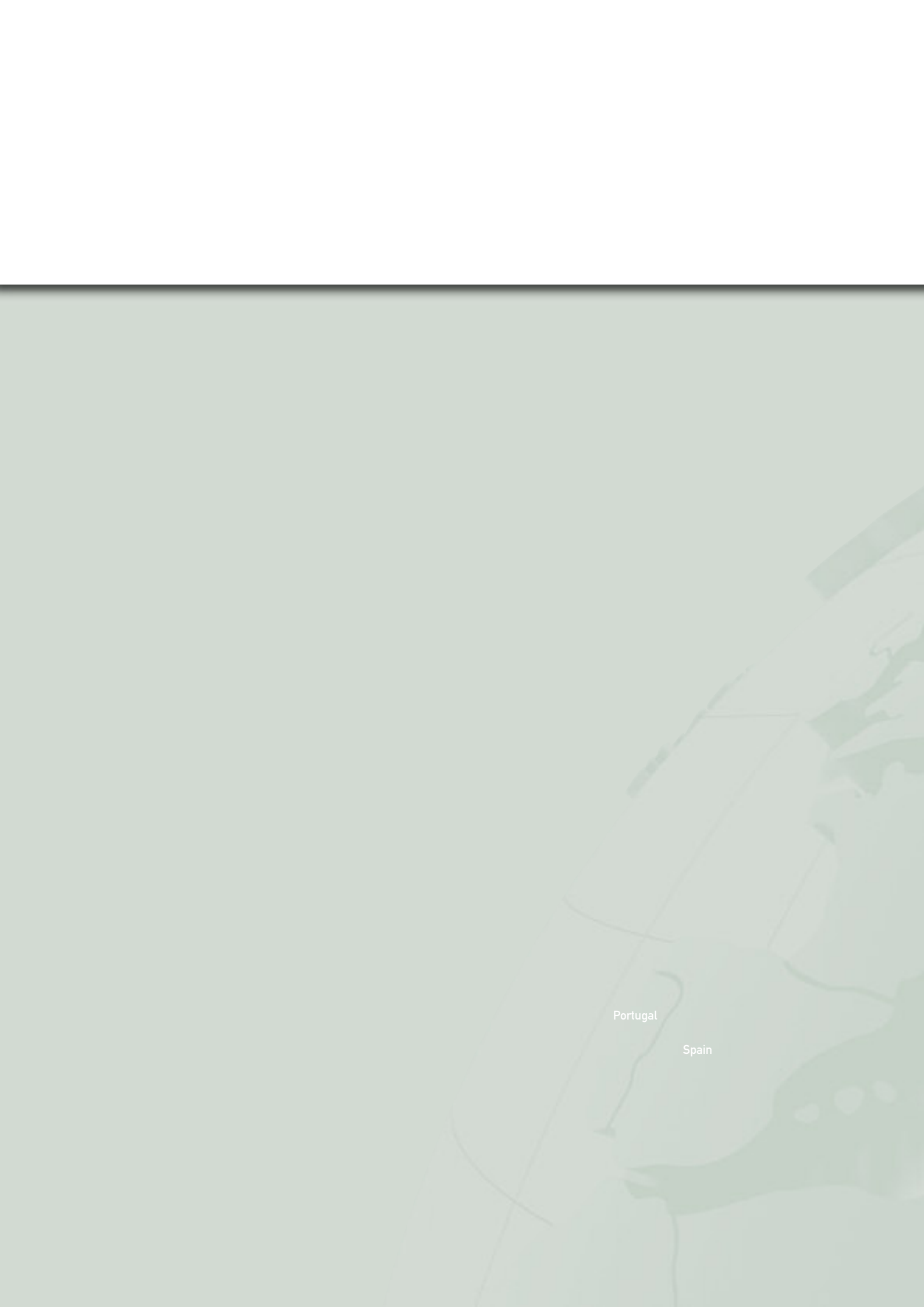
Panasonic

Biomedical Equipment

catalogue 2012- 2013

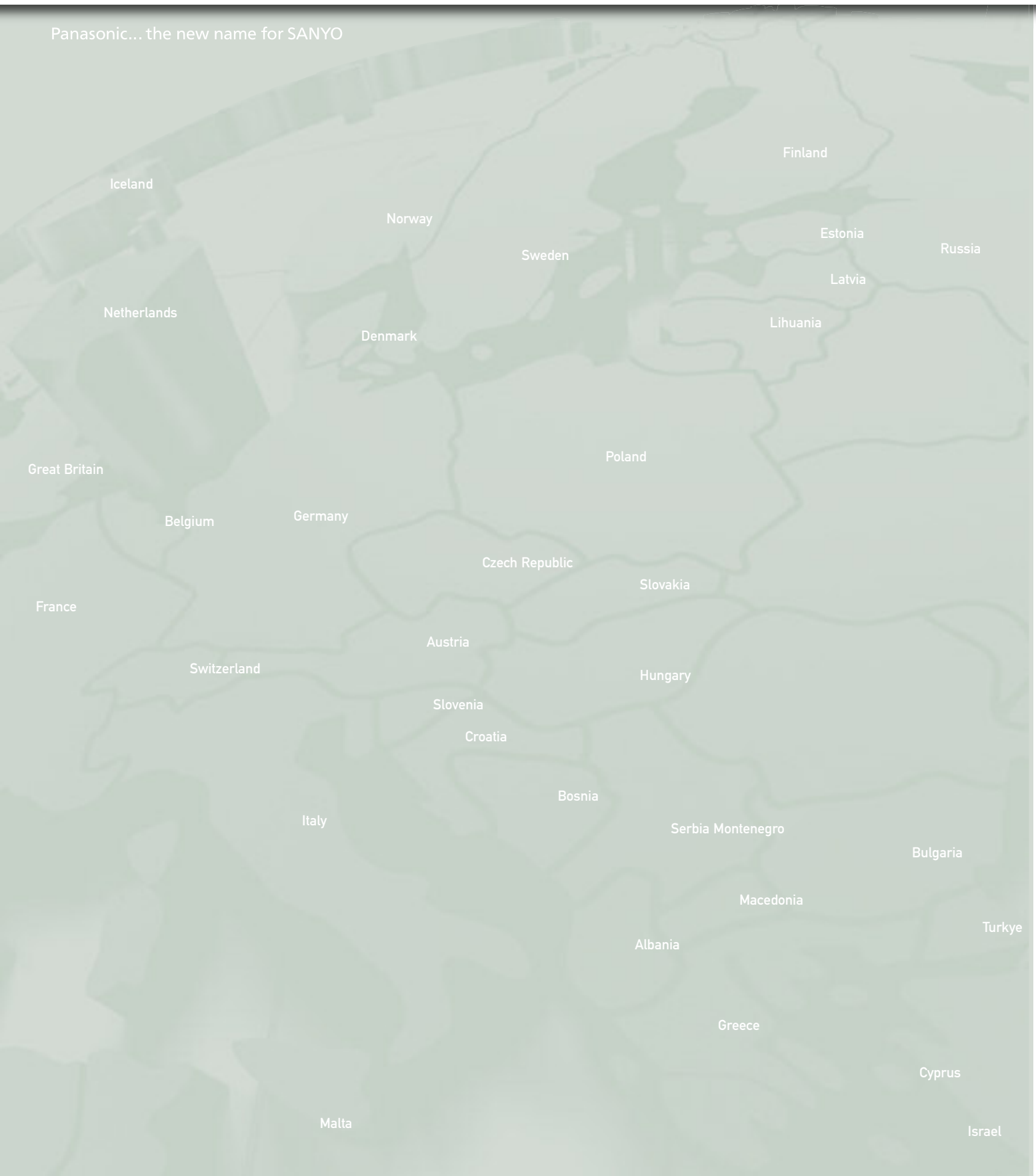

Portugal
Spain

Panasonic

Biomedical Equipment

catalogue 2012- 2013

Panasonic... the new name for SANYO



What's in a name?

As you can see, this new 'SANYO' catalogue is now a Panasonic catalogue, but the products and the customer experience are still the same.
On 1st April 2012 the SANYO Biomedical company in Europe (SEEE) became the Panasonic Biomedical company (PHCBE), so from that date the name on our Biomedical equipment also changed to Panasonic.

After more than 25 years of success in Europe this is an important step for our company. Bringing new engineering resources to the group will result in new products and even greater technical innovation.

The European sales and service organisation you are used to working with is not changing! You will have the same personal contacts, the same high service level and, above all, the same experience. This is because our success over the years has been built on mutual trust and understanding – between our customers and our companies in the UK, France and The Netherlands; between our company and dealers in more than 40 countries; and among our worldwide colleagues.

I sincerely want to thank our customers and colleagues for the success we have achieved. Without you we could not proudly say that we are the market leader in many countries worldwide in ULT freezers and CO_2 incubators. Without you we could not deliver tailor-made solutions in so many countries.

From now on you will see the name of 'Panasonic' on our equipment, a company well known throughout the world for inventing many state-of-the-art electronic products and making the impossible possible.
As our respected customer you can trust us and expect 100% commitment from our company to support you and your research. It is certain that as a Panasonic Biomedical company we will offer many innovative new 'Ideas for Life'!

Hans Brok
Panasonic Biomedical
Sales Europe B.V.

Contents

Name: Christopher Busuttil

Location in our network:
Scientific Consultant for Panasonic Biomedical products at Evolve LTD, Malta.

favourite place:
St. John's Co-Cathedral, Valetta, Malta. Because of the attention to detail in every corner which leads to grandeur. Majestic.

St. John's Co-Cathedral, Valetta, Malta

14°30'45.00"N 14°30'45.00"E

MALTA - BIOMEDICAL NETWORK

Panasonic Biomedical Sales Europe B. V.

Since April 1st 2012 Panasonic Biomedical Sales Europe B.V. is the new name for SANYO Biomedical as a result of the completion of SANYO's merger with Panasonic. We will continue to maintain and improve our high quality standards for our products and customer service.

In addition, as a Panasonic company, we now have access to extensive research and development resources that will continue our long standing leadership position in innovative technologies, available via the Panasonic network of manufacturing and research facilities worldwide.

We look forward to an exciting future and will continue to provide you with industry-leading biomedical laboratory equipment, supported by the high quality service you rely on. Our Number One priority is to continue to develop close, longstanding customer relationships through our dedicated sales and service network.

Panasonic Biomedical Sales Europe B. V.

Panasonic Biomedical Sales Europe BV, part of the Panasonic Healthcare Company (HCC), manages sales, marketing, logistics and technical service of Panasonic laboratory products throughout Europe (including Russia and Turkey). Headquartered in the Netherlands with sales and service organizations in the UK, France and the Netherlands.

In the Dutch warehouse, about 1.000 units 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 Panasonic's Biomedical European sales organization.

Medical and Laboratory equipment

Conservation system
-152ºC/-150ºC/-86ºC Ultra-low temperature freezers (MDF)
-40ºC/-35ºC/-30ºC Medical freezers (MDF)
Blood bank refrigerators (MBR)
Pharmaceutical refrigerators (MPR)
Freezers/refrigerators with dependable internal temperatures.

Culturing system
CO_2 Incubators (MCO)
Cooled incubators (MIR)
Heated incubators (MIR)
Plant growth chamber (MLR)
Incubators for advanced research and testing.

Drying & sterilising system
Laboratory ovens (MOV)
Dry heat sterilisers (MOV)
Autoclaves (MLS)
Equipped with electronic control systems, these models limit temperature fluctuations

Automated hospital pharmacy system
Automatic tablet counting and packaging machine (ATC)
Based on microcomputer advances, this unit enables accurate tablet dispensing and reduces operating costs.

Corporate brand

The Panasonic brand name was created in 1955 and was first used as a brand for audio speakers. It is a combination of the words, "Pan", and "Sonic", sound and has a meaning of bringing sound our Company creates to the world. Since 2008, it is used as the corporate brand representing the Company, products and services.

Corporate vision

Panasonic aims to be the No.1 Green Innovation Company in the Electronics Industry in 2018, the 100th anniversary of our founding. We will make the ‘environment’ central to all of our business activities and take the lead in promoting the ‘Green Revolution’ which is taking place around the world for the next generation. Specifically, we will work to realize our vision with these two ‘innovations.’

Panasonic

Brand Promise

Panasonic generates ideas for life... today and tomorrow. Through innovative thinking, we are committed to enriching people's lives around the world.

We believe the best idea's come from attentive observation of everyday living, carefully listening to customers... and a constant commitment to making life easier, more comfortable, more fun.

Every Panasonic product or service is created from these "ideas for life." Ideas to put a smile on your day and brighten our children's horizon. Ideas that embrace the planet and bring people of all ages together.

As a gobal company, Panasonic has been in touch with different peoples around the world for nearly a century. This puts us in a good position to translate "ideas for life" into the values and lifestyles our customers aspire to.

Today you will find our name on products and services that connect with every facet of daily life. This "whole life" perspective is what makes Panasonic such a trusted brand in so many languages, and every day we work to earn that trust.

That's our promise to you.

Let us help you to protect your results - At Panasonic we appreciate how much your samples and products are worth to you. Your chosen equipment has been manufactured using world leading technology and specialist engineering, so it is important that we continue to provide the best support and care possible to maximise the potential and lifespan of your equipment. We have a dedicated team of Panasonic Service Specialists who are trained to carry out repairs and service to our exacting standards, ensuring the support you need during the life of your equipment.

Using our many years of experience and collaboration with our customers, we have designed a number of service options to suit your requirements and budget.
During a Preventative Maintenance visit, using the latest technical information and recommended test equipment, our specialists will carry out extensive tests, and make any necessary adjustments to provide optimum performance.

- Dedicated Service Team focusing on Panasonic Biomedical Products
- Comprehensive range of Preventative Maintenance Plans
- In Warranty Maintenance
- Free Technical Support
- Installation
- Commissioning
- Calibration
- Validation
- Repairs
- Fully equipped workshop
- Genuine Panasonic spares

Service Training Information
Panasonic Biomedical Sales Europe B.V. offers field service training courses to third party service providers and our European distributors on all laboratory products offered in Europe.

Our field training courses are directed toward refrigeration, electronic and biomedical technicians already familiar with the basics of troubleshooting refrigeration and/or electronic equipment and can be customized to reflect the needs of the individuals being trained.

Panasonic provides a comprehensive approach that includes theory and hands on instruction to maximize the benefits in the least amount of time, utilizing the latest technology available through a variety of media. We recognize the fact that skilled people are a valuable asset to the institutions they are servicing. Our unique field training approach allows for proper training on equipment without the disruption and expense of having your skilled people unavailable for long stretches of time.

At Panasonic, we realize that to remain leaders in our industry, we must ensure that the quality of our product is maintained through the integrity of our service offerings and the network of individuals who support our product in the field with the most up-to-date information available. Therefore, we offer our training courses at minimal cost to qualified individuals and institutions.

Working together with one goal - Panasonic Biomedical has established a worldwide reputation as a manufacturer of high quality medical equipment over the past twenty five years. Together with the high standard of service we deliver, it makes us a major player in the biomedical market.

Logically we want our Panasonic dealers to offer you the same high standard of service that belongs to our equipment. Therefore Panasonic only works with dealers that do guarantee this quality. So whether you buy directly from us, or from one of our European distributors,

you are always sure that maintenance will be done by Panasonic certified service engineers who have received full, hands-on training for all Panasonic products.

In this way Panasonic provides their customers with the best products and service! or In this way Panasonic guarantees the best products and service for their customers!

Service will only be done by Panasonic trained and certified engineers

Matterhorn, Switzerland

45°58.34.00"N 7°39'30.65"E

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

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

CE 0123

Panasonic Healthcare Co., Ltd, Gunma Factory is certified for:
Quality management system: ISO9001
Medical devices quality management system: ISO13485

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

In anticipation of these developing technologies and possible changes in the regulatory landscape, Panasonic began to introduce Medical Device certified products in 2011. The first models to be certified include the:

- MDF-U55V, MDF-U74V and MDF-U700VX ultra-low freezers.
- MBR-305GR Blood bank refrigerator.
- MCO-19AIC CO_2 Incubator with rapid Hydrogen peroxide vapour decontamination option.

Innovation
Our reputation is built upon world-class design and refrigeration systems developed specifically for ultra-low temperature applications. In fact, Panasonic has pioneered the development of new technologies for ultra-low temperature storage from the -152°C freezer, the introduction of application specific CFC-Free refrigerants and the first -86°C freezer with Vacuum Insulation (VIP).

More recently Panasonic introduced the next generation of compressors for ultra-low freezers. Cool Safe compressors provide new levels of durability with significantly reduced power consumption, heat output and noise.

- -152°C Ultra-low Freezers
- -86°C VIP Upright Freezers
- -86°C Chest and Upright Freezers
- Plasma Freezers
- -30°/-40°C Biomedical Freezers
- Inventory rack system
- Medical Pharmaceutical Refrigerators and Enviro-Centers
- Panasonic Bio Secure
- Blood Bank Refrigerators
- Laboratory Refrigerators
- Isothermal Freezers
- Liquid Nitrogen Storage

World Class Design
Performance - Panasonic refrigeration systems offer superior performance and durability, even in high ambient temperatures and in response to frequent door openings. The cooling system also maintains uniform temperatures throughout the freezer, which is especially important when validation is required.

Low Frost Design - Fully insulated inner doors, advanced gasket design and heated door frames combat excessive ice build-up and ensure an effective seal against ambient air. This reduces routine maintenance and keeps samples safe.

Vacuum Insulation (VIP) - Panasonic was the first company to introduce vacuum insulation panels to ultra-low temperature freezers. The Panasonic range of VIP freezers provide typically 25% more storage capacity for a given floor area saving valuable laboratory space.

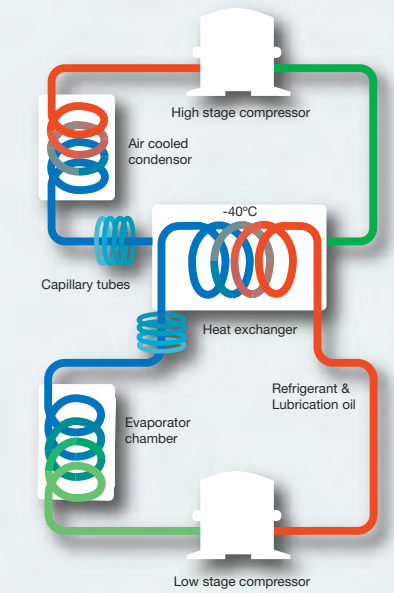
Sample Security - Advanced microprocessor controls constantly monitor freezer operation and ambient conditions to ensure reliable operation. Extensive audio-visual alarms and remote alarm contacts give immediate notice of a fault condition. Back-up and monitoring options are available.

Refrigeration cycle
The compressor compresses refrigerant gas and sends it to the condenser which transfers heat energy to the air. Under pressure, this allows the gas to change state to a liquid. The now cool refrigerant liquid travels to the capillary tube, which reduces the pressure. When the cool liquid refrigerant enters the evaporator at a reduced pressure it will want to turn back into a gas. The only way it can do this is to absorb heat energy, thus cooling the inside of the freezer or refrigerator. The now warm refrigerant gas returns to the compressor to begin the cycle again.

The role of the lubrication oil is to prevent the moving parts of the compressor from failing. Lubrication oil will exit the compressor with the refrigerant making it important that these two are able to mix. This will allow the lubrication oil to return to the compressor without collecting in small tubes or corners thus causing a blockage of the gas or liquid refrigerant flow. (commonly referred to as oil logging).

The above explains the common single compressor system, which is typically used to achieve temperatures down to -40ºC to -50ºC.

To achieve temperatures of -86ºC or below it is common to use a dual or cascade refrigeration system. A cascade system utilizes two separate refrigeration systems called the low and high stages. These stages share a common heat exchange area. The condenser of the low stage is the evaporator of the high stage. This means the low stage is responsible for removing the heat from the storage chamber and the high stage removes the heat from the low stage.



Name: Angela Skorobogataja

Location in our network:
Export Area Manager,
Panasonic Biomedical Sales
Europe B.V., EttenLeur,
The Netherlands

Favourite place:
Russian forest in wintertime

RUSSIA - BIOMEDICAL NETWORK -

Russian Forest

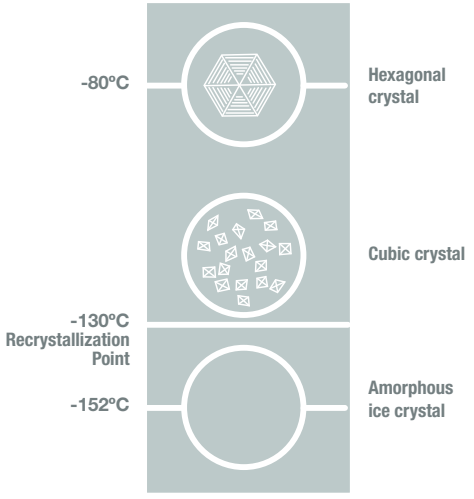
65°27'38.45"N | 124°07'25.50"E

The world of -152°C

Achieves stable long-term preservation of cells and tissues.
In preserving cells or tissues at ultra-low temperatures, the point is to prevent amorphous ice crystals from recrystalizing within and outside the cells. These ice crystals have smaller diameters than the smallest substances (4,000 to 7,000A) that compose cells or tissues.
When ice crystals become amorphous, they are stored using cryoprotective agents such as glycerine and dimethyl sulfoxide (Me_2SO). The speed of ice crystal formation is thus further restricted during preservation below a certain temperature, and complete vitrification is possible. -130°C is the recrystallization point of pure water in the ultra-low temperature zone. This is the temperature at which amorphous ice crystals recrystallize.

For a mixed solution containing Me_2SO and other cryoprotectants, recent research confirms that recrystallization occurs around -115°C. Thus samples maintained in an ultra-low temperature freezer at -152° C, far lower than the recrystallization point, can be semi-permanently preserved. Such preservation maintains vitrification without further crystallization within and outside cells. Other recent findings show that preserving cattle sperm at -135°C is insufficient, and also that superconductivity experiments require temperatures of at least -148°C. These cases show the increased necessity of -152°C freezing.

Why freeze to –152°C ?
Recrystallization mechanism



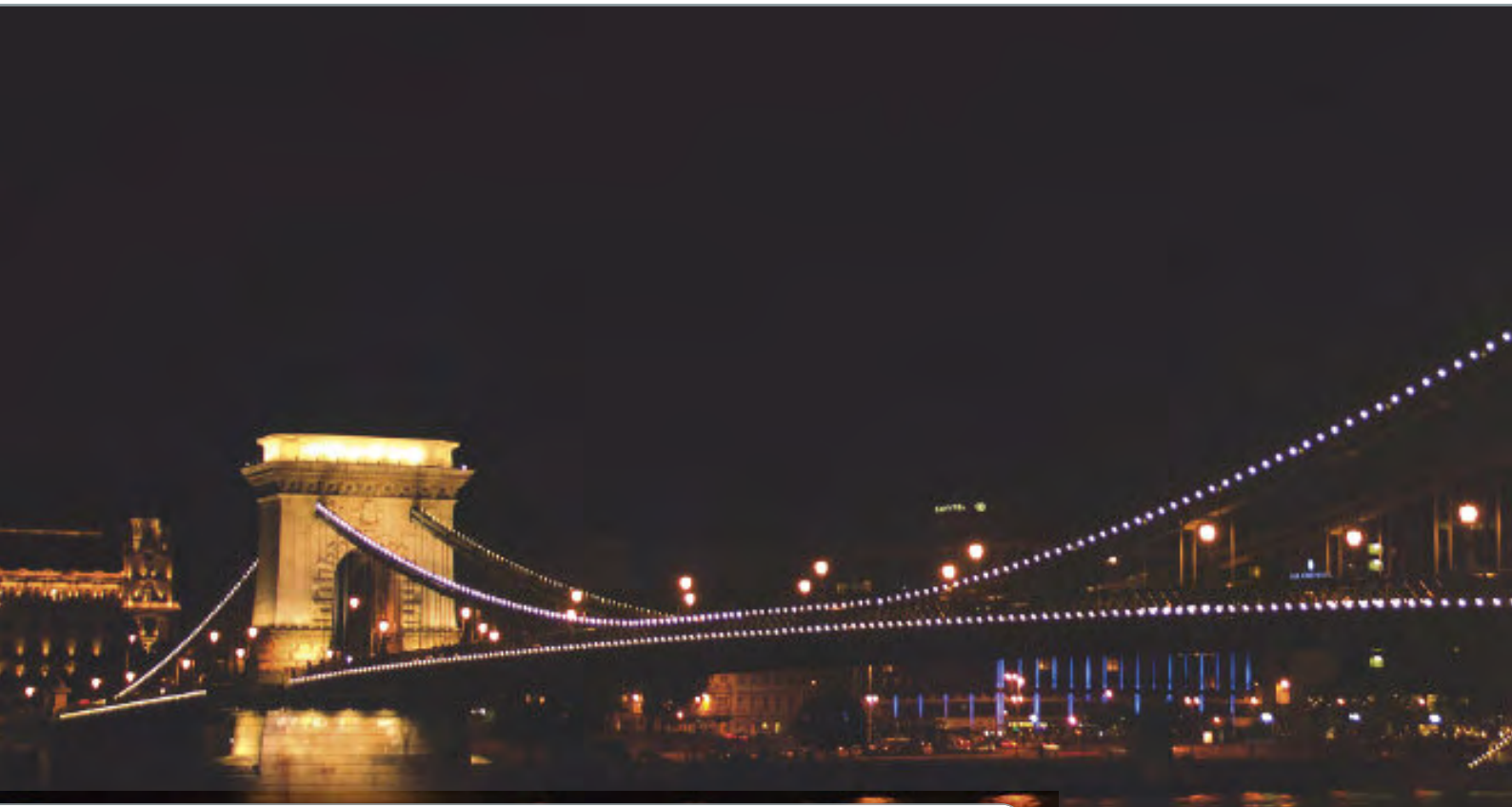
Until recently, liquid preservation containers were mainly used when preserving valuable samples over long periods. This method however, involved troublesome liquid control and the dangers of a liquid supply. In addition, mycoplasma etc. could cause cell and tissue contamination in liquid phase preservation. As a solution to this problem, demand for vapour phase preservation has increased. In preservation with liquid Nitrogen vapour, temperatures can rise to approximately -150ºC, almost the same as the ultra-low temperature freezer's inner cabinet temperature of -152ºC. And freezer preservation provides users with numerous advantages; no worries about sample contamination, no liquid supply problems, no danger of sudden liquid eruptions, and low operational costs. This freezer provides easier and more stable long-term storage below the recrystallization point than ever before.

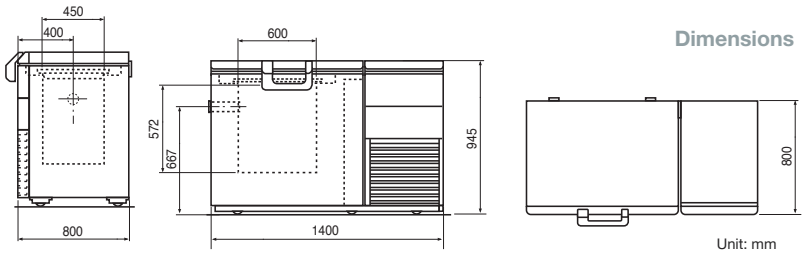
Features

HCFC-Free special mixed refrigerant
Panasonic has developed a special mixed refrigerant, replacing chlorofluorocarbons (HCFCs) that deplete the ozone layer. This new cooling system virtually eliminates damage to the earth's environment.

Specially designed compressor and cascade refrigeration system for an ultra-low temperature of -152ºC
A highly efficient, exclusive compressor has been specially developed and incorporated in the freezing unit. A refrigeration circuit with the Cool Safe compressor cascade refrigeration system enhances reliability of long-term preservation. With a powerful low noise design afforded by traditional ultra-low temperature technology, this freezer delivers durable, stable cooling.

Microprocessor temperature control with LED digital display allows accurate temperature control
Accurate temperature setting, confirmation and operation are all possible through microprocessor temperature control with a LED digital display and flat key data entry. The world's first electronically controlled freezer, this model maintains inner cabinet temperature at an ultra-low -152ºC (ambient temperature of 30ºC), far lower than the recrystallization point for pure water (-130ºC). This low temperature provides an ideal





Dimensions

Unit: mm

preservation environment for long-term storage.

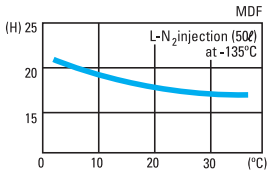
High-efficiency oil separator for stable ultra-low temperature environments
Compressors continuously repeat highly compressed operations, so lubricant oil is essential to prevent abrasion and seizure. But when lubricant oil circulates in the refrigeration circuit, piping becomes clogged and results in compressor damage. Incorporating an exclusive high-efficiency oil separator, the MDF-1156 effectively separates lubricant oil from refrigerant, offering a stable ultra-low temperature environment.

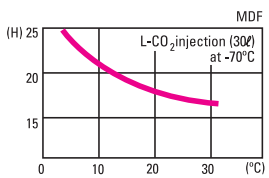
Special foamed-in-place polyurethane insulation material
The temperature difference between the inside and outside of the MDF-1156 unit reaches a maximum of 182ºC. In the ultra-low temperature range below -100ºC, ordinary foamed-in-place polyurethane insulating material can become cracked and warped. Specially designed to withstand low temperatures, Panasonic's foamed-in-place polyurethane is 170 mm thick and highly resistant to extreme temperature differences, thus helping maintain inner temperature stability.

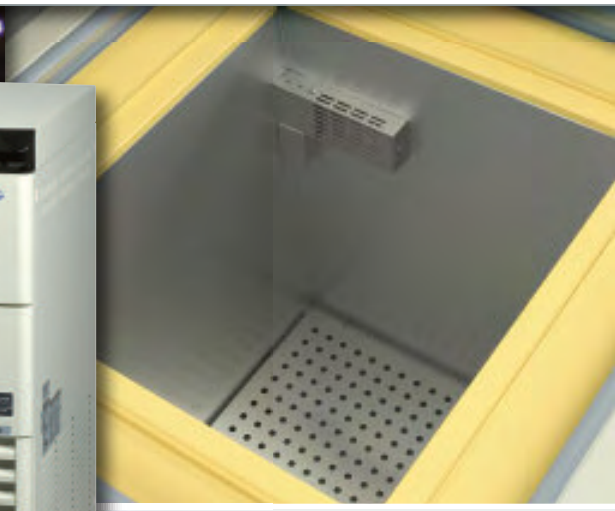
Various alarm and safety devices for protecting valuable samples
Microprocessor-controlled filter-clogged check function protects the refrigeration circuit. High temperature warning equipment automatically indicates when the temperature deviates 15ºC from the set temperature. The power failure alarm lamp and buzzer are activated in case of power failure or irregular temperature increase. A remote alarm contact is fitted. ATN models are also equipped with an auxiliary back-up system for liquid Nitrogen.

Inner cabinet's easy-to-use design
Accommodates world standard 2"and 3"boxes.

Effect of ambient temp. on holding time of liquefied gas





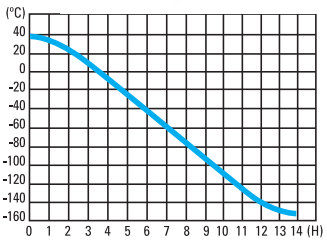


Options

LCO_2 backup system	CVK-A (MDF-1156)
LN_2 backup system with recorder	CVK-ATN2 (MDF-1156)
Temperature chart recorder (-170°C to +30°C)	MTR-155H
Chart paper	RP-155
Ink pen	DF-38FP
Storage case	MDF-49SC
Inventory racks	see page 60

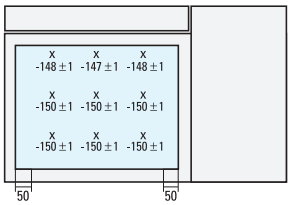
Performance data MDF-1156 / MDF-1156ATN

Pull-down characteristics



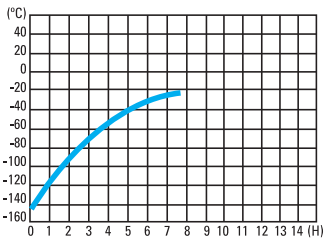
Temp. distribution inside cabinet

-150°C setting,ambient temperature 35°C, no load

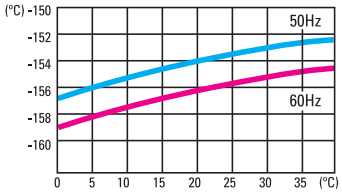


at: 20°C low-temp. side operation rate 72%
ON: 10min OFF: 4 min

Pull-up characteristics during power failure



Effect of ambient temp. on inside temp.



Applications

Preservation

- Cancer research: Tumor Cell Preservation
- Blood or Bone Marrow Preservation
- Bacteria Research: Virus Preservation
- Sperm & Fertilized Ovum (Bull, Goat, Horse, Pig, Chicken) Preservation
- Plant Cell Preservation (ie. Pollen)
- Monoclonal Antibody Preservation

Environmental Experiment

- Superconductivity & Electronics Experimentation (-148°C)

User

- University
- Private Institute
- Public Research Center
- Hospital

The world's largest capacity -150°C freezer

Ultra-low -150°C freezer with third generation VIP insulation.
The freezer is equipped with Panasonic developed third generation Vacuum Insulation Panels.
This improved VIP insulation is extremely efficient and results in a -150°C freezer with a capacity of 140 world standard 2" boxes, the largest capacity -150°C freezer in the world!

New control panel with graphic LCD display
All the alarm functions, self-diagnostic notifications and a digital graph of the temperature are available in the new, specially designed LCD display. The blue display provides a clear image of the temperature and gives a notification in the case of abnormalities in temperature, ambient temperature, power supply etc.

New Cool Safe compressors
The MDF-C2156VAN is equipped with the new Cool Safe compressors. The compressors achieve a 10% higher energy conservation and the aerodynamically designed and placed components in the refrigeration compartment provide superior airflow,

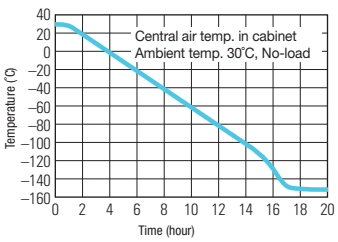
making it possible to significantly reduce the stress to the freezer and contributing to excellent durability.

New double door gaskets
The temperature difference between the inside of the cabinet and the ambient temperature can be up to 180°C! To prevent leaking the MDF-C2156VAN is equipped with a new double door gasket.

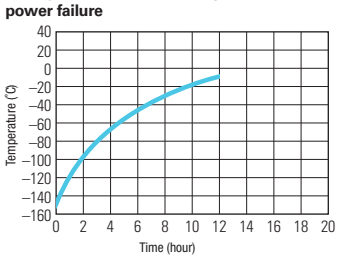
Environmentally friendly
The MDF-C2156VAN utilises binary mixed non-HCFC refrigerants. The new Vacuum Insulation Panels and double door gaskets reduce the power consumption.

Performance data MDF-C2156VAN

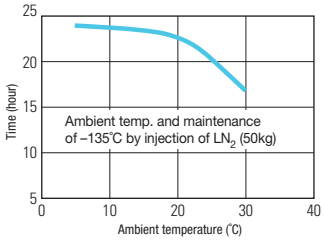
Pull-down characteristics



Pull-up characteristics during power failure



LN_2 back up system operation characteristics



The Next Generation Compressors: Cool Safe

A wide range of Ultra-low temperature freezers.
We've selected a line-up of different types and models of ultra-low freezer which can achieve and maintain temperatures down to -152ºC. Designed to meet your needs Panasonic ultra-low freezers are suitable for uses such as long term preservation, testing, frozen storage etc.

Specially Designed Compressor for Ultra-Low Temperature.
Evolving through continuous innovation; the reliability and performance of our specially designed ULT compressors has always been unmatched. Our ULT freezers are considered to be the top of the market all over the world. Where others would be satisfied with such performance, we are always searching for improvements.

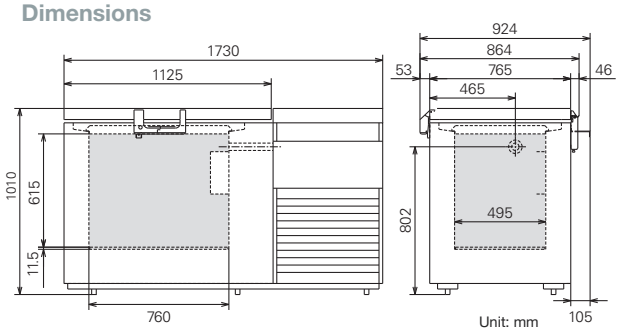
This resulted in developing the next generation of compressors: **Cool Safe**.

The Cool Safe compressors achieve a 10% higher energy

Options

Temperature chart recorder (-170°C to +30°C)	MTR-155H
Chart paper	RP-155
Ink pen	DF-38FP
Mounting kit	MDF-S30150
Storage case	MDF-49SC
Inventory racks	see page 60
Communications Interface	MTR-480

Dimensions



conservation and the aerodynamically designed and placed components in the refrigeration compartment provide superior airflow, making it possible to significantly reduce the stress to the freezer and contributing to excellent durability.

Why change a winning team is a phrase that is often heard. We changed it to obtain even better performance.

A compressor that produces less heat than before, a noise level even lower than before and a reliability and performance even more unmatched.

We are the only ULT freezer manufacturer capable of developing our own compressors. This is what we do and we are good at it!

Cool Safe™

MDF-U500VX
519 LITRES
352 2" BOXES
224 3" BOXES

Twin Guard DUAL COOL TECHNOLOGY

VIP Plus+ VACUUM INSULATION

VIP series
Vacuum Insulation Panel

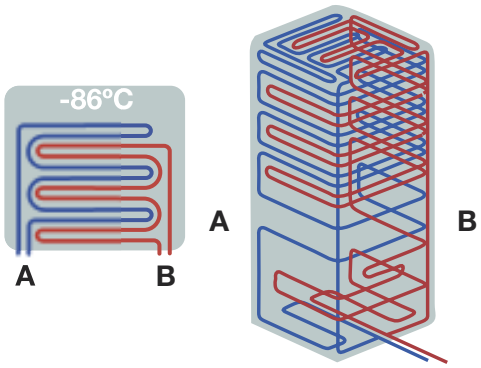
Ultra-low temperature Dual Cooling Freezer

- Extreme secure Dual Cooling System
- Evolutionary design VIP PLUS insulation
- Energy saving ECO mode operation
- Intelligent controller interface with data log function

Acropolis, Athens, Greece

37°58'21.10"N 23°43'34.20"E

MDF-U700VX
728 LITRES
528 2" BOXES
336 3" BOXES



Features

Secure storage with New Dual Cooling System

The Twin Guard Dual Cooling System is newly designed to provide the highest level of security for valuable biological samples. Two individually controlled compressors provide a reliable and exceptionally stable -86°C ultra-low temperature environment. In the case of unexpected failure of one of the cooling circuits, the other circuit will maintain the freezer in the -70°C range, protecting samples until service can be arranged.

Developed for use with conventional inventory racks and boxes, the Twin Guard Series is ideal for storage of sensitive, high-value samples.

TWIN GUARD
-86 Dual Cool Technology

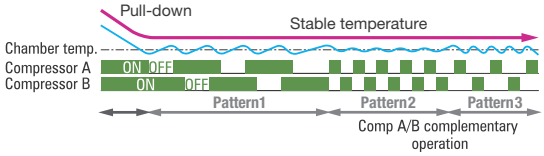
General Features & Benefits

What It Is	What It Does	Why It Is Important
-86 DualºCool Refrigeration Technology	Two independent refrigeration systems operate together or individually, depending on demand and performance environment.	One refrigeration system is always available to back-up the other in the event of a component failure.
ECO mode Performance	Two independent refrigeration systems running in overlapping cycles,	ECO mode optimizes run time, minimizes energy costs and maximizes interior temperature uniformity.
Environmentally Friendly Refrigerants	Eliminates potential for ozone depletion while maintaining cooling capacity.	Complies with the Montreal Protocol and IEC for safety and efficiency.
Filterless Condenser Design	Transfers energy from the refrigeration system with minimal heat output.	Eliminates the need for an air filter; optimizes heat exchange and minimizes compressor heat built-up over time.
Patented VIP PLUS Vacuum Panel Composite Insulation	Combines high-efficiency vacuum-panels with conventional polyurethane structural foam and barrier film into a high-tech wall assembly.	Increases interior volume within conventional dimensions offering more storage capacity per m^2 of occupied floor space.
Integrated Graphical LCD Control Center	Combines all control, alarm, monitoring and data management functions into a single door-mounted system controller.	High visibility LCD display provides a convenient user interface to setpoints, current and previous temperature status, alarm parameters, internal diagnostics, communications and security.
Structural Enhancement	Integrates inventory management, access and site installation.	Cabinet design attributes include high-strength, lockable door latches and doors, latchable inner doors, adjustable shelves, vvacuum release port and locking casters to simplify operation, installation and to satisfy local codes.
Compliant to International Standards	Assures quality standards, safety and performance criteria are met or exceeded.	Essential for compliance with LEEDs, RoHS, UL and other third-party standards and recommended practices.

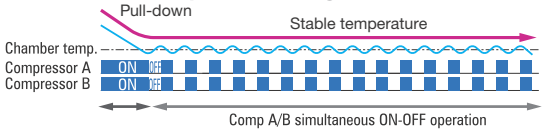
High efficiency insulation with VIP PLUS Technology
Panasonic's latest development in vacuum insulation is VIP PLUS technology. This revolutionary vacuum insulation cabinet construction reduces the wall thickness by approximately one half and achieves up to 30% more storage capacity than a conventionally insulated freezer, maximizing storage capacity and saving valuable lab space. Just as importantly, VIP PLUS insulation contributes to the overall energy efficiency of the MDF-U500VX and MDF-U700VX.

Industry first intelligent ECO mode operation
The industry's first "ECO mode" operation on these Twin Guard models achieves approximately 15% energy saving compared to a conventional model. In ECO mode, the microprocessor controller constantly monitors the load status on the freezer to optimize the operation of the two compressors to minimize energy use whilst protecting valuable samples.

ECO mode operation image



NORMAL mode operation image



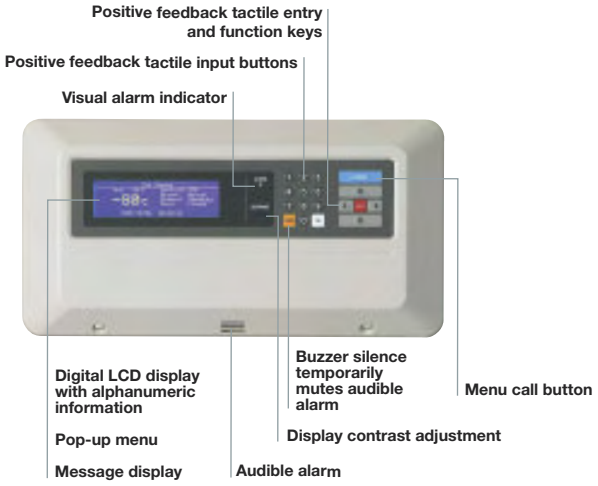
Intelligent interface

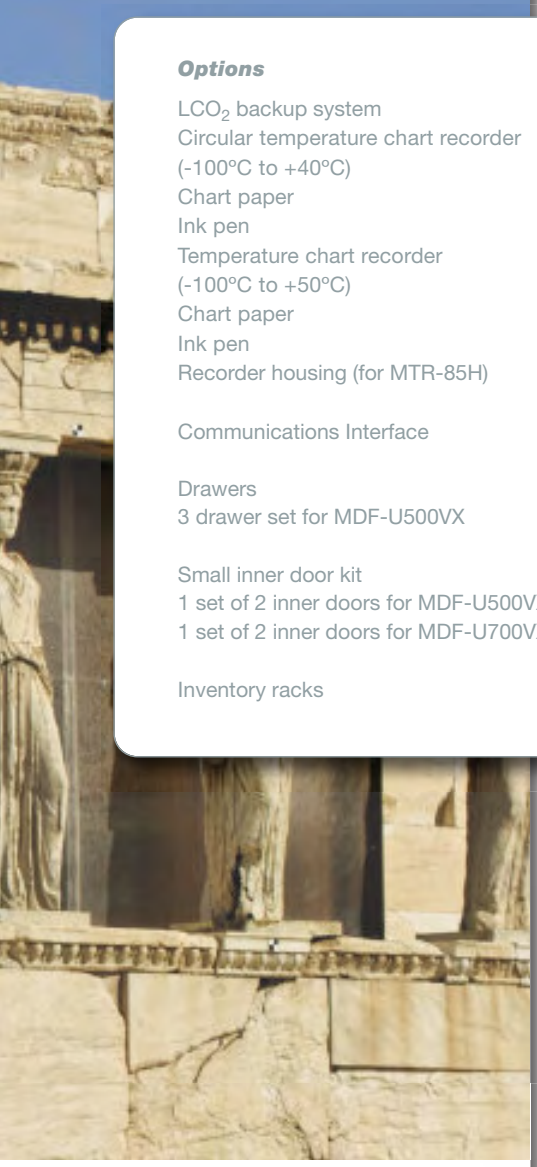
The new LCD display control panel is located at eye level for improved visibility and ease of use. A data log function stores recent temperature data allowing the user to quickly check freezer performance. This data can be directly downloaded to a PC via an optional data interface.

User-Friendly Design

Comprehensive alarms including high/low temperatures, door ajar, power failure alarm and part replacement notification help to keepsamples safe even in an emergency.

- A vacuum release port allows smooth door opening when the door is tightened by negative pressure generated from temperature difference between chamber and ambient environment.
- Filterless construction eliminates bothersome filter cleaning.
- New rugged, one-handed outer door latch allows a padlock to be attached.

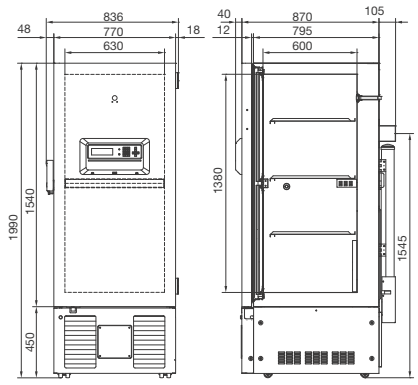




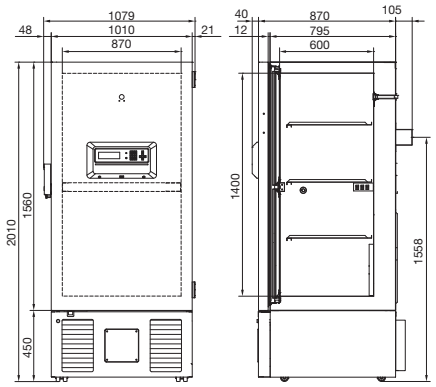
Options

LCO_2 backup system	CVK-UB2
Circular temperature chart recorder	
(-100°C to +40°C)	MTR-G85
Chart paper	RP-G85
Ink pen	PG-R
Temperature chart recorder	
(-100°C to +50°C)	MTR-85H
Chart paper	RP-85
Ink pen	DF-38FP
Recorder housing (for MTR-85H)	MDF-S3085
Communications Interface	MTR-480
Drawers	
3 drawer set for MDF-U500VX	MDF-50R
Small inner door kit	
1 set of 2 inner doors for MDF-U500VX	MDF-5ID
1 set of 2 inner doors for MDF-U700VX	MDF-7ID
Inventory racks	see page 60

Dimensions

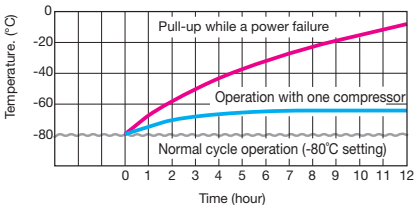


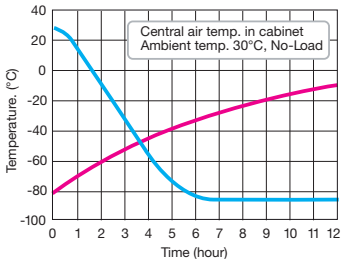
MDF-U500VX



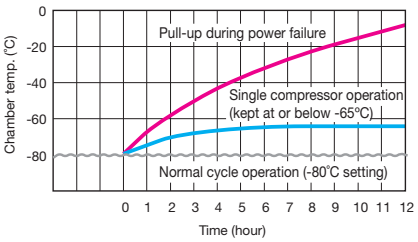
MDF-U700VX

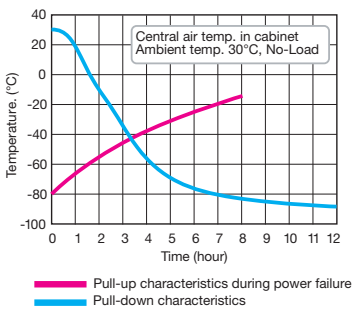
Performance data MDF-U500VX

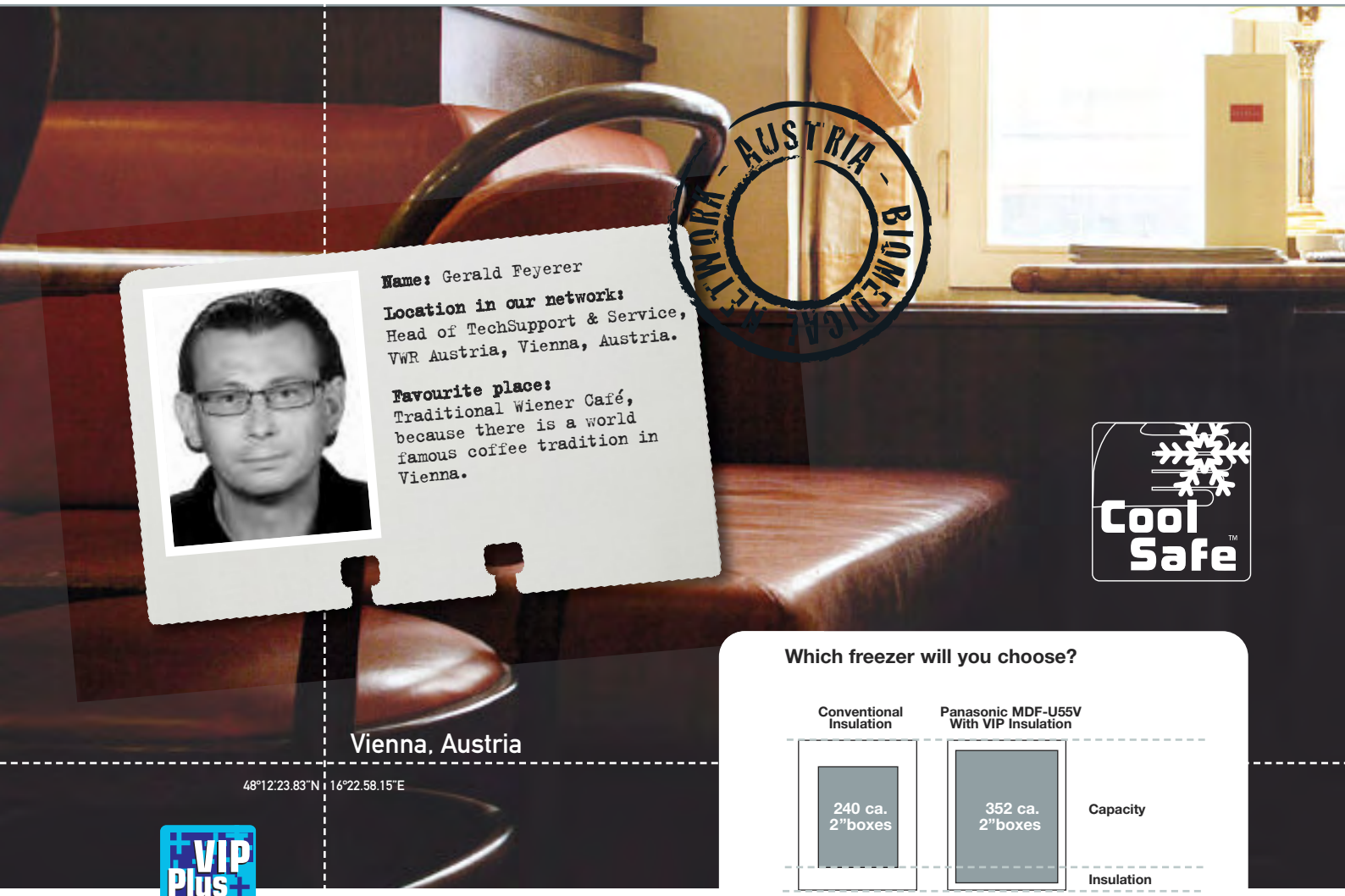




Performance data MDF-U700VX







Energy-efficient, ultra-low temperature VIP freezers

- Industry leading -86°C preservation for uniformity, reliability and reduced footprint.
- New Panasonic Cool Safe refrigeration system designed to deliver energy-saving, high performance cooling.
- Secure storage for valuable research and clinical samples.

Panasonic VIP ultra-low freezers represent the industry's most complete combination of refrigeration, control, alarm, monitoring and accessibility for product safety at -86°C. Ideal for sample storage in repositories, hospitals, clinics and medical research facilities, the VIP Series is designed to reduce energy consumption.

Enhanced Performance
Panasonic VIP Series upright freezers offer advanced cabinet design, electronics, refrigeration and critical components for enhanced product security, better performance and cost effective operation at -86°C.

The Panasonic cascade refrigeration system uses Panasonic designed compressors specific to ultra-low applications for high-performance, reliability and peace of mind. Refrigeration components are carefully selected and matched for optimum operation under demanding laboratory environments.

- Increased cooling capacity improves temperature recovery after door openings.
- The evaporator coil surrounding the chamber interior is strategically designed to provide optimum temperature uniformity from top-to-bottom.
- Quieter operation is achieved through condenser fan blade design, noise reduction insulation, anti-vibration systems and internal compressor noise reduction.

- Voltage boost and surge protection devices provide dependable operation over wider power ranges and environmental conditions.
- The rear ventilation cover combines with the aerodynamically designed and positioned components in the refrigeration compartment to provide superior airflow, drastically reducing the load on the freezer and contributing to improved durability.

Patented VIP Vacuum Insulation Panel
The combination of multiple high-performance vacuum panels with high-density foam insulation provides a reduced wall thickness for maximum interior volume. Panasonic VIP ULT freezers provide up to 30% more storage capacity than a conventionally insulated freezer without increasing the footprint. The MDF-U76V features next generation VIP PLUS vacuum panels for increased energy efficiency and cooling performance.

Panasonic Heat Exchanger Design Increases Energy Efficiency[1]
Every traditional ultra-low freezer design utilizes a heat exchanger. By increasing the efficiency of the heat exchanger through an improved new design incorporating more surface area contact at critical points in the refrigeration system, we are able to improve the overall efficiency and reduce compressor running time. This along with other improvements to the heat exchanger translates to a substantial increase in energy efficiency.

Inner Doors Improve Uniformity
High-strength, sealing, insulated inner doors help minimize change in interior temperatures during routine door openings and ensure maximum chamber uniformity. Easy-In/Easy-Out Panasonic inner door latches seal firmly against the cabinet with one hand operation.

Microprocessor Control
Comprehensive setpoint, alarm, monitoring and diagnostic functions supervised by Panasonic-built microprocessor controller with digital display of all functions. A Status Alert feature constantly monitors ambient and system conditions and notifies the user of any abnormalities before a problem occurs.

[1] Applies to models MDF-U55V, MDF-U76V

VIP Series Features, Benefits and Performance Advantages

What It Is	What It Does	Why It Is Important
Energy-Efficient Refrigeration	Microprocessor control over all cooling functions delivers cooling on demand.	Optimizes run time to minimize energy consumption.
Panasonic Cool Safe Compressors	Specific to ultra-low applications. Reduces compressor temperatures internally and externally.	Increases compressor longevity and reliability. Reduces heat output and lowers HVAC loads in room.
Environmentally Friendly Refrigerants	Eliminates potential for ozone depletion while maintaining cooling capacity.	Complies with the Montreal Protocol and IEC for safety and efficiency.
Integrated Control Center	Combines all control, alarm, monitoring and data management functions into a single system.	High visibility LED display provides a convenient user interface to setpoints, alarm parameters, internal diagnostics, communications and security.
Structural Enhancement	Integrates inventory management, access and site installation.	Cabinet design features include high-strength, lockable door latches and doors, latchable inner doors, adjustable shelves and locking casters to simplify operation and installation, and to satisfy local codes.
Compliant to International Standards	Assures quality standards, safety and performance criteria are met or exceeded.	Essential for compliance with CE, RoHS, and other third-party standards and recommended practices.
Ergonomic Design	One-handed outer and inner door latches and quiet-running compressors improve convenience, minimize sound.	Easy access to controls, displays and inventory racks, while low noise operation permits a wider choice of installation locations.

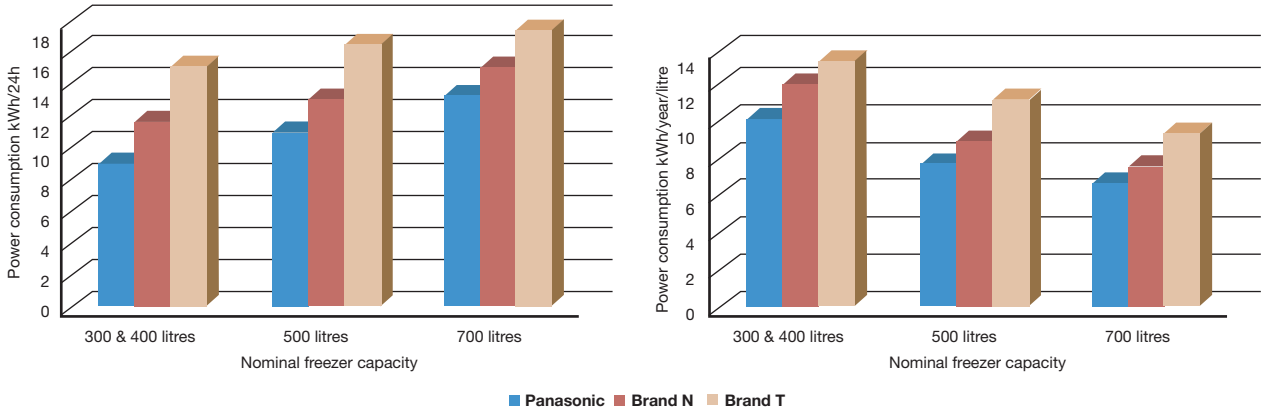
Energy efficient cascade cooling system

One of the most important concepts in designing a superior energy saving ultra-low freezer is how efficiently heat is exchanged between the high and low stage circuits. By providing optimum heat exchange pathways in the design, it not only increases efficiency of the system, leading to greater energy savings, but it will also have an effect of reducing stress on the compressors, leading to greater overall system reliability. Panasonic's new capillary tube heat exchanger is but the latest step in increasing the available heat exchange areas in the system. This patent pending innovation significantly increases the efficiency of the entire system. The end result is less energy consumption, while improving the overall efficiency of the freezer.

Power Consumption Comparison

Space-saving vacuum insulation panel ultra-low upright freezers

Published data. Freezer set-point -80°C, ambient temperature of 20-25°C, 50Hz power supply. Power consumption will depend on loading and operating conditions.



Eco Friendly Technology – helping to reduce running costs and environmental impact.

Panasonic space-saving VIP ultra-low freezers offer 'best in class' energy efficiency, whilst delivering exceptional cooling performance and durability for storing valuable research and clinical samples.

- A microprocessor controller oversees the refrigeration system to regulate cooling cycles, reducing energy consumption.
- Energy efficient Panasonic Cool Safe compressor technology for lower internal compressor temperatures and reduced air-conditioning loads.
- A new low stage capillary tube heat exchanger provides optimum heat transfer leading to greater operating efficiency (Models MDF-U55V, MDF-U76V).
- Advanced cabinet insulation technology for increased energy efficiency and cooling performance.
- Components are compliant with the RoHS directive on the use of hazardous substances in electrical and electronic equipment.
- Commercially available, non-HCFC refrigerants.
- Integrated noise reduction features.

Water Cooled Option

Now a water cooled condenser option is available for facilities equipped with chilled recirculating water systems. This option utilizes the cascade refrigeration design to reuse energy produced by an ultra-low freezer while delivering additional energy-savings and high performance cooling. Ideal for material storage in repositories, hospitals, clinics and medical research facilities, the water cooled system provides a range of benefits.

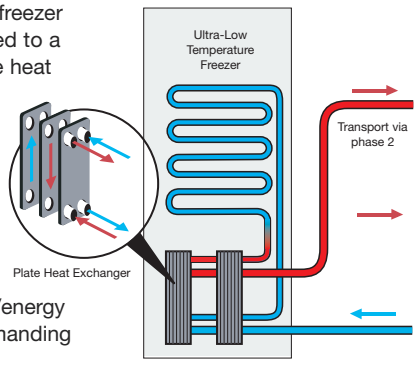
- Energy efficiency
- Cost saving
- Re-use of energy
- Faster recovery time
- Improved sample security

How It Works

Phase 1
Heat generated from the freezer compartment is transferred to a water circuit using a plate heat exchanger.

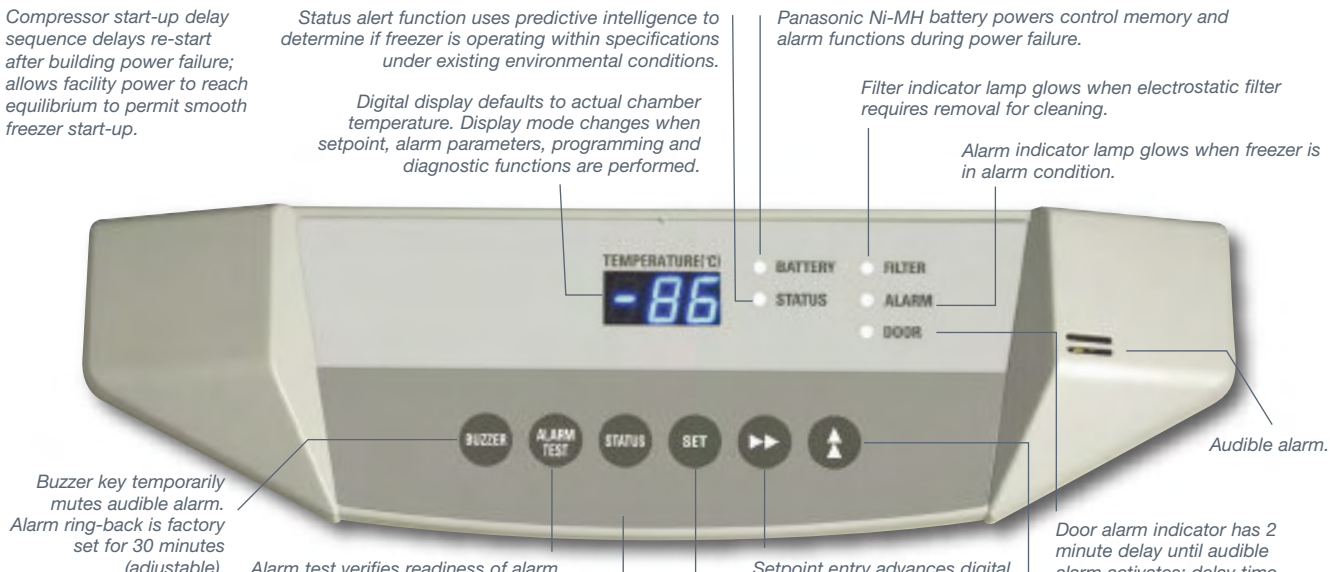
Phase 2
Transport the absorbed heat/energy from the freezer.

Phase 3
Possibility to re-use heat/energy for other heat/energy demanding systems.



Integrated Microprocessor Control System

The Panasonic microprocessor control system is secure, easy to use and comprehensive. Setpoint, alarm parameters and self-diagnostic functions are accessed through a tamper-resistant keypad. The control panel is door-mounted and angled for easy access.



Compressor start-up delay sequence delays re-start after building power failure; allows facility power to reach equilibrium to permit smooth freezer start-up.

Status alert function uses predictive intelligence to determine if freezer is operating within specifications under existing environmental conditions.

Digital display defaults to actual chamber temperature. Display mode changes when setpoint, alarm parameters, programming and diagnostic functions are performed.

Panasonic Ni-MH battery powers control memory and alarm functions during power failure.

Filter indicator lamp glows when electrostatic filter requires removal for cleaning.

Alarm indicator lamp glows when freezer is in alarm condition.

Audible alarm.

Buzzer key temporarily mutes audible alarm. Alarm ring-back is factory set for 30 minutes (adjustable).

Alarm test verifies readiness of alarm function and Ni-MH battery charge.

Alarm setpoints are factory set 10°C above and below temperature setpoint. Alarm parameters are adjustable.

Press to set temperature; set button is also used for other diagnostic functions.

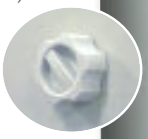
Setpoint entry advances digital display to next position.

Door alarm indicator has 2 minute delay until audible alarm activates; delay time is adjustable.

Setpoint entry advances digital display to next value from 0 to 9.

Multiple access ports permit insertion of independent probes, instrumentation or liquid Nitrogen or liquid CO_2 back-up injectors.

Vacuum relief valve (Available on MDF-U76V)



Remote alarm contacts and optional communication port available; see Options.

Universal keyed door lock offers added security.

Temperature recorder (optional) mounts easily in pre-engineered mounting space.

High impact, recessed casters and leveling feet simplify installation.

Easy-In/Easy-Out door latch for smooth, one-handed operation, positive seal against gasket. Provision for padlock.

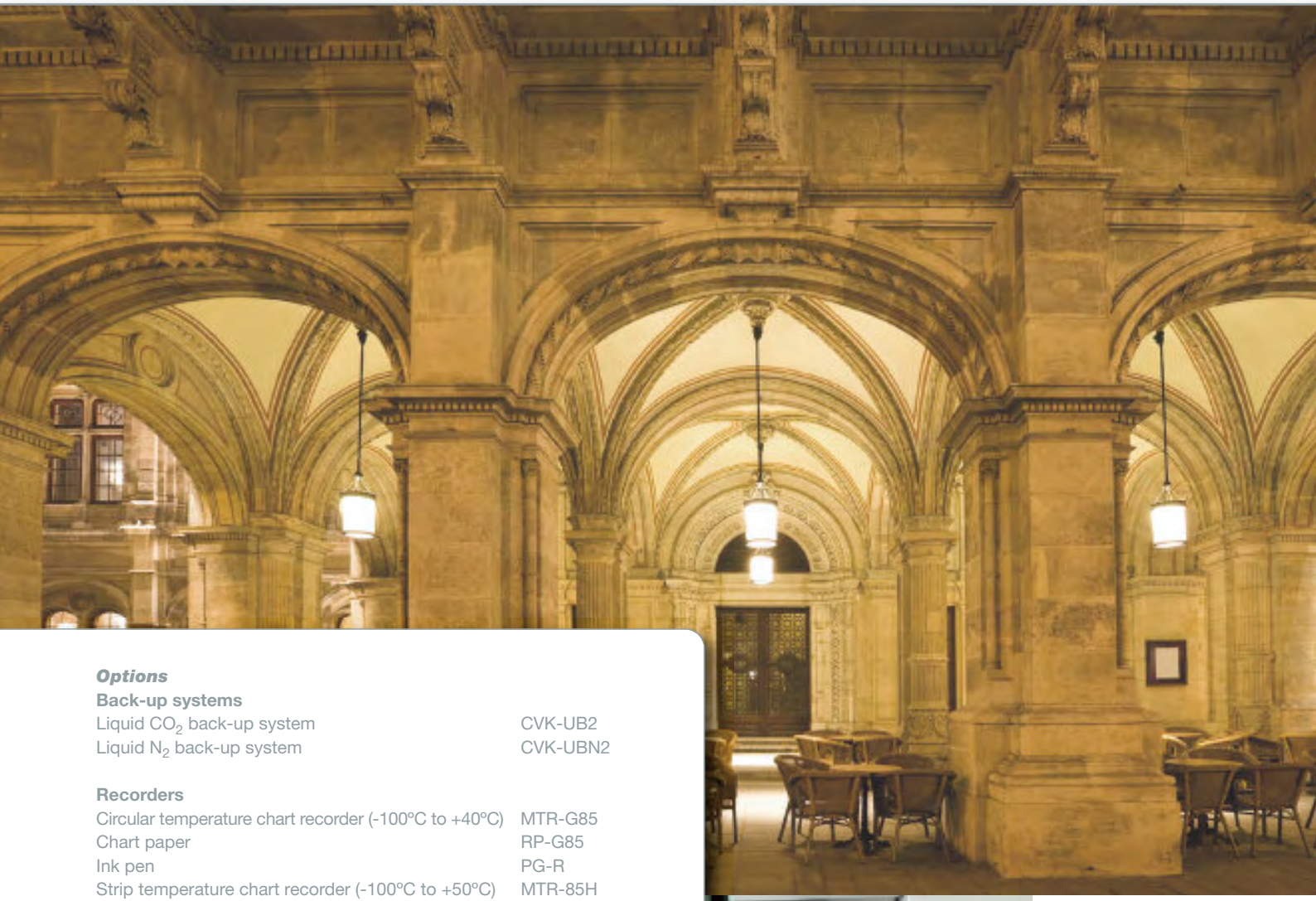
Insulated and gasketed inner doors seal inside to offer additional protection and uniformity. Inner door latches are standard.

Heated outer door gasket and a 'hot-line' circulating hot refrigerant gas around the door frame help to prevent ice build-up.

Panasonic designed Cool Safe compressors are specifically designed for ultra-low temperature applications.

Commercially available HFC refrigerants are highly efficient, environmentally safe and non-ozone depleting.

Front access to washable, electrostatic condenser air filter for routine cleaning.



Options

Back-up systems	
Liquid CO_2 back-up system	CVK-UB2
Liquid N_2 back-up system	CVK-UBN2
Recorders	
Circular temperature chart recorder (-100°C to +40°C)	MTR-G85
Chart paper	RP-G85
Ink pen	PG-R
Strip temperature chart recorder (-100°C to +50°C)	MTR-85H
Chart paper	RP-85
Ink pen	DF-38FP
Recorder housing (for MTR-85H)	MDF-S3085
Communications	
Communications Interface	MTR-480
Drawers	
3 drawer set for MDF-U33V	MDF-30R
3 drawer set for MDF-U55V	MDF-50R
Inner door kits	
1 set of 2 inner doors for MDF-U55V	MDF-5ID
1 set of 2 inner doors for MDF-U74V/MDF-U76V	MDF-7ID
Other	
Inventory racks	see page 60
Water cooled condenser	see page 35


MDF-50R

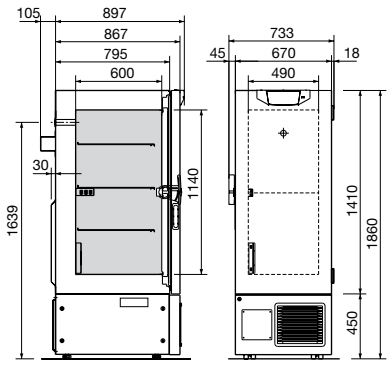
CVK-UB2


MTR-G85

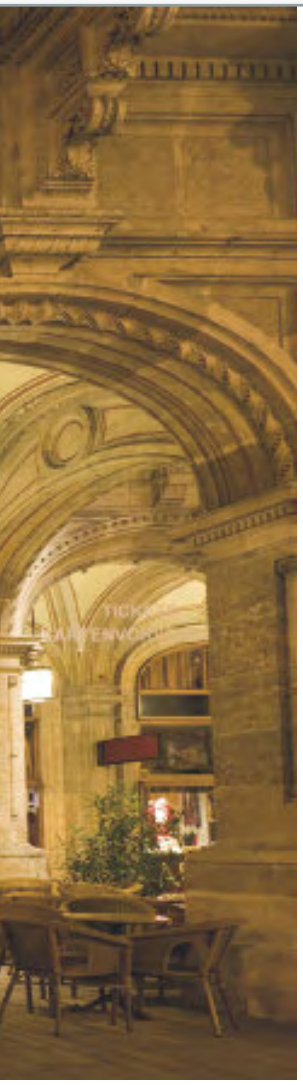
CE 0123

The MDF-U55V and MDF-U74V are certified as Class IIa Medical Devices (93/42/EEC and 2007/47/EC) for medical purposes of storing cells, DNA and/or frozen plasma. (For EU countries only)

Dimensions

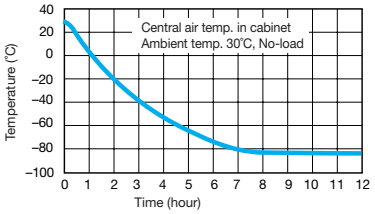


MDF-U33V Unit: mm

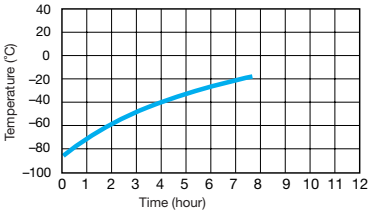


Performance data MDF-U33V

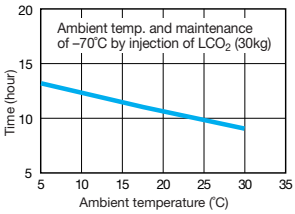
Pull-down characteristics



Pull-up characteristics during power failure

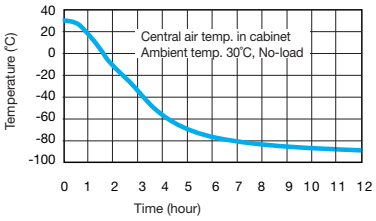


CO_2 backup system operation characteristics

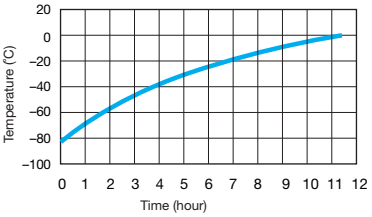


Performance data MDF-U55V

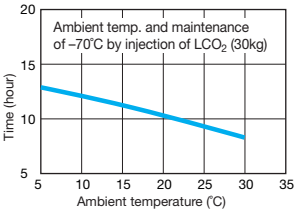
Pull-down characteristics



Pull-up characteristics during power failure

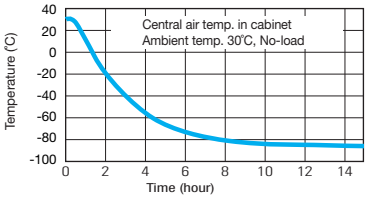


CO_2 backup system operation characteristics

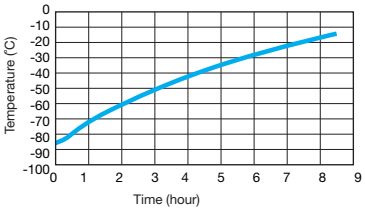


Performance data MDF-U74V

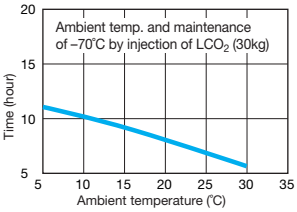
Pull-down characteristics



Pull-up characteristics during power failure

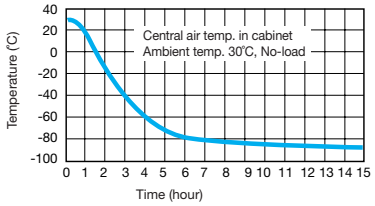


CO_2 backup system operation characteristics

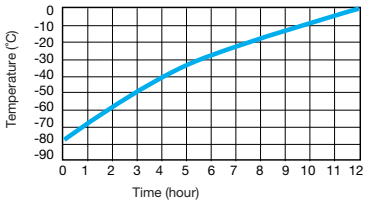


Performance data MDF-U76V

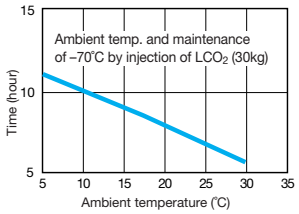
Pull-down characteristics



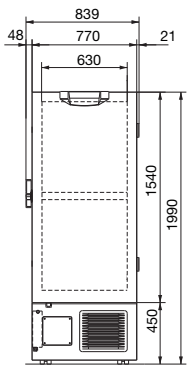
Pull-up characteristics during power failure



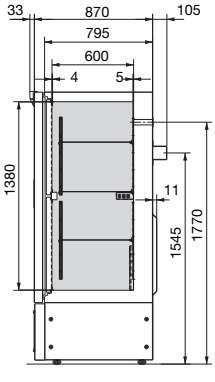
CO_2 backup system operation characteristics

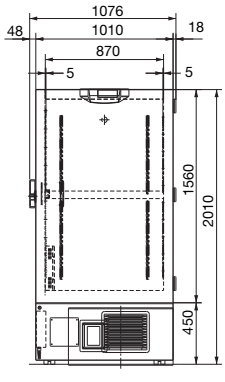


MTR-85H

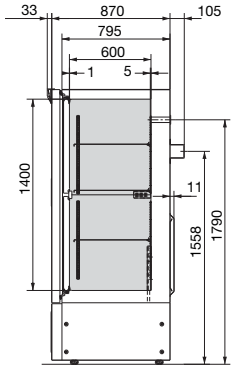


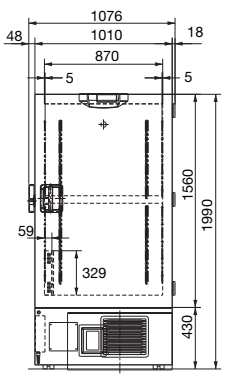
MDF-U55V



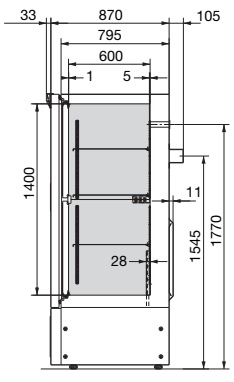


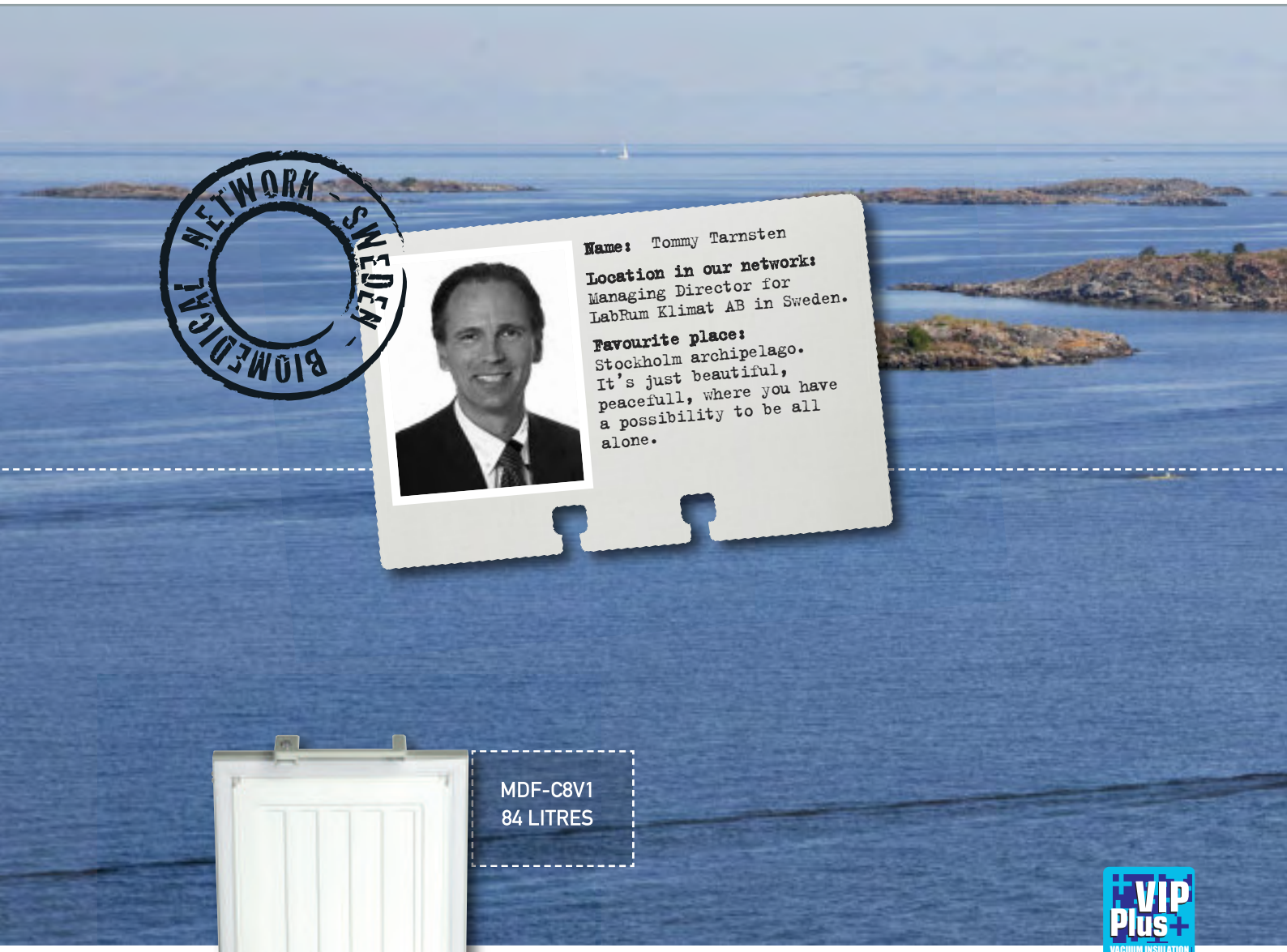
MDF-U74V





MDF-U76V





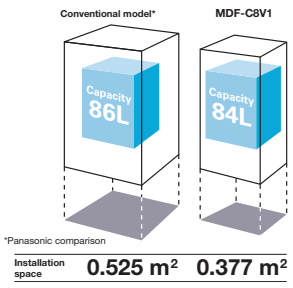
MDF-C8V1
84 LITRES

VIP Plus+ VACUUM INSULATION

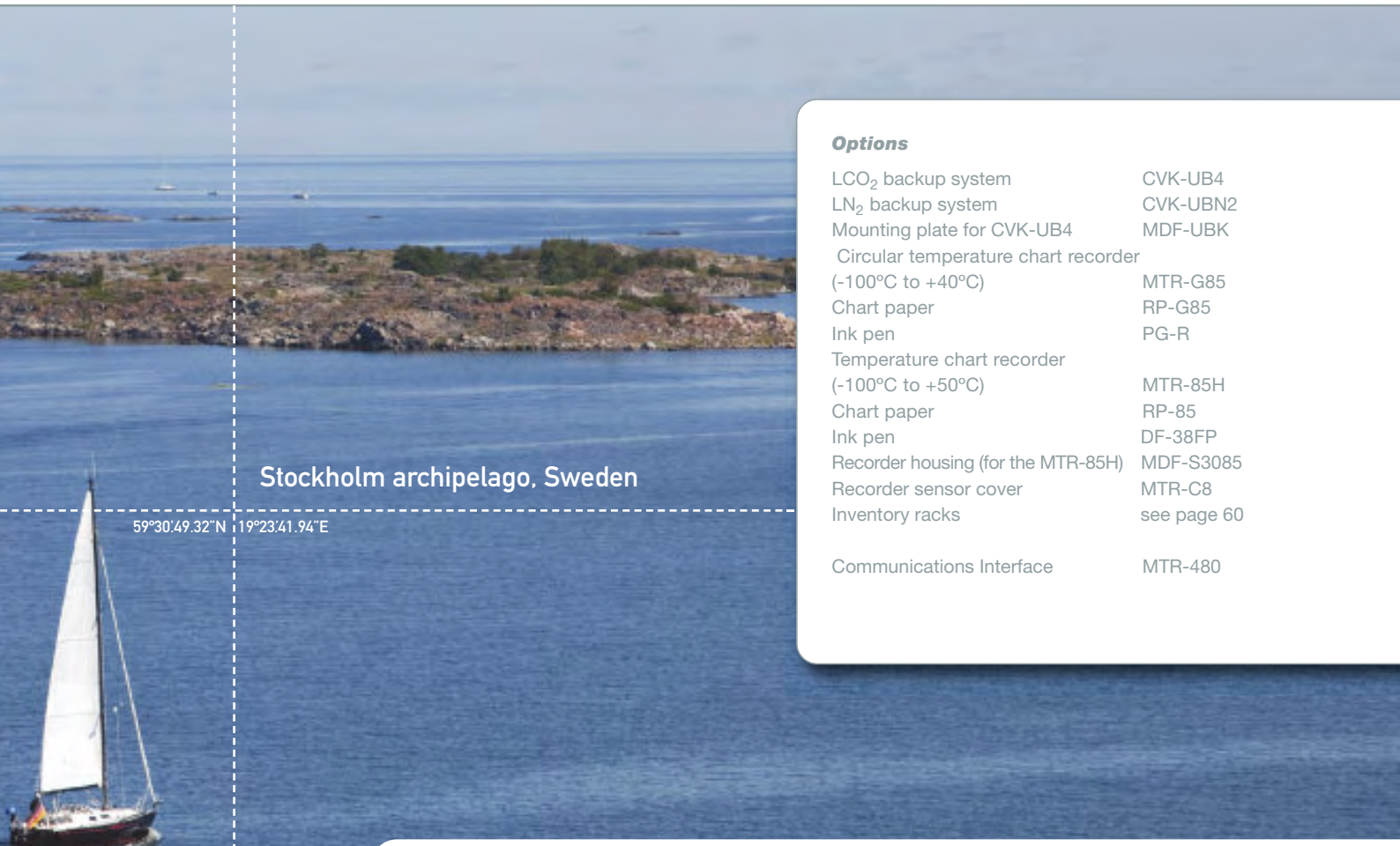
-80°C Ultra-Low Temperature VIP Freezer

- New VIP PLUS technology maximises storage capacity
- Filterless structure makes cleaning unnecessary
- Low noise design
- Achieves energy savings of approx. 40%*

* Panasonic Comparison



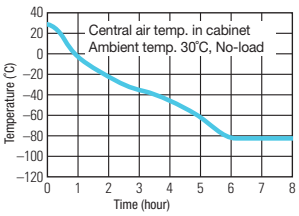
VIP series
Vacuum Insulation Panel



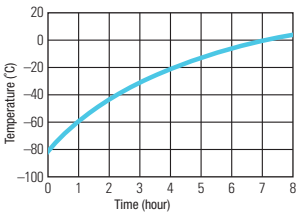
Options

LCO_2 backup system	CVK-UB4
LN_2 backup system	CVK-UBN2
Mounting plate for CVK-UB4	MDF-UBK
Circular temperature chart recorder	
(-100°C to +40°C)	MTR-G85
Chart paper	RP-G85
Ink pen	PG-R
Temperature chart recorder	
(-100°C to +50°C)	MTR-85H
Chart paper	RP-85
Ink pen	DF-38FP
Recorder housing (for the MTR-85H)	MDF-S3085
Recorder sensor cover	MTR-C8
Inventory racks	see page 60
Communications Interface	MTR-480

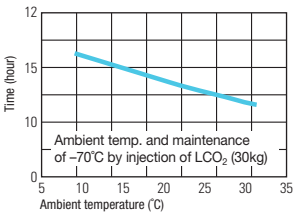
Pull-down characteristics



Pull-up characteristics during power failure



CO_2 backup system operation characteristics



Features

More advanced insulation system: VIP PLUS
Panasonic's more advanced insulation system VIP PLUS enables reducing the thickness of insulation to approximately one half compared to conventional systems. Small freezers such as MDF-C8V1 takes full advantage of this feature. Use of VIP PLUS insulation material on the front, left, and right sides enables a smaller installation space with the highest class storage capacity ratio.

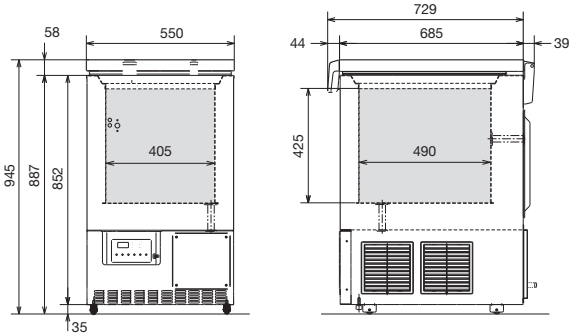
New cooling circuit enables filterless structure
A new cooling circuit makes the inconvenient customer maintenance procedure of filter cleaning unnecessary.

	Rated power consumption
MDF-C8V1	**340W/330W**
Conventional model*	**550W/600W**

*Panasonic comparison (115V, 60Hz/230V, 50Hz)

Newly developed single-compressor system
Use of a newly developed single-compressor system achieves an approximately 40% reduction in power consumption and enables low-noise operation.

Dimensions MDF-C8V1 Unit: mm



Neuschwanstein, Germany

47°33'28.11"N 10°44'59.47"E

Name: Michael Ewald

Location in our network:
Managing Director of Panasonic's long lasting relation in Germany; Ewald Innovationstechnik GmbH, Germany.

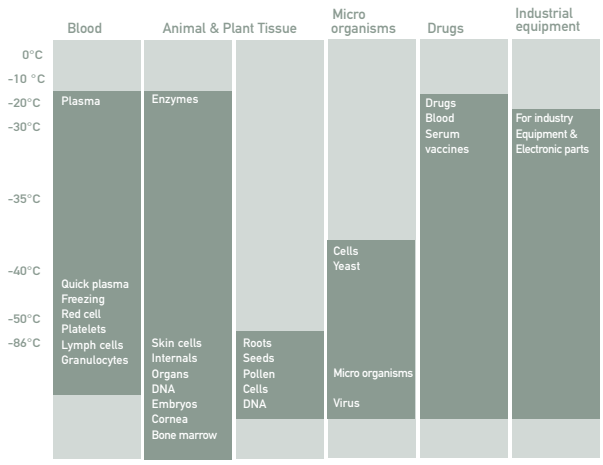
Favourite place:
Neuschwanstein is one of the most beautiful places in Germany; The Alps, green meadows, small vilages and dark forests. It really looks like a fairy tale.

BIOMEDICAL NETWORK - GERMANY -

Cool Safe™

Ultra-low temperature upright freezers -86°C

Panasonic offers a wide range of upright -86°C freezers to suit your individual storage needs. All our freezers feature the usual high-quality components you would expect from Panasonic including HCFC-free refrigerants. All units feature full alarm systems to ensure your samples are well protected and secure. Panasonic freezers ultilise a cascade cooling system, enabling ultra-low freezer temperatures to be reached quickly and quietly. Microprocessor control maintains these temperatures accurately and reliably.



Low-temperature range applications

Potential users

- Universities
- Private enterprises, Pharmaceutical companies
- Medical institutions, Hospitals
- Public research centres, research institutes

MDF-U7386S
668 LITRES
480 2" BOXES
336 3" BOXES

MDF-U5386S
483 LITRES
320 2" BOXES
192 3" BOXES

MDF-U7386S / MDF-U5386S

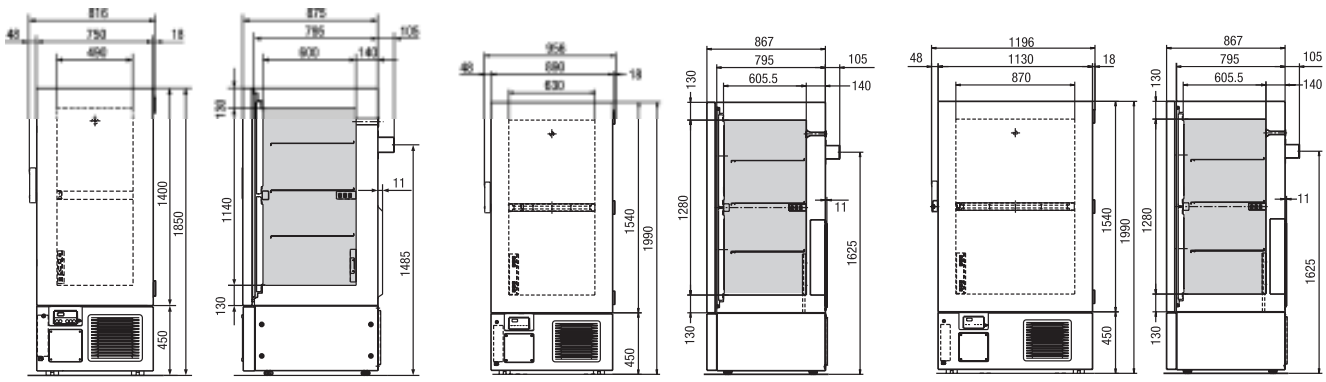
- Cool Safe Compressors
- HFC refrigerants
- Microprocessor control
- Temperature alarm
- Single action door latch
- Adjustable levellers
- Door key lock
- Casters
- Easy access filter

MDF-U3386S

- Unique design and size targets the growing trend to personal freezers and compact size. While this is a spacesaver there is no compromise on features.
- Easy access and quick placement or locating of samples.
- The foamed-in-place rigid polyurethane insulation is HCFC-free as in all other Panasonic freezers.

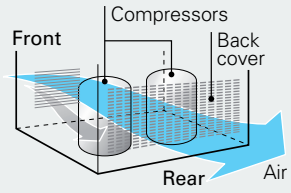
- Features all of the technology, construction and reliability you have come to expect from Panasonic freezers.
- Simplified maintenance with easy access filter.
- Less formation of ice.

Dimensions



Unit: mm

MDF-U3386S **MDF-U5386S** **MDF-U7386S**



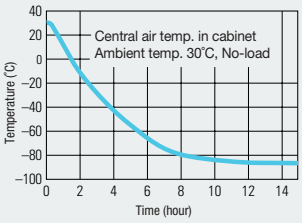
The newly developed back cover combined with new aerodynamically designed and placed components in the refrigeration compartment provide superior air flow, making it possible to drastically reduce the stress on the freezer and contributing to excellent durability.

Options

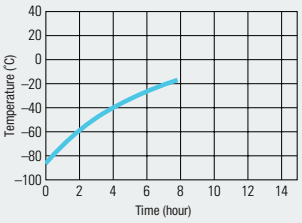
LCO_2 backup system	CVK-UB2
LN_2 backup system	CVK-UBN2
Circular temperature chart recorder (-100°C to +40°C)	MTR-G85
Chart paper	RP-G85
Ink pen	PG-R
Temperature chart recorder (-100°C to +50°C)	MTR-85H
Chart paper	RP-85
Ink pen	DF-38FP
Recorder housing (for MTR-85H)	MDF-S3085
Communications Interface	MTR-480
Inventory racks	see page 60

Performance data MDF-U3386S

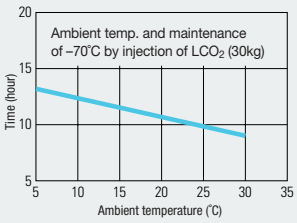
Pull-down characteristics



Pull-up characteristics during power failure

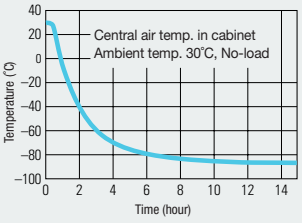


CO_2 backup system operation characteristics

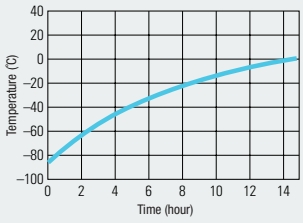


Performance data MDF-U5386S

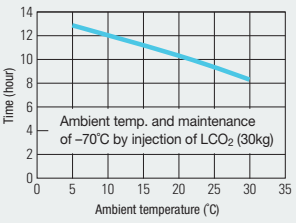
Pull-down characteristics



Pull-up characteristics during power failure

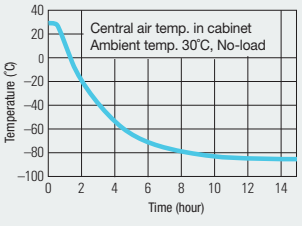


CO_2 backup system operation characteristics

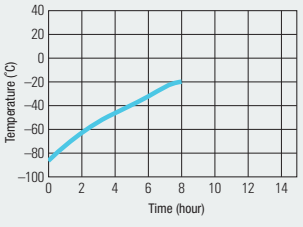


Performance data MDF-U7386S

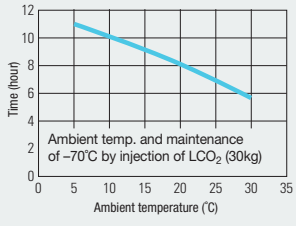
Pull-down characteristics



Pull-up characteristics during power failure



CO_2 backup system operation characteristics



MDF-U4186S

- Advanced refrigeration system
- Quiet operation
- Enhanced security
- Removable inner doors for cleaning and defrosting

Evolutionary design

- The newly developed refrigeration system and the freezer structure offer a quiet experimental environment.
- The newly developed back cover combined with new aerodynamically designed and placed components in the refrigeration compartment provide superior airflow, making it possible to drastically reduce the stress to the freezer and contributing to excellent durability.
- Two independent and insulated inner doors prevent cold air leakage.

Accessibility

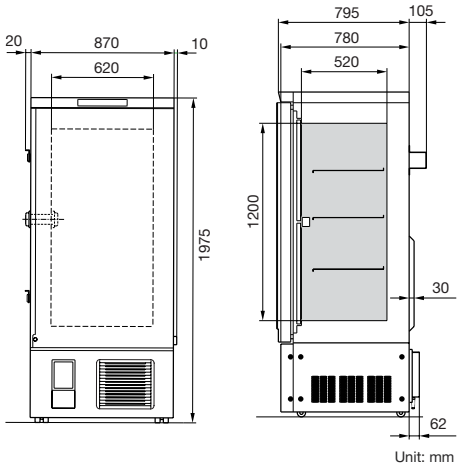
- The condenser filter is situated at the bottom right side of the front panel to make filter removal and cleaning easier.

MDF-U4186S
382 LITRES
216 2" BOXES
144 3" BOXES

Options

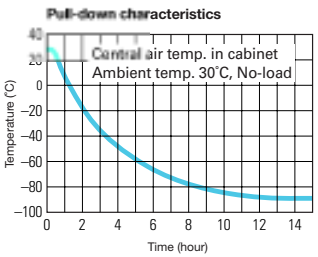
LCO_2 backup system	CVK-UB2
LN_2 backup system	CVK-UBN2
Temperature chart recorder (-100°C to +50°C)	MTR-85H
Chart paper	RP-85
Ink pen	DF-38FP
Recorder housing (for the MTR-85H)	MDF-S3085
Communications Interface	MTR-480
Inventory racks	see page 60

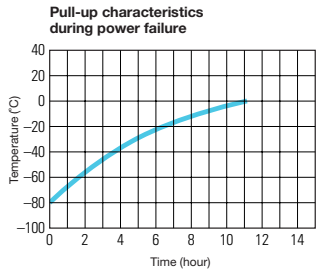
Dimensions
MDF-U4186S

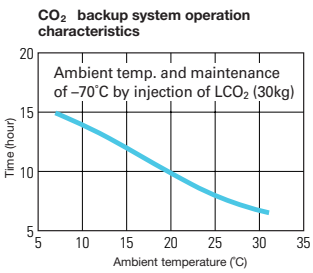


Unit: mm

Performance data
MDF-U4186S







Panasonic's Ultra-Low Temperature Chest freezers combine innovation with superior performance and reliability. Ideal for maintaining stable internal temperatures, the secure chest design is enhanced by super-efficient freezing technology and advanced features. Freezer capacities range from economical to bulk, allowing you to maximize your long-term preservation and storage environment.

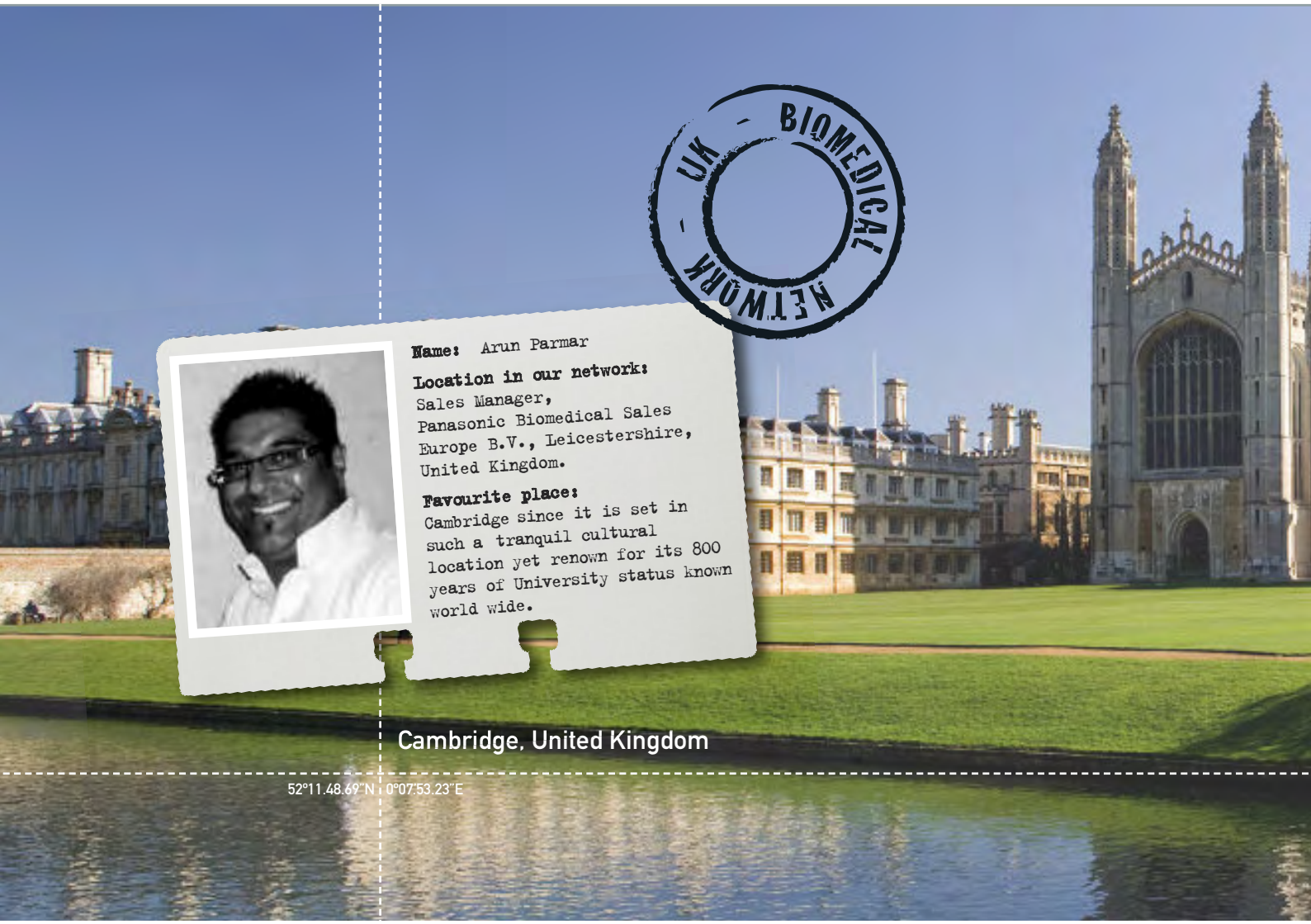
An Ideal Freezing Environment By Means of Foamed-in-place Insulation and the "Hot Line".
In Ultra-Low temperature freezers, effective insulation is extremely critical since the temperature difference between the outside and the inner compartment can be as high as 115ºC. The insulation used in Panasonic's ultra-low temperature chest freezers is highly efficient rigid, foamed in place polyurethane. Moisture condensation at the top edges of the cabinet due to differences in temperature inside and out causes frost and icing problems, which may reduce heat insulation efficiency and obstruct lid movements. They are prevented by the "hot line" by means of which hot gas from the higher temperature circuit is circulated through the problem areas.

A Special Refrigerant and Oil to Maintain Stability and Reliability.
In order to expand refrigeration capacity, a special compound refrigerant has been used. This refrigerant relieves the refrigeration system of much of its load by evaporating at a lower temperature level within the circuit. Also, a special grade of refrigeration machine oil is used with the superior properties of high rate of recovery and outstanding resistance to heat and wear. This contributes to the long life and dependability of the freezer unit as a whole.

Microprocessor Temperature Control with Digital Design. Precise setting and control is possible.
The temperature inside the freezer can be set and monitored easily by means of very accurate microprocessor temperature control with digital display. The controller utilizes a platinum resistor (Pt 100) sensor which is precise and extremely durable.

Built-In Temperature & Power Failure Alarms (Lamp/ Buzzer). Protecting Contents from Trouble.
In case of power failure or an irregular rise in temperature, a rechargeable, battery-operated indicator lamp and alarm will be activated. Optional recorders automatically record the inside temperature and an accessory LCO_2 back-up system is self-activated when the freezer temperature increases. This equipment helps ensure that the contents will be protected in the event of any power failure or mechanical trouble.

Innovative Design Easy to Operate.
Overall operability and dependability are greatly enhanced by improved design details. Highly durable hinges are used to support the lids so both opening and closing are facilitated. Lid handles are equipped with a latch-locking system, and the control panel is protected from accidental setting.



Ultra-low temperature chest type freezers -86°C

- A wide range of ultra-low temperature freezers to suit your needs from bulk preservation to personal in-lab use.
- Ideal -86°C freezing environment.
- Specially designed Cool Safe compressors for ultra-low temperature.
- Microprocessor temperature control with digital design for precise setting and control.
- Built-in temperature and power failure alarms (lamp/buzzer).

These ultra-low temperature freezers are designed by Panasonic to maintain internal temperature as low as -86°C, at an ambient temperature of +30°C. They are ideally suited for use in hospitals and laboratories, in long-term preservation and storage of blood, specimens and components, and in testing of various types. Ranging in size from economical chest freezer to large-capacity, one of these models is sure to be suitable for your needs. Advanced features include a microprocessor temperature control system with digital temperature display, a platinum resistance sensor for extra precision and reliability, a power failure warning system with built-in audible and visible indicators, and easy-open/easy-close hinged lid.

Options

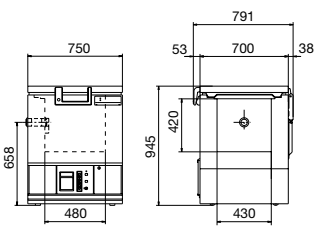
LCO_2 backup system	CVK-A
LN_2 backup system	CVK-UBN2
Temperature chart recorder (-100°C to +50°C)	MTR-85H
Chart paper	RP-85
Ink pen	DF-38FP
Inventory racks	see page 60

MDF-193
86 LITRES
42 2" BOXES
30 3" BOXES

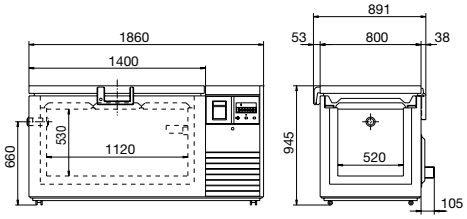
MDF-394
309 LITRES
189 2" BOXES
126 3" BOXES

1 Power switch
2 Back-up system switch (option)
3 Back-up system test switch (option)
4 Remote alarm switch
5 Temperature setting key
6 Digit shift key
7 Figure shift key
8 Entry key
9 Alarm test key
10 Buzzer key
11 Alarm lamp and buzzer
12 Filter clog check lamp
13 Temperature display
14 Temperature recorder (option)

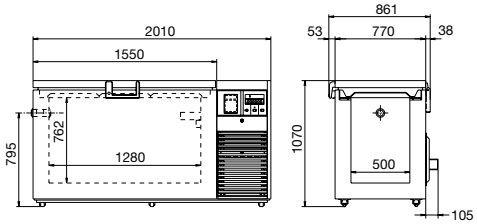
Dimensions



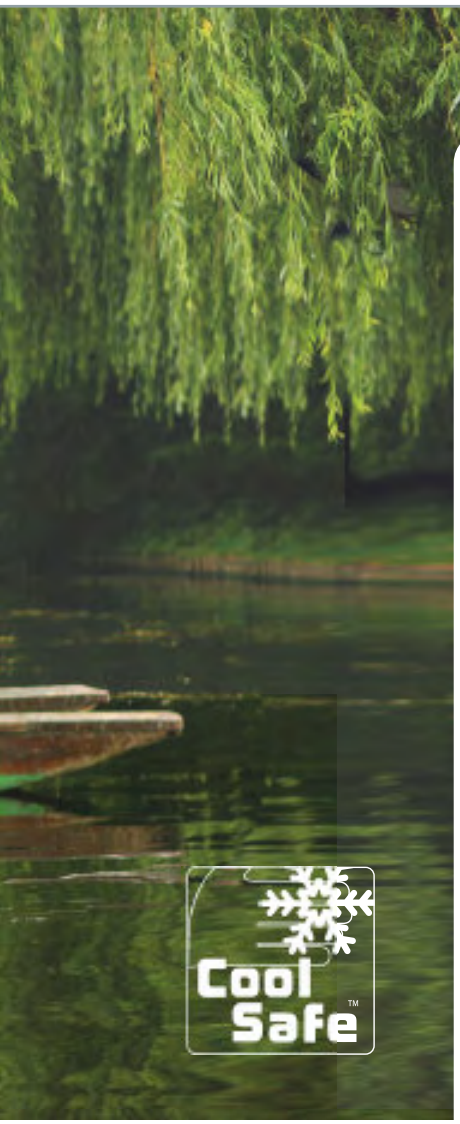
MDF-193



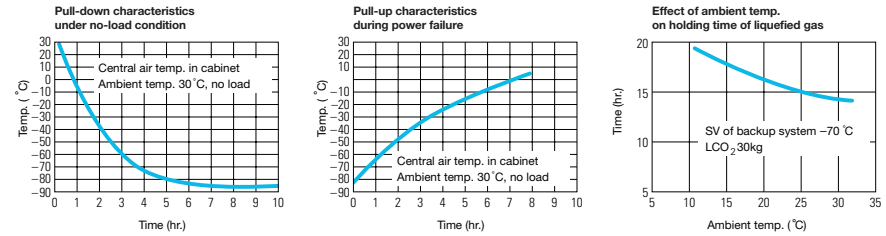
MDF-394



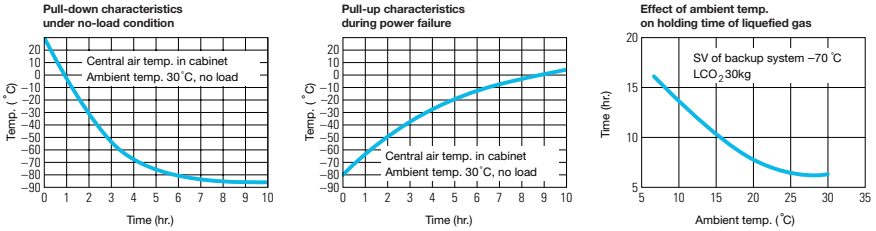
MDF-594



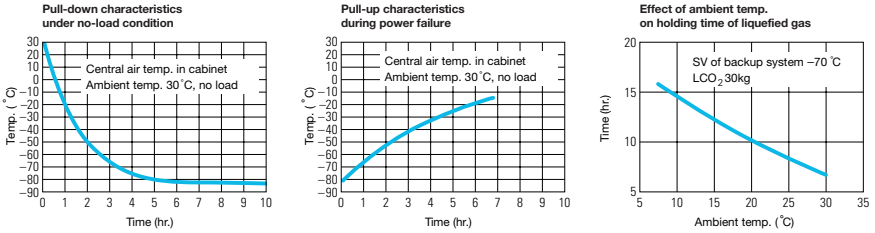
Performance data MDF-193



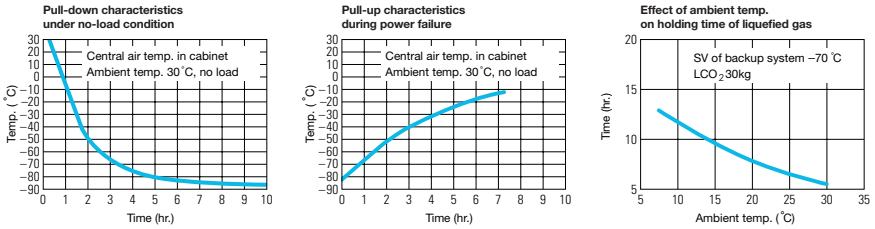
Performance data MDF-394

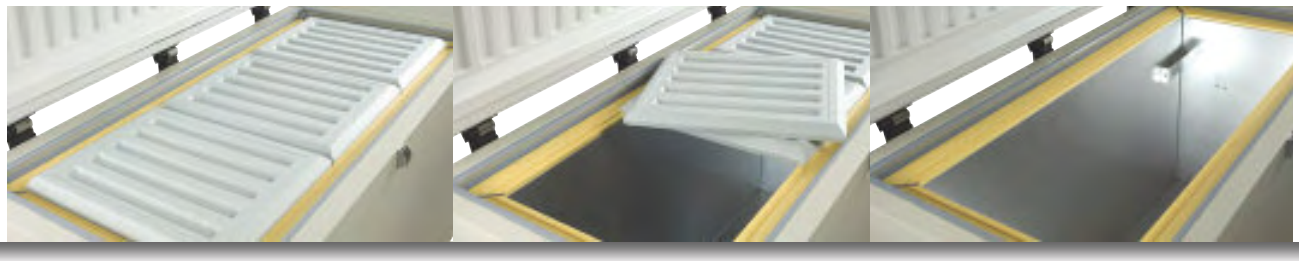


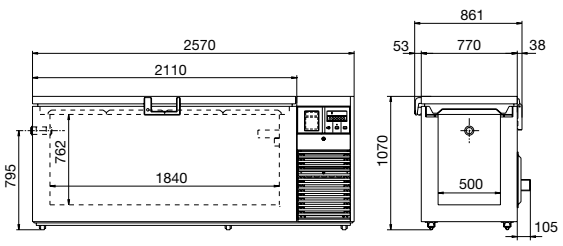
Performance data MDF-594



Performance data MDF-794







MDF-794

Performance

Type	MDF-794	MDF-594	MDF-394	MDF-193
Cooling performance	Centre part of freezing room -86°C. ambient temperature 30°C			
Control range	-50°C to -86°C			
Recording range	+ 50°C to -100°C (with optional MTR-85H recorder)			

Options

Circular temperature chart recorder (-100°C to +40°C)	MTR-G85
Chart paper	RP-G85
Ink pen	PG-R
Mounting kit	MPR-S7
Communications Interface	MTR-480

Plasma Freezer

This Panasonic Plasma Freezer provides an ideal freezing environment for the preservation of vaccines, blood plasma, test samples and specimens.

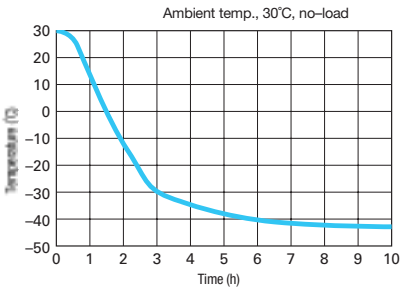
The user-friendly design includes a built-in door latch for each of the double outer doors, and simple calibration is possible via the control panel. This, coupled with a visual and audible alarm system, ensures that your samples are both safe and secure, but also easy to access when you need them.

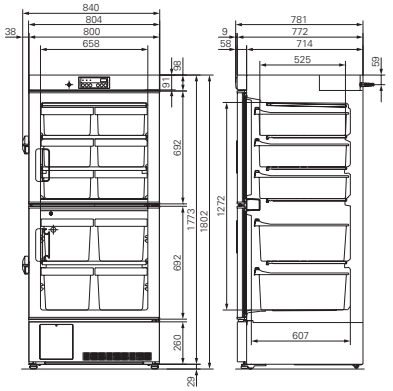
Stable & Uniform Temperature Design

- Double outer doors
- Full-height storage containers on each shelf
- Cooling tubes under every shelf
- Direct cooling system for stable temperature control
- Fine-controllable refrigeration circuit with valve

Performance data MDF-U5412

Pull-down characteristics





Unit: mm

Dimensions

Large Storage Capacity
- 300ml FFP* bag x 280 pieces.
  *Fresh Frozen Plasma

User Friendly Design
- Built-in door latch for each door
- Easy calibration through the control panel

Visual and Audible Alarm System
- High & Low temperature alarm
- Power failure alarm with non-volatile memory back up
- Self-diagnostic system

Safety Function
- Remote alarm contact
- Re-activating buzzer, lamp and remote alarm contact (30min. after buzzer stops)
- Standard door lock and independent padlock hasp door latches for extra security
- Remote monitoring by Data Acquisition System (Option)
- 1/7/30 days circular recorder (Option)

Environment friendly
- CFC-Free refrigerant and insulation

Biomedical Freezers

Panasonic's MDF Series Biomedical freezers offer the outstanding reliability and performance required in a wide variety of storage and research applications. In the medical field, they provide effective storage of life-saving blood supplies and vaccines, as well as samples for diagnosis.

In the biotechnology field, the freezers provide effective storage of enzymes for genetic research, as well as culture media, reagents and samples for testing. In the industrial field, they are ideal for ageing and temperature tests on electronic components, precision devices, and compound resins.
As a storage environment, with excellent safety features, easy operability, and a host of other features, these freezers offer unsurpassed reliability and functionality.
If you are looking for precision temperature controlled storage equipment, look to Panasonic.

Chest type Power to cope with frequent door openings

Storage baskets

MDF-137:	MDF-13B2, set of two baskets MDF-13B3, set of three baskets
MDF-237:	MDF-13B2, set of two baskets MDF-13B3, set of three baskets
MDF-436:	MDF-43B2, set of two baskets MDF-43B3, set of three baskets
MDF-U731M	MDF-T07SC, set of two containers

Small size suitable for personal use.

- Digital temperature display as standard feature.
- Compact, personal size.

Versatile mid-size model.

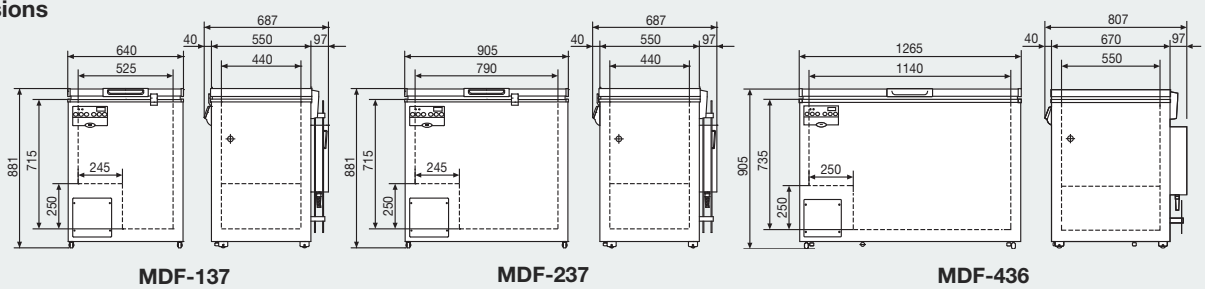
- Digital temperature display as standard feature.
- Easy-to-use 200 litre mid-size model

Large-size 400 litre class.

- Digital temperature display as standard feature.
- Large-capacity, economical size.

Dimensions

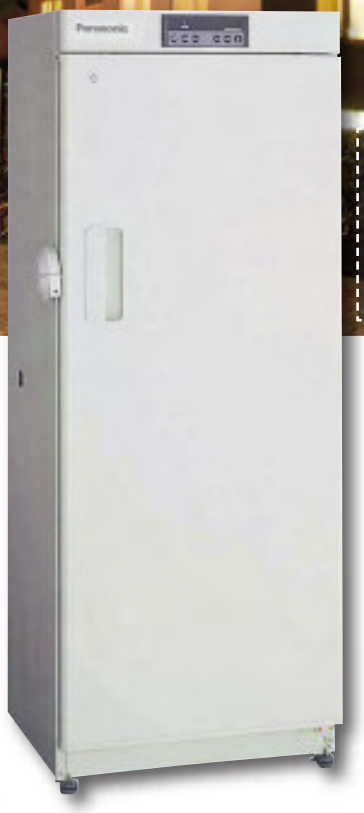
Unit: mm



Upright type Maximum capacity in minimum installation space

MDF-U334
-30°C
274 LITRES

MDF-U443
-40°C
426 LITRES



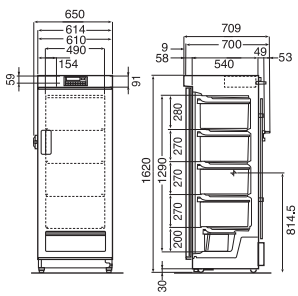
Easy-to-use, compact upright model.

- Microprocessor digital temperature display.
- Convenient storage drawers.

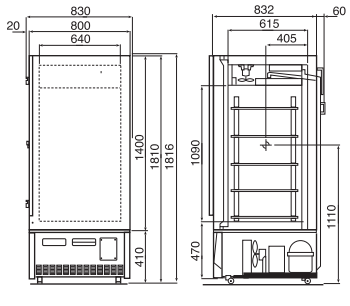
Forced air circulation & auto defrost.

- High freezing power increases temperature uniformity.
- Auto defrost for easy maintenance.

Dimensions



MDF-U334



MDF-U443

Options

Circular temperature chart recorder (-100ºC to +40ºC)	MTR-G85	(MDF-U334, U5312, U537D, U731M, 137, 237, 436)
Chart paper	RP-G85	
Ink pen	PG-R	
Mounting kit	MPR-S7	(MDF-U5312, U537D (lower chamber), U731M)
Mounting kit	MDF-S740	(MDF-137, 237, 436)
Mounting kit	MDF-S740T	(MDF- U334, U537D (upper chamber))
Temperature chart recorder (-100ºC to +50ºC)	MTR-85H	(MDF-U443)
Chart paper	RP-85	
Ink pen	DF-38FP	
Temperature chart recorder (-40ºC to +14ºC)	MTR-4015LH	(MDF-U334, U5312, U537D, 137, 237, 436, U731M)
Chart paper	RP-40	
Mounting kit	MPR-S30	(MDF-U5312, U537D(lower chamber), U731M)
Mounting kit	MDF-S3040	(MDF-137, 237, 436)
Set of 3 shelves	MDF-T07ST	(MDF-U731M)
Set of 2 containers	MDF-T07SC	(MDF-U731M)
Inventory racks	see page 60	
Communications Interface	MTR-480	(Excluding MDF-U731M)

MDF-U5312
-30ºC
482 LITRES

MDF-U537D
-30ºC
452 LITRES

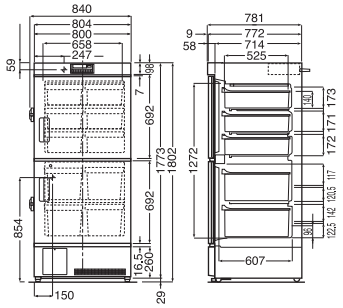
Large-capacity, economical, space-saving model

- Top/bottom twin door design prevents cold air from escaping.
- Individual freezer circuits for each of the five shelf levels.

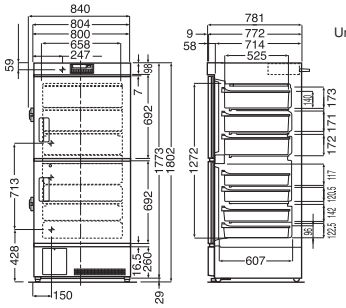
Independent top/bottom control meets differing freezer need simultaneously.

- Two independent freezer chambers in one cabinet, with separate defrost and operation.
- Individual freezer circuits for each of the five shelf levels.

Unit: mm



MDF-U5312



MDF-U537D

Features

Enhanced Operation

- Front-mounted display/control panel located at convenient height.
- Memory backup.
- Temperature display.
- Front access calibration for 7-day temperature recorder.
- The control panel, alarm system and non-volatile memory are the same for all models in the series.
- Single electrical box makes servicing simpler.
- The chamber temperature is displayed for five seconds if BUZZER key is depressed during power failure alarm.
- After a power outage, operation resumes at pre-outage settings (non-volatile memory for temperature and alarm temperature settings).
- Control panel can be reset to zero for validation.
- Access ports.
- Four casters and two adjustable feet.
- Door locks

Recording Features (Optional)

Recorder can be fitted in a convenient position that will not interfere with installation. Choice of optional recorders*.

- 7-day circular recorder (MTR-G85) and 32-day strip recorder (MTR-4015LH) are available. (except MDF-U443)
- Temperature recorder with auto recharging battery
- Front access calibration for temperature recorder

* subject to model

Environment Friendly

- HFC refrigerant (non-CFC, non-HCFC refrigerant) is environment-friendly and offers superb performance.
- Pre-coated metal body causes less environmental damage than conventional paint coating.

Safety Features

- Alarm & recording system.
- High/low temperature alarm (adjustable).
- Power failure alarm.
- Remote alarm contact.
- Self diagnostics (“E” messages shown in red figures).
- Breaker switch turns power off in event of over current abnormality.

Balance hinge allows a free choice of opening angle (Chest type)

To make this chest freezer easier to use, the balance hinge keeps the door open at whatever angle you choose. That means you have both hands free for work.

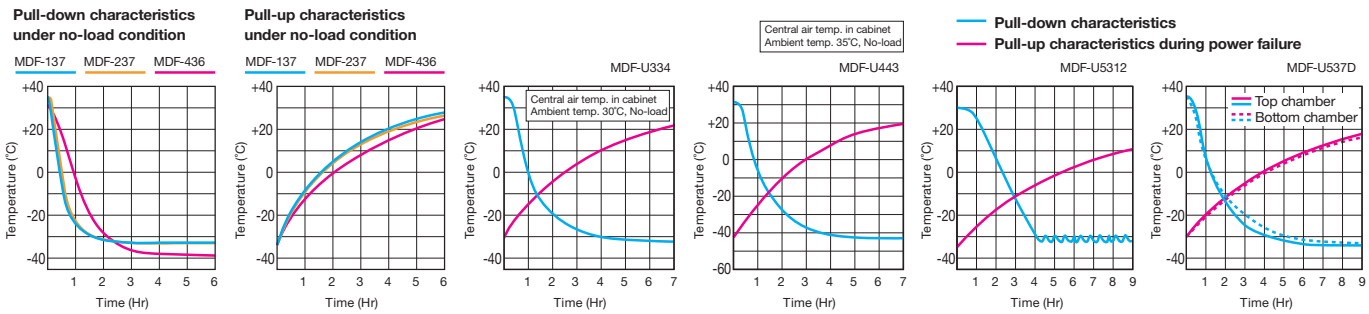
Lockable door latch for extra security (Upright type)

By adding a commercially available lock, you can safeguard the contents of the freezer and keep hazardous items out of harm’s way. (except MDF-U443)

Temperature Monitoring Features (Except MDF-U731M)

- Unified remote monitoring system for Panasonic Biomedical products (optional).

Performance data MDF-137 / MDF-237 / MDF-436 / MDF-U334 / MDF-U443 / MDF-U5312 / MDF-U537D



MDF-U334 / MDF-U443 / MDF-U5312 /MDF- U537D / MDF-U731M

Set of 2 containers
MDF-T07SC

Large-capacity Biomedical freezer with direct cooling system and manual defrost

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

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

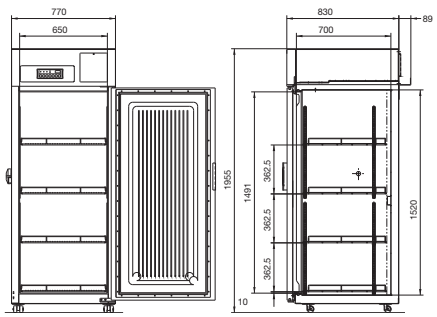
Improved security
Standard door lock and independent padlock ensure extra security. (*Padlock is not supplied)

Sturdy cabinet construction with superior insulation
The integral foamed cabinet structure is extra strong and prevents cold air loss.

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

Movable shelves
Movable wire shelves allow free position adjustment.

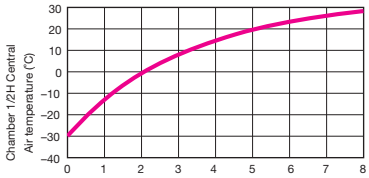
Dimensions MDF-U731M



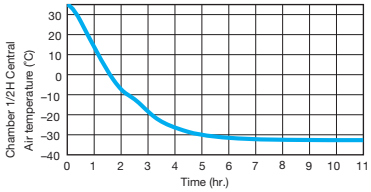
Unit: mm

Performance data MDF-U731M

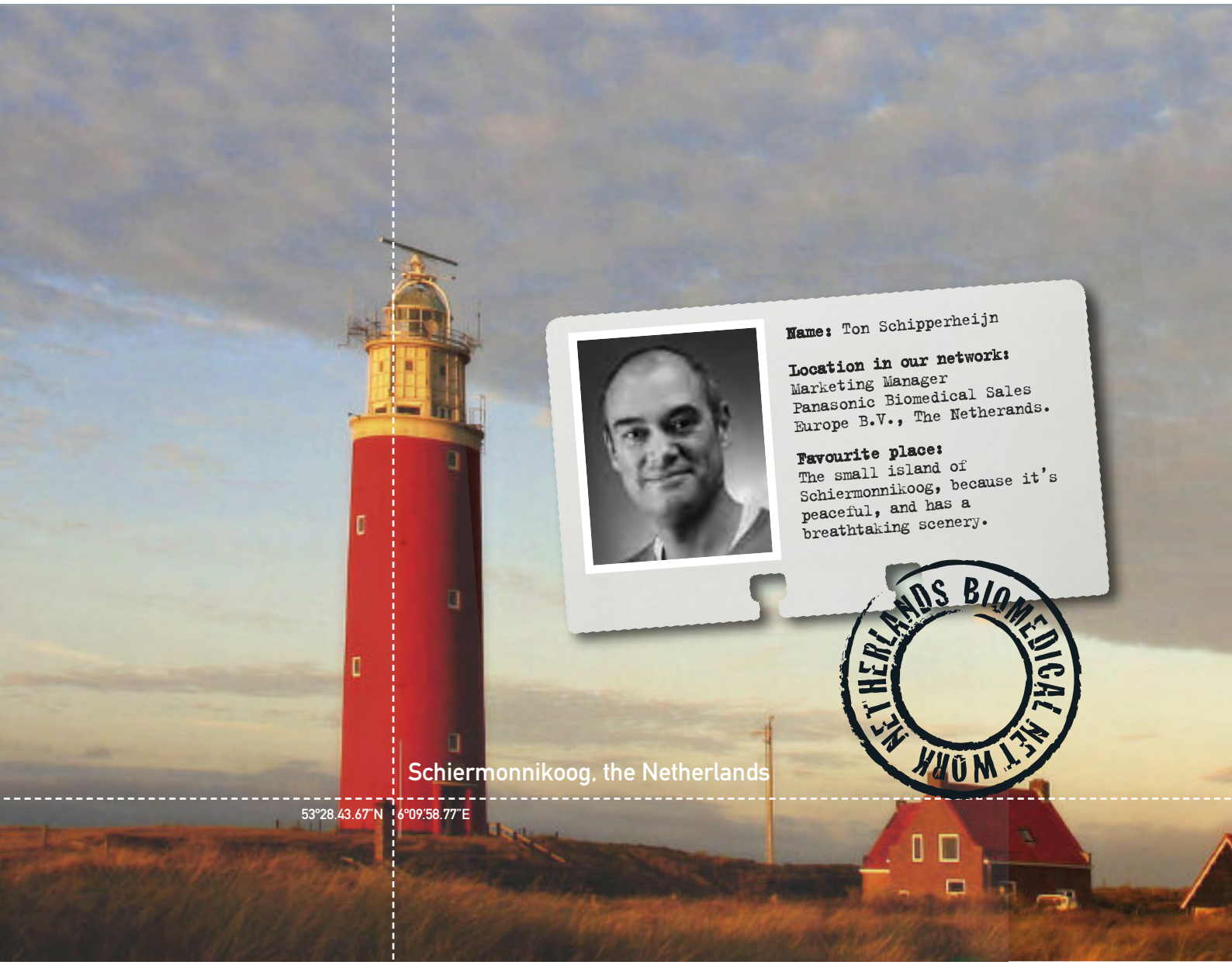
Pull-up characteristics during power failure



Pull-down characteristics under no-load condition



Conditions: AT 35°C, no load, measured at center of chamber



How to organize your low temperature freezer

Organizing the spaces in your freezer can help you to make your work more efficient. Both cost- and time savings will be the result of good sample management. But it is not only efficiency that will be influenced positively, you will also decrease the risk of damaging your samples with the right racks. This is a fact, whether you store stem cell, cord blood, bone marrow or any other type of cell or tissue samples.

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

- 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

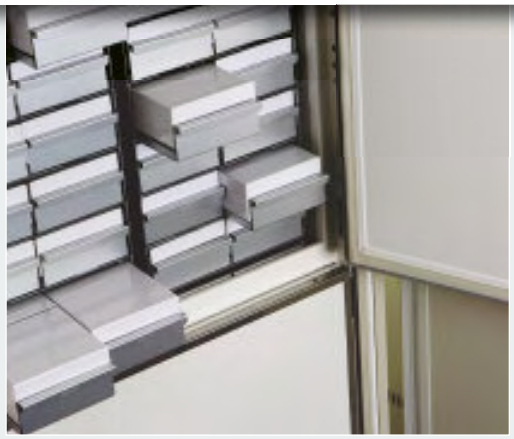
Panasonic's racks are made of stainless steel or anodized aluminum. The aluminum racks are very light, yet sturdy and corrosion free.

Racks for all liquid Nitrogen freezer applications

see: www.panasoniccryogenic.com

Standard square rack configuration 1500AB

3101A-100S



How to select the correct rack for your low temperature freezer

Since this can be a challenge, we give you an overview of a selection of popular freezers, in combination with a variety of racks in the specification section on **page 168**. There you will find the most common used racks.
If you are looking for another more economical/practical way to use your limited available freezer capacity, or just need a special sized rack, please contact us.

Options

Temperature chart recorder (-10°C to +40°C and -60°C to +40°C)	MTR-G3504
Chart paper	RP-G3504
Ink pen	PG-RB
Mounting kit	MPR-S7
Drawers for the bottom left compartment (MPR-414F only)	MPR-41R
Communications Interface	MTR-480

LED display for easy-to-read temperature and alarms

Triple pane window for viewing (MPR-414F)

Center pillarless design for easy access

Direct cooling freezer compartment for stable temperature

Optional Drawers (MPR-41R)

Pharmaceutical Refrigerator with Freezer

With the growing emphasis on proper storage of laboratory refrigerated products the market requires state-of-the-art equipment to provide unyielding parameter control. In order to achieve this goal Panasonic totally redesigned the refrigerator/freezer.

- One unit with dual temperature zone
- Superior cooling performance
- Quiet operation
- Various alarm and safety devices

Stored product integrity assured by:

- Microprocessor control system that provides accurate temperature.
- Fan convection system in refrigerator employs ducting and plenums that provide uniform temperature throughout the cabinet.
- Unique refrigerator defrost system minimises temperature variations during defrost cycles by activating after each compressor cycle, thus minimizing the duration of the defrost cycle.
- Secondary temperature deviation safety device that prevents excessive warm-up or cooling.
- Open door indicator light with 15 min. delayed audible alarm.
- Low/high temperature audible and visual alarms and remote alarm.
- Door locks.

Energy efficient and environmentally friendly operation:

- Two specially designed low wattage/ energy consuming hermetic compressors.
- Four door design reduces air loss on entry and makes efficient use of space in front of the unit (MPR-414F).
- Hot gas heated mullions prevent condensation, icing and subsequent loss of gasket sealing efficiency.
- Very quiet operation.
- CFC-free foamed-in-place insulation.
- HCFC/CFC-free refrigerant.
- Efficient use of material is demonstrated by the low overall weight 126 kg (MPR-414F).

The benefits of Enviro-center

(compared to typical domestic refrigerators)

	Enviro center	Domestic refrigerator
Reliable temp. control not Affected by ambient temp.	■●	▼
Digital display of chamber Temperature	■●	▼
Precise temperature setting of chamber	■●	▼
Variable temp. control of Refrigerator (2°C to 14°C)	■●	Max/ Mid/Min
Variable temp. control of Freezer (-20°C to -30°C)	■●	-18°C
Separate operation of Refrigerator and freezer	■●	▼
Windows for viewing	■●	▼
Racks (SUS-304, MPR-41R)	■●	▼
Monitoring hole/port	■●	▲
Temperature recorder (option)	■●	▼
Door ajar alarm	■●	▲
High/low alarm and Overheating protection	■●	▼
Remote alarm terminal	■●	▼
Set temp. deviation protection	■●	▼
Self diagnostic function	■●	▼
Condensate evaporator	■●	●

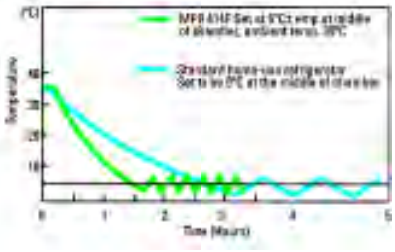
■ Necessary function, construction or performance for preservation of reagents and pharmaceuticals
● Yes
▲ Some models are Yes
▼ NO

Refrigerator with Freezer MPR-414F / MPR-215F

MPR-215F
176 LITRES
+
39 LITRES

Performance data MPR-414F

Refrigerator pull-down data



Design features which enhance user operation:

- Two full width and three half width shelves provide 1.23m² (13.5ft²) of refrigerator storage with 200mm (8") height clearance. Shelves adjustable on 100mm (4") centers (MPR-414F)
- One freezer shelf permits two levels of storage on 0.2m² (2.6ft²) of shelf area. (MPR-414F)
- The top refrigerated section has a pillarless design for easy access and triple pane windows for viewing. (MPR-414F)
- Small radius door design.
- Interior incandescent light.
- 30mm access port for the refrigerator and freezer sections.

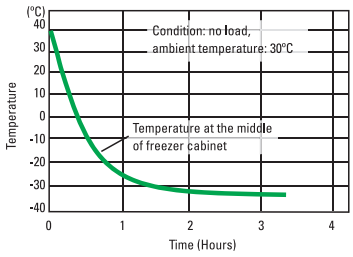
Field support and future serviceability is assured by:

- Microprocessor self-diagnosing electronics.
- The use of safe HCFC/CFC-free refrigerant.

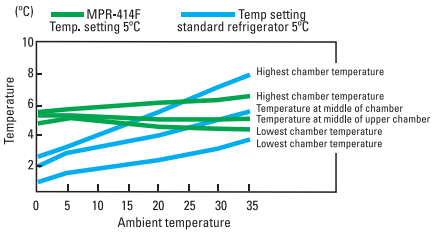
Alarm and safety functions

	MPR-414F	MPR-215F
Temperature alarm	Yes	Yes
Overheating protection	Yes	Yes
Memory back-up function	Yes	Yes
Door Ajar	Yes	Yes
Self-diagnostic function	Yes	Yes
Key lock switch	Yes	Yes

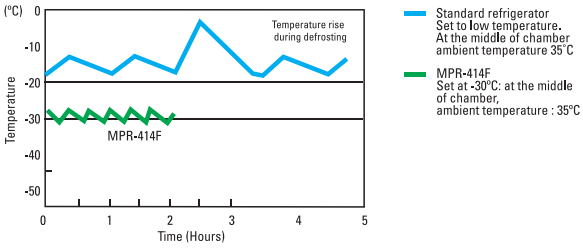
Freezer pull-down characteristics

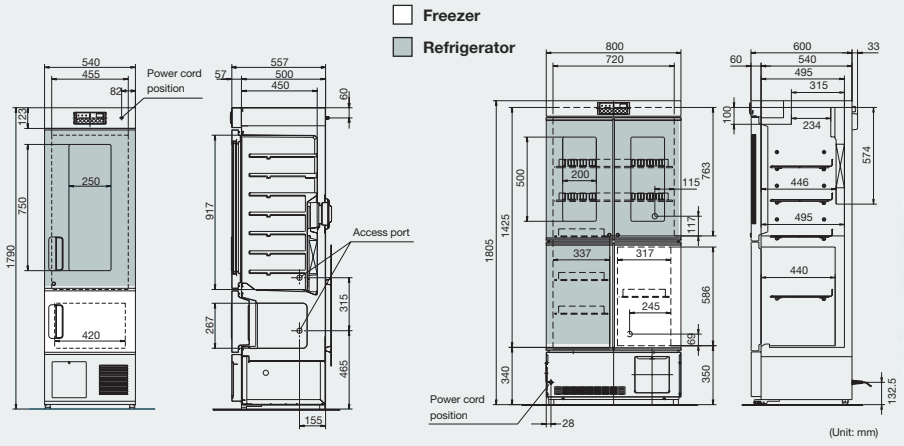


Relationship between chamber temperature and ambient temperature change (compared to standard home-use refrigerators)



Freezer chamber temperature cycle of MPR-414F compared to standard home-use refrigerators

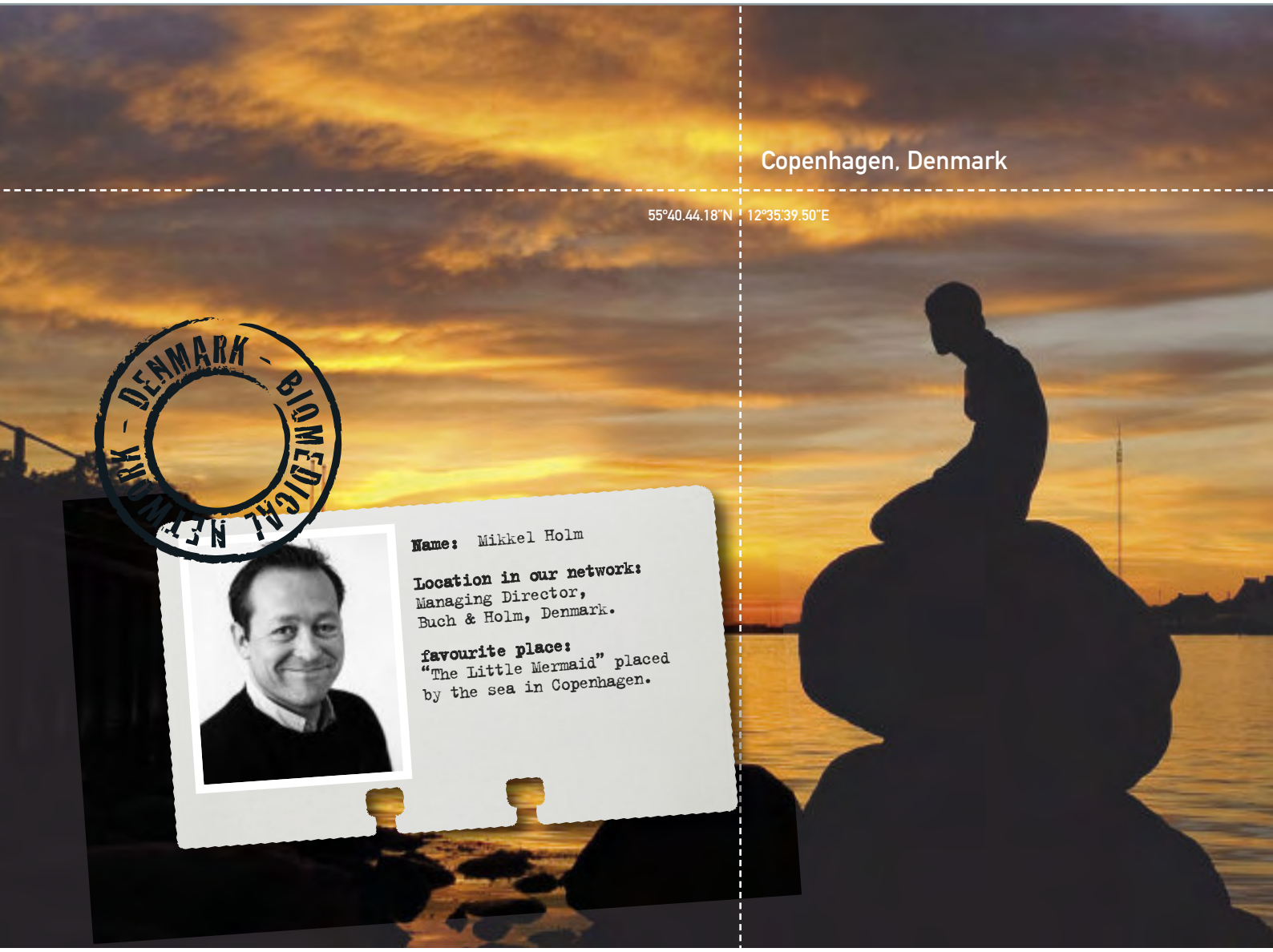




MPR-215F

MPR-414F

MDF-414F	Effective capacity	Temperature range
Refrigerator	340 litres	2°C to 14°C
Freezer	82 litres	-20°C to -30°C *ambient temp: 30°C*



Large capacity enviro-centers

Stable and reliable refrigerated environment for exacting laboratory requirements.

Environmental laboratory. Wide temperature range 2°C to 23°C (ambient temp. 0°C to 35°C).

It is common knowledge that product should be stored in stable conditions below ambient temperature. Domestic refrigerators are capable of storage at +4°C, but they suffer from the following drawbacks:

1. Temperature varies every time the door is opened
2. Temperature rises during defrosting
3. Cabinet temperature is easily affected by ambient temperature, with the risk of contents freezing if ambient drops below 0°C
4. Temperature setting by dial is inaccurate (no digital temperature indication)

Panasonic has built solutions for all these problems into its medical refrigerators, which have been well received in hospitals, laboratories and research facilities around the world.

Main Features:

1. Rapid temperature recovery after door opening.
2. Stable, uniform, and controlled cabinet temperature is unaffected by ambient temperature.
3. Cycle defrost with heater allows defrosting without increases in cabinet temperature.
4. Standard alarm and safety features prevent irregular temperature fluctuations in cabinet.

Options

Temperature chart recorder (-6˚C to +20˚C)	MTR-0621LH
Chart paper	RP-06
Mounting kit	MPR-S30
Circular Temperature chart recorder (-10˚C to +40˚C)	MTR-G04
Chart paper	RP-G04
Ink pen	PG-R
Mounting kit	MPR-S7
Exterior Power failure alarm	MPR-48B (MPR-721 only)
Communications Interface	MTR-480
Mounting bracket	MPR-48B

■ **Adjustable shelves and wide range set point for varying laboratory applications including chromatography and pharmaceutical storage.**

■ **Drawers for convenient storage.**

Adjustable shelves (MPR-721/1411)
The shelves can be arranged to accommodate tall apparatus such as fraction collectors. These shelves are deep enough and strong enough (50kg load for the MPR-721, 40kg for the MPR-1411) to hold most apparatus.

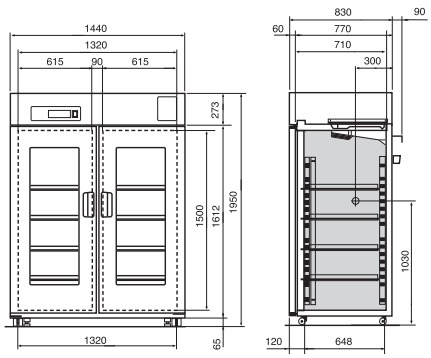
Drawer type (MPR-721R/1411R)
The “R” models are fitted with pull-out drawers. With a profile of 100mm and 530mm front to back, these drawers are deep enough to hold large bottles or reagent kits. They also allow convenient, space-efficient storage and management of patient medications and other items.

The MPR-721R is shipped with five drawers, while the MPR-1411R is shipped with ten drawers, five in each half of the cabinet.

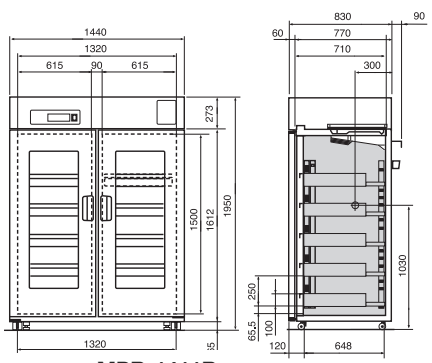
Temperature Stability
Panasonic’s temperature control system with thermistor monitor and microprocessor control reliably maintains cabinet temperature at the set level and is unaffected by ambient temperature. Forced air circulation ensures that the cabinet temperature returns to the set point quickly after door openings and remains uniform throughout the cabinet.

- Movable wire shelves for test apparatus and storage flexibility.
- Pull-out drawers for convenient filing of storage items.

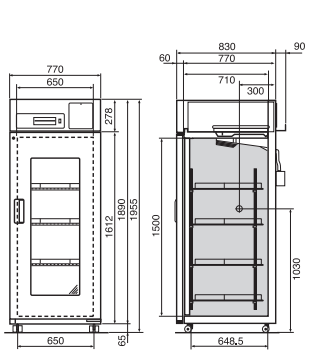
Dimensions



MPR-1411



MPR-1411R



MPR-721

Speedy & Powerful refrigeration
To cope with frequent door openings, Enviro-Centers are equipped with powerful, hermetically sealed compressors. These purpose-built compressors ensure superior pull-down characteristics and precise temperature control.

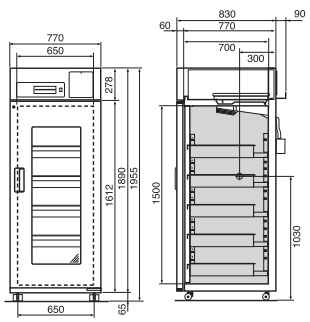
Easy-to-manage layout
The interior layout flexibility of Enviro-Centers makes them ideal for running experiments that require stable cool conditions, as well as storage.

Standard alarm & safety features
Enviro-Centers are fitted with buzzers and flashing lights to warn of high and low temperature problems. In the event of an irregular rise in cabinet temperature, the heater automatically shuts off and forced air circulation brings the temperature down. Door locks are fitted to safeguard valuable contents.

Large Capacity
With a modular width of 770mm the MPR-721 offers a capacity of 684 litres (MPR-721R: 671 litres), while the 1440mm wide MPR-1411 offers a capacity of 1370 litres (MPR-1411R: 1365 litres). The interior is spacious enough to accommodate column chromatography apparatus or large volumes of reagents, test samples and biologicals.

Wide temperature range
With a temperature range of 2°C to 23°C, Enviro-Centers are ideally suited for tests that require a stable, cool temperature.

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



MPR-721R Unit: mm

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

Cycle defrost
In the 5°C range, frost build-up on the evaporator is inevitable. This can affect the performance of the heat exchanger. Panasonic has solved this problem with a cycle defrost and evaporator temperature sensor system. This system runs automatically, so there is no need to turn off the power for defrosting. Temperature rise during defrost is minimal. The evaporation heater also doubles as protection against drops in cabinet temperature caused by a low ambient temperature.

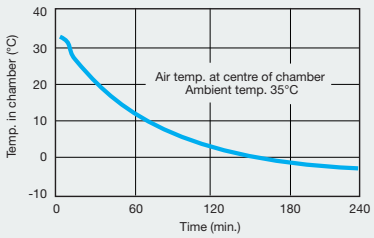
Other features (MPR-721/721R)
New concept features have been added to the MPR-721 and 721R. The filterless condenser cuts down on cleaning maintenance. All glass doors now include a protective film to prevent shattering in the event of accidental collisions.

User friendly design and double function door
Easy to read and operate control panel featuring a full array of alarm and safety functions. Access ports are standard to allow access for power cords. Aesthetically attractive exterior colour blends well in most lab colour schemes. The “catch-free” rounded corners are safe and attractive. Doors open smoothly and close automatically. Some laboratory refrigerators have solid doors for temperature stability, while others have glass doors for easy viewing.
Panasonic Enviro-Centers give you the best of both versions. The broad, solid frames with effective gaskets ensure excellent temperature stability, and the double-pane glass windows offer an excellent view of the interior without compromising temperature stability.

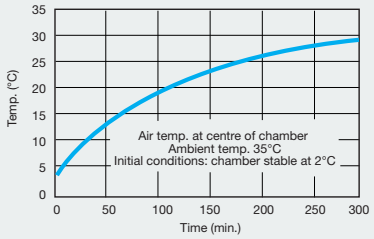
Model	Shelves/Drawers
MPR-1411	8 wire shelves
MPR-1411R	10 drawers
MPR-721	4 wire shelves
MPR-721R	5 drawers

Performance data MPR-1411 MPR-1411R

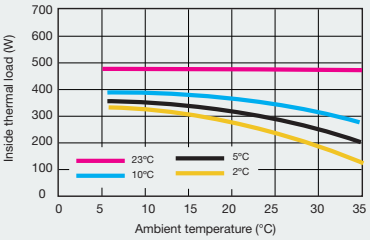
MPR-1411 Pull-down characteristics (no-load)



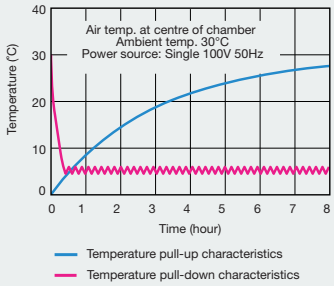
MPR-1411 Pull-up characteristics (no-load)



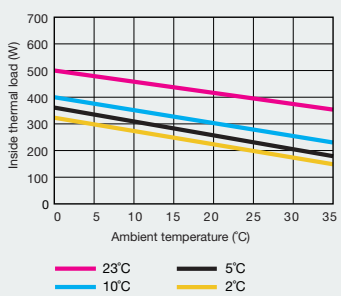
MPR-1411 Test of permissible inside thermal load



Performance data MPR-721 MPR-721R



MPR-721 Permissible inside thermal load



Stable and reliable environment control – the key to high-precision performance for exacting storage or research requirements

Spacious capacity meets versatile requirements of pharmaceutical refrigeration, from small-variety packages to large-variety packages.

Several factors are important to assure the quality of pharmaceuticals, samples and reagents. These are storage temperature, expiry date, exposure to ultraviolet light and humidity. Of these the most important is storage temperature. If the temperature is too high, chemical changes can occur which affect the quality of the materials. If the temperature is too low, there is a risk of structural changes brought about by freezing. Narrow and uniform temperature control without regard to ambient conditions is very important. Don't compromise your results!

Rosh HaNikrah, Israël

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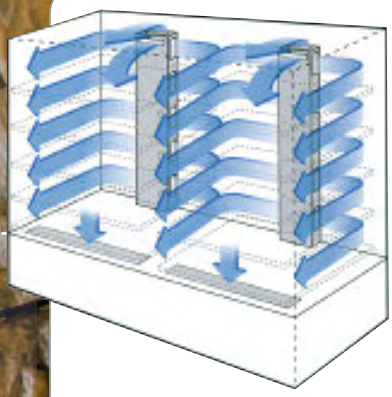


Plenums
Panasonic's plenum design features uniform cold air flow distribution throughout the chamber to ensure temperature uniformity - essential for validated storage requirements.

MPR-1014
1.033 LITRES

Equipped with wire shelves

Uniform storage unaffected by ambient temperature
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. Panasonic's easily calibrated, reliable and stable controls make validation easier.

Remarkable cooling efficiency
A highly efficient hermetic compressor, specially designed and developed by Panasonic, is utilized to provide powerful and rapid cooling to maintain proper temperature level.

Ergonomic design
The ergonomic design of the MPR series 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.

Double-sensor temperature management
The double-sensor control system with alarm-exclusive sensor added to the temperature control sensor always monitors the precise chamber temperature.

Safety is a Panasonic standard
Even the best designed refrigerator must be prepared for the unexpected.

- Cabinet construction
  View Window design with protective film to prevent shattered glass from scattering onto the floor. Also features key locked doors.
- Control safety devices
  Audible and flashing LED visual alarms alert you to the unlikely event of either a high or low temperature condition. An

over-shooting prevention circuit automatically switches off the fan motor or heater, if the inside temperature rises abnormally.

- Comprehensive alarms
  In addition to Low/High temperature alarms and door ajar alarm, power failure alarm can be installed as an option. Remote alarm terminal is also provided as standard.

Worry-free cycle defrosting system
With Panasonic's cycle defrost system, defrosting is performed automatically during compressor "off" cycles, and by sensing frost levels. This way defrosting is performed only when required, further protecting the contents against unnecessary temperature rise. The defrosting heater also acts as an emergency heat source to prevent samples from freezing.

HFC refrigerant & HCFC-free insulation
Panasonic biomedical equipment is designed for low environmental impact. The MPR-514 and 1014 series use HFC refrigerant and the foamed-in-place insulation is HCFC free.

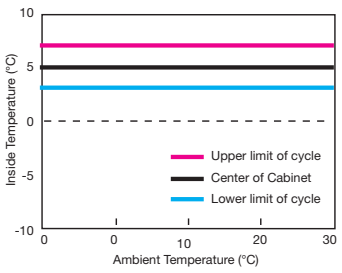
Options

Temperature chart recorder	
(-6˚C to +20˚C)	MTR-0621LH
Chart paper	RP-06
Mounting kit	MPR-S30
Circular Temperature chart recorder	
(-10˚C to +40˚C)	MTR-G04
Chart paper	RP-G04
Ink pen	PG-R
Mounting kit	MPR-S7
External mounting Power Failure Alarm	MPR-48B
Communications Interface	MTR-480
Mounting bracket	MPR-48B

Performance data MPR-1014 / MPR-1014R / MPR-514 / MPR-514R

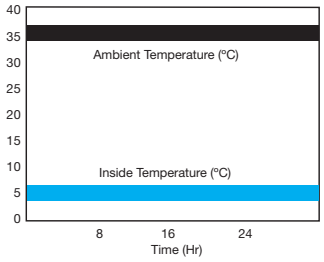
Uniform Storage Temperature-ambient Temperature

SANYO MPR

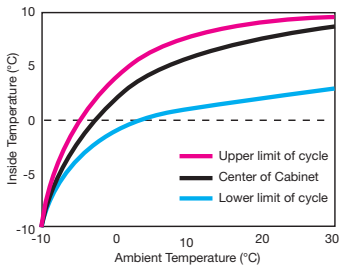


Uniform Storage Temperature-Cycle Defrost

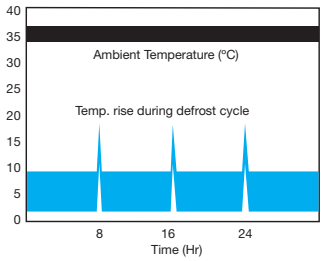
SANYO MPR



Conventional Refrigerator

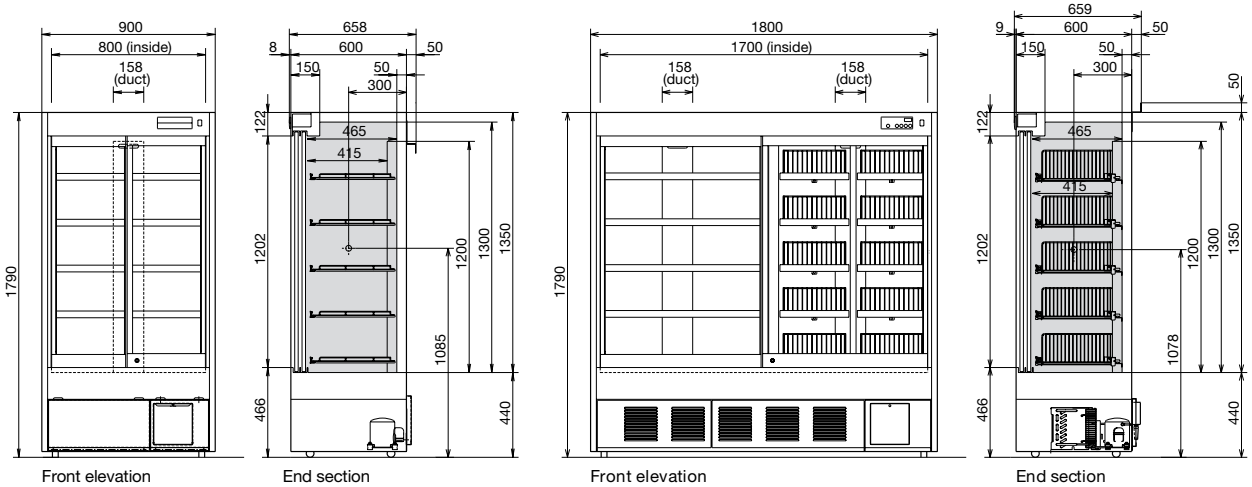


Conventional Refrigerator



Dimensions

Unit: mm



MPR-514/MPR-514R **MPR-1014/MPR-1014R**

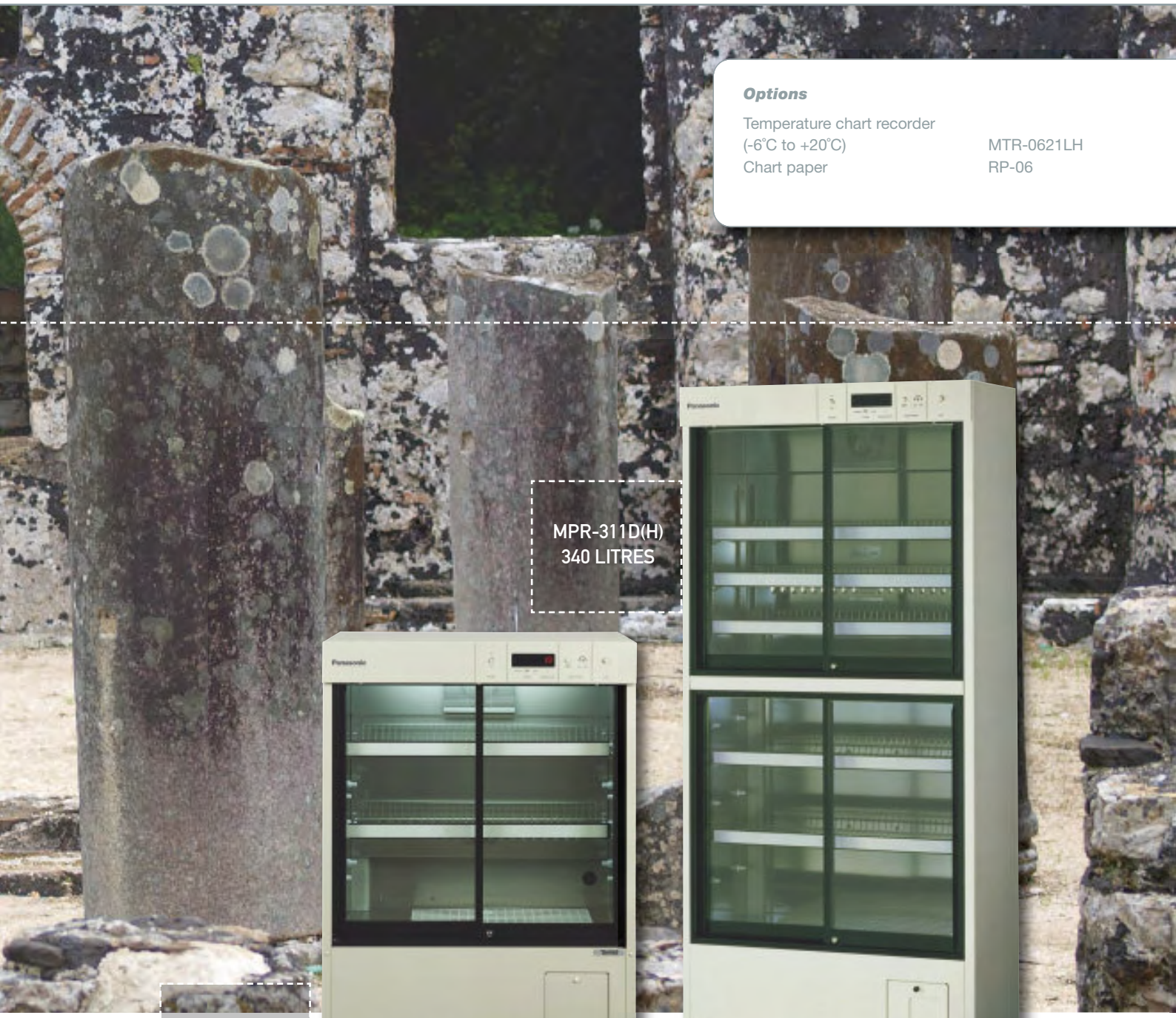
MPR-514
489 LITRES

MPR-514R
486 LITRES

Safe, worry-free cold storage of valuable medical supplies

Medical refrigerators for reliable storage of pharmaceutical and medical supplies. For a versatile range of storage applications – compact and large-capacity medical refrigerators.

Panasonic pharmaceutical refrigerators – safe, worry-free cold storage of valuable medical supplies.
To ensure quality, safety and effectiveness of vital medical supplies, Panasonic medical refrigerators feature precisely regulated cooling systems that maintain a delicate temperature balance under a wide range of conditions. For many years, Panasonic has



Options

Temperature chart recorder (-6˚C to +20˚C)	MTR-0621LH
Chart paper	RP-06

provided equipment for medical supply storage and temperature control to hospitals and pharmacies throughout the world. Now, utilizing this accumulated experience plus valuable feedback from the medical community, Panasonic has developed the Medi-Cool line of medical refrigerators, each of which is equipped with advanced cooling and electronic technology to provide the ideal temperature for the perfect preservation of a wide range of medical supplies.

Remarkable Cooling Efficiency

Taking into consideration that pharmaceutical refrigerators must be opened frequently, a highly efficient hermetic compressor, specially designed and developed by Panasonic, is utilized in each model of the Medi-Cool series.

The hermetic compressor provides powerful, immediate cooling which is effective in maintaining the inside temperature at a constant level.

Effective Temperature Control

1. Electronic Temperature Control System

A thermistor sensor monitors temperature inside the chamber and microprocessor and electronic temperature control ensure that the set temperature is maintained. Even if the door is opened and closed frequently, the

circulation fan ensures rapid temperature adjustment to provide a highly reliable, stable preservation environment that is not affected by ambient temperature. The MPR-161D(H) and 311D(H) have a digital temperature display for easy confirmation.

2. Fan-Forced Air Circulation
The temperature stays even throughout the inside of the refrigerator with the fan-forced air circulation system. No matter how the load is distributed, every corner of the unit is immediately cooled with no noticeable variation in temperature apparent inside the cabinet.

3. Cyclical Defrosting System
During normal operation, the cyclical defrosting system permits defrosting to take place without increasing the temperature inside the cabinet.

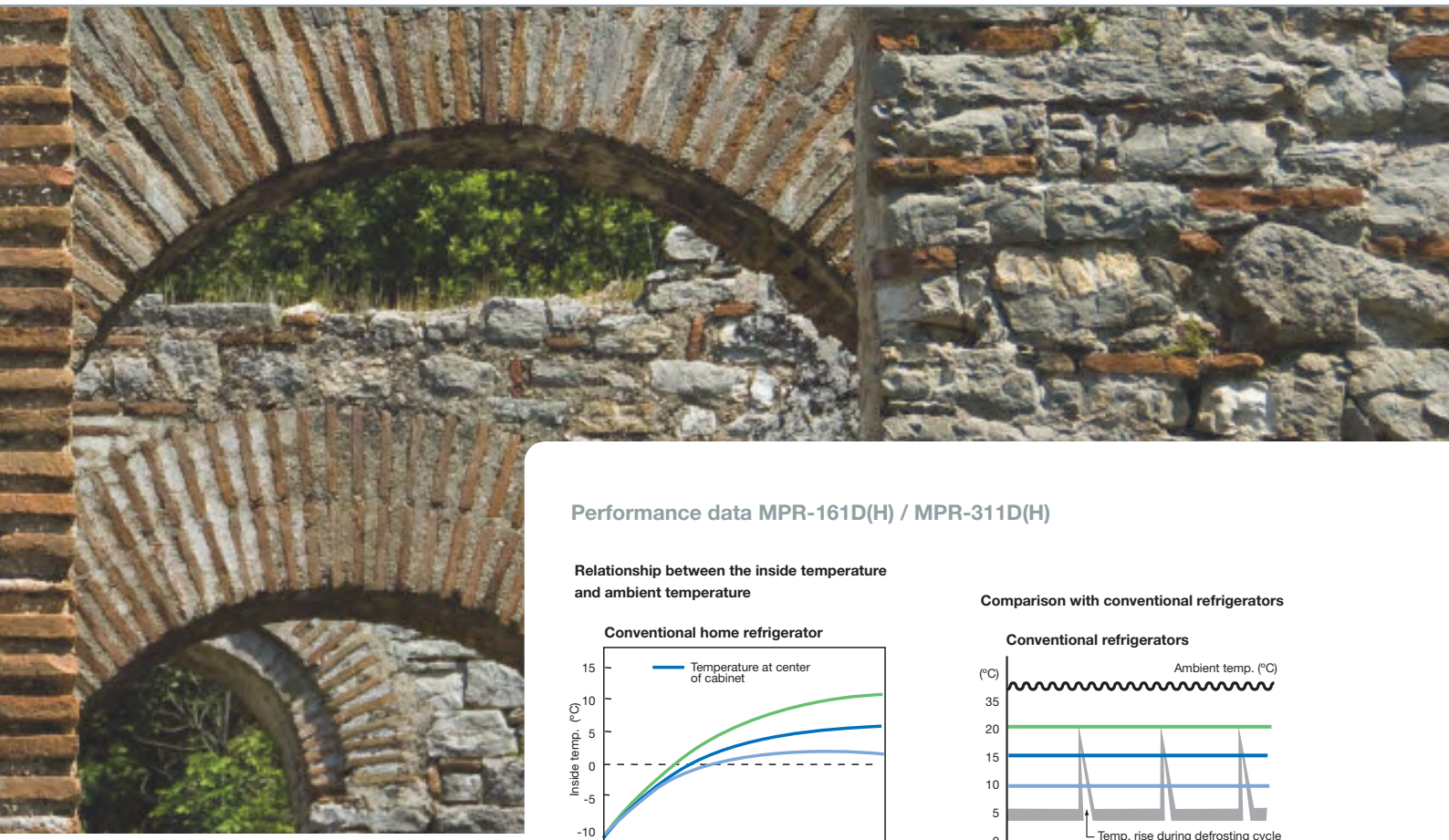
Equipped with Digital Temperature Display
Easy-to-read digital temperature display provides at-a-glance confirmation of the current operating temperature. To simplify temperature control, temperature readings are displayed in graduations of 1°C for temperatures ranging from 0°C to 15°C.

Easy-to-Use Doors
1. Double-Paned Glass with Heat-Reflective Film
The refrigerator doors, constructed of double-paned glass with heat-reflective film, allow easy loading and unloading of medical supplies while preventing ultraviolet rays, which may damage the stored items, from entering the unit. Panasonic's unique heat-reflective film blocks the passage of radiant heat rays through the glass panels and keeps the inside temperature from being adversely affected by excessive amounts of heat.

2. Door Open Alarm
When the door is opened, the Door Open indicator lamp lights automatically. After approx. 30 seconds a buzzer alarm will sound if the door has not been closed. When you want to keep the door open for more than 30 seconds, you can deactivate the alarm via the buzzer switch provided.

Abnormal Temperature Alarm and Safety Devices
1. Abnormal Temperature Alarm
If the inside temperature suddenly descends to below 0°C or rises to above 15°C, the buzzer sounds an alarm. Simultaneously, the digital temperature display flashes.

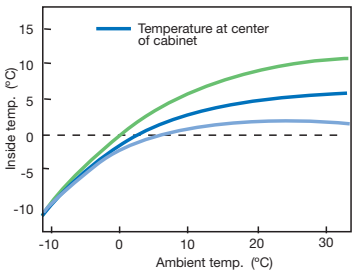
2. Abnormal Temperature Safety Device
If the internal temperature reaches below –2°C or above 20°C (approx.), the low and high-temperature safety devices prevent the contents of the refrigerator from freezing or the temperature from rising abnormally while visible and audible alarms are activated.



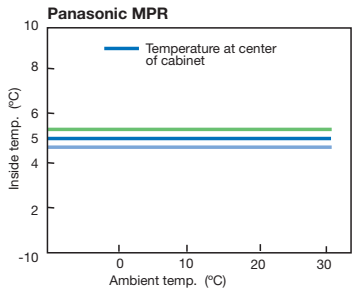
Performance data MPR-161D(H) / MPR-311D(H)

Relationship between the inside temperature and ambient temperature

Conventional home refrigerator

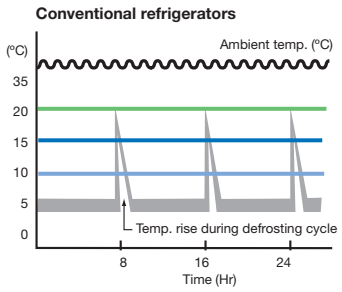


Panasonic MPR

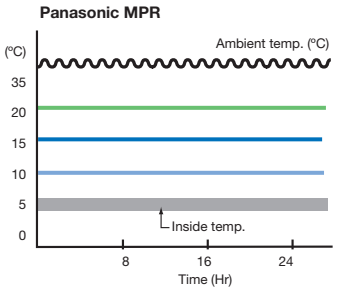


Comparison with conventional refrigerators

Conventional refrigerators



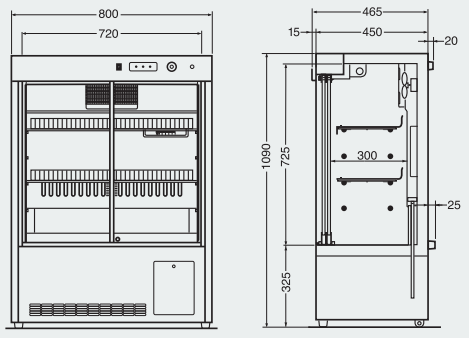
Panasonic MPR



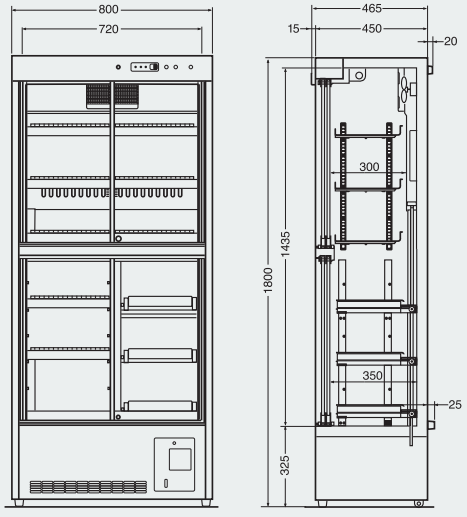
- Rigid polyurethane foam insulation acts to keep cold air inside the unit and effectively protects against the intrusion of warm air.
- Chemical-resistant interior surface of the cabinet ensures reliable service for many years of use.
- Less installation area is required with the use of 2 easy-open sliding doors.

Unit: mm

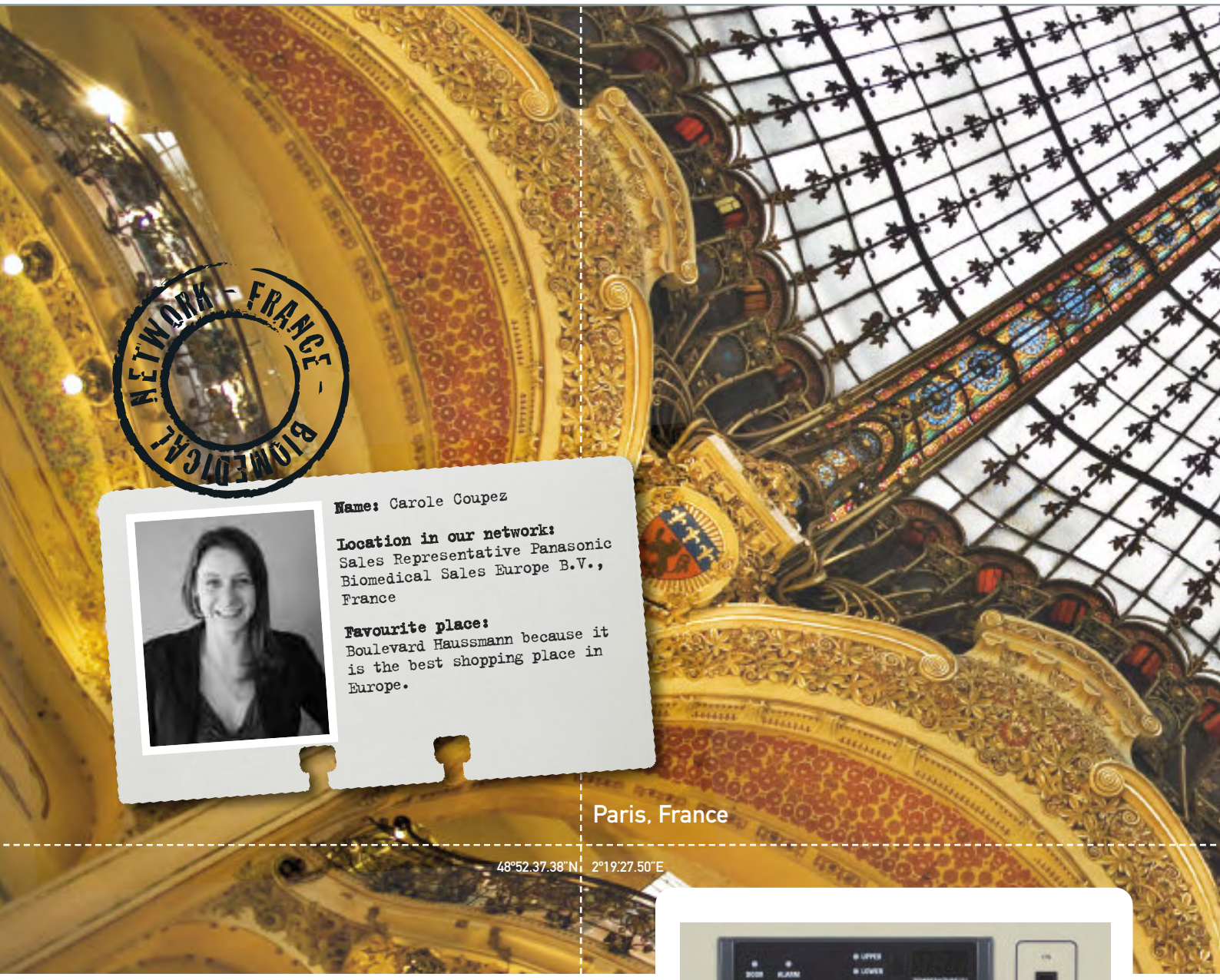
Dimensions



MPR-161D(H)



MPR-311D(H)



Blood Bank Refrigerators

Panasonic MBR-series provide two styles of storage systems, DH-type (coated steel wire shelf) and GR-type (stainless steel roll-out drawer with card holder). Designed to conform to AABB criteria, with assured stable and reliable temperature control utilizing Panasonic original technology: A special highly efficient compressor designed and developed by Panasonic, to provide rapid cooling and quiet performance for each model.

Options

Temperature chart recorder is standard built-in on the MBR models

Chart paper	RP-G04 (for MBR-305GR, 704GR, 1405GR)	
Ink pen	PG-R (for MBR-305GR, 704GR, 1405GR)	
Chart paper	RP-06 (for MBR- 107D(H), 506D(H))	
Chart paper	RP-G04 (for MBR-305GR, 704GR, 1405GR)	
Storage basket	MBR-15B (for MBR-107D(H))	7 bags of 220 ml, max. 8 baskets
	MBR-16B (for MBR-107D(H))	4 bags of 450 ml, max. 8 baskets
	MBR-55B (for MBR-506D(H))	10 bags of 220 ml, max. 20 baskets
	MBR-56B (for MBR-506D(H))	6 bags of 450 ml, max. 20 baskets

Stable Temperature Control

- Temperature is controlled by two sensors located in the liquid-loaded monitor bottles, which are in the shape of a blood bag.
- Two thermistor sensors for constantly monitoring the temperature in both the upper and lower part of the chamber.
- Microprocessor control ensures the most accurate temperature control available.
- Multi air-flow plenum system ensures excellent temperature uniformity in larger capacity models. (MBR-704GR, MBR-1405GR).
- Temperature-maintained defrost, designed with thermal sensors and heaters on the evaporator, all under precise microprocessor control.

Temperature Variations Prevented

Panasonic 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 and promotes complete door closings.
- Large air circulation fan enables rapid temperature recovery after door openings (double fan for MBR-1405GR).

User Friendly Design

- Selectable storage system (DH-type and GR-type) 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 is calibratable through the control panel.

Alarm and safety functions

To ensure the safety of the precious blood supply, Panasonic 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 alarmcontact. (30min. after buzzer stops).
- Built-in temperature recorder.

Environment Friendly

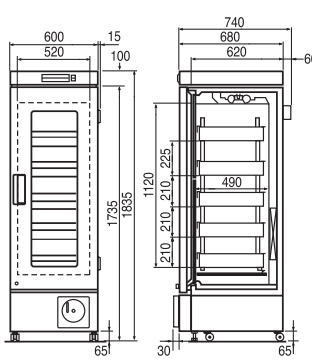
Panasonic refrigerators feature commercially available CFC-free, HFC refrigerants and CFC-free insulation.

Temperature Monitoring Features

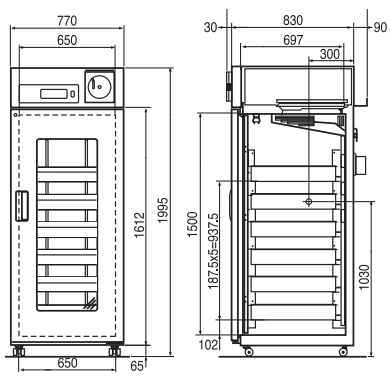
- Unified remote monitoring system for Panasonic Biomedical products (optional).

note: descriptions in this catalogue are based on the models MPR-305GR, 704GR, 1405GR

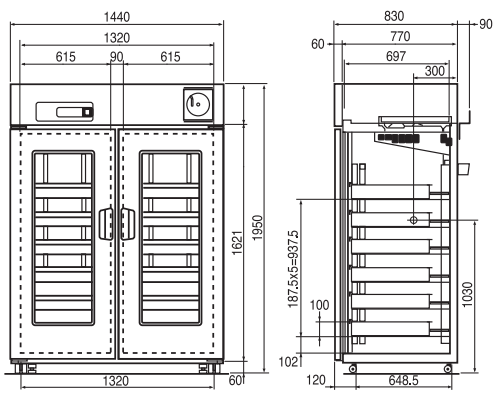
Dimensions



MBR-305GR



MBR-704GR



MBR-1405GR

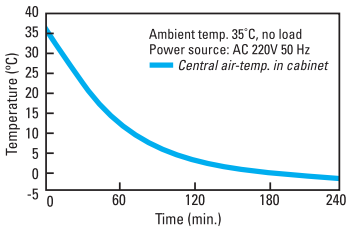
MBR-506D(H)
425 LITRES
120 Blood bags
450 ml

MBR-107D(H)
79 LITRES
32 Blood bags
450 ml

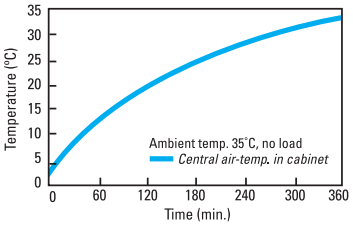
Cooling performance: 4°C ±1°C (Ambient temp. 35°C)

Performance data MBR-305GR / MBR-704GR / MBR-1405GR

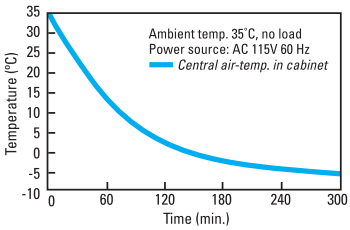
Pull-down characteristics MBR-305GR



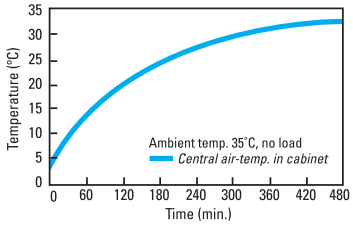
Pull-up characteristics during power failure MBR-305GR



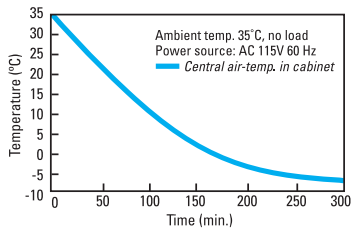
Pull-down characteristics MBR-704GR



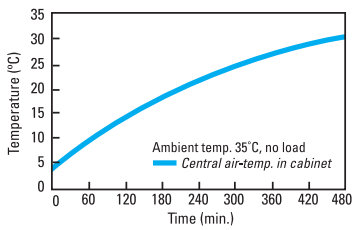
Pull-up characteristics during power failure MBR-704GR

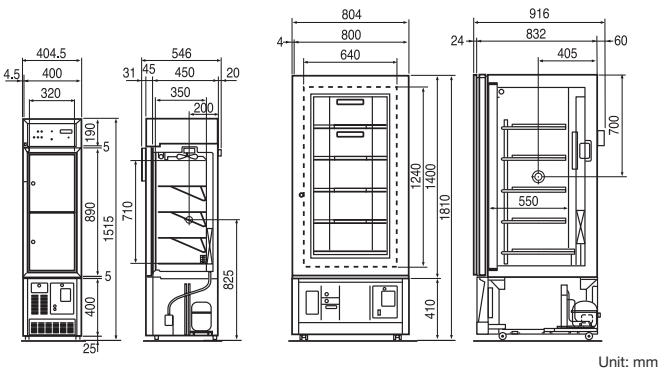


Pull-down characteristics MBR-1405GR



Pull-up characteristics during power failure MBR-1405GR





Unit: mm

MBR-107D(H) MBR-506D(H)

* A continuously operating compressor was used to obtain data for the three pull-down graphs.

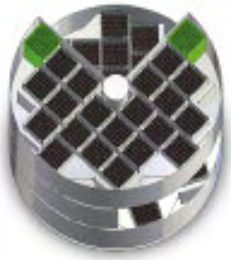
The world of -190ºC

CBS Isothermal Freezers feature a patented liquid Nitrogen jacket to provide uniform storage temperatures in the -190°C range, free from liquid Nitrogen contact. This innovative design eliminates the risk of cross-contamination through liquid Nitrogen and the need for additional packaging to protect valuable cells and tissue.

With a minimal temperature gradient, the full internal volume of each freezer is available for storing samples at liquid Nitrogen temperatures making the most efficient use of available capacity. CBS Isothermal Freezers also provide added user safety by eliminating contact or splashing of liquid Nitrogen. All models are certified to the Medical Device Directive 93/42/EEC: 1993 Class IIA and feature the Series 2301 Auto-fill and Monitor System providing sample security and ease of operation. A wide selection of inventory systems for vials and bags is offered, and installation, commissioning and calibration service are available.

Straw Storage Inventory System

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



The upper level provides aconvenient 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.

The Straw Storage Inventory System is specially designed for the CBS V-1500AB and CBS V-3000AB Isothermal Freezers. This patent-pending Inventory System provides an efficient solution for storing and working with straws, free from liquid Nitrogen contact. Working with a 3-level rotating carousel, the system can hold up to 24.480 straws in 68 canisters for the CBS V-1500AB. In combination with the CBS V-3000AB the system can hold up to 61.200 straws in 170 canisters .

The Isothermal Concept

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

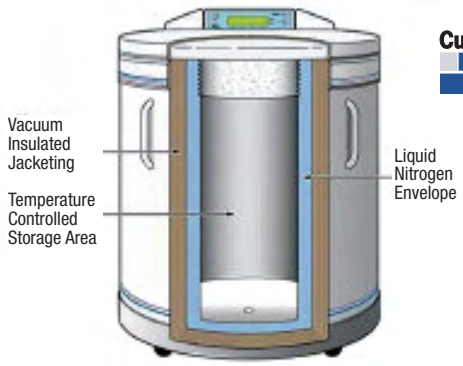
No Liquid Nitrogen Contact
With no liquid Nitrogen in the storage area, samples can be stored safely in the -190°C range without the risk of cross-contamination through liquid Nitrogen. The Isothermal design also provides added user safety with no splashing or contact of liquid Nitrogen when removing racks and samples from the freezer.

Automatic Operation
CBS 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 BMS or monitoring system.

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

- Outstanding temperature uniformity in the -190°C range.
- No loss of storage space.
- No cross-contamination through liquid Nitrogen.
- User safety with no liquid Nitrogen in the sample storage area.
- Automatic operation and filling.
- Certified to Medical Device Directive 93/42/EEC: 1993 Class IIA.
- Choice of 4 models offering capacities between 9,100 and 45,000 2ml vials.



Key features of the 2301 controller

Features

- Compatible with all on site automated LN_2 supply systems
- Availble on all standard and Isothermal LN_2 freezers
- Programming of LN_2 auto-fill levels and cycles
- Sequential filling capabilities, one-fill-all-fill
- Warm gas by-pass
- Output data to PC / Printer (USB Port and printer port)
- RS-485 communication port
- Cryomonitor software for freezer function and alarm download
- System validation with print out
- Key pad lock
- Lid lock

Front Panel Display

- System status display
- Liquid level inches / centimeters

- Two level temperature display; at lid and inside storage space
- System status start / stop fill

Alarms

- Visual, audible and remote
- High and low LN_2 levels in jacket
- Temperature deviation
- Sensor and valve abnormality
- LN_2 source / supply
- Remote alarm contact
- Overflow sensor/alarm (optional)

Isothermal Carousel

The Isothermal Carousel Liquid Nitrogen Vapor Storage System combines the innovative -190°C Isothermal design with a small opening and an interior rotating carousel. The small opening provides low liquid nitrogen consumption, a lightweight, user-friendly lid and a consistently low temperature in the freezer. The interior carousel is rotated by a unique ratcheting handle on top of the freezer that will position samples to the front of the freezer, even with the lid on. Each Isothermal Carousel system includes the advanced 2301 auto- fill/monitoring controller to provide security and ease of operation.

- No need to remove one rack to retrieve another rack
- No unnecessary exposure to room temperatures
- Carousel is rotated from the outside of the freezer eliminating the risk of injury or temperature fluctuations.
- Exceptional temperature uniformity
- Easy access to samples from the front of the freezer
- Removable console allows for complete access to the sample storage space if necessary.
- CBS Isothermal Carousel freezers are cooled by a PATENTED liquid nitrogen jacket, with no liquid in the sample storage space
- The only true DRY STORAGE FREEZER available
- No risk of cross-contamination through liquid nitrogen contact or the need for special packaging
- The isothermal design also provides added user-safety eliminating contact or splashing of liquid nitrogen
- Manufactured to ISO 13485 Standards

There are several Isothermal Carousel models available and an extensive selection of inventory racks to store any size tube, vial, box, microplate, etc. to complete the system. Custom congurations can also be designed to meet any requirement.

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 are controlled by either the chamber or the sample temperature. The freezing rate can be programmed at the optimum rate for each individual sample.

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

Standard LN_2 Freezers

Standard liquid Nitrogen freezers are designed to meet temperature, storage and security specifications required by laboratories storing frozen samples at cryogenic temperatures.

Five liquid Nitrogen freezers are available ranging in sizes from 90 litres to 720 litres, with sample storage capacities up to 40,000 2 ml vials or over 3,500 blood bags. Each unit includes a liquid level auto-fill and alarm system to provide security, ease of operation, plus flexibility to operate vapor storage, immersion storage or a combination of both to store any type or size of sample. An extensive selection of standard inventory racks or canisters and frames are available to complete the system. Custom configurations can also be designed to fit any requirements.

- Standard LN_2 Freezers include the 2301 controller

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

Cryosystems

Manual-fill Cryosystems provide versatile, low cost sample storage at cryogenic temperatures with maximum capacity and low liquid Nitrogen consumption.

- 'XC', 'Classic' and 'Value Added' Series fulfil a wide range of storage requirements
- Capacities from 210 to 6,000 2ml vials
- Advanced vacuum and insulation for maximum thermal performance
- Durable, lightweight aluminium construction and roller bases for easy mobility
- Storage solutions for vials and straws
- Easy access to store and retrieve samples
- Sample security with low-level alarm and lockable lids (padlock not supplied)

'XC' Series – Compact Cryosystems for vial or straw storage. With roller base and handle mounted low level alarm.

'Classic' Series – Medium capacity storage for vials in standard cryogenic boxes. With roller base and handle mounted low level alarm.

'Value Added' Series – Same as 'Classic' Series but with the low level alarm built into a lid console.

Vapor Shippers

The Vapor Shippers are designed for the safe transportation of biological samples at cryogenic temperatures.

Fabricated from durable, lightweight aluminum, the shippers contain a hydro-phobic absorbent which holds the liquid Nitrogen. The absorbent also repels moisture and humidity, assuring the maximum holding time. A protective shipping carton is available for all models which protects the container from being placed on its side and helps in withstanding the rigors of transportation. These containers can be used to ship your samples with a "non-hazardous" classification throughout the world.

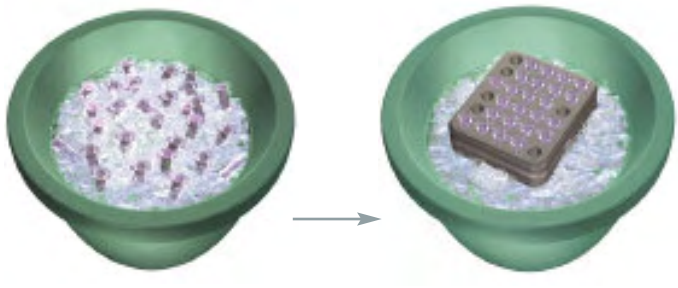
Lab Tanks

The LAB Series dewars use high efficiency super-insulation and aluminum construction to make them lightweight and the most efficient containers available. Their shape and handles make them easy to lift and pour. The LAB Series dewars can also be fitted with pouring spouts, withdrawal devices, or dippers to aid in liquid Nitrogen transfer.

The CF-9511 Transport container is also a high-quality unit, primarily for use in moving samples over shorter distances, such as from one lab to another.

CoolProducts

The CoolProducts from BioCision are portable bench-top tools for ensuring reproducible sample handling and preparation. Its patent-pending products enable researchers to achieve pre-analytical sample standardization: experiment to experiment, lab to lab, site to site. The highly thermo-conductive bench-top tube and plate modules, ice-free cooling containers and alcohol-free cell freezing containers are used by researchers in the pharmaceutical, biotechnology, academic and health care industries worldwide.



Problem Solution

Features CoolRack

- Highly reproducible cooling, (snap)freezing and thawing reduces user error
- Rapid thermo-conductivity through patented aluminum-alloy construction
- Maintains temperature indefinitely when placed in direct contact with ice, dry ice, LN_2, water bath, heat block, incubator, oven
- Precision-engineered for superior tube/plate fit and optimal thermal transfer
- -200°C to 100°C+ temperature range
- Type III hard annodized surface to prevent corrosion and rust
- Autoclavable, high-heat sterilizable, or clean with bleach, RNase Away, common lab detergents and disinfectants

CoolRack

Organized and Protected

CoolRacks rapidly equilibrate to any temperature they contact. Index, organize and protect samples in ice, dry ice, liquid Nitrogen, water baths or any other lab temperature source. Get the benefit of the temperature without the mess!

Cool, (Snap)Freeze or Thaw

Insert samples in a CoolRack instead of directly immersing into ice, dry ice, liquid Nitrogen or water baths. CoolRacks provide temperature consistency and high reproducibility during cooling, (snap)freezing or thawing procedures, eliminating one often-overlooked variable.

Modular and Versatile

CoolRacks accommodate a wide variety of tubes and plates and adapt to any temperature from -200°C through 100°C+. Ideal for a wide range of laboratory applications from collection to processing to transport.

Features CoolBox

- Manufactured from highly durable cross-linked dense polyethylene foam
- Use with ice-free cartridges, wet ice, dry ice, liquid Nitrogen or standard gel packs
- +2°C and -12°C cartridges are reusable and can be recharged in a -20°C freezer
- Clean with aqueous detergents, alcohol, bleach or acid/base viricides. Do not autoclave.
- Excellent resistance to fluid absorption, surface abrasion and rust
- For labeling, use lab markers or tape. Repeated application and removal of tape will not affect surface

CoolBox

Ice-Free Cooling and Freezing

Keep tubes and plates cold or frozen on the bench-top in a compact, versatile and portable CoolBox. Insert your CoolRack or CoolSink module and samples will stay cold or frozen for up to ten hours through the use of interchangeable, reusable cartridges. All wells stay at a consistent 0.1°C temperature uniformity throughout the cooling period eliminating worries of edge-effect.

Snap-Freezing

In addition to cooling and freezing with cartridges, CoolBox can be used with dry ice or LN_2 to create a compact, portable cryogenic freezing station. Rest a CoolRack module on dry ice or LN_2 and get improved work flow and high levels of consistency and reproducibility in snap-freezing procedures.

Collect and Process

CoolBox instantly organizes, protects and standardizes tube and plate sample collection and handling. Compared to directly immersing samples into ice, dry ice or LN_2, CoolBox provides a compact and clean workstation while delivering highly reproducible cooling and freezing results.

Modular and Versatile

CoolBox 30 System accommodates all 30-well CoolRack tube modules. CoolBox Microplate System accommodates all CoolRack and CoolSink SBS-format plate and tube modules. Mix and match for use with a variety of tubes and plates at five different temperatures.

CoolSystem CRYO provides ice-free cold cryo vial preparation and alcohol-free cell freezing. CoolBox CFT30 keeps up to 30 cryo vials at ice temperature while allowing one-handed opening and closing of seated vials. Prepared vials are placed in the CoolCell for alcohol-free highly reproducible freezing in a -80˚C freezer or dry ice locker.

CoolCell

-1°C/minute Alcohol-free Cell Freezing

Alcohol-free means no fluids, no on-going expense, no maintenance, no waste and no variability in freeze runs.

Highly Reproducible

With CoolCell each freeze run profile is exactly the same. The solid core design never varies in cooling rate and, unlike alcohol-filled containers, the insulated design provides repeatable, constant cooling throughout the freezing period.

Improved Work Flow

CoolCell is ready to use “off the shelf” and is ready again just minutes after a freeze cycle. Freeze up to 12 screw cap 1ml or 2ml cryo vials. The insulated design protects hands when removing from the -80˚C freezer. No frosty fingers. No stuck lids.

CoolCell FTS30 is a high capacity controlled-rate cell freezing container for cryopreservation of 30 cryo vials in a -80°C freezer. The innovative, patent-pending device utilizes a novel alloy and controlled micro-convection technology to evenly draw in cold freezer air through a bottom intake valve, uniformly disperse the cold air around each vial in the central FTS chamber and then release the thermal load from the vials through an exhaust port on the top of the device. Each vial achieves a uniform and reproducible -1°C/minute freezing profile.

The inner removable FTS Vial Module holds 30 cryo vials. It can be placed in a biosafety cabinet for efficient loading of the prepared vials and then placed into the CoolCell FTS30 for freezing. Frozen vials can then be removed in one step on the vial module and placed into a standard 5.5" x 5.5" x 2" cryo storage box.

Panasonic CO_2 and Multigas Incubators provide the very best conditions for cell cultivation, from routine cell culture to the most critical applications. Panasonic has pioneered the development of technologies, which set new standards for temperature and CO_2 control. In addition, Panasonic's contamination control technology constantly helps to protect valuable samples, without downtime or compromise to the incubator's performance.

World Class Design
Performance - Panasonic CO_2 and Multi-gas Incubators offer outstanding control and rapid recovery of temperature and CO_2/O_2 concentration to provide optimum conditions and reproducible results.
Temperature - Direct Heat and Air Jacket technology (DHA) provides precise and uniform temperature control, with rapid response following door opening. Uniform temperatures (and CO_2 levels) are further enhanced by gentle fan circulation, which unlike convection methods of air circulation, is much less affected by incubator loading and other factors.

CO_2
Panasonic introduced reliable, long-life solid-state Infrared sensors and PID control of CO_2 injection to provide exceptional CO_2 stability and recovery times. Auto-calibration using room air eliminates drift and fan circulation ensures efficient distribution and uniformity of CO_2 inside the incubator.

Note: Featured models are the MCO-19AIC/19M. Specifications vary between models – for details, please refer to the individual model descriptions.

- CO_2 Incubators
- Multigas Incubators
- Plant Culture Chambers
- Heated Incubators
- Cooled Incubators

Relative Humidity
A removable water pan combined with an independent heater at the base of the incubator provides an efficient, cost effective method for maintaining elevated humidity levels. The humidifying pan can be easily removed and a water level sensor provides an easy maintenance system.

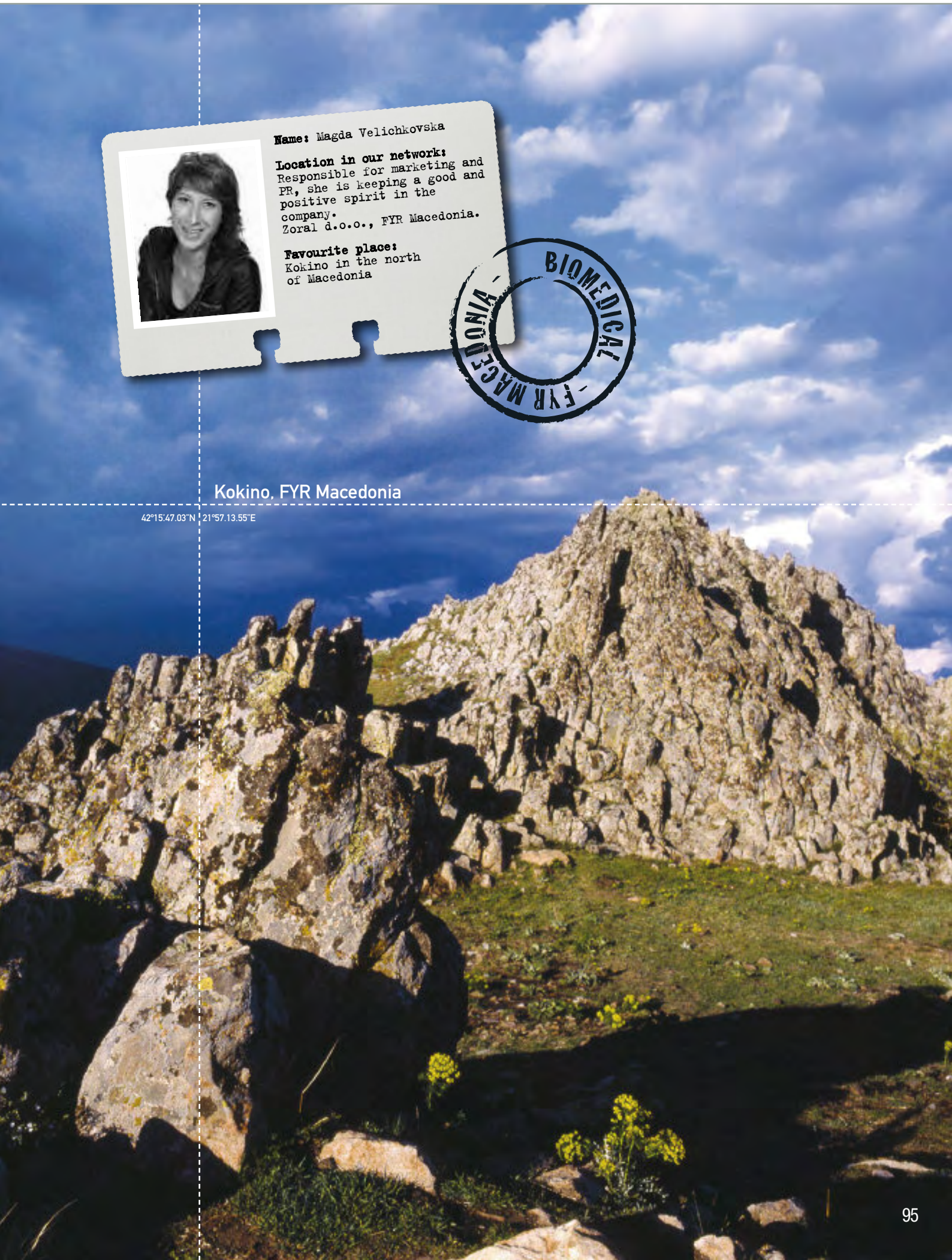
Preventive Contamination Control - Panasonic's InCu saFe® and SafeCell UV work in combination to provide the most effective protection against contamination during culturing, without downtime or affecting cultures.

InCu saFe® Copper-Stainless Steel Alloy
InCu saFe® copper-stainless steel alloy combines the corrosion resistance and durability of stainless steel with the germicidal properties of Copper. The InCu saFe® walls and shelves significantly reduce the risk of contamination developing on internal surfaces.

SafeCell UV (U.S. Patent 6255103)
Panasonic's SafeCell UV system with programmable, ozone-free UV lamp sterilises the chamber air, and water in the humidifying pan.

The UV lamp is completely isolated from the cell cultures and unlike other methods; the SafeCell UV system does not trap contaminants inside the incubator or require the temporary removal of critical components.

Note: Featured models are the MCO-19AIC/19M. Specifications vary between models – for details, please refer to the individual model descriptions.



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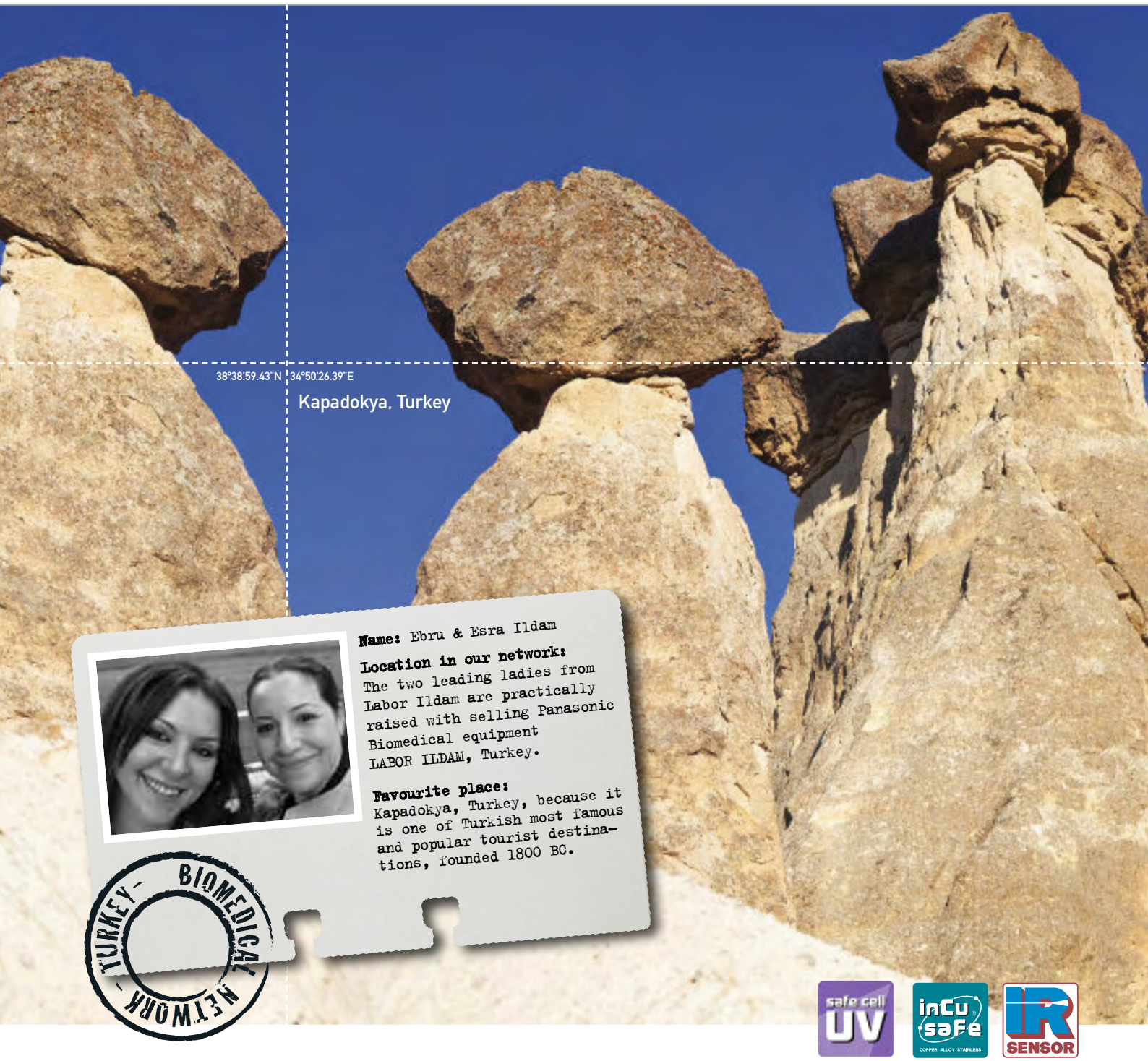


Large Scale Cell Culture CO_2 Incubator

The MCO-80IC is ideal for culturing high volumes of patient samples, performing short-term studies, and working with large volume cell culture apparatus. The MCO-80IC includes Panasonic's advanced incubator technologies such as InCu saFe® interior, UV decontamination* and solid-state infrared CO_2 sensor with P.I.D. control to provide outstanding performance and anti-contamination control. The incubator also features exceptionally low CO_2 gas consumption for economic operation.

Options

Shelf and brackets (InCu saFe®)	MCO-80ST
Roller bottle rack mounting kit	MCO-80RBS
Automatic CO_2 gas cylinder switchover system	MCO-80GC
UV system kit	MCO-80UVS
Inner door kit	MCO-80ID
Automatic water supply system kit	MCO-80AS
mA Analogue output for MCO-80IC	MCO-420MA
Communications Interface[1)]	MTR-480

[1)]*Can only be fitted with one communications terminal*

Superior CO_2 and Temperature Control

- **Horizontal Laminar Airflow System**
  The MCO-80IC features a cross-shelf horizontal air flow system, which promotes optimum temperature uniformity throughout the incubator and contributes to rapid recovery after door openings. The conditioned air is directed evenly through the incubator using perforated side plenums made from Panasonic's exclusive InCu saFe® copper-enriched stainless steel. The horizontal airflow helps to maintain uniform air circulation and even temperature distribution when samples are placed in the incubator.
- **P.I.D. temperature control**
  Limits temperature fluctuation to ±0.1˚C.
- **Infrared (IR) CO_2 sensor with P.I.D. microprocessor control**
  Delivers precise control and fast CO_2 recovery characteristics.
- **Exceptionally low CO_2 gas consumption rates**
  Less than half of a similar competitor unit.

* *Optional UV sterilisation system for humidity reservoir.* *See page 157.*

Large Scale CO_2 Incubator MCO-80IC

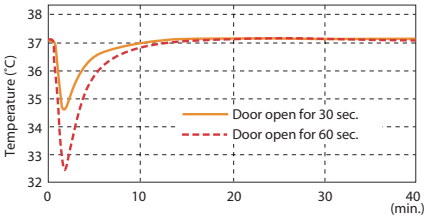
Faster CO_2 Recovery & Lower CO_2 Consumption
Panasonic's large scale cell culture incubator has been designed specifically for critical applications in pharmaceutical, biotechnology and clinical investigation.

Large chamber capacity applications require special consideration of gas usage and recovery. Panasonic's proprietary IR sensor with P.I.D. CO_2 control algorithm is paramount to the industry's leading design. An optional inner door system (MCO-80ID) is also available to enhance these results further.

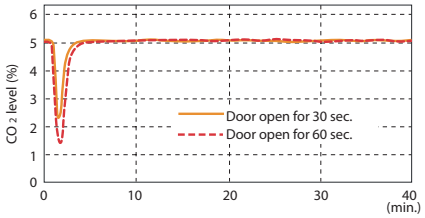
Control Panel

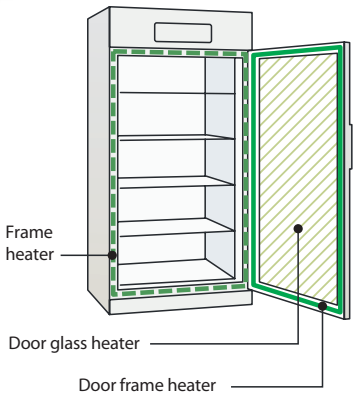
Performance data MCO-80IC

Temperature level recovery characteristics



CO_2 level recovery characteristics





Flexibility and Ease of Use

- Large capacity, 851 litre CO_2 Incubator with adjustable shelving provides flexibility in use.
- Accommodates roller bottle apparatus, 5 bottles wide x 7 bottles high (requires optional Mounting Ramp Kit, MCO-80RBS).
- Full view, double paned glass door allows clear observation of cultured samples.
- Large LED digital display and keypad for greater visibility and ease of set-up.

Preventative Contamination Control

- Incubator interior, plenums and shelving made from Panasonic's exclusive InCu saFe® germicidal, copper-enriched stainless steel.
- Heated glass door and door frame heater prevent condensation.
- Optional UV sterilisation system for humidity reservoir.

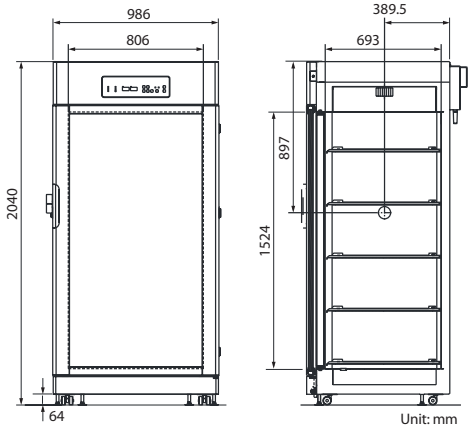
Humidity Selection

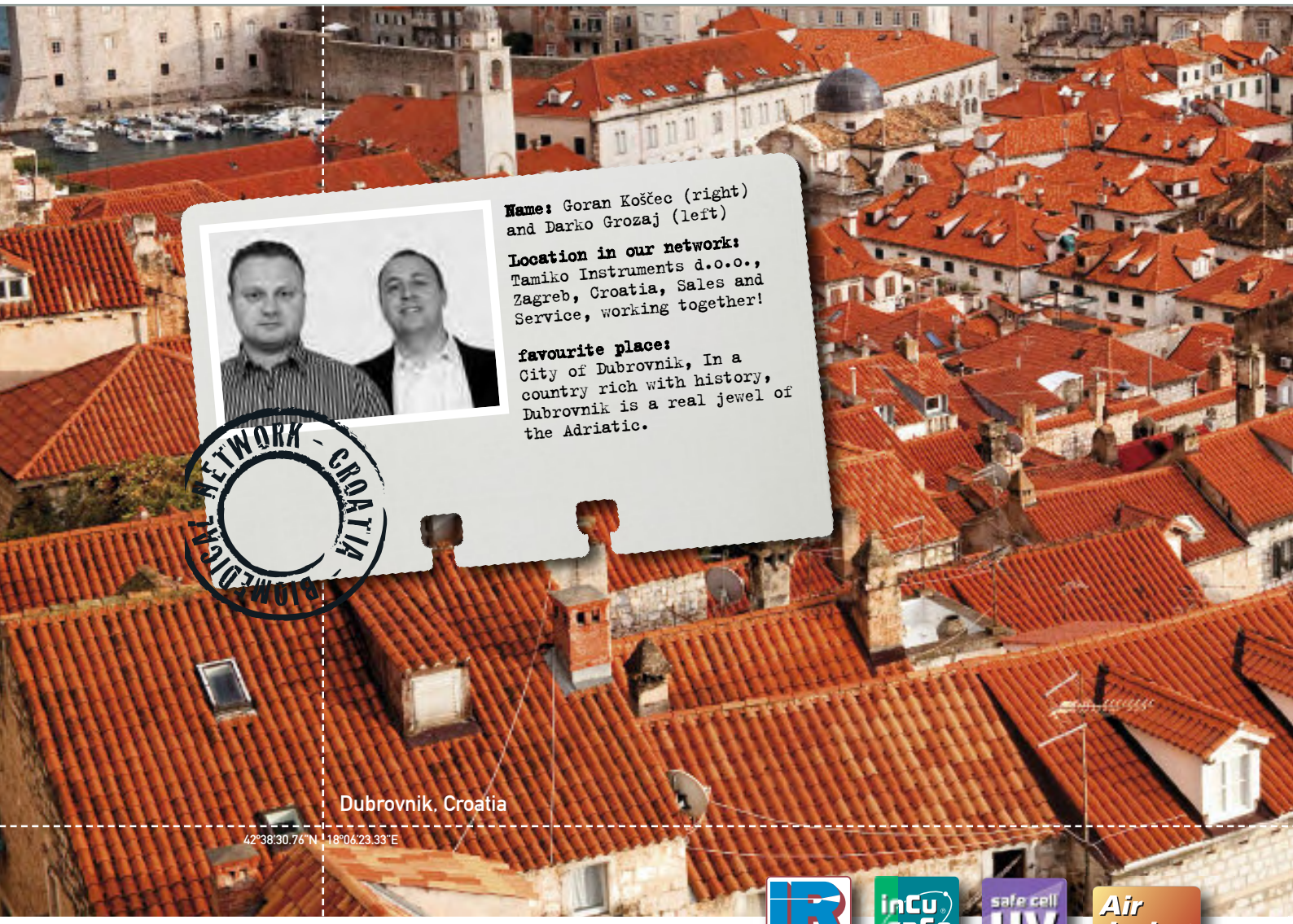
As standard, the MCO-80IC offers a choice of normal and high humidity modes for different application needs. For reliability and reduced maintenance the humidity reservoir heaters are located on the outside walls of the reservoir and are not susceptible to corrosion or scaling through contact with water. An optional auto-fill 20 litre secondary water tank (Model MCO-80AS) provides an additional water supply to the humidity reservoir.

Dimensions

	Panasonic MCO-80IC			Competitor Model		
Door Openings (Number per day)	0	2 x 30 sec	2 x 60 sec	0	2 x 30 sec	2 x 60 sec
CO_2 Consumption (litres per day)	280 l/day	440 l/day	457 l/day	597 l/day	728 l/day	752 l/day
30kg CO_2 Cylinder Retention Time*	60 days	39 days	37 days	28 days	23 days	23 days

* Test conditions: Set temperature = 37°C, set CO_2 = 5%, Ambient temperature = 20°C.
* All values are actual test values for reference only, and cannot be guaranteed in operation.





Professional Cell Culture CO_2 Incubator with UV sterilization

The MCO-20AIC Automatic CO_2 Incubator provides a stable cell culture environment where contamination control is a continuous process, not an inconvenience.

Background Contamination Control
The Panasonic MCO-20AIC is the world's first cell culture CO_2 incubator to employ continuous active background ultraviolet light sterilization in combination with the passive resistance of a copper-enriched stainless steel chamber to destroy contaminants in vitro without affecting cell cultures and without downtime.

Eliminates HEPA Filter Scrubber and Decontamination Heat Cycle
The MCO-20AIC inhibits the growth of mycoplasmas, bacteria, molds, spores, yeasts and fungi without costly HEPA filter air scrubbers which accumulate contaminants in the chamber, or disruptive, high temperature decontamination schemes which can actually encourage growth of heat resistant thermophilic and hyperthermophilic microorganisms in vitro.
As a result, the MCO-20AIC offers a sensitive yet robust platform for short term, high-throughput drug discovery projects as well as intermediate and long-term cell culture investigations.

High Performance In Vitro Modeling
Stable temperature, humidity and CO_2 density are

achieved through a combination of performance systems supervised by a centralized microprocessor controller complete with alarm, programming, calibration and diagnostic protocols exportable to remote databases through optional communications ports for compliance monitoring.

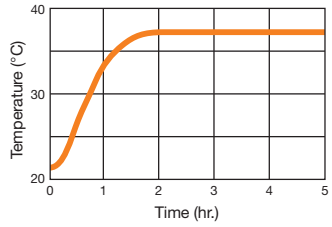
Direct Heat, Air Jacket (DHA) Heating System
The Direct Heat, Air Jacket (DHA) heating system eliminates the need for a conventional water jacket, while achieving temperature stability, uniformity and fast recovery following door openings.

Elevated Humidity, Low Water Level Warning
To avoid cell culture desiccation, the MCO-20AIC maintains 95% RH at 37ºC through a combined forced air and natural evaporation method, which is enhanced by the DHA base heater and protected by an optical water level indicator to warn of low water in the removable humidity pan. A unique optical water level sensor automatically inserts into the humidity pan when filled and replaced.

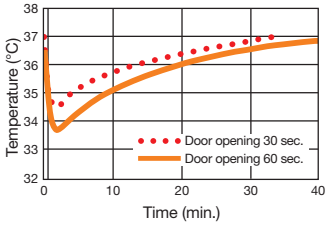
CO_2 Incubator MCO-20AIC

Performance data MCO-20AIC

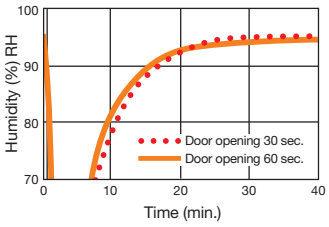
Temperature Pull-up Characteristics



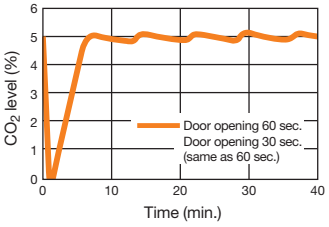
Temperature Recovery Characteristics



Humidity Recovery Characteristics

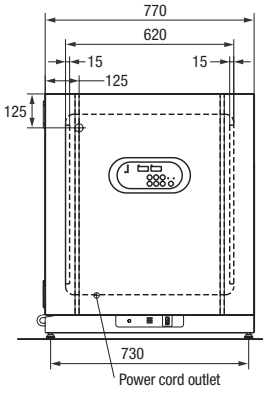


CO_2 Level Recovery Characterics

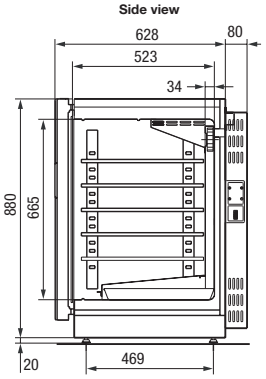


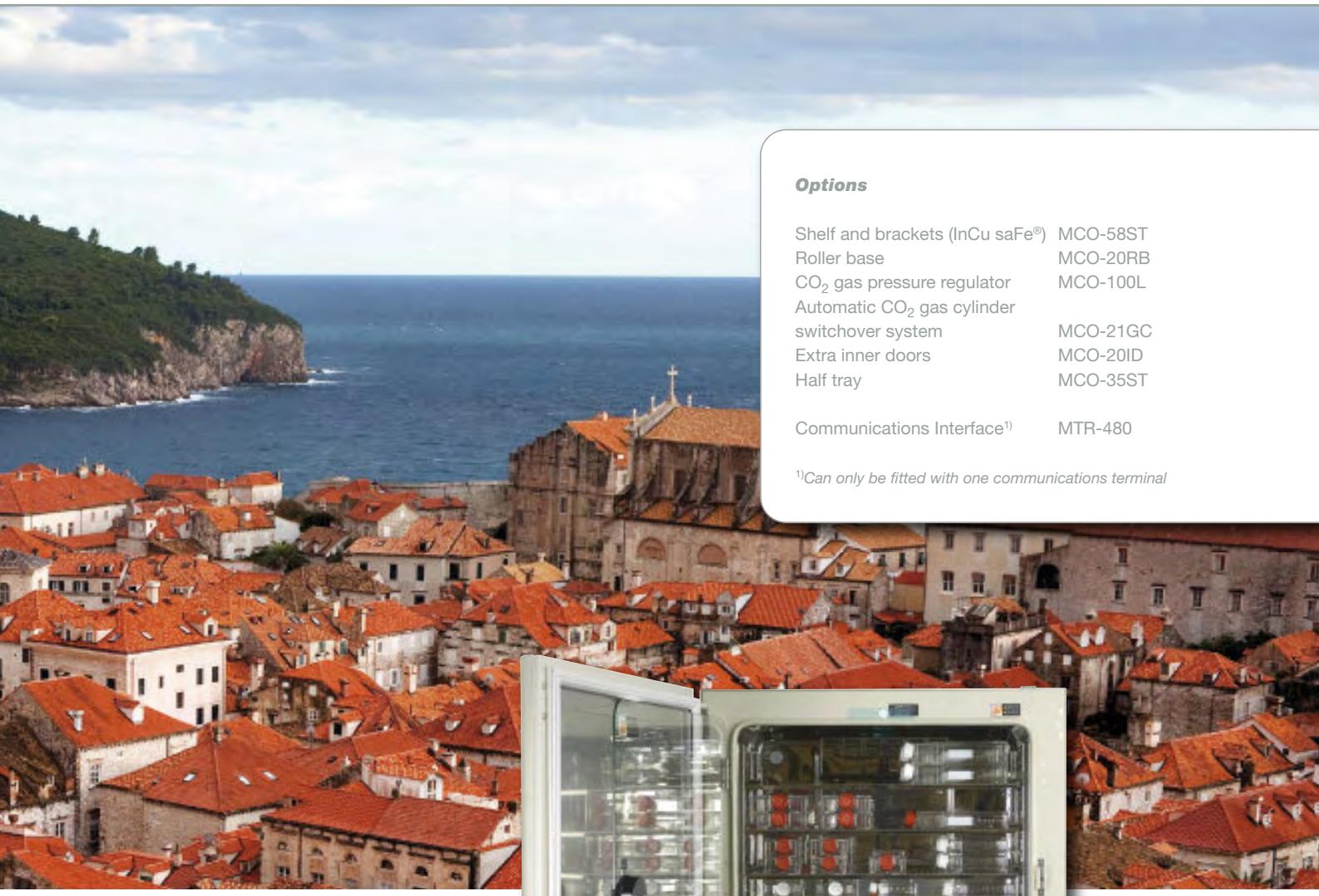
Dimensions

Front view



Side view



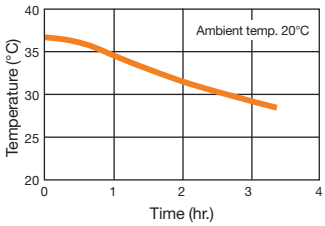


Options

Shelf and brackets (InCu saFe®)	MCO-58ST
Roller base	MCO-20RB
CO_2 gas pressure regulator	MCO-100L
Automatic CO_2 gas cylinder switchover system	MCO-21GC
Extra inner doors	MCO-20ID
Half tray	MCO-35ST
Communications Interface[1)]	MTR-480

[1)]*Can only be fitted with one communications terminal*

Temperature decrease characteristics when power failure occurs



Direct Heat and Air Jacket Heating System

Zone	Location	Function	Energy	Microprocessor Controller
Main (Red)	Side, top and rear walls	Principal heat source	Variable	Energizes any, all or a combination of heating elements as required
Base (Yellow)	Floor	Base heater elevates the humidity reservoir to achieve 95%RH at 37°C	Variable	
Front (Green)	Outer door	Warms the inner glass in response to ambient conditions; prevents condensation on glass and around door opening and promotes temperature uniformity	Variable	
Air Jacket (White)	Side, top and rear walls	Sealed, surrounds interior chamber with natural air convection	--	--
Insulation (Grey)	Side, top and rear walls, door	Promotes energy efficiency, reduces effect of ambient temperature fluctuations on air jacket	--	--

The industry's most complete cell culture solution for research, clinical and regulated applications.

The Panasonic MCO-19AIC CO_2 Incubator is designed for demanding and regulated applications in the biomedical, pharmaceutical, medical research and clinical laboratory. Representing years of research, development and component testing, the MCO-19AIC offers outstanding performance and advanced, multi-level contamination control to provide the ideal solution for cell culture protocols.

Options

Model	MCO-19AIC(UV)	MCO-19AIC
Decontamination Options		
H_2O_2 Decontamination Kit	MCO-HL	MCO-HL[1)]
H_2O_2 Vapour Generator (Requires MCO-HL)	MCO-HP	MCO-HP[1)]
H_2O_2 Reagent, pack of 6 bottles, each pre-measured bottle is sufficient for a complete H_2O_2 decontamination cycle (specially formulated for MCO-19AIC)	MCO-H2O2	MCO-H2O2[1)]
SafeCell UV System Kit narrow-bandwidth 253.7nm lamp and assembly	Built-in	MCO-19UVS
Common Options		
Small inner doors (4)kit	MCO-19ID	MCO-19ID
Automatic CO_2 Cylinder Changeover System	MCO-21GC	MCO-21GC
Semi-automatic one point Gas Calibration Kit	MCO-SG	MCO-SG
Roller Base, for use in single or stacked installations	MCO-18RB	MCO-18RB
InCu saFe® Shelf and Brackets	MCO-47ST	MCO-47ST
InCu saFe® Half Tray System	MCO-25ST	MCO-25ST
Communication interfaces[2)]		
Communication Terminal (RS-232C/RS485)	MTR-480	MTR-480
Communication Terminal (LAN)	MTR-L03	MTR-L03
Communication Terminal (Analog 4-20 mA)	MCO-420MA	MCO-420MA

[1)] *Also Requires SafeCellTM UV kit*

[2)] *Can only be fitted with one communications terminal*

H_2O_2 Vapour Generator. Shown with connecting cable, standard.

Decontamination

The unique H_2O_2 decontamination option limits downtime to less than three hours when total chamber decontamination with verification is desired. All interior components and CO_2 sampling loop are decontaminated in situ. There is no need to remove or replace critical components.

Active Background Contamination Control fights contamination while cell culture protocols are in process. The patented SafeCell UV treats interior airflow to destroy airborne and humidity pan contaminants.

Exclusive InCu saFe® copper-enriched stainless steel interior surfaces assure constant germicidal protection.

Control and Monitoring

- The MCO-19AIC control and information centre features a multi-function LCD with intuitive pop-up menu for straight-forward programming of set-points, alarms and controller functions. The LCD displays set-points, actual performance and incubator status at-a-glance.
- Precise PID control logic provides stable CO_2, temperature and humidity conditions.
- Multi-point data logging offers push-button graphical display. An optional PC interface permits remote transmission for GMP/GLP protocols as required.

CO_2 Control

Panasonic proprietary single-beam, dual detector infrared (IR) CO_2 sensor delivers precise CO_2 control and fast recovery following door openings with no moving parts.

- Continuous auto-zero calibration is standard.
- An optional semi-automatic, one-point span calibration system is available. (See Options)

Temperature and Humidity Control

- The patented Direct Heat and Air Jacket conditioning system precisely regulates temperature through multiple heating zones under microprocessor control.
- The humidity pan is easy to fill, easy to clean and the automatic optical sensor advises of low water level.

Cabinet Design

- The 170 litre capacity incubator is stackable with field-reversible doors.
- Interior components and adjustable shelves are configured for easy access.

Panasonic H_2O_2 solution is specially formulated for optimal use with the MCO-HP Vapour Generator. Each pre-measured bottle is sufficient for a complete H_2O_2 sterilization sequence. Unit of issue: six per carton.

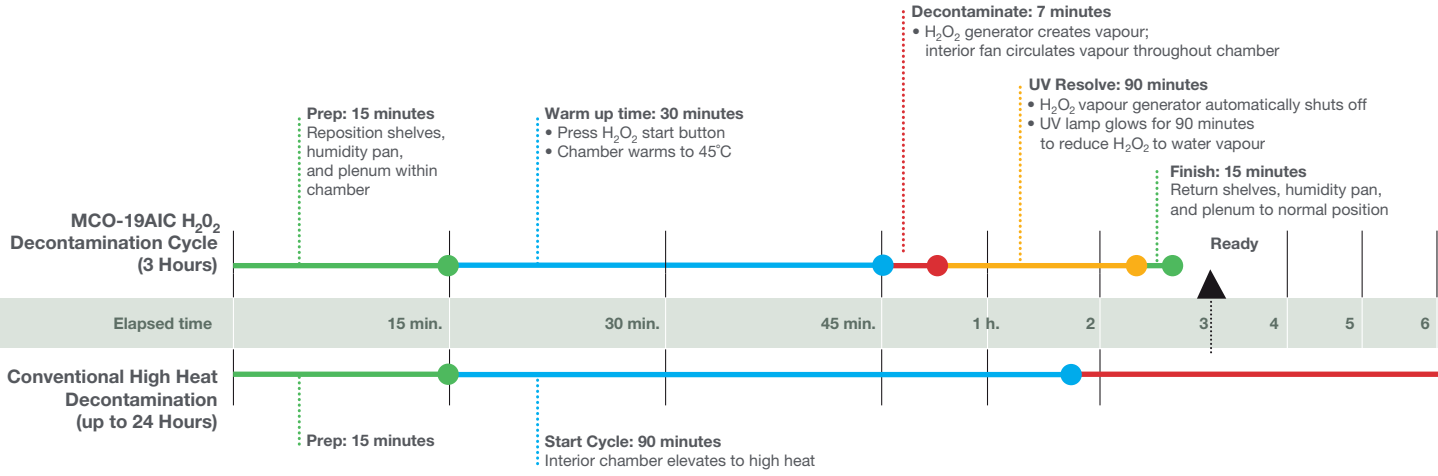
Hydrogen Peroxide Vapour Decontamination

The use of low temperature H_2O_2 sterilisation in biological safety cabinets and barrier isolators is a popular alternative to ethylene oxide (EtO) as a safer, more efficient decontamination method. H_2O_2 has long been widely used in the pharmaceutical industry and in aerospace research. H_2O_2 is used to sterilise satellites and interplanetary exploration probes.

The MCO-19AIC Design Permits Safe, Effective H_2O_2 Decontamination

Unlike conventional incubators, the unique design features of the MCO-19AIC permit the safe use of H_2O_2 decontamination in situ with zero impact on adjacent equipment or the environment, and relative speed to return the incubator to service.

- The H_2O_2 decontamination process functions with the patented Panasonic SafeCell UV system. Following a seven minute H_2O_2 vaporization, circulation and dwell cycle, the vaporization is stopped and the SafeCell UV lamp turned ON for 90 minutes.
- When exposed to UV light the H_2O_2 vapour breaks down into water vapour and oxygen. Throughout the entire cycle the MCO-19AIC airflow system continues to gently



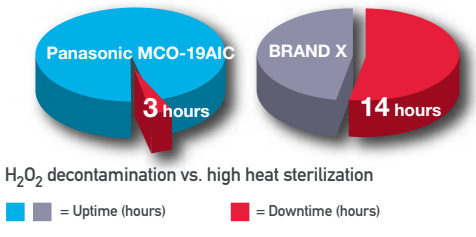
MCO-19AIC configured for decontamination sequence.

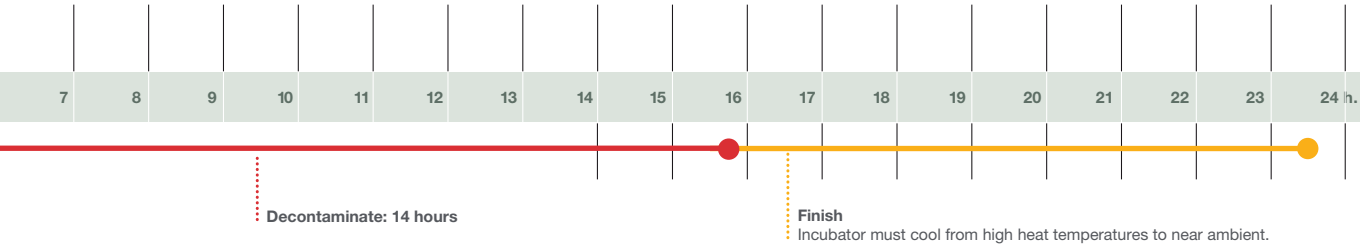
Interior components are reoriented for *in situ* decontamination. The H_2O_2 generator is placed on the rear floor. The incubator fan gently circulates vapourized H_2O_2 during the vaporization phase, decontaminating all interior surfaces. Following the vaporization cycle the UV lamp reduces H_2O_2 to trace decontaminated water.

Incubator configured for decontamination. Generator receptacle is built-in and capped when not in use.

circulate interior air assuring 100% vapour contact with all interior surfaces and ultimately breaking down the H_2O_2 vapour as it passes over the UV lamp.

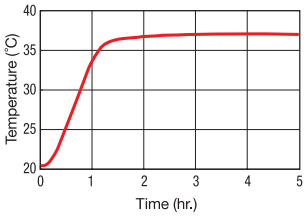
- The location of the interior sample ports of the single beam, dual detector IR CO_2 sensor creates a slight Venturi flow through the sensor permitting total decontamination of the CO_2 system at the same time.
- Shape and placement of interior components such as shelves, shelf brackets, plenum covers and the humidity tray permit the components to remain inside the
- MCO-19AIC during the decontamination process, conveniently by passing the need for a separate autoclave cycle.
- Once the cycle is complete, the door locking system is released; the door can be opened, interior components repositioned and the incubator is returned to service.
- The H_2O_2 decontamination cycle is monitored for safety and cycle status. A physical door interlock and H_2O_2 neutralization sequence assures total decontamination and operator safety.



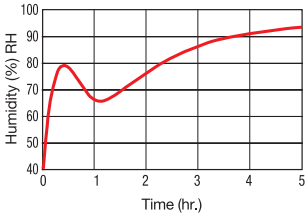


Performance

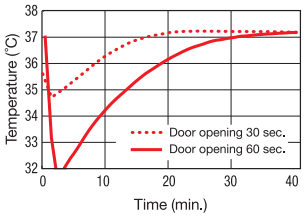
Temperature Pull-up Characteristics



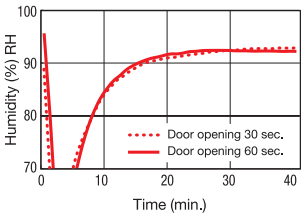
Humidity Pull-up Characteristics



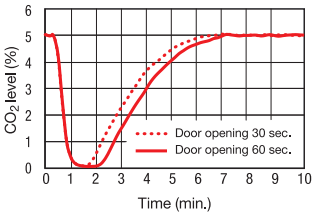
Temperature Recovery Characteristics



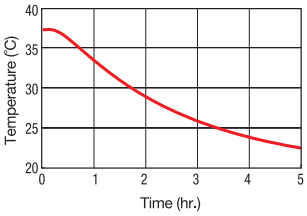
Humidity Recovery Characteristics



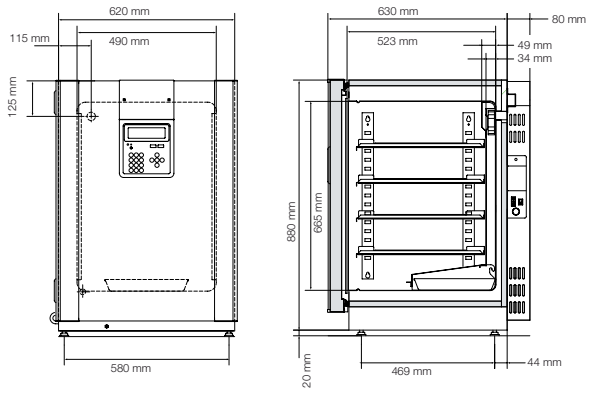
CO_2 Level Recovery Characteristics

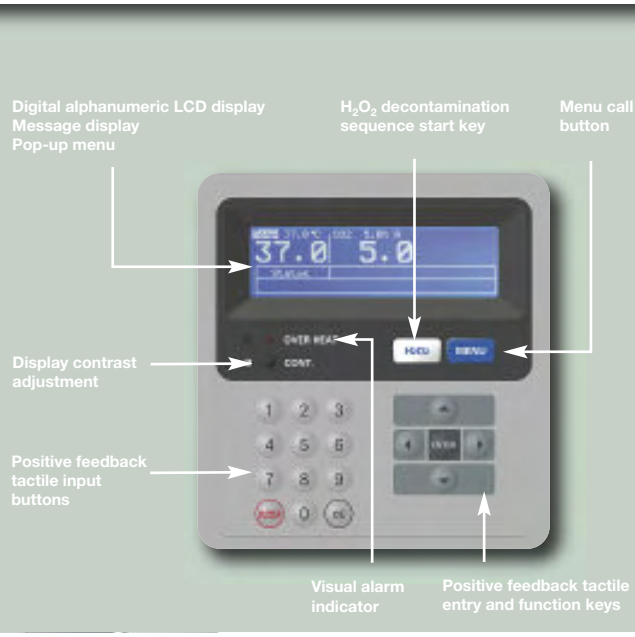


Temperature decrease characteristics when power failure occurs



Dimensions





Intelligent Control Interface with Integrated LCD Display
The MCO-19AIC Incubator is managed by an integrated microprocessor controller with LCD graphical display to simplify all incubator functions. The PID controller supervises the incubator's advanced systems to provide stable CO_2, temperature and humidity conditions complete with alarm, programming, calibration and diagnostic protocols.

- A multi-function, high resolution LCD displays set-points, actual performance and incubator status at-a-glance.
- An intuitive Pop-up menu and function keys provide straight-forward programming of set-points, alarms and controller functions.
- Standard parameters are factory-set for quick start-up, and all parameters can be changed as required.
- Multi-point data logging offers a graphical display of selected performance history.
- Logged parameters can be exported to remote databases, off-site alarm or data capture systems through optional communication boards for GMP/GLP compliance monitoring as required. (See Options)
- A remote alarm terminal mounted at the rear of the incubator can be connected to an external alarm system.
- The control panel is centre mounted in the outer door for easy access and viewing.

Name: Teodor Zamfirov

Location in our network:
Director of ELTA'90, Panasonic's distributor in Bulgaria.

favourite place:
Alexander Nevski Cathedral, Sofia which is one of the most impressive monuments of Orthodox Christianity in Bulgaria.

BULGARIA - BIOMEDICAL NETWORK

Alexander Nevski Cathedral, Sofia

42°41.45.23"N 23°19'57.91"E

Professional CO_2 incubator with preventitive contamination control

- Continuous contamination control with InCu saFe® interior and SafeCell UV (Option) technologies.
- Direct Heat Air Jacket (DHA) heating system provides accurate temperature control.
- Precise temperature and CO_2 control.
- Stackable design for efficient use of available laboratory space.
- Reversible door available for easy installation.

Options

Shelf and brackets (InCu saFe®)	MCO-47ST
Half tray	MCO-25ST
Roller base	MCO-18RB
CO_2 gas pressure regulator	MCO-100L
Automatic CO_2 gas cylinder switchover system	MCO-21GC
UV system kit	MCO-18UVS3
Individual inner doors (4)	MCO-19ID
Communications Interfaces[1)]	
Digital (RS232/RS485)	MTR-480
Analogue	MTR-420MA
Ethernet (LAN)	MTR-L03

[1)]*Can only be fitted with one communications terminal*

InCu saFe® Construction for Germicidal Protection
Panasonic offers exclusive use of InCu saFe® copper-enriched stainless steel alloy interior surfaces within a technical design created to eliminate contamination sources and to mitigate the effect of airborne contaminates introduced through normal use.
Chart summarizes test results with four strains of mycoplasma. Results demonstrate how Panasonic InCu saFe® copper enriched stainless steel alloy offers germicidal properties of conventional C1100 copper while maintaining both corrosion-proof and discoloration-resistant properties of conventional stainless steel 304.

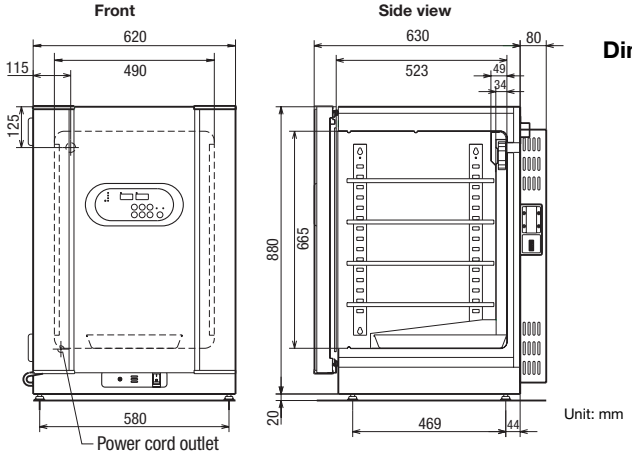
Accurate Temperature and Humidity Control
The patented Direct Heat and Air Jacket conditioning system precisely regulates temperature through three independent heating zones under microprocessor PID control. Uniform temperatures are further enhanced by gentle fan circulation. Humidification is achieved by reliable natural evaporation and forced-air circulation and protected by an automatic optical sensor that advises of low water level (option).

SafeCell UV Sterilization System (option)
The unique air duct system and ultraviolet light sterilization lamp maintain contamination-free air conditions in the chamber and improve temperature recovery characteristics. The circulating chamber air and water in the humidifying pan are sterilized by ultraviolet light, preventing the spread of bacteria and molds.

Field-Reversible Door
The field reversible door can be set up for right-swing or left-swing door openings, allowing for multiple configurations during laboratory installation. A special door handle allows for easier door grab and opening in double stacked configurations.

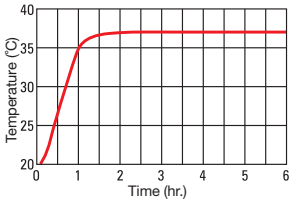
Automatic CO_2 Cylinder Switchover System (option)
This system automatically switches from the primary to secondary gas cylinder when a CO_2 gas level drop in the chamber is detected. The in-use gas cylinder is confirmed on the control panel.

Stackability
To help ensure effective use of limited space, these incubators are designed to be stacked in a way that suits your work plans. Simply by using the parts provided, you can create a twin-chamber setup.



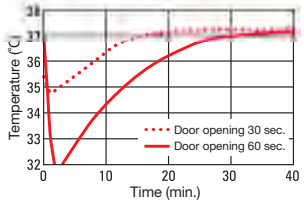
Dimensions

Temperature Pull-up Characteristics

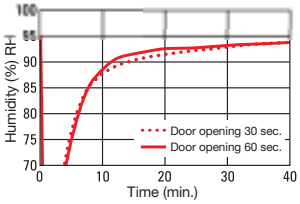


Performance

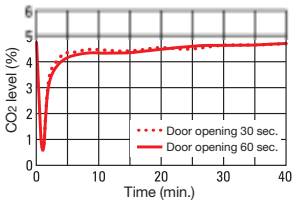
Temperature Recovery Characteristics



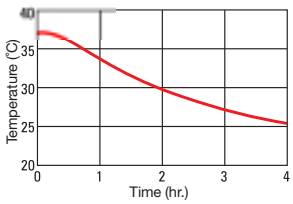
Humidity Recovery Characteristics



CO_2 Level Recovery Characteristics



Temperature decrease characteristics when power failure occurs



Air Jacket | safe cell UV | inCu saFe

Personal Series Compact CO_2 Incubator

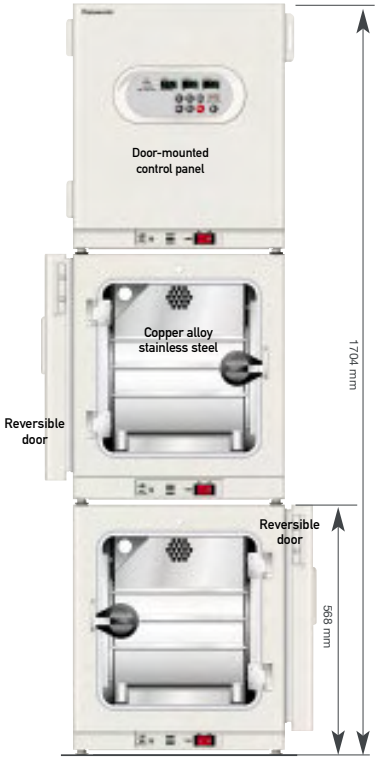
Patient Specific, Space Saving, Triple Stackable, Compact Design

Preventive Contamination Control
InCu saFe® copper-enriched stainless steel chamber, shelves, and air plenum inhibit surface contamination growth continuously.
Airborne and water pan contaminants can also be prevented and continuously controlled by use of a patented SafeCell UV, ultraviolet decontamination method (optional). The ozone-free UV light is shielded from the cell culture area allowing for UV use while cultures remain in the incubation chamber.

Improved Temperature Stability with DHA System
Three independently controlled heaters plus Panasonic's exclusive and patented air jacket construction provide high-precision temperature control, uniformity, and quick recovery after door openings.

MCO-5AC
49 LITRES

When placed in triple stackable configurations (pictured below), this unit meets GLP (Good Laboratory Practice) requirements by helping to avoid patient-to-patient cross contamination in individualized patient-specific clinical incubation applications, such as in vitro fertilization and regenerative medicine techniques.



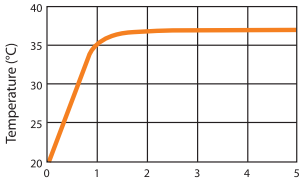
Ergonomic Design
Even in a triple-stack configuration, the units are space-saving and low-profile, allowing for the most efficient use of laboratory space and also user-friendly access to the door-mounted control display panel.

Automatic CO_2 Cylinder Switchover System (option)
This system automatically switches from the primary to secondary gas cylinder when a CO_2 gas level drop in the chamber is detected. The in-use gas cylinder is confirmed on the control panel.

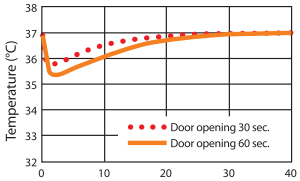
Field-reversible Door
The field-reversible door can be set up for right-hand or left-hand door openings, allowing for multiple configurations during laboratory installation.
A special door handle allows for easier door grab and opening in triple-stacked configurations.

Performance data MCO-5AC

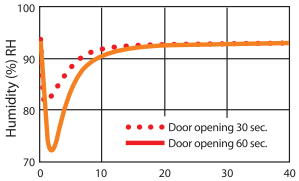
Temperature Pull-up Characteristics



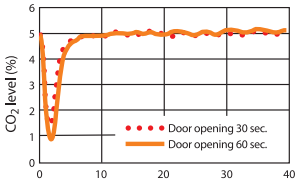
Temperature Recovery Characteristics



Humidity Recovery Characteristics



CO_2 Level Recovery Characterics

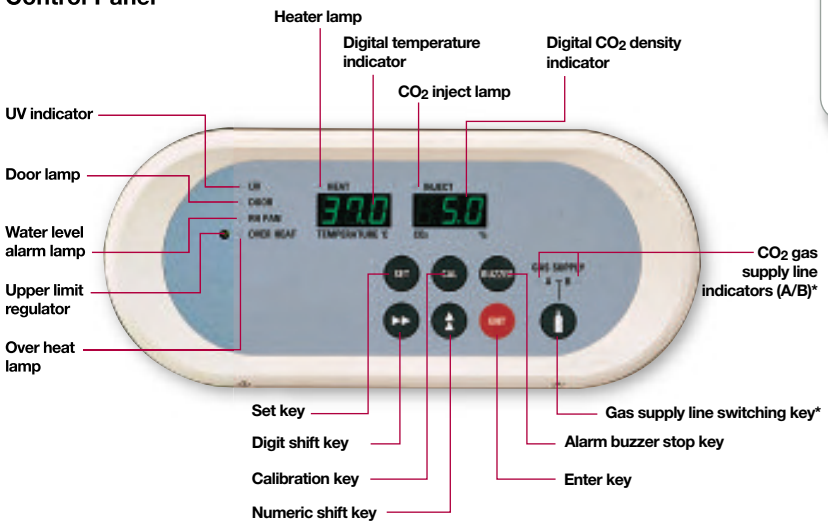


Options

Shelf and brackets (InCu saFe®)	MCO-30ST
Roller base	MCO-5RB
CO_2 gas pressure regulator	MCO-100L
Automatic CO_2 gas cylinder switchover system	MCO-5GC
UV system kit	MCO-19UVS
Stacking kit	MCO-18PS
Communications Interface[1)]	MTR-480

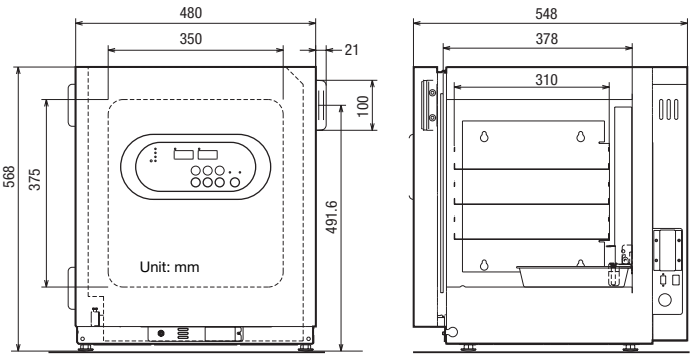
[1)]*Can only be fitted with one communications terminal*

Control Panel

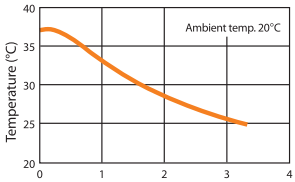


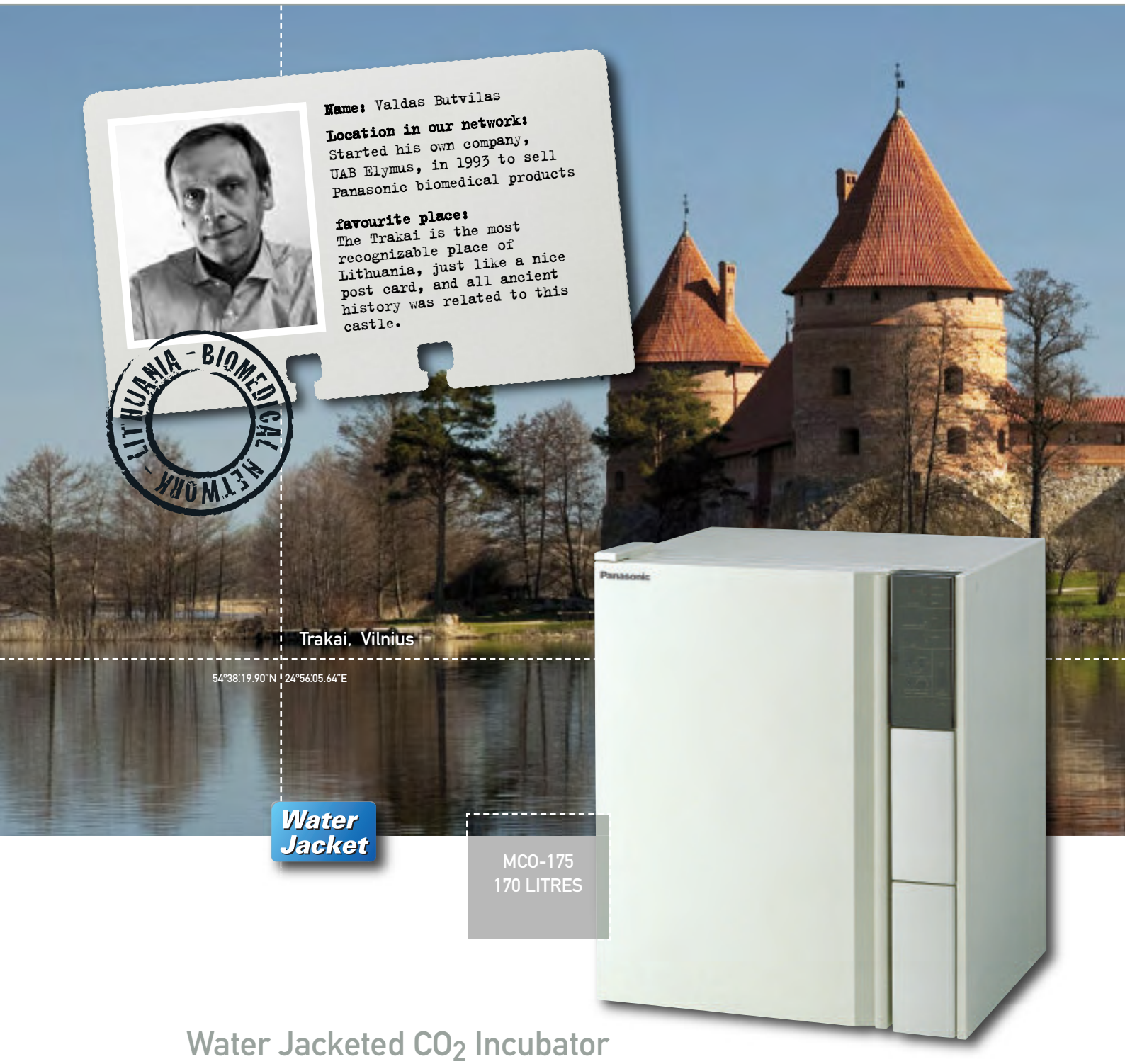
* requires optional MCO-5GC

Dimensions



Temperature decrease characteristics when power failure occurs





Water Jacketed CO_2 Incubator

PID control plus chamber direct sensing system maintains a high-precision temperature environment.
Through the combination of a PID (Proportional, Integrated and Differential) control system for ultra-precise temperature control and a cabinet-air sensing system which accurately monitors inside temperature, this model exhibits exceptional precision within ±0,1 degree of the preset temperature. For the temperature sensor, a durable, ultra-precise PT sensor (Pt 100) is used.

Automatic stop mechanism for Fan Motor and CO_2 valve. With this mechanism, the fan motor and CO_2 valve are automatically stopped when the door is opened. This minimises air flow from the chamber and reduces air contamination due to the mixing of air.

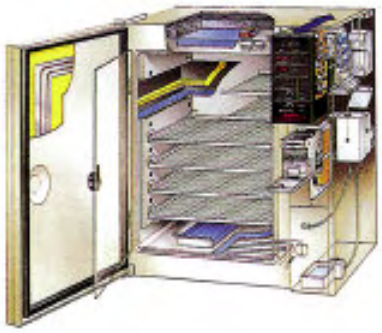
Automatic control door heater
The outer door incorporates a door heater that is automatically controlled. This prevents temperature differences between the chamber and the inner door, thereby preventing condensation on the inner door.

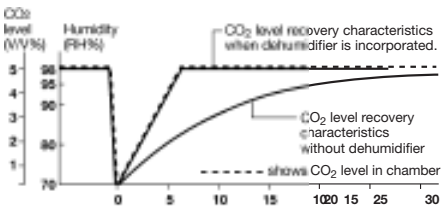
Options

Stacking kit	MCO-175SB
CO_2 pressure regulator	MCO-100L
Water preservative agent	MCO-100C (cleaner #1000)
Extra shelf	MCO-47ST
Half tray	MCO-25ST

Water Jacketed MCO-175 System

The large size MCO-175 model incorporates a water jacketed system which takes advantage of the heat retention characteristics of water. Because there is no sudden temperature change or loss of temperature during power failure, a stable temperature environment is ensured.





A compact electronic dehumidifier plus a thermal conductivity CO_2 sensor produces a high-precision CO_2 environment

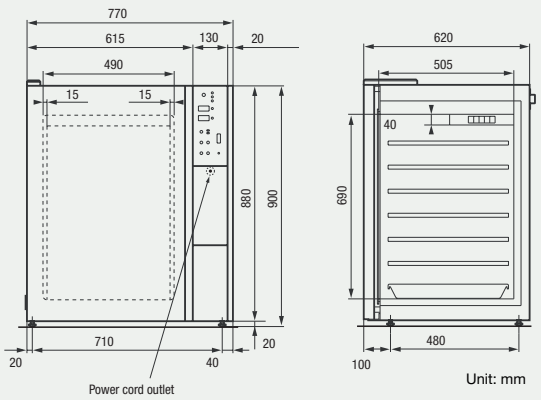
SUS-304 Stainless steel with rounded corner structure

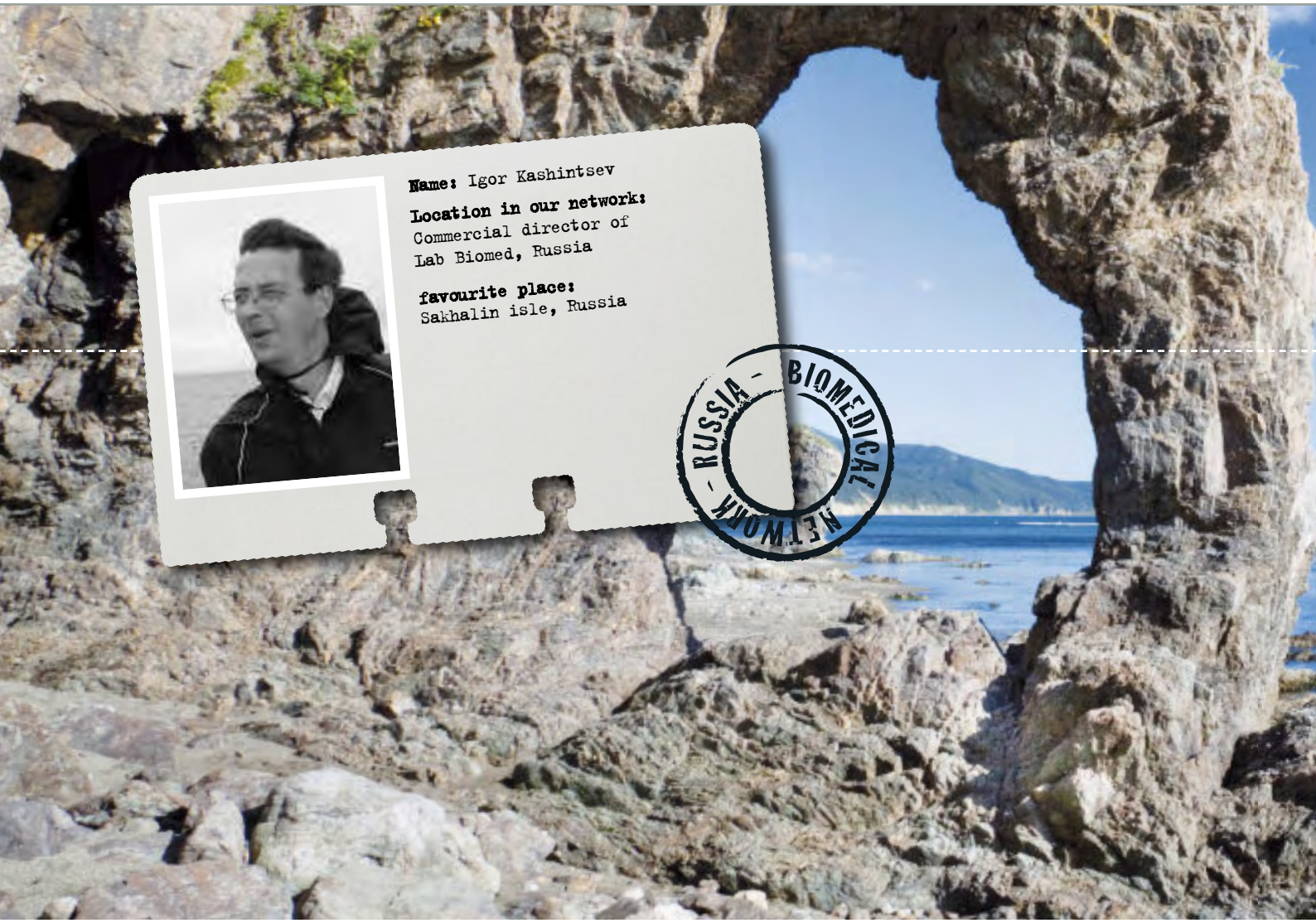
Stainless steel featuring superior chemical resistance and a rounded corner structure are incorporated within the cabinet interior. The shelves, shelf supports and shelf support tabs are easily removable to allow thorough cleaning and sterilization.

Specific Tube for CO_2 Gas

A specific tube is used for supply and sampling of the CO_2. Featuring superior mold resistance and enabling autoclave sterilization, the tube conforms to the Japanese regulations for Medical and Health and Food Hygiene, eliminating causes of contamination.

Dimensions





State-of-the-art Professional Cell Culture Multi-gas incubator

The MCO-19M automatic air jacket multi-gas incubator provides precise CO_2 and O_2 level controls to realise a stable cell culture environment. It features multiple-patented technologies to safely achieve in-vitro performance.

InCu saFe® Construction for Germicidal Protection
Panasonic's exclusive InCu saFe® copper-enriched stainless steel alloy interior surfaces, plenum and shelving eliminate contamination sources and mitigate the effect of airborne contaminates introduced through normal use.

SafeCell UV
Airborne and water contaminants in the water pan can also be eliminated by patented SafeCell UV, an automatic ozone-free ultraviolet lamp, without affecting cell cultures (option).

Industry-first H_2O_2 decontamination system
Panasonic unique high-speed decontamination system utilizing vaporized H_2O_2 offers time-saving and documented chamber decontamination with complete safety. Whole decontamination process takes less than three hours, saving valuable time.
for more detailed information see page 106

Accurate Temperature and Humidity Control
The patented Direct Heat and Air Jacket conditioning system precisely regulates temperature through three independent heating

zones under microprocessor PID control. Uniform temperatures are further enhanced by gentle fan circulation. Humidification is achieved by reliable natural evaporation and forced-air circulation and protected by an automatic optical sensor that advises of low water level.

Immediate Recoveries

Panasonic proprietary singlebeam, dual detector infrared CO_2 sensor delivers precise CO_2 control quick recovery following door openings, and auto sampling with no moving parts. Along with a zirconia O_2 sensor, a PID control is used for fast O_2 level control.

Intelligent Control Interface with Integrated LCD Display

The MCO-19M Incubator is managed by an integrated microprocessor controller with LCD graphical display to simplify all incubator functions. The PID controller supervises the incubator's advanced systems to provide stable CO_2, O_2, temperature and humidity conditions complete with alarm, programming, calibration and diagnostic protocols.

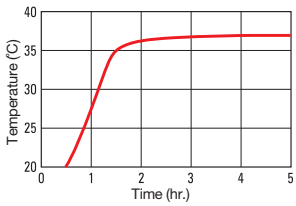
Newly-designed Middle Door with Small Doors (standard equipment)
Utilizing “Middle Door” with 4 small doors attached, and a full door opening is not needed for removing cell cultures.

- “Middle Door” can open/close by itself.
- “Middle Door” is reversible like the outer door.

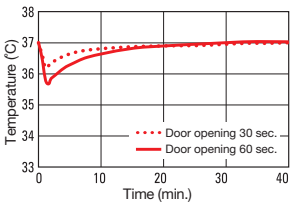
Graphical Control Panel
The MCO-19M control and information center includes an intuitive pop-up menu, graphic LCD for inputs, outputs and performance at-a-glance.

Ergonomic Cabinet Design
The 170 liter-capacity, low profile cabinet is stackable with the field-reversible doors.
Convenient, space efficient inventory management is simplified through a system of adjustable, extendable, perforated shelves. To permit vertical airflow. All shelves are made from InCu saFe®

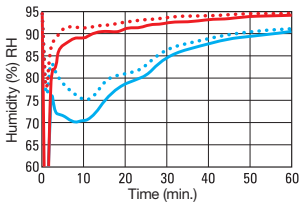
Temperature Pull-up Characteristics



Temperature Recovery Characteristics

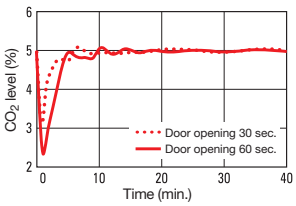


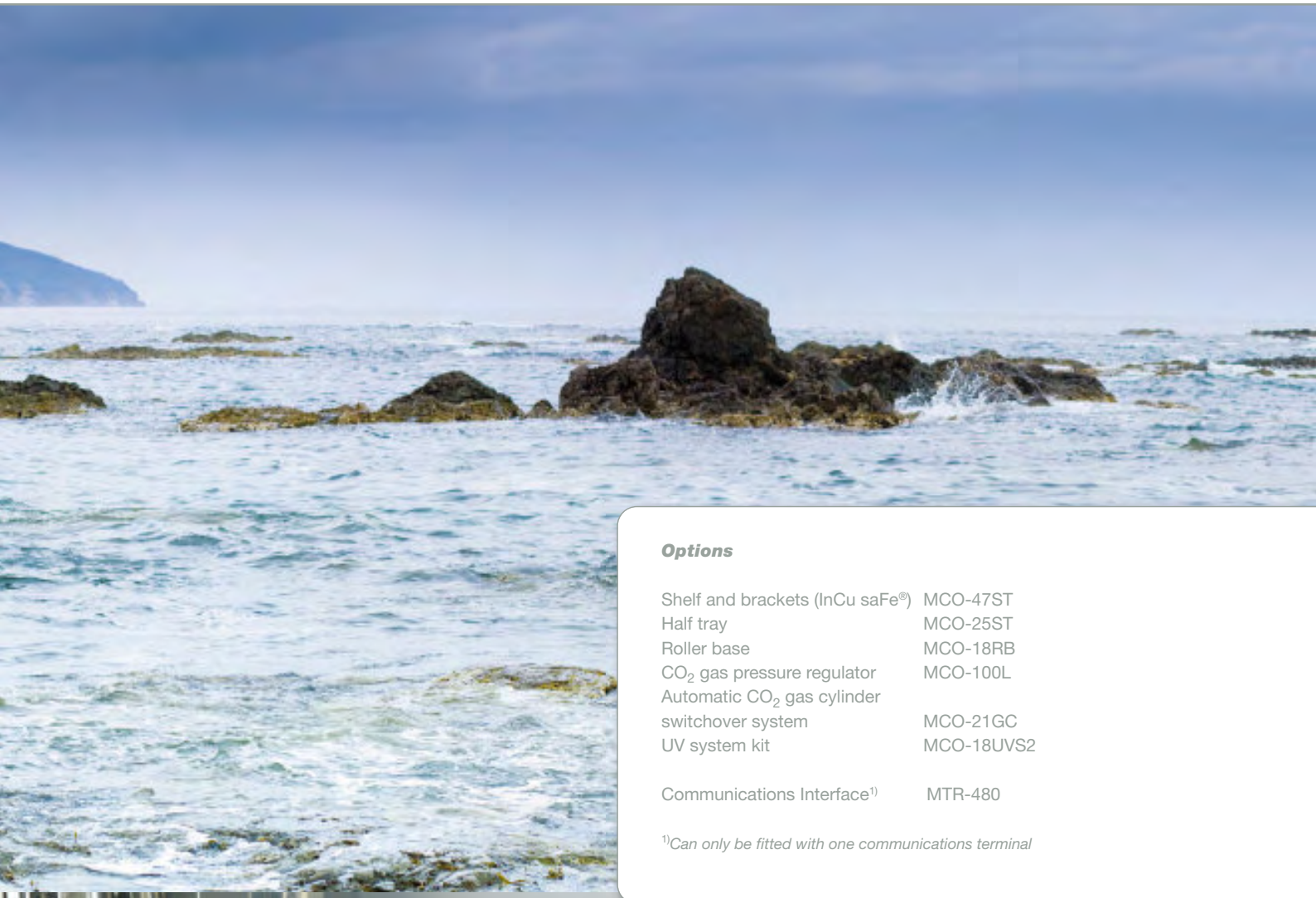
Humidity Recovery Characteristics



One small inner door opening 30 sec. (without N_2 bubbling)
One small inner door opening 60 sec. (without N_2 bubbling)
One small inner door opening 30 sec. (with N_2 bubbling)
One small inner door opening 60 sec. (with N_2 bubbling)

CO_2 Level Recovery Characteristics



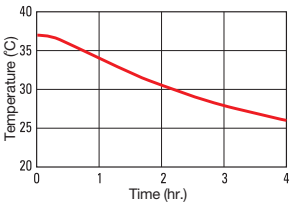


Options

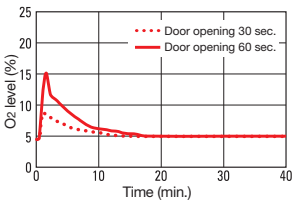
Shelf and brackets (InCu saFe®)	MCO-47ST
Half tray	MCO-25ST
Roller base	MCO-18RB
CO_2 gas pressure regulator	MCO-100L
Automatic CO_2 gas cylinder switchover system	MCO-21GC
UV system kit	MCO-18UVS2
Communications Interface[1)]	MTR-480

[1)]*Can only be fitted with one communications terminal*

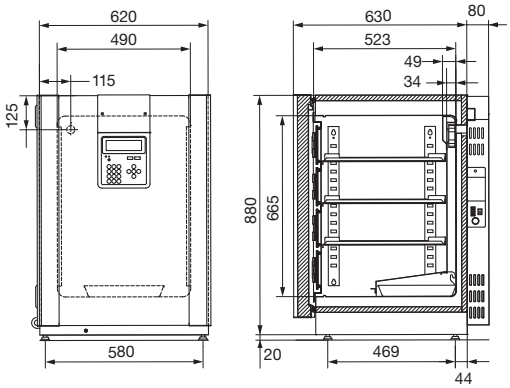
Temperature decrease characteristics when power failure occurs

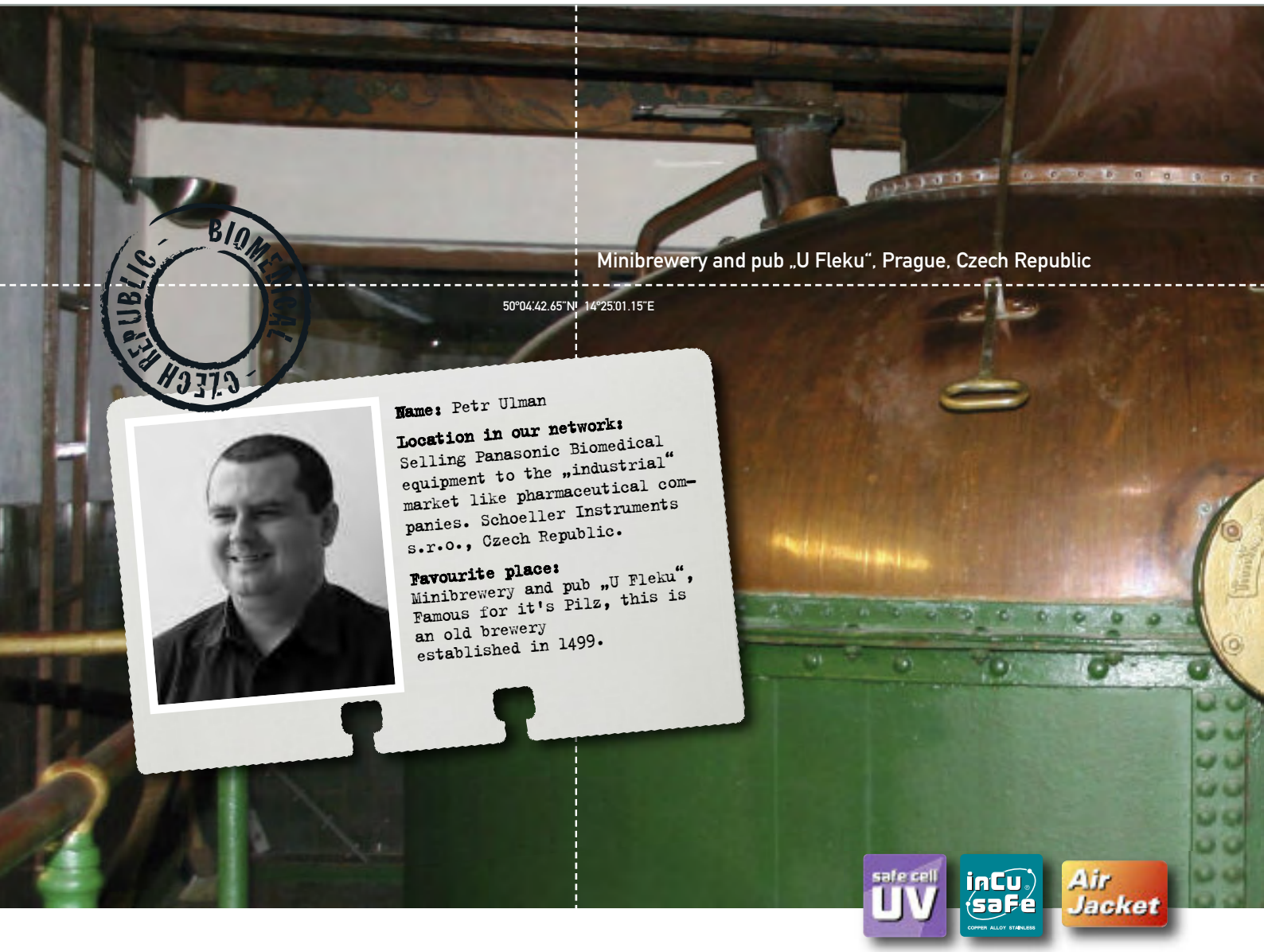


O_2 Level Recovery Characteristics



Dimensions





Professional Cell Culture Compact Multi-gas Incubator

The MCO-5M automatic air jacket multi-gas incubator provides precise CO_2 and O_2 level controls to realise a stable cell culture environment. It features multiple-patented technologies to safely achieve in-vitro performance. Also, the MCO-5M has been cleared by the US FDA for In-Vitro Fertilization (IVF) use.

Rapid Recovery
Exceptional CO_2 recovery is obtained by the combination of a unique P.I.D. TC sensor with long lifespan. Additionally, along with a zirconia O_2 sensor, P.I.D. control is used for fast O_2 level control. The N_2 gas bubbler in the water pan helps recover humidity level quickly after door openings.

Water Level Sensor
The humidity pan has an optical water level sensor to warn of low water level.

Automatic Gas Cylinder Switchover System
This system automatically switches from the primary to secondary gas cylinder when the O_2 gas level does not change while an injection valve is open. Optional Switchover for CO_2 gas is available.

Preventive Contamination Control
InCu saFe® copper enriched stainless steel chamber with coved corners inhibits bacteria growth on its surface continuously. Airborne and water contaminants in the water pan can also be eliminated by patented

Options

Shelf and brackets (InCu saFe®)	MCO-30ST
Roller base	MCO-5RB
CO_2 gas pressure regulator	MCO-100L
Automatic CO_2 gas cylinder switchover system	MCO-5GC
UV system kit	MCO-19UVS
Communications Interface[1)]	MTR-480

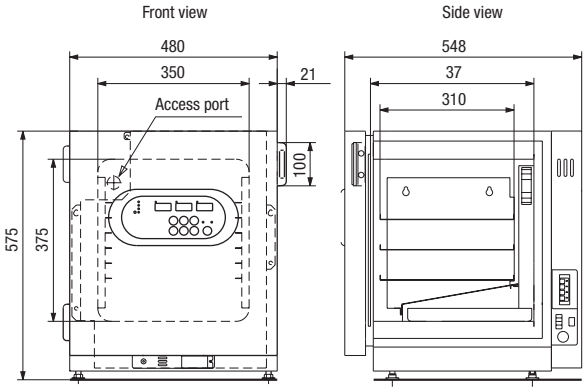
[1)]*Can only be fitted with one communications terminal*

MCO-5M
49 LITRES

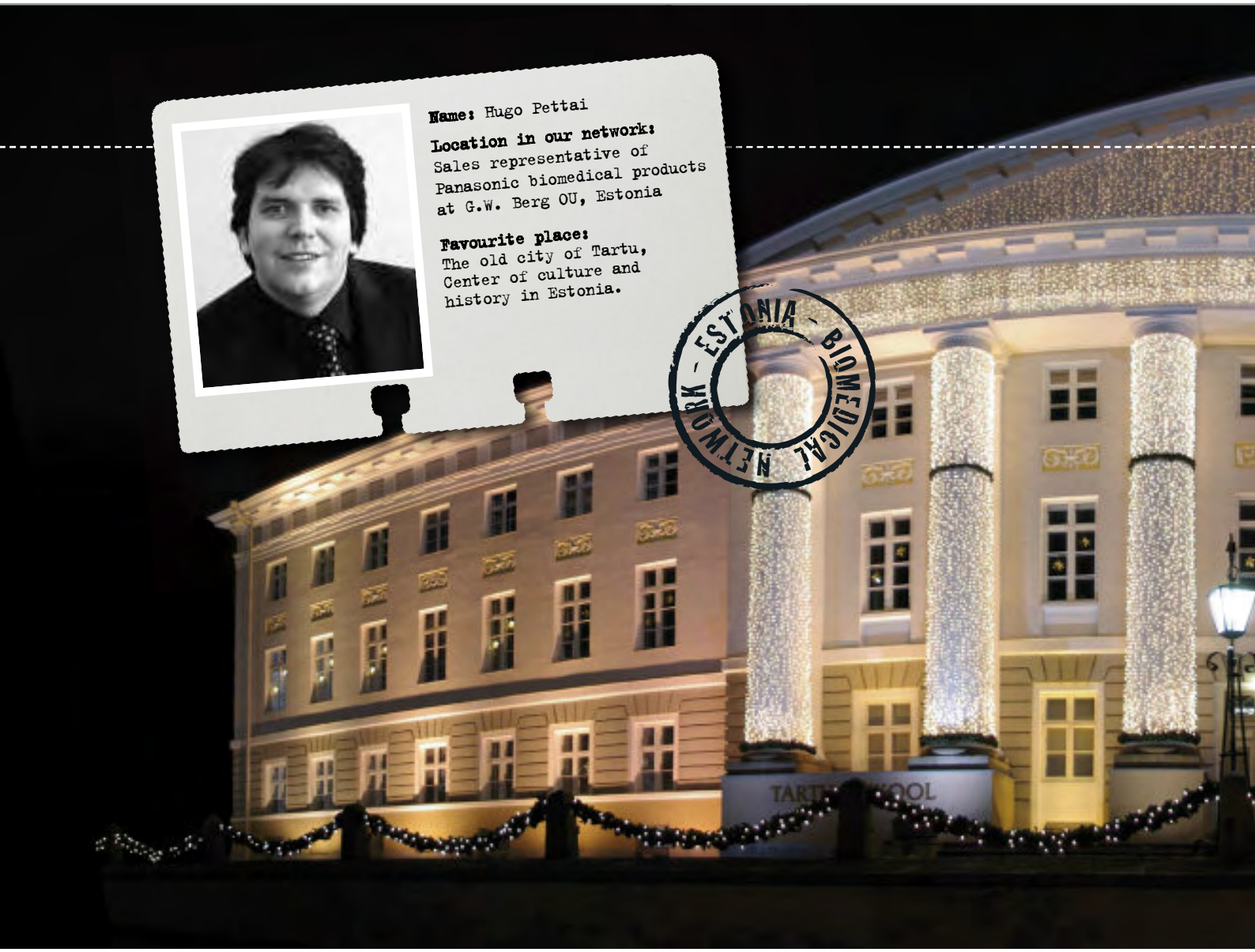
SafeCell UV, an automatic ozone-free ultraviolet lamp (option), without affecting cell cultures.

Improved Temperature Stability with D.H.A. System
P.I.D. controlled 3-way heaters plus Panasonic's proprietary D.H.A. (Direct Heat and Air jacket) provides a high-precision temperature environment, and minimizes the risk of condensation and subsequent contamination.

Dimensions



Unit: mm



Versatile Plant Growth Chamber

- Graphic LCD provides easier operation
- Programmable temperature, lighting and humidity function (MLR-352H)
- Microprocessor PID control and Refrigeration Capacity Control
- Data logging function

The wide variety of temperatures and lighting patterns that are essential in various research and testing can now be accurately reproduced and controlled. And humidity control too! Microprocessor PID 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.

- Microprocessor PID and Refrigeration Capacity control minimise temperature fluctuations and thereby improve temperature control. This allows superior precision experiments plus energy and electricity savings.

- Programmable temperature function is perfect for temperature cycle and vernalization treatment research.

  – 12-step programmes x 10 patterns can be stored.
  – Selectable clock mode or timer mode.
  – Multiple programmes can be “connected” (Join mode).
  – Starting day and time of operation can be programmed.

Applications:

- Plant growth
- Culture of plant cells, tissue and organs
- Acclimatization and rearing of plants
- Incubation and rearing of insects
- Electronic testing
- Food testing

- Operation data of approximately last 2 weeks (6-minute intervals) is automatically recorded.
  - The data can be viewed on the control panel.
  - The data can be transmitted to a PC (CSV data via RS-232C, interface board MTR-480 required).

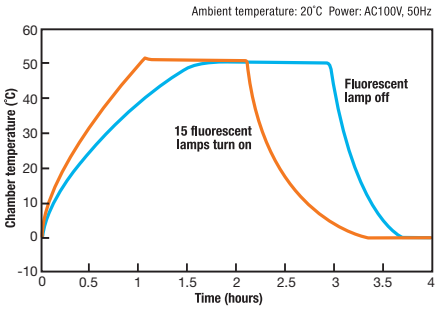
- Easy calibration: temperature and humidity can be calibrated easily through the control panel.

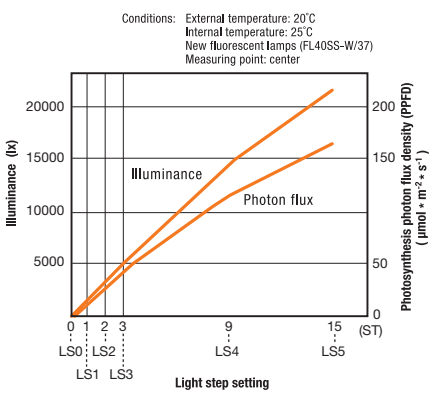
- Small and lightweight, high-molecular membrane-type humidity sensor also boasts a high degree of accuracy and reproducibility. Of the newest high-molecular membrane type, the humidity sensor accurately measures chamber humidity (MLR-352H only).

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

Performance data MLR-352 / MLR-352H

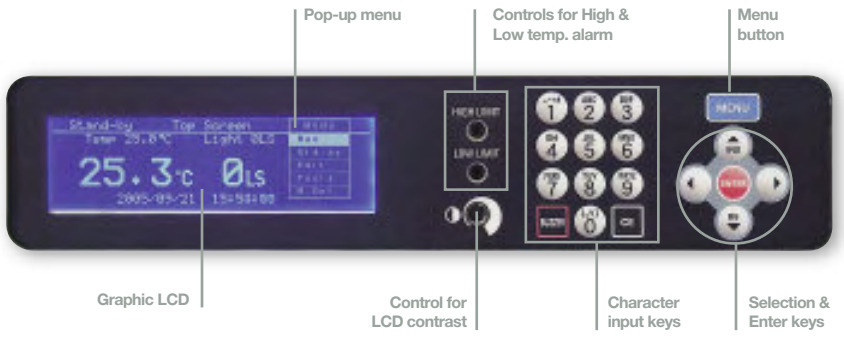
Pull down, Pull up performance (The chamber temperature of center)



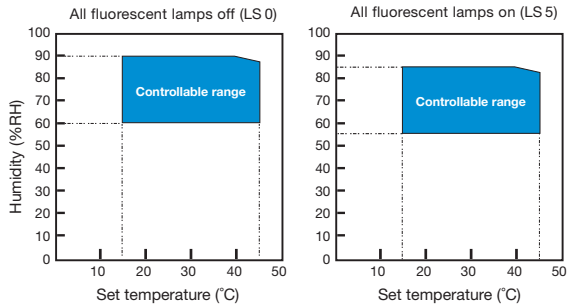


Options

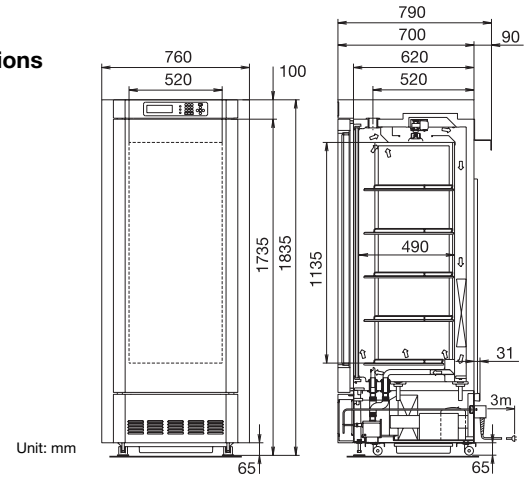
Communications Interface	MTR-480



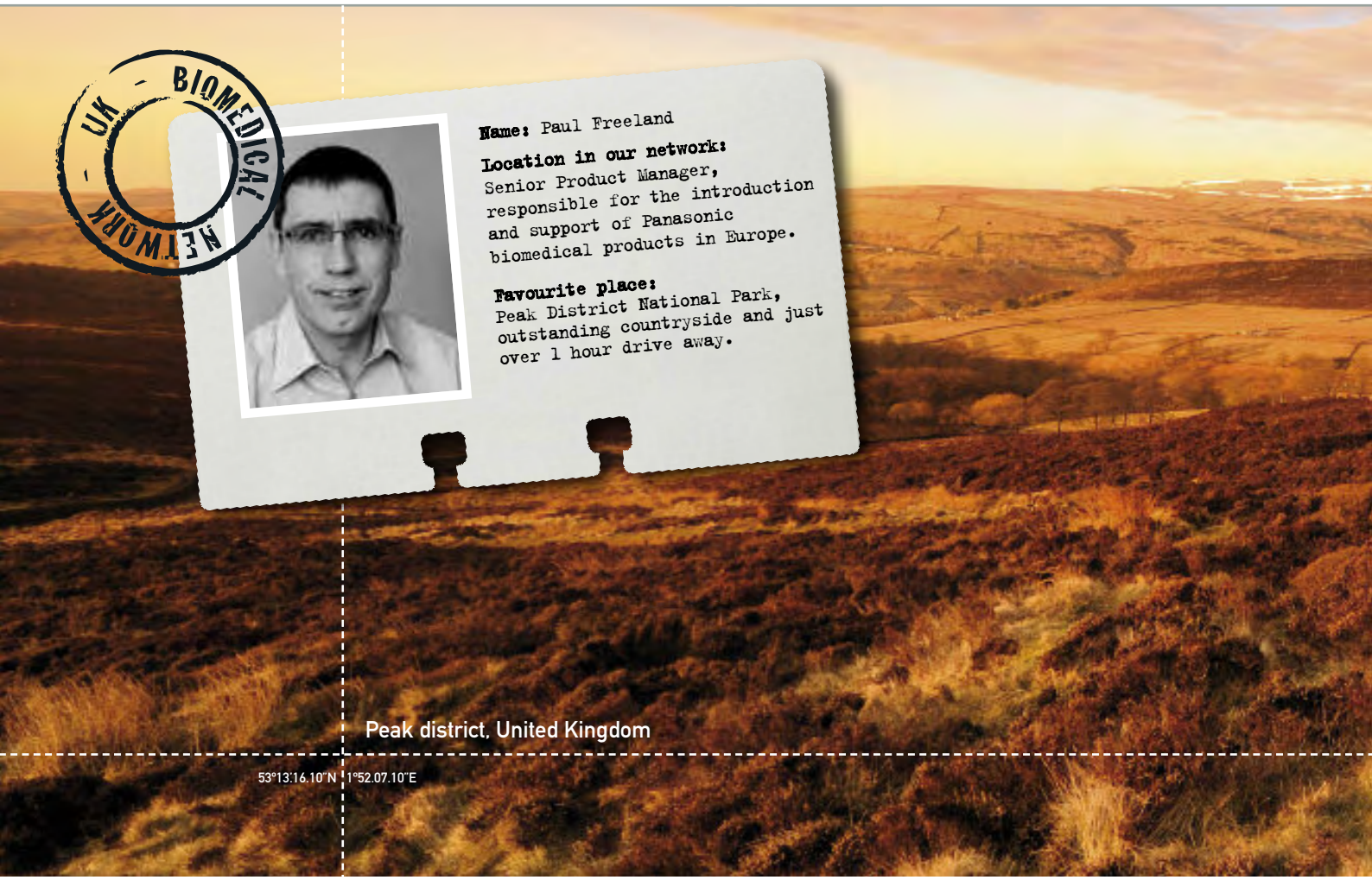
Humidity Control Range (MLR-352H only)



Dimensions



Unit: mm



Versatile cooled incubators for a wide range of experimental needs

Panasonic's MIR series incubators have been recognised as exceptional units suitable for a wide range of applications. The wide variety of temperatures and lighting patterns that are essential in biological research and environmental studies can now be accurately reproduced and controlled.

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, and is ideal for experimentation during night time and holidays, experimentation that requires settings to be changed and microorganism culture and preservation.

Also new MIRs offer the choice of timer mode, 24-hours clock mode and Timer mode to suit the user's experiment. Up to 10 programs can be stored for convenient retrieval and set-up of frequently run experiments. Individual programs can be combined using the Join function. Constant operation mode without step operation is also available.

Options

Stacking kit	MIR-S154SB (MIR-154 only)
Door Padlock Bracket (Padlock not supplied)	MIR-LP (MIR-154, 254 only)
Additional Illumination kit	MIR-L15
Inner doors	MIR55ID (MIR-554 only)
Door Window Blanking Plate	
for MIR-154	MIR-154BP
for MIR-254	MIR-254BP
Communications Interface	MTR-480

High-precision Temperature Environment

Wide Temperature Control Range from -10°C to +60°C
With a wide temperature range from -10°C to +60°C, Panasonic Cooled Incubators allow a full range of precise experiments including environmental tests to microorganism cultures and plant germination tests.

Precise Microprocessor Temperature Control
Panasonic Cooled Incubators incorporate a high precision microprocessor temperature control combined with a heater PID and compressor ON-OFF system.

Intuitive Operation with LCD Display
- Easy operability by LCD display and pop up menu
- 24-hour mode and timer mode are selectable.
- Combination of multiple programs in Join function
- Booking of operation start date and hour
- Operation data can be auto-recorded and graphical displayed.
- Data can be sent to PC using optional communication interface (MTR-480)
- Chamber Light ON-OFF control

Condensation Prevention
(MIR-554 only)
A humidity reduction mode helps reduce inner chamber condensation that may occur during high temperature operation

Prevents Medium from Drying Out
(MIR-154, 254 only) A DC fan is designed to be aimed obliquely upward to prevent direct wind against samples. This reduces medium drying by approx 50% in MIR-154, and by approx 15% in MIR-254.

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

Energy Savings
In addition to a microprocessor-controlled high efficient heater output and compressor ON/OFF, a renewal control program and low heat-emission inner chamber fan are newly adopted that allow high-energy saving operation over a wider range of ambient environments.

Automatic Defrosting
To combat annoying frost during low temperature operation, new MIRs provide an automatic defrost function that operates automatically at a specified time every day. Manual defrosting is also selectable.

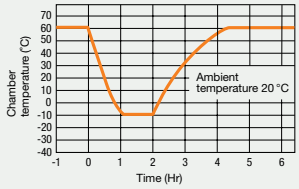
Light Timer Control
On-Off programmed timer control for initially equipped fluorescent light (15W x 1pc) is available. Optional light addition kit (MIR-L15) can add three more fluorescent lights into the chamber ceiling, giving approx. 3000lx in 30 cm below from the light sources.

Environmentally Conscious
Microprocessor controlled optimum control results in high energy savings and a HCFC free foamed-in-place rigid polyurethane insulator also helps save energy.

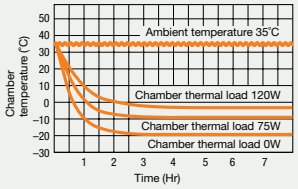
Performance data

MIR-154

Chamber pull-down/pull-up characteristics
(Outside air temperature 20°C Power source: AC 100V/50Hz)



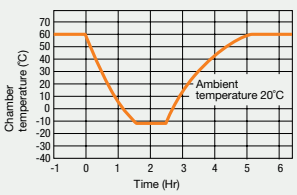
Pull-down characteristics for thermal load in chamber
(Outside air temperature 35°C Power source: AC 100V/50Hz)



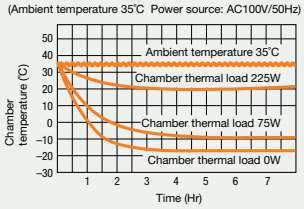
*The data shown above are taken with the fluorescent lamp turned off.
*Characteristics may vary depending on the product or operating conditions.

MIR-254

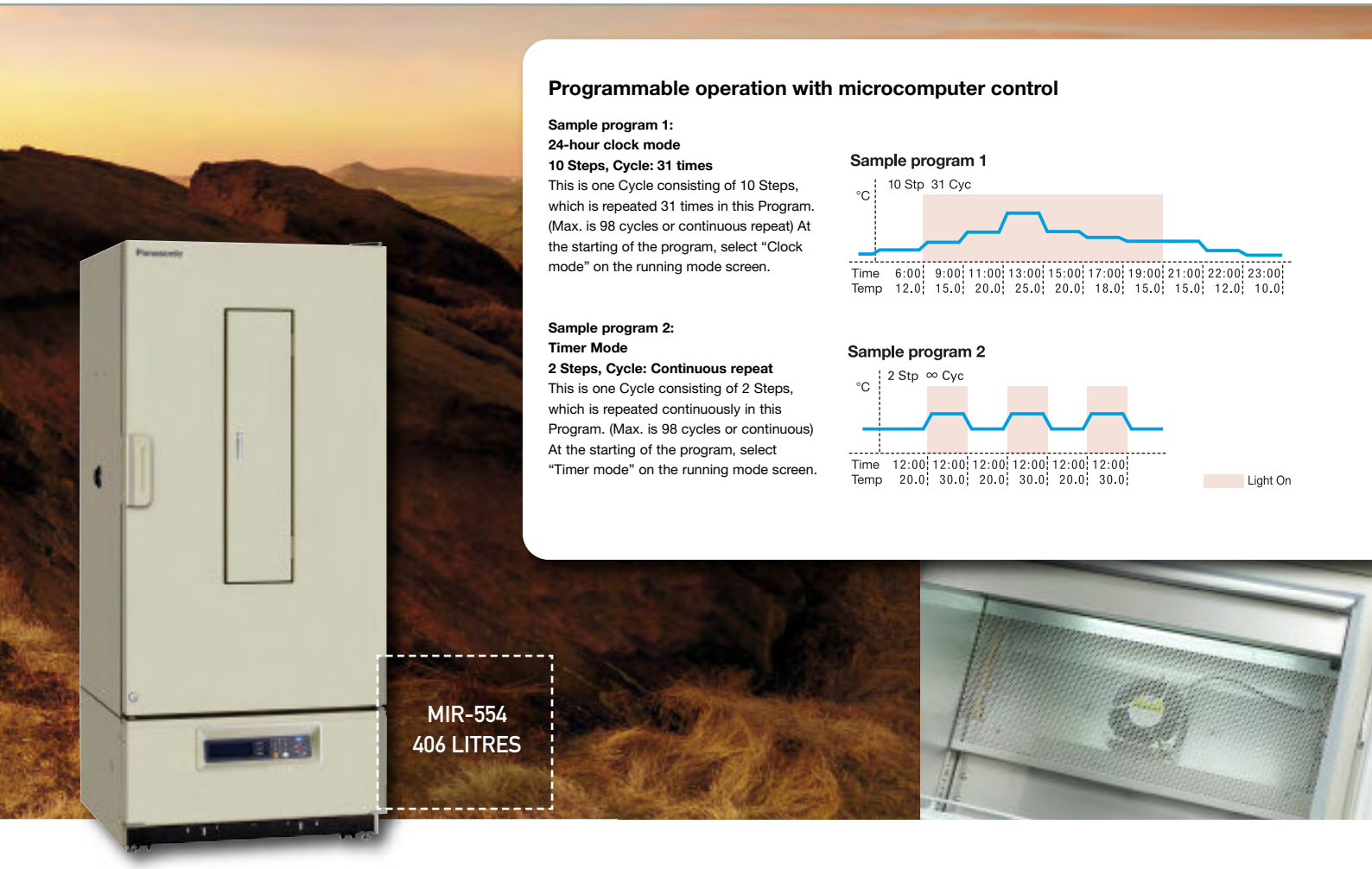
Chamber pull-down/pull-up characteristics
(Outside air temperature 20°C Power source: AC 100V/50Hz)



Temperature pull-down characteristics for thermal load in chamber
(Ambient temperature 35°C Power source: AC100V/50Hz)



*The data shown above are taken with the fluorescent lamp turned off.
*Characteristics may vary depending on the product or operating conditions.



Programmable operation with microcomputer control

Sample program 1:
24-hour clock mode
10 Steps, Cycle: 31 times
This is one Cycle consisting of 10 Steps, which is repeated 31 times in this Program. (Max. is 98 cycles or continuous repeat) At the starting of the program, select “Clock mode” on the running mode screen.

Sample program 1

Sample program 2:
Timer Mode
2 Steps, Cycle: Continuous repeat
This is one Cycle consisting of 2 Steps, which is repeated continuously in this Program. (Max. is 98 cycles or continuous) At the starting of the program, select “Timer mode” on the running mode screen.

Sample program 2

Alarm and Security System to Protect Sample Safety

Automatic Setting Temperature Alarm
When the chamber temperature deviates more than ±1 to ±5°C, all digits of the digital indicator flash. Fifteen minutes (default) later a buzzer will sound. This system also automatically allows programmed operation or setting value changes.

Independent Over-temperature Protection Device
This incubator incorporates an excessive temperature prevention circuit that protects experimentation materials in the rare event that a temperature abnormality does occur. This system turns off the heater and chamber fan motor when too high a temperature is detected, and turns off the compressor when too low a temperature is detected.

Programmed Memory Backup Mechanism
Should the power source be interrupted due to power failure or other event, programmed data remains stored in memory. When the power source is restored, operation can be continued according to the predetermined program.

Automatic Return Buzzer Switch
After an abnormality occurs, the alarm automatically switches to the ON mode, even if the operator forgets to return the alarm buzzer to the ON mode, thus ensuring safe and secure operation.

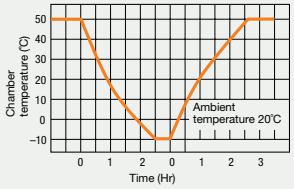
Tamper Proof
A key lock function is provided so that settings may not be changed unintentionally.

Self Diagnostic Function
Should a malfunction occur, the location of the malfunction can be digitally indicated, allowing quick operator response.

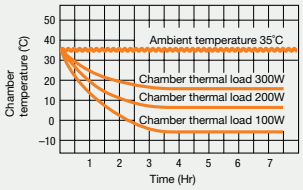
Panasonic DAQ System
Panasonic original DAQ (data acquisition) software enables remote monitoring of cooled incubators.

MIR-554

Chamber pull-down/pull-up characteristics
(Ambient temperature 20°C Power source: AC100V/50Hz)



Temperature pull-down characteristics for thermal load in chamber
(Ambient temperature 35°C Power source: AC100V/50Hz)



*The data shown above are taken with the fluorescent lamp turned off.
*Characteristics may vary depending on the product or operating conditions.

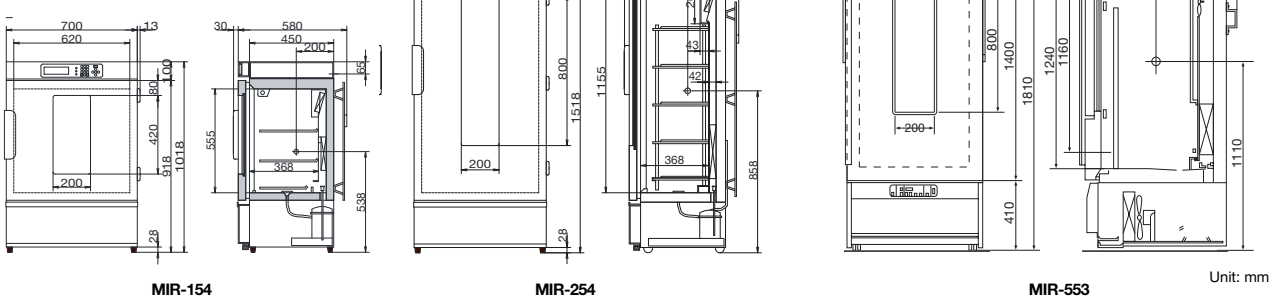
Heated Incubators

Microcomputer PID Control + Air Jacketed System
Microcomputer PID control and air jacketed system gives precise temperature control within the chamber. Temperature accuracy is within ±0,2°C (at 37°C) and temperature uniformity is within ±1°C (at 37°C).

Microcomputer Timer Function
An accurate microcomputer timer is fitted to allow experiments up to 99 hours and 59 minutes. Desired start time is set by an automatic start (delay function). The program activates a buzzer when a set time is over and keeps a set temperature after an operation finishes. Various operation patterns can be set by utilizing these functions.

Temperature Control Range- Ambient Temperature +5°C~80°C (AT 20°C)
Panasonic heated incubators allow incubation at normal temperature to high temperature.

Dimensions



MIR-154 MIR-254 MIR-553

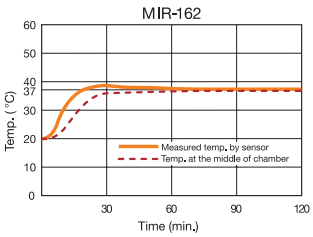
Unit: mm

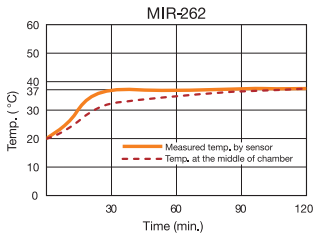
Advanced Design

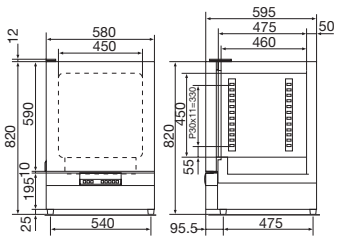
Control panel uses a touch keyboard and an easy-to-read green LED display. Temperature and time are shown respectively by digital displays. Durable stainless steel (SUS-304) for interior cabinet.

Performance data MIR-162 / MIR-262

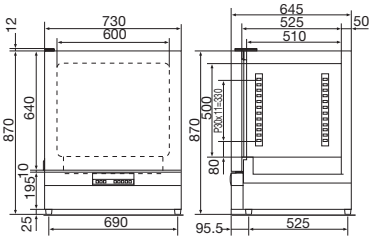
Temperature uniformity data







MIR-162



MIR-262

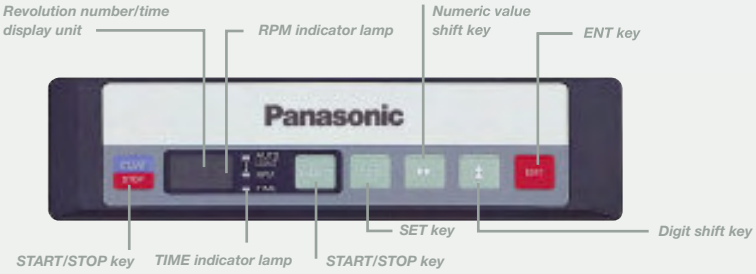
Unit: mm

MIR-S100
50 TO 500 RPM

Compact & High-Speed Orbital Shaker

The Panasonic MIR-S100 orbital shaker delivers superior performance and functions in a compact, low-vibration design.

- Low vibration, low noise
- Compact design, intelligent operation
- Easy installation in Panasonic incubator or growth chamber



No. of units that can be installed

MIR-154	1 unit
MIR-254	2 units
MIR-554	2 units
MLR-352	2 units

* *The optional Mounting Kit is required for installation.*
* *Please refer to the instruction manual for details before use.*

High-speed Shaking
The MIR-S100 offers high-speed shaking from 50 to 500 rpm, which significantly reduces waiting time for cultures.

Easy Operation with MIR/MLR models
Can be installed in the MIR-154/254/554 and MLR-352. Control panel located in center of unit enables checking of indicators through the window of the MIR/MLR.

Soft Start
Gradually accelerates until reaching the preset number of revolutions so that samples inside flasks and test tubes are not spilled or foamed. Three levels of acceleration speed can be selected.

Timer
Indicates time of operation from 0 to 99.9 hours in increments of 0.1 hour (6 minutes).

Integrated Operating Time Display
Displays the integrated operating time (which can be checked in the function mode).

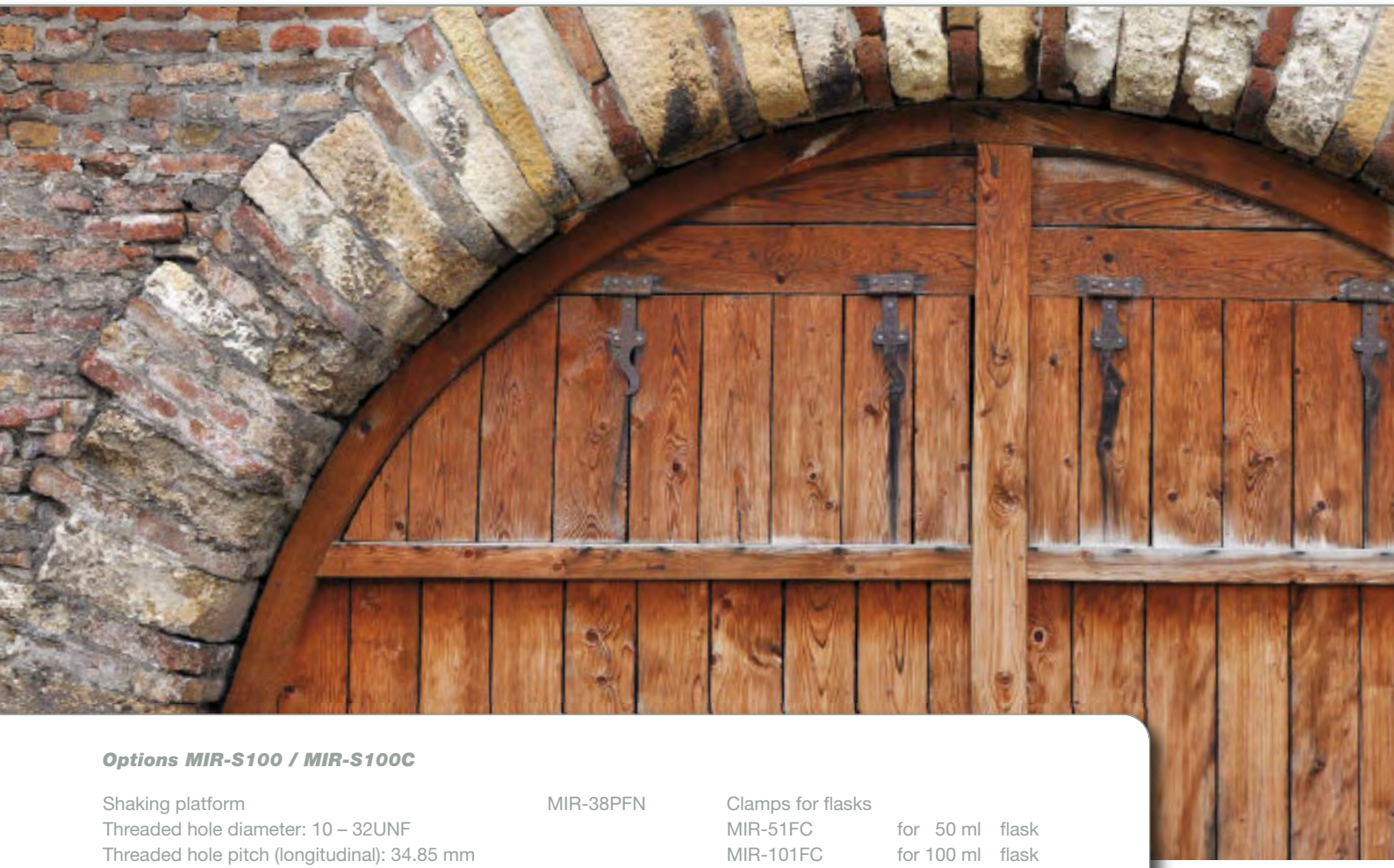
Key Lock
Locks the keys on the control panel to avoid accidental function selection.

Auto Recovery after Power Interruption
Automatically recovers after power interruption, and indicates that power interruption has occurred.

Speed Error Alarm
Indicates an error when the number of revolutions does not reach or exceeds the preset value.

Motor Overload Protection Circuit
Detects over-current and automatically stops operation. Indicates an error when overload is applied to the motor.

Sturdy Stainless Steel Finish
Equipped with a cover made of stainless steel with hair line finish to facilitate cleaning.



Options MIR-S100 / MIR-S100C

Shaking platform	MIR-38PFN	Clamps for flasks	
Threaded hole diameter: 10 – 32UNF		MIR-51FC	for 50 ml flask
Threaded hole pitch (longitudinal): 34.85 mm		MIR-101FC	for 100 ml flask
Threaded hole pitch (lateral): 20.65 mm		MIR-201FC	for 200 ml flask
		MIR-301FC	for 300 ml flask
Test tube rack for various tubes	MIR-204SC	MIR-501FC	for 500 ml flask
Mounting kit	MIR-15FP	MIR-1001FC	for 1000 ml flask
for use with MIR-154/254/554 and MLR-352		MIR-2001FC	for 2000 ml flask

Compact orbital shaker for culture incubation in high humidity conditions

- Usable in a CO_2 incubator.
- Controller and shaker sections are separated to prevent humidity from affecting electrical components.
- Copper alloy stainless steel is used for the shaker section.
- Revolution speed is from 40 to 200 rpm.
- Best suited to operation in a Panasonic CO_2 incubator.

Structural Design
Antibacterial copper alloy stainless steel is used for the shaker section. Also, the shaker section is equipped with a small window that can be used for spraying disinfectant inside.

Soft Start
Gradually accelerates until reaching the preset number of revolutions so that samples inside flasks and test tubes are not spilled or foamed. Three levels of acceleration speed can be selected.

Timer
Indicates time of operation from 0 to 99.9 hours in increments of 0.1 hour (6 minutes).

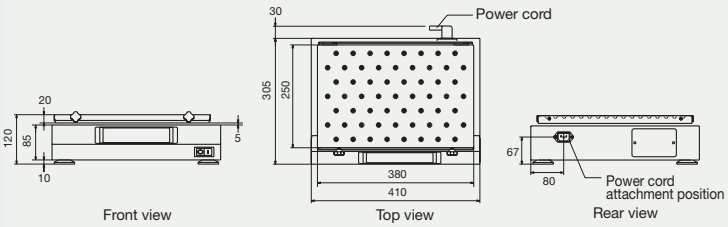
Auto Recovery after Power Interruption
Automatically recovers after power interruption and indicates that power interruption has occurred.

Speed Error Alarm
Indicates an error when the number of revolutions does not reach or exceeds the preset value.

Motor Overload Protection Circuit
Detects over-current and automatically stops operation. Indicates an error when overload is applied to the motor.

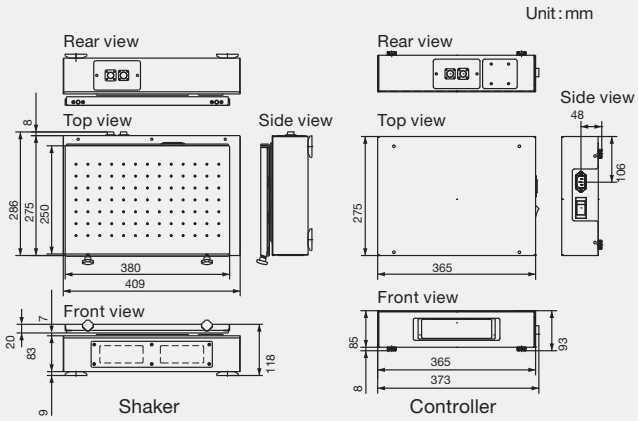
Maintenance-required Indicator
Automatically alerts you when maintenance is required or when bearings and belts need replacing after operational hours exceed 10,000.

Dimensions MIR-S100



Unit: mm

Dimensions MIR-S100C



Panasonic recognizes that in order to excel you must be strong, focused and balanced. We focus on that vision by creating equipment that strikes a strong balance between cost and materials, design and usability. So that you can focus on accomplishing your goals. You and Panasonic a perfect match.

- Autoclaves
- Laboratory Autoclaves
- Laboratory Ovens
- Dry Heat Sterilizers

Portable Laboratory Autoclaves - Accurate, efficient temperature control. Easy-to-use functions. Portability so these Autoclaves go with you, wherever that may be. Above all these Autoclaves feature a wealth of security features to ensure the safety of the user and the material inside. What more could you want from an Autoclave!
With generous capacities of up to 12 1000ml flasks (MLS-3781L) and sterilisation temperatures up to 135°C, we give you two important reasons why your next autoclave should be a Panasonic autoclave.
For safe use of our new MLS-37 series, precautions and operating instructions are given by voice guidance. The working conditions, that are shown on the control panel, can be printed by a optional line thermal dot printer for record-keeping, management and storage. Two ranges of portable Autoclaves designed for the individual laboratory or user.

MOV Laboratory Ovens - Panasonic has always aimed to provide research support equipment that offers complete satisfaction to suit its users. Inspired by the search for even higher precision and greater flexibility of control, Panasonic presents the MOV series of Laboratory Ovens; accurate, high-temperature equipment for scientific research.

Lofoten, Norway

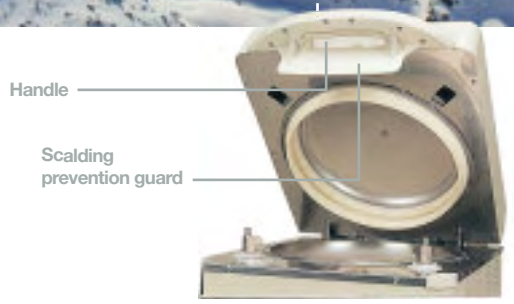
68°24'58.02"N 13°56'31.44"E

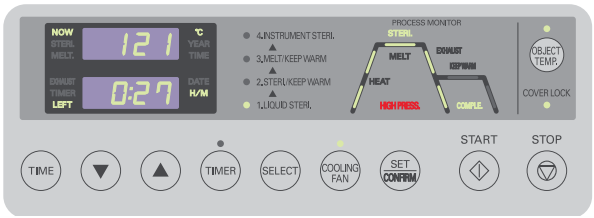
Compact design In-Lab Autoclaves

Researchers waste valuable time and energy when limited to using a centralized building autoclave. Installation and maintenance of central autoclaves are not only costly but time consuming. Panasonic offers two solutions: The MLS-3781L and MLS-3751L portable autoclaves are designed for individual lab use and can be conveniently wheeled from one lab to another. Model MLS-3751L has a low enough profile to be stored under a lab bench when not in use.

Surprisingly Large Chamber
Despite the compact outer dimensions of these autoclaves, they store 8 (MLS-3751L) or 12 (MLS-3781L) 1,000ml flasks. The MLS-3751L has two baskets, and the larger MLS-3781L has three.

Compact Design, Swing-up Lid for Easy Access
Both Panasonic models can be easily installed in minimal space. A swing-up lid provides effortless access for loading and unloading test tubes, flasks and lab instruments.





Setting example

Cycle	Program	Steriliz. Temp.	Steriliz. Time	Heat-retent. Temp.
1. Sterilizing	1 - 1	121°C	27 min.	–
2. Sterilizing/Keep Warm	2 - 1	121°C	27 min.	50°C
3. Melting/Keep Warm	3 - 1	100°C	30 min.	50°C
4. Instrument Sterilizing	4 - 1	135°C	3 min.	–

Newly designed handle lets users open and close the lid easily with one hand.

The conventional slide handle has been completely redesigned to develop a hand-pull system that enables easy opening/closing by gripping with one hand. In addition, the cover is equipped with a scalding prevention guard to prevent scalding due to steam.

Equipped with 4 selectable courses and 3 customizable programs

Any of 4 courses can be selected according to the purpose of use, and 3 types of setting values can be stored for each course according to the usage conditions. The setting values (sterilizing temperature, sterilizing time, melting temperature, melting time, keep warm, exhaust temperature, exhaust rate) for each program can be easily changed by the user for easy use.

1. Sterilizing
For water, culture media, reagents and other fluids. After completion and cooling to a selected temp., air is expelled automatically through the exhaust valve.

Sterilizing temp.: 115°C to 135°C
Timer: 1 to 300 min.
Exhaust temp.: 0°C to 45°C.

2. Sterilizing/Keep Warm
After sterilizing culture media, reagents and other liquids, and cooling down naturally to a selected temp., air is expelled automatically from the exhaust valve. High temp. prevents solidifying.

Sterilizing temp.: 115°C to 135°C
Timer: 1 to 300 min.
Exhaust temp.: 0°C to 45°C
Incubation temp.: 45°C to 60°C.

3. Melting/Keep Warm
To melt or keep culture media at a fixed temp. (This function is not for sterilizing but prevents solidifying).

Melting temp.: 60°C to 114°C
Timer: 0 to 300 min., 72 hrs.
Incubation temp.: 45°C to 60°C

4. Instrument Sterilizing
For flasks, beakers, test tubes, other lab instruments. When completed, the exhaust valve opens and the temp. drops to 100°C. Thus, cool down period can be shortened. Suitable for equipment that can withstand sharp drops in pressure and for sterilizing waste.

Sterilizing temp.: 115°C to 135°C
Timer: 1 to 300 min.

Options

Object temperature sensor	MLS-37SB	
Printer (with 1 roll of paper)	MLS-37PR	
Printer paper	MLS-37PR-S (5-roll set)	

Stainless Steel Baskets and Buckets		inner dims.
Wire Baskets	MLS-37BL	ø335 x 220
	MLS-37BS	ø335 x 170
Solid Bucket	MLS-37C30	ø330 x 300
Perforated Buckets	MLS-37PB30	ø330 x 300
	MLS-37PB40 (MLS-3781L only)	ø330 x 400

Functions for user safety and cooling fan/exhaust level adjustment to reduce cooling time.
Conforming to the requirements of IEC standards, when using sterilizing liquid the temperature when opening the cover is set to 65°C or less. In addition, by adding exhaust holes at several positions on the side of the product and positioning the standard-equipment cooling fan under the chamber, cooing efficiency and sterilizing efficiency are increased, so that operating time can be reduced. Furthermore, a constant open/close interval (with 5-step adjustment) for the exhaust process valve enables selection of the exhaust rate for steam inside the chamber to enable cooling in a shorter time while reducing exhaust time and preventing boiling over of sterilizing liquid.

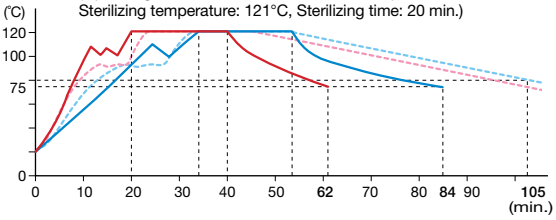
Thermal printer (optional)
The work conditions shown on the control panel (temperature/pressure inside chamber, sterilizing course, time) can be printed out by a line thermal dot printer for record-keeping, management, and storage.

Microprocessor temperature control
Sterilizing temperature is controlled to within +2°C/-0°C of the set temperature in the range of 115°C to 135°C.

Air vent control
Can be set to allow automatic release after sterilizing is completed.

Process operation

Example: Instrument sterilisation course
(Operating conditions: No load; Ambient temperature: 20°C; Sterilizing temperature: 121°C, Sterilizing time: 20 min.)



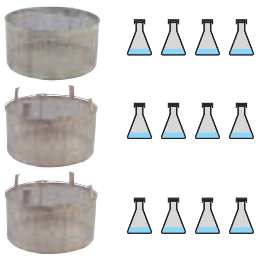
MLS-3751L
MLS-3781L
MLS-3750*
MLS-3780*
*Our company's previous models

- Operating time varies depending on operating conditions.
- For liquid sterilisation course, the operating time will be longer than for instrument sterilisation course.

MLS-3751L
Load example

Eight 1000ml flasks

MLS-3781L
Load example



Twelve 1000ml flasks

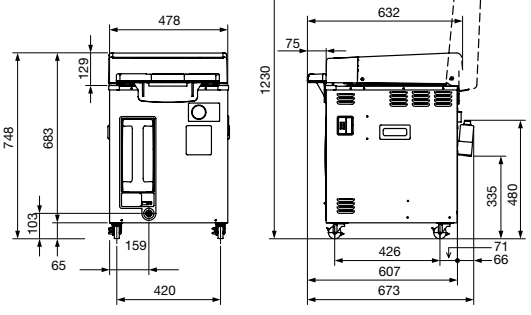
Wire Baskets

Solid Bucket

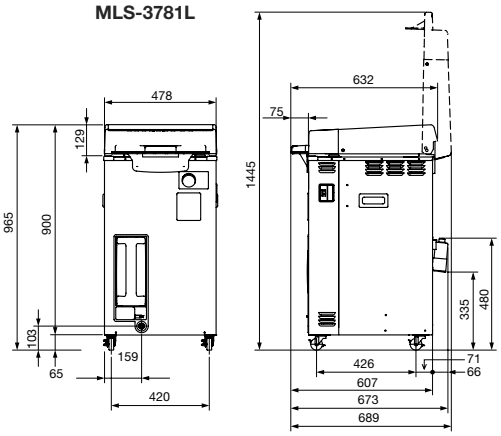
Perforated Bucket

Dimensions

MLS-3751L



MLS-3781L



Accurate sterilisation temperature control - easy to use

The importance of sterilisation is growing in the field of good laboratory practice in areas such as biotechnology and medicine. Of all sterilisation methods, the use of high pressure steam (autoclave) is the most widely used because of its efficacy, speed and reliability. This method is suitable for a wide range of applications including culture media, glass and metal implements, and waste products.

Panasonic laboratory autoclaves provide a safe, reliable high pressure steam sterilizing environment within a unit that is particularly easy to use. Microprocessor control ensures that the correct temperature is accurately maintained and easily operated with one-touch operation. Fail-safe functions ensure user safety and the compact design maximises use of valuable laboratory space. These reliable, energy saving autoclaves are ideal for a wide range of applications.

Microprocessor control maintains accurate sterilisation temperature.
A microprocessor monitors and controls the steam temperature within the chamber, ensuring that it is maintained within the range 105°C - 126°C.

Easy to operate ergonomic design
The interior of the chamber is free of protrusions such as sensors or piping joints that could interfere with the

insertion or removal of items. The single rectangular handle turns easily and securely seals the chamber. The control panel is mounted at the top of the unit, making it easier to see and operate.
A water outlet valve allows easy changeover of the sterilisation water.

Digital controls and display eliminate setting errors
The digital control panel allows temperature and time settings to be entered accurately in 1°C and 1-minute intervals. The display panel is easy to read helping to prevent errors when setting parameters. Pressing the (TEMP) and (TIMER) keys simultaneously displays the remaining sterilisation time.

Safety assured with fail-safe functions

1. *Dry scorch protection function*
   Should the water level drop too low, an overheating protection circuit is triggered, a buzzer sounds and an error message appears on the display. Buzzer alert: pairs of short beeps repeated in succession.
2. *Door switch*
   A safety mechanism prevents the autoclave from operating if the door is not completely closed. A door closed lamp lets you check whether the door is closed.
3. *Pressure safety valve*
   A reliable pressure safety valve is used to prevent the pressure inside the chamber from rising above acceptable levels.
4. *Thermistor error detector function*
   If the thermistor temperature sensor goes open circuit (connection broken), the heater turns off to prevent overheating. Buzzer alert: pairs of short beeps repeated in succession.
5. *Overheating protection function*
   The digital display starts to flash if the temperature in the chamber rises more than 2°C above the temperature setting. If it rises 3°C or more above the setting, the relay shuts off and cuts off power to the heater.
6. *Door protection function*
   If the magnet-holder is not connected to the switch button, the high pressure lamp will flash when the temperature inside the chamber is over 99°C.

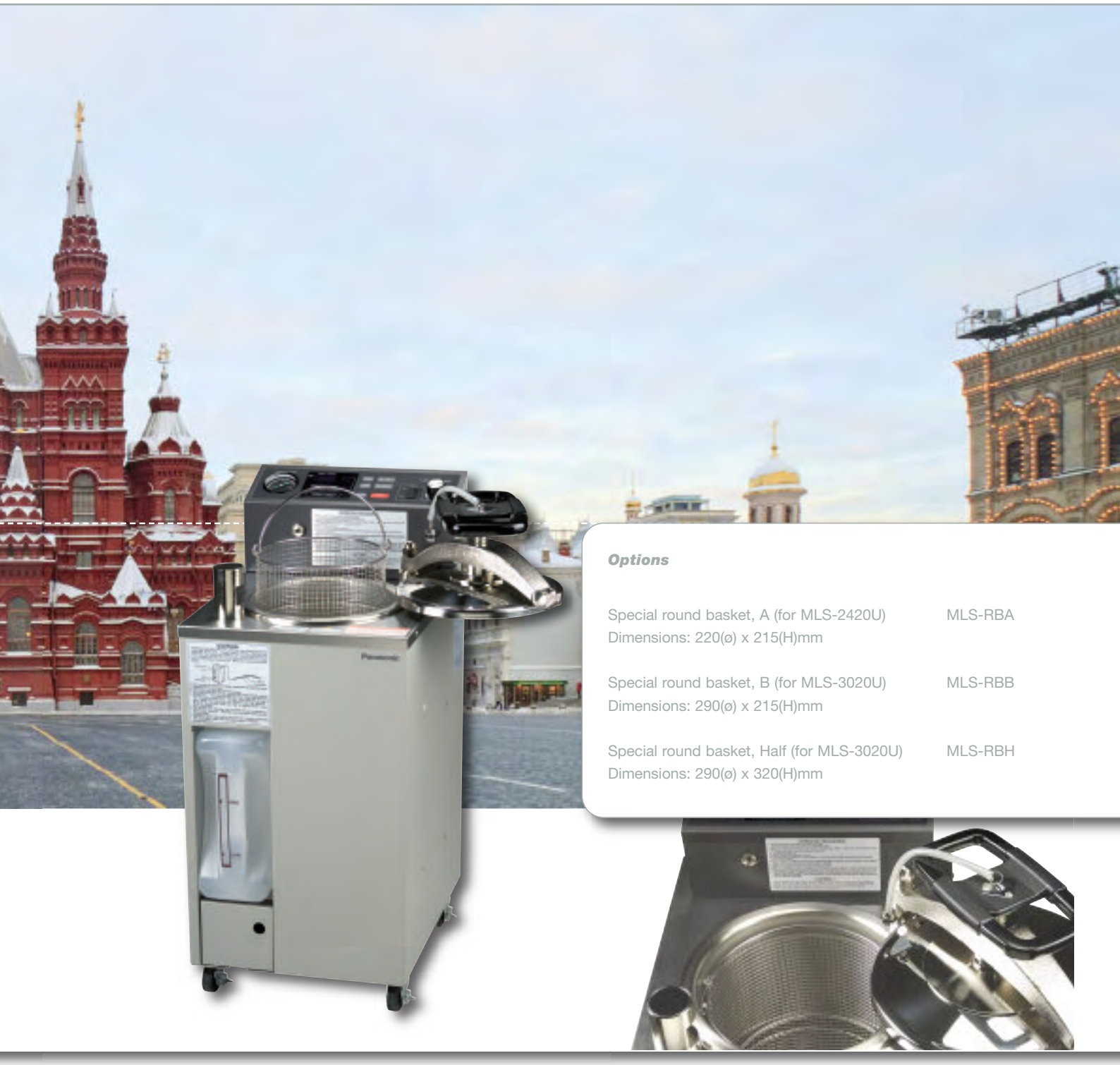
Audible and visual alarms alert the user to end of cycle and error conditions.
The unit sounds a buzzer to alert the user to any error conditions requiring attention and to the end of the sterilisation cycle so that items can be removed from the autoclave.

1. *Sterilisation finished alert function*
   A buzzer sounds to tell you when sterilisation is finished.
2. *Safe to open door alert function*
   The unit continues to monitor the temperature inside the chamber after sterilisation is finished. Once the autoclave has cooled to the point where it is safe to open the door, a buzzer sounds.
3. *Safe to remove contents alert function (cycle fully complete)*
   When the items being sterilized have cooled down to the point where it is safe to remove them, a buzzer sounds.

Compact design ideal where space is limited.
The body of the unit, with its built in exhaust bottle, measures a mere 380 x 490 mm (MLS-2420U) and 440 x 550 mm (MLS-3020U) so it will fit in the tightest spaces.

Features of MLS-3020U/2420U.

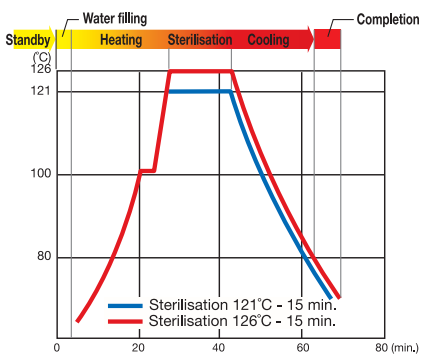
- Wide variety of items can be autoclaved using 126°C sterilisation.
- The pressure vessel is designed to meet the ASME safety code. In accordance with the code, these units have a lid interlock function.



Options

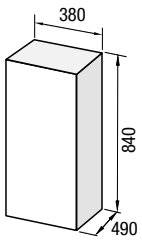
Special round basket, A (for MLS-2420U) Dimensions: 220(ø) x 215(H)mm	MLS-RBA
Special round basket, B (for MLS-3020U) Dimensions: 290(ø) x 215(H)mm	MLS-RBB
Special round basket, Half (for MLS-3020U) Dimensions: 290(ø) x 320(H)mm	MLS-RBH

Process operation

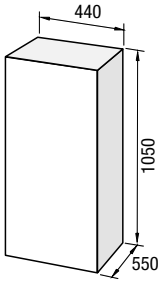


Dimensions

MLS-2420U



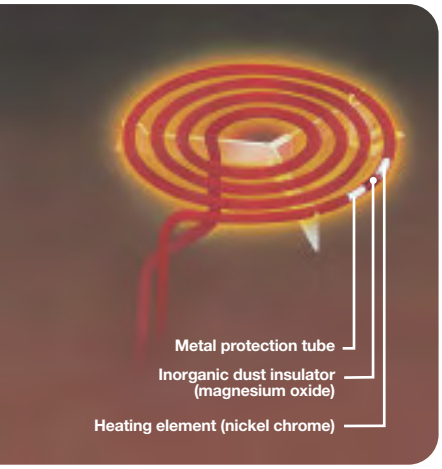
MLS-3020U



Unit: mm

Accurate, High-Temperature Equipment for Scientific Research

Panasonic has always aimed to provide research support equipment that offers complete satisfaction to its users. Inspired by the search for even higher precision and greater flexibility of control, Panasonic presents the MOV Series.



Microprocessor PID temperature control system guarantees an accurate temperature environment

The microprocessor PID (Proportional, Integrated and Differential) temperature control system ensures accurate inside temperature. With less offset or overshoot, precise control is possible. This system provides the high-temperature environment that exactly meets experimentation requirements.

The MOV Series can be widely used for basic to applied experimentation in the areas of scientific, industrial and environmental testing.

Sheathed heater ensures durability and safety

A sheathed heater is incorporated in the heater section. The heating element is wrapped in a magnesium oxide insulating material and covered with a metal protection tube. With conventional wire heating elements, gases or dust can cause corrosion, resulting in loss of heating capacity and electrical leakage. With its durability and high chemical resistance, the sheathed heater ensures safer, more stable operation without the risk of electrical leakage.

Alarm and safety functions
A comprehensive range of alarm and safety devices is included as standard in the MOV Series.

Microprocessor timer function
Panasonic has included a microprocessor timer function, so operated times can be set up to a maximum of 99 hours and 59 minutes. The combination of auto start and auto stop provides operating patterns suited to a wide variety of applications. The auto stop operates the timer when the heater is on, or when the set temperature has been reached. A buzzer indicates the end of timer operation.

Attractive design
Panasonic believes that laboratory equipment should be attractive as well as functional. The MOV Series features a future-oriented design, with rounded corners, door handles that blend with the main body, and a flat control panel.

Alarm and safety functions	Trigger	Alarm notification method and operation
Automatic set temperature alarm	More than 10°C deviation from set temperature.	Lamp, LED, buzzer.
Independent overheating protection circuit	Abnormal temperature increase above upper limit.	While not in operation: buzzer. While in operation: lamp, LED and buzzer. Independent circuit switches off heater and fan motor.
Overtemp. safety system for control section	Ambient temperature of main part (base) of control section exceeds 65°C.	Lamp, LED, buzzer. Heater and fan motor switched off.
Keylock switch	Keylock switch on.	Key input not possible (excl. buzzer and call key).
Memory backup function	During power failure, breaker cut or when unit is not connected to power supply	Stores operation patterns for set temperatures/ times.

User-oriented design for easy operation
The control panel has soft-touch keys and bright, green digital LED display that allows easy confirmation of temperature and remaining operation time.
Other advantages of the design include a soft-latched door handle integrated with the door, an observation window for checking conditions inside the cabinet, two exhaust vents (shared with an access vent) on the top of the unit, and a stainless-steel (SUS-304) interior to guarantee durability and superior resistance to chemicals.

Malfunction Monitor (Self diagnosis function)
Should a malfunction occur, it is diagnosed and indications are given on the digital display.

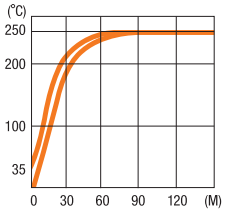
Built-in microprocessor timer guarantees accurate sterilisation time
The built-in microprocessor timer (max. setting 99 hours and 59 minutes) accurately adjusts sterilisation time. A consecutive display of the inner cabinet temperature is provided for quick confirmation of the time when

Performance data MOV-112F / MOV-212F / MOV-112 / MOV-212 / MOV-112S / MOV-212S

MOV-112

Pull-up characteristics

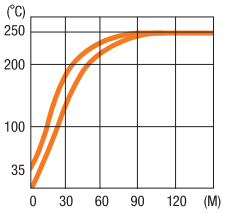
AC 100V/no load, exhaust vent closed.



MOV-212

Pull-up characteristics

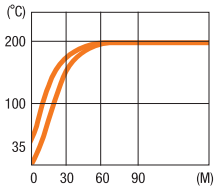
AC 100V/no load, exhaust vent closed.



MOV-112F/S

Pull-up characteristics

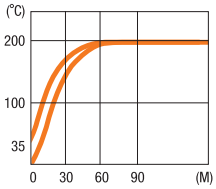
AC 100V/no load, exhaust vent closed.



MOV-212F/S

Pull-up characteristics

AC 100V/no load, exhaust vent closed.



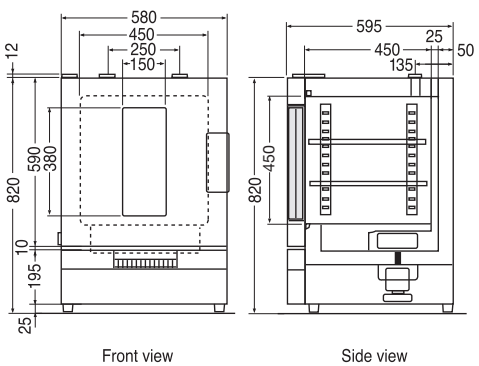
samples should be removed. And a buzzer sounds at the end of timer operation. In combination with auto start and auto stop, operation patterns can be set for a wide range of applications.

Natural convection system (MOV-112/MOV-212)
Natural convection is best for drying very small samples and fine particles which would be scattered by a fan. This system can be used for high-temperature applications up to 250°C.

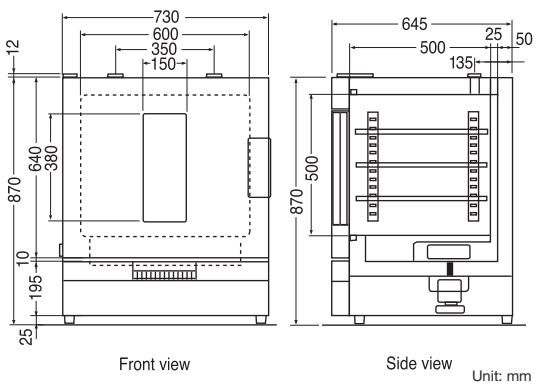
Forced air circulation system (MOV-112F/MOV-212F/MOV-112S/MOV-212S)
Sirocco fan circulation keeps variations in inner cabinet temperature within ±4°C at 200°C. Compared with natural convection, quicker drying is possible. And Panasonic's unique fan motor not only circulates hot air in the cabinet but also keeps the motor cool, improving the reliability and safety of the motor.

Dimensions

MOV-112F/S



MOV-212F/S



Unit: mm

note: The size of the MOV-112/212 is 25mm deeper, due to the fact that these models use a natural convection system.


REMOTE ALARM
ON
OFF

GROUP		-150°C/-152°C Freezers		
Characteristics		• Long-term storage below recrystallisation point • Safe storage without risk of cross contamination • Reliable Panasonic Cool Safe compressors • Low operational costs		
PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm				
MODEL		**MDF-1156-PE**	**MDF-1156ATN-PE**	**MDF-C2156VAN-PE**
Dimensions				
External dimensions (W x D x H)[6]	mm	1400 x 800 x 945	1400 x 800 x 945	1730 x 765 x 1010
Internal dimensions (W x D x H)	mm	500 x 450 x 572	500 x 450 x 572	760 x 495 x 615
Volume	litres	128	128	231
Net weight (approx)	kg	265	272	318
Performance				
Cooling performance [1]	°C	-152	-152	-150
Temperature setting range	°C	-125 ~ -155	-125 ~ -155	-125~-152
Temperature control range [1]	°C	-130 ~ -152	-130 ~ -152	-125 ~ -150
Control				
Controller		Microprocessor Non-volatile memory		
Display		LED	LED	LCD
Temperature sensor		Pt-100	Pt-100	Pt-1000
Refrigeration				
Refrigeration system		Cascade	Cascade	Cascade with auto-cascade low-stage
High-stage compressor	W	1100	1100	1100
High-stage refrigerant		HFC	HFC	HFC
Low-stage compressor	W	1100	1100	1100
Low-stage refrigerant		HFC Mixed	HFC Mixed	HFC Mixed
Insulation material		PUF	PUF	PUF / VIP Plus
Insulation thickness	mm	175	175	135
Alarms				
Power failure		V-B-R	V-B-R	V-B-R
High temperature		V-B-R	V-B-R	V-B-R
Low temperature		-	-	V-B-R
Filter		V-B	V-B	V-B
Lid / door open		-	-	V-B
Construction				
Exterior material		Painted steel	Painted steel	Painted steel
Interior material		Aluminium	Aluminium	Aluminium
Inner door/lid	qty	1	1	2
Outer door/lid lock		Y	Y	Y
Shelves	qty	-	-	-
Max. load - per shelf	kg	-	-	-
Max. load - total	kg	300	300	207
Access port	qty	1	1	1
- position		left	left	right
- diameter	Ø mm	40	40	40
Casters	qty	6 (2 leveling feet)	6 (2 leveling feet)	6 (3 leveling feet)
Electrical and Noise Level				
Power supply		230V 50Hz Single		
Noise level [7]	dB	61	61	51
Options				
See page 161 for Inventory Racks				
Drawers	qty	-	-	-
Small inner door kit	Set of 2			
Temperature recorders				
- Circular type		-	-	-
- Continuous strip type		MTR-155H	Supplied as standard	MTR-155H
- Recorder housing (if required)		-	-	MDF-S30150
RS485 interface module		-	-	MTR-480
Liquid CO_2 Back-up		CVK-AT2 [2,5]	-	
Liquid N_2 Back-up		CVK-ATN2 [2]	Supplied as standard	Supplied as standard

notes:
[1] Air temperature measured at freezer centre, ambient temperature +30°C, no load
[2] Requires Recorder MTR-155H
[3] Requires Sensor Cover MTR-C8
[4] Requires Mounting Plate MDF-UBK
[5] CVK-A may also be used
[6] Exterior dimensions of main cabinet only - see dimension drawings showing handles and other external projections
[7] Nominal Value

GROUP		VIP -86°C Upright & -80°C Chest Freezers				
Characteristics PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm		• Maximum storage capacity with Vacuum Insulation Panel technology • Reliable Panasonic Cool Safe compressors • Optimal sample security • Superior performance and safe storage				
						
MODEL		**MDF-C8V1-PE**	**MDF-U33V-PE**	**MDF-U55V-PE**	**MDF-U74V-PE**	**MDF-U76V-PE**
Dimensions						
External dimensions (W x D x H)[6]	mm	550 x 685 x 945	670 x 867 x 1860	770 x 870 x 1990	1010 x 870 x 2010	1010 x 870 x 1990
Internal dimensions (W x D x H)	mm	405 x 490 x 425	490 x 600 x 1140	630 x 600 x 1380	870 x 600 x 1400	870 x 600 x 1400
Volume	litres	84	333	519	728	728
Net weight (approx)	kg	67	255	290	346	360
Performance						
Cooling performance [1]	°C	-80	-86	-86	-86	-86
Temperature setting range	°C	-55~-85	-50 ~ -90	-50 ~ -90	-50 ~ -90	-50 ~ -90
Temperature control range [1]	°C	-60 ~ -80	-50 ~ -86	-50 ~ -86	-50 ~ -86	-50 ~ -86
Control						
Controller		Microprocessor Non-volatile memory				
Display		LED	LED	LED	LED	LED
Temperature sensor		Pt-1000	Pt-1000	Pt-1000	Pt-1000	Pt-1000
Refrigeration						
Refrigeration system		Auto-cascade	Cascade	Cascade	Cascade	Cascade
High-stage compressor	W	-	450	450	1100	750
High-stage refrigerant		-	HFC	HFC	HFC	HFC
Low-stage compressor	W	400	750	750	1100	750
Low-stage refrigerant		HFC Mixed	HFC	HFC	HFC	HFC
Insulation material		PUF / VIP Plus	PUF / VIP	PUF / VIP	PUF / VIP	PUF/VIP PLUS
Insulation thickness	mm	70	70	70	70	70
Alarms						
Power failure		V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
High temperature		V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
Low temperature		V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
Filter		Filterless design	V	V-B	V-B	V-B
Lid / door open		-	V-B	V-B	V-B	V-B
Construction						
Exterior material		Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
Interior material		Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
Inner door/lid	qty	1	2 (Insulated)	2 (Insulated)	2 (Insulated)	2 (Insulated)
Outer door/lid lock		Y	Y	Y	Y	Y
Shelves (adjustable)	qty	-	3	3	3	3
Max. load - per shelf	kg		50	50	50	50
Max. load - total	kg	100	150	150	150	150
Access port	qty	2	3	3	3	2
- position		Back/Bottom	Back/Bottom x 2	Back/Bottom x 2	Back/Bottom x 2	Back/Bottom x 1
- diameter	Ø mm	17	17	17	17	17
Casters	qty	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)
Electrical and Noise Level						
Power supply		230V 50Hz Single				
Noise level [7]	dB	47	49	52	51	49
Options						
See page 161 for Inventory Racks						
Drawers	qty	-	MDF-30R (Max 2)	MDF-50R (Max 1)	-	-
Small inner door kit	Set of 2			MDF-5ID (Max 2)	MDF-7ID (Max 2)	MDF-7ID (Max 2)
Temperature recorders						
- Circular type		MTR-G85 [3]	MTR-G85	MTR-G85	MTR-G85	MTR-G85
- Continuous strip type		MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H
- Recorder housing (if required)		MDF-S3085	MDF-S3085	MDF-S3085	MDF-S3085	MDF-S3085
RS485 interface module		MTR-480	MTR-480	MTR-480	MTR-480	MTR-480
Liquid CO_2 Back-up		CVK-UB4 [4]	CVK-UB2	CVK-UB2	CVK-UB2	CVK-UB2
Liquid N_2 Back-up			CVK-UBN2	CVK-UBN2	CVK-UBN2	CVK-UBN2

notes:
1) Air temperature measured at freezer centre, ambient temperature +30°C, no load
2) Requires Recorder MTR-155H
3) Requires Sensor Cover MTR-C8
4) Requires Mounting Plate MDF-UBK
5) CVK-A may also be used
6) Exterior dimensions of main cabinet only - see dimension drawings showing handles and other external projections
7) Nominal Value

Dual-Cooling VIP -86°C Freezers		-86°C Chest Freezers				-86°C Upright Freezers			
• Extreme secure Dual Cooling System • Evolutionary VIP PLUS insulation • Maximum sample security • Energy saving ECO mode operation		• Ideal -86°C freezing environment • Specially designed Panasonic Cool Safe compressors • Microprocessor temperature control with digital design • Built-in temperature and power failure alarms				• Wide range of ULT freezers, to suit individual needs • Reliable Panasonic Cool Safe compressors • Microprocessor temperature control for accuracy and reliability • Superior performance and safe storage			
									
MDF-U500VX-PE	MDF-U700VX-PE	MDF-193-PE	MDF-394-PE	MDF-594-PE	MDF-794-PE	MDF-U3386S-PE	MDF-U4186S-PE	MDF-U5386S-PE	MDF-U7386S-PE
770 x 870 x 1990	1010 x 870 x 2010	750 x 700 x 945	1860 x 800 x 945	2010 x 770 x 1070	2570 x 770 x 1070	750 x 875 x 1850	870 x 780 x 1975	890 x 867 x 1990	1130 x 867 x 1990
630 x 600 x 1380	870 x 600 x 1400	480 x 430 x 420	1120 x 520 x 530	1280 x 500 x 762	1840 x 500 x 762	490 x 600 x 1140	620 x 515 x 1200	630 x 600 x 1280	870 x 600 x 1280
519	728	86	309	487	701	333	382	483	668
320	383	103	219	291	335	255	281	305	355
-86	-86	-86	-86	-86	-86	-86	-86	-86	-86
-50 ~ -90	-50 ~ -90	-50 ~ -95	-50 ~ -90	-20～-95	-20～-95	-50 ~ -90	-20 ~ -95	-50 ~ -90	-50 ~ -90
-50 ~ -86	-50 ~ -86	-50 ~ -86	-50 ~ -86	-20 ~ -86	-20 ~ -86	-50 ~ -86	-20 ~ -86	-50 ~ -86	-50 ~ -86
Microprocessor Non-volatile memory		Microprocessor Non-volatile memory				Microprocessor Non-volatile memory			
LCD	LCD	LED	LED	LED	LED	LED	LED	LED	LED
Pt-1000	Pt-1000	Pt-100	Pt-1000	Pt-100	Pt-100	Pt-1000	Pt-100	Pt-1000	Pt-1000
"Independent Dual-Cooling"	"Independent Dual-Cooling"	Auto-cascade	Cascade	Cascade	Cascade	Cascade	Cascade	Cascade	Cascade
-	-	-	450	1100	1100	450	1100	1100	1100
-	-	-	HFC	HFC	HFC	HFC	HFC	HFC	HFC
2 x 1100	2 x 1100	450	750	1100	1100	750	1100	1100	1100
HFC Mixed	HFC Mixed	HFC Mixed	HFC	HFC	HFC	HFC	HFC	HFC	HFC
PUF / VIP Plus	PUF / VIP Plus	PUF	PUF	PUF	PFU	PUF	PUF	PUF	PUF
70	70	135	140	135	135	130	125	130	130
V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
V-B-R	V-B-R	V-B-R	V-B-R	-	-	V-B-R	-	V-B-R	V-B-R
Filterless design	Filterless design	Filterless design	V-B	V-B	V-B	V	V-B	V-B	V
V-B	V-B	-	-	-	-	-	V-B	-	-
Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
Painted steel	Painted steel	Stainless Steel	Stainless steel	Stainless steel	Stainless steel	Painted steel	Painted steel	Painted steel	Painted steel
2 (Insulated)	2 (Insulated)	1	3	3	4	2 (Insulated)	2 (Insulated)	2 (Insulated)	2 (Insulated)
Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	3	-	-	-	-	3	3	3	3
50	50	-		-	-	50	50	50	50
150	150	200	81	234	190	150	150	150	150
3	3	1	1	1	1	3	1	3	3
Back/Bottom x 2	Back/Bottom x 2	left	left	left	left	Back/Bottom x 2	left	Back/Bottom x 2	Back/Bottom x 2
17	17	40	40	40	40	17	40	17	17
4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (3 leveling feet)	4 (3 leveling feet)	4 (3 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)
230V 50Hz Single		230V 50Hz Single				230V 50Hz Single			
53	53	46	49	50	50	49	49	49	49
MDF-50R (Max 1)				-		MDF-30R (Max 2)	-	-	-
MDF-5ID (Max 2)	MDF-7ID (Max 2)								
MTR-G85	MTR-G85	-	-	-	-	MTR-G85	-	MTR-G85	MTR-G85
MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H	MTR-85H
MDF-S3085	MDF-S3085	-	-	-	-	MDF-S3085	-	MDF-S3085	MDF-S3085
MTR-480	MTR-480	-	-	-	-	MTR-480	-	MTR-480	MTR-480
CVK-UB2	CVK-UB2	CVK-A	CVK-UB2 [5)]	CVK-UB2 [5)]	CVK-UB2 [5)]	CVK-UB2	CVK-UB2	CVK-UB2	CVK-UB2
CVK-UBN2	CVK-UBN2	-	CVK-UBN2	CVK-UBN2	CVK-UBN2	CVK-UBN2	CVK-UBN2	CVK-UBN2	CVK-UBN2

*Appearance and specification are subject to change without notice.

GROUP		-30°C/-40°C Biomedical Chest Freezers		
Characteristics PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm		• Outstanding performance & reliability level • Power to cope with frequent lid openings • From small "personal use" size to large 400 litre capacity • Low operational costs		
				
MODEL		**MDF-137-PE**	**MDF-237-PE**	**MDF-436-PE**
Dimensions				
External dimensions (W x D x H) 2)	mm	640 x 687 x 881	905 x 687 x 881	1265 x 807 x 905
Internal dimensions (W x D x H)	mm	525 x 440 x 715	790 x 440 x 715	1140 x 550 x 735
Volume	litres	138	221	426
Net weight (approx)	kg	52	60	71
Performance				
Cooling performance 1)	°C	-30	-30	-35
- at ambient temperature	°C	35	35	35
Temperature setting range	°C	-18 ~ -35	-18 ~ -35	-18 ~ -40
Temperature control range 1)	°C	-20 ~ -30	-20 ~ -30	-20 ~ -35
Control				
Controller		Electronic	Electronic	Electronic
Display		LED	LED	LED
Temperature sensor		Thermistor	Thermistor	Thermistor
Refrigeration				
Cooling method		Direct	Direct	Direct
Compressor	W	150	200	350
Refrigerant		HFC	HFC	HFC
Insulation material		PUF	PUF	PUF
Insulation thickness	mm	55	55	60
Alarms				
Power failure		V-B-R	V-B-R	V-B-R
High temperature		V-B-R	V-B-R	V-B-R
Low temperature		V-B-R	V-B-R	V-B-R
Filter		-	-	-
Lid/door open		-	-	-
Construction				
Exterior material		Painted steel	Painted steel	Painted steel
Interior material		Coloured Aluminium	Coloured Aluminium	Coloured Aluminium
Outer door/lid	qty	1	1	1
Inner door/lid	qty	-	-	-
Outer door/lid lock		Y	Y	Y
Shelves	qty	-	-	-
Drawers	qty	-	-	-
Containers / baskets	qty (L/M/S)	2	3	4
Max. load - per shelf/basket/drawer	kg	10	10	10
Max. load - total	kg	50	80	110
Access port	qty	2	2	2
- position		right / bottom left	right / bottom left	right / bottom left
- diameter	Ø mm	17	17	17
Interior fluorecent lamp	qty	-	-	-
Casters	qty	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)
Electrical and Noise level				
Power supply		230V 50 Hz Single phase		
Noise level 3)	dB	35	41	40
Options				
Storage systems		MDF-13B2, sets of two baskets MDF-13B3, set of three baskets	MDF-13B2, sets of two baskets MDF-13B3, set of three baskets	MDF-43B2, sets of two baskets MDF-43B3, set of three baskets
Temperature recorders 4)				
- Circular type (recorder housing)		MTR-G85 (MDF-S740)	MTR-G85 (MDF-S740)	MTR-G85 (MDF-S740)
- Continuous strip type (recorder housing)		MTR-4015LH (MDF-S3040)	MTR-4015LH (MDF-S3040)	MTR-4015LH (MDF-S3040)
RS485 Interface Module		MTR-480	MTR-480	MTR-480

notes:
1) Air temperature measured at centre of unit, specified ambient temperature, no load
2) Exterior dimensions of main cabinet only - see dimension drawings showing handles and other external projections
3) Nominal Value
4) Will require recorder housing shown in (brackets).
5) MDF-U537D - temperature can be independently set in upper and lower compartments

-30°C/-40°C Biomedical Upright Freezers

- Outstanding reliability and performance
- Available for a wide variety of storage and research applications
- Excellent safety features
- Maximum capacity in minimum installation space






**

MDF-U334-PE	MDF-U5312-PE	MDF-U537D-PE	MDF-U5412-PE	MDF-U443-PE	MDF-U731M-PE
614 x 709 x 1620	804 x 772 x 1802	804 x 772 x 1802	804 x 772 x 1802	800 x 832 x 1810	770 x 830 x 1955
490 x 486 x 1290	658 x 607 x 1272	Upper: 658 x 607 x 589 Lower: 658 x 607 x 603	658 x 607 x 1272	640 x 615 x 1090	650 x 700 x 1520
274	482	452	482	426	690
81	134	136	134	213	152
-30	-30	-30	-40	-40	-30
35	35	35	30	35	35
-18 ~ -35	-20~ -30	-18 ~ -40	-18 ~ -45	-15 ~ -44	-18 ~ -35
-20~ -30	-20~ -30	-20 ~ -30 [5)]	-20 ~ -40	-15 ~ -40	-20 ~ -30
Micrprocessor	Micrprocessor	Electronic	Micrprocessor	Micrprocessor	Micrprocessor
LED	LED	LED	LED	LED	LED
Thermistor	Thermistor	Thermistor	Thermistor	Thermistor	Thermistor
Direct	Direct	Direct	Direct	Cascade + Forced air circulation	Direct
200	400	350	400	H:400/L:750	400
HFC	HFC	HFC	HFC	HFC	HFC
PUF	PUF	PUF	PUF	PUF	PUF
60	70	70	70	80	60
V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
-	-	-	-	V-B	-
-	-	-	-	V-B	V-B
Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
Styrol resin	Styrol resin	Styrol resin	Styrol resin	Stainless steel	Painted steel
1	2	2	2	1	1
-	-	-	-	2	-
Y	Y	Y	Y	Y	Y
Fixed	Fixed	Fixed	Fixed	5	4
-	-	-	-	-	-
4/0/1	4/6/0	0/6/8	4/6/0	-	Optional
30	U:30\L:30	U:30/L:20	U:30\L:30	50	50
80	100	100	100	200	200
1	1	2	1	1	2
left	back	back	back	left	left/top
30	30	30	30	40	30
-	-	-	-	1	-
4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)	4 (2 leveling feet)
230V 50 Hz Single phase					
37	40	42	42	51	42
					MDF-T07SC, Set of 2 containers
MTR-G85 (MDF-S740T)	MTR-G85 (MPR-S7)	MTR-G85 (L:MPR-S7,U:MDF-S740T)	MTR-G85 (MPR-S7)	-	MTR-G85 (MPR-S7)
MTR-4015LH	MTR-4015LH (MPR-S30)	MTR-4015LH (L:MPR-S30)	MTR-4015LH (MPR-S30)	MTR-85H or MTR-4015LH	MTR-4015LH (MPR-S30)
MTR-480	MTR-480	MTR-480	MTR-480	MTR-480	-

*Appearance and specification are subject to change without notice.
** Picture shows optional containers and additional 3 shelves

Refrigerators						
Characteristics		• Extremely stable and reliable • Speedy and powerful refrigeration		• Adjustable shelves or pull out drawers • Easy-to-manage lay out		
						
MODEL		**MPR-721-PE**	**MPR-721R-PE**	**MPR-1411-PE**	**MPR-1411R-PE**	**MPR-514-PE**
Dimensions						
Exterior (W x D x H)	mm	770 x 830 x 1955	770 x 830 x 1955	1440 x 830 x 1950	1440 x 830 x 1950	900 x 600 x 1790
Interior (W x D x H)	mm	650 x 710 x 1500	650 x 710 x 1500	1320 x 710 x 1500	1320 x 710 x 1500	800 x 465 x 1300
Effective capacity	litres	684	671	1364	1359	489
Weight	kg	174	193	248	287	141
Construction						
Exterior finish		Acrylic finish baked on zinc galvanised steel	Acrylic finish baked on zinc galvanised steel	Acrylic finish baked on zinc galvanised steel	Acrylic finish baked on zinc galvanised steel	Baked-on acrylic finish galvanised steel
Interior finish		Acrylic finish baked on zinc galvanised steel	Acrylic finish baked on zinc galvanised steel	Acrylic finish baked on zinc galvanised steel	Acrylic finish baked on zinc galvanised steel	Stainless steel
Outer doors	qty	1 door, double pane glass, self closing	1 door, double pane glass, self closing	2 doors, double pane glass, self closing	2 doors, double pane glass, self closing	2 sliding doors, double layer glass window with heat reflecting film
Inner doors		-	-	-	-	-
Shelves	qty	4 wire shelves, polyethylene-coated	-	8 wire shelves, polyethylene-coated	-	5 wire shelves, polyester-coated
Drawers	qty	-	5 coated steel drawers	-	10 coated steel drawers	-
- max. load/shelf or drawer	kg	50	40	40	40	50
Castors	qty	4	4	4	4	4
Access port	qty	3	3	3	3	1
- position		2 in sides, 1 in cabinet top	2 in sides, 1 in cabinet top	2 in sides, 1 in cabinet top	2 in sides, 1 in cabinet top	left hand side
- diameter	Ø mm	30	30	30	30	30
Refrigeration & Temperature						
Insulation		HCFC-free rigid polyurethane foamed-in-place	HCFC-free rigid polyurethane foamed-in-place	HCFC-free rigid polyurethane foamed-in-place	HCFC-free rigid polyurethane foamed-in-place	HCFC-free rigid polyurethane foamed-in-place
Cooling method		Forced air with single fan	Forced air with single fan	Forced air with double fan	Forced air with double fan	Forced cool air circulation
Defrost method		Forced type (cycle defrost), fully automatic	Forced type (cycle defrost), fully automatic	Forced type (cycle defrost), fully automatic	Forced type (cycle defrost), fully automatic	Forced type, fully automatic
Refrigerant		HFC	HFC	HFC	HFC	HFC
Temperature control range	°C	2 ~ 23 (AT 0°C - 35°C no-load)	2 ~ 23 (AT 0°C - 35°C no-load)	2 ~ 23 (AT 0°C - 35°C no-load)	2 ~ 23 (AT 0°C - 35°C no-load)	2 ~ 14 (AT -5°C - 35°C no-load)
Temperature sensor		Thermistor	Thermistor	Thermistor	Thermistor	Thermistor
Temperature control		Microprocessor	Microprocessor	Microprocessor	Microprocessor	Electronic
Options		MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)	MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)	MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)	MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)	MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)
Alarms						
		High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A
Temperature display						
		Digital LED	Digital LED	Digital LED	Digital LED	Digital LED

Refrigerators			Refrigerators		Refrigerator with Freezer	
• Stable and reliable environment control • Double sensor temperature management • Remarkable cooling efficiency • Automatic cycle defrosting system			• Stable and reliable environment control • Remarkable cooling efficiency • Electronic temperature control system • Fan-forced air circulation		• One unit with dual temperature zone • Superior cooling performance • Quiet operation • Various alarm and safety devices	
						
MPR-514R-PE	**MPR-1014-PE**	**MPR-1014R-PE**	**MPR-161DH-PE**	**MPR-311DH-PE**	**MPR-215F-PE**	**MPR-414F-PE**
900 x 600 x 1790	1800 x 600 x 1790	1800 x 600 x 1790	800 x 450 x 1090	800 x 450 x 1800	540 x 557 x 1794	800 x 600 x 1805
800 x 465 x 1300	1700 x 465 x 1300	1700 x 465 x 1300	720 x 300 x 725	720 x 350 x 1435	455 x 466 x 917 (Ref) 420 x 342 x 267 (Frz)	720 x 495 x 1425 (Ref) 317 x 440 x 576 (Frz)
486	1033	1029	158	340	176/39 (Ref/Frz)	340/82 (Ref/Frz)
147	246	258	59	90	80	126
Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Polyester resin finish baked on zinc galvanized steel	Polyester resin finish baked on zinc galvanized steel
Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Styrol resin/Painted aluminium plate (Ref/Frz)	Stainless steel/Painted aluminium plate (Ref/Frz)
2 sliding doors, double layer glass window with heat reflecting film	2 sliding doors, double layer glass window with heat reflecting film	2 sliding doors, double layer glass window with heat reflecting film	2 sliding doors, double layer glass window with heat reflecting film	4 sliding doors, double layer glass window with heat reflecting film	2	4
-	-	-	-	-	-	-
5 wire shelves, polyester-coated	10 wire shelves, polyester-coated	5 wire shelves, polyester-coated	2 wire shelves, polyethylene-coated	5 wire shelves, polyethylene-coated	3/1 (Ref/Frz) 20/10 kg (Ref/Frz)	2 large & 3 small/1 (Ref/Frz) 25 & 15 kg/15 kg (Ref/Frz)
5 sliding racks, polyester coated	-	10 sliding racks, polyester coated	-	-	-	-
20	50	50/20 (shelves/racks)	20	20	-	
4	4	4	2	2	4	4
1	1	1	1	1	2	2
left hand side	left hand side	left hand side	back side	back side	1 left/1 left (Ref/Frz)	1 rear/1 rear (Ref/Frz)
30	30	30	30	30	30	30
HCFC-free rigid polyurethane foamed-in-place	HCFC-free rigid polyurethane foamed-in-place	HCFC-free rigid polyurethane foamed-in-place	Rigid polyurethane foam	Rigid polyurethane foam	CFC-free rigid polyurethane foamed-in-place	CFC-free rigid polyurethane foamed-in-place
Forced cool air ciculation	Forced cool air ciculation	Forced cool air ciculation	Fan forced air circulation	Fan forced air circulation	Fan forced air circulation (Ref) Direct cooling (Frz)	Fan forced air circulation (Ref) Direct cooling (Frz)
Forced type, fully automatic	Forced type, fully automatic	Forced type, fully automatic	Forced type (cycle defrost), fully automatic	Forced type (cycle defrost), fully automatic	-	-
HFC	HFC	HFC	HFC	HFC	HFC	HFC
2 ~ 14 (AT -5°C - 35°C no-load)	2 ~ 14 (AT -5°C - 35°C no-load)	2 ~ 14 (AT -5°C - 35°C no-load)	2 ~ 14 (AT: +35°C no-load)	2 ~ 14 (AT: +35°C no-load)	2 ~ 14 (Ref) / -20 ~ -30 (Frz) (AT: +30°C no-load)	2 ~ 14 (Ref) / -20 ~ -30 (Frz) (AT: +35°C no-load)
Thermistor	Thermistor	Thermistor	Thermistor	Thermistor	Thermistor	Thermistor
Electronic	Electronic	Electronic	Electronic	Electronic	Microprocessor	Microprocessor
MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)	MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)	MPR-48B Power failure alarm (audio-visual) MTR-480 RS485 Interface module (requires MPR-48B)				
High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure (option) Remote alarm contact DC 30V, 2A	High/Low temperature, door open	High/Low temperature, door open	High/Low temperature, power failure, door open Remote alarm contact DC 30V, 2A	High/Low temperature, power failure, door open Remote alarm contact DC 30V, 2A
Digital LED	Digital LED	Digital LED	Digital LED	Digital LED	Digital LED	Digital LED

*Appearance and specification are subject to change without notice.

GROUP		Blood Bank Refrigerators				
Characteristics		• Constant temperature control by two thermistor sensors • Designed to conform AABB criteria		• Temperature chart recorder is standard built in • Excellent temperature uniformity		
						
MODEL		MBR-305GR-PE	MBR-704GR-PE	MBR-1405GR-PE	MBR-107DH-PE	MBR-506DH-PE
Dimensions						
Exterior (W x D x H)	mm	600 x 680 x 1835	770 x 830 x 1955	1440 x 830 x 1950	400 x 495 x 1515	800 x 832 x 1810
Interior (W x D x H)	mm	520 x 490 x 1150	650 x 697 x 1500	1320 x 697 x 1500	320 x 350 x 710	640 x 550 x 1240
Effective capacity	litres	302 120 bags (450ml)	617 360 bags (450ml)	1301 720 bags (450ml)	79 32 bags (450ml)	425 120 bags (450ml)
Weight	kg	147	210	315	70	185
Construction						
Exterior finish		Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel
Interior finish		Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Baked-on acrylic finish galvanised steel	Stainless steel	Stainless steel
Outer doors	qty	1, double layer glass window	1, double layer glass window	2, double layer glass windows	1, triple layer glass window	1, triple layer glass window
Inner doors	qty	2, Acrylic	3, Acrylic	6, Acrylic	2, Acrylic	5, Acrylic
Shelves	qty	-	-	-	3, zinc plated steel wire & 1, stainless steel	5, coated hard steel wire
Drawers	qty	5, Stainless steel	6, Stainless steel	12, Stainless steel	-	-
- max. load/shelf or drawer	kg	20	40	40	20	50
Castors	qty	4	4	4	-	4
Access port	qty	1	2	2	1	1
- position		left hand side	left & right hand side	left & right hand side	left hand side	left hand side
- diameter	Ø mm	30	30	30	30	40
Refrigeration & Temperature						
Insulation		CFC-free rigid polyurethane foamed-in-place	CFC-free rigid polyurethane foamed-in-place	CFC-free rigid polyurethane foamed-in-place	CFC-free rigid polyurethane foamed-in-place	CFC-free rigid polyurethane foamed-in-place
Cooling performance	°C	4 +/- 1.5 (AT 35°C)	4 +/- 1 (AT 35°C)	4 +/- 1,5 (AT 35°C)	4 +/- 1 (AT 35°C)	4 +/- 1 (AT 35°C)
Defrost method		Fully automatic	Fully automatic	Fully automatic	Fully automatic	Fully automatic
Air circulation		Forced air	Forced air	Forced air	Forced air	Forced air
Refrigerant		HFC	HFC	HFC	HFC	HFC
Temperature sensor		2 bottles with thermistor sensor	2 bottles with thermistor sensor	2 bottles with thermistor sensor	Thermistor	Thermistor
Temperature recorder		MTR-G04 (Included)	MTR-G04 (Included)	MTR-G04 (Included)	Included	Included
Temperature control		Microprocessor	Microprocessor	Microprocessor	Microprocessor	Microprocessor
Alarms						
		High/Low temperature, door open, power failure Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure Remote alarm contact DC 30V, 2A	High/Low temperature, door open, power failure Remote alarm contact DC 24V 1A	High/Low temperature, door open, power failure Remote alarm contact DC 24V 1A
Power supply						
		230V 50Hz Single phase	230V 50Hz Single phase	230V 50Hz Single phase	230V 50Hz Single phase	230V 50Hz Single phase
Temperature display						
		Digital LED	Digital LED	Digital LED	Digital LED	Digital LED
Options						
Interface		RS485 Interface module MTR-480		RS485 Interface module MTR-480		
Storage systems		Baskets; MBR-55B, MBR-56B			Baskets; MBR-15B, max. 8/unit 7 x 220ml bags/basket MBR-16B, max. 8/unit 4 x 450ml bags/unit	Baskets; MBR-55B, max. 20/unit 10 x 220ml bags/basket MBR-56B, max. 20/unit 6 x 450ml bags/unit

*Appearance and specification are subject to change without notice.

Bled, Slovenia

46°22'00.07"N 14°06'30.64"E

Name: Borut Repina

Location in our network:
Panasonic service specialist at Kemomed d.o.o., Kranj, Slovenia

favourite place:
our beautiful place in Slovenia called Bled with Medieval castle on top of a cliff and a church in the middle of the Lake beneath it.Bled is also known as one of the most beautiful places in Europe and a must visit for most of the turists who come to Slovenia.

NETWORK - SLOVENIA - BIOMEDICAL

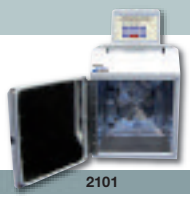
GROUP		Isothermal -190°C Dry Storage Freezers				Isothermal Carousel	
Characteristics		• Outstanding temperature uniformity • No LN_2 in sample storage area		• No cross contamination • Certified MDD 93/42/EEC:1993 Class IIA			
							
MODEL		**V-1500AB**	**V-3000AB**	**V-5000AB**	**V-5000ABEH**	**V3000-AB/C**	**V3000EH-AB/C**
Liquid Nitrogen Capacity	ltr	30	70	93	140	70	89
Static Evaporation Rate	ltr/days	5	9	11	11		
Static Holding Time	days	6	8	8	12	8	9
Dimensions							
External dimensions (W x D x H)	mm	660 x 939 x 1143	939 x 1219 x 1206	1219 x 1371x 1320	1219 x 1371 x 1473	940 x 1219 x 1130	940 x 1219 x 1384
Usable interior height	mm	736	736	736	864	686	889
Usable interior diameter	mm	534	787	1016	1016	737	737
Weight empty	kg	148	272	425	453	272	288
Weight full	kg	174	327	500	566	327	361
Maximum Capacity							
Max. vial capacity (2ml)**		9100	22100	40300	46500	18000	22500
Max. blood bag capacity (50ml)**		434	1120	1936	2208	852	1136

** Capacity is subject to rack type

GROUP		Standard LN_2 Freezers				
Characteristics		• Outstanding temperature uniformity • Liquid level auto-fill		• Alarm system to provide security • Custom configurations possible		
						
MODEL		**S90-AB**	**S-1500AB**	**S-3000AB**	**S-5000AB**	**S-5000ABEH**
Liquid Nitrogen Capacity	ltr	90	145	345	615	720
Static Evaporation Rate	ltr/days	2.75	4	7	9	9
Static Holding Time	days	33	41	49	61	80
Dimensions						
External dimensions (W x D x H)	mm	457x 457x 965	558x 787x 1041	863x 1092x 1066	1117x 1320x 1219	1117x 1320x 1397
Usable interior height	mm	711	736	736	736	863
Usable interior diameter	mm	406	508	787	1016	1016
Weight empty	kg	36	70	159	227	245
Weight full	kg	109	188	438	724	827
Maximum Capacity						
Max. vial capacity (2ml)**		5832	9100	22100	40300	46500
Max. blood bag capacity (50ml)**		266	434	1120	1936	2208

** Capacity is subject to rack type

GROUP		Classic			Value added			XC series		
Characteristics		• Storage solutions foe vials and straws • Easy access to store and retrieve samples			• Durable lightweight aluminium construction • Capacities from 210 to 6.000 2ml vials					
										
MODEL		**Classic 2002**	**Classic 4002**	**Classic 6002**	**Value added 2001**	**Value added 4001**	**Value added 6001**	**20/20**	**34/18**	**47/11**
Liquid Nitrogen Capacity	ltr	61	121	175	61	121	175	20.5	34.8	47.4
Static Evaporation Rate	ltr/days	0.85	0.99	0.99	0.85	0.99	0.99	0.09	0.18	0.39
Static Holding Time	days	38	70	104	38	70	104	140	123	76
Working Volume	ltr	51	111	165	61	111	165			
Weight empty	kg	26.3	36.7	46.7	26.3	36.7	46.7	11.8	15.4	16.4
Weight full	kg	82.5	136	193	82.5	136	193	28.3	43.5	54.6
Dimensions										
Neck opening (mm)	mm	216	216	216	216	216	216	55.4	89	127
Overall height (mm)	mm	723	1003	1003	723	1003	1003	652	675	673
Outside diameter (mm)	mm	559	559	665	559	559	665	368	464	508
Canister Dimensions										
Canister height (mm)	mm	-	-	-	-	-	-	279	279	279
Canister diameter (mm)	mm	-	-	-	-	-	-	41.9	71	102
Maximum Capacity										
Maximum number of racks	qty	4	4	6	4	4	6	-	-	6
Maximum vial capacity		2000	4000	6000	2000	4000	6000	-	-	750
Maximum number of canisters		-	-	-	-	-	-	6	6	6
Maximum boxes per rack	qty	5	10	10	5	10	10	-	-	-
Maximum number of 1/2cc straws (10/cane)		-	-	-	-	-	-	780	2100	4500
Maximum number of 1/2cc straws (1 level bulk)		-	-	-	-	-	-	1122	3000	6216
Maximum number of 1.2 & 2.0 ml vials (5/cane)		-	-	-	-	-	-	210	630	1320
Alarm										
Low-level alarm		standard	standard	standard	standard	standard	standard	standard	standard	standard

GROUP		Controlled Rate Freezer
Characteristics		
Model		**2101**
Dimensions		
Exterior (W x D x H)	mm	485 x 648 x 743
Interior (W x D x H)	mm	243 x 349 x 356
Effective capacity	litres	28
Weight	kg	34.7
Power		
Voltage		220 - 240V
Frequency		50 Hz
Current		10A
Maximum Capacity		
2ml vials		650
4ml / 5 ml vials		390
Bag Canisters		20
Canes		130

GROUP		Lab tanks					
Characteristics		• For LN_2 transport • High efficiency super insulation		• Easy to lift • Withdrawel device available			
MODEL		**Lab4**	**Lab5**	**Lab10**	**Lab20**	**Lab30**	**Lab50**
Liquid Nitrogen Capacity	ltr	4	5	10	21	32	50
Static Evaporation Rate	ltr/days	0.2	0.15	0.18	0.18	0.25	0.45
Static Holding Time	days	18	33.3	55.6	116.7	128	111
Weight Empty	kg	2.7	4	6	9	12	15
Weight Full	kg	6	8	14	26	38	56
Max. vial capacity (2ml)		-	-	-	-	-	-
Exterior Dimensions							
Neck Opening	mm	35.5	56	26	51	64	64
Overall Height	mm	426	463	546	627	611	779
Outside Diameter	mm	185	222	260	368	432	432
Overall opening	mm						
Outside opening	mm						
Interior Dimensions							
Interior Diameter	mm	139	165	210	289	356	356
Usable Height	mm	198	266	343	348	378	559

GROUP		Vapor Shippers				Shipper
Characteristics		• For shipment of "non-hazardous" samples • Protecting shipping carton available		• Made of lightweight durable aluminum		
MODEL		**SC 2/1 V**	**SC 4/2 V**	**SC 4/3 V**	**DS-3**	**CF-9511**
LN2 Capacity	ltr	1.5	3.6	4.3	10	10.5
Static Evaporation Rate	ltr/day	0.19	0.26	0.20	0.7	3.3
Static Holding Time	days	8	13	21	14	3
Weight Empty	kg	2.7	11	13	30	13
Weight Full	kg	4	17	20	47	32
Number of Canisters		1	1	1	-	-
Max Vial Capacity (2ml)		9	106	48	500	-
Unit Dimensions						
Overall Height	mm	343	468	492	584	431.8
Outside Diameter	mm	184	222	222	381	254
Neck Opening	mm	35	70	51	216	228.6
Usable interior Dimensions						
Interior Height	mm	-	-	-	317.5	228.6
Interior Diameter	mm	-	-	-	216	228.6
Canister Height	mm	127	278	278	-	-
Canister Diameter	mm	31	67	46	-	-

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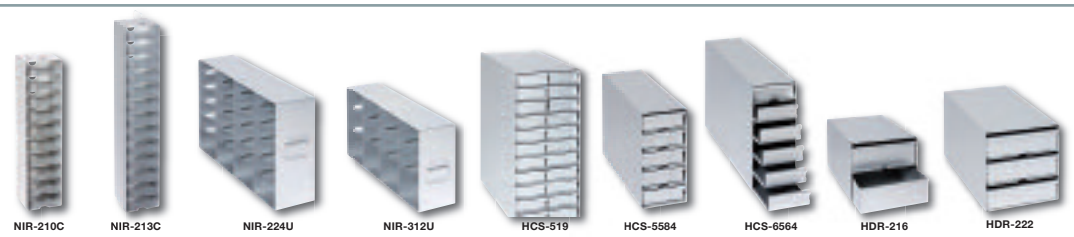
GROUP		CO_2 Incubator				Multigas Incubator	
Characteristics		• DHA Direct Heat & Air Jacket System for optimal temperature stability • Preventative contamination control with InCu saFe® • 3 minutes CO_2 recovery time • Field reversible doors				• Exceptional CO_2 and O_2 recovery times • Preventative contamination control • Optional SafeCell UV system • FDA clearance for IFV use	
PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm							
MODEL		**MCO-5AC-PE**	**MCO-18AC-PE**	**MCO-19AIC-PE**	**MCO-20AIC-PE**	**MCO-5M-PE**	**MCO-19M-PE**
Dimensions							
External dimensions (W x D x H)	mm	480 x 548 x 575	620 x 710 x 900	620 x 710 x 900	770 x 708 x 900	480 x 548 x 575	620 x 710 x 900
Internal dimensions (W x D x H)	mm	350 x 378 x 375	490 x 523 x 665	490 x 523 x 665	620 x 523 x 665	350 x 378 x 375	490 x 523 x 665
volume	ltr	49	170	170	215	49	170
net weight	kg	49	92	93	106	50	94
Technical Data							
Power supply	V	230	230	230	230	230	230
Frequency	Hz	50	50	50	50	50	50
Noise Level [2]	dB	24	24	30	30	24	30
Insulation material		PUF	PUF	PUF	PUF	PUF	PUF
Performance							
Temperature sensor		Thermistor	Thermistor	Thermistor	Thermistor	Thermistor	Thermistor
CO_2 sensor		TC	TC	Dual IR	IR	TC	Dual IR
O_2 sensor		-	-	-	-	Zirconia	Zirconia
Temp control range and fluctuation	°C	Ambient temp +5 ~ +50, ±0.1	Ambient temp +5 ~ +50, ±0.1	Ambient temp +5 ~ +50, ±0.1	Ambient temp +5 ~ +50, ±0.1	Ambient temp +5 ~ +50, ±0.1	Ambient temp +5 ~ +50, ±0.1
Temperature uniformity	°C	±0.25 [4]	±0.25 [4]	±0.25 [4]	±0.25 [4]	±0.25 [4]	±0.25 [4]
CO_2 control range and fluctuation	%	0 ~ 20, ±0.15	0 ~ 20, ±0.15	0 ~ 20, ±0.15	0 ~ 20, ±0.15	0 ~ 20, ±0.15	0 ~ 20, ±0.15
O_2 control range	%	-	-	-	-	1 ~ 18, 22 ~ 80 ±0.2	1 ~ 18, 22 ~ 80 ±0.2
Humidity control range and fluctuation	%RH	95, ±5	95, ±5	95, ±5	95, ±5	95, ±5	95, ±5
Light control range	Lx	-	-	-	-	-	-
Alarms							
Power failure		-	R	-	-	-	R
Out of temperature setting		V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
High temperature		V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
Out of CO_2 setting		V-B-R	V-B-R	V-B-R	V-B-R	V-B-R	V-B-R
Out of humidity setting		-	-	-		-	-
Door open		V	V	V-B	V	V	V-B
Water level		V	V	V	V	V	V
General							
Exterior material		Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
Colour (exterior)		Bio-gray	Bio-gray	Bio-gray	Bio-gray	Bio-gray	Bio-gray
Cabinet material (interior)		SS copper alloyed	SS copper alloyed	SS copper alloyed	SS copper alloyed	SS copper alloyed	SS copper alloyed
Outside lid/door	qty	1	1	1	1	1	1
Reversable door		Y	Y	Y	Y	Y	Y
Inside lid/door	qty	1	1	1	1	1	1
Lid / outside door lock		N	N	N	N	N	N
Shelves	qty	3	3	4	5	3	3
Max. load per shelf	kg	4	7	7	5	4	7
Max. total load	kg	12	28	28	35	12	28
Max. Shelf capacity	qty	6	15	15	15	6	15
Access port	qty	1	1	1	1	1	1
- position		rear	rear	rear	rear	rear	rear
- diameter	Ø mm	30	30	30	30	30	30
CO_2 Incubator Contamination Control & Operating Systems							
H_2O_2 decontamination system (option)		N	N	Y	N	N	Y
SafeCell UV system (option)		Y	Y	Y	Standard	Y	Y
InCu saFe®		Y	Y	Y	Y	Y	Y
Water level sensor		Y	Option	Y	Y	Y	Y
DHA heating system		Y	Y	Y	Y	Y	Y
CO_2 incubator options							
Shelfs and brackets (InCu saFe®)		MCO-30ST	MCO-47ST	MCO-47ST	MCO-58ST	MCO-30ST	MCO-47ST
Half tray		-	MCO-25ST	MCO-25ST	MCO-35ST	-	MCO-25ST
Roller base		MCO-5RB	MCO-18RB	MCO-18RB	MCO-20RB	MCO-5RB	MCO-18RB
CO_2-gas pressure regulator		MCO-100L	MCO-100L	MCO-100L	MCO-100L	MCO-100L	MCO-100L
Automatic CO_2 switchover system		MCO-5GC	MCO-21GC	MCO-21GC	MCO-21GC	MCO-5GC	MCO-21GC
UV-system kit		MCO-19UVS	MCO-18UVS3 [3]	MCO-19UVS	Standard	MCO-19UVS	MCO-19UVS
Inner door with 4 small doors		-	MCO-19ID	MCO-19ID	-	-	Standard
Stacking kit		Standard	Standard	Standard	Standard [6]	Standard	Standard
Digital interface [1]		MTR-480	MTR-480	MTR-480	MTR-480	MTR-480	MTR-480
Analogue interface [1]		MCO-420MA	MCO-420MA	MCO-420MA	MCO-420MA	MCO-420MA	MCO-420MA
H_2O_2 decontamination kit		-	-	MCO-HL [7]	-	-	MCO-HL [7]
H_2O_2 vapour generator (requires MCO-HL)		-	-	MCO-HP [7]	-	-	MCO-HP [7]

notes:
[1] MCO-18, 19 and 5 series can only be fitted with one communications terminal
[2] Nominal Value
[3] Includes humidifying pan cover and water level sensor
[4] ±0.25°C; ambient temp 25°C, settings 37°C, CO_2 5%, O_2 5% (Multigas), no load
[5] Not Applicable
[6] MCO-21SB is required for stacking with the MCO-19 series or MCO-18AC
[7] Requires SafeCellTM UV option

CO_2 reach-In Incubator	Waterjacket CO_2 Incubator	Plant Growth Chamber		Heated Incubators	
• Laminar Airflow • PID temperature control • InCu saFe® • High volume of samples	• Stable temperature env. • PID temperature control • Power failure protected • Door heater in outer door	• Programmable temperature, lightning function • Graphic LCD for easy operation • Microprocessor PID & refrigeration capacity control • Data logging Function		• Microcomputer PID control • Microcomputer timer function • Advanced designed control panel • Air Jacketed heating system	
					
MCO-80IC-PE	**MCO-175-PE**	**MLR-352-PE**	**MLR-352H-PE**	**MIR-162-PE**	**MIR-262-PE**
986 x 853 x 2040	770 x 620 x 900	760 x 700 x 1835	760 x 700 x 1835	580 x 595 x 820	730 x 645 x 870
806 x 693 x 1524	490 x 505 x 690	520 x 490 x 1135	520 x 490 x 1135	450 x 460 x 450	600 x 510 x 500
851	170	294	294	93	153
275	108	226	235	44	61
230	230	230	230	230	230
50	50	50	50	50	50
33	33	45	45	NA[5]	NA[5]
PUF	PUF	PUF	PUF	Glass fiber	Glass fiber
Thermistor	Pt-100	Thermistor	Thermistor	Thermistor	Thermistor
IR	TC				
-	-				
Ambient temp. +5 to 50 (AT; 20°C to 35°C)	Ambient temp. +5 ~ +50, ±0.1	0 ~ +50 (Lamp off) ±0.3 +10 ~ +50 (lamp on) ±0.3	+5 ~ +50 (Lamp off) ±0.3 +10 ~ +50 (lamp on) ±0.3	Ambient temp +5 ~ +80 ±0.2 (≤60) ~ ± 0.5 (60 ~ 80)	Ambient temp +5 ~ +80 ±0.2 (≤60) ~ ± 0.5 (60 ~ 80)
±0.5[4]	±0.2[4]	±1 (lamp off) ±2.5 (lamp on)	±1 (lamp off) ±2.5 (lamp on)	±1	±1
0 ~ 20, ±0.15	0 ~ 20, ±0.15	-	-	-	-
-	-	-	-	-	-
Normal mode; >80% R.H. High mode; > 90% R.H.	95, ±5	-	60~90 / LS:0 (15~45°C) 55~85 / Lamp On (15~45°C)	-	-
-	-	Programmable 0 ~ 20000	Programmable 0 ~ 20000	-	-
R	V-B	R	R		
V-B-R	V-B	B-R	B-R	V-B	V-B
V-B-R	V-B	B-R	B-R	V-B	V-B
V-B-R	V-B	-	-	-	-
-	-	-	V		
V	V	V-B	V-B		
V	V	-	-		
Painted steel	Painted steel	Painted steel	Painted steel	Painted steel	Painted steel
Bio-gray	Bio-gray	Bio-beige	Bio-beige	Bio-gray	Bio-gray
SS copper alloyed	SS SUS-304	SS SUS-304	SS SUS-304	SS SUS-304	SS SUS-304
1 double paned glass	1	3	3	1	1
Y		N	N	N	N
Option	1	1	1	1	1
N	N	N	N	N	N
5	6	5	5	2	3
30	7	25	25	15	15
150	42	100	100	30	30
5	19				
2	1	1	1	0	0
One on each side	Right hand side	Ceiling	Ceiling	-	-
40	30	40	40	-	-
N	N				
Y	N				
Y	N				
Y	N				
N (laminar airflow)	N (Water Jacket)				
MCO-80ST	MCO-47ST				
-	MCO-25ST				
-	-	-	-		
MCO-100L	-	-	-		
MCO-80GC	-	-	-		
MCO-80UVS	-	-	-		
MCO-80ID (5 small doors)	-	-	-		
-	MCO-175SB	-	-		
MTR-480	-	MTR-480	MTR-480		
MCO-420MA	-	-	-		
-	-	-	-		
-	-	-	-		

*Appearance and specification are subject to change without notice.

All boxes are available:
in Polypropylene (P)
or carton (A)
as 2 inch (1)
or 3 inch (2)



Chest freezer model	Vertical rack type	Box type	Rack/quantity Wesbart (aluminium)	Total boxes	Storage Cases/quantity
MDF-C2156VAN-PE	side openings	(P) A1	15 x NIR-210C	150	9 x MDF-49SC
	side openings	(P) A2	15 x NIR-307C	105	
MDF-1156-PE	side openings	(P) A1	9 x NIR-209C	81	6 x MDF-49SC
	side openings	(P) A2	9 x NIR-306C	54	
MDF-C8V1-PE	side openings	(P) A1	6 x NIR-207C	42	4 x MDF-19SC
	side openings	(P) A2	6 x NIR-305C	30	
MDF-794-PE	side openings	(P) A1	36 x NIR-213C	468	24 x MDF-59SC
	side openings	(P) A2	36 x NIR-309C	324	
MDF-594-PE	side openings	(P) A1	24 x NIR-213C	312	18 x MDF-59SC
	side openings	(P) A2	24 x NIR-309C	216	
MDF-394-PE	side openings	(P) A1	21 x NIR-209C	189	MDF-39SC
	side openings	(P) A2	21 x NIR-306C	126	
MDF-193-PE	side openings	(P) A1	6 x NIR-207C	42	6 x MDF-19SC
	side openings	(P) A2	6 x NIR-305C	30	

Upright freezer model	Vertical rack type	Box type	Rack/quantity Wesbart (aluminium)	Total boxes	Storage Cases/quantity
MDF-U4186S-PE	with trays	(P) A1	8 x HCS-460 + 8 x HCS-558	216	8 x MDF-48SC
	side opening	(P) A1	8 x NIR-212U + 8x NIR-215U	216	
	with trays	(P) A2	16 x HCS-380	144	
	side opening	(P) A2	16 x NIR-309U	144	
MDF-U3386S-PE	with trays	(P) A1	6 x HCS-32-4584/143 + 6 x HCS-32-5584/143	216	-
	side opening	(P) A1	6 x NIR-216U + 6 x NIR-220U	216	
	with trays	(P) A2	12 x HCS-32-3804/143	144	
	side opening	(P) A2	12 x NIR-312U	144	
MDF-U33V-PE	with trays	(P) A1	6 x HCS-32-4584/143 + 6 x HCS-32-5584/143	216	-
	side opening	(P) A1	6 x NIR-216U + 6 x NIR-220U	216	
	with trays	(P) A2	12 x HCS-32-3804/143	144	
	side opening	(P) A2	12 x NIR-312U	144	
MDF-U5386S-PE	with trays	(P) A1	16 x HCS-5584	320	-
	side opening	(P) A1	16 x NIR-220U	320	
	with trays	(P) A2	16 x HCS-3804	192	
	side opening	(P) A2	16 x NIR-312U	192	
MDF-U55V-PE/	with trays	(P) A1	4 x HCS-519	352	
MDF-U500VX-PE	with trays	(P) A1	8 x HCS-5584 + 8 x HCS-6564	352	32 x MDF-70SC
	side opening	(P) A1	8 x NIR-220U + 8 x NIR-224U	352	
	with trays	(P) A2	8 x HCS-4804 + 8 x HCS-3804	224	
	side opening	(P) A2	8 x NIR-316U + 8 x NIR-312U	224	
MDF-U7386S-PE	with trays	(P) A1	24 x HCS-5574	480	
	side opening	(P) A1	24 x NIR-220U	480	-
	with trays	(P) A2	12 x HCS-3804 + 12 x HCS-4804	336	
	side opening	(P) A2	24 x NIR-312U	336	
MDF-U74V-PE/	with trays	(P) A1	6 x HCS-519	528	
MDF-U700VX-PE	with trays	(P) A1	12 x HCS-5584 + 12 x HCS-6564	528	48 x MDF-70SC
	side opening	(P) A1	12 x NIR-220U + 12 x NIR-224U	528	
	with trays	(P) A2	12 x HCS-4804 + 12 x HCS-3804	336	
	side opening	(P) A2	12 x NIR-316U + 12 x NIR-312U	336	

*Appearance and specification are subject to change without notice.

Rack/quantity Tenak (stainless steel)	Total boxes
15 x TE-NIR-211COM	165
15 x TE-NIR-307COM	105
9 x TE-NIR-210COM	90
9 x TE-NIR-307COM	63
6 x TE-NIR-207COM	42
6 x TE-NIR-305COM	30
39 x TE-NIR-213COM	507
39 x TE-NIR-309COM	351
27 x TE-NIR-213COM	351
27 x TE-NIR-309COM	243
21 x TE-NIR-209COM	189
21 x TE-NIR-306COM	126
9 x TE-NIR-207COM	63
9 x TE-NIR-305COM	45

Rack/quantity Tenak (stainless steel)	Total boxes
8 x TE-HCS-243COM + 8 x TE-HCS-253COM	216
8 x TE-NIR-243CLA + 8 x TE-NIR-253CLA	216
16 x TE-HCS-333COM	144
16 x TE-NIR-333CLA	144
6 x TE-HCS-244COM + 6 x TE-HCS-254COM	216
6 x TE-NIR-244CLA + 6 x TE-NIR-254CLA	216
12 x TE-HCS-334COM	144
12 x TE-NIR-334CLA	144
6 x TE-HCS-244COM + 6 x TE-HCS-254COM	216
6 x TE-NIR-244CLA + 6 x TE-NIR-254CLA	216
12 x TE-HCS-334COM	144
12 x TE-NIR-334CLA	144
16 x TE-HCS-254COM	320
16 x TE-NIR-254CLA	320
16 x TE-HCS-334COM	192
16 x TE-NIR-334CLA	192
8 x TE-HCS-254COM + 8 x TE-HCS-264COM	352
8 x TE-NIR-254CLA + 8 x TE-NIR-264CLA	352
8 x TE-HCS-334COM + 8 x TE-HCS-344COM	224
8 x TE-NIR-334CLA + 8 x TE-NIR-344CLA	224
24 x TE-HCS-254COM	480
24 x TE-NIR-254CLA	480
24 x TE-HCS-334COM	288
24 x TE-NIR-334CLA	288
12 x TE-HCS-254COM + 12 x TE-HCS-264COM	528
12 x TE-NIR-254CLA + 12 x TE-NIR-264CLA	528
24 x TE-HCS-344COM	384
24 x TE-NIR-344CLA	384

GROUP		Programmable Cooled Incubators		
Characteristics		• High-precision temperature environment • Microprocessr controled for optimal sample security • Refined alarm and security systems • Programmable operation for long lasting experimentation		
PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm				
MODEL		**MIR-154-PE**	**MIR-254-PE**	**MIR-554-PE**
Dimensions				
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	ltr	123	238	406
Net weight	kg	78	108	195
Technical Data				
Power supply	V	230	230	230
Frequency	Hz	50	50	50
Noise level [1]	dB	41	44	45
Refrigeration				
Insulation material		PUF		
Insulation thickness	mm	40	40	80
Compressor	W	150	250	250
Refrigerant		R-134a	R-404a	R-404A
Cooling method		Forced air circulation		
Performance				
Temperature sensor		Thermistor		
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)		
Temperature uniformity	°C	±0.5 SV (35)		
Performance ambient temperature	°C	20, no load		
Alarms				
Power failure		-	-	R
High temperature		V-B-R		
Low temperature		V-B-R		
Filter		-		
Lid/door open		V-B		
General				
Exterior material		Painted steel		
Colour (exterior)		Bio-gray		
Cabinet material		SS SUS-304		
Outside lid/door		1		
Reversable door		Y	Y	N
Inside lid/door		N	N	2 small inner doors (MIR-55ID option) MIR-LP option
Lid / outside door lock		MIR-LP option	MIR-LP option	Y
Shelves	qty	3	5	5
Max. load per shelf	kg	20	20	50
Max. total load	kg	61	100	250
Access port	qty	1	1	2
- position		left side	left side	left and right side
- diameter	Ø mm	40	40	40
Interiour fluorecent lamp	qty, W	1, 15, with MIR-L152 option		
Options				
Comunications interface		MTR-480, MTR-L03		

Notes
[1] Nominal Value
[2] MIR-L15 operates between +2°C and +50°C

*Appearance and specification are subject to change without notice.

GROUP		Dry Heat Sterilizers		Laboratory Ovens	
Characteristics		• Accurate high temperature oven • Microprocessor PID temperature control system • Self diagnosis function			
					
MODEL		MOV-112S-PE	MOV-212S-PE	MOV-112F-PE	MOV-212F-PE
Dimensions					
Exterior (W x D x H)	mm	580 x 595 x 820	730 x 645 x 870	580 x 595 x 820	730 x 645 x 870
Interior (W x D x H)	mm	450 x 450 x 450	600 x 500 x 500	450 x 450 x 450	600 x 500 x 500
Effective capacity	ltr	90	150	90	150
Net weight	kg	50	66	50	66
Construction					
Exterior finish		Baked acrylic finish on galavanized steel	Baked acrylic finish on galavanized steel	Baked acrylic finish on galavanized steel	Baked acrylic finish on galavanized steel
Interior finish		Stainless-steel plate (SUS-304)	Stainless-steel plate (SUS-304)	Stainless-steel plate (SUS-304)	Stainless-steel plate (SUS-304)
Insulation		Glass wool	Glass wool	Glass wool	Glass wool
See through window		Reinforced triple glass window (t=5 mm)	Reinforced triple glass window (t=5 mm)	Reinforced triple glass window (t=5 mm)	Reinforced triple glass window (t=5 mm)
Shelves	qty	2	3	2	3
Max load per shelf	kg	15	15	15	15
Temperature, Light & Humidity					
Air exhaust vent		Two on top plate (32mm inside Ø)	Two on top plate (32mm inside Ø)	Two on top plate (32mm inside Ø)	Two on top plate (32mm inside Ø)
Interior fan		Sirocco fan, Ø 149 mm	Sirocco fan, Ø 149 mm	Sirocco fan, Ø 149 mm	Sirocco fan, Ø 149 mm
Exterior fan		Propeller fan, Ø 107 mm	Propeller fan, Ø 107 mm	Propeller fan, Ø 107 mm	Propeller fan, Ø 107 mm
Heating system		Forced air circulation system	Forced air circulation system	Forced air circulation system	Forced air circulation system
Temperature setting		Digital setting (adjustable range +/- 1°C)	Digital setting (adjustable range +/- 1°C)	Digital setting (adjustable range +/- 1°C)	Digital setting (adjustable range +/- 1°C)
Temperature/timer display		Digital LED display	Digital LED display	Digital LED display	Digital LED display
Temperature range	°C	40 ~ 200	40 ~ 200	40 ~ 200	40 ~ 200
Temperature control	°C	+/- 1 deg	-	+/- 1 deg	+/- 1 deg
Temperature uniformity	°C	+/- 4 (AT 200°C)	+/- 4 (AT 200°C)	+/- 4 (AT 200°C)	+/- 4 (AT 200°C)
Sensor		Thermo couple	Thermo couple	Thermo couple	Thermo couple
Alarms & Safety functions		automatic set temperature (set point 10°C), independent overheating protection circuit, overtemperature safety system for control section, self diagnosis			

GROUP		Autoclaves		Laboratory Autoclaves	
Characteristics		• Designed for individual lab use • Surprisingly large chamber • 4 Selectable courses • 3 Customizable programs		• Accurate sterilisation temperature • Fail-safe functions • Audible and visual alarms • Compact design	
					
MODEL		MLS-3751L-PE	MLS-3781L-PE	MLS-2420U-PE	MLS-3020U-PE
Dimensions					
Exterior (W x D x H)	mm	478 x 632 x 748	478 x 632 x 965	380 x 490 x 840	440 x 550 x 1050
Chamber dimensions (diameter x depth)	Ø mm	370 x 415	370 x 630	240 x 450	300 x 670
Effective chamber height incl. recess in lid	mm	463	688		
Effective capacity	ltr	50	75	20	48
Net Weight	kg	61	71	45	67
Construction					
Chamber material		Stainless steel (SUS 304)	Stainless steel (SUS 304)	Stainless steel (SUS 304)	Stainless steel (SUS 304)
Interior finish		Stainless steel plate	Stainless steel plate	-	-
Stainless steel baskets		1 large & 1 small	2 large & 1 small	2	3
Sterilization					
Max. pressure	Mpa	0,240	0,240	-	-
Sterilisation temperature	°C	115 ~ 135	115 ~ 135	105 ~ 126	105 ~ 126
Temperature gauge range	°C	-	-	Digital display 80 ~ 141	Digital display 80 ~ 141
Culture media melting temperature	°C	60 ~ 114	60 ~ 114	-	-
Safety valve release pressure		-	-	177 kPa (25 psig)	177 kPa (25 psig)
Pressure gauge range		-	-	0 - 0.3 Mpa / 0 -45 psi	0 - 0.3 Mpa / 0 -45 psi
Timer setting range	min.	-	-	1 - 180	1 - 180
Keep warm temperature	°C	45 ~ 60	45 ~ 60	-	-
Sterilisation timer	min	1 to 300	1 to 300	-	-
Melting timer	min	1 to 300	1 to 300	-	-
Keep warm timer	hrs	72 hours fixed	72 hours fixed	-	-
Exhaust tank		2 ltr polyethylene tank	2 ltr polyethylene tank	3 ltr polyethylene tank	3 ltr polyethylene tank
Exhaust control		Exhaust valve open temperature setting	Exhaust valve open temperature setting	-	-
Safety Devices		Pressure safety valve	Pressure safety valve	Pressure safety valve	Pressure safety valve
		Over-temperature limiter	Over-temperature limiter	Anti dry scorch thermo limiter	Anti dry scorch thermo limiter
		Over-pressure limiter	Over-pressure limiter	Door switch	Door switch
		Anti-scorch limiter	Anti-scorch limiter	Handle switch	Handle switch
		Door interlock	Door interlock	Current fuse	Current fuse
		Current fuse	Current fuse		
Pressure vessel		Small-scale pressure vessel	Small-scale pressure vessel	-	-

Laboratory Ovens	
• Various alarm and safety devices	
	
MOV-112-PE	**MOV-212-PE**
580 x 595 x 820	730 x 645 x 870
450 x 450 x 450	600 x 500 x 500
97	157
47	63
Baked acrylic finish on galavanized steel	Baked acrylic finish on galavanized steel
Stainless-steel plate (SUS-304)	Stainless-steel plate (SUS-304)
Glass wool	Glass wool
Reinforced triple glass window (t=5 mm)	Reinforced triple glass window (t=5 mm)
2	3
15	15
	-
Two on top plate (32mm inside Ø)	Two on top plate (32mm inside Ø)
-	-
-	-
Natural convection system	Natural convection system
Digital setting (adjustable range +/- 1°C)	Digital setting (adjustable range +/- 1°C)
Digital LED display	Digital LED display
40 ~ 250	40 ~ 250
+/- 1 deg	+/- 1 deg
+/- 10 (AT 200°C)	+/- 10 (AT 200°C)
Thermo couple	Thermo couple

*Appearance and specification are subject to change without notice.

GROUP		Orbital Shaker	Orbital Shaker for CO_2 Incubators
Characteristics		• Compact design & intelligent operation • Low-vibration & low-noise • Preventative contamination control with InCu saFe® platform • Easy installation in Panasonic incubators or growth chambers	
PUF = Rigid polyurethane foamed insulation V = Visual alarm B = Buzzer alarm R = Remote alarm			
MODEL		**MIR-S100-PE**	**MIR-S100C-PE**
Dimensions			
External dimensions (WxDxH)	mm	410 x 305 x 120	Shaker 409 x 275 x 118 Controller 365 x 275 x 93
Internal dimensions (WxDxH)	mm	Platform 380 x 250	
net weight	kg	15	Shaker - 12, controller - 4
Technical Data			
Power supply	V	230	
Frequency	Hz	50	
Noise level [1]	dB	38 [2]	38.9
Shaking motion		Circular orbit	
Amplitude of orbiting motion	mm	20	
Revolution	rpm	50 ~ 500	40 ~ 200
Operating temperature range	°C	0 ~ 60	Shaker 0 ~ 50 in CO_2; Controller 0 ~ 40
Operating CO_2 range	%	Ambient	0 ~20
Operating relative humidity range	%	≤80	Shaker ≤95, controller ≤80
Motor		Brushless DC	
Flask capacity		e.g. 11 x 100ml, 6 x 500ml	
Soft start		Y	
Timer		0-99.9 hrs	
Maximum load	kg	5	
Alarms			
Power failure		-	
Revolution abnormality		V-B-R	
Motor overload		V-B-R	
Abnormal vibration		V-B-R	
Temperature abnormality		V-B-R	
General			
Exterior material		Body painted steel, platform SS copper alloyed	Controller painted steel, shaker SS copper alloyed
Colour (exterior)		Bio-gray	Bio-gray, SS
Options			
InCu saFe® Platform		MIR-38PFN	
Flask clamps		Available for 50, 100, 200, 500, 1000, 2000 ml	
Test tube rack		MIR-204SC	
Communications interface		MTR-480, MTR-L03	

Notes
[1] Nominal Value
[2] Nominal value in a 13dB background, no load

*Appearance and specification are subject to change without notice.

Publication Number: 22764

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Quality management system: ISO9001 / Medical devices quality management system: ISO13458 / Environmental management system: ISO14001