously measuring two wavelengths for continuous zero calibration.
- Benefits include ultra-fast recovery without overshoot and accurate CO<sub>2</sub> averages during periods of frequent incubator access with multiple door openings.
- An optional STD gas auto calibration kit is available.

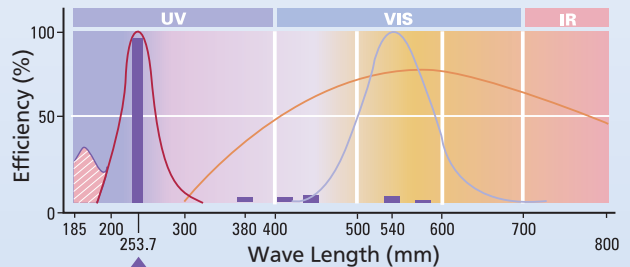


## SafeCell UV Decontamination

- SafeCell UV includes a programmable ultraviolet lamp, isolated from cell cultures, that decontaminates conditioned air and humidity reservoir water to prevent contamination without affecting cell cultures in vitro.
- Contaminants trapped within the humidifying pan at the base of the plenum are destroyed by high intensity, ozone-free ultraviolet light.
- Decontaminated, 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 unique air duct system also improves temperature recovery characteristics.



Airflow and water pan decontamination using a UV system



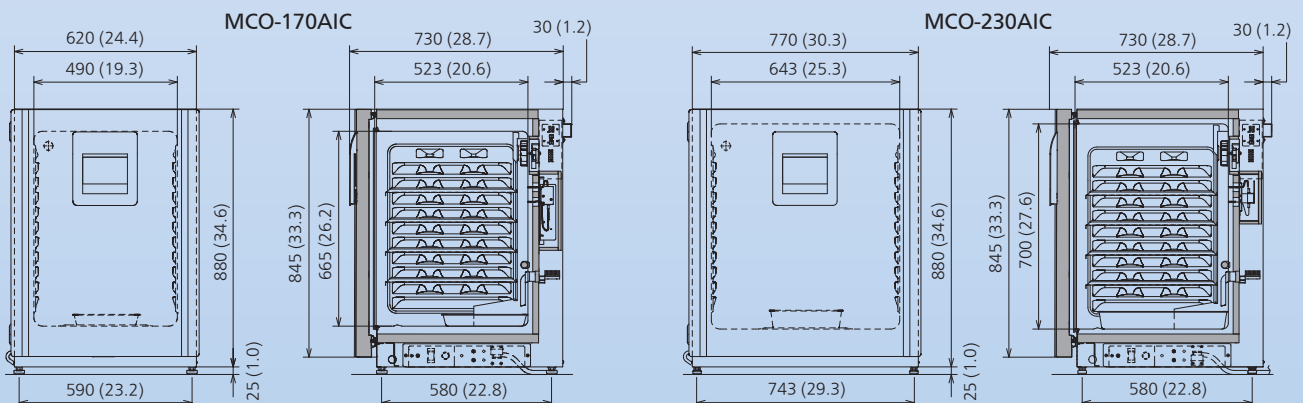
Use of the MCO-170AICUVH/MCO-170AICUV/MCO-230AICUV ultraviolet lamp is a highly effective ozone-free contamination control technique.

■ Panasonic Lamp ■ Ozone Release ■ Germicidal Effect ■ Sunlight

The SafeCell UV lamp cycle is factory set for normal use, and can be re-programmed as desired by entering parameters through the central microprocessor control panel. Program parameters for the H<sub>2</sub>O<sub>2</sub> decontamination cycle are non-adjustable for operator safety.

## Dimensions

Unit: mm (inch)





# H<sub>2</sub>O<sub>2</sub> Decontamination Cycle



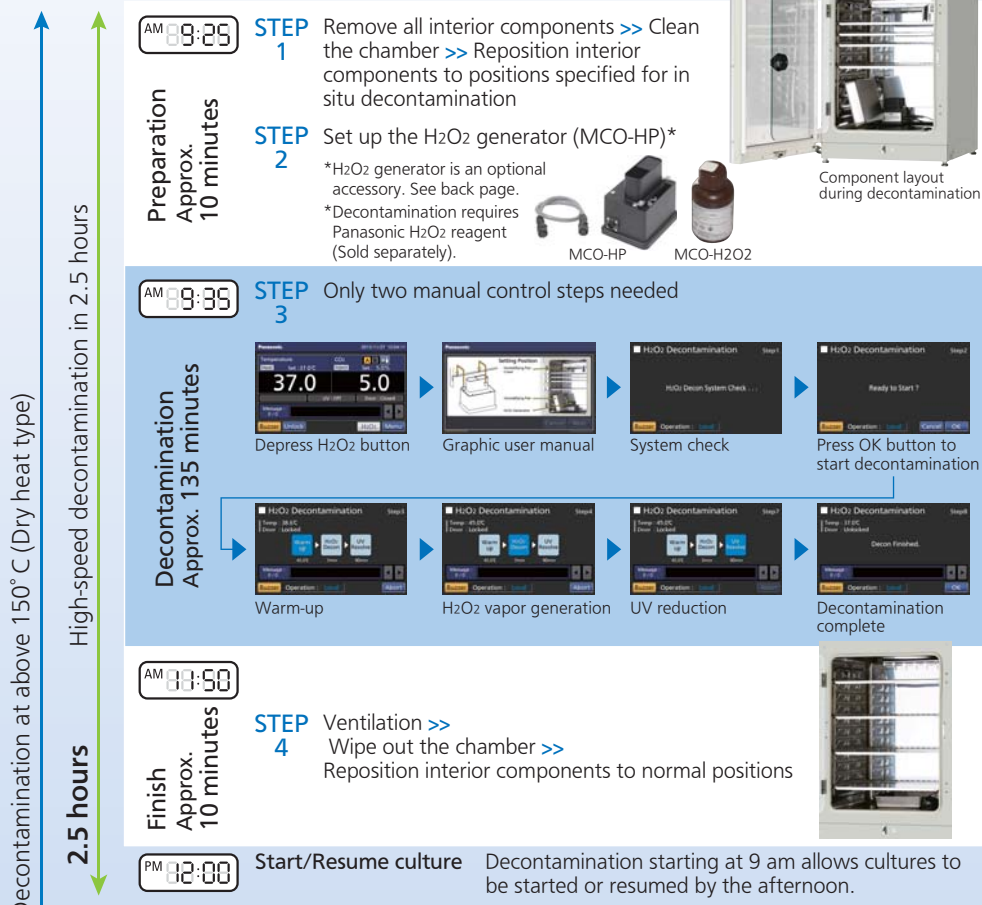
## Rapid, Effective and Safe H<sub>2</sub>O<sub>2</sub> Decontamination Cycle

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

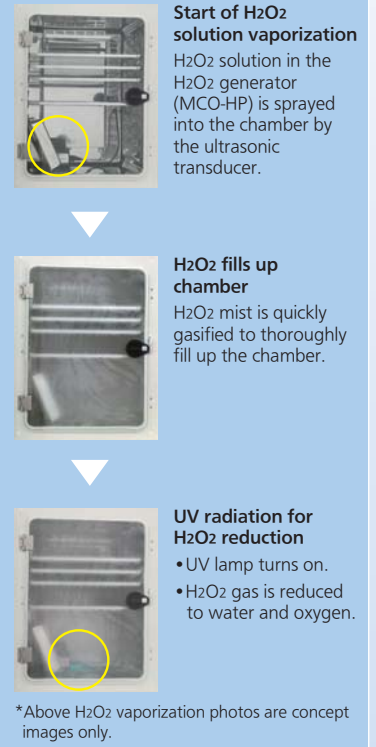
- Full decontamination process takes less than three hours, saving valuable time. For example, if the decontamination cycle is started at 9 am, the unit will be ready for use in the afternoon.
- All interior components are decontaminated in situ. No need for time-consuming removal and autoclaving.
- No high heat emission. No sensor removal necessary.

- After decontamination H<sub>2</sub>O<sub>2</sub> vapor is decomposed to harmless water and oxygen by UV light.
- Outer door is locked automatically by the electric interlock system during the decontamination cycle to ensure operator safety.
- Unlike high-heat decontamination incubators, Panasonic's unique H<sub>2</sub>O<sub>2</sub> decontamination cycle does not emit high heat. Therefore, when two MCO-170AIC/MCO-230AIC units are stacked, one incubator can be decontaminated without affecting the temperature of the other.

### H<sub>2</sub>O<sub>2</sub> decontamination process (example)



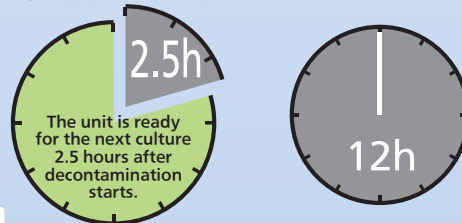
### Chamber conditions during decontamination



12 hours  
One-day cultures are not possible with dry heat type.

Time comparison between the H<sub>2</sub>O<sub>2</sub> decontamination process and sterilization at above 150° C

MCO-170AIC/MCO-230AIC H<sub>2</sub>O<sub>2</sub> decontamination Average time required for decontamination above 150° C

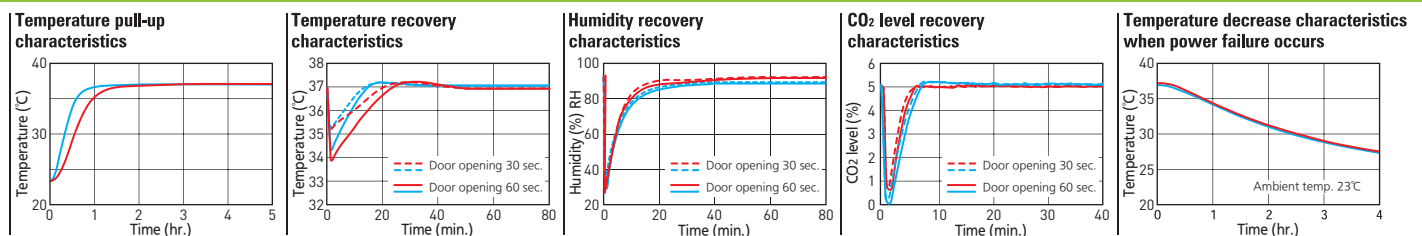


\* Above decontamination process is performed with standard interior items. Additional shelves and dishes may reduce decontamination effectiveness.

\* Decontamination times shown above are for indication only. Actual process time may differ depending on chamber cleaning time and set-up time.

\*Panasonic research as of November 2013

### Performance Data MCO-170AIC / MCO-230AIC



## Specifications

	Model No.				
	MCO-170AIC-PA	MCO-170AICUV-PA	—	—	MCO-230AICUV-PA
110V-120V, 60Hz	MCO-170AIC-PA	MCO-170AICUV-PA	—	—	MCO-230AICUV-PA
220V, 60Hz	MCO-170AIC-PK	MCO-170AICUV-PK	—	MCO-230AIC-PK	MCO-230AICUV-PK
220V-240V, 50Hz/60Hz (CE)	MCO-170AIC-PE	MCO-170AICUV-PE	MCO-170AICUVH-PE	MCO-230AIC-PE	MCO-230AICUV-PE
<b>Contamination control</b>					
H <sub>2</sub> O <sub>2</sub> decontamination system	Optional		Standard		Optional
SafeCell UV system	Optional	Standard		Optional	Standard
inCu safe copper-enriched stainless steel interior			Standard		
Single beam, dual detector IR CO <sub>2</sub> sensor			Standard		
Direct Heat & Air Jacket (DHA) heating system			Standard		
<b>Environmental performance</b>					
Temperature control range	+5°C above ambient to 50 °C*1 (Ambient temperature: 5°C-35°C)				
Temperature control uniformity	±0.25°C (23°C ambient, setting: 37°C, CO <sub>2</sub> : 5%, no load)*2				
CO <sub>2</sub> control range and deviation	0% to 20% / ±0.15% (23°C ambient, setting 37°C, 5% CO <sub>2</sub> , no load)				
CO <sub>2</sub> sensor platform	Ceramic based, single beam infrared sensor, with dual wavelength measurement for continuous auto-zero calibration				
CO <sub>2</sub> sampling, patent pending	No moving parts; airflow passes over in/out ports to sustain continuous sampling				
CO <sub>2</sub> calibration	Automatic, continuous zero reference calibration. Optional STD gas auto calibration				
Airflow	Gentle vertical airflow, continuous with inner door closed				
Interior humidity	95% ±5%R.H. at 37°C by natural evaporation with humidifying pan				
<b>Control, monitoring, alarm</b>					
Temperature and CO <sub>2</sub> control	P.I.D. control system setpoint resolution 0.1°C, 0.1%				
Data acquisition	Automatic log function of temperature, CO <sub>2</sub> , Door opening/closing, Alarm and CSV file output				
Communication	Remote alarm contacts standard. Optional 4-20mA connection. Optional with RS-232C/ RS-485/LAN data ports				
<b>Cabinet design and construction</b>					
Touch panel (WVGA full color LCD)			Standard		
USB data logging			Standard		
Exterior cabinet and door			Galvanized steel with baked-on finish		
Interior and shelves			Copper-enriched stainless steel		
Inner door			Tempered glass		
Insulation			Extruded polystyrene foam		
Outer door			Reversible heated		
Access port			Diameter 30mm port with non-VOC silicone stoppers (1 on back side)		
Leveling feet			4, Adjustable		
<b>Energy and CO<sub>2</sub> utilities</b>					
Maximum power consumption	Max. 380W				Max. 440W
Maximum heat discharge	Max. 1,070kJ/h				Max. 1,250kJ/h
CO <sub>2</sub> gas connection			4mm to 6mm inner diameter tubing		
CO <sub>2</sub> gas pressure			0.03 MPa (G) (0.3kgf/cm <sup>2</sup> G, 4.3psiG) from two stage CO <sub>2</sub> regulator		
<b>Dimensions, weights, capacities</b>					
Internal dimensions (W x D x H)	490 x 523 x 665mm / 19.3 x 20.6 x 26.2inch				643 x 523 x 700mm / 25.3 x 20.6 x 27.6inch
External dimensions (W x D x H) *3	620 x 710 x 905mm / 24.4 x 28.0 x 35.6inch				770 x 730 x 905mm / 30.3 x 28.7 x 35.6inch
Volume	165 Liters (5.8 cu.Ft.)				230 Liters (8.1 cu.Ft.)
Shelves	4 supplies as standard (Maximum 10), Exterior dimensions: 475 (W) x 450 (D) x 12 (H) mm, maximum load 7 kg/shelf				4 supplies as standard (Maximum 10), Exterior dimensions: 620 (W) x 450 (D) x 12 (H) mm, maximum load 7 kg/shelf
Net weight	80 kg (176 lbs.)				90 kg (198 lbs.)

\*1 When ambient temperature is 25°C, temperature control range: 30 °C - 50 °C. Regardless of ambient temperature, the maximum of temperature control range is always 50°C.

\*2 The measurement condition complies with Panasonic specified measuring method. \*3 External dimensions of main cabinet only. See dimension drawings showing handles and other external projections.

\*4 Attaching the optional MCO-170HB and MCO-170EL to MCO-230AICUV will add the H<sub>2</sub>O<sub>2</sub> decontamination function.

## Data Management

Multi-point data logging offers push-button graphical display. Panasonic DAQ\* system permits remote transmission, data logging and live monitoring.

\*Data Acquisition

## Field-reversible Door (select right/left opening)

## Double-stacking matching table

Spacer for double-stacking	Upper unit		
	MCO-230AIC	MCO-170PS	MCO-170AIC
Lower unit	MCO-230AIC	MCO-170PS	MCO-230SB
	MCO-170AIC	—	MCO-170PS
	MCO-19AIC(M)	—	MCO-170SB
	MCO-18AC	—	MCO-170SB
	MCO-20AIC	MCO-230SB	MCO-170SB
MCO-5AC	—	—	
MCO-5M	—	—	

\*For positioning units on a roller base, please refer to "Optional Accessories".

\*If configuring a double-stack, make sure the double-stacking dedicated securing hardware and spacer are used (see "Optional Accessories").

## Optional Accessories

	MCO-170AIC	MCO-170AICUV	MCO-170AICUVH	MCO-230AIC	MCO-230AICUV*4
UV system set	MCO-170UVS	Standard equipment		MCO-170UVS	Standard equipment
H <sub>2</sub> O <sub>2</sub> decon board	MCO-170HB		Standard equipment	MCO-170HB	
Electric lock	MCO-170EL		Standard equipment	MCO-170EL	
H <sub>2</sub> O <sub>2</sub> generator			MCO-HP		
Double stacking bracket			MCO-170PS		
Stacking plate	MCO-170SB				MCO-230SB
H <sub>2</sub> O <sub>2</sub> reagent			MCO-H2O2		
Gas regulator			MCO-100L		
Gas auto changer			MCO-21GC		
STD gas auto calibration kit			MCO-SG		
Tray	MCO-170ST (same as standard accessory)				MCO-230ST (same as standard accessory)
Half tray			MCO-25ST		MCO-35ST
Roller base			MCO-170RB		MCO-230RB
Small door			MCO-170ID		MCO-230ID
<b>Optional Software product</b>					
Interface board; for LAN			MTR-L03		
Interface board; for RS-232C/RS-485			MTR-480		
Interface board			MCO-420MA		
Optional product for using in the chamber			Shaker for CO <sub>2</sub> incubator (MIR-S100C)		

Appearance and specifications are subject to change without notice.

**Caution:** Panasonic guarantees the product under certain warranty conditions.

Panasonic is in no way shall be responsible for any loss of content or damage to content.

## Preservation, Culturing, Drying, and Sterilization Equipments



The management of the design, development, production, sales support, and servicing of the above.

Panasonic Healthcare Co., Ltd. Biomedical Division

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Panasonic Healthcare Co., Ltd. Biomedical Division, the producer of Incubators, is certified by TÜV SÜD for the product quality management system.



Panasonic Healthcare Co., Ltd., Biomedical Division is certified for:

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