



## PATHOLOGY, BLOOD AND TRANSPLANT SCIENCES

### Model Ranges:

**MBR** Blood Bank Refrigerators  
**MPR** Pharmaceutical Refrigerators  
**Biomedical & Plasma** Freezers  
**VIP** Series ULT Freezers  
**Cryogenic** Freezers  
**MIR** Cooled Incubators  
**IncuSafe** Cell Culture Incubators

PHCbi products provide the ideal environments for the storage of blood and blood products, cells and tissues for transplant sciences and in the research and support of new generation therapies and treatments.



**PHCbi  
Solutions offer:**

Precise  
uniformity

Temperature  
stability

Micro-processor  
based controller

Quiet, reliable  
compressors

Sample  
safety

Energy  
savings

Alarms &  
Monitoring

CFC-Free

Ergonomic  
design

Service and  
support

# Innovative solutions for Pathology, Blood and Transplant Sciences

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Dedicated storage for  
biomedical samples



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# Find the right laboratory



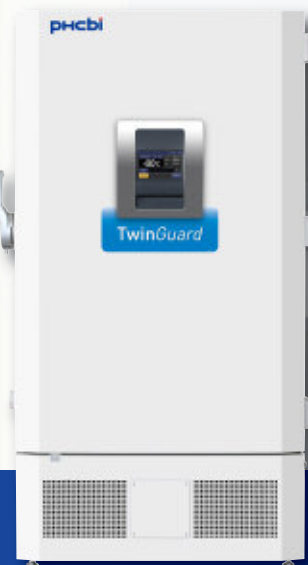
## Blood Bank Refrigerators

4°C Refrigerators



## Plasma & Biomedical Freezers

-30°C / -40°C Freezers



## TwinGuard Freezers

-86°C Ultra-low Freezers

### Robust design for safest storage of whole blood

- Liquid-loaded monitor bottles designed to mimic the shape and thermal properties of blood bags.
- Stable temperature control.
- Designed to minimise cold-air loss, even with frequent door openings.
- Certified as a Class IIa Medical Device.

### The ideal freezing environment for the preservation of fresh frozen plasma

- Low running costs.
- More efficient cooling due to a high latent heat of evaporation.
- Direct cooling system for uniform temperature control.
- Full-height storage containers on each shelf.
- Double outer doors.
- Low environmental impact.

### The safest ultra-low temperature freezers for the storage of high value samples

- Dual Cooling refrigeration system for ultimate sample protection.
- Intelligent 'ECO mode' operation results in lower running costs.
- Vacuum release port for improved accessibility.
- VIP PLUS insulation: technology that maximises storage capacity.
- Quiet operation.
- User-friendly filter-less design.

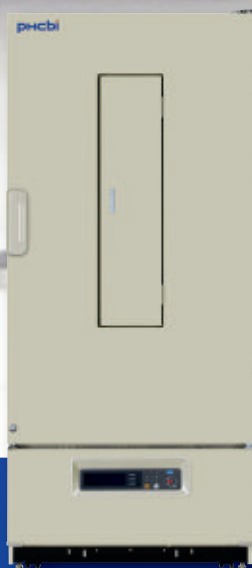


# equipment for your needs



## Cryogenic Freezers

-150°C Cryogenic Freezers



## Cooled Incubators

Wide temperature range



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

Incubators from 49 litres to 851 litres

### The most uniform storage temperatures for cryopreservation solutions

- No cross contamination.
- Safe and convenient usability.
- Specially designed cascade refrigeration system.
- Standard LN<sub>2</sub> back-up.
- Low operational costs.
- Convenient control with LCD panel.
- Saves costs on LN<sub>2</sub>.

### All-round performance

- Prevention of media drying because of unique fan positioning.
- Programmable operation.
- Wide temperature range from -10°C to +60°C with excellent uniformity.
- Precise temperature control for accurate, repeatable conditions.
- Comprehensive alarm system.
- Glass door.

### Optimising cell culture outcomes and reproducibility

- Integrated shelf-supports.
- Full-colour LCD touch screen.
- USB port.
- Excellent control of CO<sub>2</sub> and temperature.
- Dew stick prevents condensation.
- Removable, easy-to-clean, humidifying pan.
- Certified as a Class IIa Medical Device.



# MBR Blood Bank Refrigerators



Model: MBR-305GR-PE

**MBR Blood Bank Refrigerators** provide the ideal +4°C environment for safe and reliable storage of whole blood. These are designed to create stable, reliable temperature control pre-set to 4°C with precise top-to-bottom temperature uniformity. The refrigerators feature a highly efficient refrigeration system that provides superior temperature recovery, rapid cooling, and quiet performance.

## STABLE TEMPERATURE CONTROL

Temperature is controlled by two sensors located in the liquid-loaded monitor bottles, which are in the shape of a blood bag.

- Two thermistor sensors for constantly monitoring the temperature in both the upper and lower part of the chamber.
- Microprocessor control ensures the most accurate temperature control available.
- Multi air-flow plenum system ensures excellent temperature uniformity in larger capacity models. (MBR-704GR, MBR-1405GR).
- Temperature-maintained defrost, designed with thermal sensors and heaters on the evaporator.

## MEDICAL DEVICE DIRECTIVE

PHCbi's MBR-305GR-PE and MBR-705GR-PE Blood Bank Refrigerators are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) for medical purposes.



## TEMPERATURE VARIATIONS PREVENTED

MBR series are designed to minimize cold air loss even with frequent door openings.

- Separated transparent inner doors minimize the chamber air leakage during door openings.
- Foamed-in-place insulation in the walls and magnetic sealed outer doors with double-pane glass window prevent chamber air leakage.
- Large air circulation fan enables rapid temperature recovery after door openings.

## USER FRIENDLY DESIGN

- Selectable storage system to suit user needs.
- Fluorescent interior lamp with ON/OFF switch and a large view window in the outer door provide a clear view of stored items.
- Digital display is easy to see, and can be calibrated through the control panel.

## ALARM AND SAFETY FUNCTIONS

To ensure the safety of critical blood supplies MBR series provide the following safety functions.

- Audible and flashing LED visual alarms with remote alarm contacts, in the event of power failure, high or low temperature condition, or due to thermal sensor abnormality.
- Door alarm and key lock are standard features.
- Re-activating buzzer, lamp and remote alarm contact. (30min. after buzzer stops).
- Built-in temperature recorder.

### Audible and flashing LED Visual alarms

Audible and flashing LED visual alarms with remote alarm sounds, in case of power failure, high or low temperature condition, or during any thermal sensor abnormality.

### Stable Temperature Control

Two thermistor sensors constantly monitor the temperature in both the upper and lower part of the chamber. The sensors are located in the liquid loaded monitor bottles, which are in the shape of a blood bag to accurately simulate product temperature.



### Insulated windows

Insulated window prevents condensation and ensures temperature uniformity.

### Interior Lamps

Fluorescent interior lamp with ON/OFF switch and a large view window in the outer door provide a clear view of stored items.

Model: MBR-1405GR-PE



# MPR Pharmaceutical Refrigerators



In the Biomedical field they provide effective storage of critical and high value supplies, samples, reagents and test kits.

## ADJUSTABLE SHELVES (MPR-721/1411)

The shelves can be arranged to accommodate all types of samples. The "R" models are fitted with pull-out drawers. With a profile of 100mm and 530mm front to back, these drawers are deep enough to hold large bottles or reagent kits.

## POWERFUL REFRIGERATION

To cope with frequent door openings, Pharmaceutical refrigerators are equipped with powerful, hermetically sealed compressors.

## STANDARD ALARM & SAFETY FEATURES

Pharmaceutical refrigerators are fitted with buzzers and flashing lights to warn of high and low temperature problems. In the event of an irregular rise in cabinet temperature, the heater automatically shuts off and forced air circulation brings the temperature down.

## TEMPERATURE STABILITY

PHCbi's temperature control system with thermistor monitor and microprocessor control reliably maintains cabinet temperature at the set level and is unaffected by ambient temperature. Forced air circulation ensures that the cabinet temperature returns to the set point quickly after door openings.

Model: MPR-721-PE



# Dedicated storage for biomedical samples

## HFC REFRIGERANT & CFC FREE INSULATION

PHCbi biomedical equipment is designed for low environmental impact. The MPR-721 and 1411 series use HFC refrigerant, and the foamed-in-place insulation is also CFC free.

## LARGE FANS

The 120mm diameter fan ensures an even temperature throughout the cabinet (MPR-1411/R models have a double flow system with two fans). Heat spots from powered test apparatus are minimized and pull-down characteristics after door openings are outstanding.



Model: MPR-1411-PE



- 1 Adjustable shelves (MPR-721/1411)  
The height adjustable shelves can be arranged to accommodate a variety of sample types and specimen racks.

- 2 Drawer type (MPR-721R/1411R)  
The "R" models are fitted with pull-out drawers. With a profile of 100mm and 530mm front to back, these drawers are deep enough to hold large bottles or reagent kits. They also allow convenient, space-efficient storage and management of patient medications and other items.



Model: MPR-1411R-PE

## MICROPROCESSOR CONTROLLED

An electronic sensor accurately monitors chamber temperature and feeds the information to the microprocessor for precise control at preset temperature. Fans ensure gentle air circulation to provide uniform top to bottom temperature control after frequent door openings. PHCbi's easily calibrated, reliable and stable controls make validation easier.

## ERGONOMIC DESIGN

The ergonomic design of the MPR series pharmaceutical refrigerators provides a clear view of stored items through the large framed windows.



The slim profile allows for easy-reach retrieval of your products. Users can choose from two types to suit their needs; one with all wire shelves or one with sliding racks on one side.

# Safe and reliable sample storage



### Visual LED Alarm Alerts

Audible and flashing LED visual alarms alert you to the unlikely event of either a high or low temperature condition. An over-shooting prevention circuit automatically switches off the fan motor or heater, if the inside temperature rises abnormally.

### Easy to read digital display

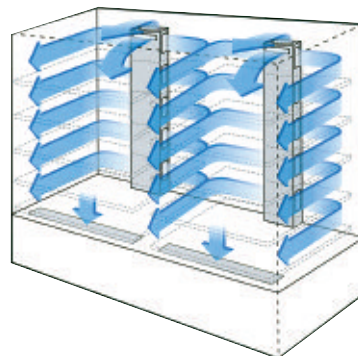
Temperature readings are displayed in gradients of 1°C for configurable temperatures ranging from 2° to 14°C.

### Cabinet Construction:

View window door design with protective film for safety. Key locked doors. Black out glass design is optional.

### Plenums Direct Airflow:

PHCbi's plenum design features uniform cold air flow distribution throughout the chamber to ensure temperature uniformity – essential for validated storage requirements.



Model: MPR-514R-PE

# Biomedical ECO -40°C Plasma Freezer

The MDF-U5412H-PE provides an ideal freezing environment for the preservation of blood plasma, vaccines, test samples, and other biological specimens. The Biomedical Eco Series freezers with natural refrigerants minimise energy consumption, reduce environmental impact and save money while providing superior stability and uniformity. A comprehensive alarm system and Class IIa Medical Device Certification ensure this freezer provides unsurpassed reliability and sample security.



The MDF-U5412H-PE is certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) for medical purposes of storing cells, DNA and/or frozen plasma (For EU countries only)



## LARGE STORAGE CAPACITY

- 300ml Fresh frozen plasma bag x 280 pieces.

## RELIABLE SAMPLE SECURITY

- A comprehensive visual and audible alarm system with remote alarm contacts ensures users are aware of any abnormalities and can take appropriate actions.
- Self-diagnostic system.
- Standard door lock allows a padlock to be fitted for extra security.
- An access port allows external temperature monitoring with the use of a probe, or an optional temperature chart recorder can be added.

## STABLE & UNIFORM TEMPERATURE DESIGN

- Double outer doors.
- Full-height storage containers on each shelf.
- Cooling tubes under every shelf.
- Direct cooling system for uniform temperature control.
- Manual defrost ensures a stable environment with no large temperature.

## NATURAL HYDROCARBON (HC) REFRIGERANTS

- More efficient cooling due to a high latent heat of evaporation.
- Greater energy efficiency.
- Up to 28% reduction in power consumption and running costs.
- Exceptionally low global warming potential.
- Better for the environment.



Model: MDF-U5412H-PE

## USER FRIENDLY DESIGN

- Built-in door latch for each door.
- Easy calibration through the control panel.



# Biomedical -30°C / -40°C Freezers

## STABLE TEMPERATURE CONTROL

The MDF-U731M provides precise and uniform storage temperatures regardless of ambient conditions through microprocessor temperature control.

## ENERGY-SAVING OPERATION

The specially designed compressor results in an energy-saving medical freezer with superior cooling and quiet operation.

## MANUAL DEFROST

Manual defrost freezers provide stable temperature control and do not exhibit the transient temperature increases that can be associated with auto-defrost type freezers. The MDF-U731M is therefore ideal for storing your important, temperature-sensitive samples.

## STURDY CABINET CONSTRUCTION WITH SUPERIOR INSULATION

The integral foamed cabinet structure is extra strong and prevents cold air loss.

## RAPID TEMPERATURE RECOVERY MAINTAINS UNIFORMITY

The rapid pull-down speeds of PHCbi Biomedical freezers ensures that the effects of door openings are minimized. Uniform temperatures are maintained throughout the chamber through direct cooling with a full cold wall design. The inner chamber temperature offers outstanding uniformity and stability without temperature spikes.

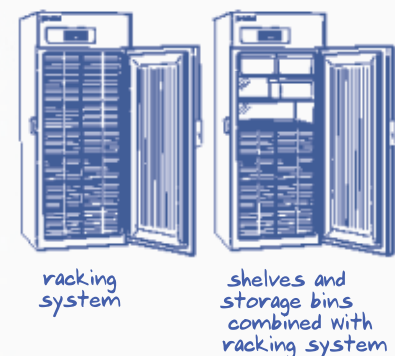
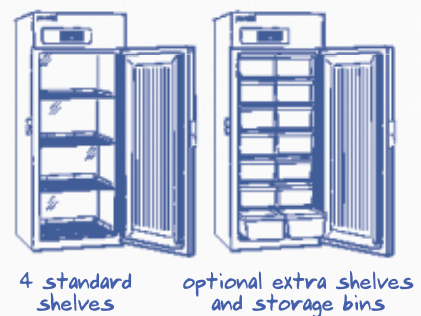
**1 Microprocessor controls:**  
Configure temperature set-points, alarms, monitoring, and diagnostic functions through a digital display.

**2 Sample storage freezer bins:**  
For all PHCbi -30°C & -40°C freezers a wide variety of storage solutions are available. From shelves to racks and / or bins.



Model: MDF-U731M-PE

### MDF-U731M Extensive storage possibilities



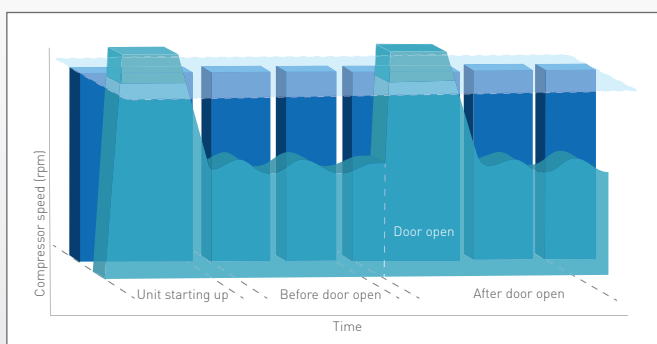


# Inverter technology saves energy and enhances sample security

With the introduction of inverter technology, PHCbi is offering exceptional performance and energy efficiency in our latest Biomedical freezers. While conventional freezers use single speed compressors which cycle on and off, PHCbi's latest Biomedical freezers contain inverter compressors that can run at different speeds to maximise cooling performance under different conditions.

## INVERTER TECHNOLOGY LEADS TO COST EFFICIENCY

The start up of a compressor is the most energy consuming part of the cycle. The ability of the inverter compressor to run at lower speeds has the advantage that the compressor will not turn off and on as often thus saving energy and reducing wear.



## NATURAL REFRIGERANTS

Natural hydrocarbon (HC) refrigerants provide more efficient cooling due to their high latent heat of evaporation. As a result the refrigeration system offers greater energy efficiency. With an exceptionally low global warming potential, natural refrigerants are also better for the environment.

The freezers provide effective storage of life-saving vaccines and samples for diagnosis in the medical field.

## INVERTER TECHNOLOGY LEADS TO SAMPLE SAFETY

The intelligent control of the inverter compressor optimizes running speed for the conditions. When the inverter compressor is running as normal it will stay on for longer than a conventional compressor but at a minimal speed. This reduces the power consumption and keeps freezer temperatures stable. When the door has been opened the compressor will run at maximum capacity to bring the temperature inside the freezer back down to set value quickly before resuming a normal cycle again.



# TwinGuard ULT Freezers

**TwinGuard** Ultra Low Temperature Freezers with Dual Cooling Technology offer the highest level of security for high-value samples. Alongside exceptional ease-of-use and data monitoring, the Dual Cooling System provides the highest level of protection through the use of two independent refrigeration systems. If one system unexpectedly fails, the other can maintain the freezer's temperature uniformly in the  $-70^{\circ}\text{C}$  range. Developed for use with conventional inventory racks and boxes, the **TwinGuard** Series is ideal for storage of sensitive, high-value samples.

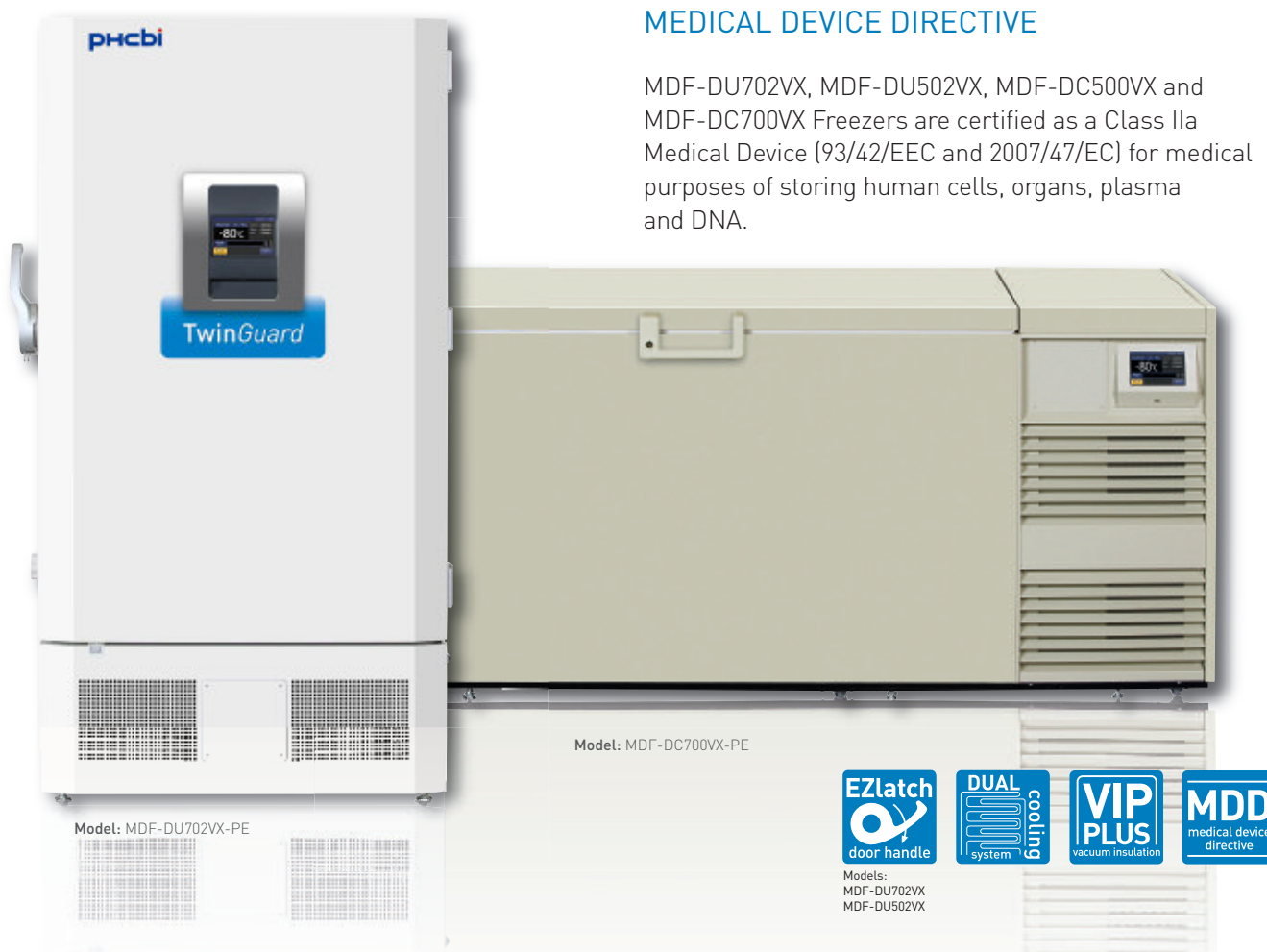
## SCIENTIFIC APPLICATIONS

- Temperature sensitive samples such as therapeutics and biospecimens.
- Samples needing to retain viability such as stem cells, engineered tissue, organs, vaccines, hydromas, cancer cells or fibroblasts.
- Longitudinal study samples.
- Important medical research samples.
- Valuable pharmaceutical products.
- Clinical trial samples.
- Pathogenic samples within high security laboratories.

In the case of unexpected failure of one of the cooling circuits, the other circuit will maintain the freezer continuously in the  $-70^{\circ}\text{C}$  range.

## MEDICAL DEVICE DIRECTIVE

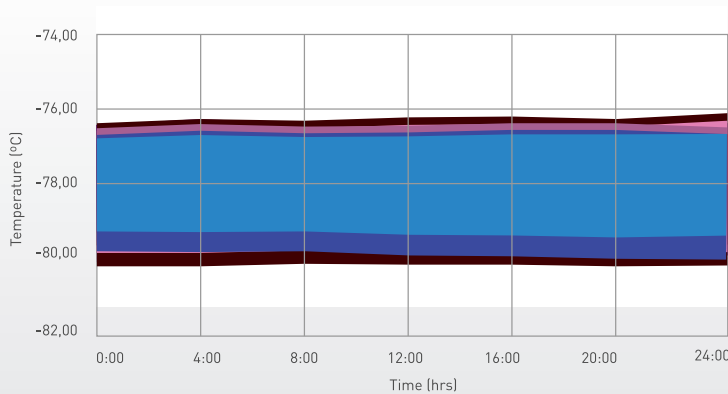
MDF-DU702VX, MDF-DU502VX, MDF-DC500VX and MDF-DC700VX Freezers are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) for medical purposes of storing human cells, organs, plasma and DNA.



## PRESERVE SAMPLE INTEGRITY FOR BETTER END PRODUCTS

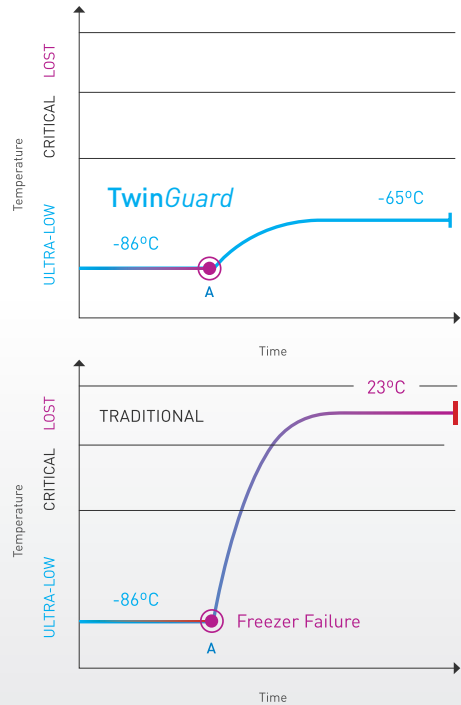
Uneven interior temperatures can lead to a loss in sample integrity. Freezers with uniform, stable temperatures and quick recovery times provide the best protection for your samples, ensuring reliable preservation while guarding against degradation.

FIGURE 2A - MDF-DU702VX; 9 POINT TEMPERATURE MAPPING



## -86°C ULTRA-LOW FREEZERS (TwinGuard)

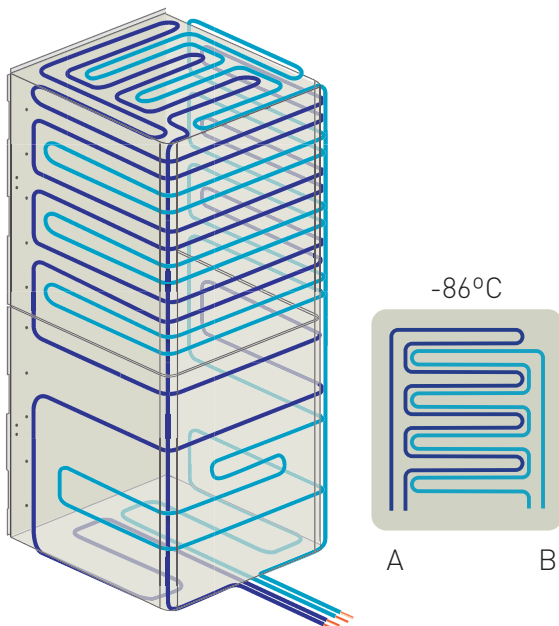
FIGURE 2B



## DUAL COOLING SYSTEM

Within **TwinGuard's** independent systems, efficient ultra-low cooling is achieved through two independent evaporator circuits surrounding the interior chamber.

### Two independent evaporator circuits



Dual Cooling System Upright freezers

## FILTERLESS DESIGN

The filterless construction of the freezers reduces routine maintenance time by eliminating the need for regular cleaning of filters.

## SUPERIOR FOOTPRINT

PHCbi ultra-low temperature freezers with space-saving VIP insulation offer outstanding energy efficiency, whilst delivering exceptional cooling performance and durability for storing valuable research and clinical samples.

- The Dual Cooling System offers the highest level of security through the use of two independent refrigeration systems. If one system unexpectedly fails the other can maintain the freezer at the -70°C range.



## Meeting your freezer storage needs

### ENHANCED USE & INTELLIGENT SECURITY

The freezers are managed and monitored by an integrated microprocessor controller with a comprehensive alarm system and diagnostic functions. Status and control of parameters are accessible via an LCD information centre.

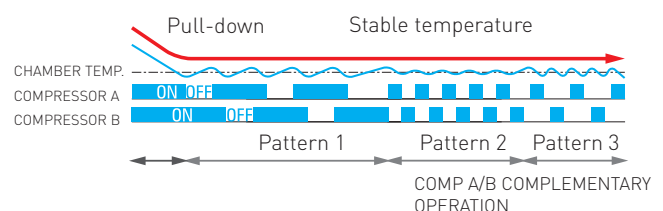
The EZlatch, on the upright models, makes access to stored samples even easier. A colour LCD touch panel allows full user control, even with gloved hands, while the USB port makes transferring logged data to a PC convenient.

### INDUSTRY FIRST INTELLIGENT ECO MODE OPERATION

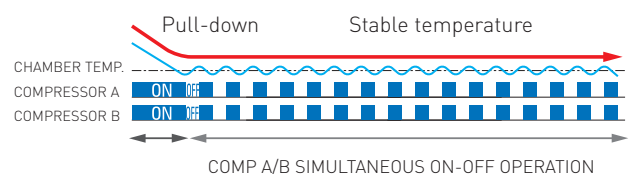
The **TwinGuard** series freezer can be set to Normal or ECO mode operation, depending on the requirements of the user. Although both refrigeration systems are completely independent, ECO mode establishes an overlapping cycle to significantly reduce energy consumption while maintaining optimum interior uniformity for protection of high value materials. Normal mode maintains the most repeatable, cycling wave form for the strictest of GMP applications.

LCD touch panel  
(MDF-DU502VX-PE and MDF-DU702VX-PE)

#### ECO MODE OPERATION IMAGE



#### NORMAL MODE OPERATION IMAGE





# VIP ECO ULT Freezers

At PHCbi, we have designed freezers that are both efficient and reliable without compromising performance. A unique heat exchanger technology decreases energy usage and makes our freezers 40% more efficient than leading competitors.

The VIP ECO Series also uses vacuum insulation panel (VIP) technology reducing wall thickness by around 50%, achieving 30% more storage capacity, and reducing the average cost per box stored. Leveraging the power of natural hydrocarbon refrigerants also allows the VIP ECO ULT freezers to use smaller compressors, due to their greater efficiency. The natural hydrocarbon refrigerants combined with VIP insulation technology also help the environment by reducing the carbon footprint with up to 40% fewer emissions.



Model: MDF-DU702VH-PE



Model: MDF-C8V1-PE

## VIP CHEST Freezer

### PRODUCT FEATURES

- Alarm lamp and buzzer offer secure warning of power failure or abnormal temperature increase.
- High and low temperature warning provides an audible and visual alarm when the temperature deviates more than  $\pm 5^{\circ}\text{C}$  to  $\pm 20^{\circ}\text{C}$  (adjustable) from the set point.
- Alarm ring-back function ensures the buzzer will resume operation should alarm conditions continue after it is silenced.
- Microprocessor-controlled filter-clog check function protects the refrigeration circuit.
- The rugged, one-handed outer door latch allows a padlock to be used to securely protect valuable samples.
- Control panel with digital display for easy operation.
- PHCbi's patented VIP PLUS technology has resulted in a revolutionary vacuum insulation cabinet construction that reduces wall thickness by approximately one half and achieves up to 30% more storage capacity than conventionally insulated freezers of the same footprint.
- Single compressor system achieves an approximately 40% reduction in power consumption and enables low-noise operation.

# Cryogenic Freezers

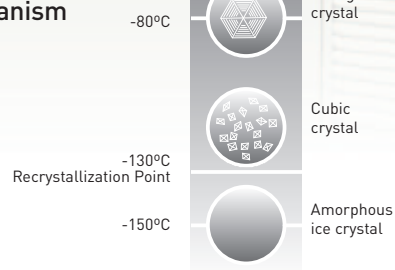
**Cryogenic** freezers are well-known for maintaining uniform temperatures at  $-150^{\circ}\text{C}$  for the reliable, long-term preservation of cells and tissue. With thin vacuum insulation panel (VIP) walls, the MDF-C2156VAN cryogenic freezer can achieve more storage capacity than a conventionally insulated freezer without increasing footprint, while also maintaining superior temperature uniformity.



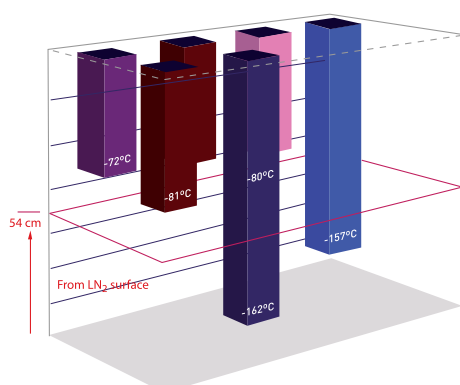
## CRYOGENIC FREEZERS PROMOTE SAMPLE STABILITY

A uniformity of  $\pm 5^{\circ}\text{C}$  in PHCbi mechanically refrigerated cryogenic freezers is far superior to the top-to-bottom temperature uniformity provided by liquid nitrogen vapour phase storage, without the concern of cross-contamination often associated with liquid nitrogen (liquid phase storage).

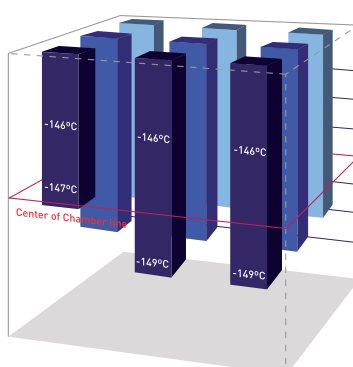
### Recrystallization mechanism



### Liquid Nitrogen freezer (Traditional vapour phase)



### Cryogenic MDF-C2156VAN mechanically refrigerated cryogenic freezer



Comparison of temperature distribution in a liquid nitrogen freezer (vapour phase) and the MDF-C2156VAN mechanically refrigerated cryogenic freezer. The graph shows temperatures at different locations within the chamber. This data demonstrates that 100% of the MDF-C2156VAN storage space maintains uniform storage temperatures safely below  $-130^{\circ}\text{C}$ , while temperature in the LN<sub>2</sub> vapour system is dependent on storage location.

# CBS Isothermals



Model: V-3000AB/C

Model: V-5000EH AB/C

The sample storage area is cooled by a liquid nitrogen jacket surrounding the stainless steel interior, and by nitrogen vapour entering the freezer from the jacket via directional vents. This patented technology provides exceptional temperature uniformity in the  $-190^{\circ}\text{C}$  range, allowing the full freezer capacity to be used with confidence. The circulation of vapour within the freezer also results in less cold air loss during lid opening and improved visibility. This allows full-width lids to be used providing quick, unrestricted access to sample racks.

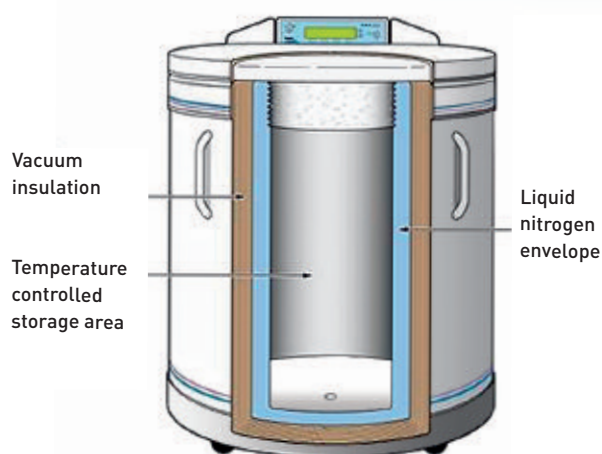
With no liquid nitrogen in the storage area, samples can be stored safely in the  $-190^{\circ}\text{C}$  range without the risk of cross-contamination through liquid nitrogen.

Standard square rack configuration V-1500AB



## KEY ADVANTAGES

- 1) Dry storage freezer.
- 2) Unique patented liquid nitrogen jacket allows for no liquid in sample storage space and improves user safety.
- 3) Reduced exposure to room temperatures.
- 4) Superior temperature uniformity.
- 5) No risk of cross-contamination through liquid nitrogen contact.
- 6) Carousel is rotated from outside of the freezer eliminating risk of injury or temperature fluctuations.
- 7) Manufactured to ISO 13485 standards.



# MIR Cooled Incubators

These MIR incubators offer precise, repeatable control of programmable temperatures which are essential for the culturing of microbiological and environmental samples and they can also be used to provide temperature controlled storage environments.



## INTUITIVE OPERATION WITH LCD DISPLAY

- Easy operability with LCD display and pop up menu.
- 24-hour Clock mode and Timer mode are selectable.
- Combination of multiple programs in Join function.
- Programmable operation start date and hour.
- Operation data can be auto-recorded and graphically displayed.
- Chamber light ON-OFF control.

## METICULOUS DESIGN FOR COMFORTABLE OPERATION

The cooled incubators are crafted with a comfortable rounded corner design and offer a reversible door for a choice of left- or right-hand door opening. Low vibration setting is also available depending on the sample to be cultured (reversible door is unavailable for MIR-554).

## HIGH-PRECISION TEMPERATURE ENVIRONMENT

### Wide temperature control range from -10°C to +60°C

With a wide temperature range from -10°C to +60°C, MIR Cooled Incubators allow a full range of precise experiments, culturing and storage environments.

### Precise microprocessor temperature control

MIR Cooled Incubators incorporate a high precision microprocessor temperature control combined with a heater PID and compressor on/off system.



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

IncuSafe CO<sub>2</sub> Incubators, with PHCbi's innovative technologies, offer outstanding quality in performance to maximise cell culture productivity and provide optimum results with reproducibility to meet the demands of today's varied cell culture applications.



## ACTIVE BACKGROUND DECONTAMINATION

Proactive contamination control is achieved through a combination of a copper-enriched stainless steel interior (inCu saFe®) and an optional ultraviolet light. The copper-enriched stainless steel interior surface combines the germicidal properties of copper and the anti-corrosive nature of stainless steel.

## CONSISTENT AND UNIFORM ENVIRONMENT FOR CELL GROWTH

PHCbi combines Direct Heat and Air Jacket heating system that surrounds the inner walls with a natural convection airflow to achieve exceptional temperature uniformity within the chamber. Combined with a dual



Model: MCO-170AIC-PE

infrared sensor for unprecedented control over CO<sub>2</sub> gas levels, the **IncuSafe** incubator provides a stable environment for cell growth even with multiple door openings daily.

## MCO-80IC REACH IN CO<sub>2</sub> INCUBATOR

- Large capacity, 851 litre CO<sub>2</sub> incubator with adjustable shelving provides flexibility in use.
- Accommodates roller bottle apparatus, 5 bottles wide x 7 bottles high (requires optional Mounting Ramp Kit, MCO-80RBS).
- Full view, double paned glass door allows clear observation of cultured samples.
- Large LED digital display and keypad for greater visibility and ease of set-up.

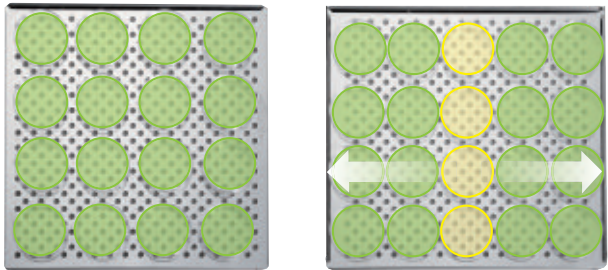


Model: MCO-80IC-PE

We have designed our incubators with ease of use and efficiency in mind. By delivering a user friendly cell culture incubator with rapid systems and processes PHCbi can help make your work as simple as possible.

MORE SPACE FOR MORE CULTURES

In a laboratory environment it is important to make the most of all the space available. With new integrated shelf supports the **IncuSafe** MCO-170AIC CO<sub>2</sub> incubators provide space for up to 25% more culture vessels.\*



\* Compared to previous PHCbi 170 litre CO<sub>2</sub> incubators.

**IncuSafe** incubator design delivers exceptional ease of use, effortless maintainance, and outstanding performance with multi-level contamination control.



USB PORT

Optimise cell culture protocols and adhere to standard operating procedures by conveniently transferring data to a USB memory stick to pass on to a PC. Logged parameters include chamber temperature, CO<sub>2</sub> level, door open status and alarms.

INTEGRATED SHELF SUPPORTS

The MCO-170AIC, MCO-170M and MCO-230AIC incubators have less removable parts than the traditional incubators. The new interior design with integrated shelf supports makes it easier to clean which saves valuable time and reduces risk of contamination.



MEDICAL DEVICE DIRECTIVE



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

MCO-170M MULTIGAS INCUBATOR WITH PRECISION O<sub>2</sub> CONTROL



The latest **IncuSafe** MCO-170M multi gas incubator offers the most precise regulation of oxygen and other gasses, while maintaining superior temperature uniformity, contamination control, and usability.

The Dual Infra Red sensor achieves ultra-fast CO<sub>2</sub> recovery without overshoot, even following multiple door openings whilst the unique solid Zirconia O<sub>2</sub> sensor delivers precise control of physiological oxygen levels to simulate in vivo conditions.



## ULTRAVIOLET LIGHT AND COPPER-ENRICHED STAINLESS STEEL INTERIOR REDUCE THE CHANCE OF CONTAMINATION

To further prevent contamination in the incubator, PHCbi implemented a unique SafeCell ultraviolet (UV) system. SafeCell UV technology uses a programmable ultraviolet lamp that sterilises air and the humidity water pan without affecting cell cultures. It inhibits the growth of all contaminants including mycoplasma without costly HEPA filter air scrubbers which are ineffective on particles less than 0.3 microns.

## RAPID HYDROGEN PEROXIDE DECONTAMINATION REDUCES EXPERIMENTAL DOWNTIME

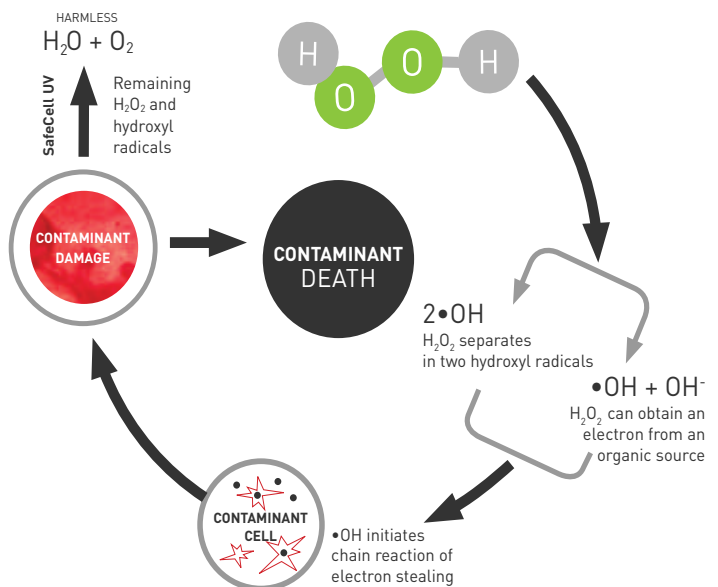
With PHCbi's hydrogen peroxide technology, achieve complete decontamination 8X faster than conventional high heat methods. The cycle completes in just 3 hours including the post ultraviolet conversion of  $H_2O_2$  into water and oxygen for easy clean-up. This allows researchers to get back to their cell culture work the same day and allows companies to achieve faster drug discoveries.



Model: MCO-230AIC-PE

## ADVANCED TOUCH SCREEN

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



# Validation & qualification SOLUTIONS

Keeping up with evolving regulations that are constantly becoming stricter can be a daunting task. When it comes to your laboratory equipment it is important to know that it will pass compliance checks and that the manufacturer has years of experience in validation training and services. PHCbi is a vertical component manufacturer that can provide turn-key solutions for validation and qualification in accordance with all current regulations and specific customer requirements and applications.

## Validation Solutions

Turn key solutions available for:

- Ultra-low freezers
- Cryogenic freezers
- Medical freezers
- Pharmaceutical refrigerators
- Incubators
- Ovens
- Autoclaves
- Environmental test chambers



## PHCbi VALIDATION SOLUTIONS

	In-house	Third party	Manufacturer
Equipment experience	Broad based	Broad based	Most PHCbi specific experience
Up to date technical info	General knowledge	General knowledge	Direct updates
Unexpected service issues	Time delay	Time delay	Immediate solutions
Time consuming	More prep. time	More prep. time	Most experience
Knowledge of industry standards	High level	Broad based	Best applicable knowledge



## INSTALLATION AND OPERATIONAL QUALIFICATION (IQ)

PHCbi offers onsite validation of PHCbi manufactured equipment via Installation and Operational Protocol (IQ).

### 1) INSTALLATION QUALIFICATION (IQ)

Verifies and documents the equipment installation to be compliant with the manufacturer's requirements and specifications.

### 2) OPERATIONAL QUALIFICATION (OQ)

Verifies and documents the full functional operation of the installed equipment (as specified by PHCbi or other OEM supplied equipment). Temperature performance will be mapped over a continuous 24-hr period. Data produced will be compared with manufacturer's published equipment specification. Product specific parameters such as the CO<sub>2</sub>/O<sub>2</sub>, %RH, etc can be included within the relevant equipment IQ protocol.

### 3) PROCESS QUALIFICATION (PQ)

Usually conducted and performed by the end-user as the equipment will be in an environment where specific user conditions apply, i.e., the customer's actual production or product processing area. The PQ will make reference to customer specific Standard Operation Procedures documents (SOPs).

### 4) TEMPERATURE MAPPING

Offered for customers wishing to verify actual equipment performance as installed. This is also available for non-PHCbi equipment.

### 5) FACTORY ACCEPTANCE TESTING (FAT)

In-depth factory acceptance testing covers alarms, temperature and CO<sub>2</sub> stability, and temperature recovery. This service can be customised to SOPs.

PHCbi validation services by model						
	Temp.	CO <sub>2</sub>	O <sub>2</sub>	%RH	Lighting (Lux/Par)	Pressure
Validation by Model	✓					
MDF-150°C Freezers	✓					
MDF-86°C Freezers	✓					
MDF-30°C Freezers	✓					
MBR Blood Bank Refrigerators	✓					
MPR Pharmaceutical Refrigerators	✓					
MIR Incubator Series	✓					
MCO CO <sub>2</sub> & O <sub>2</sub> /CO <sub>2</sub> Incubators	✓	✓	✓	✓		
MLS Top Loading Autoclaves	✓					✓
MLR Environmental Test Chamber	✓			✓	✓	
CBS Standard LN <sub>2</sub> Freezers	✓					

## THERMAL VALIDATION

PHCbi also provides a thermal validation solution specifically designed to conform with new FDA data protection guidelines (21 CFR Part 11) and meet international and European cGMP requirements for inspection of pharmaceutical, biotechnology, and medical device (EN285, EN554), manufacturing.

## SERVICES

- Measurement of temperature profiles, CO<sub>2</sub>, O<sub>2</sub>, %RH, lighting, and pressure
- Reduced Setup Time
- Automatic Sensor Calibration
- Data Analysis
- System Design

## INSTALLATION, CALIBRATION & MAINTENANCE

In order to trace and keep an accurate record of performance of your lab equipment, a regular schedule of calibration and preventive maintenance is required. PHCbi offers the following services:

- Commissioning/Setup/Installation
- Calibration
- Onsite Protocol Execution
- Warranty response
- Factory Acceptance Testing
- Custom Validation Protocols

# SPECIFICATIONS

MBR Blood Bank Refrigerators				
Model Number		MBR-305GR-PE	MBR-705GR-PE	MBR-1405GR-PE
Dimensions				
External dimensions (WxDxH) <sup>1)</sup>	mm	600 x 680 x 1835	770 x 830 x 1955	1440 x 830 x 1950
Internal dimensions (WxDxH)	mm	520 x 490 x 1150	650 x 697 x 1500	1320 x 697 x 1500
Volume	litres	302	622	1301
Net weight (approx)	kg	120	360	720
Capacity	450ml bags	147	213	315
Performance				
Temperature setting range	°C	4 +/- 1.5	4 +/- 1.5	4 +/- 1.5
Control				
Controller		Microprocessor	Microprocessor	Microprocessor
Display		LED	LED	LED
Temperature recorder		MTR-G04 (included)	MTR-G04 (included)	MTR-G04 (included)
Temperature sensor		2 bottles with thermistor sensor	2 bottles with thermistor sensor	2 bottles with thermistor sensor
Refrigeration				
Cooling method		Forced air	Forced air	Forced air
Defrost method		Fully automatic	Fully automatic	Fully automatic
Refrigerant		PUF	PUF	PUF
Insulation		HFC	HFC	HFC
Construction				
Exterior material		Painted steel	Painted steel	Painted steel
Interior material		Painted steel	Painted steel	Painted steel
Outer doors	qty	1, Double layer glass window	1, Double layer glass window	2, Double layer glass windows
Outer door lock		Y	Y	Y
Inner door	qty	2, Acrylic	3, Acrylic	6, Acrylic
Shelves	qty	5, Stainless steel	6, Stainless steel	12, Stainless steel
Drawers	qty	-	-	-
Max. load - per shelf/drawer	kg	20	40	40
Max. load - total	kg	100	240	480
Access port	qty	1	3	2
- position		Left	Left / right / top	Left / right
- diameter	Ø mm	30	30	30
Castors	qty	4	4	4
Interior light		Fluorescent	Fluorescent	Fluorescent
Alarms				
Power failure		V-B-R	V-B-R	V-B-R
High temperature		V-B-R	V-B-R	V-B-R
Low temperature		V-B-R	V-B-R	V-B-R
Door open		V-B	V-B	V-B
Electrical and Noise Level				
Power Supply		230V 50Hz single phase	230V 50Hz single phase	230V 50Hz single phase
Noise Level <sup>2)</sup>	dB(A)	41	45	48
Options				
Temperature recorders				
Temperature chart recorder		Included	Included	Included
- chart paper		RP-G04-PW	RP-G04-PW	RP-G04-PW
- recorder housing		PG-R-PW	PG-R-PW	PG-R-PW
Circular type				
- chart paper				
- Ink pen				
- recorder housing				
External mounting power failure alarm				

## Notes:

<sup>1)</sup> Exterior dimensions of main cabinet only, excluding handle and other external projections

- See dimensions drawings on website for full details

<sup>2)</sup> Nominal value - Background noise 20dB

<sup>3)</sup> Remote alarm comes with optional power failure alarm MPR-48B1-PW

<sup>4)</sup> Double pane glass window with heat reflecting film

**Models:** MBR-305GR-PE | MBR-705GR-PE | MBR-1405GR-PE | MPR-721(R)-PE | MPR-1411(R)-PE  
MPR-514(R)-PE | MPR-1014(R)-PE

MPR Pharmaceutical Refrigerators				MPR Sliding Door Pharmaceutical Refrigerators			
MPR-721-PE	MPR-721R-PE	MPR-1411-PE	MPR-1411R-PE	MPR-514-PE	MPR-514R-PE	MPR-1014-PE	MPR-1014R-PE
770 x 830 x 1955		1440 x 830 x 1950		900 x 600 x 1790		1800 x 600 x 1790	
650 x 710 x 1500		1320 x 710 x 1500		800 x 465 x 1300		1700 x 465 x 1300	
684	671	1364	1359	489	486	1033	1029
174	193	248	287	141	147	246	258
2 ~ 23		2 ~ 23		2 ~ 14		2 ~ 14	
Microprocessor		Microprocessor		Microprocessor		Microprocessor	
LED		LED		LED		LED	
Thermistor		Thermistor		Thermistor		Thermistor	
Forced cool air circulation		Forced cool air circulation		Forced cool air circulation		Forced cool air circulation	
Forced type (cycle defrost), fully automatic		Forced type (cycle defrost), fully automatic		Forced type, fully automatic		Forced type, fully automatic	
HFC		HFC		HFC		HFC	
PUF		PUF		PUF		PUF	
Painted steel		Painted steel		Painted steel		Painted steel	
Painted steel		Painted steel		Stainless steel		Stainless steel	
1 door, double pane glass, self closing		2 doors, double pane glass, self closing		2 sliding doors <sup>4)</sup>		2 sliding doors <sup>4)</sup>	
Y		Y		Y		Y	
4 wire shelves, polyethylene-coated		8 wire shelves, polyethylene-coated		5 wire shelves, polyester-coated		10 wire shelves, polyester-coated	
	5 coated steel drawers		10 coated steel drawers		5 wire shelves + 5 sliding racks		5 wire shelves + 10 sliding racks
50	40	40	40	50	50 + 20	50	50 + 20
200	200	320	400	250	350	500	450
3		3		1		1	
Left/right/top		Left/right/top		Left		Left	
30		30		30		30	
4		4		4		4	
Fluorescent		Fluorescent		Fluorescent		Fluorescent	
V-B-R (Optional)		V-B-R (Optional)		V-B-R (Optional)		V-B-R (Optional)	
V-B-R		V-B-R		V-B-R		V-B-R	
V-B-R		V-B-R		V-B-R		V-B-R	
V-B		V-B		V-B		V-B	
230V 50Hz single phase		230V 50Hz single phase		230V 50Hz single phase		230V 50Hz single phase	
41		42		42		42	
MTR-0621LH-PE		MTR-0621LH-PE		MTR-0621LH-PE		MTR-0621LH-PE	
RP-06-PW		RP-06-PW		RP-06-PW		RP-06-PW	
MPR-S30-PW		MPR-S30-PW		MPR-S30-PW		MPR-S30-PW	
MTR-G04C-PE		MTR-G04C-PE		MTR-G04C-PE		MTR-G04C-PE	
RP-G04-PW		RP-G04-PW		RP-G04-PW		RP-G04-PW	
PG-R-PW		PG-R-PW		PG-R-PW		PG-R-PW	
MPR-S7-PW		MPR-S7-PW		MPR-S7-PW		MPR-S7-PW	
MPR-48B-PW (V-B) <sup>3)</sup>		MPR-48B-PW (V-B) <sup>3)</sup>		MPR-48B-PW (V-B) <sup>3)</sup>		MPR-48B-PW (V-B) <sup>3)</sup>	

## SPECIFICATIONS

Biomedical ECO -40°C Plasma Freezer			Biomedical -40°C Freezers
Model Number	MDF-U5412H-PE		MDF-U443-PE
Dimensions			
External dimensions (WxDxH) <sup>1)</sup>	mm	804 x 772 x 1802	800 x 832 x 1810
Internal dimensions (WxDxH)	mm	658 x 607 x 1272	640 x 615 x 1090
Volume	litres	482, 280 FFP packs (300ml)	426, 300 FFP packs (300ml)
Capacity	2" boxes	224	256
Net weight (approx)	kg	134	213
Performance			
Cooling performance <sup>2)</sup>	°C	-40 <sup>2)</sup>	-40 <sup>3)</sup>
Temperature setting range	°C	-18 ~ -45	-15 ~ -44
Temperature control range <sup>2)</sup>	°C	-20 ~ -40 <sup>2)</sup>	-15 ~ -4 <sup>3)</sup>
Control			
Controller		Microprocessor non-volatile memory	Microprocessor non-volatile memory
Display		LED	LED
Temperature sensor		Thermistor	Thermistor
Refrigeration			
Cooling method		Direct	Cascade + forced air circulation
Compressor	W	400	H:400/L:750
Refrigerant		HFC	HFC
Insulation material	W	PUF	PUF
Insulation thickness	mm	70	80
Construction			
Exterior material		Painted steel	Painted steel
Interior material		Stainless steel	Stainless steel
Outer door		2	1
Outer door lock	qty	Y	Y
Shelves	qty	4 (fixed)	5
Containers / baskets	kg	4/6/0	-
Max. load per shelf / container / basket	kg	30	50
Max. load - total		100	200
Access port	qty	1	1
- position		Back	Left
- diameter	Ø mm	30	40
Interior fluorescent lamp		-	Y
Castors	qty	4 (2 levelling feet)	4 (2 levelling feet)
Alarms			
Power failure		V-B-R	V-B-R
High temperature		V-B-R	V-B-R
Low temperature		V-B-R	V-B-R
Filter			V-B
Door open			V-B
Electrical and Noise Level			
Power Supply		230V 50Hz single phase	230V 50Hz single phase
Noise Level <sup>5)</sup>	dB(A)	42	51
Options			
Storage systems			
Temperature recorders			
Circular type		MTR-G85C-PE	-
Chart paper		RP-G85-PW	-
Ink pen		PG-R-PW	-
Recorder housing		MPR-S7-PW	-
Continuous strip type		MTR-4015LH-PE	MTR-4015LH-PE (-40 ~ +14°C range) or MTR-85H (-100 ~ +50°C range)
Chart paper		RP-40-PW	RP-40-PW <sup>8)</sup> or RP-G85-PW <sup>9)</sup>
Ink pen		-	DF-38FP-PW <sup>9)</sup>
Recorder housing		MPR-S30-PW	MPR-S30-PW <sup>8)</sup>
External mounting power failure alarm		-	-



Biomedical -30°C Freezers	Biomedical ECO -30°C Freezers		MPR Pharmaceutical Refrigerators with Freezer
MDF-731M-PE	MDF-MU300H-PE	MDF-MU500H-PE	MPR-715F-PE
770 x 830 x 1955	610 x 598 x 1620	800 x 772 x 1802	900 x 715 x 1910
650 x 700 x 1520	490 x 486 x 1290	658 x 607 x 1272	810 x 615 x 1894 (Ref), 770 x 552 x 422 (Frz)
690	274	482	415/176 (Ref/Frz)
384	150	224	
152	76	124	168
-30 <sup>2)</sup>	-30 <sup>2)</sup>		+5 / -30
-18 ~ -35	-18 ~ -35		+2 to +14/ -35 to -15
-20 ~ -30 <sup>2)</sup>	-20 ~ -30 <sup>2)</sup>		+2 to +14/ -30 to -20
Microprocessor, non-volatile memory	Microprocessor, non-volatile memory		Microprocessor, non-volatile memory
LED	LED		LED
Thermistor	Thermistor		Thermistor
Direct	Direct		Fan forced air circulation (Ref) / Direct cooling (Frz) <sup>7)</sup>
400			
HFC	250 (inverter control)		HFC
PUF	HC		PUF
60	60	70	40 / 60
Painted steel	Painted steel	Painted steel	Painted Steel
Painted steel	ABS resin	Styrol resin	Painted Steel (Ref/Frz)
1	1	2	4, glass window (2)
Y	Y	Y	Y, 2
4 (fixed)	4 (fixed)	4 (fixed)	3 (Ref) / 2 (Frz)
Optional	4/0/1	4/6/0	-
50	30	U:30/L:20	25 / 15 (Ref/Frz)
200	80	100	105
1	1	1	2
Left	Left	Back	Back
30	30		30
	-		LED
4 (2 levelling feet)	4 (2 levelling feet)		4
V-B-R	V-B-R <sup>4)</sup>		V-B-R
V-B-R	V-B-R <sup>4)</sup>		V-B-R
V-B-R	V-B-R <sup>4)</sup>		V-B-R
V-B	-		-
	-		V-B
230V 50Hz single phase	230V 50Hz single phase		230V 50Hz single phase
42	40		43
MDF-T07SC-SW, Set of 2 containers	-		-
MDF-T07ST-SW, Set of 3 shelves			
MTR-G85C-SE	MTR-G85C-PE		MTR-G3504C-PE
RP-G85-SW	RP-G85-PW		RP-G3504-PW
PG-R-SW	PG-R-PW		PG-RB-PW
MPR-S7-SW	MPR-S470T-PW	MPR-S7-PW	-
MTR-4015LH-PE	MTR-4015LH-PE		MTR-0621LH-PE (Ref) / MTR-4015LH-PE (Frz)
RP-40-SW	RP-40-PW		RP-06-PW (Ref) / RP-40-PW (Frz)
-	-		-
MPR-S30-SW	-	MPR-S30-PW	MPR-S30-PW
-	MPR-48B1-PW <sup>6)</sup>		-

**Notes:**

- 1) Exterior dimensions of main cabinet only, excluding handle and other external projections - See dimensions drawings on website for full details
- 2) Air temperature measured at freezer centre, ambient temperature +30°C, no load
- 3) Air temperature measured at freezer centre, ambient temperature +35°C, no load
- 4) Remote alarm comes with optional power failure alarm MPR-48B1-PW

- 5) Nominal value - Background noise 20dB
- 6) Requires MPR-48B1-PW
- 7) Defrost method: Cyclical defrost (Ref) / Manual (Frz)
- 8) For use with MTR-4015LH-PE
- 9) For use with MTR-85H-PW

# SPECIFICATIONS

TwinGuard Upright Freezers				TwinGuard Chest Freezers	
Model Number		MDF-DU502VX-PE	MDF-DU702VX-PE	MDF-DC500VX-PE	MDF-DC700VX-PE
<b>Dimensions</b>					
External dimensions (WxDxH) <sup>1)</sup>	mm	790 x 882 x 1993	1030 x 882 x 1993	2010 x 845 x 1070	2300 x 845 x 1070
Internal dimensions (WxDxH)	mm	630 x 600 x 1400	870 x 600 x 1400	1190 x 640 x 756	1480 x 640 x 756
Volume	litres	528	729	575	715
Capacity	2" boxes	384	576	416	520
Net weight (approx)	kg	276	320	328	358
<b>Performance</b>					
Cooling performance <sup>2)</sup>	°C	-86		-86	
Temperature setting range	°C	-50 ~ -90		-50 ~ -90	
Temperature control range <sup>2)</sup>	°C	-50 ~ -86		-50 ~ -86	
<b>Control</b>					
Controller		Microprocessor non-volatile memory		Microprocessor non-volatile memory	
Display		LCD		LCD Touch Screen	
Temperature sensor		Pt-1000		Pt-1000	
<b>Refrigeration</b>					
Refrigeration system		Independent Dual-Cooling		Independent Dual-Cooling	
High-stage compressor	W	2 x 1100		2 x 1100	
High-stage refrigerant		HFC mixed		HFC mixed	
Low-stage compressor	W				
Low-stage refrigerant					
Insulation material		PUF / VIP PLUS		PUF / VIP PLUS	
Insulation thickness	mm	80		70 / 135	
<b>Construction</b>					
Exterior material		Painted steel		Painted steel	
Interior material		Painted steel		Stainless Steel	
Outer door lock		Y		Y	
Inner door/lid	qty	2 (insulated)		3 (Styrofoam)	
Shelves	qty	3		-	
Max. load - per shelf	kg	50		-	
Max. load - total <sup>3)</sup>	kg	415	515	-	
Vacuum release port		Y		-	
Access port	qty	3		1	
- position		Back x 1, bottom x 2		Back	
- diameter	Ø mm	17		17	
Casters	qty	4 (2 levelling feet)		6 (3 levelling feet)	
<b>Alarms</b>					
Power failure		V-B-R		V-B-R	
High temperature		V-B-R		V-B-R	
Low temperature		V-B-R		V-B-R	
Filter		Filterless design		Filterless design	
Door open		V-B		V-B	
<b>Electrical and Noise Level</b>					
Power Supply		230V 50Hz single phase		230V 50Hz single phase	
Noise Level <sup>4)</sup>	dB(A)	52		52	
<b>Options</b>					
Liquid CO <sub>2</sub> back-up		MDF-UB7-PW		MDF-UB5-PW	
Liquid N <sub>2</sub> back-up		-		-	
Temperature recorders					
- Circular type		MTR-G85C-PE		MTR-G85C-PE	
- Chart paper		RP-G85-PW <sup>8)</sup>		RP-G85-PW	
- Ink pen		PG-R-PW		PG-R-PW	
- Continuous strip type		MTR-85H-PW		MTR-85H-PW	
- Chart paper		RP-85-PW <sup>8)</sup>		RP-85-PW	
- Ink pen		DF-38FP-PW		DF-38FP-PW	
- Recorder housing		MDF-S3085-PW		MDF-S3085-PW	
Drawers	qty	-		-	
Small inner door kit	set of 2	-		-	
Small inner door kit	set of 5	MDF-5ID5-PW	MDF-7ID5-PW	-	
Small inner door kit	set of 4	MDF-5ID4-PW <sup>6)</sup>	MDF-7ID4-PW <sup>7)</sup>	-	

## Notes:

- 1) Exterior dimensions of main cabinet only, excluding handle and other external projections - See dimensions drawings on website for full details
- 2) Air temperature measured at freezer centre, ambient temperature +30°C, no load

- 3) Max. load is the total of the load distributed over all shelves (3) and chamber bottom surface. The weight is the maximum load for chamber inside and excludes load on casters equipped with product.
- 4) Nominal value. Background noise 20dB

**Models:** MDF-DU502VX-PE | MDF-DU702VX-PE | MDF-DC500VX-PE | MDF-DC700VX-PE  
MDF-DU502VH-PE | MDF-DU700VH-PE | MDF-C8V1-PE | MDF-C2156VAN-PE

VIP ECO Upright Freezers		VIP Chest Freezers	Cryogenic Freezer
MDF-DU502VH-PE	MDF-DU702VH-PE	MDF-C8V1-PE	MDF-C2156VAN-PE
790 x 870 x 1990	1030 x 882 x 1993	550 x 685 x 945	1730 x 765 x 1010
630 x 600 x 1400	870 x 600 x 1400	405 x 490 x 425	760 x 495 x 615
528	729	84	231
384	576	42	150
246	278	67	318
-86		-80	-150
-50 ~ -90		-55~-90	-125 ~ -152
-50 ~ -86		-60 ~ -80	-125 ~ -150
Microprocessor non-volatile memory		Microprocessor non-volatile memory	Microprocessor non-volatile memory
LCD Touch Screen		LED	LCD
Pt-1000		Pt-1000	Pt-1000
Cascade		Auto-cascade	Cascade with auto-cascade low-stage
750		-	1100
HC		-	HFC
750		400	1100
HC		HFC mixed	HFC mixed
PUF / VIP PLUS		PUF / VIP PLUS	PUF / VIP PLUS
80		70	135
Painted steel		Painted steel	Painted steel
Painted steel		Painted steel	Aluminium
Y		Y	Y
2 (insulated)		1	2
3		-	
50		-	
415	515	100	207
2 (1 automatic, 1 manual)			
3		2	1
Back x 1 / bottom x 2		Back/bottom	Right
17		17	40
4 (2 levelling feet)		4 (2 levelling feet)	6 (3 levelling feet)
V-B-R		V-B-R	V-B-R
V-B-R		V-B-R	V-B-R
V-B-R		V-B-R	V-B-R
V-B		Filterless design	V-B
V-B		-	V-B
230V 50Hz single phase		230V 50Hz single phase	230V 50Hz single phase
52		47	51
MDF-UB7-PW		CVK-UB4-PW	-
-		CVK-UBN2-PW	Supplied as standard
MTR-G85C-PE		MTR-G85C-PE	
RP-G85-PW <sup>8)</sup>		RP-G85-PW	
PG-R-PW		PG-R-PW	
MTR-85H-PW		MTR-85H-PW	MTR-155H-PW
RP-85-PW <sup>8)</sup>		RP-85-PW	RP-155-PW
DF-38FP-PW		DF-38FP-PW	DF-38FP-PW
MDF-S3085-PW		MDF-S3085-PW	MDF-S30150-PW
-		-	-
-		-	-
MDF-5ID5-PW	MDF-7ID5-PW	-	-
MDF-5ID4-PW <sup>6)</sup>	MDF-7ID4-PW <sup>7)</sup>	-	-

5) Installation of small inner door kit may affect usable storage capacity.

6) Usable storage capacity will be 320 x 2" boxes with installation of MDF-5ID5-PW and additional shelf

7) Usable storage capacity will be 480 x 2" boxes with installation of MDF-7ID5-PW and additional shelf.

8) Requires sensor cover MTR-DU700SF-PW.

Isothermal -190°C Dry Storage Freezers						
Model Number		V-1500AB	V-3000AB	V-3000ABEH	V-5000AB	V-5000ABEH
Liquid nitrogen capacity	litres	30	70	89	93	140
Dimensions						
External dimensions (WxDxH)	mm	660 x 939 x 1143	939 x 1219 x 1206	939 x 1219 x 1473	1219 x 1371x1320	1219 x 1371 x 1473
Usable interior height	mm	736	736	940	736	864
Usable interior diameter	mm	534	787	787	1016	1016
Weight empty	kg	148	272	295	425	453
Weight full	kg	174	327	367	500	566
Maximum capacity						
Max. vial capacity (2ml)**		9100	22100	25500	40300	46500
Max. blood bag capacity (50ml)**		434	1120	1280	1936	2208

\*\* Capacity is subject to rack type

Isothermal Carousel					
Model Number		V-3000AB/C	V-3000ABEH/C	V-5000AB/C	V-5000ABEH/C
Liquid nitrogen capacity	litres	70	89	93	140
Dimensions					
External dimensions (WxDxH)	mm	939 x 1219 x 1130	939 x 1219 x 1384	1194 x 1372 x 1257	1194 x 1372 x 1384
Usable interior height	mm	686	889	737	813
Usable interior diameter	mm	736	736	978	978
Weight empty	kg	272	288	425	452
Weight full	kg	327	361	499	566
Maximum capacity					
Max. vial capacity (2ml)**		16800	21000	36400	42000
Max. blood bag capacity (50ml)**		852	1136	1722	1968

\*\* Capacity is subject to rack type

## Medical Device Directive

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

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

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

In anticipation of these developing technologies and

possible changes in the regulatory landscape, PHCbi began to introduce Medical Device certified products in 2011. The first models to be certified include the:

- MDF-DU300H, MDF-U55V, MDF-DU502VH, MDF-DU702VH, MDF-DU702VX, MDF-DC502VX, MDF-DU900V-PE
- MDF-U5412H, MDF-U443
- MBR-305GR, MBR-705GR, MBR-1405GR
- MCO-170AIC, MCO-230AIC, MCO-170M



PHC Corporation, Gunma Factory is certified for:  
Quality management system: ISO9001  
Medical devices quality management system: ISO13485



# SPECIFICATIONS

Models: MIR-154-PE | MIR-254-PE | MIR-554-PE

MIR Cooled incubators				
Model Number		MIR-154-PE	MIR-254-PE	MIR-554-PE
External Dimensions (W x D x H <sup>1)</sup>	mm	700 x 580 x 1018	700 x 580 x 1618	800 x 832 x 1810
Internal Dimensions (W x D x H)	mm	620 x 368 x 555	620 x 368 x 1088	640 x 550 x 1160
Volume	liters	123	238	406
Net Weight	kg	78	108	195
Performance				
Temp control range and fluctuation	°C	-10 ~ +60 (AT; +5 ~ +35, no load), ±0.2 with Heater PID control (SV 50), ±1.5 with Compressor control (SV 5) PID control: 7°C above AT for MIR-154/254; 10°C above AT for MIR-554		
Temperature uniformity	°C	±0.5 SV (35)		
Performance ambient temperature	°C	20, no load		
Control				
Temperature Sensor		Thermistor		
Refrigeration				
Insulation material		PUF		
Insulation thickness	mm	40	40	80
Compressor		150	250	250
Refrigerant		R-134a	R-404A	R-404A
Cooling method		Forced air circulation		
Construction				
Exterior material		Painted steel		
Interior material		SS SUS-304		
Outer door	qty	1		
Outer door lock		MIR-LP option		
Reversible door		Y	Y	N
Inner door	qty	N	N	2 small inner doors (MIR-55ID option) MIR-LP option
Shelves	qty	3	5	5
Max. load per shelf	kg	20	20	50
Max. total load	kg	61	100	250
Access port	qty	1	1	2
- position		left side	left side	left and right side
- diameter	Ø mm	40		
Interior fluorescent lamp		1, 15, with MIR-L15-PE <sup>2)</sup> option		
Alarms		(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)		
Power failure		-	-	R
High temperature		V-B-R		
Low temperature		V-B-R		
Door open		V-B		
Electrical and noise level				
Power supply	V	230		
Frequency	Hz	50		
Noise level <sup>3)</sup>	dB(A)	41	44	45
Options				
Stacking kit		MIR-S154SB-PW	-	-
Door padlock bracket		MIR-LP-PW	MIR-LP-PW	-
Additional illumination kit		MIR-L15-PE	MIR-L15-PE	MIR-L15-PE
Inner doors		-	-	MIR-55ID-PW
Door window blanking plate		MIR-154BP-PW	MIR-254BP-PW	-

## Notes:

1) Exterior dimensions of main cabinet only, excluding handle and other external projections - See dimensions drawings on website for full details

2) MIR-L15-PE operates between +2°C and +50°C

3) Nominal value. Background noise 20dB

# SPECIFICATIONS

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

IncuSafe CO <sub>2</sub> incubators		
MCO-230AIC-PE	MCO-230AICUV-PE	MCO-230AICUVH-PE
	770 x 730 x 905	
	643 x 523 x 700	
	230	
	90	
	AT +5 ~ +50, ±0.1	
	±0.25	
	0 ~ 20, ±0.15	
	95, ±5	
	Thermistor	
	Dual IR	
	LCD touch screen	
	Painted Steel (rear cover not painted)	
	Stainless Steel Copper-Enriched Alloy	
	Extruded polystyrene	
	Direct Heat & Air Jacket System	
	1	
Optional	Optional	Standard
	Standard	
	1 gastight - made of tempered glass	
	4 x Stainless Steel Copper-enriched Alloy	
	620 x 450 x 12	
	7	
	10	
	1	
	Rear Upper Left	
	30	
	R	
	V-B-R	
	V-B-R	
	V-B-R	
	-	
	V-B	
	230	
	50	
	25	
MCO-170UVS-PE <sup>6)</sup>	Standard	Standard
MCO-170HB-PE <sup>6)</sup>	MCO-170HB-PE <sup>6)</sup>	Standard
MCO-170EL-PW <sup>6)</sup>	MCO-170EL-PW <sup>6)</sup>	Standard
	MCO-HP-PW <sup>6)</sup>	
	MCO-H202-PE	
	-	
	MCO-100L-PW	
	-	
	MCO-216C-PW	
	MCO-S6-PW	
	MCO-230ST-PW	
	MCO-35ST-PW	
	MCO-170PS-PW	
	MCO-230SB-PW	
	MCO-230RB-PW	
	-	
	-	
	MCO-420MA-PW	

IncuSafe Reach In CO <sub>2</sub> incubator
MCO-80IC-PE
986 x 853 x 2040
806 x 693 x 1524
851
275
AT +5 to 50 (AT; 20°C to 35°C)
±0.5
0 ~ 20, ±0.15
Normal mode; >80% R.H., High mode; > 90% R.H.
Thermistor
IR
LED
Painted steel
SS copper alloyed
PUF
N (laminar airflow)
1 double paned glass
N
Y
Option
5
30
150
5
2
Left and right hand side
40
R
V-B-R
V-B-R
V-B-R
V
V
230
50
33
MCO-80UVS-PE
-
-
-
-
MCO-80ID-PW (5 small doors)
MCO-100L-PW
MCO-80GC-PW
-
MCO-80ST-PW
-
-
-
-
-
MCO-80RBS-PW
MCO-80AS-PW
MCO-420MA-PW

**Notes:**

- 1) Exterior dimensions of main cabinet only, excluding handle and other external projections  
 2,3 & 4) Ambient temperature 23°C, setting 37°C, CO<sub>2</sub> 5%, O<sub>2</sub> 5%, no load  
 5) Nominal value

- 6) Requires MCO-170HB-PE, MCO-170EL-PW, MCO-HP-PW and SafeCell UV option for H<sub>2</sub>O<sub>2</sub> decontamination  
 7) Can only be fitted with one communications interface.

- \* If stacking two incubators, make sure the double-stacking dedicated securing hardware and spacer are used.

# SPECIFICATIONS

Models: MCO-170M-PE series

IncuSafe Multigas incubators				
Model Number		MCO-170M-PE	MCO-170MUV-PE	MCO-170MUVH-PE
External Dimensions (W x D x H <sup>1)</sup>	mm	620 x 710 x 905		
Internal Dimensions (W x D x H)	mm	490 x 523 x 665		
Volume	liters	161		
Net Weight	kg	79		
Performance				
Temperature Control Range & Fluctuation	°C	AT +5 ~ +50, ±0.1		
Temperature Uniformity <sup>2)</sup>	°C	±0.25		
CO <sub>2</sub> Control Range & Fluctuation <sup>3)</sup>	%	0 ~ 20, ±0.15		
O <sub>2</sub> control range & Fluctuation <sup>4)</sup>	%	1 -18 and 22 - 80, ±0.2		
Humidity Level & Fluctuation	%RH	95, ±5		
Control				
Temperature Sensor		Thermistor		
CO <sub>2</sub> Sensor		Dual IR		
O <sub>2</sub> Sensor		Stabilized Zirconia Sensor		
Display		LCD Touch Screen		
Construction				
Exterior Material		Painted Steel (rear cover not painted)		
Interior Material		Stainless Steel Copper-Enriched Alloy		
Insulation Material		Extruded polystyrene		
Heating Method		Direct Heat & Air Jacket System		
Outer Door	qty	1		
Outer Door Lock		Optional	Optional	Standard
Field Reversible Door		Standard		
Inner Doors	qty	4 gastight - made of tempered glass		
Shelves	qty	3 x Stainless Steel Copper-enriched Alloy		
Shelf Dimensions (W x D x H)	mm	470 x 450 x 12		
Max. Load per Shelf	kg	7		
Max. Shelf Capacity	qty	10		
Access Port	qty	1		
Access Port Position		Rear Upper Left		
Access Port Diameter	Ø mm	30		
Alarms		(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)		
Power Failure		R		
Out of Temperature Setting		V-B-R		
High Temperature		V-B-R		
Out of CO <sub>2</sub> Setting		V-B-R		
Out of O <sub>2</sub> setting		V-B-R		
Door open		V-B		
Electrical and Noise Level				
Power Supply	V	230		
Frequency	Hz	50		
Noise Level <sup>5)</sup>	dB	25		
Options				
SafeCell UV System		MCO-170UVS-PE <sup>6)</sup>	Standard	Standard
H <sub>2</sub> O <sub>2</sub> Decontamination Board		MCO-170HB-PE <sup>6)</sup>	MCO-170HB-PE <sup>6)</sup>	Standard
Electric Door Lock with Password		MCO-170EL-PW <sup>6)</sup>	MCO-170EL-PW <sup>6)</sup>	Standard
H <sub>2</sub> O <sub>2</sub> Vapour Generator		MCO-HP-PW <sup>6)</sup>		
H <sub>2</sub> O <sub>2</sub> Reagent, pack of 6 bottles		MCO-H2O2-PE		
Multiple Inner Doors		Standard		
CO <sub>2</sub> Gas Pressure Regulator		MCO-100L-PW		
N <sub>2</sub> Gas Pressure Regulator		MCO-100L-PW		
Automatic CO <sub>2</sub> Cylinder Changeover System		MCO-21GC-PW		
Semi-automatic one point Gas Calibration Kit		MCO-SG-PW		
InCu saFe® Shelf		MCO-170ST-PW		
InCu saFe® Half Tray System		MCO-25ST-PW		
Double Stacking Bracket*		MCO-170PS-PW		
Stacking Plate*		MCO-170SB-PW		
Roller Base		MCO-170RB-PW		
Optional communication systems <sup>7)</sup>				
Analogue interface (4-20mA)		MCO-420MA-PW		

1) Exterior dimensions of main cabinet only, excluding handle and other external projections

2,3 & 4) Ambient temperature 23°C, setting 37°C, CO<sub>2</sub> 5%, O<sub>2</sub> 5%, no load

5) Nominal value - Background noise 20dB

6) Requires MCO-170HB-PE, MCO-170EL-PW, MCO-HP-PW and SafeCell UV option for H<sub>2</sub>O<sub>2</sub> decontamination

7) Can only be fitted with one communications interface.



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