PHCbi

PHARMACEUTICAL LIFE SCIENCE SOLUTIONS

Model Ranges:
Cryogenic Freezers
Twin*Guard* ULT Freezers
VIP ECO ULT Freezers
Biomedical Freezers
MPR Pharmaceutical Refrigerators
Incu*Safe* CO_2 & Multigas Incubators
MIR Heated and Cooled Incubators

PHCbi Biomedical products are designed to meet the demands of the pharmaceutical & biotechnology industries providing reliability, accuracy, and sample security to facilitate cutting-edge research and drug discovery.

PHC Europe B.V.
Formerly Known as Panasonic Biomedical Sales Europe

www.phchd.com/eu/biomedical

PHCbi Pharmaceutical Solutions offer:

Precise uniformity

Temperature stability

Quiet, reliable compressors

Sample safety

Energy savings

Alarms & monitoring

Ergonomic design

Service and support

Innovative solutions for the Pharmaceutical Industry

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Best storage temperature uniformity

Step into the world of validation

Find the right laboratory

Cryogenic Freezers

-150ºC / -152ºC Ultra-low Temperature Freezers

The most uniform storage temperatures for cryopreservation solutions

- No cross contamination.
- Safe and convenient usability.
- Specially designed cascade refrigeration system.
- Low operational costs.
- VIP PLUS vacuum insulation maximises storage capacity.

Twin*Guard* ULT Freezers

-86ºC ULT Freezers

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 vacuum insulation maximises storage capacity.

Biomedical Freezers

-30ºC / -40ºC Freezers

Stable environment with extensive storage possibilities

- Low running costs.
- HC Refrigerants provide 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.
- Low environmental impact.

equipment for your needs

MPR Pharmaceutical Refrigerators

Uniform storage temperature for the most demanding applications

- Available in a range of sizes and with swing or sliding door options.
- Excellent temperature stability and uniformity.
- Wide temperature range.
- Powerful and responsive refrigeration system.

Incu*Safe* CO_2 & Multigas incubators

Incubators from 49 litres to 230 litres

Optimising cell culture outcomes and reproducibility

- Integrated shelf-supports.
- Full-colour LCD touch screen.
- USB port.
- Excellent control of O_2, CO_2 and temperature.
- Dew stick prevents condensation.
- Removable, easy-to-clean, humidifying pan.
- Certified as a Class IIa Medical Device.

Incu*Safe* CO_2 Reach-in Incubator

851 litres

Large-scale cell culture CO_2 Incubator

- Superior temperature and CO_2 control.
- Rapid recovery times.
- Exceptionally low CO_2 consumption rates.
- Reach-in design with large, 851-litre capacity.

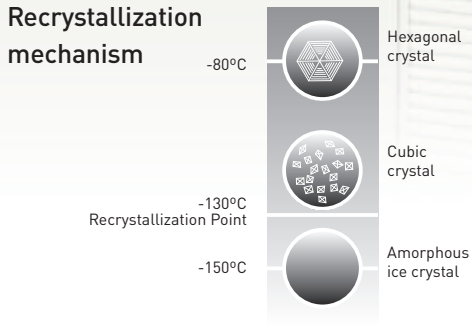
Cryogenic Freezers

Cryogenic Freezers are well-known for maintaining uniform temperatures at -150ºC for the reliable, long-term preservation of cells and tissues. With thin vacuum insulation panel (VIP) walls, the MDF-C2156VAN **Cryo**genic Freezer can achieve more storage capacity than a conventionally insulated freezer without increasing footprint, while also maintaining superior temperature uniformity.

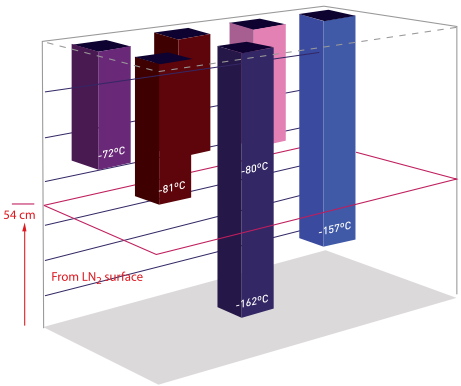
Model: MDF-C2156VAN-PE

CRYOGENIC FREEZERS PROMOTE SAMPLE STABILITY

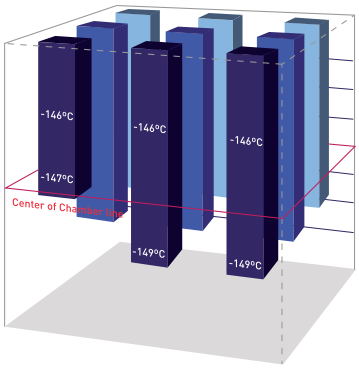
A uniformity of +/-5ºC in our mechanically refrigerated **Cryo**genic Freezers is far superior to the top-to-bottom temperature uniformity provided by liquid nitrogen vapour phase storage, without the concern of cross-contamination often associated with liquid nitrogen (liquid phase storage).



Liquid Nitrogen freezer
(Traditional vapour phase)



MDF-C2156VAN
mechanically refrigerated **Cryo**genic Freezer



Comparison of temperature distribution in a liquid nitrogen freezer (vapour phase) and PHCbi's MDF-C2156VAN mechanically refrigerated **Cryo**genic 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 -130ºC, while temperature in the LN_2 vapour system is dependent on storage location.

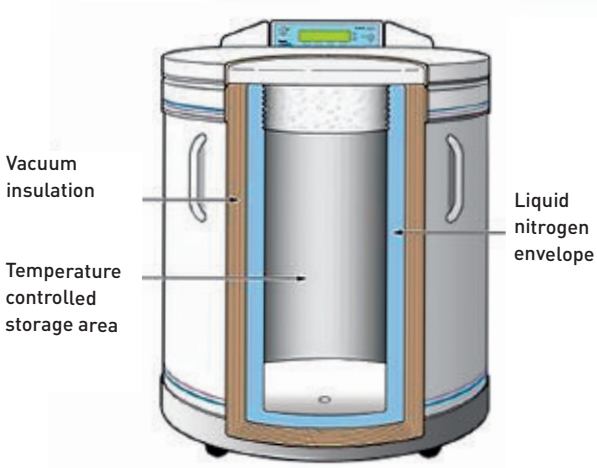
CBS Isothermals

Model: V-3000AB/C

Model: V-5000EH AB/C

PHCbi also offers Isothermal Carousel Liquid Nitrogen Vapor Storage system which combines the innovative -190ºC isothermal design with a small opening and an interior rotating carousel. The system has a small opening which helps to reduce liquid nitrogen consumption, ensures the lid is both lightweight and user-friendly and keeps temperatures in the freezer consistently low. With improved operation and design, the system provides superior temperature uniformity for maximum sample preservation. In addition, a unique patented liquid nitrogen jacket allows samples to stay cool without coming into contact with 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.

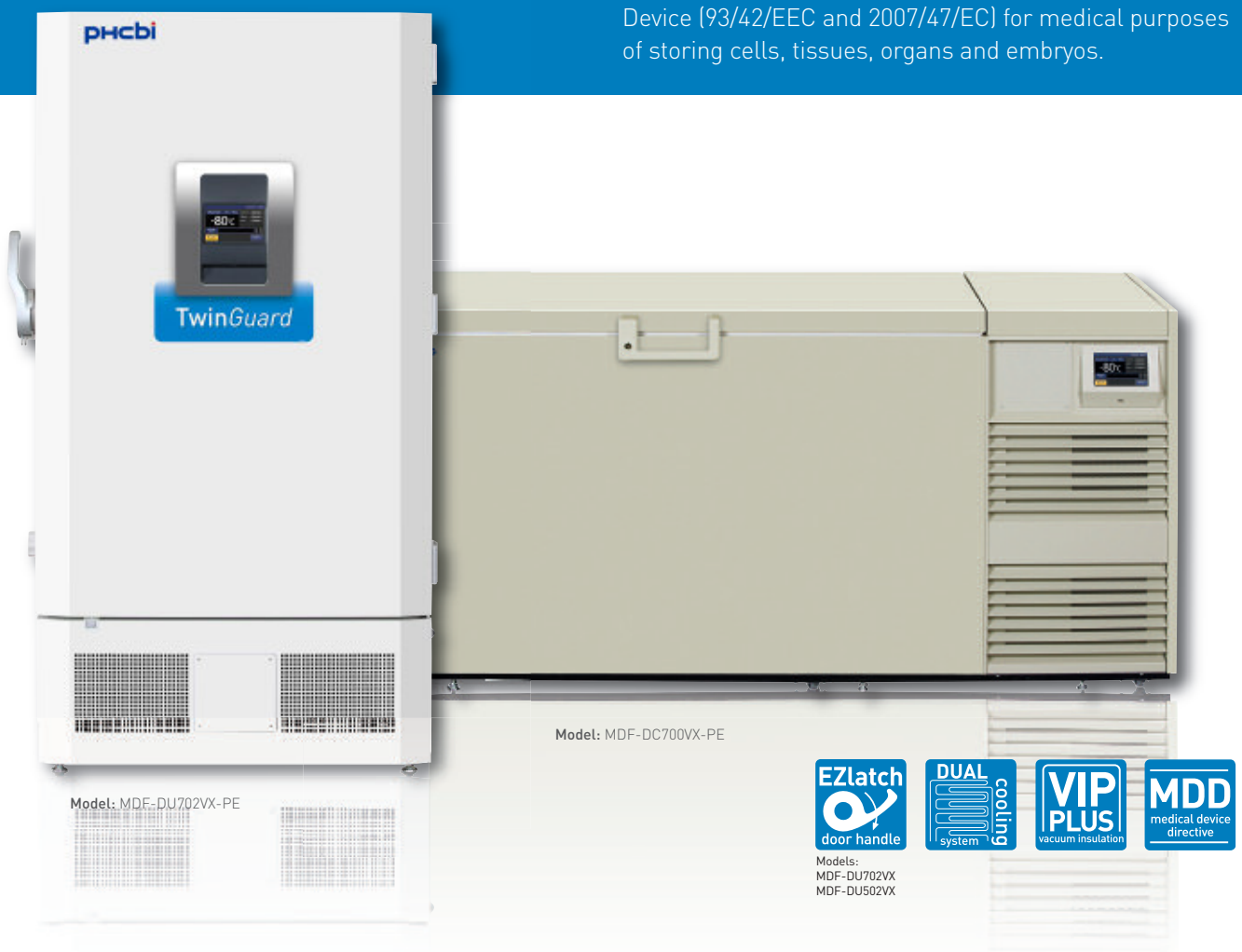
Twin*Guard* ULT Freezers

Twin*Guard* 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°C range. Developed for use with conventional inventory racks and boxes, the **Twin***Guard* 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, hybrodmas, cancer cells or fibroblasts.
- Longitudinal study samples.
- Important medical research samples.
- Valuable pharmaceutical products.
- Clinical trial samples.
- Pathogenic samples within high security laboratories.

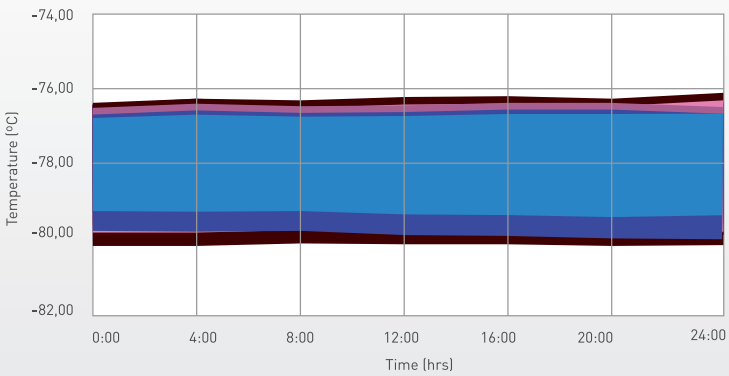
MDF-DU502VX, MDF-DU702VX, MDF-DC500VX and MDF-DC700VX Freezers are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) for medical purposes of storing cells, tissues, organs and embryos.



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.

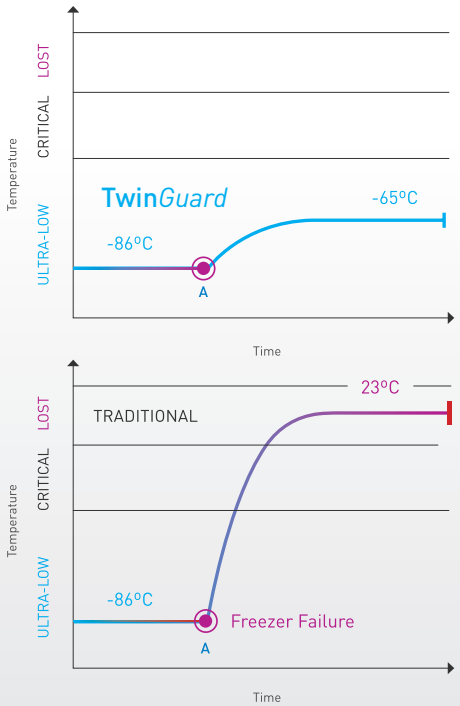
FIGURE 2A - MDF-DU702VX; 9 POINT TEMPERATURE MAPPING



-86ºC ULTRA-LOW FREEZERS

(**Twin***Guard*)

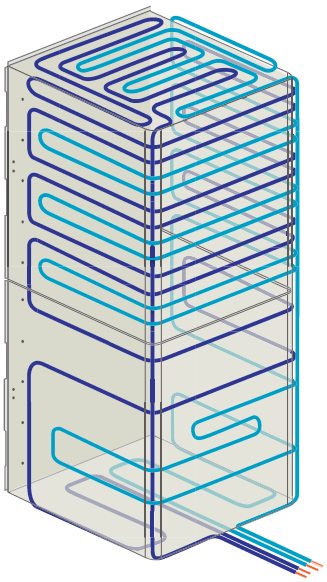
FIGURE 2B



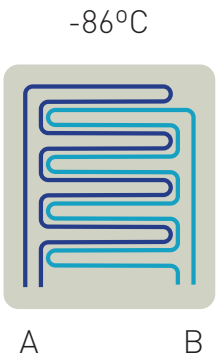
DUAL COOLING SYSTEM

Within **Twin***Guard*'s refrigeration system, efficient ultra-low cooling is achieved through two independent evaporator circuits surrounding the interior chamber.

Two independent evaporator circuits



Dual Cooling System Upright freezers



- 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.

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.

FILTERLESS DESIGN

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

SUPERIOR FOOTPRINT

Twin*Guard* Ultra-Low Temperature Freezers with space-saving VIP insulation deliver exceptional cooling performance and durability for storing valuable research and clinical samples.

VIP ECO ULT Freezers

VIP ECO Ultra Low Temperature Freezers with natural refrigerants minimise energy consumption, reduce environmental impact and save money. Innovative technology and Class IIa Medical Device Certification provide secure storage of valuable research and clinical samples. The VIP vacuum insulation ensures an optimal footprint to storage capacity ratio.

The **VIP ECO** ULT Freezers use 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, and reduce energy consumption. 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

MDF-DU502VH and MDF-DU702VH Freezers are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) for medical purposes of storing cells, tissues, organs and embryos.

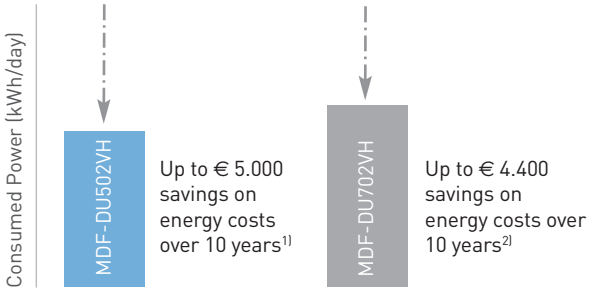
VIP PLUS vacuum insulation | ECO natural refrigerants | EZlatch door handle | MDD medical device directive

REDUCED RUNNING COSTS

VIP ECO Ultra Low Temperature Freezers, with reduced power consumption, have the benefit of much lower running costs. They also dissipate less heat, reducing air conditioning requirements for further cost savings.

MDF-DU502VH up to **55%** more efficient

MDF-DU702VH up to **46%** more efficient



*MDF-DU702VH compared to existing PHCbi models of equivalent size.

1) Model MDF-DU702VH-PE (728 litres) compared to MDF-U73V at set value -80°C, 23°C ambient, no load, 230V 50Hz, € 0.12/kWh. Actual energy use and savings will depend on operating conditions and price of electricity paid.
2) Model MDF-DU502VH-PE (526 litres) compared to MDF-U53V at set value -80°C, 23°C ambient, no load, 230V 50Hz, € 0.12/kWh. Actual energy use and savings will depend on operating conditions and price of electricity paid.

EXTREMELY LOW ENVIRONMENTAL IMPACT

Naturally occurring hydrocarbon (HC) refrigerants used within the **VIP ECO** ULT Freezers are non ozone depleting, have short atmospheric lifetimes and have extremely low global warming potentials (GWP's). This makes the freezers very environmentally friendly so they are an ideal solution for complying with objectives for reduced carbon footprints.

VIP ULT Freezers

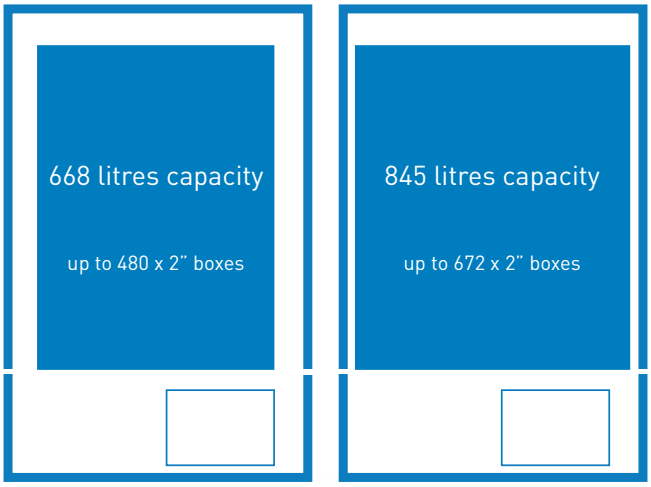
VIP ULT Freezers represent an industry leading combination of refrigeration, control, alarm, monitoring and accessibility for reliable sample preservation.

HIGHEST BOX CAPACITY

The use of highly efficient VIP PLUS insulation optimizes interior volume in the smallest footprint possible. This ensures the most efficient use of space for up to 40%* more 2" box storage capacity within the same footprint.

*MDF-DU900V-PE compared with PHCbi model with an equivalent footprint

WHICH FREEZER WILL YOU CHOOSE?



Conventional Freezer

VIP ULT Freezer With VIP Insulation

Model: MDF-DU900V-PE

EZlatch

The EZLatch door handle on the MDF-DU900V makes access to stored samples even easier. Designed to open with minimal effort and repeatedly stress tested to ensure endurance.

VIP PLUS vacuum insulation

EZlatch door handle

MDD medical device directive

Biomedical -30º / -40ºC Freezers

HIGH PERFORMANCE FREEZERS WITH OPTIMAL TEMPERATURE UNIFORMITY

The Biomedical Freezers are designed for long or intermediate-term storage at temperatures as low as -40ºC. Constructed with time-tested laboratory and clinical-grade refrigeration systems, these freezers are ideal for the storage of a wide variety of samples including enzymes, biologics and medicines.

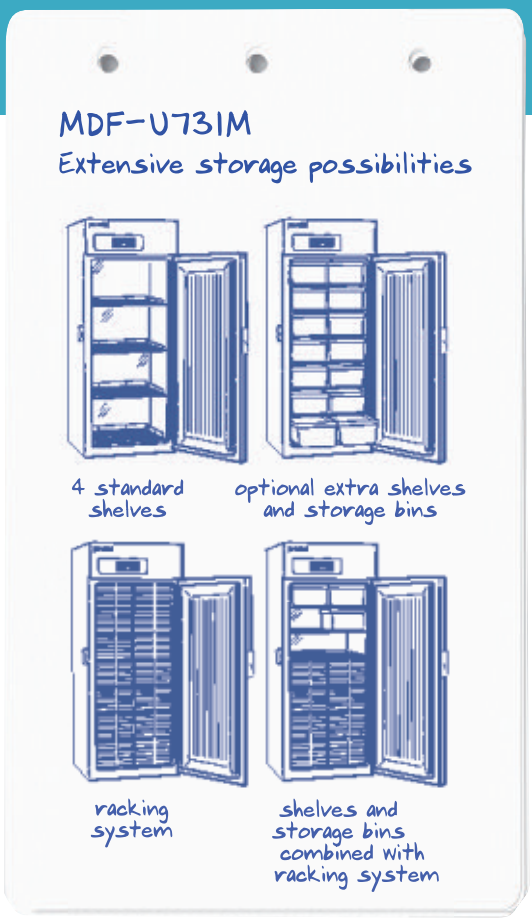
RAPID TEMPERATURE RECOVERY MAINTAINS UNIFORMITY

The rapid pull-down speeds of our Biomedical Freezers ensures that the effects of door openings are minimized. Uniform temperatures are maintained throughout the chamber through direct cooling. 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 -30ºC & -40ºC freezers a wide variety of storage solutions are available. From shelves to racks and / or bins.

Model: MDF-U731M-PE



MPR Pharmaceutical Refrigerators

MPR PHARMACEUTICAL REFRIGERATORS OFFER A COMPLETE SOLUTION FOR THE MOST DEMANDING REQUIREMENTS FOR STORAGE OF PHARMACEUTICALS, MEDICINES, VACCINES, AND OTHER TEMPERATURE-SENSITIVE APPLICATIONS.

MPR Pharmaceutical Refrigerators are specially designed to comply with pharmaceutical regulations. Exceptional temperature uniformity is paired with easy calibration access to meet critical validated storage regulations. A thermistor sensor monitors temperature inside the chamber, while microprocessor controls ensure that an accurate set temperature is maintained. Even with frequent door openings, the circulation fan provides rapid temperature recovery for a stable preservation environment unaffected by ambient temperature.

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.

1

Model: MPR-715F-PE

2

Model: MPR-1411R-PE

A COMPLETE STORAGE SOLUTION: REFRIGERATOR AND FREEZER IN ONE UNIT.

The **MPR** Pharmaceutical Refrigerators with Freezer combine high performance refrigeration with a -30ºC freezer environment in one unit. These models feature dual temperature zones that are provided by separate refrigeration systems for fridge and freezer section. The multi-door design reduces temperature fluctuation during door openings.

Incu*Safe* CO_2 & Multigas Incubators

Incu*Safe* CO_2 & Multigas Incubators, with innovative technologies, offer outstanding quality in performance to maximise cell culture productivity and provide optimum results with reproducibility to meet the demands of todays varied cell culture applications.

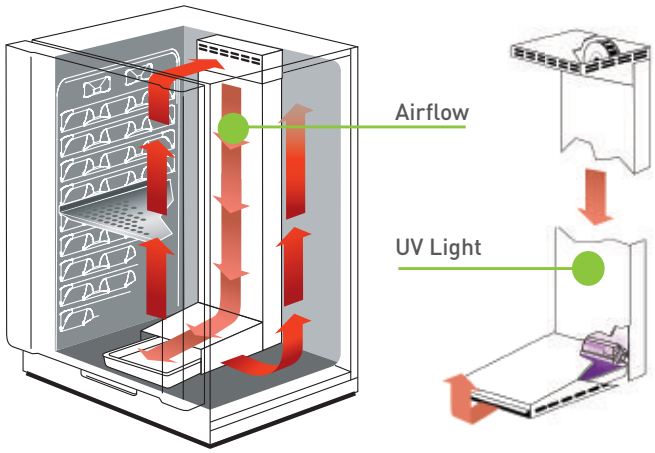
Model: MCO-170AIC-PE

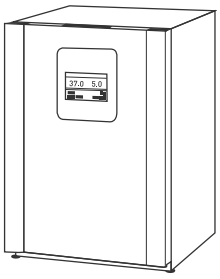
ACTIVE BACKGROUND DECONTAMINATION

During cell culture, inCu-saFe and SafeCell UV actively prevent contamination The exclusive inCu-saFe copper-enriched stainless steel alloy interior offers the germicidal properties of copper and the durability of stainless steel. The optional, isolated, SafeCell UV lamp decontaminates circulating air and water in the humidifying pan, without harming cultured cells.

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.

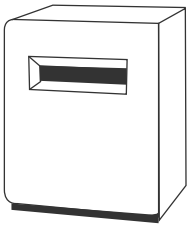




InCu-saFe Interiors

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

VS.



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

CONSISTENT AND UNIFORM ENVIRONMENT FOR CELL GROWTH

Incu*Safe* CO_2 & Multigas Incubators combines a Direct Heat System with an 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 infrared sensor for unprecedented control over CO_2 gas levels, the incubator provides a stable environment for cell growth even with multiple door openings daily.

PRECISE CO_2 CONTROL & RECOVERY

The single beam, dual detector IR CO_2 sensor offers continuous calibration for excellent control, accuracy and stability. The sensor simultaneously measures sample and reference wavelengths for continuous auto-zero calibration. The ceramic-based sensor is unaffected by moderate changes in temperature and relative humidity and is linked to the P.I.D. controller for fast recovery times.

ZIRCONIA O_2 SENSOR

The more O_2 passes through the Zirconia sensor, the more electrical current is induced. This creates a signal to inject more N_2, for when samples require low oxygen levels or to inject more O_2 for when samples require elevated oxygen levels.

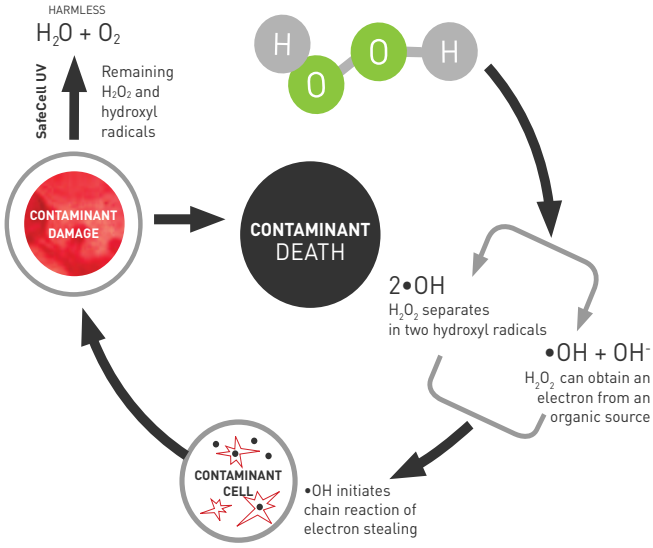
Model: MCO-230AIC-PE

CONDENSATION MANAGEMENT

With a unique antibacterial coating the 'dew stick'- controlled by Peltier technology - condenses water vapour on its surface, which then drips into the humidifying pan, preventing unwanted condensation in the chamber and possible contamination.

RAPID HYDROGEN PEROXIDE DECONTAMINATION REDUCES EXPERIMENTAL DOWNTIME

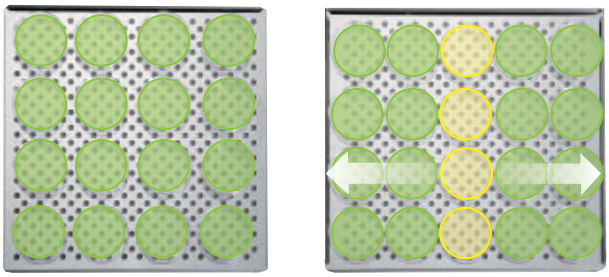
With our hydrogen peroxide technology, achieve complete decontamination 8X faster than conventional high heat methods. The cycle completes in just 3 hours including the final ultraviolet decomposition of H_2O_2 into water and oxygen for easy clean-up. This allows researchers to get back to their cell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



Incu*Safe* Incubators are designed with ease of use and efficiency in mind. By delivering a user friendly cell culture incubator with responsive systems and processes we 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 integrated shelf supports the **Incu***Safe* MCO-170AIC CO_2 incubators provide space for up to 25% more culture vessels.*



* Compared to previous 170 litre CO_2 incubators.

The **Incu***Safe* 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_2 level, O_2 level, door open status and alarms.

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.

INTEGRATED SHELF SUPPORTS

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

Model: MCO-170AIC-PE

Model: MCO-80IC-PE

Incu*Safe* MCO-80IC REACH-IN INCUBATOR

Sometimes your pharmaceutical research may call for large scale processing. With the **Incu***Safe* MCO-80IC large scale reach-in incubator, take your cell culture needs to greater levels by growing more cell lines at once. Improved decontamination technologies (24/7 Active Background Decontamination control with optional UV light) and CO_2 and temperature sensors allow for faster turnaround and higher cell yield.

MIR Heated and Cooled Incubators

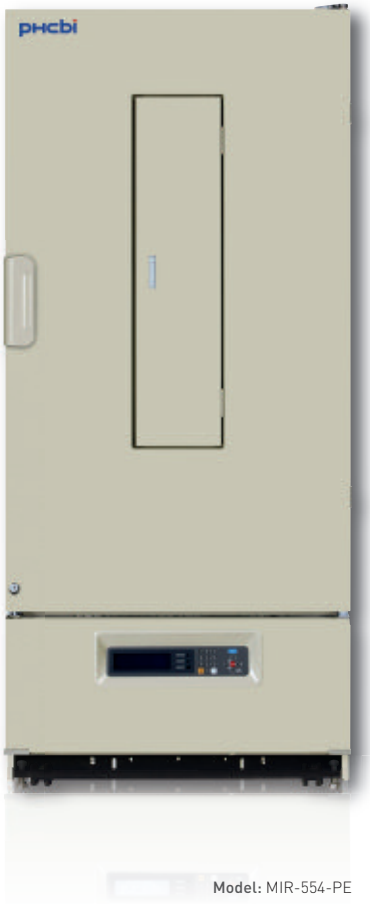
Quality control and testing is an important aspect of pharmaceutical development. With our heated and cooled incubators, achieve optimal temperature configuration for a variety of protocols, including QA / QC, microbiology and stability conditioning.

Models:

MIR-163H-PE | MIR-263H-PE

MIR-154-PE | MIR-254-PE | MIR-554-PE

Model: MIR-H163-PE



Model: MIR-554-PE

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
- **Cryo**genic 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 (IOQ)

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

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_2/O_2, %RH, etc can be included within the relevant equipment IOQ 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_2 stability, and temperature recovery. This service can be customised to SOPs.

PHCbi validation services by model						
	Temp.	CO_2	O_2	%RH	Lighting (Lux/Par)	Pressure
Validation by Model	✓					
MDF-150ºC Freezers	✓					
MDF-86ºC Freezers	✓					
MDF-30ºC Freezers	✓					
MBR Blood Bank Refrigerators	✓					
MPR Pharmaceutical Refrigerators	✓					
MIR Incubator Series	✓					
MCO CO_2 & O_2/CO_2 Incubators	✓	✓	✓	✓		
MLS Top Loading Autoclaves	✓					✓
MLR Environmental Test Chamber	✓			✓	✓	
CBS Standard LN_2 Freezers	✓					

THERMAL VALIDATION

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

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 CRYOGENIC FREEZERS

Cryogenic Freezers			
Model Number		**MDF-1156-PE**	**MDF-C2156VAN-PE**
Dimensions			
External dimensions (WxDxH) [1]	mm	1400 x 800 x 945	1730 x 765 x 1010
Internal dimensions (WxDxH)	mm	500 x 450 x 572	760 x 495 x 615
Volume	litres	128	231
Capacity	2" boxes	81	150
Net weight (approx)	kg	265	318
Performance			
Cooling performance [2]	°C	-152	-150
Temperature setting range	°C	-125 ~ -155	-125 ~ -152
Temperature control range [2]	°C	-130 ~ -152	-125 ~ -150
Control			
Controller		Microprocessor, non-volatile memory	Microprocessor non-volatile memory
Display		LED	LCD
Temperature sensor		Pt-100	Pt-1000
Refrigeration			
Refrigeration system		Cascade	Cascade with auto-cascade low-stage
High-stage compressor	W	1100	1100
High-stage refrigerant		HFC	HFC
Low-stage compressor	W	1100	1100
Low-stage refrigerant		HFC mixed	HFC mixed
Insulation material		PUF	PUF / VIP PLUS
Insulation thickness	mm	175	135
Construction			
Exterior material		Painted steel	Painted steel
Interior material		Aluminium	Aluminium
Outer door lock		Y	Y
Inner door/lid	qty	1	2
Max. load - total	kg	300	207
Access port	qty	1	1
- position		Left	Right
- diameter	Ø mm	40	40
Casters	qty	6 (2 levelling feet)	6 (3 levelling feet)
Alarms		**(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)**	
Power failure		V-B-R	V-B-R
High temperature		V-B-R	V-B-R
Low temperature		-	V-B-R
Filter		V-B	V-B
Door open		-	V-B
Electrical and Noise Level			
Power Supply		230V 50Hz single phase	230V 50Hz single phase
Noise Level [3]	dB(A)	61	51
Options			
Liquid CO_2 back-up		CVK-AT2-PW [4,5]	-
Liquid N_2 back-up		CVK-ATN2-PW [4]	Supplied as standard
Temperature recorders			
- Continuous strip type		MTR-155H-PW	MTR-155H-PW
- Chart paper		RP-155-PW	RP-155-PW
- Ink pen		DF-38FP-PW	DF-38FP-PW
- Recorder housing		-	MDF-S30150-PW

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) Nominal value. Background noise 20dB
4) Requires recorder MTR-155H-PW
5) CVK-A-PW may also be used

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 (W x D x H)	mm	660 x 939 x 1143	939 x 1219 x 1206	939 x 1219 x 1473	1219 x 1371x 1320	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 (W x D x H)	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

MDD 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-U702VX, MDF-DC502VX, MDF-DC700VX, MDF-DU900V-PE
- MDF-U5412H, MDF-U443
- MBR-305GR, MBR-705GR, MBR-1405GR
- MCO-170AIC, MCO-230AIC, MCO-170M

CE 0123

TÜV SÜD

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

SPECIFICATIONS ULT FREEZERS

		TwinGuard Upright Freezers		TwinGuard Chest Freezers	
Model Number		**MDF-DU502VX-PE**	**MDF-DU702VX-PE**	**MDF-DC500VX-PE**	**MDF-DC700VX-PE**
Dimensions					
External dimensions (WxDxH) [1]	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
Performance					
Cooling performance [2]	°C	-86		-86	
Temperature setting range	°C	-50 ~ -90		-50 ~ -90	
Temperature control range [2]	°C	-50 ~ -86		-50 ~ -86	
Control					
Controller		Microprocessor non-volatile memory		Microprocessor non-volatile memory	
Display		LCD		LCD Touch Screen	
Temperature sensor		Pt-1000		Pt-1000	
Refrigeration					
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	
Construction					
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 [3]	kg	415	515	-	
Vacuum release port		2 (1 automatic, 1 manual)		-	
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)	
Alarms		**(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)**			
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	
Electrical and Noise Level					
Power Supply		230V 50Hz single phase		230V 50Hz single phase	
Noise Level [4]	dB(A)	52		52	
Options					
Liquid CO_2 back-up		MDF-UB7-PW		MDF-UB5-PW	
Liquid N_2 back-up		-		-	
Temperature recorders					
- Circular type		MTR-G85C-PE		MTR-G85C-PE	
- Chart paper		RP-G85-PW [8]		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 [8]		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 [6]	MDF-7ID4-PW [7]	-	

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-DU702VH-PE | MDF-DU900V-PE | MDF-C8V1-PE

VIP ECO Upright Freezers		VIP Upright Freezers	VIP Chest Freezers
MDF-DU502VH-PE	MDF-DU702VH-PE	MDF-DU900V-PE	MDF-C8V1-PE
790 x 870 x 1990	1030 x 882 x 1993	1150 x 870 x 1990	550 x 685 x 945
630 x 600 x 1400	870 x 600 x 1400	1010 x 600 x 1400	405 x 490 x 425
528	729	845	84
384	576	672	42
246	278	372	67
-86		-86	-80
-50 ~ -90		-50 ~ -90	-55~-90
-50 ~ -86		-50 ~ -86	-60 ~ -80
Microprocessor non-volatile memory		Microprocessor non-volatile memory	Microprocessor non-volatile memory
LCD Touch Screen		LCD Touch Screen	LED
Pt-1000		Pt-1000	Pt-1000
Cascade		Cascade	Auto-cascade
750		1100	-
HC		HFC	-
750		1100	400
HC		HFC	HFC mixed
PUF / VIP PLUS		PUF / VIP PLUS	PUF / VIP PLUS
80			70
Painted steel		Painted steel	Painted steel
Painted steel		Painted steel	Painted steel
Y		Y	Y
2 (insulated)		2 (insulated)	1
3		3	-
50		50	-
415	515	150	100
2 (1 automatic, 1 manual)		Y	
3		2	2
Back x 1 / bottom x 2		Back/bottom	Back/bottom
17		17	17
4 (2 levelling feet)		4 (2 levelling feet)	4 (2 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		V-B	Filterless design
V-B		V-B	-
230V 50Hz single phase		230V 50Hz single phase	230V 50Hz single phase
52		52	47
MDF-UB7-PW		MDF-UB6-PW	CVK-UB4-PW
-		-	CVK-UBN2-PW
MTR-G85C-PE		MTR-G85C-PE	MTR-G85C-PE
RP-G85-PW [8]		RP-G85-PW	RP-G85-PW
PG-R-PW		PG-R-PW	PG-R-PW
MTR-85H-PW		MTR-85H-PW	MTR-85H-PW
RP-85-PW [8]		RP-85-PW	RP-85-PW
DF-38FP-PW		DF-38FP-PW	DF-38FP-PW
MDF-S3085-PW		MDF-S3085-PW	MDF-S3085-PW
-		-	-
-		MDF-9ID-PW (max 2) [5]	-
MDF-5ID5-PW	MDF-7ID5-PW	-	-
MDF-5ID4-PW[6]	MDF-7ID4-PW [7]	-	-

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.

SPECIFICATIONS BIOMEDICAL FREEZERS

		Biomedical ECO -40°C Plasma Freezer	Biomedical -40°C Plasma Freezer
Model Number		**MDF-U5412H-PE**	**MDF-U443-PE**
Dimensions			
External dimensions (WxDxH) [1]	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 [2]	°C	-40 [2]	-40 [3]
Temperature setting range	°C	-18 ~ -45	-15 ~ -44
Temperature control range [2]	°C	-20 ~ -40 [2]	-15 ~ -4 [3]
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 fluorecent lamp		-	Y
Casters	qty	4 (2 levelling feet)	4 (2 levelling feet)
Alarms			**(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)**
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 [5]	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 [8] or RP-G85-PW [9]
Ink pen		-	DF-38FP-PW [9]
Recorder housing		MPR-S30-PW	MPR-S30-PW [8]
External mounting power failure alarm		-	-

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

Models: MDF-U5412H-PE | MDF-U443-PE | MDF-U731M-PE | MDF-MU300H-PE | MDF-MU500H-PE | MPR-715F-PE

	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 [2]	-30 [2]		+5 / -30
-18 ~ -35	-18 ~ -35		+2 to +14/ -35 to -15
-20~ -30 [2]	-20 ~ -30 [2]		+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) [7]
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 (Optional)		V-B-R
V-B-R	V-B-(R4)		V-B-R
V-B-R	V-B-(R4)		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 [6]		-

SPECIFICATIONS
MPR PHARMACEUTICAL REFRIGERATORS

Models: MPR-721(R)-PE | MPR-1411(R)-PE
MPR-514(R)-PE | MPR-1014(R)-PE

		MPR Pharmaceutical Refrigerators			
Model Number		**MPR-721-PE**	**MPR-721R-PE**	**MPR-1411-PE**	**MPR-1411R-PE**
Dimensions					
External dimensions (WxDxH) [1]	mm	770 x 830 x 1955		1440 x 830 x 1950	
Internal dimensions (WxDxH)	mm	650 x 710 x 1500		1320 x 710 x 1500	
Volume	litres	684	671	1364	1359
Net weight (approx)	kg	174	193	248	287
Capacity					
Performance					
Temperature setting range	°C	2 ~ 23		2 ~ 23	
Control					
Controller		Microprocessor		Microprocessor	
Display		LED		LED	
Temperature recorder					
Temperature sensor		Thermistor		Thermistor	
Refrigeration					
Cooling method		Forced cool air circulation		Forced cool air circulation	
Defrost method		Forced type (cycle defrost), fully automatic		Forced type (cycle defrost), fully automatic	
Refrigerant		HFC		HFC	
Insulation		PUF		PUF	
Construction					
Exterior material		Painted steel		Painted steel	
Interior material		Painted steel		Painted steel	
Outer doors	qty	1 door, double pane glass, self closing		2 doors, double pane glass, self closing	
Outer door lock		Y		Y	
Inner door	qty				
Shelves	qty	4 wire shelves, polyethylene-coated		8 wire shelves, polyethylene-coated	
Drawers	qty		5 coated steel drawers		10 coated steel drawers
Max. load - per shelf/drawer	kg	50	40	40	40
Max. load - total	kg	200	200	320	400
Access port	qty	3		3	
- position		Left/right/top		Left/right/top	
- diameter	Ø mm	30		30	
Casters	qty	4		4	
Interior light		Fluorescent		Fluorescent	
Alarms		**(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)**			
Power failure		V-B-R (Optional)		V-B-R (Optional)	
High temperature		V-B-R		V-B-R	
Low temperature		V-B-R		V-B-R	
Door open		V-B		V-B	
Electrical and Noise Level					
Power Supply		230V 50Hz single phase		230V 50Hz single phase	
Noise Level [2]	dB(A)	41		42	
Options					
Temperature recorders					
Temperature chart recorder		MTR-0621LH-PE		MTR-0621LH-PE	
- chart paper		RP-06-PW		RP-06-PW	
- recorder housing		MPR-S30-PW		MPR-S30-PW	
Circular type		MTR-G04C-PE		MTR-G04C-PE	
- chart paper		RP-G04-PW		RP-G04-PW	
- Ink pen		PG-R-PW		PG-R-PW	
- recorder housing		MPR-S7-PW		MPR-S7-PW	
External mounting power failure alarm		MPR-48B-PW (V-B) [3]		MPR-48B-PW (V-B) [3]	

Notes:
1) Exterior dimensions of main cabinet only, excluding handle and other external projections
- See dimensions drawings on website for full details
2) Nominal value - Background noise 20dB
3) Remote alarm comes with optional power failure alarm MPR-48B1-PW

SPECIFICATIONS INCU*SAFE* CO_2 & MULTIGAS INCUBATORS

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 [1]	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	ºC	AT +5 ~ +50, ±0.1		
Temperature Uniformity [2])	ºC	±0.25		
CO_2 Control Range & Fluctuation [3])	%	0 ~ 20, ±0.15		
O_2 control range & Fluctuation [4])	%	1 -18 and 22 - 80, ±0.2		
Humidity Level & Fluctuation	%RH	95, ±5		
Control				
Temperature Sensor		Thermistor		
CO_2 Sensor		Dual IR		
O_2 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_2 Setting		V-B-R		
Out of O_2 setting		V-B-R		
Door open		V-B		
Electrical and Noise Level				
Power Supply	V	230		
Frequency	Hz	50		
Noise Level [5])	dB	25		
Options				
SafeCell UV System		MCO-170UVS-PE[6])	Standard	Standard
H_2O_2 Decontamination Board		MCO-170HB-PE[6])	MCO-170HB-PE[6])	Standard
Electric Door Lock with Password		MCO-170EL-PW[6])	MCO-170EL-PW[6])	Standard
H_2O_2 Vapour Generator		MCO-HP-PW[6])		
H_2O_2 Reagent, pack of 6 bottles		MCO-H2O2-PE		
Multiple Inner Doors		Standard		
CO_2 Gas Pressure Regulator		MCO-100L-PW		
N_2 Gas Pressure Regulator		MCO-100L-PW		
Automatic CO_2 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 [7]				
Analogue interface (4-20mA)		MCO-420MA-PW		

Notes:
1) Exterior dimensions of main cabinet only, excluding handle and other external projections
2,3 & 4) Ambient temperature 23ºC, setting 37ºC, CO_2 5%, O_2 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_2O_2 decontamination
7) Can only be fitted with one communications interface.

SPECIFICATIONS INCU*SAFE* CO_2 & MULTIGAS INCUBATORS

		IncuSafe CO_2 Incubators		
Model Number		**MCO-170AIC-PE**	**MCO-170AICUV-PE**	**MCO-170AICUVH-PE**
External Dimensions (W x D x H [1]	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	ºC	AT +5 ~ +50, ±0.1		
Temperature Uniformity [2])	ºC	±0.25		
CO_2 Control Range & Fluctuation [3])	%	0 ~ 20, ±0.15		
Humidity Level & Fluctuation	%RH	95, ±5		
Control				
Temperature Sensor		Thermistor		
CO_2 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_2 Setting		V-B-R		
Water level		-		
Door open		V-B		
Electrical and Noise Level				
Power Supply	V	230		
Frequency	Hz	50		
Noise Level [5])	dB	29		
Options				
SafeCell UV System		MCO-170UVS-PE[6])	Standard	Standard
H_2O_2 Decontamination Board		MCO-170HB-PE[6])	MCO-170HB-PE[6])	Standard
Electric Door Lock with Password		MCO-170EL-PW[6])	MCO-170EL-PW[6])	Standard
H_2O_2 Vapour Generator		MCO-HP-PW[6])		
H_2O_2 Reagent, pack of 6 bottles		MCO-H2O2-PE		
Multiple Inner Doors		MCO-170ID-PW		
CO_2 Gas Pressure Regulator		MCO-100L-PW		
N_2 Gas Pressure Regulator		-		
Automatic CO_2 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		
Roller bottle rack mounting kit		-		
Automatic water supply system kit		-		
Optional communication systems [7]				
Analogue interface (4-20mA)		MCO-420MA-PW		

* If stacking two incubators, make sure the double-stacking dedicated securing hardware and spacer are used. (see options)

IncuSafe CO_2 Incubators			IncuSafe Reach In CO_2 Incubator
MCO-230AIC-PE	MCO-230AICUV-PE	MCO-230AICUVH-PE	MCO-80IC-PE
770 x 730 x 905			986 x 853 x 2040
643 x 523 x 700			806 x 693 x 1524
230			851
90			275
AT +5 ~ +50, ±0.1			AT +5 to 50 (AT; 20 to 35)
±0.25			±0.5
0 ~ 20, ±0.15			0 ~ 20, ±0.15
95, ±5			Normal mode; >80% R.H., High mode; > 90% R.H.
Thermistor			Thermistor
Dual IR			IR
LCD touch screen			LED
Painted Steel (rear cover not painted)			Painted steel
Stainless Steel Copper-Enriched Alloy			SS copper alloyed
Extruded polystyrene			PUF
Direct Heat & Air Jacket System			N (laminar airflow)
1			1 double paned glass
Optional	Optional	Standard	N
Standard			Y
1 gastight - made of tempered glass			Option
4 x Stainless Steel Copper-enriched Alloy			5
620 x 450 x 12			30
7			150
10			5
1			2
Rear Upper Left			Left and right hand side
30			40
R			R
V-B-R			V-B-R
V-B-R			V-B-R
V-B-R			V-B-R
-			V
V-B			V
230			230
50			50
25			33
MCO-170UVS-PE[6]	Standard	Standard	MCO-80UVS-PE
MCO-170HB-PE[6]	MCO-170HB-PE [6]	Standard	-
MCO-170EL-PW[6]	MCO-170EL-PW [6]	Standard	-
	MCO-HP-PW [6]		-
	MCO-H2O2-PE		-
	-		MCO-80ID-PW (5 small doors)
	MCO-100L-PW		MCO-100L-PW
	-		MCO-80GC-PW
	MCO-21GC-PW		-
	MCO-SG-PW		MCO-80ST-PW
	MCO-230ST-PW		-
	MCO-35ST-PW		-
	MCO-170PS-PW		-
	MCO-230SB-PW		-
	MCO-230RB-PW		-
	-		MCO-80RBS-PW
	-		MCO-80AS-PW
	MCO-420MA-PW		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_2 5%, O_2 5%, no load
5) Nominal value
6) Requires MCO-170HB-PE, MCO-170EL-PW, MCO-HP-PW and SafeCell UV option for H_2O_2 decontamination
7) Can only be fitted with one communications interface.

SPECIFICATIONS MIR HEATED INCUBATORS

Models: MIR-H163-PE I MIR-H263-PE

		MIR Heated Incubators	
Model Number		**MIR-H163-PE**	**MIR-H263-PE**
External Dimensions (W x D x H [1]	mm	580 x 595 x 820	730 x 645 x 870
Internal Dimensions (W x D x H)	mm	450 x 460 x 450	600 x 510 x 500
Volume	liters	93	153
Net Weight	kg	50	67
Performance			
Temperature control range		Ambient temp +5 ~ +80	
Fluctuation		±0.2 (<-60) ~ ± 0.5 (60 ~ 80)	
Temperature uniformity		±1	
Control			
Temperature sensor		Thermistor	
Display		LED	
Construction			
Exterior material		Painted steel	
Interior material		SS SUS-304	
Insulation material		Glass fibre	
Outer door	qty	1	
Inner door	qty	1	
Shelves	qty	2	3
Max. load per shelf	kg	15	15
Max. total load	kg	30	30
Alarms		**(R = Remote Alarm, V = Visual Alarm, B = Buzzer Alarm)**	
Out of temperature setting		V-B	
High temperature		V-B	
Electrical and Noise Level			
Power Supply	V	230	
Frequency	Hz	50	

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

Appearance and specifications are subject to change without notice.

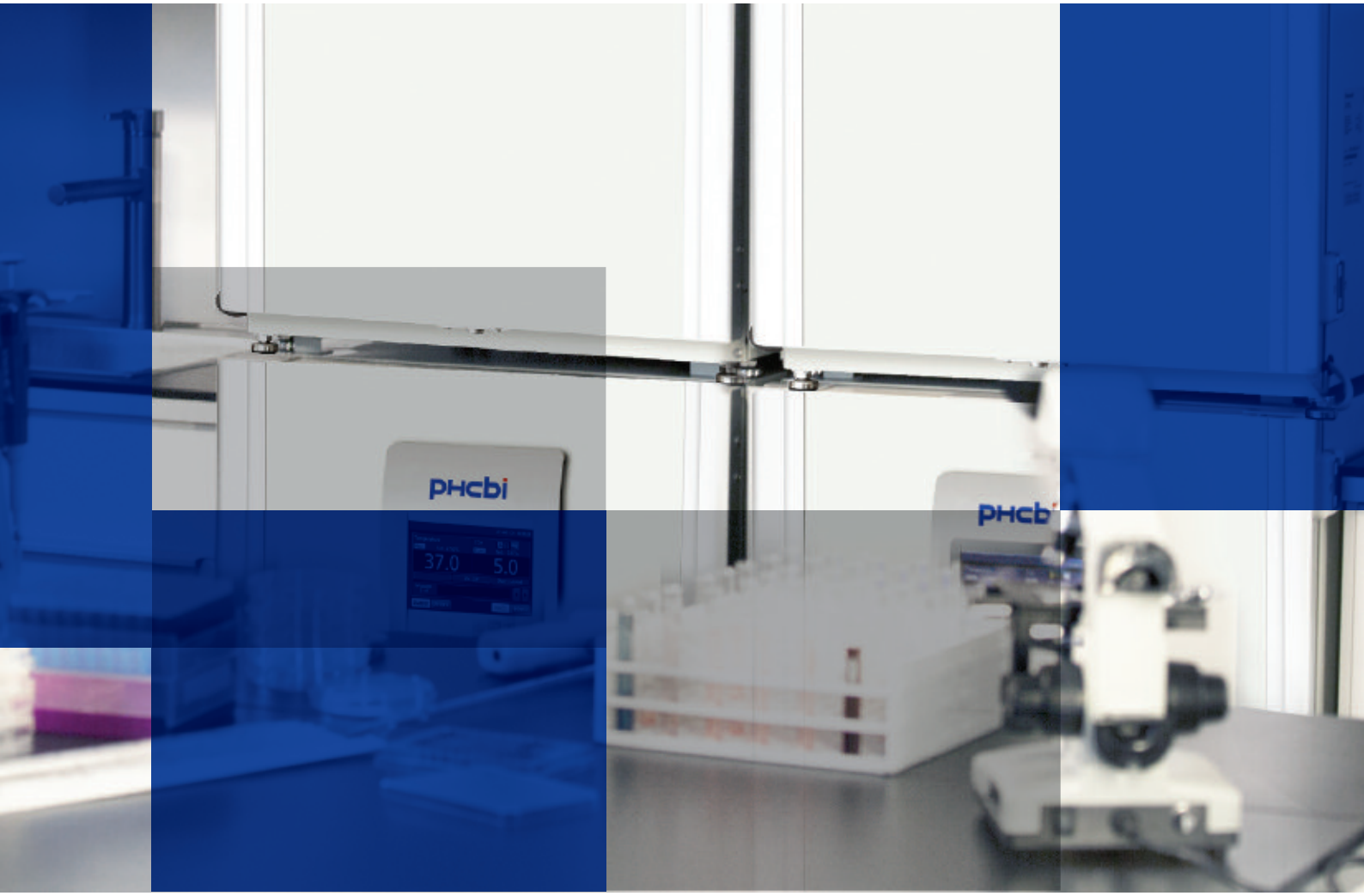
SPECIFICATIONS MIR COOLED INCUBATORS

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

		MIR Cooled Incubators		
Model Number		**MIR-154-PE**	**MIR-254-PE**	**MIR-554-PE**
External Dimensions (W x D x H [1]	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	ºC	-10 ~ +60 (AT; +5 ~ +35, no load), ±0.2 with Heater PID control (SV 50), ±1.5 with Compressor control (SV 5) PID control: 7ºC above AT for MIR-154/254; 10ºC above AT for MIR-554		
Temperature uniformity	ºC	±0.5 SV (35)		
Performance ambient temperature	ºC	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	Y
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 2) 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		230		
Frequency		50		
Noise level[3]		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

Appearance and specifications are subject to change without notice.



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