PHCbi

INNOVATIVE PARTNERS FOR LIFE SCIENCES DEVELOPMENT

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.

www.phchd.com/eu/biomedical

PHCbi products include technology that spans preservation, incubation, sterilization and healthcare, whether you need excellent sample security in a ULT freezer or the best environment for cell culture in a CO_2 incubator, PHC Europe B.V. has the most reliable, high-quality medical and laboratory equipment – backed by more than 50 years' experience in the sector.

This longstanding presence in the market means we've built valuable relationships with leading pharmaceutical, healthcare and biotechnology partners. Our European network means we can satisfy customer demands across the continent within days.
You will benefit from market-leading, innovative technology, as well as service that's second to none.

Innovative partners for
Life Sciences development

Table of contents

Committed to Quality

We at PHC Europe B.V. are committed to providing our customers with first class biomedical and pharmacy automation products and supporting services. Our goal is to maintain our market-leading reputation for excellent standards and for consistently living up to our customers' expectations.

We are very proud that PHC Europe B.V's quality management system is certified (by TÜV Nederland) to **ISO9001:2015**

We hold the certification that covers the sales, distribution, service and validation of biomedical and pharmacy-automation equipment covering our sites in Etten-Leur (Netherlands), Avon (France) and Loughborough (UK).

Life Science Innovator Since 1966

Quality - It's a word we are all familiar with and one which many manufacturers claim to have or strive for. In the view of PHC, quality is a term that is ultimately defined by the customer. Quality is a customer-driven concept, which includes meeting or exceeding our customers' needs or expectations. We focus on total quality which includes advanced processes and the culture of our organization. The result of our total quality initiatives involve many steps to provide our customers with superior value.

10 steps to guarantee superior value

Understanding Customer Demands

Our vision of total quality involves many face-to-face visits to customers to directly hear what they have to say about using the equipment we have supplied.

Creating a New Product Concept

Developing a concept for a new product is very similar to the "basic research" processes in life sciences. Technical staff and engineers develop various basic and innovative technologies to realize the concept for a new product.

Creating a New Product Designs

As soon as engineering personnel begin developing a technological element, the design staff sets out to work on images.

Checking Local Legislation

We manufacture products for use in approximately 110 countries and regions around the world. Obviously, different laws and regulations apply, so we are always working to ensure our products conform to the laws and regulations of the individual locations

Design Review

Beyond determining specifications, evaluation criteria and achievement levels affecting product quality such as reliability, durability and safety standards must be achieved in mass-production models.

Founded in 1990 as a subsidiary of the PHC Holdings Corporation, it is our mission to become a leading, trusted brand for sustainable healthcare and biomedical product solutions, supporting the work of our customers to improve the health and well-being of people around the world.

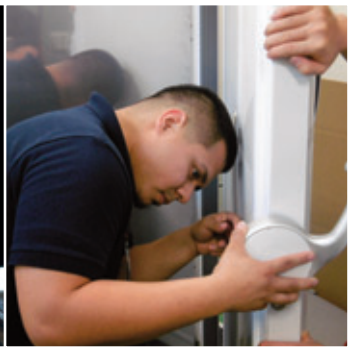
For more than 25 years we have responded to the needs of our pharmaceutical, biotechnology, hospital/clinical and industrial customers, offering an unique perspective on scientific research in general. As a result we play a critical role in product development for worldwide applications and have established a reputation as a manufacturer of high-quality and innovative medical and laboratory equipment.

Long lasting relationships have been built with leading pharmaceutical, healthcare and biotechnology companies as well as with major academic and research institutes in Europe. PHC Europe B.V. has set the standard in many aspects. V.I.P. panels, Cool Safe compressors, Active Background Contamination Control and the world's first -152°C ULT freezer. Where PHC Europe B.V. took the initiative, the others followed. This made us a very important player in both the ultra-low temperature and the CO_2 market.

PHC Europe BV, part of the PHC Corporation, Biomedical Division, manages sales, marketing, logistics and technical service of PHCbi laboratory products throughout Europe (including Russia and Turkey). Headquartered in the Netherlands with sales and service organizations in the UK, France and the Netherlands.

We maintain high levels of inventory at our warehouse in the Netherlands which are waiting to be delivered directly from stock. Within a couple of days, spare parts can be delivered in every part of Europe. That's one of the strengths of PHC's European sales organization.



Quality Assurance

Under PHC standards, quality actions required in new product development must clear three hurdles: AQ-0 approval for design completion, AQ-1 decision for shifting to mass production and AQ-2 decision for shipping mass-produced units.

Mass Production

The Gunma factory was established in 1959 as the Tokyo manufacturing site for Sanyo Electric Co., Ltd. It is a core facility housing the Product Technology Development & Design Department, Quality Assurance Department and Production Department.

Transportation packaging design

Our product packaging is designed to fulfill various distribution challenges around the world. Using past accumulated lessons learned we focus on reducing and recycling materials to support environmental initiatives.

Installation

Product installations are often performed carefully by regional suppliers who are trained specialists. The path from facility entrance to the laboratory is measured and examined in advance to ensure precise, efficient installation. In some regions "white glove' service is also available to aid in installation and set-up.

Sales and After-Sales Service

We always strive to learn more about our products. Before new products go into mass production at the factory, our sales personnel receives extensive knowledge about the products through intensive sales training

The complete line of PHC Europe B.V. products includes an array of laboratory equipment with the most advanced technology, controls, construction and performance attributes in the industry. Today we apply the most sophisticated refrigeration compressor design and state-of-the-art electronics to ultra-low and cryogenic freezers, refrigerators, CO_2 and Multigas incubators and Climatic Test Chambers marketed to life science, pharmaceutical, biotechnology, healthcare and industrial laboratory markets.

Preservation

-86ºC storage temperature

Ultra Low Temperature Freezers
Our most complete combination of refrigeration, control, alarm, monitoring and accessibility for product safety at -86°C.

9

-150ºC storage temperature

Cryogenic Freezers
Our most uniform storage temperatures for cryopreservation solutions.

20

-190°C storage temperature

Isothermal Freezers
With no liquid nitrogen in the storage area, samples can be stored safely in the -190°C range without the risk of cross-contamination through liquid nitrogen.

22

Cell Analysis

LiCellMo

Live Cell Metabolic Analyzer
Continuous, sampling-free measurement of glucose and lactate in culture medium. Visualize real-time changes in cell metabolism.

50

Incubation

Cooled and Heated incubators

Cooled and Heated Incubators
The MIR Cooled Incubators have variety of temperatures and lighting patterns that are essential in research, environmental studies and testing.
The MIR Heated Incubators incorporate an 8-bit microprocessor controller for heat and refrigeration control.

52

Climatic chamber

Climatic Test Chambers
The Climatic Test Chamber has been recognized as an exceptional unit suitable for a wide range of applications.

54

PHCbi core technologies, patents, and intellectual properties are represented in every product line. Core technologies apply to critical components and processes such as compressors, microprocessor electronics, and patented VIP vacuum insulation panels. These are engineered to exact specifications for important applications in life science, pharmaceutical, biotechnology, clinical, and industrial laboratories. As a result, PHCbi products operate with dependability, safety, energy efficiency, and ergonomic sensitivity.

Preservation

-20°C to -40°C storage temperature

Biomedical Freezers
Effective storage of life-saving vaccines and samples for diagnosis in the medical field.

28

+4°C storage temperature

Pharmaceutical/Bloodbank Refrigerators
Uniform storage temperature for the most demanding applications.

32

Incubation

CO_2 incubators

CO_2 Incubators
IncuSafe CO_2 Incubators are well known throughout the world for their high-quality. Creating successful cell cultures requires an incubator that has a high level of precision, security and is easy to use.

Sterilization

Laboratory Autoclaves

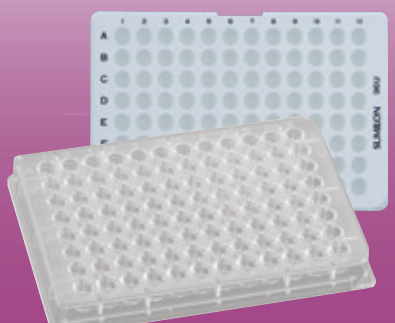
Laboratory Autoclaves
MLS series top-loading autoclaves are a popular method of sterilization for today's research laboratories.

56

Cell Culture

3D Cell Culture Plates and Dishes

Ultra Low attachment 3D Cell Culture Plates. PHC provide superior quality three-dimensional cell culture platforms with a variety of well shapes to enable spheroid culturing of your specific cell type.



58

Live Cell Transport

Unique Live Cell Transport Packaging Solutions

Live transport; delivering cells in an unfrozen and "ready to use" condition.
Total solutions so that various cells and biological tissues including iPS cells can be transported alive without freezing.

61

ULTRA LOW TEMPERATURE FREEZERS

In response to the needs of leading pharmaceutical, biotechnology, hospital/clinical and industrial customers, PHC Europe B.V. offer a unique perspective on Ultra Low Temperature preservation. As part of PHC Corporation, Biomedical Division, PHC Europe B.V. plays a critical role in product development for worldwide applications.

As a result, PHCbi products incorporate the latest applied theories and ideas, refrigeration compressors, electronic components, energy efficiency, robotic manufacturing and economies-of-scale that directly benefit our customers. Furthermore, PHCbi products are extensively tested to meet the toughest quality standards in the world; our own! Through the vigorous application of our unique Vertical Component Integration™, PHCbi products offer tangible benefits - from performance and reliability to ergonomics and convenience, that no other manufacturer can provide.

Dual Cooling System
Dual Cooling System offers ultimate sample protection.

VIP PLUS vacuum insulation
VIP PLUS vacuum insulation maximises storage capacity.

Natural Refrigerants
Naturally occurring hydrocarbon (HC) refrigerants improve performance and reduce running costs.

Inverter Compressors
Inverter Compressors maximise cooling performance and reduce energy consumption.

EZlatch Easy Acces Door Handle
The EZlatch makes access to stored samples even easier.

Medical Device Directive
PHC Europe was one of the first companies in our industry to introduce Medical Device certification to underline our strong commitment to product design, quality and safety.

Hybrid water cooled
This technology on our Eco VIP ULT and cryogenic freezers improves the compressor efficiency.

A full-color LCD Touch Panel
Various functions such as logging the temperature history, and setting up passwords and alarms can all be managed on the screen.

ISO Certification
Equipment that meets GMP standards are ISO cleanroom classified by an independent approved testing laboratories.

TwinGuard ULT Freezers

Our most secure ultra-low temperature freezers for the storage of your valuable samples

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.

DUAL COOLING SYSTEM

DUAL cooling system

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

Medical Device Directive

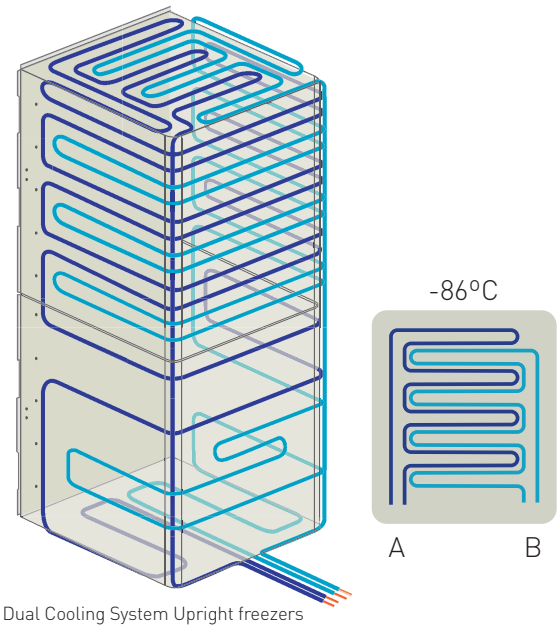
MDD medical device directive

The MDF-DU302VX-PE, MDF-DU502VX-PE, MDF-DU702VX-PE, MDF-DC500VX-PE and MDF-DC700VX-PE series are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC).

Applicable countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Spain, Switzerland and the United Kingdom only

For laboratory use
Applicable countries: EEA countries, Switzerland and Turkey

Two independent evaporator circuits

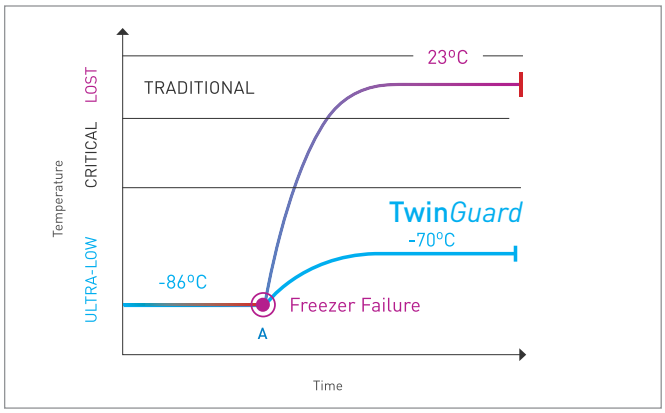


Dual Cooling System Upright freezers

- 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.

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 whilst guarding against degradation. The compressors are specifically designed for ultra-low temperature applications and feature innovative refrigerant feedback processes to reduce compressor temperature, thereby extending compressor life and minimizing heat output.



EZlatch

The EZ Latch door handle was developed based on human engineering. It is designed for secure door opening/closing with Minimum effort as the name suggests and make access to stored sample easier.

FLEXIBLE SHELF LAYOUT

Multiple shelf configurations in the upright models allow a variety of storage options. Organize your samples by using your existing inventory racks or select from the many different rack types we offer.

PHCbi's racks are made of stainless steel or anodized aluminum. The aluminum racks are very light, yet sturdy and corrosion free.

- High quality racks – designed for safe working and easy access to samples.
- Affordable solutions – making freezer storage cost-effective as well as space-efficient.
- Large selection of products – additional rack types and boxes are available on request.

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.

FILTERLESS DESIGN

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

FIRST INTELLIGENT ECO MODE OPERATION

The TwinGuard ULT Freezers 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.

MICROPROCESSOR CONTROL WITH TOUCH SCREEN DISPLAY

The TwinGuard ULT Freezers are managed by an integrated microprocessor controller with LCD touchscreen to simplify all freezer functions. Uniform ultra-low temperature is achieved through a combination of performance systems supervised by the controller complete with alarm, programming and diagnostic protocols. The built in USB port allows logged data to be easily transferred to a PC.

When sample security and peace of mind are of paramount importance, put your trust in Twin*Guard* ultra low freezers.

- An optimal Dual Cooling System provides an unparalleled level of safety and added peace of mind through the use of two independent refrigeration systems.
- ECO mode overlaps refrigeration cycles to reduce energy consumption.
- Advanced space-saving VIP PLUS technology (compared to our conventional models).
- Graphical LCD display with data monitoring and data log exported by USB.
- Available in Upright and Chest models.
- Filterless design reduces the time for routine maintenance
- Vacuum Release Port
- No icing on frame
- ALARM AND SAFETY FUNCTIONS

ISO Class 6.0

MDF-DU302VX-PE
360L / 240 2" Boxes

MDF-DU502VX-PE
528L / 384 2" Boxes

MDF-DU702VX-PE
729L / 576 2" Boxes

TwinGuard Upright Freezers				
Model Number		**MDF-DU302VX-PE**	**MDF-DU502VX-PE**	**MDF-DU702VX-PE**
Temperature control range	°C	-50 ~-86		
External dimensions (WxDxH)	mm	670 x 882 x 1840	790 x 882 x 1993	1030 x 882 x 1993
Internal dimensions (WxDxH)	mm	490 x 600 x 1230	630 x 600 x 1400	870 x 600 x 1400
Volume	litres	360	528	729
Capacity	2" boxes	240	384	576
Power Consumption	kWh/day	Normal Mode: 9,7 / Eco Mode: 8,3*	Normal Mode: 16,5 / Eco Mode: 15,3*	Normal Mode: 16,9 / Eco Mode: 15,7*

* (Set value temp. -80°C, Ambient temp. 23 °C, no load)
* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases.

MDF-DC500VX-PE
575L / 416 2" Boxes

MDF-DC700VX-PE
715L / 520 2" Boxes

TwinGuard Chest Freezers			
Model Number		**MDF-DC500VX-PE**	**MDF-DC700VX-PE**
Temperature control range	°C	-50 ~-86	
External dimensions (WxDxH)	mm	2010 x 845 x 1070	2300 x 845 x 1070
Internal dimensions (WxDxH)	mm	1190 x 640 x 756	1480 x 640 x 756
Volume	litres	575	715
Capacity	2" boxes	416	520
Power Consumption	kWh/day	Normal Mode: 15,5 / Eco Mode: 13,6*	Normal Mode: 16,3 / Eco Mode: 14,9*

* (Set value temp. -80°C, Ambient temp. 23 °C, no load)
* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases.

VIP ECO ULT FREEZERS

Cost-saving and environmentally friendly sample storage within an optimal footprint.

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

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.

Natural Refrigerants

ECO natural refrigerants

Naturally occurring hydrocarbon (HC) refrigerants improve performance and reduce running costs.

Inverter Compressors

IC+ inverter compressor

The intelligent control of the inverter compressor optimizes running speed. 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.

REDUCED RUNNING COSTS

The use of highly efficient hydrocarbon refrigerants results in reduced energy consumption and lower running costs. With key equipment and instrumentation operating continuously laboratories are able to significantly reduce running costs by investing in energy efficient facilities. PHC designs and builds advanced preservation systems to deliver maximum cost efficiency while maintaining the reliability and performance necessary for reliable storage of valuable research and clinical samples.

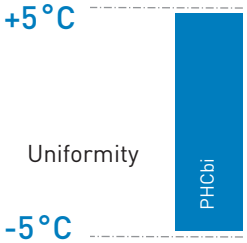
EXTREMELY LOW ENVIRONMENTAL IMPACT

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.

OPTIMUM UNIFORMITY

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

Surpasses the customer preference of +/-5°C*



* Based on internal validation data tested at -80°C setpoint, in an empty chamber with 23°C ambient temperature.

* The data may vary depending on the use, circumstances and optional accessories. Validation documents can be provided for each serial number for an additional fee.

Medical Device Directive

The MDF-DU502VH-PE, MDF-DU702VH-PE and MDF-DU300H-PE are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC).

Applicable countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Spain, Switzerland and the United Kingdom only

For laboratory use
Applicable countries: EEA countries, Switzerland and Turkey

VIP PLUS INSULATION

PHCbi's patented VIP PLUS technology has resulted in a revolutionary vacuum insulation cabinet construction with improved thermal properties for superior temperature performance.

VACUUM RELEASE PORT

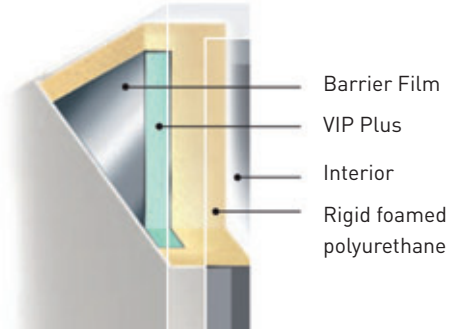
A vacuum release port (available on the VIP ECO and TwinGuard upright series) allows smooth door opening when the door seal is tightened by negative pressure generated from temperature difference between chamber and ambient.

When low electrical running costs and environmental considerations are of paramount importance, put your trust in VIP ECO and PRO ECO ULT freezers.

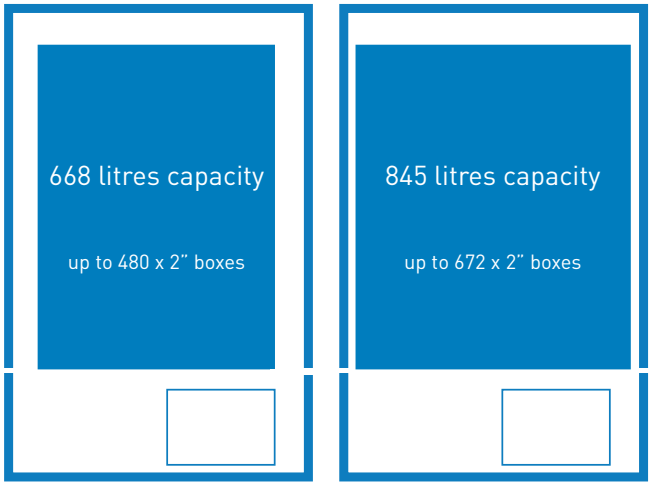
- New heat exchanger design for greater surface area contact and overall efficiency.
- Advanced space-saving VIP PLUS Insulation (compared to our conventional models).
- Graphical LCD display with data monitoring and data log exported by USB (for MDF-DU502VH-PE, MDF-DU502VHW-PE, MDF-DU702VH-PE and MDF-DU702VHW-PE).
- VIP Plus Insulation
- Low heat emmission
- Vacuum Release Port
- No icing on frame
- Alarm and Safety functions

INNOVATIVE DESIGN

PHC was the first company to introduce vacuum insulation panels to ultra low temperature nd cryogenic freezers. The PHCbi patented VIP vacuum insulation panel thin-wall composite is a high-efficiency design that yields more interior storage volume in a conventional freezer footprint. The PHCbi VIP Freezer range typically provide 30% more storage capacity for a given floor area saving valuable laboratory space.



WHICH FREEZER WILL YOU CHOOSE?



MDF-DU502VH-PE
528L / 384 2" Boxes

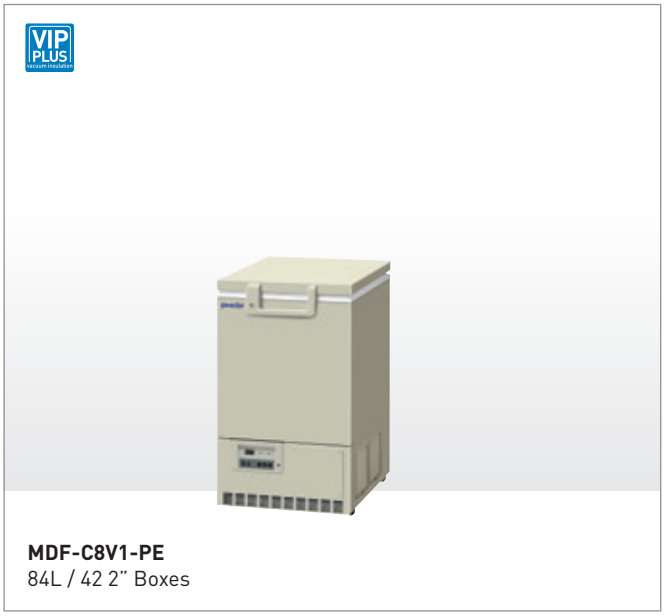
MDF-DU702VH-PE
729L / 576 2" Boxes

MDF-DU901VHL-PE
845L / 672 2" Boxes

VIP ECO ULT Freezers				
Model Number		**MDF-DU502VH-PE**	**MDF-DU702VH-PE**	**MDF-DU901VHL-PE**
Temperature control range	°C	-40 ~-86		-50 ~-86
External dimensions (WxDxH)	mm	790 x 882 x 1993	1030 x 882 x 1993	1150 x 870 x 1993
Internal dimensions (WxDxH)	mm	630 x 600 x 1400	870 x 600 x 1400	1010 x 600 x 1400
Volume	litres	528	729	845
Capacity	2" boxes	384	576	672
Power Consumption	kWh/day	6,7*	7,7*	8,7*

* (Set value temp. -80°C, Ambient temp. 23 °C, no load). * Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases.

MDF-DU300H-PE
333L / 216 2" Boxes



MDF-C8V1-PE
84L / 42 2" Boxes

		PRO ECO ULT Freezers	VIP ULT Freezers
Model Number		**MDF-DU300H-PE**	**MDF-C8V1-PE**
Temperature control range	°C	-86	-86
External dimensions (WxDxH)	mm	750 x 870 x 1830	550 x 685 x 945
Internal dimensions (WxDxH)	mm	490 x 600 x 1140	405 x 490 x 425
Volume	litres	333	84
Capacity	2" boxes	216	42
Power Consumption	kWh/day	5,7*	4,2*

* (Set value temp. -80°C, Ambient temp. 23 °C, no load) * Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases.

HYBRID TECHNOLOGY

PHCbi's Hybrid water cooled technology on ECO VIP ultra low temperature and cryogenic freezers improves the compressor efficiency. The power consumption of a Hybrid ULT can be reduced by typically 10~12% compared to the equivalent air-cooled model. PHC offers a selection of ECO VIP and cryogenic freezers with hybrid water cooling technology.

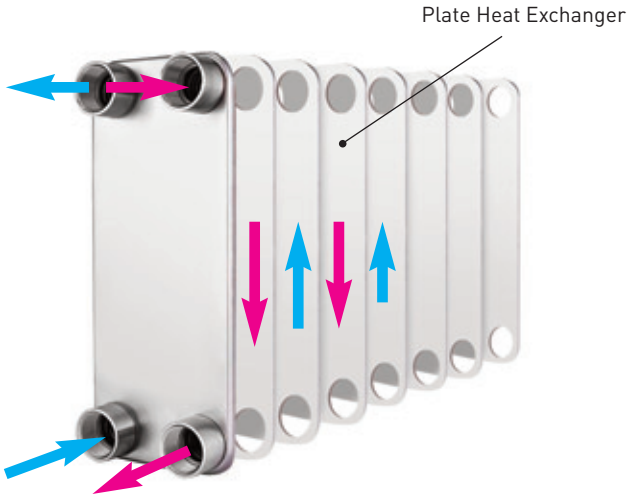
AN INTRODUCTION TO PHCbi HYBRID COOLING

When a high-quality ultra low temperature or cryogenic freezer is equipped with a Hybrid water cooling option, the unit can handle a chilled water circuit to extract the generated heat from the condenser or use the traditional air-cooled method with a fan motor. With this new setup, the freezer can switch from water cooled to air cooled in case the water system is not operated. A Hybrid water cooled freezer will contribute to a significant reduction in power consumption and will also reduce the amount of heat dissipated into the air.

Compared to an air cooled freezer a Hybrid water cooled freezer will also have an improved temperature stability.

PLATE HEAT EXCHANGER

Heat energy from inside the freezer compartment is transferred by refrigerant gasses to a plate heat exchanger. Inside the plate heat exchanger, energy is transferred from the refrigerant to a closed water circuit. The greater cooling capacity of water compared to air improves the performance of the refrigeration system leading to reduced pull-down times. This provides faster temperature recovery after door opening and sample loading.



MDF-DU502VHW-PE
528L / 384 2" Boxes

MDF-DU702VHW-PE
729L / 576 2" Boxes

VIP HYBRID ULT Freezers			
Model Number		**MDF-DU502VHW-PE**	**MDF-DU702VHW-PE**
Temperature control range	°C	-40 ~-86	
External dimensions (WxDxH)	mm	790 x 882 x 1993	1030 x 882 x 1993
Internal dimensions (WxDxH)	mm	630 x 600 x 1400	870 x 600 x 1400
Volume	litres	528	729
Capacity	2" boxes	384	576

* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases.

Optimize access to stored materials with **inventory racks** suitable for your application

TWINGUARD / VIP ECO INVENTORY RACKS

Models: MDF-DU302VX-PE | MDF-DU502VX-PE | MDF-DU702VX-PE | MDF-DU502VH-PE | MDF-DU702VH-PE | MDF-DU901VHL-PE

ALUMINIUM RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Aluminium	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Maximum box dimensions		
					Width	Depth	Height	Footprint of box max width*	Lid of box max width*	Box height max height*
MDF-DU302VX-PE										
with trays	2 inch	12 x HCS-32-5584/143	3x4	240	143	560	280	133	136	52
side opening	2 inch	12 x NIR-220U	3x4	240	139	559	279	135	135	52
with trays	3 inch	12 x HCS-32-3804/143	3x4	144	143	560	232	133	136	71
side opening	3 inch	12 x NIR-312U	3x4	144	139	559	279	135	135	88
MDF-DU502VX-PE / MDF-DU502VH-PE / MDF-DU502VHW-PE										
with trays	2 inch	4 x HCS-296	2x2	384	280	560	685	133	136	52
with trays	2 inch	16 x HCS-6564	4x4	384	140	560	339	130	133	52
side opening	2 inch	16 x NIR-224U	4x4	384	139	559	334	135	135	52
with trays	3 inch	16 x HCS-4804	4x4	256	140	560	320	130	133	75
side opening	3 inch	16 x NIR-316U	4x4	256	139	560	334	135	135	75
MDF-DU702VX-PE / MDF-DU702VH-PE / MDF-DU702VHW-PE										
with trays	2 inch	6 x HCS-296	3x2	576	280	560	685	133	136	52
with trays	2 inch	24 x HCS-6564	6x4	576	140	560	339	130	133	52
side opening	2 inch	24 x NIR-224U	6x4	576	139	559	334	135	135	52
with trays	3 inch	24 x HCS-4804	6x4	384	140	560	320	130	133	75
side opening	3 inch	24 x NIR-316U	6x4	384	139	559	324	135	135	75
MDF-U901VHL-PE										
with trays	2 inch	14 x HCS-5584 + 14 x HCS-6564	7x2 + 7x2	616	140	560	290/339	130	133	52
side opening	2 inch	14 x NIR-220U + 14 x NIR-224U	7x2 + 7x2	616	139	559	279/334	130	133	52
with trays	3 inch	14 x HCS-4804 + 14 x HCS-3804	7x2 + 7x2	392	140	560	340/279	130	133	75
side opening	3 inch	14 x NIR-316U + 14 x NIR-312U	7x2 + 7x2	392	139	559	324/279	135	135	75

STAINLESS STEEL RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Stainless steel	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Maximum box dimensions		
					Width	Depth	Height	Footprint of box max width*	Lid of box max width*	Box height max height*
MDF-DU302VX-PE										
with trays	2 inch	12 x SDR-524-N	3x4	240	139.45	559.82	288.80	134	138	54
side opening	2 inch	12 x SUR-524-N	3x4	240	139.7	569.72	279.65	137	138	54
with trays	3 inch	12 x SDR-334-N	3x4	144	139.45	565.4	250.69	134	138	78
side opening	3 inch	12 x SUR-334-N	3x4	144	139.7	569.72	244.85	137	138	78
MDF-DU502VX-PE / MDF-DU502VH-PE / MDF-DU502VHW-PE										
with trays	2 inch	16 x SDR-624-N	4x4	384	139.45	565.4	325.12	134	137	52
		16 x SDR-624-P	4x4	384	139.45	565.4	339.59	134	137	54,5
side opening	2 inch	16 x SUR-624-N	4x4	384	139.7	569.72	320.29	136	137	52
		16 x SUR-624-P	4x4	384	139.7	569.72	332.74	136	137	54,5
with trays	3 inch	16 x SDR-434-N	4x4	256	139.45	565.4	320.54	134	137	78
side opening	3 inch	16 x SUR-434-N	4x4	256	139.7	569.72	320.29	136	137	78
MDF-DU702VX-PE / MDF-DU702VH-PE / MDF-DU702VHW-PE										
with trays	2 inch	24 x SDR-624-N	6x4	576	139.45	559.82	325.12	139.45	137	52
		24 x SDR-624-P	6x4	576	139.45	565.4	339.59	134	137	54,5
side opening	2 inch	24 x SUR-624-N	6x4	576	139.7	569.72	320.29	136	137	52
		24 x SUR-624-P	6x4	576	139.7	569.72	332.74	136	137	54,5
with trays	3 inch	24 x SDR-434-N	6x4	384	139.45	565.4	320.54	134	137	78
side opening	3 inch	24 x SUR-434-N	6x4	384	139.7	569.72	320.29	136	137	78
MDF-U901VHL-PE										
with trays	2 inch	28 x SDR-624-N	7x4	672	139.45	559.82	325.12	139.45	137	52
side opening	2 inch	28 x SUR-624-N	7x4	384	139.7	569.72	320.29	136	137	52
with trays	3 inch	14 x SDR-334-N	7x2	392	139.45	565.4	250.69	136	137	78
		14 x SDR-434-N	7x2	392	139.45	565.4	320.29	136	137	78
side opening	3 inch	14 x SUR-334-N	7x2	392	139.7	569.72	244.85	136	137	78
		14 x SUR-434-N	7x2	392	139.7	569.72	320.29	136	137	78

* Unit: mm

TWINGUARD CHEST FREEZER INVENTORY RACKS

Models: MDF-DC500VX-PE | MDF-DC700VX-PE

ALUMINIUM RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Aluminium	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Maximum box dimensions		
					Width	Depth	Height	Footprint of box max width*	Lid of box max width*	Box height max height*
MDF-DC500VX-PE										
side opening	2 inch	32 x NIR-213C	8x4	416	139	137	745	133	133	52
side opening	3 inch	32 x NIR-309C	8x4	288	139	137	745	133	133	75
MDF-DC700VX-PE										
side opening	2 inch	40 x NIR-213C	10x4	520	139	137	745	133	133	53
side opening	3 inch	40 x NIR-309C	10x4	360	139	137	745	133	133	75

STAINLESS STEEL RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Stainless steel	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Maximum box dimensions		
					Width	Depth	Height	Footprint of box max width*	Lid of box max width*	Box height max height*
MDF-DC500VX-PE										
side opening	2 inch	32 x SCR-132-N	8x4	416	139.7	144	725.93	136	142	54
side opening	3 inch	32 x SCR-093-N	8x4	288	139.7	144	738.63	136	142	75
MDF-DC700VX-PE										
side opening	2 inch	40 x SCR-132-N	10x4	520	139.7	144	725.93	136	142	54
side opening	3 inch	40 x SCR-093-N	10x4	360	139.7	144	738.63	136	142	75

* Unit: mm

PRO ECO / VIP INVENTORY RACKS

Models: MDF-DU300H-PE | MDF-C8V1-PE

ALUMINIUM RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Aluminium	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Maximum box dimensions		
					Width	Depth	Height	Footprint of box max width*	Lid of box max width*	Box height max height*
MDF-DU300H-PE										
with trays	2 inch	6 x HCS-32-4584/143 + 6 x HCS-32-5584/143	3x2 + 3x2	216	143	560	232/280	133	136	52
side opening	2 inch	6 x NIR-216U + 6 x NIR-220U	3x2 + 3x2	216	139	559	232/279	135	135	52
with trays	3 inch	12 x HCS-32-3804/143	3x4	144	143	560	232	133	136	71
side opening	3 inch	12 x NIR-312U	3x4		144	139	559	279	135	135
MDF-C8V1-PE										
side openings	2 inch	6 x NIR-207C	3x2	42	142	141	403	133	133	53
side openings	3 inch	6 x NIR-305C	3x2	30	142	141	403	133	133	75

STAINLESS STEEL RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Stainless steel	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Maximum box dimensions		
					Width	Depth	Height	Footprint of box max width*	Lid of box max width*	Box height max height*
MDF-DU300H-PE										
with trays	2 inch	6 x SDR-424-N + 6 x SDR-524-N	3x2 + 3x2	216	139.45	559.82	231.65 / 288.80	134	137	54
side opening	2 inch	6 x SUR-424-N + 6 x SUR-524-N	3x2 + 3x2	216	139.7	569.72	233.68 / 279.65	134	137	54
with trays	3 inch	12 x SDR-334-N	3x4	144	139.45	565.4	250.69	134	137	78
side opening	3 inch	12 x SUR-334-N	3x4	144	139.7	569.72	244.85	136	137	78
MDF-C8V1-PE										
side openings	2 inch	6 x SCR-072-N	3x2	42	139.7	144	397	136	142	54
side openings	3 inch	6 x NIR-305C	3x2	30	142	141	403	133	133	75

* Unit: mm

HCS-296

NIR-224U

SDR-624-N

SDR-434-N

HCS-32-5584/143

SUR-524-N

SDR-334-N

Optional accessories

OPTIONS				
VIP ECO ULT Freezers				
Model number		**MDF-DU502VH-PE / MDF-DU502VHW-PE**	**MDF-DU702VH-PE / MDF-DU702VHW-PE**	**MDF-DU901VHL-PE**
Liquid CO_2 back-up		MDF-UB7-PW		
Liquid N_2 back-up		-		
Temperature recorders				
- Circular type		MTR-G85C-PE		
- Chart paper		RP-G85-PW [8]		
- Ink pen		PG-R-PW		
- Continuous strip type		MTR-85H-PW		
- Chart paper		RP-85-PW [8]		
- Ink pen		DF-38FP-PW		
- Recorder housing		MDF-S3085-PW		
Drawers	qty	-	-	-
Small inner door kit	set of 2	-	-	MDF-9ID-PW (max 2)
	set of 5	MDF-5ID5-PW	MDF-7ID5-PW	-
	set of 4	MDF-5ID4-PW	MDF-7ID4-PW	-

TwinGuard ULT Freezers						
Model number		**MDF-DU302VX-PE**	**MDF-DU502VX-PE**	**MDF-DU702VX-PE**	**MDF-DC500VX-PE**	**MDF-DC700VX-PE**
Liquid CO_2 back-up		MDF-UB7-PW			MDF-UB7-PW	
Liquid N_2 back-up		-			-	
Temperature recorders						
- Circular type		MTR-G85C-PE			MTR-G85C-PE	
- Chart paper		RP-G85-PW			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			RP-85-PW	
- Ink pen		PG-R-PW			DF-38FP-PW	
- Recorder housing		MDF-S3085-PW			MDF-S3085-PW	
Drawers	qty					
Small inner door kit	set of 2					
	set of 5	-	MDF-5ID5-PW	MDF-7ID5-PW	-	
	set of 4	-	MDF-5ID4-PW	MDF-7ID4-PW	-	

VIP ULT Freezers				
Model number		**MDF-DU300H-PE**		**MDF-C8V1-PE**
Liquid CO_2 back-up		CVK-UB2-PW		CVK-UB4-PW
Liquid N_2 back-up		-		CVK-UBN2-PW
Temperature recorders				
- Circular type		MTR-G85C-PE		MTR-G85C-PE
- Chart paper		RP-G85-PW		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		RP-85-PW
- Ink pen		DF-38FP-PW		DF-38FP-PW
- Recorder housing		MDF-S3085-PW		MDF-S3085-PW
Drawers	qty	MDF30RPW (max)2		-
Small inner door kit	set of 2	-		-
	set of 5	-		-
	set of 4	-		-

Models: MDF series

SMALL INNER DOOR KITS

MDF-DU702VX-PE series / MDF-DU702VH-PE series

MDF-7ID4-PW

MDF-7ID5-PW

MDF-DU502VX-PE series / MDF-DU502VH-PE series

MDF-5ID4-PW

MDF-5ID5-PW

MDF-DU901VHL-PE

MDF-9ID-PW

max 2 sets of 2 doors

4 or 5 inner doors make 1 set. MDF-5ID5 and 7ID5 include an additional shelf.

* Installation of the kit may effect usable storage capacity.

LIQUID CO_2 BACK UP KIT

MDF-DU300H-PE

CVK-UB2-PW

MDF-C8V1-PE with Liquid CO_2 back-up

CVK-UB4-PW

VIP ECO and Twinguard series with Liquid CO_2 back-up

MDF-UB7-PW

MTR-UB5-PW

MTR-UB7-PW

TEMPERATURE RECORDERS

2-month Strip Chart Recorders
Recording range:
-100°C to +50°C

MTR-85H-PW

1-day/7-day/32-day Circular Chart Recorders
Recording range:
-100°C to +40°C

MTR-G85C-PE

Step into the world of **Cryopreservation**

Cryopreservation refers to the storage of a living organism, cell or tissue at ultra-low temperatures such that it can be restored to the same viable state as before it was frozen. Storage for an indefinite amount of time requires samples to be maintained below the glass transition temperature of aqueous solutions, approximately -130°C, the temperature at which frozen water no longer sublimes and recrystallizes. Therefore -150°C mechanical freezers or liquid nitrogen storage tanks are required for long-term preservation.

When you need long-term preservation at -150°C, put your trust in PHC Cryogenic freezers.

- 230V / 50Hz connection supply for flexible use in the laboratory, without additional installations
- Low heat emission. Allows multiple devices to be placed in one room
- Cool-Safe compressors increase the reliability of long-term preservation
- High performance cooling with low noise level designed by PHCbi
- ALARM AND SAFETY FUNCTIONS
- Remote alarm contact (NO / NC)
- Multiple access ports allow independent probescan be introduced
- Emergency cooling with liquid N_2 already standard on some models

CONTROL PANEL WITH GRAPHIC LCD DISPLAY

All alarm functions, self-diagnostic notifications and a graphical display of temperature performance over time are available in the specially designed LCD control panel. The blue display provides a clear view of the temperature and gives a notification in the case of abnormalities in temperature, ambient temperature, power supply etc.

APPLICATION SPECIFIC COMPRESSORS

The MDF-C2156VAN-PE is equipped with compressors that are specifically designed for ultra-low temperature applications. These compressors achieve a 10% reduction in energy consumption and the aerodynamically designed and placed components in the refrigeration compartment provide superior airflow, significantly reducing the stress to the freezer and contributing to excellent durability.

CRYOGENIC FREEZERS PROMOTE SAMPLE STABILITY

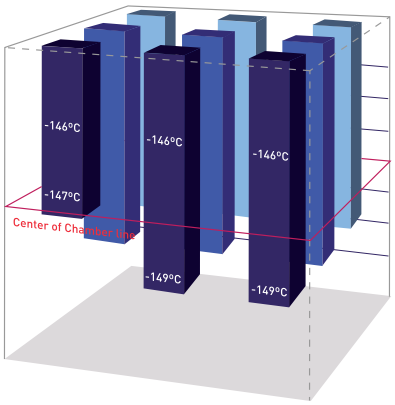
A uniformity of +/-5°C in PHCbi mechanically refrigerated cryogenic freezers is far superior to the top-to-bottom temperature uniformity provided by liquid nitrogen vapour phase storage, without the concern of cross-contamination often associated with liquid nitrogen (liquid phase storage).

VIP PLUS INSULATION

Cryogenic Freezers with VIP PLUS vacuum insulation provide up to 30% more storage capacity than a conventionally insulated freezer, without increasing the footprint. A glass fibre core provides advanced thermal properties. This results in a large capacity -150°C freezer for storage of up to 150 2" boxes with a minimal footprint.

MDF-C2156VAN-PE

mechanically refrigerated **Cryo**genic Freezer



Comparison of temperature distribution in a liquid nitrogen freezer (vapour phase) and the MDF-C2156VAN-PE mechanically refrigerated cryogenic freezer. The graph shows temperatures at different locations within the chamber. This data demonstrates that 100% of the MDF-C2156VAN-PE storage space maintains uniform storage temperatures safely below -130°C, while temperature in the LN_2 vapour system is dependent on storage location.

HYBRID WATERCOOLING OPTION

When a high-quality ultra low temperature or cryogenic freezer is equipped with a Hybrid water cooling option, the unit can handle a chilled water circuit to extract the generated heat from the condenser or use the traditional air-cooled method with a fan motor. With this new setup, the freezer can switch from water cooled to air cooled in case of water system failure. A Hybrid water cooled freezer will contribute to a significant reduction in power consumption and will also reduce the amount of heat dissipated into the air.

Compared to an air cooled freezer a Hybrid water cooled freezer will also have an improved temperature stability.

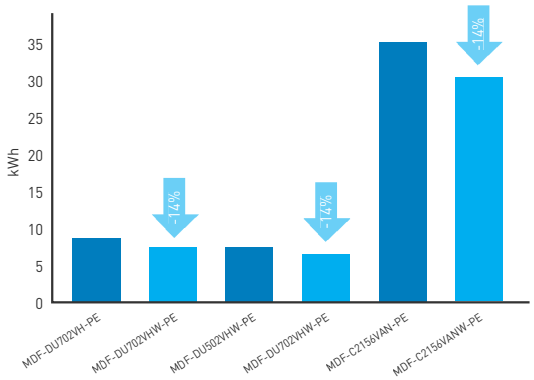
The CE-certified optional PHCbi HYBRID water cooling enables further energy savings compared to the air-cooled PHCbi models, but also flexible air- or water-cooled use and in particular uninterrupted operation, e.g. in the event of failure or clogging of the on-site water ring infrastructure.

HYBRID TECHNOLOGY

HYBRID

PHCbi's Hybrid water cooled technology on VIP ultra low temperature and cryogenic freezers improves the compressor efficiency. The power consumption of a Hybrid ULT can be reduced by typically 10~12% compared to the equivalent air-cooled model.

Energy saving



MDF-1156-PE / MDF 1156ATN-PE
128L / 81 2" Boxes

MDF-C2156VAN-PE / MDF-C2156VANW-PE
231L / 150 2" Boxes

Cryogenic Freezers					
Model Number		**MDF-1156-PE**	**MDF-1156ATN-PE**	**MDF-C2156VAN-PE**	**MDF-C2156VANW-PE**
Temperature control range	°C	-150		-150	
External dimensions (WxDxH)	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	272	318	318

* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases.

CBS Isothermal Freezers: **No liquid nitrogen contact**

Liquid nitrogen is, like all liquids, a possible transporter of contaminants. Contamination between samples, leakage of liquid nitrogen into sample vials during storage and contact of liquid nitrogen with skin are just some of the risks that can be eliminated with an Isothermal liquid nitrogen dry storage freezer.

The innovative design of CBS Isothermal freezers eliminates a number of major risks of traditional LN_2 storage, including:

- **Cross contamination:** Studies have shown that viral, bacterial and fungal pathogens can survive after suspension in liquid nitrogen. Infected samples can cross contaminate other samples in the same liquid nitrogen tank.
- **Loss of samples:** Storage directly in liquid nitrogen can make vials shrink. This may cause liquid nitrogen to seep into the vials, which on rewarming, expand and subsequently explode as nitrogen vapourizes inside the vials.
- **Health and safety:** Traditional storage in liquid nitrogen exposes users to direct contact with LN_2 which can lead to cold skin burns.

AUTOMATIC OPERATION

Isothermal freezers feature the series 2301 auto-fill and monitor system, which controls the automatic filling of the liquid nitrogen jacket and provides the user with an easy to read overview of the freezer temperature and status.

SAMPLE SECURITY

A comprehensive alarm system with remote alarm contact constantly monitors all aspects of the freezer's operation. Samples are also protected by lid and control panel locks. The freezer can be monitored by a central building management or monitoring system.

SAMPLE STORAGE

A wide selection of inventory systems for vials and bags are available to complete the system and optimize sample storage.

MEDICAL DEVICE DIRECTIVE

The **CBS Cryopreservation Storage System** is the product family that covers the Standard, Isothermal and Carousel Series. The CBS Cryopreservation Storage Sytems are certified under the EU Medical Device Directive 93/42/EEC.

STRAW STORAGE INVENTORY SYSTEM FOR THE CBS V-1500AB AND V-3000AB

Designed for the CBS V-1500AB and V-3000AB Isothermal freezers, this patent-pending inventory system provides an efficient solution for storing and working with straws, free from liquid nitrogen contact.

Rotating carousels provide access to lower storage levels and maximise storage space.

The upper level provides a convenient workspace where canisters can be parked (shown in green) and samples inspected at -190°C.

Use the retrieval tool to place and retrieve canisters quickly and easily.

V-1500AB
30L

V-3000ABEH
89L

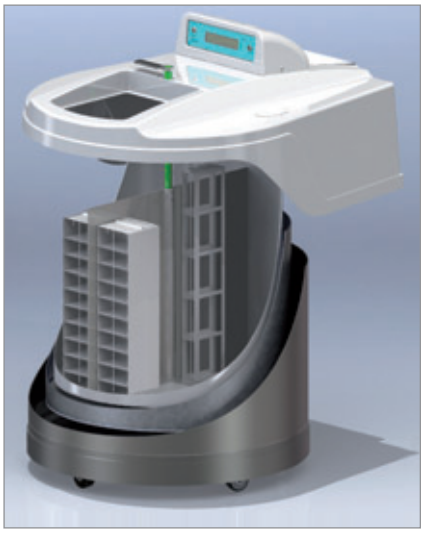
V-5000ABEH
140L

Isothermal -190ºC 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)**	qty	9100	22100	25500	40300	46500
Max. blood bag capacity (50ml)**	qty	434	1120	1280	1936	2208

** Capacity is subject to rack type

V-3000AB/C
70L

V-5000AB/C
93L



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)**	qty	16800	21000	36400	42000
Max. blood bag capacity (50ml)**	qty	852	1136	1722	1968

** Capacity is subject to rack type

S-1500AB
345L

S-3000AB
345L

S-5000AB / S-5000ABEH
615L / 720L

Standard LN_2 Freezers					
Model Number		**S-1500AB**	**S-3000AB**	**S-5000AB**	**S-5000ABEH**
Liquid nitrogen capacity	litres	145	345	615	720
Dimensions					
External dimensions (W x D x H)	mm	558 x 787 x 1041	863 x 1092 x 1066	1117 x 1320 x 1219	1117 x 1320 x 1397
Usable interior height	mm	736	736	736	863
Usable interior diameter	mm	508	787	1016	1016
Weight empty	kg	70	159	227	245
Weight full	kg	188	438	724	827
Maximum capacity					
Max. vial capacity (2ml)**	qty	9100	22100	40300	46500
Max. blood bag capacity (50ml)**	qty	434	1120	1932	2208

Rack configurations

Organizing the space in your freezer can help you to make your work more efficient. Good sample management can result in both cost and time savings. By choosing the right racks, not only will efficiency be increased, but the risk of sample degradation due to exposure to ambient temperatures will be significantly reduced. This is a fact, whether you store stem cells, cord blood, bone marrow or any other type of cell or tissue sample.

Whether your storage unit a chest freezer or even a liquid Nitrogen freezer, an organized freezer will provide you with:

- Time efficiency because you can locate, retrieve and replace your samples easily and quickly.
- Cost efficiency because organized samples and cell lines might reduce the number of freezers.
- Safety because your samples are better protected.

2101 Controlled rate freezer

The 2101 controlled rate freezer meets the highest standards for the programmed freezing of biological samples. Computer controlled temperatures ensure your samples are frozen at precisely the same rate during each run. Freeze protocols can be controlled by either the chamber or the sample temperature. The freezing rate can be programmed at the optimum rate for each individual sample.

The 2101 controlled rate freezer comes equipped with a dedicated laptop and 2100 programming software as standard to provide the highest levels of flexibility and user convenience.

Benefits include:

- Unlimited programming capability.
- Multi-colour graph for sample, chamber and program temperature.
- Sample or chamber temperature set-point control.
- Continuous control status indication.
- Programs and freeze data saved to hard drive or disc.
- Password protected software.
- Selectable password levels.
- Searchable database for freeze run history.
- Freeze run graphs and data available via any standard computer printer.
- 30 data field available for each freeze run.
- Continuous digital and graphical display of time and temperature during operation.
- Audible and visual indicators for:
  - End of each freeze run.
  - Temperature probes.
  - Freeze run tracking.
- On screen help.

Standard system Includes:

- Laptop computer with 2100 software.
- Freezing chamber.
- Choice of sample rack.
- 1.2 m LN_2 transfer hose.

Options:

- Choice of sample racks for vials, tubes, straws, bags & canes.
- Temperature probes for different sample types.
- Roller cart.

2101 Controlled rate freezer
28L

2101 Controlled Rate Freezer					
Dimensions			**Control**		
External Dimensions (W x D x H)	mm	484 x 648 x 770	Controller		Laptop controller (included)
Internal Dimensions (W x D x H)	mm	356 x 243 x 349	Operating System		Windows based
Volume	litres	28	Temperature sensor		type T thermocouple (2 as standard, up to 8 with multi-probe)
Net Weight	kg	34,7			
Capacity	1.2-2ml vials	650	**Construction**		
	4-5ml vials	390	Exterior Material		Powder coated stainless steel
	bag canisters	10 - 20	Interior Material		Stainless steel
	canes	130	Max. load - total	kg	20
Performance			**Electrical and Noise Level**		
Programmable Temperature Range	°C	+50 to -180	Power Supply	V	230
Programmable Cooling Rate Range	°C / min	0.01 to 99.9	Frequency	Hz	50
			Noise Level	dB [A]	<66

Inventory racks for your Cryopreservation application

ULT FREEZER INVENTORY RACKS

Models: MDF-1156(ATN)-PE | MDF-C2156VAN-PE | MDF-C2156VANW-PE

ALUMINIUM RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Aluminium	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Footprint of box	Lid of box	Box height
					Width	Depth	Height	max width*	max width*	max height*
MDF-1156(ATN)-PE										
side opening	2 inch	9 x NIR-209C	3x3	81	142	141	516	133	133	53
side opening	3 inch	9 x NIR-306C	3x3	54	142	141	516	133	133	75
MDF-C2156VAN-PE / MDF-C2156VANW-PE										
opening	2 inch	15 x NIR-210C	5x3	150	142	141	590	133	133	53
side opening	3 inch	15 x NIR-307C	5x3	105	142	141	590	133	133	78

STAINLESS STEEL RACK SOLUTIONS

Vertical rack type	Box type	Rack/quantity Stainless steel	Freezer layout (Columns x Rows)	Total boxes	Rack dimensions*			Footprint of box	Lid of box	Box height
					Width	Depth	Height	max width*	max width*	max height*
MDF-1156(ATN)-PE										
side opening	2 inch	9 x SCR-102-N	3x3	90	139.7	144	564.13	136	142	54
side opening	3 inch	9 x SCR-063-N	3x3	54	139.7	144	494.28	136	142	75
MDF-C2156VAN-PE / MDF-C2156VANW-PE										
side opening	2 inch	15 x SCR-102-N	5x3	150	139.7	144	564.13	136	142	54
side opening	3 inch	15 x SCR-073-N	5x3	105	139.7	144	575.31	136	142	75

* Unit: mm

Standard square rack configuration V-1500AB

CRYOGENIC INVENTORY RACKS

Models: CBS

STANDARD SQUARE RACKS

Model number	Rack type	Description	Rack/quantity
V-1500AB	2001A-100S	Aluminium rack system with cardboard boxes + dividers.	7 racks x 13 boxes high. Max. cap. 9.100 2ml vials.
S-1500AB	2001S-C81	Aluminium rack system with cardboard boxes + dividers.	7 racks x 13 boxes high. Max. cap. 9.100 2ml vials.
V-3000AB	3101A-100S	Aluminium rack system with cardboard boxes + dividers.	17 racks x 13 boxes high. cap. 22.100 2ml vials.
S-3000AB	3101A-100S	Aluminium rack system with cardboard boxes + dividers.	17 racks x 13 boxes high. cap. 22.100 2ml vials.
V-5000AB	3301A-100S	Aluminium rack system with cardboard boxes + dividers.	28 racks x 13 boxes high. cap. 36.400 2ml vials.
S-5000AB	3301A-100S	Aluminium rack system with cardboard boxes + dividers.	28 racks x 13 boxes high. cap. 36.400 2ml vials.
V-5000ABEH	3325A-100S	Aluminium rack system with cardboard boxes + dividers.	28 racks x 15 boxes high. cap. 42.000 2ml vials.
S-5000ABEH	3325A-100S	Aluminium rack system with cardboard boxes + dividers.	28 racks x 15 boxes high. cap. 42.000 2ml vials.

VERTICAL RACKS

Model number	Rack type	Description	Rack/quantity
V-1500AB	RC-V1500-1209-VLR	Stainless steel rack system with cardboard boxes + dividers.	20 racks x 5 boxes high. cap. 10.000 2ml vials.
S-1500AB	RC-S1500-1209-VLR	Stainless steel rack system with cardboard boxes + dividers.	20 racks x 5 boxes high. cap. 10.000 2ml vials
V-3000AB	RC-V3000-1209-VLR	Stainless steel rack system with cardboard boxes + dividers.	48 racks x 5 boxes high. cap. 24.000 2ml vials.
S-3000AB	RC-S3000-1209-VLR	Stainless steel rack system with cardboard boxes + dividers.	48 racks x 5 boxes high. cap. 24.000 2ml vials.
V-5000AB	RC-V5000-1209-VLR	Stainless steel rack system with cardboard boxes + dividers.	80 racks x 5 boxes high. cap. 40.000 2ml vials.
S-5000AB	RC-S5000-1209-VLR	Stainless steel rack system with cardboard boxes + dividers.	80 racks x 5 boxes high. cap. 40.000 2ml vials
V-5000ABEH	RC-V5000EH-1208-VLR	Stainless steel rack system with cardboard boxes + dividers.	80 racks x 6 boxes high. cap. 48.000 2ml vials.
S-5000ABEH	RC-S5000EH-1208-VLR	Stainless steel rack system with cardboard boxes + dividers.	80 racks x 6 boxes high. cap. 48.000 2ml vials

Optional accessories

OPTIONS		
Cryogenic Freezers		
Model Number	**MDF-1156-PE / 1156ATN-PE**	**MDF-C2156VAN-PE / MDF-C2156VANW-PE**
Liquid CO_2 back-up	CVK-AT2-PW	-
Liquid N_2 back-up	CVK-ATN2-PW	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

Isothermals, LN_2 freezers & cryosystems			
Cryo-Gloves	Made from state-of-the art fabrics, tempshield Cryo-gloves® use a flexible, multi-layered insulated construction that provides maximum thermal protection, yet offers comfort, flexibility, and dexterity so you can perform tasks effectively and safely.	LN_2 Level stick	• 1/2 Centimeter and 1/4 inch increments. • Can withstand temperatures up to -190°C. • Measures up to 36"(92cm).
"T" Valve	Solid brass cryogenic shut-off valve (rated for temperatures from -196° C to 74° C). • 2 Male 1/2" NPT brass fittings. • 1 Female 1/2" NPT stainless steel Flared fitting.	LN_2 Transfer hose	• Flexible stainless steel construction. • 1/2" NPT flared fitting on both ends. (3/8" I.D.) • 4', 6' lengths are available (custom lengths are available upon request).
"Y" Valve	• 2 Male 1/2" NPT brass fittings. • 1 Female 1/2" NPT stainless steel flared fitting. • Overall length approximately 6".	Cardboard sleeves	• 5 and 6 place sleeves for standard 2ml cane. • Cardboard construction.
LN_2 Phase separator	Designed to minimize hazardous splashing and vapourization, phase separators are available to use when transferring liquids into various open containers.	Canes	• 2ml cane. • 5 and 6 place vial canes. • Lightweight aluminum construction. • Overall length approximately 11.5" (6 place cane).
		Hose covers	• Water resistant fabric 4', 6' lengths are available.

CRYOKIT glove 400

CRYOKIT GLOVE is a fully waterproof glove to protect the hand and the arm in operations that involve the use of Liquid Nitrogen (or other cryogenic liquids and gases). Made with specially designed composite materials for this application, it keeps the hands warm and dry even for long periods of use. The CRYOKIT GLOVES are proven effective to protect the hands and arms, by contact with Liquid Nitrogen (-195.82 °C) for one minute and maintain their flexibility (RCT Test method). The multilayered construction allows a high level of thermal protection, flexibility and dexterity at -200 °C.

Indicated for all work in the presence of Liquid Nitrogen or other liquids and gases, to prevent contact of cold and burns in the event of leakage of the cryogenic liquid.

The glove is made entirely with specially coupled composite materials. On the inside there is a integral membrane which allows perspiration but does not allow liquids to penetrate inside.

The cold protection is ensured by an inner lining made of soft fleece, which also coupled with polyester.

BIOMEDICAL FREEZERS

PHCbi's Biomedical freezers are not only suited for effective storage of life-saving vaccines and samples for diagnosis, but are also perfectly suited for temperature tests and aging. The natural refrigerants in the Biomedical ECO freezers and low power consumption contribute to the corporate social responsiblity policy for every company.

The Biomedical freezers are suited to the medical and biotechnology field. They can be used for storage of fresh and frozen blood supplies and vaccines, but also for storage of enzymes for research. The Biomedical freezers are available in different capacities, ranging from 138 litres to 690 litres. The Biomedical freezers are available as an upright freezer or chest freezer. If you are looking for precisely controlled storage as low as -30°/-40°C, trust the Biomedical freezers series. All the freezers have great safety features and are reliable.

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.

Natural Refrigerants
Naturally occurring hydrocarbon (HC) refrigerants improve performance and reduce running costs.

Inverter Compressors
Inverter Compressors maximise cooling performance and reduce energy consumption.

OLED alphanumeric Keypad
An OLED alphanumeric Keypad allows convenient but secure user control and display internal conditions.

HIGH PERFORMANCE FREEZERS WITH OPTIMAL TEMPERATURE UNIFORMITY

The Biomedical Freezers are designed for long or intermediate-term storage at temperatures as low as -40°C. 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.

VERSATILE ALARM FUNCTIONS

Alarms for high/low temperatures and an error code display with self diagnostic functions inform users of any abnormalities such as power failures, allowing prompt actions to be taken to avoid damaging valuable samples

Inverter technology

ENERGY & COST EFFICIENCY

An inverter compressor can operate at different speeds depending on the ambient and load conditions. At times when the freezer only needs a minimal amount of cooling due to lower ambient temperatures, such as overnight, the compressor will move at a slower speed, using much less energy.
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.

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.

MDF-MU339HL-PE
369L / 150 2" Boxes

MDF-MU539HL-PE
504L / 224 2" Boxes

MDF-U731M-PE
690L / 384 2" Boxes

		Biomedical -30°C Freezers		
Model Number		**MDF-MU339HL-PE***	**MDF-MU539HL-PE***	**MDF-U731M-PE**
Temperature control range	°C	-20°C to-30°C	-20°C to-30°C	-20°C to-30°C
External dimensions (WxDxH)	mm	616 x 770 x 1802	793 x 770 x 1802	770 x 830 x 1955
Internal dimensions (WxDxH)	mm	472 x 614 x 1262	649 x 614 x 1262	650 x 700 x 1520
Volume	litres	369	504	690
Capacity	2" boxes	150	224	384

* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases in hermetically sealed equipment.

MDF-137-PE
138L

MDF-237-PE
221L

MDF-437-PE
426L

Biomedical -30°C Freezers				
Model Number		**MDF-137-PE**	**MDF-237-PE**	**MDF-437-PE**
Temperature control range	°C	-20°C to-30°C	-20°C to-30°C	-20°C to-30°C
External dimensions (WxDxH)	mm	640 x 687 x 881	905 x 687 x 881	1265 x 807 x 905
Internal dimensions (WxDxH)	mm	525 x 440 x 715	790 x 440 x 715	1140 x 550 x 735
Volume	litres	138	221	426

Biomedical -40°C Plasma Freezers

COST-SAVING AND ENVIRONMENTALLY FRIENDLY FRESH FROZEN PLASMA STORAGE

The MDF-MU549DH-PE Biomedical ECO Plasma Freezer, with two independent chambers for sample storage at selectable temperatures, provides an ideal freezing environment for the preservation of blood plasma, vaccines, test samples, and other biological specimens.

The Biomedical ECO Freezer MDF-MU549DH-PE with natural refrigerants minimise energy consumption, reduce environmental impact and save money while providing superior stability and uniformity. A comprehensive alarm system ensure this freezer provides unsurpassed reliability and sample security.

MDF-MU549DH-PE
479L

MDF-U443-PE
426L

Biomedical -40°C Plasma Freezers			
Model Number		**MDF-MU549DH-PE**	**MDF-U443-PE**
Temperature control range	°C	-40°C	-40°C
External dimensions (WxDxH)	mm	793 x 770 x 1802	800 x 832 x 1810
Internal dimensions (WxDxH)	mm	649 x 614 x 600	640 x 615 x 1090
Volume	litres	479	426

* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases in hermetically sealed equipment.

MDD medical device directive

The MDF-MU549DH-PE and MDF-U443-PE are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC).

Applicable countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Spain, Switzerland and the United Kingdom only

For laboratory use
Applicable countries: EEA countries, Switzerland and Turkey

Optional accessories

OPTIONS

Biomedical -30°C Freezers			
Model Number	**MDF-MU339HL-PE**	**MDF-MU539HL-PE**	**MDF-U731M-PE**
Temperature recorders			
- Circular type	MTR-G85C-PE	MTR-G85C-PE	MTR-G85C-PE
- Chart paper	RP-G85-PW	RP-G85-PW	RP-G85-PW
- Ink pen	PG-R-PW	PG-R-PW	PG-R-PW
- Recorder housing	MPR-S7-PW	MPR-S7-PW	MPR-S7-PW
- Continuous strip type	MTR-4015LH-PE	MTR-4015LH-PE	MTR-4015LH-PE
- Chart paper	RP-40-PW	RP-40-PW	-
- Ink pen	-	-	-
- Recorder housing	MPR-S30-PW	MPR-S30-PW	MPR-S30-PW
Storage container	MDF-03SC-PW (2 pcs/set, 3 sets/freezer) MDF-05SC-PW (2 pcs/set, 6 sets/freezer	MDF-03SC-PW (2 pcs/set, 3 sets/freezer) MDF-05SC-PW (2 pcs/set, 6 sets/freezer	MDF-T07SC-SW
(Inner dimension) mm	W420 x D552 x H157 W280 x D552 x H157	W420 x D552 x H157 W280 x D552 x H157	
Shelves			MDF-T07ST-SW

Model Number	**MDF-137-PE**	**MDF-237-PE**	**MDF-437-PE**
Temperature recorders			
- Circular type	MTR-G85	MTR-G85	MTR-G85
- Chart paper	-	-	-
- Ink pen	-	-	-
- Recorder housing	MDF-S740	MDF-S740	MDF-S740
- Continuous strip type	MTR-4015LH-PE	MTR-4015LH-PE	MTR-4015LH-PE
- Chart paper	-	-	-
- Ink pen	-	-	-
- Recorder housing	MDF-S3040	MDF-S3040	MDF-S3040
Storage system	MDF-13B2	MDF-13B2	MDF-13B2

Biomedical -40°C *Plasma* Freezers		
Model Number	**MDF-MU549DH-PE**	**MDF-U731M-PE**
Temperature recorders		
- Circular type	MTR-G85C-PE	MTR-G85C-PE
- Chart paper	RP-G85-PW	RP-G85-PW
- Ink pen	PG-R-PW	DF-38FP-PW
- Recorder housing	MDF-S740T-PW (for top side) MPR-S7-PW (for lower front)	MPR-S30-PW
- Continuous strip type	MTR-4015LH-PE	MTR-4015LH-PE
- Chart paper	RP-40-PW	-
- Ink pen	-	-
- Recorder housing	MPR-S30-PW (for lower front)	-
Storage container	MDF-05SC-PW (2 pcs/set) 6 sets/Freezer	
(Inner dimension) mm	W280 x D552 x H157	

MTR-G85C-PE

MTR-155H-PW

MTR-85H-PW

MTR-4015LH-PE

MPR PHARMACEUTICAL REFRIGERATORS

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.

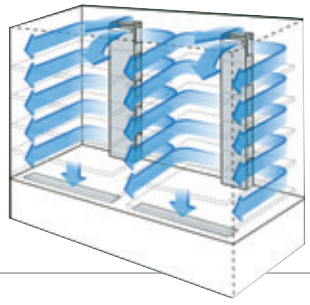
The MPR Pharmaceutical Refrigerators are not only complete and integrated solutions for pharmaceuticals, medicines and temperature sensitive biologicals, but also suitable for the stable and reliable laboratory requirements. The refrigerators provide an ideal temperature environment for clinical, pharmaceutical and industrial research.

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.

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.



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.

ADVANCED MONITORING AND SAFETY FEATURES

Minimise the risks to important biological samples and experiments with added sample security. Comprehensive set point, alarm monitoring, and diagnostic functions are supervised by the microprocessor controller with digital display of all input/output functions. Visual and audible signals alert users to any abnormal conditions enabling them to take prompt action, while a potential remote alarm contact ensures added peace of mind even during non-working hours.

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.

OLED CONTROL PANEL

The OLED panel has good visibility and intuitive operation. It displays detailed temperatures with increment of 0.1°C, alarm conditions and minimal and maximal temperature for every 12/24 hours. The USB port and data log functions simplifies temperature data management.

LED INTERIOR LIGHT

The LED interior light automatically turns on/off in combination with the door opening/closing. It can also be controlled from the control panel.

MPR-S150H-PE
165L

MPR-S300H-PE
345L

MPR Pharmaceutical Refrigerators Sliding door type			
Model Number		**MPR-S150H-PE**	**MPR-S300H-PE**
Temperature control range	°C	+2°C to +14°C	
External dimensions (WxDxH)	mm	800 x 500 x 1120	800 x 500 x 1820
Internal dimensions (WxDxH)	mm	720 x 360 x 725	720 x 360 x 1435
Volume	litres	165	345
Type		Wire shelves type	Wire shelves type

* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases in hermetically sealed equipment.

MPR-S500H-PE
554L

MPR-S500RH-PE
550L

MPR-1014-PE
1033L

MPR-1014R-PE
1029L

MPR Pharmaceutical Refrigerators Sliding door type					
Model Number		**MPR-S500H-PE**	**MPR-S500RH-PE**	**MPR-1014-PE**	**MPR-1014R-PE**
Temperature control range	°C	+2°C to +14°C		+2°C to +14°C	
External dimensions (WxDxH)	mm	900 x 650 x 1824		1800 x 600 x 1790	
Internal dimensions (WxDxH)	mm	800 x 510 x 1425		1700 x 465 x 1300	
Volume	litres	554	550	1033	1029
Type		Wire shelves type	Drawer type	Wire shelves type	Drawer type

MPR-722-PE
684L

MPR-722R-PE
671L

MPR-1412-PE
1364L

MPR-1412R-PE
1359L

MPR Pharmaceutical Refrigerators					
Model Number		**MPR-722-PE**	**MPR-722R-PE**	**MPR-1412-PE**	**MPR-1412R-PE**
Temperature control range	°C	+2 to +23 °C		+2 to +23 °C	
External dimensions (WxDxH)	mm	770 x 920 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
Type		Wire shelves type	Drawer type	Wire shelves type	Drawer type
Number of shelves/drawers		4 wired shelves	5 coated steel drawers	8 wired shelves	10 coated steel drawers

MPR-N250FH-PE
179/80L (Ref/Frz)

MPR-N450FH-PE/MPR-N450FHD-PE[1)]
326/136L (Ref/Frz)

MPR-715F-PE
415/176L (Ref/Frz)

		Pharmaceutical Refrigerators with Freezer			
Model Number		**MPR-N250FH-PE**	**MPR-N450FH-PE**	**MPR-N450FHD-PE**[1)]	**MPR-715F-PE**
Temperature control range	°C	+2 to +14 (Ref), -35 to -15 (Frz)*		+5 (Ref), -35 to -15 (Frz)*	+2 to +14 (Ref), -35 to -15 (Frz)*
External dimensions (WxDxH)	mm	510 x 640 x 1810	800 x 640 x 1810	800 x 640 x 1810	900 x 715 x 1910
Internal dimensions (WxDxH)	mm	430 x 516 x 903 (Ref) 390 x 501 x 413 (Frz)	720 x 516 x 913 (Ref) 680 x 470 x 415 (Frz)	720 x 516 x 913 (Ref) 680 x 470 x 415 (Frz)	810 x 615 x 1894 (Ref) 770 x 552 x 422 (Frz)
Volume	litres	179/80 (Ref/Frz)	326/136 (Ref/Frz)	326/136 (Ref/Frz)	415/176 (Ref/Frz)

* Complies with Art. 11, Annex III of F-Gas Regulation (EU) No 517/2014. Contains fluorinated greenhouse gases in hermetically sealed equipment.
1) The MPR-N450FHD-PE is specifically designed for high performance sample storage. The refrigerator compartment is suitable for drug storage in accordance with the DIN 58345 standard.

Natural Refrigerants

Naturally occurring hydrocarbon (HC) refrigerants MPR-N450FH-PE and MPR-N450FHD-PE improve performance and reduce running costs.

Inverter Compressors

The intelligent control of the inverter compressor MPR-N450FH-PE and MPR-N450FHD-PE optimizes running speed. This reduces the power consumption and keeps freezer temperatures stable.

Optional accessories

OPTIONS

MPR Pharmaceutical Refrigerators **Sliding door type**			
Model Number	**MPR-S163-PE / MPR-S313-PE**	**MPR-S500H-PE/MPR-S500RH-PE**	**MPR-1014-PE / MPR-1014R-PE**
Temperature recorders			
Temperature chart recorder	MTR-0621LH-PE	MTR-0621LH-PE	MTR-0621LH-PE
- chart paper	RP-06-PW	RP-06-PW	RP-06-PW
- recorder housing	MPR-S30-PW	MPR-S30-PW	MPR-S30-PW
Circular type	MTR-G04C-PE	MTR-G04C-PE	MTR-G04C-PE
- chart paper	RP-G04-PW	RP-G04-PW	RP-G04-PW
- Ink pen	PG-R-PW	PG-R-PW	PG-R-PW
- recorder housing	MPR-S7-PW	MPR-S7-PW	MPR-S7-PW
External mounting power failure alarm	MPR-48B1-PW (V-B-R)	MPR-48B-PW (V-B)	MPR-48B-PW (V-B)

MPR Pharmaceutical Refrigerators		
Model Number	**MPR-722-PE / MPR-722R-PE**	**MPR-1412-PE / MPR-1412R-PE**
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)	MPR-48B-PW (V-B)

Pharmaceutical Refrigerators with Freezer			
Model Number	**MPR-N250FH-PE**	**MPR-N450FH-PE / MPR-N450FHD-PE**	**MPR-715F-PE**
Temperature recorders			
Temperature chart recorder	MTR-0621LH-PE (Ref)	MTR-0621LH-PE	-
- chart paper	RP-06-PW	RP-06-PW	-
- recorder housing	MPR-S30-PW	MPR-S30-PW	-
Circular type	MTR-G3504C-PE (Ref/Frz)	MTR-G3504C-PE	MTR-G3504C-PE (Ref/Frz)
- chart paper	RP-G3504-PW	RP-G3504-PW	RP-06-PW (Ref) / RP-40-PW (Frz)
- Ink pen	PG-RB-PW	PG-RB-PW	PG-RB-PW
- recorder housing	MPR-S7-PW		
Continuous strip type	MTR-4015LH-PE (Frz)	MTR-4015LH-PE	MTR-0621LH-PE (Ref) / MTR-4015LH-PE (Frz)
- chart paper	RP-40-PW	RP-40-PW	
- recorder housing	MPR-S30-PW	MPR-S30-PW	MPR-S30-PW
Battery kit for power failure alarm	MPR-48B2-PW	MPR-48B2-PW[1]	
Containers inside freezer		MPR-45FSC-PW	
Door window blanking plates	MPR-25BP-PW	MPR-45BP-PW	

[1] Supplied as standard on MPR-N450FHD-PE

MBR BLOOD BANK REFRIGERATORS

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.

PHCbi designed a special compressor to provide rapid cooling and quiet performance. Every PHCbi blood bank refrigerator of has features which are great for blood product preservation, such as microprocessor control, flexible storage capacity and uniformity. With a variety of specification and sizes available PHCbi provides the right equipment to suit your needs.

Medical Device Directive

MDD medical device directive

The MBR-305GR-PE and MBR-705GR-PE are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC).

Applicable countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Spain, Switzerland and the United Kingdom only

For laboratory use
Applicable countries: EEA countries, Switzerland and Turkey

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-705GR-PE included).
- Temperature-maintained defrost, designed with thermal sensors and heaters on the evaporator.

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.

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.

TEMPERATURE VARIATIONS PREVENTED

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

- Seperated transparant 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.

When you need safe and reliable storage of whole blood , put your trust in PHCbi's MBR series.

- 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.
- ALARM AND SAFETY FUNCTIONS

MBR-305GR-PE
302L

MBR-705GR-PE
617L

MBR Blood Bank Refrigerators			
Model Number		MBR-305GR-PE	MBR-705GR-PE
Temperature control range	°C	4 °C +/-1 °C (AT 35°C)	4 °C +/-1 °C (AT 35°C)
External dimensions (WxDxH)	mm	600 x 680 x 1835	770 x 830 x 1955
Internal dimensions (WxDxH)	mm	520 x 490 x 1150	650 x 697 x 1500
Volume	litres	302	617
Capacity		120 bags (450ml)	360 bags (450ml)

Optional accessories

OPTIONS

MBR Blood Bank Refrigerators		
Model Number	MBR-305GR-PE	MBR-705GR-PE
RS485 interface module	MTR-480-PW	MTR-480-PW
Temperature chart recorder	included	included
chart paper	RP-G04-PW	RP-G04-PW
Ink pen	PG-R-PW	PG-R-PW

LPR LABORATORY REFRIGERATOR

The LPR Laboratory Refrigerator is designed for general laboratory storage with user-friendly features. The combination of temperature control accuracy, interior temperature uniformity, quick recovery and resistance to high ambient temperature delivers a quality storage refrigerator that characterizes our commitment to engineering, storage safety and reliability.

TEMPERATURE UNIFORMITY

Forced air circulation technology ensures a uniform temperature throughout the chamber and quick temperature recovery even with frequent door openings. A thermistor sensor detects and maintains temperature in the chamber at set point.

Microprocessor controller simplifies operation
The digital display shows actual temperature in the chamber and the intuitive touch pad makes operation simple.

SAMPLE SAFETY AND PROTECTION

Visual and audible alarms alert users when the temperature falls outside the safe range, so prompt action can be taken to protect precious samples. The door is equipped with a cylinder lock to restrict access.

CONDENSATION PREVENTION

Glass door heater prevents dew condensation without affecting the samples stored in the chamber. The heater can be easily operated with an ON/OFF switch located to the right of the control panel.

The control panel is located above the glass door. An access port in the back allows sensors, probes and other equipment to be connected.

The height of the shelves can be adjusted to accommodate storage items of various sizes. This flexibility allows different storage needs to be met.

The self-closing double glass door offers better visibility of stored items and provides complete isolation from the outside.

TIMER-CONTROLLED OFF CYCLE DEFROSTING

Reducing labour and time for removing frost, defrosting starts automatically when the accumulated compressor operation time reaches the threshold. During defrosting, the refrigerator will display the "dF" indication and the in-chamber temperature alternatively on the control panel.

LPR-400-PE
400L

LPR Laboratory Refrigerator		
Model Number		
External Dimensions (W x D x H)[1]	mm	610 x 716 x 1886
Internal Dimensions (W x D x H)	mm	516 x 550 x 1467
Volume	litres	400
Net Weight	kg	81
Performance		
Temperature control range	°C	+4°C to +14°C [2]
Control		
Controller		Microprocessor, non-volatile memory
Temperature display		LED
Temperature sensor		Thermistor
Refrigeration		
Cooling Method		Forced cool air circulation
Defrost method		Timer Cycle defrost
Refrigerant*		R-134A
Insulation		Rigid polyurethane foamed-in place
Construction		
Exterior Material		Painted steel
Interior Material		Vacuum molding (ABS resin)
Outer Doors	qty	1 (Plastic sash with 2-layer glass window)
Outer Door Lock		1 (Cylinder key lock)
Shelves	qty	5 (polyethylene-coated wire, W500 x D465 mm, adjustable)
Max. load - per shelf / drawer	kg	30
Access Port	qty	1
Access Port		Position Back
Access Port Diameter	Ø mm	30
Casters	qty	4 (2 levelling feet)
Accessories		
Key set		1
Alarms		(V = Visual Alarm, B = Buzzer Alarm)
High Temperature		V-B
Low Temperature		V-B
Electrical and Noise Level		
Power Supply		230 V, 50 Hz
Noise Level[3]	dB (A)	48

1) External dimensions of main cabinet only, excluding external projections - See dimensions drawings on website for full details
2) Air temperature measured at refrigeration compartment centre with no load and ambient temperature of +10°C to +35°C.
3) Nominal value - Background noise 20 dB (A)

INCUBATORS

Providing a precisely controlled environment for sensitive cell cultures and delivering long-term performance, optimal cell viability and successful experiments, each PHCbi incubator provides precise control of CO_2 concentration and temperature, while remaining easy to operate and maintain. IncuSafe CO_2 Incubators support a reliable, stable cell culture environment across all shelf positions, meaning each and every cell is safely maintained under ideal conditions.
"Outstanding quality and performance for successful cell growth, optimal results and reproducibility. Perfect fit for the strictest and most sensitive protocols."

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, PHC can help make your work as simple as possible.

inCu-saFe germicidal interior
inCu-saFe germicidal interior prevents contamination.

SafeCell UV Lamp
The SafeCell UV lamp prevents contamination.

Dual IR CO_2 Sensor
The single beam, dual detector IR CO_2 Sensor offers continuous calibration for excellent control, accuracy and stability.

Direct Heat System
This system regulates temperature through three independent heating zones under microprocessor control.

Zirconia O_2 Sensor
The unique, solid state Zirconia O_2 sensor delivers precise oxygen control.

OLED alphanumeric Keypad
An OLED alphanumeric Keypad allows convenient but secure user control and display internal conditions.

Integrated Tray Catches
Significantly minimize cleaning time and improves productivity.

A full-color LCD Touch Panel
Various functions such as logging the temperature history, and setting up passwords and alarms can all be managed on the screen.

H_2O_2 Decontamination
The unique H_2O_2 decontamination system delivers fast and validatable decontamination.

Dual Heat Sterilization
Dual heat sterilization utilises the incubator's two heaters during the 180°C sterilization process, which takes 11 hours.

Medical Device Directive
PHC 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.

ISO Certification
Equipment that meets GMP standards are ISO cleanroom classified by an independent approved testing laboratories.

The **Incu*Safe*** Advantage

Optimising cell culture outcomes and reproducibility

Combining advanced technology, unique design features and high-quality engineering, IncuSafe Incubators offer the most precise and regulated environment for cell culture. Providing outstanding performance and flexibility, this innovative range of incubators enables you to optimise results and reproducibility. The IncuSafe Advantage is delivered through three important benefits:

A PRECISE & REGULATED ENVIRONMENT

Incu*Safe* Incubators offer accurate, uniform and highly responsive control of conditions within the chamber. Temperature is regulated through three independent heating zones under microprocessor P.I.D. control. High quality sensors within the incubators ensure excellent control of CO_2 and O_2.

STERILIZATION TO MEET EVERY NEED

When additional sterilization is required to complement background decontamination within the **Incu*Safe*** Incubators, PHC offers two sterilization methods. For a fast turnaround, H_2O_2 decontamination safely cleans the chamber in less than three hours. Dual Heat Sterilization (available in the MCO-170AICD-PE CO_2 Incubator) provides an 11-hour, 180°C sterilization process. With extremely low heat dissipation during sterilization, cell culturing can continue uninterrupted in stacked **Incu*Safe*** Incubators as the procedure is carried out.

ACTIVE BACKGROUND DECONTAMINATION

Incu*Safe* Incubators are designed to actively prevent contamination during cell culture. The unique, copper-enriched stainless steel alloy interior eliminates contamination and mitigates the effect of airborne contaminates that can be introduced through normal use. An optional, isolated, UV lamp decontaminates circulating air and water in the humidifying pan, without harming cultured cells.

Medical Device Directive

MDD medical device directive

The MCO-170AIC-PE, MCO-170AICD-PE, MCO-230AIC-PE, MCO-170AC-PE, MCO-50M-PE and MCO-170M-PE are certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC).

Applicable countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Spain, Switzerland and the United Kingdom only

For laboratory use
Applicable countries: EEA countries, Switzerland and Turkey

TOUCH control panel

ADVANCED TOUCH PANEL

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

OLED control panel

OLED KEYPAD ON MCO-170AC-PE AND MCO 50 SERIES

An OLED alphanumeric keypad allows convenient but secure user control. It can display internal conditions, such as CO_2 level, temperature and alarms.Transfer of data is easy via an USB port.

ACTIVE BACKGROUND DECONTAMINATION

Incu*Safe* Incubators are designed to actively prevent contamination during cell culture. The unique, copper- enriched stainless steel alloy interior eliminates contamination and mitigates the effect of airborne contaminates that can be introduced through normal use. An optional, isolated, UV lamp decontaminates circulating air and water in the humidifying pan, without harming cultured cells.

inCu-saFe

inCu-saFe germicidal interior prevents contamination. The exclusive inCu-saFe copper-enriched stainless steel alloy interior offers the germicidal properties of copper and the durability of stainless steel. Selected to provide passive germicidal protection without rust or corrosion, inCu-saFe expresses a natural germicidal effect,inhibiting the growth of molds, fungi, mycoplasma and bacteria on its surface continuously. All interior components, including the air management plenum, humidity pan and fan assembly are easily removable without tools if required. When components are removed, all interior surfaces are exposed for conventional wipe down.

SafeCell UV Lamp

SafeCell UV Lamp The programmable ultraviolet lamp, isolated from cell cultures, eliminates contaminants in the air-flow and water-pan without affecting cell cultures. SafeCell UV inhibits the growth of mycoplasma, bacteria, molds, spores, yeasts and fungi without costly HEPA filters that accumulate contaminants in the chamber air. Interior air motion is suspended when the door is opened, minimising movement of room air contaminants into the chamber.

- Ozone-free UV lamp
- UV shielded from culture area by the tray cover of humidifying pan.

STERILIZATION TO MEET EVERY NEED

When additional sterilization is required to complement background decontamination within the IncuSafe Incubators, PHCbi offers two sterilization methods. For a fast turnaround, H_2O_2 decontamination safely cleans the chamber in less than three hours. Dual Heat Sterilization (available in the MCO-170AICD CO_2 Incubator) provides an 11-hour, 180°C sterilization process. With extremely low heat dissipation during sterilization, cell culturing can continue uninterrupted in stacked IncuSafe Incubators as the procedure is carried out.

H_2O_2 DECONTAMINATION

In 2 hours and half (approx.)

The unique H_2O_2 decontamination system delivers fast and validatable decontamination. The high-speed decontamination system uses vaporised hydrogen peroxide and UV light. It cleans the chamber of the incubator safely in less than three hours, achieving a minimal 6 log reduction of major contaminants.

MCO-170AICUVH-PE / MCO-230AICUVH-PE / MCO-170MUVH-PE
MCO-50AIC-PE (option)

DUAL HEAT STERILIZATION

Solving issues in dry heat sterilization

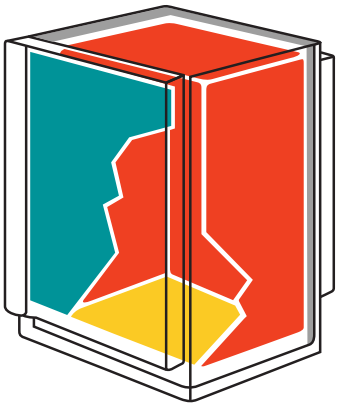
Dual heat sterilization utilises the incubator's two heaters during the 180°C sterilization process, which takes 11 hours. There is no effect on temperature inside stacked incubators due to low heat dissipation, so cell culturing can continue uninterrupted. There is no need to remove inner parts such as the CO_2 sensor and UV light, or recalibrate after sterilization, therefore, laboratory processes are more efficient with less incubator downtime.

MCO-170AICD-PE / MCO-170AICUVD-PE

TEMPERATURE CONTROL

DIRECT HEAT SYSTEM

The Direct Heat system regulates temperature through three independent heating zones under microprocessor P.I.D* control. The system anticipates the amount of energy needed to recover chamber temperature for fast recovery times.



AIR JACKET SYSTEM

Precise and uniform temperature control is ensured by the Air Jacket system. The jacket itself is surrounded by high-density foam insulation to protect against ambient temperature fluctuations, eliminating 'cold-spots' and preventingcondensation. Uniform temperatures are further ensured by gentle fan circulation within the chamber.*

MELAMINE FOAM

The MCO-170AICD-PE has melamine foam insulation, which provides high thermal insulation and excellent heat endurance. Melamine foam insulation limits heat dissipation during dry heat sterilization. This means that cell culture can continue uninterrupted in incubators stacked with those actively running sterilization.

* In MCO-170AIC,MCO-230AIC & MCO-170M series

Heat zones

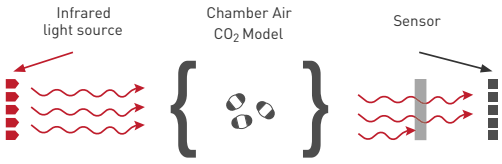
- Side, top and rear walls form the dominant radiant heat source.
- The bottom heater elevates the humidity reservoir water temperature to achieve 95% RH at 37°C.
- The outer door heater warms the inner glass door to prevent condensation on the glass and to assure interior temperature

CO_2 CONTROL

DUAL IR CO_2 SENSOR

The incubator's Dual IR sensor and P.I.D control enables ultra-fast CO_2 recovery without overshoot, even following multiple door-openings. 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.

The IR sensor measures the absorbance of light from an infrared lamp of a specific wavelength over a fixed distance. As only CO_2 absorbs light at the selected wavelength, the sensor functions independently of both temperature and humidity.



If CO_2 levels are low, a high number of IR rays pass through.

If CO_2 levels are high, a lower number of IR rays pass through.

CONDENSATION MANAGEMENT

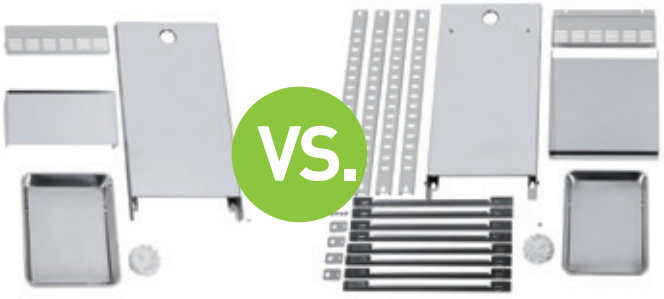
The unique condensation management "dew stick" controlled by Peltier technology condenses water vapour on its surface, which then drips into the humidifying pan, preventing unwanted condensation in the chamber and possible contamination.

INCREASE IN CLEANING AND STORAGE EFFICIENCY WITH INTEGRATED SHELF SUPPORTS

The MCO-50, MCO-170 and MCO-230 series employ an integrated tray structure without shelf supports, reducing the number of interior components by approximately 80%* and significantly saving cleaning time needed when changing cells for incubation. Save valuable time and reduce the risk of contamination with an easy to clean incubator interior featuring fully rounded corners and integrated shelf supports.

Interior components of MCO-170AIC

Traditional Incubator

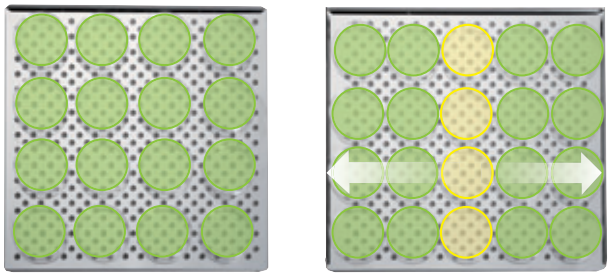


5

26

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*** incubators provide space for up to 25% more culture vessels.*



* Compared to previous 170 litre CO_2 incubators.

USB PORT

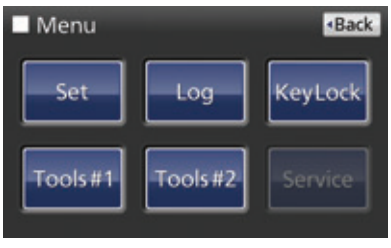
Optimise cell culture protocols and adhere to standard operating procedures by conveniently transferring data to a USB memory stick to pass on to a PC. Logged parameters include chamber temperature, CO_2 level, O_2 level, door open status and alarms.

ELECTRIC LOCK OPTION

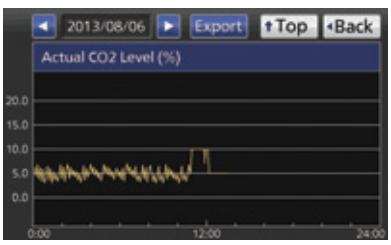
A Electric Lock option is available for the MCO-50, MCO-170 and MCO-230 series.

NEW MULTI-USER LOCK ACCESS
(MCO-230AIC & MCO-170M SERIES ONLY)

Now available with user ID function that allows registration of up to 99 user-IDs and passwords through a master user account for better control and traceability. Detailed activity logs can be exported easily as individual CSV files.



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



Graphical Display
The system allows for viewing the logs of the actual temperature, CO_2 levels and the door openings of the chamber.

ISO Class 5.0 MCO-170AICUVH-PE

MCO-170AIC-PE series
165L

MCO-170AICD-PE series
165L

ISO Class 5.0 MCO-230AICUVH-PE

MCO-230AIC-PE series
230L

IncuSafe CO_2 Incubators				
Model Number		**MCO-170AIC-PE / MCO-170AICUV-PE MCO-170AICUVH-PE**	**MCO-170AICD-PE MCO-170AICUVD-PE**	**MCO-230AIC-PE / MCO-230AICUV-PE MCO-230AICUVH-PE**
External Dimensions (W x D x H	mm	620 x 730 x 900		770 x 730 x 905
Internal Dimensions (W x D x H)	mm	490 x 523 x 665		643 x 523 x 700
Volume	litres	165		230
Net Weight	kg	80		90
Temperature Control Range	°C	AT +5 ~ +50, ±0.1		AT +5 ~ +50, ±0.1
Temperature Uniformity	°C	±0.25		±0.25
CO_2 Control Range & Fluctuation	%	0 ~ 20, ±0.15		0 ~ 20, ±0.15
Humidity Level & Fluctuation	%RH	95, ±5		95, ±5
Sterilization Method		H_2O_2 Decontamination	Dry heat sterilization, 180°C	H_2O_2 Decontamination

MCO-50AIC-PE
50L

MDD medical device directive

Medical device
The MCO-50AIC-PE is in conformity as a Class I Medical Device.
Applicable countries: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Malta, the Netherlands, Spain, Switzerland and the United Kingdom only

Research device
Applicable countries: EEA countries, Switzerland and Turkey

MCO-170AC-PE
165L

ISO Class 5.5

MCO-80IC-PE
851L

IncuSafe CO_2 Incubators				
Model Number		**MCO-50AIC-PE**	**MCO-170AC-PE**	**MCO-80IC-PE**
External Dimensions (W x D x H	mm	480 x 550 x 585	620 x 730 x 905	986 x 853 x 2040
Internal Dimensions (W x D x H)	mm	370 x 363 x 385	490 x 523 x 665	806 x 693 x 1524
Volume	litres	50	165	851
Net Weight	kg	46	74	275
Temperature Control Range	°C	AT +5 ~ +50, ±0.1 °C	AT +5 ~ +50, ±0.1 °C	AT +5 ~ +50, ±0.1
Temperature Uniformity	°C	±0.25	±0.25	±0.5
CO_2 Control Range & Fluctuation	%	0 ~ 20, ±0.15 %	0 ~ 20, ±0.15 %	0 ~ 20, ±0.15
Humidity Level & Fluctuation	%RH	95, ±5	95, ±5	Normal mode; >80 | High mode; > 90

MULTIGAS INCUBATORS

Tightly controlled physiological oxygen environment with time-saving decontamination and improved usability. **Incu*Safe*** multigas incubators optimize mammalian cell cultures through variable O_2 control to simulate in vivo conditions for regenerative medicine and stem cell applications. The MCO-170M-PE and MCO-50M-PE help to achieve more accurate results when culturing cells at physiological oxygen levels.

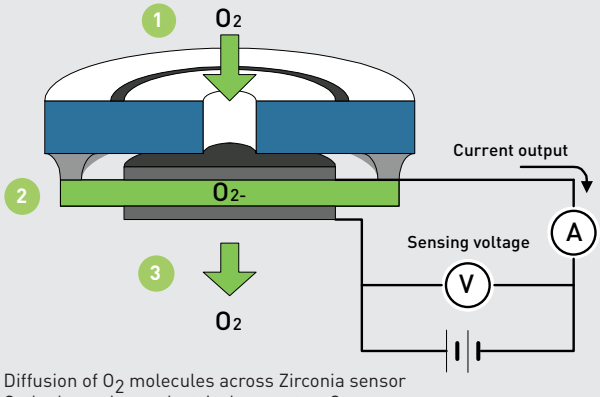
ZIRCONIA O_2 SENSOR

zirconia O_2 control

Reaching a correct level of O_2 requires a sensor capable of reading O_2 levels directly to assure accuracy and precise environmental control. The unique, solid state Zirconia O_2 sensor delivers precise oxygen control. The sensor maintains long-term high accuracy, while offering a long life-span, and no need for periodic calibration.

The more O_2 passes through the Zirconia sensor, the more electrical current is induced. This creates a signal to inject more N_2 molecules to displace O_2 molecules.

Conversion of O_2 concentration to electrical current



1. Diffusion of O_2 molecules across Zirconia sensor
2. Cathode produces electrical current as O_2 passes
3. O_2 reacts with Zirconia to produce ions

MCO-50M-PE
50L

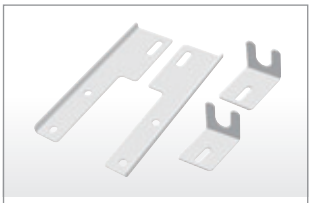
MCO-170M-PE series
165L

IncuSafe Multigas Incubators			
Model Number		**MCO-50M-PE**	**MCO-170M-PE / MCO-170MUV-PE / MCO-170MUVH-PE**
External Dimensions (W x D x H	mm	480 x 550 x 585	620 x 730 x 900
Internal Dimensions (W x D x H)	mm	370 x 363 x 385	490 x 523 x 665
Volume	litres	50	161
Net Weight	kg	46	77
Temperature Control Range	°C	AT +5 ~ +50, ±0.1 °C	AT +5 ~ +50, ±0.1
CO_2 Control Range & Fluctuation	%	0 to 20, ±0.15	0 to 20
O_2 Control Range	%	1 to 18%, 22 to 80%, ±0.2	1 to 18%, 22 to 80%
Humidity Level & Fluctuation	%RH	95, ±5	95, ±5
Sterilization Method		H_2O_2 Decontamination	H_2O_2 Decontamination

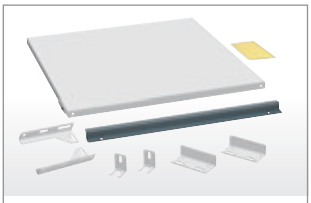
Optional accessories

- All PHCbi incubators are designed for stacking, allowing one unit to be positioned on top of another, doubling interior volume without additional floor space.
- An optional roller base is available for single and stacked installations for easier mobility.

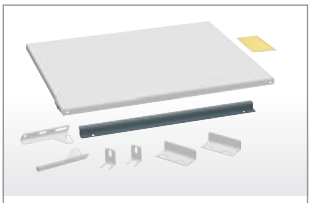
Stacking kits



MCO-170PS-PW



MCO-170SB-PW



MCO-230SB-PW

Double-Stacking Matching Table (MCO-50 series can be Triple Stacked)

SPACER FOR DOUBLE-STACKING		UPPER UNIT		
		MCO-170 series	**MCO-230AIC-PE**	**MCO-50 series**
LOWER UNIT	MCO-170 series	MCO-170PS-PW	N/A	MCO-170PS-PW
	MCO-230AIC-PE	MCO-230SB-PW	MCO-170PS-PW	MCO-170PS-PW
	MCO-19AIC-PE	MCO-170SB-PW	N/A	MCO-170SB-PW
	MCO-18AC/18AIC-PE	MCO-170SB-PW	N/A	MCO-170SB-PW
	MCO-20AIC-PE	MCO-170SB-PW	MCO-230SB-PW	MCO-170SB-PW
	MCO-50 series	N/A	N/A	MCO-170PS-PW
	MCO-5 series/Vice versa	N/A	N/A	MCO-50SB-PW

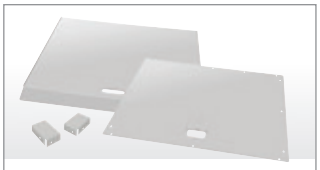
Roller Bases

MCO-230RB-PW
[for MCO-230AIC series]

MCO-170RB-PW
[for MCO-170 series]

MCO-50RB-PW
[for MCO-50 series]

Roller botle rack mount



MCO-80RBS-PW
[for MCO-80IC]

Trays

Tray (same as standard)

Half tray

Reinforced trays

Reinforced tray [front]

Reinforced tray (back]

Tray options				
description	MCO-170-PE series	MCO-230-PE series	MCO-50-PE series	MCO-80IC-PE
Tray (same as standard accessory)	MCO-170ST-PW	MCO-230ST-PW	MCO-50ST-PW	MCO-80ST-PW
Reinforced Tray	MCO-170RT-PW	MCO-230RT-PW	-	-
Half tray	MCO-25ST-PW	MCO-35ST-PW	-	-

Multiple inner doors

MCO-170ID-PW
[for MCO-170AIC-PE and MCO-170AC-PE series)

MCO-80ID-PW
[for MCO-80IC-PE)

H_2O_2 option for 170 and 230 series

H_2O_2 decon board
MCO-170HB-PE

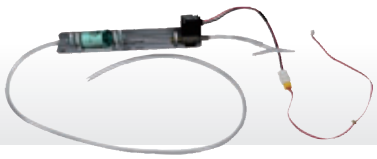
H_2O_2 generator
MCO-HP-PW

H_2O_2 reagent
MCO-H2O2-PE

CO_2 incubators 170 series					
Model Number	**MCO-170AIC-PE**	**MCO-170AICUV-PE**	**MCO-170AICUVH-PE**	**MCO-170AICD-PE**	**MCO-170AICUVD-PE**
SafeCell UV® System	MCO-170UVS-PE	Standard	Standard	MCO-170UVSD-PE	Standard
H_2O_2 Decontamination Board	MCO-170HB-PE	MCO-170HB-PE	Standard	-	
Electric Door Lock with Password	MCO-170EL-PW	MCO-170EL-PW	Standard	Standard	
H_2O_2 Vapour Generator	MCO-HP-PW			-	
H_2O_2 Reagent, pack of 6 bottles	MCO-H2O2-PE			-	
Multiple Inner Doors	MCO-170ID-PW			N/A	
CO_2 Gas Pressure Regulator	MCO-010R-PW			MCO-010R-PW	
Automatic CO_2 Cylinder Changeover System	MCO-21GC-PW			MCO-21GC-PW	
Semi-automatic one point Gas Calibration Kit	MCO-SG-PW			MCO-SG-PW	
InCu-saFe® Shelf	MCO-170ST-PW			MCO-170ST-PW	
InCu-saFe® Half Tray System	MCO-25ST-PW			MCO-25ST-PW	
Double Stacking Bracket*	MCO-170PS-PW			MCO-170PS-PW	
Stacking Plate*	MCO-170SB-PW			MCO-170SB-PW	
Roller Base	MCO-170RB-PW			MCO-170RB-PW	
Optional communication systems					
Analogue interface (4-20mA)	MCO-420MA-PW				

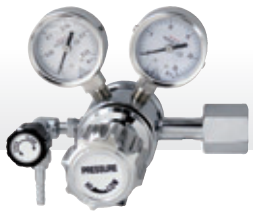
CO_2 incubators 230 series			
Model Number	**MCO-230AIC-PE**	**MCO-230AICUV-PE**	**MCO-230AICUVH-PE**
SafeCell UV® System	MCO-170UVS-PE	Standard	Standard
H_2O_2 Decontamination Board	MCO-170HB-PE	MCO-170HB-PE	Standard
Electric Door Lock with Password	MCO-170EL-PW	MCO-170EL-PW	Standard
H_2O_2 Vapour Generator	MCO-HP-PW [6]		
H_2O_2 Reagent, pack of 6 bottles	MCO-H2O2-PE		
CO_2 Gas Pressure Regulator	MCO-010R-PW		
Automatic CO_2 Cylinder Changeover System	MCO-21GC-PW		
Semi-automatic one point Gas Calibration Kit	MCO-SG-PW		
InCu-saFe® Shelf	MCO-230ST-PW		
InCu-saFe® Half Tray System	MCO-35ST-PW		
Double Stacking Bracket*	MCO-170PS-PW		
Stacking Plate*	MCO-230SB-PW		
Roller Base	MCO-230RB-PW		
Optional communication systems			
Analogue interface (4-20mA)	MCO-420MA-PW		

Gas auto changer



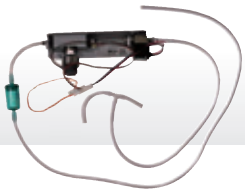
MCO-21GC-PW [for MCO-170 series and MCO-230 series]
MCO-50GC-PW [for MCO-50 series]
MCO-80GC-PW [for MCO-80IC]

Gas regulator



MCO-010R-PW

STD gas auto calibration kit



MCO-SG-PW
[for MCO-170 series and MCO-230 series]

UV system set

MCO-170UVS-PE

MCO-19UVS-PE

MCO-80UVS-PE

CO_2 incubators			
Model Number	**MCO-50AIC Series**	**MCO-170AC-PE**	**MCO-80IC-PE**
SafeCell UV® System	MCO-170UVS-PE	MCO-010R-PW	MCO-80UVS-PE
H_2O_2 Decontamination Board	MCO-50HB-PW	-	-
H_2O_2 Vapour Generator	MCO-50HP-PW	-	-
H_2O_2 Reagent, pack of 6 bottles	MCO-5H2O2-PE	-	-
Electric Door Lock with Password	MCO-170EL-PW	-	-
Multiple Inner Doors	-	MCO-170ID-PW	MCO-80ID-PW (5 small doors)
CO_2 Gas Pressure Regulator	MCO-010R-PW	MCO-010R-PW	MCO-010R-PW
N_2 Gas Pressure Regulator	-	-	-
Automatic CO_2 Cylinder Changeover System	MCO-50GC-PW	MCO-21GC-PWS	MCO-80GC-PW
Semi-automatic one point Gas Calibration Kit	-	-	-
InCu-saFe® Shelf	MCO-50ST-PW	MCO-170ST-PW	MCO-80ST-PW
InCu-saFe® Half Tray System	-	MCO-25ST-PW	--
Double Stacking Bracket*	MCO-170PS-PW	MCO-170PS-PW	-
Stacking Plate*	MCO-50SB-PW	MCO-170SB-PW	-
Roller Base	MCO-50RB-PW	MCO-170RB-PW	-
Roller bottle rack mounting kit	-	-	MCO-80RBS-PW
Automatic water supply system kit	-	-	MCO-80AS-PW
Optional communication systems			
Analogue interface (4-20mA)		MCO-420MA-PW	

Multigas incubators				
Model Number	**MCO-50M-series**	**MCO-170M-PE**	**MCO-170MUV-PE**	**MCO-170MUVH-PE**
SafeCell UV® System	MCO-170UVS-PE	MCO-170UVS-PE	Standard	Standard
H_2O_2 Decontamination Board	MCO-50HB-PW	MCO-170HB-PE	MCO-170HB-PE	Standard
H_2O_2 Vapour Generator	MCO-50HP-PW	MCO-HP-PW[6]		
H_2O_2 Reagent, pack of 6 bottles	MCO-5H2O2-PE	MCO-H2O2-PE		
Electric Door Lock with Password	MCO-170EL-PW	MCO-170EL-PW	MCO-170EL-PW	Standard
Multiple Inner Doors	-	Standard		
CO_2 Gas Pressure Regulator	MCO-010R-PW	MCO-010R-PW		
N_2 Gas Pressure Regulator	MCO-010R-PW	MCO-010R-PW		
Automatic CO_2 Cylinder Changeover System	-	MCO-21GC-PW		
Semi-automatic one point Gas Calibration Kit	MCO-50SB-PW	MCO-SG-PW		
InCu-saFe® Shelf	MCO-50ST-PW	MCO-170ST-PW		
InCu-saFe® Half Tray System	MCO-50GC-PW	MCO-25ST-PW		
Double Stacking Bracket*	MCO-170PS-PW	MCO-170PS-PW		
Stacking Plate*	MCO-50SB-PW	MCO-170SB-PW		
Roller Base	MCO-50RB-PW	MCO-170RB-PW		
Optional communication systems				
Analogue interface (4-20mA)	MCO-420MA-PW			

LiCellMo
LIVE CELL METABOLIC ANALYZER

Continuous, sampling-free measurement of glucose and lactate in culture medium. Visualize real-time changes in cell metabolism.

Cells are constantly growing and differentiating, and these processes are known to be closely linked to metabolism. In the field of cancer immunology, stem cell research, and the development of manufacturing processes for cell-based formulations, understanding the metabolic state of cells is a factor of ever-growing importance in the analysis of cell activation and disease. Continuous analysis of cell metabolism offers the ability to visualize the state of cells in real time, creating opportunities for unprecedented new discoveries in cell metabolism.

The PHCbi Live Cell Metabolic Analyzer will open new doors to those discoveries.

Cancer research

Immunology research

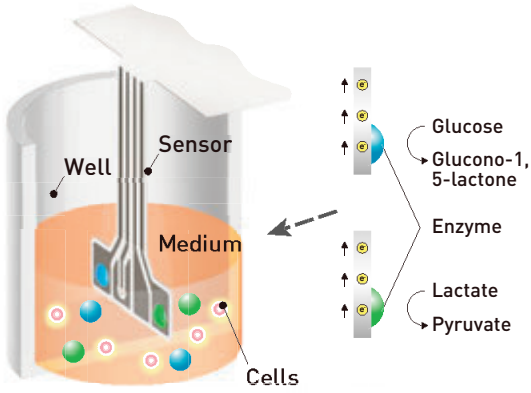
stem cell research

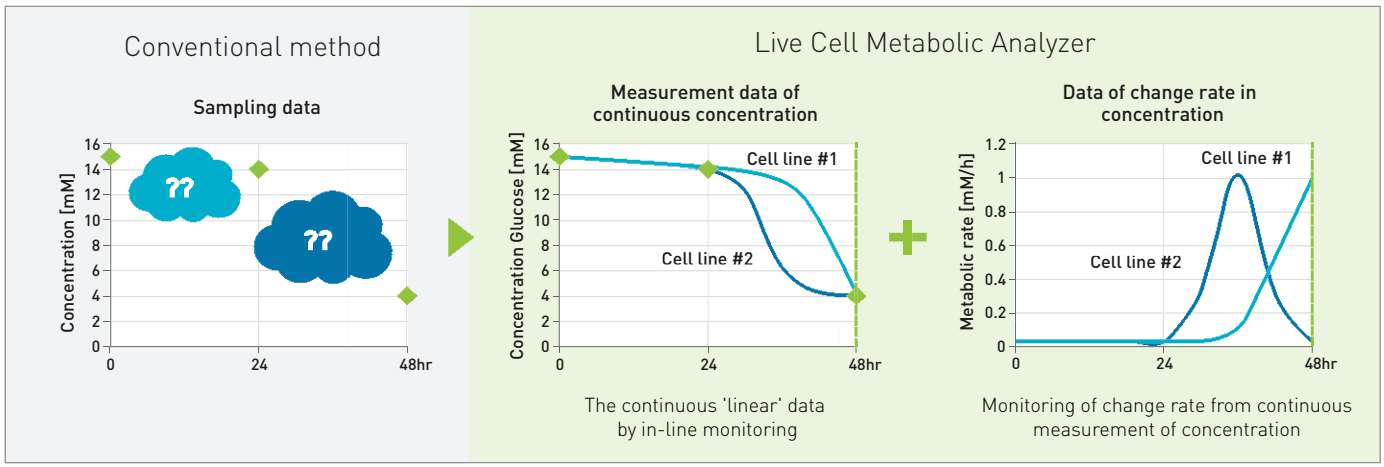
–PRODUCT CURRENTLY UNDER DEVELOPMENT–

IN-LINE SENSORS: THE KEY TO CONTINUOUS MEASUREMENTS OF GLUCOSE AND LACTATE

The glycolytic pathway is one of the main components of cellular energy metabolism. During glycolysis, glucose is taken up into cells and lactate is produced. Conventional analysis of cell metabolism typically involves estimating glucose and lactate concentrations from data points obtained from periodic sampling. With its unique high-precision in-line sensors, the PHCbi Live Cell Metabolic Analyzer offers these unique advantages:

- real-time monitoring of glucose and lactate concentrations
- continuous measurements
- no sampling of the culture medium and the same cells can also be used for separate evaluation after measurement.





Continuous visualization of changes between sampling time points reveals real differences in cell conditions

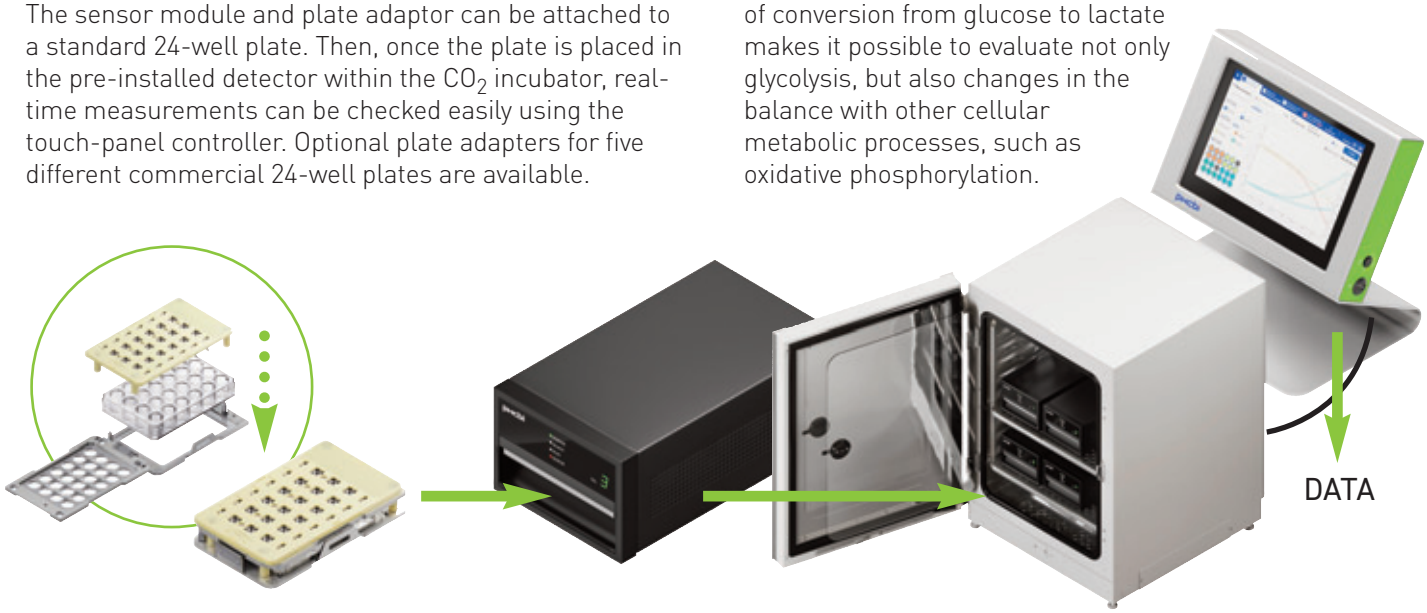
Measure cells in their usual culture environment

The simple design of the PHCbi Live Cell Metabolic Analyzer makes it suitable for any laboratory space. Plus, there is no need for specialized cell culture equipment. Common commercial products (culture medium, 24-well plates, calibration liquid, additive reagents) can be used for cell culture.

The sensor module and plate adaptor can be attached to a standard 24-well plate. Then, once the plate is placed in the pre-installed detector within the CO_2 incubator, real-time measurements can be checked easily using the touch-panel controller. Optional plate adapters for five different commercial 24-well plates are available.

Evaluate glycolytic changes directly

Changes in the glycolytic pathway can be evaluated directly by measuring the culture medium concentrations of glucose taken up by cells and lactate produced. With the PHCbi Live Cell Metabolic Analyzer, the state of cell metabolism can be visualized as the rate of metabolic change using the consumption rate and production rate based on concentration values. Monitoring the efficiency of conversion from glucose to lactate makes it possible to evaluate not only glycolysis, but also changes in the balance with other cellular metabolic processes, such as oxidative phosphorylation.



MIR HEATED AND COOLED INCUBATORS

The MIR Heated Incubators provide a precise and stable incubation environment. An accurate microprocessor timer is fitted to allow experiments up to 99 hours and 59 minutes. The MIR Heated Incubators incorparate a microprocessor PID control and air jacketed system that gives accurate temperature control within ± 0.2°C.

The MIR Cooled Incubators are recognized as exceptional units suitable for a wide range of applications requiring a -10ºC to +60ºC environment. The wide variety of temperatures and lighting patterns that are essential in research, environmental studies and testing can now be accurately reproduced and controlled.

HEATED INCABATORS

MIR-H163-PE
93L

MIR-H263-PE
153L

		MIR Heated Incubators	
Model Number		**MIR-H163-PE**	**MIR-H263-PE**
External Dimensions (W x D x H	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	litres	93	153
Net Weight	kg	50	67
Temperature control range	ºC	Ambient temp +5 ~ +80	
Fluctuation	ºC	±0.2 (<-60) ~ ± 0.5 (60 ~ 80)	
Temperature uniformity	ºC	±1	

COOLED INCABATORS

MIR-154-PE
78L

MIR-254-PE
108L

MIR-554-PE
406L

MIR Cooled Incubators				
Model Number		MIR-154-PE	MIR-254-PE	MIR-554-PE
External Dimensions (W x D x H	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	litres	123	238	406
Net Weight	kg	78	108	195
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		

IMPROVED EXPERIMENTATION OF REPETITIVE OPERATION AND OPERABILITY

Programmable operation function with microprocessor control
Combining flexible temperature (H), light on/off (L) and time control (T), a maximum 12-step plus constant operation or max. 12-step repeating operation can be programmed according to the experimentation requirements. A program can be set to repeat for a minimum of one time to a maximum of 98 times or continuous repeat.

Program input is simple and the incubator accommodates a range of diversified experimentation requirements, proving ideal for experimentation during night time and holidays, experimentation that requires settings to be changed, microorganism culture and preservation.

MIR-154-PE stacked
Using stacking kit MIR-S154SB-PW

Optional accessories

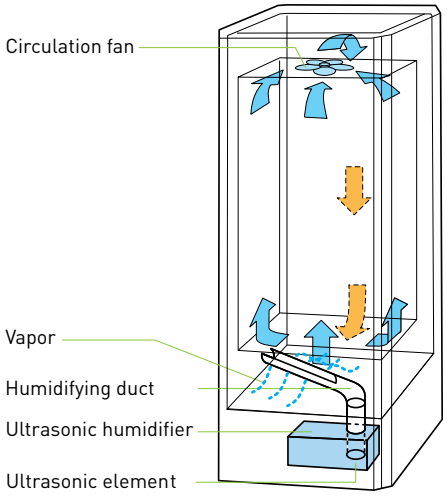
MIR Cooled Incubators			
Model Number	MIR-154-PE	MIR-254-PE	MIR-554-PE
Stacking kit	MIR-S154SB-PW	-	-
Door padlock bracket	MIR-LP-PW	MIR-LP-PW	-
Additional illumination kit	MIR-L15-PE	MIR-L15-PE	MIR-L15-PE
Inner doors	-	-	MIR-55ID-PW
Door window blanking plate	MIR-154BP-PW	MIR-254BP-PW	-

MLR CLIMATE CHAMBERS

PHCbi 's Climate Chambers are suitable for a wide range of applications, including plant growth and insect studies. The wide variety of temperatures, humidity and lighting patterns that are essential in research, environmental studies and testing can be accurately reproduced and controlled.

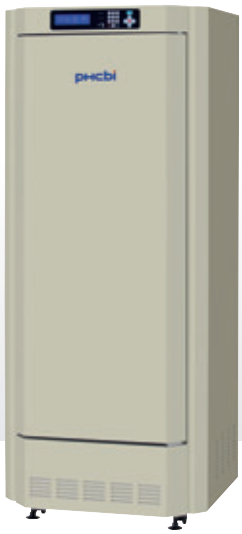
VERSATILE CLIMATIC CHAMBER

The MLR-352-PE Climatic Test Chamber has been recognized as an exceptional unit suitable for a wide range of applications. The wide variety of temperatures, humidity and lighting patterns that are essential in research, environmental studies and testing can now be accurately reproduced and controlled.

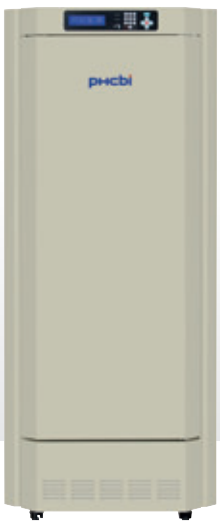


Humidity control function (only for H type)
This holds an ultrasound humidifier controlled by a PID controller, making it able to control the humidity of an area of 60 — 90% RH (fluorescent light off). Furthermore, it is able to humidify the chamber with the L-shaped humidifying pipe installed at the bottom of the chamber. From raising plants that hate dry, or high temp. high humidity environments to raising insects, it can create any humidified environment.
Special coated evaporators for higher corrosion restistance are available upon request.

* The surface of the cooling device may rust by the excrement of the insects when putting many insects in the chamber. We recommend frequent maintenances.



MLR-352-PE
294L



MLR-352H-PE
294L

MLR Climate Chambers			
Model Number		**MLR-352-PE**	**MLR-352H-PE**
External Dimensions (W x D x H	mm	760 x 700 x 1835 mm	
Internal Dimensions (W x D x H)	mm	520 x 490 x 1135 mm	
Volume	litres	294 litres	
Net Weight	kg	226	235
Temperature Control Range	°C	0°C to 50°C (Light OFF) / 10°C to 50°C (Light ON)	5°C to 50°C (Light OFF) / 10°C to 50°C (Light ON)
Humidity Control Range	°C		60 to 90 % RH (Light OFF) / 55 to 85 % (Light ON)

Microprocessor P.I.D and Refrigeration Capacity Control eliminate temperature fluctuations improving temperature control. The small and light weight membrane-type humidity sensor allows for high accuracy and reproducibility.

Microprocessor P.I.D control of temperature and humidity (0°C to +50°C, 0 to 20,000lux and 55 to 90%RH resp.) create the optimum environments for various applications.

Programming of temperature, light, and humidity can be used for small plants, environmental tests, algae, drosophila, etc. Easy calibration of temperature and humidity can be calibrated easily through the control panel.

Temperature and light settings are programmable to provide the perfect cycles for vernalization. 10 programmes of up to 12 steps each can be memorized.

Graphic LCD panel with pop-up menu function on control panel provides visual display of operation and allows intuitive operation.

Data can be viewed on the LCD control panel display and can be automatically stored for approximately 2 weeks (at 6 minute intervals). Temperature and humidity can be calibrated easily from the control panel.

MLS LABORATORY AUTOCLAVES

Convenient sterilization on demand offers great flexibility MLS series top-loading autoclaves are a popular method of sterilization for today's research laboratories. Self-contained and easy to use, these reliable autoclaves are ideal for a wide range of applications.

PHCbi laboratory autoclaves provide a safe and reliable high pressure steam sterilizing environment within a unit that is particularly easy to use. The permission management function can be set to security High or Low. In High security a password is required to modify sterilization settings and relevant parameters.

ACCURATE & CUSTOMIZABLE

A microprocessor monitors and controls steam temperature within the chamber, ensuring that it is maintained within the 105°C – 135°C range. Sterilization temperature and time can be easily adjusted as needed.

The work conditions shown on the control panel (temperature/ pressure inside chamber, sterilizing course, time) can be printed for record-keeping.

Customizable sterilization program
Sterilization temperature and time can be easily adjusted as needed. Latest set values are always stored in the system, even after the autoclave is switched off.

Temperature control
Several audible and visual alarms add to the user safety. A buzzer sounds to alert the user the end of sterilization cycle so the items can be removed from the autoclave.

USER SAFETY

The autoclave is equipped with multiple safety functions, forced cooling and memory functions. The lid has four safety-locking mechanisms.

Door protection function
Ergonomic up and down lid opening, with a safety mechanism attached. The lid will not open due to the safety lock mechanism under the high pressure condition. An electronic door lock prevents and detect the correct closure of the lid.

Compact
The compact design is ideal where space is limited. The body of the unit, with its built in exhaust bottle, measures a mere 520 x 660 mm so it will fit in the tightest spaces. Four wheels allow the unit to be easily moved

USER FRIENDLY DESIGN

7-inch large color LCD touch screen allows easy operation. Each mode (normal sterilization, medium/liquid sterilization, and medium dissolution) can be easily started up by the presets. The new 7" touchscreen display allows the user to program in a very userfriendly way the protocols, save them and even schedule the instrument for the future.

LABORATORY AUTOCLAVES

MLS-530L-PE
50L

MLS-830L-PE
80L

		MLS Laboratory Autoclaves	
Model Number		**MLS-530L-PE**	**MLS-830L-PE**
External Dimensions (W x D x H	mm	520 x 660 x 881	520 x 660 x 1161
Internal Dimensions	Ø mm	370 x 470	6370 x 750
Volume	litres	50	80
Net Weight	kg	105	125
Model Number			
Pressure Gauge		0 - 0.4 Mpa	
Sterilization temperature	°C	105 - 135	
Liquefy temperature	°C	60 - 110	
Retain temperature	°C	45 - 60	
Preheat temperature	°C	45 - 80	
Operating ambient temp	°C	5 - 35	
Timer setting range		1 min to 99h59min	
Temperaure gauge range	°C	Touchscreen display 45 - 150	
Max. Operating pressure		0.255 Mpa	
Control			
Temperature control		PID control by microcomputer	
Construction			
Interior material		Stainless Steel (SUS 304)	
Stainless steel baskets		2	3
Dimension baskets	Ø mm	332 x 195,5	
Drain bottle		5 ltr polyetylene tank	
Safety devices			
		Pressure safety valve • Over-temperature limiter • Over-pressure limiter • Anti-scorch limiter • Door interlock • Current fuse	

PRIMESURFACE® ULTRA LOW ATTACHMENT 3D CELL CULTURE PLATES AND DISHES

PHC provides superior quality three-dimensional cell culture platforms with a variety of well shapes to enable spheroid culturing of your specific cell type.

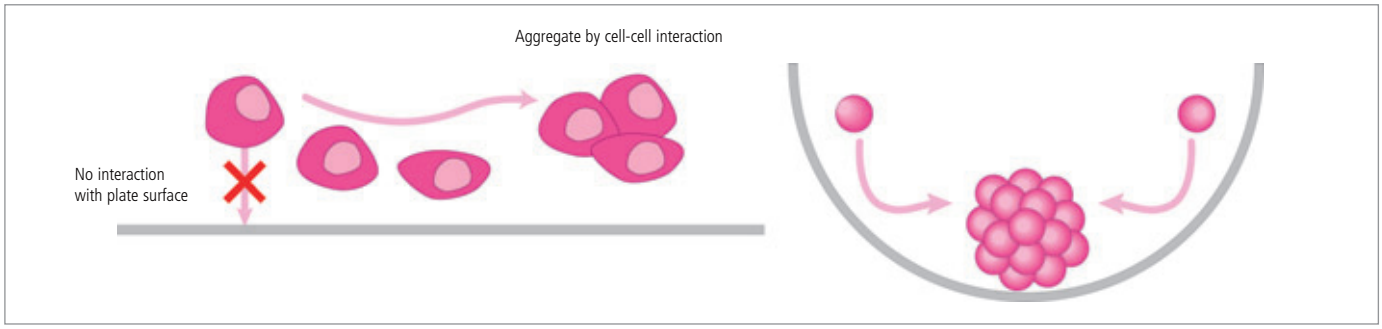
PrimeSurface cell culture labware are ultra low attachment (ULA) dishes and plates that promote scaffold free, self assembly of spheroid formation. The plates and dishes are pre-coated with unique ultra hydrophilic polymer that enables spontaneous spheroid formation of uniform size and shape. The ULA plates have high optical clarity making them highly suitable for bright field imaging and confocal microscopy. In addition to the widely used 96 well U bottom plate, 96 well plates are also available in V and M bottom. For high throughput screening (HTS) needs, 384 well plates are available in clear and white.

UNIQUE ULTRA HYDROPHILIC POLYMER

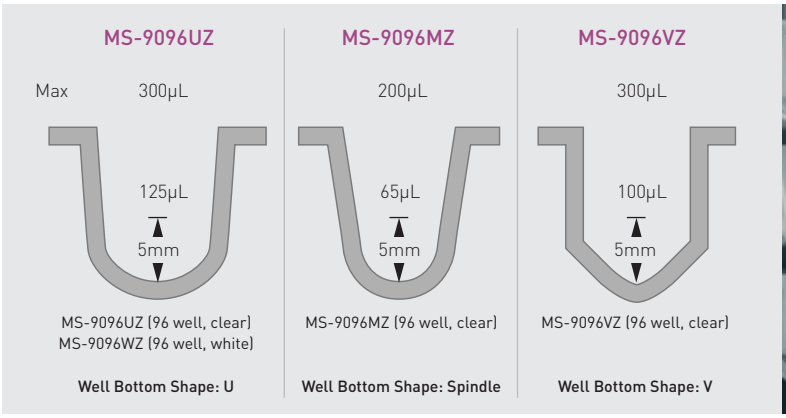
PrimeSurface series are coated with a unique ultra-hydrophilic polymer that covalently bound to plastic surface, and effectively inhibits cell attachment without cytotoxic and material degradation. The superior coating technologies and manufacturing processes offer uniform spheroid/EB formation and smooth surface to obtain clear cell images.

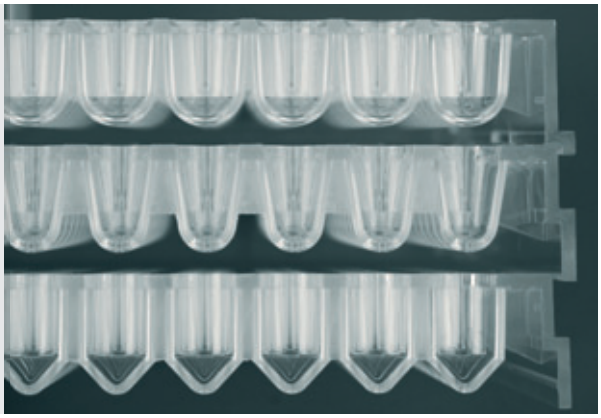
KEY BENEFITS

- Non-binding surface for cells to facilitate natural spheroid formation
- Uniform single spheroid/EB formation in each well
- Spheroid assay formation and analysis in the same plate
- A variety of well bottom shapes: U-bottom, Spindle-bottom and V-bottom in 96 well format
- High optical clarity plates for imaging
- Stable, non-cytotoxic and cell non-adhesion surface
- Easy handling, compatible with liquid robotic system
- 384 well formats for high throughput assay
- Compatible with bright-field and fluorescence imaging systems
- White plates compatible with luminescent assays



THREE WELL BOTTOM SHAPES OF PRIMESURFACE 96 WELL PLATE





MS-9024XZ
PrimeSurface 24 well

MS-9096MZ
96 wells, Clear, Spindle well bottom shape

MS-9384UZ
384 well, clear, U well bottom shape

MS-9096WZ
96 wells, white U well bottom shape

MS-90600Z
PrimeSurface dish 60 mm

MS-90900Z
PrimeSurface dish 90 mm

	Cat. No.	Product Name	Number of wells	Color	Well bottom	Maximum volume in each well	Package (radiation sterilized)
Microplates	MS-90240Z	PrimeSurface 24 well	24	Clear	Flat	3.4 ml	Individually packed, 10 plates/case
	MS-9096UZ*	PrimeSurface 96U	96	Clear	U	300 μL	Individually packed, 20 plates/case
	MS-9096WZ*	PrimeSurface 96W	96	White	U	300 μL	Individually packed, 20 plates/case
	MS-9096MZ*	PrimeSurface 96M	96	Clear	Spindle	200 μL	Individually packed, 20 plates/case
	MS-9096VZ*	PrimeSurface 96V	96	Clear	V	300 μL	Individually packed, 20 plates/case
	MS-9384UZ*	PrimeSurface 384U	384	Clear	U	106 μL	Individually packed, 20 plates/case
	MS-9384WZ*	PrimeSurface 384W	384	White	U	106 μL	Individually packed, 20 plates/case
Dishes	MS-90240Z	PrimeSurface dish 35 mm	-	Clear	Flat (9 cm^2)	-	5 dishes/package, 50 dishes/case
	MS-90600Z	PrimeSurface dish 60 mm	-	Clear	Flat (21 cm^2)	-	10 dishes/package, 120 dishes/case
	MS-90900Z	PrimeSurface dish 90 mm	-	Clear	Flat (57 cm^2)	-	10 dishes/package, 50 dishes/case

* For research / laboratory use only

PRIMESURFACE 96 SLIT-WELL PLATE

A slit-well, ultra-low attachment 3D plate to facilitate easy handling of media exchange without disrupting spheroid formation.

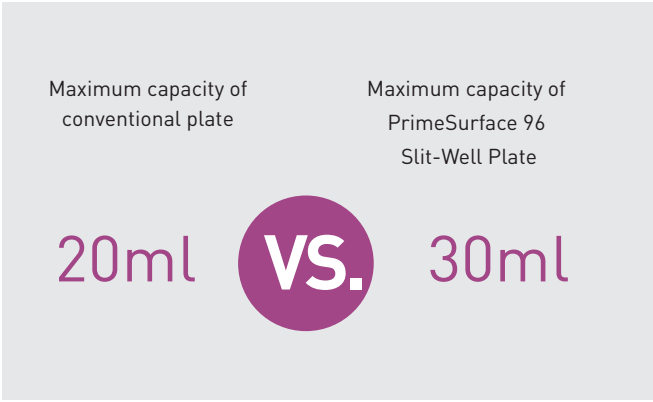
Cell culturing involves frequent media replacement to provide nutrition to growing cells. In a standard 96 well ultra low cell attachment plate, media aspiration or dispensing has to be done extremely carefully to avoid disturbing the unattached spheroid, making this a time consuming operation.

With the introduction of PrimeSurface 96 Slit-Well Plate, media exchange for 96 well plates can be effciently handled with one step dispensing or aspiration for all 96 wells. This product can decrease pipetting time by over 80% while minimizing the risk of spheroid damage.

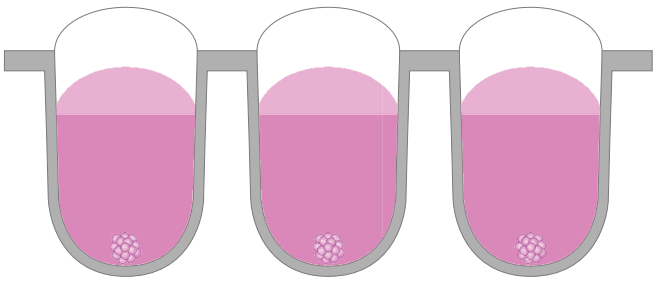
KEY BENEFITS

- Generate and maintain uniform spheroids
- Exchange media without disturbing spheroid formation
- Minimize media exchange time by simultaneous delivery of cell culture media to all 96 wells
- Use up to 1.5 times more media than in conventional plates, less media changes and more nutrients for the culture

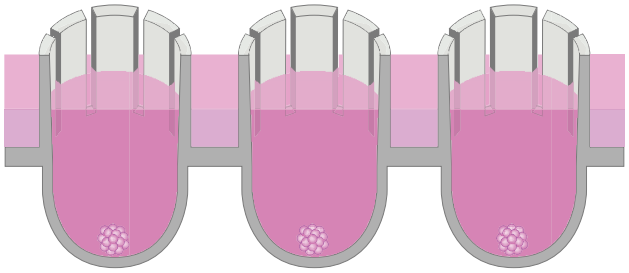
Grow larger spheroids in the same well for long-term cultures.
Growing larger spheroids needs more media. Slit-Well plates allow 1.5 times more media volume compared to conventional plates providing more nutrients for larger spheroids.



Time Saving Design
Slit-Well structure allows simultaneous delivery of cell culture medium to all 96 wells



Conventional product: medium is independent in each well



Slit-Well plate: medium is shared between wells

PRIMESURFACE 96 Slit-Well Plates

Catalog Number	Product Name	Well Type	Color	Well Bottom Shape	Maximum Well Volume	Package
MS-9096SZ*	PrimeSurface 96 Slit-Well Plate	96	Clear	Spindle	0.3 ml	Individually packed, 20 plates/case

* For research / laboratory use only

iP-TEC® UNIQUE LIVE CELL TRANSPORT PACKAGING SOLUTIONS

With the iP-TEC® series, we have added a complete range of cell transportation solutions to the PHCbi product line. Ranging from primary/secondary containers for cell transportation to accessories, and high-performance temperature-controlled transport boxes (tertiary containers, heat and cold storage materials). Various combinations are available depending on the type of samles and purpose to be transported, the transport time, and the temperature.

IP-TEC® SOLUTIONS

Transporting samples in a frozen state has been the norm and a stable method of transportation, but comes with problems such as a risk of harming the cells when freezing and thawing them, losing vast amounts of cells in the process. Also, the lab-time, specialized equipment and personnel add considerable costs to shipping cells in a frozen state. However, these problems can be solved with live transport; delivering cells in an unfrozen and in a "ready to use" condition. There has been an increasing demand for live transport as regenerative medicine continues to develop, but there are unique challenges to overcome in transporting live cells without freezing them. iP-TEC® offers a complete solution that ranges from T-flasks to culture plate covers, providing solutions in accomplishing live cell transport.

KEY BENEFITS

- **Reduce your cost**: Reduce the cost of culture media needed to fill a flask by 55%-65%
- **No Trapped Bubbles**: Cells will not be affected by vibration as the flasks can be capped without trapping any bubbles inside.
- **No Leakage**: Dishes and well plates that were difficult to transport can now be shipped without leakage.
- **Stable Transport**: Transport cells stably using a cell culture insert.

MINI SCRAPER

The superb pliant shape and ingenious nose geometry make it possible to scrape out cells in every corner. This shape of the iP-TEC® mini scraper provides ease of grabbing enables nuanced movements.

- Scrapers are packaged separately for ease of opening and sterility.

28448
iP-TEC Mini Scraper

FLASK-25

When transporting cells in live condition, there is a risk that culture medium in a flask gets shaken and cells scale. By filling a flask with culture medium it can be transported in safety without this risk. Yet, this will make the amount of culture medium increase and costs more in conventional flasks. To solve this, we created a revolutionary form which minimizes the amount of culture medium used for transport without changing its incubation area.

FLASK-25		
Code	**Name**	**Quantity**
28445	iP-TEC Flask-25	100 (10 pcs/bag x 10)
28448	iP-TEC Mini Scraper	100 (10 bags x 10)

28445
iP-TEC Flask-25

FLASK-25 WITH VENT CAP

Our containers allow cells to be transported in containers filled with culture solution in the absence of bubbles. Also it minimizes the risk of damage by vibration during transportation. The flasks also reduces the use of expensive culture medium by 55% - 65%.

FLASK-25		
Code	**Name**	**Quantity**
28642	Flask-25 with vent cap	50 (5 pcs/bag × 10)
28643	Vent Cap for Flask-25	10 (10 pcs/bag x 1)

28642
Flask-25 with vent cap

28643
Vent Cap for Flask-25

SECONDARY CONTAINER FOR FLASK 25

During transport the iP-TEC® T-25 flasks must be kept as save as possible. A dedicated transport container provides a sable environment with specially designed holders for the flasks. Up to 6 iP-TEC®T-25 flasks van be shipped at once.

CELL TRANSPORT CONTAINER #RPE12		
Code	**Name**	**Quantity**
28451	**A** - 1 Set (includes 1 x A, 1 pair B, 6 pcs C)	1 Set
28452	**B** - Insert for 3 x iP-TEC®T-25 flask	6 pairs
28453	**C** - Liquid Absorbing sheet	36 pcs

CELL TRANSPORT CONTAINER #RPE12

A closed-type primary container developed through joint research with the RIKEN Center for Biosystems Dynamics Research. It allows for high efficiency in cell processing and packaging, etc. to stabilize and maintain the cell' s characteristics and structure.

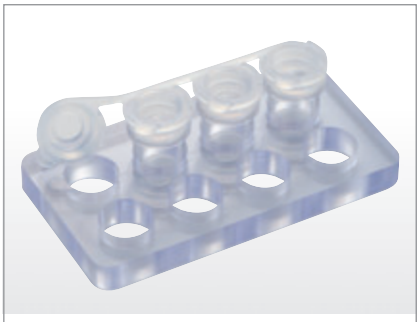
CELL TRANSPORT CONTAINER #RPE12		
Code	**Name**	**Quantity**
28635	Closed type	12 pcs (2 pcs/bag x 6)
28636	Vent type	12 pcs (2 pcs/bag x 6)
28516	Secondary Container	1 pcs
28530	Mesh Cushion 20 mm	1 pcs

28635
Cell Transport Container #RPE12

IP-TEC® CELL TRANSPORT CONTAINER #24

28637
Silicon cap, row of 4

28638
Containers



28639
Dedicated 8-hole rack

When being transported, the container is firmly stabilized by the lid of iP-TEC® secondary container. The secondary container is capable of containing up to 24 containers.

Code	Name	Quantity
28637	Silicon cap, row of 4	60 pcs (6 pcs / bag x 10)
28638	Containers	240 pcs (24 pcs / bag x 10)
28639	Dedicated 8-hole rack	1 pcs
28516	iP-TEC Secondary Container	1 pcs

28640
Cell Sheet Transport Container

CELL SHEET TRANSPORT CONTAINER Ø38, Ø50

Stable and safe transportation of cell sheets, living tissues, etc. Containers can be filled with culture medium and capped without trapping any bubbles inside. The container is specifically designed to prevent foaming of medium or wobbling of the contents.

Code	Name	Quantity
28640	Ø38	6 pcs (1 pcs/bag)
28641	Ø50	6 pcs (1 pcs/bag)

LIVE TRANSPORT SOLUTION FOR WELL PLATES AND DISHES

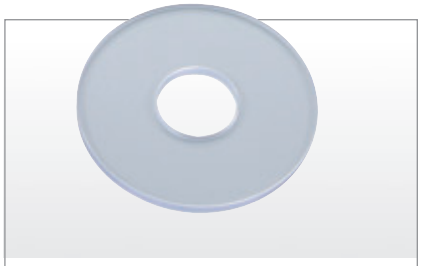
Using Medical Silicone Rubber without cytotoxic effect
No need for the use of adhesive with the iP-TEC® covers. Simply put the cover over the cell culture plate, put the plank on top and clip to seal. This much easier process minimizes the risk of touching and contaminating the culture medium.

Liquid seal, optimal CO_2 gas penetration
The silicone covers consist of two parts:
- A thin layer which falls into the wells or dish to allow CO_2 exchange.
- A thicker layer to smoothly cover the full plate or dish and provide the liquid seal.

Easy Live Cell Transportation
The cover falls into each individual well for optimum seal and minimizing the need for culture medium at the same time. This results in less costs and less stress for the cells during transportation.

iP-TEC® Dish cover

Code	Name	Quantity
28505	suitable for Ø35	10 pcs
28507	suitable for Ø60	10 pcs
28509	suitable for Ø90	10 pcs



iP-TEC® Plank for Dish cover

Code	Name	Quantity
28510	suitable for Ø35	1 pcs
28512	suitable for Ø60	1 pcs
28514	suitable for Ø90	1 pcs

iP-TEC® Well Plate Cover

Code	Name	Quantity
28489	suitable for 6 wells	10 pcs
28491	suitable for 12 wells	10 pcs
28493	suitable for 24 wells	10 pcs
28495	suitable for 96 wells	10 pcs

iP-TEC® Plank for Well Plate

Code	Name	Quantity
28496	suitable for 6 wells	1 pcs
28498	suitable for 12 wells	1 pcs
28500	suitable for 24 wells	1 pcs
28502	suitable for 96 wells	1 pcs

iP-TEC® Secondary container

Code	Name	Quantity
28516	iP-TEC Secondary Container	1 pcs

iP-TEC® Secondary container private mesh cushion

Code	Name	Quantity
28530	Thickness 20mm	1 pcs
28531	Thickness 30mm	1 pcs

STANDARD BOX-X13

The standard box is designed to transport all iP-TEC® secondary containers safely and with confidence. All inner isolation is fitted to prevent unwanted heat loss and gaps and prevent the samples from being damaged. With holding times of 36 °C for up to 100 hours it is ideally suited for medium and long distance shipments.

- When Using Temperature Stabilizer 36,
  100 hours (at ambient temperature 25 °C)
  35 hours (at ambient temperature 5 °C)

Code	Name	Quantity
28463	Box & insert	1 pcs

28463
Standard Box-X13

28543
iP-TEC® tote BOX-6.6

IP-TEC® TOTE BOX-6.6

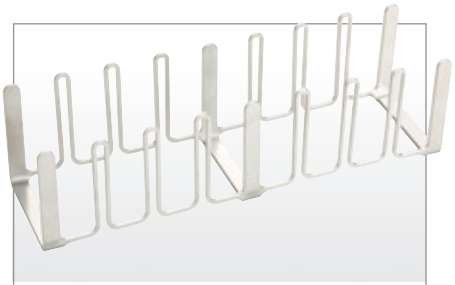
This tertiary custom-made bag for hand-carry is ideally suited for short distance travel. Easy to use and light weight transportation of live cells.

- Container for transporting the cells by hand.
- The weight including the Temperature Stabilizer (Phase Change Material) is approx. 3 kg!

Code	Name	Quantity
28543	Bag & Box insert	1 pcs

Temperature stabalizers

Code	Name	Quantity
28457	Temperature Stabilizer 36 °C	1 pcs
28483	Temperature Stabilizer 24 °C	1 pcs
28648	Temperature Stabilizer 5 °C	1 pcs



Racks for temperature stabilizers

Code	Name	Quantity
28522	Rack for 8 Temperature Stabilizers	1 pcs
28523	Rack for 6 Temperature Stabilizers	1 pcs

Barrier pouch and liquid absorbent sheet.

Code	Name	Quantity
28628	Barrier Pouch (B4 Type)	20 pcs
28630	Liquid Absorbent Sheets	20 pcs

VALIDATION & QUALIFICATION SOLUTIONS

PHC Europe BV is a vertical component manufacturer that can provide turn-key solutions for validation and qualification in accordance with all current GMPs, GLPs, GCPs, 21 CFR Part 11, PAT, ISO and specific customer requirements and applications. Because many of our key component parts are designed and built by PHC Europe BV, we offer the most precise and in-depth validation resources specific to PHCbi laboratory products. Whatever your validation needs are, PHCbi provides comprehensive expertise in laboratory equipment to meet your exact compliance needs. PHCbi validation systems employ advanced technology coupled with the latest trends to insure compliance with accurate and time efficient completion.

Validation & Qualification Solutions for laboratory equipment

Turn key solutions available for:

- Ultra-Low Freezers
- Cryogenic Freezers
- Biomedical Freezers
- Bloodbank refrigerators
- Pharmaceutical refrigerators
- Incubators
- Ovens
- Environmental test chambers

Installation and Operational Qualification

Qualification IOQ
PHC Europe BV offer onsite validation of PHCBI supplied equipment via Installation and Operational Qualification Protocol IOQ.

Installation Qualification (IQ)
Verifies and documents the equipment installation is compliant with the manufacturer's requirements and specifications.

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 24hr period; also, a short open-door test included toward the end of this period. Data produced will be compared with manufacturers published equipment specification. Product specific parameters such as CO_2/O_2, %RH etc. are included within the relevant equipment IOQ protocol.

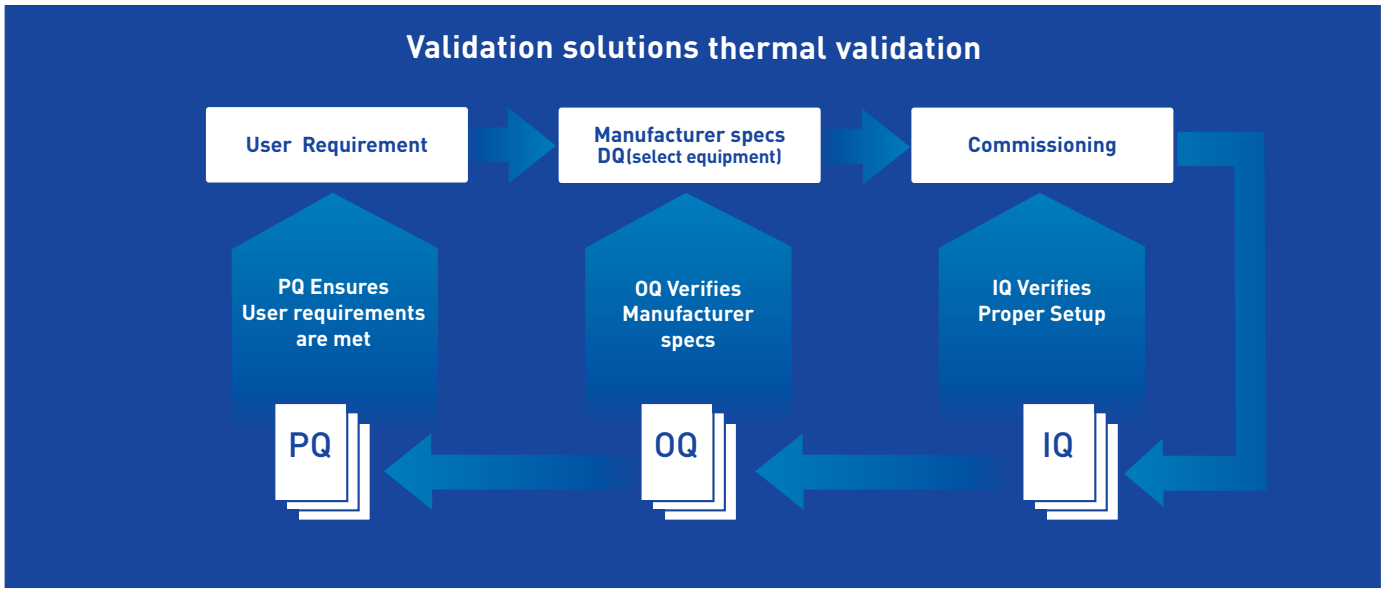
Additional options:
Additional temperature sensor positions, Extended logging period 48/72hrs, Simulated customer loaded mapping, Powerfail/ Recovery performance tests.

Process Qualification (PQ) is usually conducted and performed by customer/end-user as the equipment will be in an environment where specific user conditions and actual product is loaded, stored and accessed e.g. the customers actual production or product processing area. The PQ will probably refer to customer specific Standard Operating Procedures documents (SOPs).

PHCbi validation services by model						
	Temp.	CO_2	O_2	%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_2 & O_2/CO_2 Incubators	✓	✓	✓	✓		
MLS Top Loading Autoclaves	✓					✓
MLR Environmental Test Chamber	✓			✓	✓	
CBS Standard LN_2 Freezers	✓					

Example: product identification and specific storage requirements; loading patterns etc. therefore making the PQ a unique and customer specific document. PHC Europe however will provide assistance to customers where required in either the preparation or assisted execution of the Process Qualification.

PHC Europe BV is also able to offer a "Temperature Mapping Service" for customers wishing to verify actual equipment performance as installed, this service is also available for all NON PHCBI equipment.



* The information contained in this brochure is as of February 2021
* Appearance and specifications are subject to change without notice

Head Office
Nijverheidsweg 120
4879 AZ Etten Leur
The Netherlands
Tel: +31 (0)76 543 38 33
Fax: +31 (0)76 541 37 32
biomedical.nl@eu.phchd.com
www.phchd.com/eu/biomedical

UK Office
9 The Office Village
North Road, Loughborough
Leicestershire LE11 1QJ
United Kingdom
Tel. +44(0)1509 265265
Fax. +44(0)1509 269770
biomedical.uk@eu.phchd.com
www.phchd.com/eu/biomedical

France Office
44, avenue de Valvins, BP 44
F-77212 Avon Cedex
France
Tel. +33 1 60719911
Fax. +33 1 60711693
biomedical.fr@eu.phchd.com
www.phchd.com/eu/biomedical

PHCbi