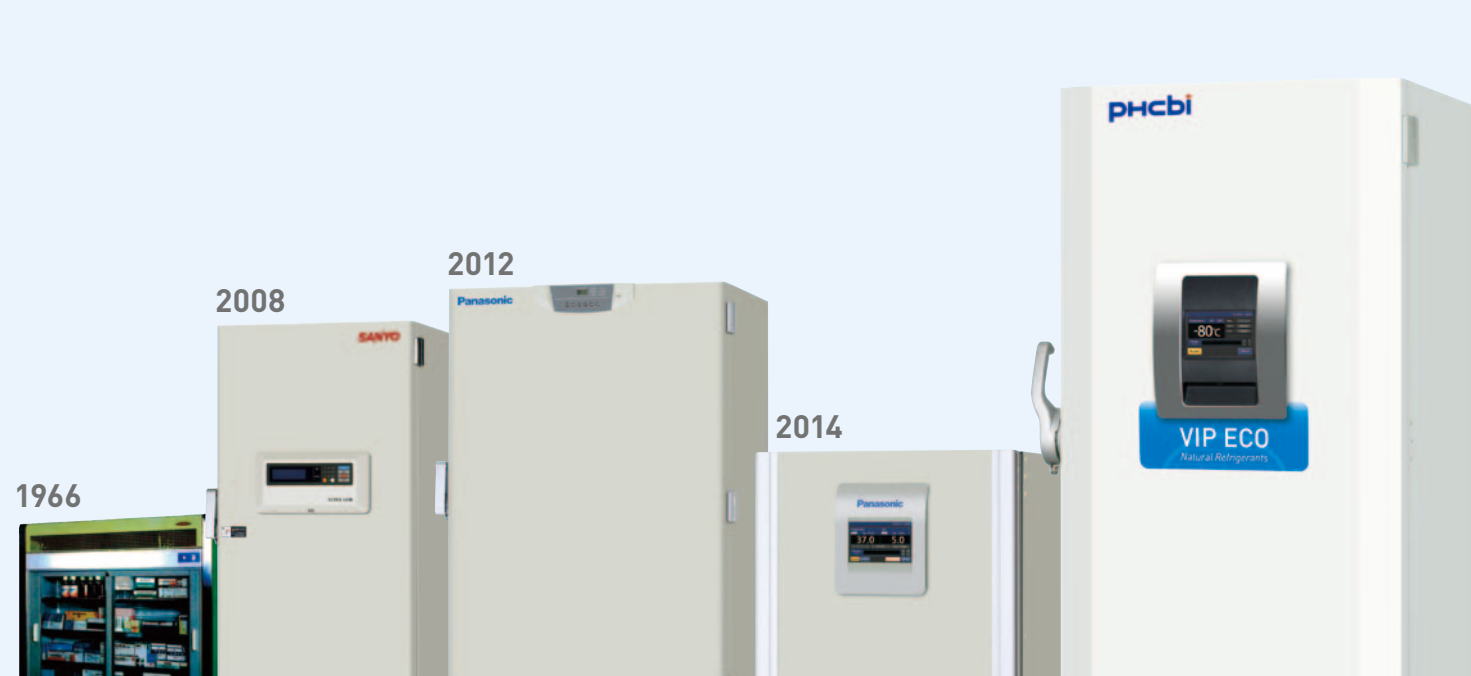




Partnering Life Sciences Development

PHCbi Biomedical products are designed to meet the demands of the life science industries by providing reliability, accuracy, and usability to facilitate cutting-edge research and preservation of precious samples.





"PHCbi" is a new brand for our Biomedical business that has globally supported cutting-edge research and healthcare for over 50 years.

Since 1966, when we first launched pharmaceutical refrigerators, we aimed to support cutting-edge research in life sciences. We have provided equipment and services required for sample preservation, bacterial and cell culture as well as maintenance of cleanroom environments.

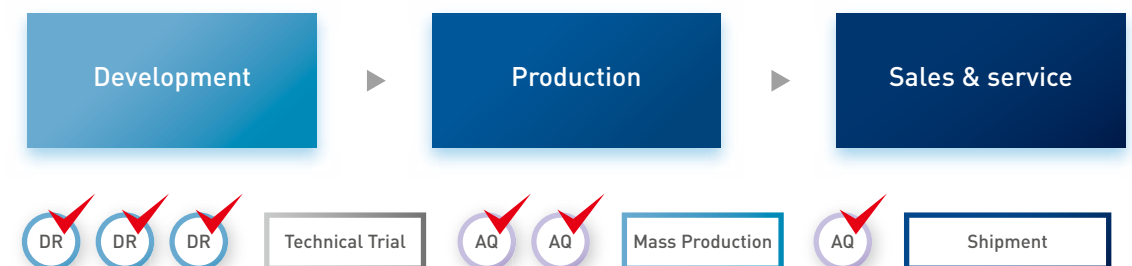
Life Science Innovator Since 1966

1966	1977	1991	2008	2009	2012	2014	2017	2019
SAR-130M Pharmaceutical Refrigerator	MDF-390AT -80°C Ultra Low Temperature Freezer developed	MDF-1155ATN World's Lowest Temperature -152°C Freezer Developed	MDF-U400VX -85°C Dual Cooling System Freezer developed	MCO-19AICUVH World's First H ₂ O ₂ / Hydrogen Peroxide Chamber decontamination Function equipped	MDF-DU700VH Energy saving HFC-free -86°C Ultra Low Temperature Freezer	MCO-170AICUVH Enhanced efficient Cleaning and storage Integrated Tray Catches Structure CO ₂ Incubator	MDF-DU702VX High Efficiency Insulation/Efficient Sample Storage and more Efficient Dual Cooling System	MPR-N450FH Energy saving HFC-free Pharmaceutical Refrigerator with Freezer

Commitment to Quality PHCbi MONOZUKURI* Way

The most important points that customers demand of our products are quality and reliability. At our factories, we have established the "MONOZUKURI Way" as a theme of action. We carry out various initiatives to improve quality while working to pass on the legacy of traditional Japanese manufacturing technology in a multi-faceted fashion. * [MONOZUKURI] is the Japanese word for [Craftsmanship]

Our Quality Management System



In our quality management and development process (Quality Management System), we establish a number of checkpoints in the value chain. Staff with various occupational abilities carry out stringent evaluation and improvement of products from the customer's perspective. This is the system that creates our high level of quality.

Japan Factory (Gunma)

Established in 1959 as the Tokyo Manufacturing Site of Sanyo Electric Co., Ltd., this is our core factory which has the Product Technology Development/Design Department, Quality Assurance Department, and Production Department.

As of April 2018, Over 500 PHC employees engaged in the development, quality assurance, and production of products of PHCbi. Within the facility, we have many environmental testing laboratories, and these are used for stringent product screening with the aim of studying technology development and maintaining quality.




In addition, at the "MONOZUKURI-Dojo (Training)," the purpose is to pass down our legacy for traditional technology. We carry out various kinds of training to improve skills such as brazing capillary tubes of Ultra-low Temperature Freezers, etc., which require a high level of skill.



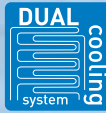





Application

Preservation




*Blood must be preserved in Blood Bank Refrigerator.










Client	Universities, private companies, laboratories/research institutions		Hospitals, universities, private companies, blood centers
Typical needs	Preservation of cells, microbes, specimens	Preservation of reagents, frozen plasma	Drugs, blood*, reagents
Storage temperature	-80°C, -150°C	-20°C to -30°C/-40°C	+4°C
	Ultra-low temperature freezers 	Biomedical Freezers 	Pharmaceutical Refrigerators Blood Bank Refrigerators 
Pages	5 — 10	11 — 12	13 — 16

Function icons / Logos

- 
DUAL cooling system
 Dual Cooling System offers ultimate sample protection.
- 
VIP PLUS vacuum insulation
 VIP PLUS vacuum insulation maximises storage capacity.
- 
EZlatch door handle
 EZlatch Easy Access Door Handle. The EZlatch makes access to stored samples even easier.
- 
ECO natural refrigerants
 Naturally occurring hydrocarbon (HC) refrigerants improve performance and reduce running costs.
- 
IC+ inverter compressor
 Inverter Compressors maximise cooling performance and reduce energy consumption.
- 
Touch CONTROL PANEL
 A full-color LCD Touch Panel. Various functions such as logging the temperature history, and setting up passwords and alarms can all be managed on the screen.

Incubation

Client	Universities, private companies, hospitals	Universities, private companies, hospitals, waterworks (water quality inspection)	Universities, private companies, agricultural experiment stations
Typical needs	Animal cell incubation (temperature, humidity, gas density)	Incubation of microbes (temperature)	Incubation of plants (temperature, illuminance, humidity)
	CO₂ Incubators 	Cooled Incubators 	Climate Chambers 
Pages	17 — 20	21	22

- 
Integrated Tray Catches
 Significantly minimize cleaning time and improves productivity.
- 
Touch CONTROL PANEL
 A full-color LCD Touch Panel. Various functions such as logging the temperature history, and setting up passwords and alarms can all be managed on the screen.
- 
inCu saFe
 inCu-saFe germicidal interior prevents contamination.
- 
IR dual sensor
 Dual IR CO₂ Sensor. The single beam, dual detector IR CO₂ Sensor offers continuous calibration for excellent control, accuracy and stability.
- 
DUAL HEAT sterilisation
 Two independent heaters enable cell culturing to continue uninterrupted during sterilization.
- 
zirconia O₂ control
 Zirconia O₂ Sensor. The unique, solid state Zirconia O₂ sensor delivers precise oxygen control.
- 
H₂O₂ decontamination
 H₂O₂ Decontamination. The unique H₂O₂ decontamination system delivers fast and validatable decontamination.
- 
SafeCell UV
 SafeCell UV Lamp. The SafeCell UV lamp prevents contamination.
- 
IR sensor
 IR CO₂ Sensor. The IR CO₂ Sensor offers accurate and reliable CO₂ measurement.

Sterilization

Client	Universities, private companies, experiment/research institutions, hospitals
Typical needs	Guaranteed sterilization process
	Laboratory Autoclaves 
Pages	22

TwinGuard

The most secure ultra-low temperature freezers for the storage of high value samples

-86°C



MDF-DU302VX 360 L

MDF-DU502VX 528 L

MDF-DU702VX 729 L



Model No.	MDF-DU302VX	MDF-DU502VX	MDF-DU502VXC	MDF-DU702VX	MDF-DU702VXC
Temperature Control Range	-50°C to -86°C				
Effective Capacity	360 liters	528 liters		729 liters	
External Dimensions (W x D x H)*	670 x 882 x 1840 mm	790 x 882 x 1993 mm		1030 x 882 x 1993 mm	
Internal Dimensions (W x D x H)	490 x 600 x 1230 mm	630 x 600 x 1400 mm		870 x 600 x 1400 mm	
Net Weight (Approx.)	225 kg	285 kg	294 kg	328 kg	338 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.



MDF-DC500VX 575 L

MDF-DC700VX 715 L



Model No.	MDF-DC500VX	MDF-DC700VX
Temperature Control Range	-50°C to -86°C	
Effective Capacity	575 liters	715 liters
External Dimensions (W x D x H)*	2010 x 845 x 1070 mm	2300 x 845 x 1070 mm
Internal Dimensions (W x D x H)	1190 x 640 x 756 mm	1480 x 640 x 756 mm
Net Weight (Approx.)	328 kg	358 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.



TwinGuard

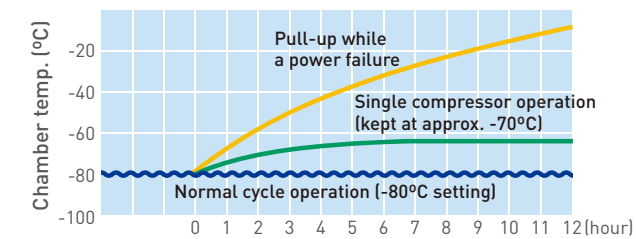
Ultimate Sample Protection

Unlike conventional ultra low freezers, TwinGuard ULT freezers have two independent refrigeration systems to provide the highest levels of sample security. Should one system unexpectedly fail, the other will maintain a temperature in the -70°C range ensuring that the integrity of irreplaceable and potentially life-saving samples are not put at risk.

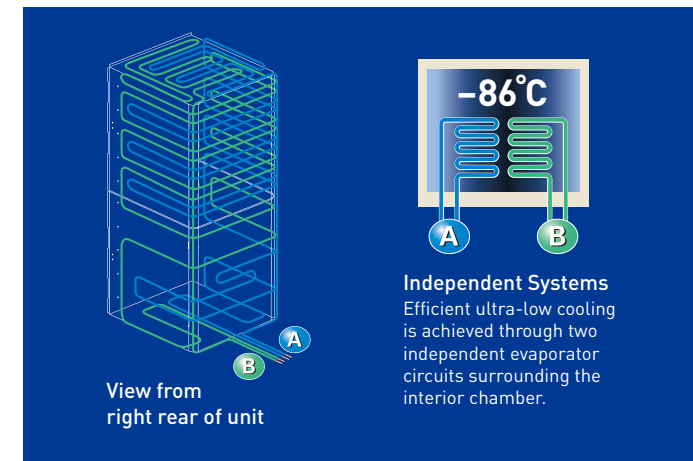
Safe and Secure Extra-Large Capacity Ultra-Low Freezer with Dual Cooling System

Secure storage with new dual cooling system

The Dual Cooling system is newly designated to securely store valuable biological samples. It consists of two individual compressors to provide a reliable -86°C ultra-low temperature environment. Should unexpected failure occur in one cooling circuit, the other will maintain at least -70°C.

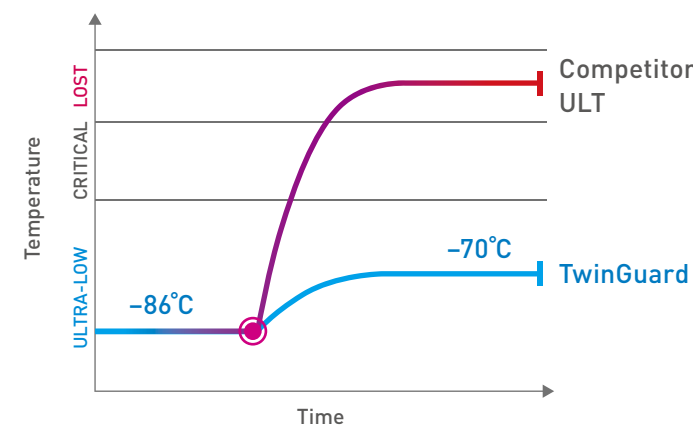


*Any unexpected failure on either of the single compressor will be alerted
*The data is a measured [AT23°C, 230V/50Hz, no load] Actual power consumption will vary depending on ambient conditions, settings and local voltage.



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

- An optimal Dual Cooling System provides an unparalleled level of safety and added peace of mind through the use of two independent refrigeration systems.
- ECO mode overlaps refrigeration cycles to reduce energy consumption.
- Advanced space-saving VIP PLUS technology (compared to our conventional models).
- Graphical LCD display with data monitoring and data log exported by USB.
- Available in Upright and Chest models.



EZlatch

EZlatch door handle newly developed based on human engineering

EZlatch is designed for secure door opening/closing with minimum strength as the name suggests and makes access to stored samples easier.



ECO ULT Freezer

Cost-saving and environmentally friendly sample storage



MDF-DU300H 333 L



VIP ECO

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



MDF-DU502VH 528 L



MDF-DU702VH 729 L



-86°C

Model No.	MDF-DU300H	MDF-DU502VH/MDF-DU502VHL	MDF-DU702VH/MDF-DU702VHL
Temperature Control Range	-50°C to -86°C		
Effective Capacity	333 liters	528 liters	729 liters
External Dimensions (W x D x H)*	750 x 870 x 1830 mm	790 x 882 x 1993 mm	1030 x 882 x 1993 mm
Internal Dimensions (W x D x H)	490 x 600 x 1140 mm	630 x 600 x 1400 mm	870 x 600 x 1400 mm
Net Weight (Approx.)	241 kg	246 kg	278 kg

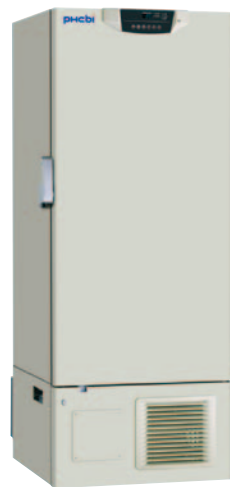
* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

VIP

Excellent reliability and uniformity within an optimal footprint



MDF-U33V 333 L



MDF-U54V 519 L
MDF-U55V



MDF-U74V 728 L



MDF-DU900V 845 L
MDF-DU900VC



-86°C

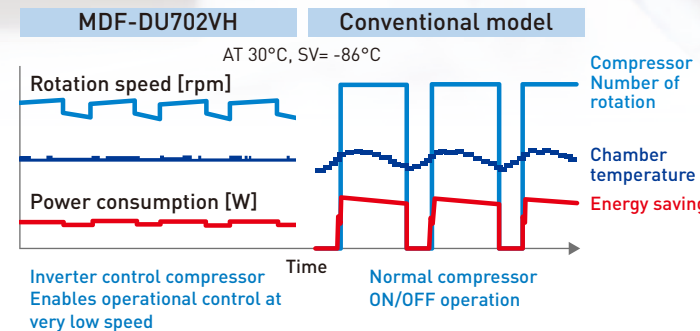
Model No.	MDF-U33V	MDF-U54V	MDF-U55V	MDF-U74V	MDF-DU900V	MDF-DU900VC
Temperature Control Range	-50°C to -86°C					
Effective Capacity	333 liters	519 liters		728 liters	845 liters	
External Dimensions (W x D x H)*	670 x 870 x 1860 mm	770 x 870 x 1990 mm		1010 x 870 x 2010 mm	1150 x 870 x 1990 mm	
Internal Dimensions (W x D x H)	490 x 600 x 1140 mm	630 x 600 x 1380 mm		870 x 600 x 1400 mm	1010 x 600 x 1400 mm	
Net Weight (Approx.)	255 kg	296 kg	288 kg	346 kg	376 kg (PB, PE) 382 kg (PK)	382 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

ECO IC+ VIP ECO

Eco operation and Energy saving

Unlike conventional ultra low freezers, TwinGuard ULT freezers ECO ULT freezers use natural hydrocarbon (HC) refrigerants to provide minimal energy consumption, reduced environmental impact and substantially lower running costs. HC refrigerants have a high latent heat of evaporation making them much more efficient at removing heat from the freezer chamber than conventional refrigerants, resulting in up to a 55% reduction in energy consumption and costs. These refrigerants also have an extremely low Global Warming Potential, helping organizations to meet environmental objectives.

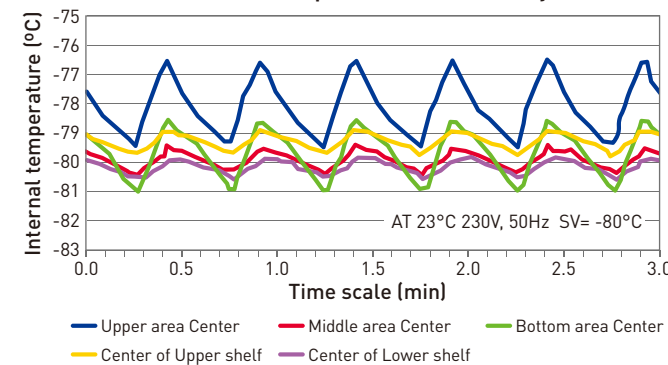


When low electrical running costs and environmental considerations are of paramount importance, put your trust in VIP ECO and PRO ECO ULT freezers.

- New heat exchanger design for greater surface area contact and overall efficiency.
- Advanced space-saving VIP PLUS Insulation (compared to our conventional models).
- Graphical LCD display with data monitoring and data log exported by USB (for MDF-DU502VH/MDF-DU702VH).
- Class IIa Medical Device certified quality (Certification itself for Europe area only to comply with European regulations).

Energy Efficient, Balanced Power Smart compressors, natural refrigerants and integrated electronics combine to lower your facility's operating costs. Freezer operation is managed by the practical balance of temperature performance and energy management.

MDF-DU702VH Temperature Uniformity Data



Reliable controllability and data log function

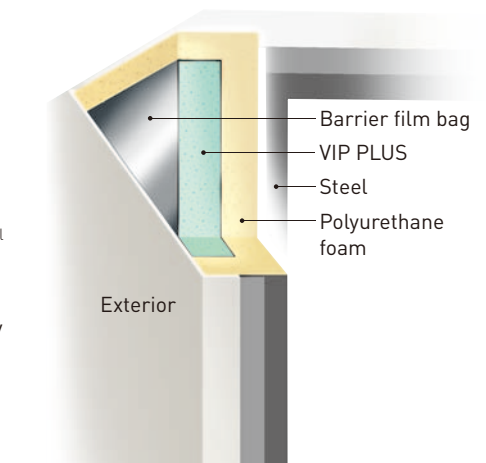
Large color LCD touchpanel is accurately controlled even with a gloved hand, while the USB port makes transferring logged data of product's operational status to a PC convenient.



VIP PLUS

Innovative V.I.P.* Technology *Vacuum Insulation Panel

VIP is the innovative insulation technology developed by PHC. VIP series contain densely packed, open cell foam insulation under the vacuum panel. This configuration dramatically enhanced the insulation capability of the freezer while reducing the wall thickness from 140mm to 70mm, and achieved nearly 30% more storage capacity than conventional insulated freezers. The VIP Plus achieved 6 times stronger thermal resistance with more rigid foam polyurethane while keeping the same thickness of 70mm.



Cryogenic Freezers

-150 / -152°C

The most uniform storage temperatures for cryopreservation solutions



MDF-1156 128 L
MDF-1156ATN



MDF-C2156VAN 231 L



Model No.	MDF-1156	MDF-1156ATN	MDF-C2156VAN
Temperature Control Range	-130°C to -152°C		-125°C to -150°C
Effective Capacity	128 liters		231 liters
External Dimensions [W x D x H]*	1400 x 800 x 945 mm		1730 x 765 x 1010 mm
Internal Dimensions [W x D x H]	500 x 450 x 572 mm		760 x 495 x 615 mm
Net Weight [Approx.]	265 kg	272 kg	318 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

ATN: LN₂ back-up, Temperature recorder

VIP

MDF ULT Freezers

-80 / -86°C

Excellent reliability and uniformity within an optimal footprint



MDF-C8V1 84 L



MDF-594 487 L
MDF-594AT



MDF-794 701 L
MDF-794AT

Model No.	MDF-C8V1	MDF-594	MDF-594AT	MDF-794	MDF-794AT
Temperature Control Range	-60°C to -80°C	-20°C to -86°C		-20°C to -86°C	
Effective Capacity	84 liters	487 liters		701 liters	
External Dimensions [W x D x H]*	550 x 685 x 945 mm	2010 x 770 x 1070 mm		2570 x 770 x 1070 mm	
Internal Dimensions [W x D x H]	405 x 490 x 425 mm	1280 x 500 x 762 mm		1840 x 500 x 762 mm	
Net Weight [Approx.]	70 kg	291 kg	301 kg	335 kg	345 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

AT: LCO₂ back-up, Temperature recorder

Optional Accessories (for MDF series)

Small Inner Door Kits*



MDF-5ID-PW [for MDF-U54V/MDF-U55V]



MDF-7ID-PW [for MDF-U74V]



MDF-9ID-PW [for MDF-DU900V/MDF-DU900VC] 2 small inner doors make 1 set (2 sets are needed if all small inner door options are selected).



MDF-7ID4-PW



MDF-7ID5-PW



MDF-5ID4-PW



MDF-5ID5-PW

MDF-7ID4-PW/MDF-7ID5-PW [for MDF-DU702VX/MDF-DU702VXC/MDF-DU702VH/MDF-DU702VHL] 4 or 5 inner doors make 1 set. MDF-5ID5 and 7ID5 include an additional shelf.

MDF-5ID4-PW/MDF-5ID5-PW [for MDF-DU502VX/MDF-DU502VXC/MDF-DU502VH/MDF-DU502VHL]

*Please be aware cooling capacity will be less than specified if small inner doors are installed. Installation of the kit may effect usable storage capacity.

Liquid CO₂ Backup Kits

Liquid N₂ Backup Kit



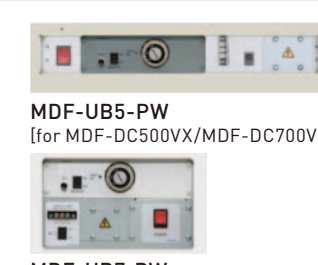
CVK-UB2-PW [for MDF-U33V/MDF-U54V/MDF-U55V/MDF-U74V/MDF-594/MDF-794]



CVK-UB4-PW [for MDF-C8V1 (Mounting kit MDF-UBK-PW)]



MDF-UB6B-PW [for MDF-DU900V/MDF-DU900VC]



MDF-UB5-PW [for MDF-DC500VX/MDF-DC700VX]

MDF-UB7-PW [for MDF-DU302VX/MDF-DU502VX/MDF-DU502VXC/MDF-DU502VH/MDF-DU502VHL/MDF-DU702VX/MDF-DU702VXC/MDF-DU702VH/MDF-DU702VHL]



CVK-UBN2-PW [for MDF-U33V/MDF-U54V/MDF-U55V/MDF-U74V/MDF-594/MDF-794]

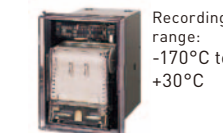
Temperature Recorders

2-month Strip Chart Recorders



MTR-85H-PW

No Mounting Brackets Required MDF-594, MDF-794



MTR-155H-PW

MDF-1156

1-day/7-day/32-day Circular Chart Recorders



MTR-G85A-PA/MTR-G85C-PE

MDF-DU302VX, MDF-DU502VX, MDF-DU502VXC, MDF-DU702VX, MDF-DU702VXC, MDF-DC500VX, MDF-DC700VX, MDF-U33V, MDF-U54V, MDF-U55V, MDF-U74V, MDF-DU900V, MDF-DU900VC, MDF-DU300H, MDF-DU502VH, MDF-DU502VHL, MDF-DU702VH, MDF-DU702VHL, MDF-C8V1

Recorder Mounting Brackets **MDF-S3085-PW** MDF-DU302VX, MDF-DU502VX, MDF-DU502VXC, MDF-DU702VX, MDF-DU702VXC, MDF-DC500VX, MDF-DC700VX, MDF-U33V, MDF-U54V, MDF-U55V, MDF-U74V, MDF-DU900V, MDF-DU900VC, MDF-DU300H, MDF-DU502VH, MDF-DU502VHL, MDF-DU702VH, MDF-DU702VHL, MDF-C8V1

MDF-S30150-PW MDF-C2156VAN

Sensor Cover **MTR-DU700SF-PW** MDF-DU302VX, MDF-DU502VX, MDF-DU502VXC, MDF-DU702VX, MDF-DU702VXC, MDF-DU900V, MDF-DU900VC, MDF-DU502VH, MDF-DU502VHL, MDF-DU702VH, MDF-DU702VHL
MTR-C8-PW MDF-C8V1, MDF-DU300H

MTR-DU700SF-PW MDF-DU302VX, MDF-DU502VX, MDF-DU502VXC, MDF-DU702VX, MDF-DU702VXC, MDF-DU900V, MDF-DU900VC, MDF-DU502VH, MDF-DU502VHL, MDF-DU702VH, MDF-DU702VHL
MTR-C8-PW MDF-C8V1, MDF-DU300H

MDF Biomedical Freezers

Stable -30°C environment with extensive storage possibilities

-30°C



Model No.	MDF-MU339	MDF-MU539	MDF-MU539D	MDF-U731M
Temperature Control Range	-20°C to -30°C			
Effective Capacity	369 liters	504 liters	479 liters	690 liters
External Dimensions (W x D x H)*	616 x 770 x 1802 mm	793 x 770 x 1802 mm	793 x 770 x 1802 mm	770 x 830 x 1955 mm
Internal Dimensions (W x D x H)	472 x 614 x 1262 mm	649 x 614 x 1262 mm	649 x 614 x 600 mm [2 chambers]	650 x 700 x 1520 mm
Baskets	[W420 x D552 x H157 mm]: 6	[W280 x D552 x H157 mm]: 12	[W280 x D552 x H157 mm]: 12	Option
Net Weight (Approx.)	135 kg	163 kg	185 kg	152 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MDF Biomedical Freezers

Able to provide a stable -30°C environment

MDF Biomedical ECO Freezers

Cost-saving and environmentally friendly

-30°C



Model No.	MDF-U334	MDF-U5312	MDF-MU300H	MDF-MU500H
Temperature Control Range	-20°C to -30°C			
Effective Capacity	274 liters	482 liters	274 liters	482 liters
External Dimensions (W x D x H)*	614 x 709 x 1620 mm	804 x 772 x 1802 mm	610 x 598 x 1620 mm	800 x 772 x 1802 mm
Internal Dimensions (W x D x H)	490 x 486 x 1290 mm	658 x 607 x 1272 mm	490 x 486 x 1290 mm	658 x 607 x 1272 mm
Baskets	Large [W446 x D369 x H220 mm]: 4 Small (dew pan) [W487 x D221 x H155 mm]: 1	[W290 x D536 x H238 mm]: 4 [W290 x D536 x H136 mm]: 6	[W446 x D369 x H220 mm]: 4 [W487 x D221 x H155 mm]: 1	[W290 x D536 x H238 mm]: 4 [W290 x D536 x H136 mm]: 6
Net Weight (Approx.)	81 kg	132 kg (PT) / 134 kg (PK, PR)	76 kg	124 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MDF Biomedical ECO Freezer

Cost-saving and environmentally friendly fresh frozen plasma storage

MDF Biomedical Freezers

The ideal freezing environment for preservation

-40°C



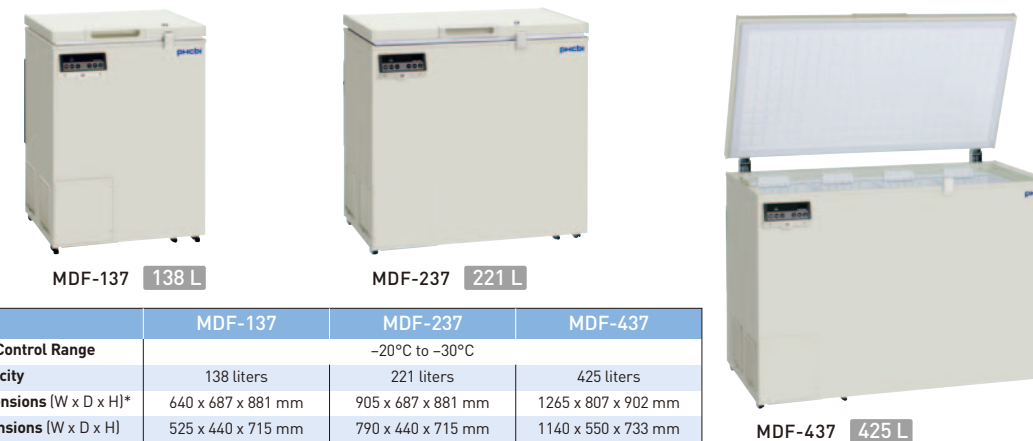
Model No.	MDF-U5412H	MDF-U443	MDF-U5412
Temperature Control Range	-20°C to -40°C	-15°C to -40°C	-20°C to -40°C
Effective Capacity	482 liters	426 liters	482 liters
External Dimensions (W x D x H)*	804 x 772 x 1802 mm	800 x 832 x 1810 mm	804 x 772 x 1802 mm
Internal Dimensions (W x D x H)	658 x 607 x 1272 mm	640 x 615 x 1090 mm	658 x 607 x 1272 mm
Baskets	Large [W290 x D536 x H238 mm]: 4 Small [W290 x D536 x H136 mm]: 6	—	[W290 x D536 x H238 mm]: 4 [W290 x D536 x H136 mm]: 6
Net Weight (Approx.)	132 kg	213 kg	132 kg (PB, PE) / 134 kg (PK, PR)

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MDF Biomedical Freezers

Power to counteract frequent door openings

-30°C



Model No.	MDF-137	MDF-237	MDF-437
Temperature Control Range	-20°C to -30°C		
Effective Capacity	138 liters	221 liters	425 liters
External Dimensions (W x D x H)*	640 x 687 x 881 mm	905 x 687 x 881 mm	1265 x 807 x 902 mm
Internal Dimensions (W x D x H)	525 x 440 x 715 mm	790 x 440 x 715 mm	1140 x 550 x 733 mm
Net Weight (Approx.)	52 kg	60 kg	81 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

Optional Accessories (for MDF series)

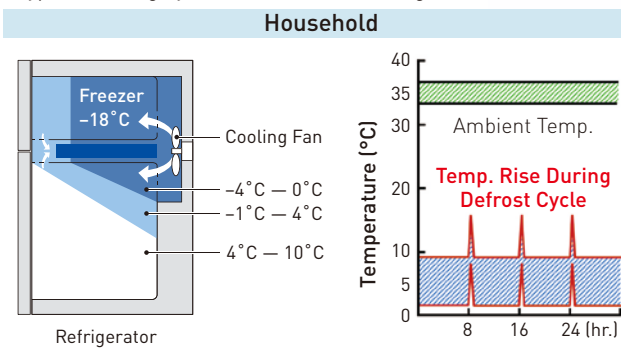
Temperature Recorders	Baskets
<p>32-day Strip Chart Recorder</p> <p>Recording range: -40°C to +14°C</p> <p>MTR-4015LH-PE/MTR-4015LH-PA</p>	<p>1-day/7-day/32-day Circular Chart Recorder</p> <p>Recording range: -100°C to +40°C</p> <p>MTR-G85A-PA/MTR-G85C-PE</p>
<p>2-month Strip Chart Recorder</p> <p>Recording range: -100°C to +50°C</p> <p>MTR-85H-PW</p>	<p>MDF-T07SC-PW [for MDF-U731M]</p> <p>2 baskets are included. 14 baskets are needed to fill the entire cabinet.</p>
<p>No Mounting Brackets Required</p> <p>MDF-MU300H MDF-U334, MDF-U443</p>	<p>MDF-S740-PW [for external mounting]</p> <p>MDF-U334, MDF-MU539D, MDF-MU300H</p>
<p>Recorder Mounting Brackets</p> <p>MPR-S30-PW MDF-U5312, MDF-U5412, MDF-U5412H, MDF-U731M, MDF-MU339, MDF-MU539, MDF-MU539D, MDF-MU500H</p> <p>MDF-S3040-PW MDF-137, MDF-237, MDF-437</p>	<p>MPR-S7-PW MDF-U5312, MDF-U5412, MDF-U5412H, MDF-U731M, MDF-MU339, MDF-MU539, MDF-MU500H</p>

MPR/MBR

A stable temperature environment is important for the storage of your precious drugs and samples. However, household refrigerators do not offer a stable temperature environment due to relatively simple construction. PHCbi pharmaceutical refrigerators employ a forced air circulation and sophisticated plenum systems to realize a uniformed temperature throughout the chamber even under a changing ambient temperature environment.

Inside Temperature of Household Refrigerator

- Typical Cooling System of Household Refrigerator

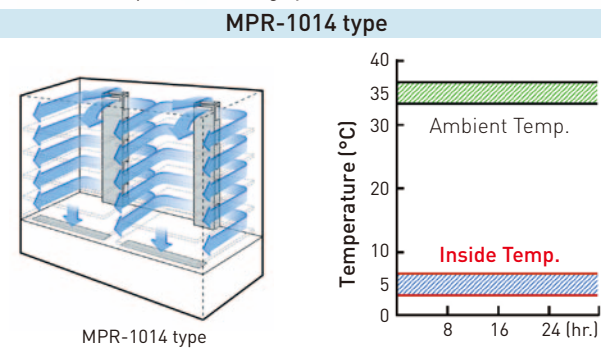


- Only one FAN to cool down refrigerator and freezer
- The difference in the temperature between the upper and lower areas of the refrigerator section can be 10°C.

In regular refrigerators it is possible for the chamber temperature to fall below 0°C depending on the ambient temperature which may cause the freezing of medicines and mediums. The auto defrost system turns on every 7 – 8 hours. During this time, the chamber air temperature rises.

Temperature Stability – temperature Uniformity

- Multi air-flow plenum cooling system



- Uniform cold air flow distribution throughout the chamber
- Ensure temperature uniformity of big capacity chamber

The cycle defrost system turns on the defrost heater during each off period of the compressor only when needed. This control method prevents large temperature rises.

MPR Pharmaceutical Refrigerators

2°C to 14°C

Sliding Door Type



Model No.	MPR-514	MPR-514R	MPR-1014	MPR-1014R
Temperature Control Range	2°C to 14°C			
Effective Capacity	489 liters	486 liters	1033 liters	1029 liters
External Dimensions (W x D x H)*	900 x 600 + [58] mm x 1790 mm		1800 x 600 + [58] mm x 1790 mm	
Internal Dimensions (W x D x H)	800 x 465 x 1300 mm		1700 x 465 x 1300 mm	
Net Weight (Approx.)	141 kg	147 kg	246 kg	258 kg
	Wire shelves type	Drawer type	Wire shelves type	Drawer type

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MPR Pharmaceutical Refrigerators 2°C to 14°C

Sliding Door Type



Model No.	MPR-S163	MPR-S313
Temperature Control Range	2°C to 14°C	
Effective Capacity	158 liters	340 liters
External Dimensions (W x D x H)*	800 x 465 x 1090 mm	800 x 465 x 1800 mm
Internal Dimensions (W x D x H)	720 x 300 x 725 mm	720 x 350 x 1435 mm
Net Weight (Approx.)	71 kg	100 kg
	Wire shelves type	Wire shelves type

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MPR Pharmaceutical Refrigerators

2°C to 23°C

Swing Door Type



Model No.	MPR-722	MPR-722R	MPR-1412	MPR-1412R
Temperature Control Range	2°C to 23°C			
Effective Capacity	684 liters	671 liters	1364 liters	1359 liters
External Dimensions (W x D x H)*	770 x 830 x 1955 mm		1440 x 830 x 1950 mm	
Internal Dimensions (W x D x H)	650 x 710 x 1500 mm		1320 x 710 x 1500 mm	
Net Weight (Approx.)	174 kg	193 kg	248 kg	287 kg
	Wire shelves type	Drawer type	Wire shelves type	Drawer type

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MPR Pharmaceutical Refrigerators with Freezer

Refrigerator: 2°C to 14°C | Freezer: -20°C to -30°C

Providing a complete storage solution; Refrigerator and freezer in one unit



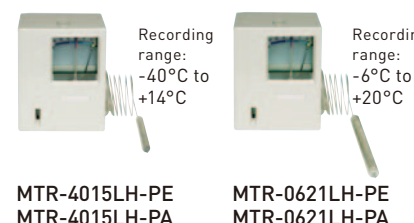
Model No.	MPR-215F	MPR-414F	MPR-414FS	MPR-N450FH	MPR-N450FSH	MPR-715F
Temperature Control Range	Refrigerator: 2°C to 14°C Freezer: -20°C to -30°C					
Effective Capacity	Refrigerator: 176 liters Freezer: 39 liters	Refrigerator: 340 liters Freezer: 82 liters		Refrigerator: 326 liters Freezer: 136 liters		Refrigerator: 415 liters Freezer: 176 liters
External Dimensions (W x D x H)**	540 x 557 x 1794 mm	800 x 600 x 1805 mm		800 x 640 x 1810 mm		900 x 715 x 1910 mm
Internal Dimensions (W x D x H)	Refrigerator: 455 x 466 x 917 mm Freezer: 420 x 342 x 267 mm	Refrigerator: 720 x 495 x 1425 mm Freezer: 317 x 440 x 576 mm		Refrigerator: 720 x 516 x 913 mm Freezer: 680 x 470 x 415 mm		Refrigerator: 810 x 615 x 894 mm Freezer: 770 x 552 x 422 mm
Net Weight (Approx.)	86 kg	126 kg	119 kg	129 kg	121 kg	170 kg

* Limited countries and regions
** External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.
FS: No glass window

Optional Accessories (for MPR/MBR series)

Temperature Recorders

32-day Strip Chart Recorders



2-month Strip Chart Recorder



1-day/7-day/32-day Circular Chart Recorders

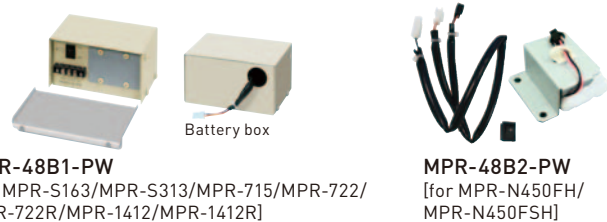


MTR-G3504A-PA
MTR-G3504C-PE
* 2-pen type circular recorder for refrigeration and freezing

No Mounting Brackets Required	MPR-215F MPR-414F MPR-414FS [MBR-107DH]* [MBR-506DH]	[MBR-305GR]* [MBR-705GR] [MBR-1405GR]
		* MBR has recorder as a standard accessory.

Recorder Mounting Brackets	MPR-S30-PW MPR-215F MPR-414F MPR-414FS MPR-N450FH MPR-N450FSH MPR-715F	MPR-S30-PW MPR-S163, MPR-S313 MPR-514, MPR-514R MPR-1014, MPR-1014R MPR-722, MPR-722R MPR-1412, MPR-1412R MPR-N450FH, MPR-N450FSH MPR-715F	MPR-S7-PW MPR-S163, MPR-S313 MPR-514, MPR-514R MPR-1014, MPR-1014R MPR-722, MPR-722R MPR-1412, MPR-1412R	MPR-S7-PW MPR-215F, MPR-414F MPR-414FS, MPR-N450FH MPR-N450FSH, MPR-715F
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External mounting power failure alarm



MPR-48B1-PW
[for MPR-S163/MPR-S313/MPR-715/MPR-722/
MPR-722R/MPR-1412/MPR-1412R]

MPR-48B2-PW
[for MPR-N450FH/
MPR-N450FSH]

MBR Blood Bank Refrigerators

4°C

Robust design for safest storage of whole blood



Model No.	MBR-107DH	MBR-305GR	MBR-506DH
Temperature	4°C		
Effective Capacity	79 liters	302 liters	425 liters
External Dimensions (W x D x H)*	400 x 495 x 1515 mm	600 x 680 x 1835 mm	800 x 832 x 1810 mm
Internal Dimensions (W x D x H)	320 x 350 x 710 mm	520 x 490 x 1150 mm	640 x 550 x 1240 mm
Net Weight (Approx.)	70 kg	147 kg	185 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

D: 32-day strip chart recorder
G: 1-day/7-day/32-day circular chart recorder
R: Drawer type



Model No.	MBR-705GR	MBR-1405GR
Temperature	4°C	
Effective Capacity	622 liters	1301 liters
External Dimensions (W x D x H)*	770 x 830 x 1955 mm	1440 x 830 x 1950 mm
Internal Dimensions (W x D x H)	650 x 697 x 1500 mm	1320 x 710 x 1500 mm
Net Weight (Approx.)	213 kg	315 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

G: 1-day/7-day/32-day circular chart recorder
R: Drawer type

MCO CO₂ Incubators

Ambient temp. +5°C to 50°C

Optimising cell culture outcomes and reproducibility



MCO-170AIC/MCO-170AICL 165 L
MCO-170AICUV/MCO-170AICUVL
MCO-170AICUVH/MCO-170AICUVHL



MCO-170AICD/MCO-170AICDL 165 L
MCO-170AICUVD/MCO-170AICUVDL



MCO-230AIC/MCO-230AICL 230 L
MCO-230AICUV/MCO-230AICUVL



*1 Standard for Model No. Including UV *2 Standard for Model No. Including UVH

Model No.	MCO-170AIC MCO-170AICL MCO-170AICUV MCO-170AICUVL MCO-170AICUVH MCO-170AICUVHL	MCO-170AICD MCO-170AICDL MCO-170AICUVD MCO-170AICUVDL	MCO-230AIC MCO-230AICL MCO-230AICUV MCO-230AICUVL
Temperature Control Range	Ambient temperature + 5°C to 50°C (AT 5°C to 35°C)		
CO ₂ Setting Range	0 to 20%		
Chamber Humidity	95 ±5% R.H.		
Interior Volume	165 litres	165 litres	230 litres
External Dimensions (W x D x H)*	620 x 730 x 905 mm	620 x 755 x 905 mm	770 x 730 x 905 mm
Internal Dimensions (W x D x H)	490 x 523 x 665 mm	490 x 523 x 665 mm	643 x 523 x 700 mm
Net Weight (Approx.)	80 kg	79 kg (AICD), 80 kg (AICUVD)	90 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.



MCO-5AC 49 L



MCO-170AC/MCO-170ACL 165 L



MCO-80IC 851 L



Model No.	MCO-5AC	MCO-170AC/MCO-170ACL	MCO-80IC
Temperature Control Range	Ambient temperature + 5°C to 50°C (AT 5°C to 35°C)		
CO ₂ Setting Range	0 to 20%		
Chamber Humidity	95 ±5% R.H.		Normal mode; Over 80% R.H. High humidity mode; Over 90% R.H.
Interior Volume	49 litres	165 litres	851 litres
External Dimensions (W x D x H)*	480 x 548 x 575 mm	620 x 730 x 905 mm	986 x 853 x 2040 mm
Internal Dimensions (W x D x H)	350 x 378 x 375 mm	490 x 523 x 665 mm	806 x 693 x 1524 mm
Net Weight (Approx.)	49 kg	74 kg	275 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.



Increase in cleaning and storage efficiency with Integrated Tray Catches

The unit employs an integrated tray structure without shelf supports thereby reducing the number of interior components by approximately 80%* and significantly saving cleaning time needed when changing cells for incubation.

Compared to current products, the required cleaning time and task are Approx. **1/5***

Interior components of MCO-170AIC



Approx. **80%*** fewer interior components

Interior components: 5

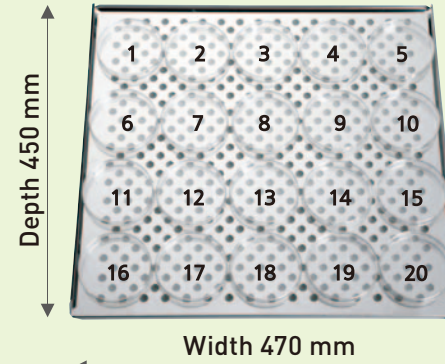
Interior components of MCO-19AIC



Interior components: 26

Tray space has increased by approximately 25%* while using virtually the same installation space used in conventional models. Four more 100ø dishes can be set up than when using conventional models.

Tray from MCO-170AIC

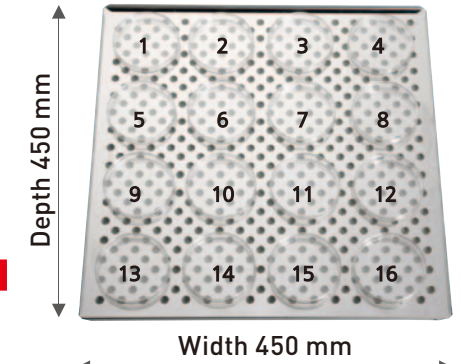


100ø 20 dishes

Approx. **25%*** more storage

4 additional 100ø dishes can be set up

Tray from MCO-19AIC



100ø 16 dishes



In 2 hours and half (approx.) H₂O₂ Decontamination

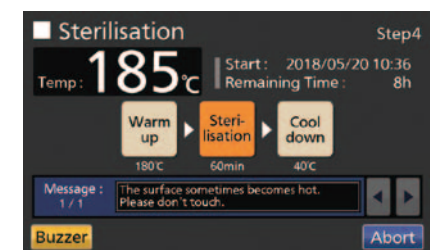


Approx. **2.5 hrs****

The high-speed decontamination system using H₂O₂ that is also used for in regenerative medicine equipment can complete the entire decontamination process in approximately 135 minutes (about 2 hours including preparation time), enhancing work efficiency for researchers and enabling complete decontamination within the unit.



Solving issues in dry heat sterilisation Dual Heat Sterilisation



Approx. **11 hrs 180°C**

No more problems during dry heat sterilisation: such as interior components removal during sterilisation; temperature/CO₂ density composition before restart; impacts to temperature when stacking two boxes; and current consumption.

*Compared to MCO-19AIC

**PHCbi measurement. Decontamination time differs depending on time required for cabinet cleaning and interior parts installation.



MCO-170M 161 L
MCO-170ML



MCO-5M 49 L



Model No.	MCO-170M/MCO-170ML	MCO-5M
Temperature Control Range	Ambient temperature + 5°C to 50°C (AT 5°C to 35°C)	
CO ₂ Setting Range	0 to 20%	
O ₂ Setting Range	1 to 18%, 22 to 80%	
Chamber Humidity	95 ±5% R.H.	
Interior Volume	161 litres	49 litres
External Dimensions (W x D x H)*	620 x 730 x 905 mm	480 x 548 x 575 mm
Internal Dimensions (W x D x H)	490 x 523 x 665 mm	350 x 378 x 375 mm
Net Weight (Approx.)	77 kg	50 kg

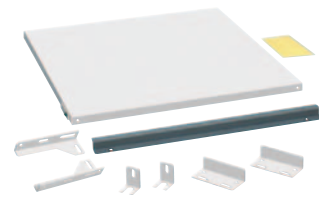
* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

Optional Accessories (for MCO series)

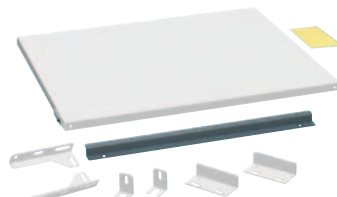
Stacking Kits



MCO-170PS-PW
Upper unit:
MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series
Lower unit:
MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series
Upper unit:
MCO-230AIC series
Lower unit:
MCO-230AIC series



MCO-170SB-PW
Upper unit:
MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series
Lower unit:
MCO-20AIC series/MCO-19AIC series/
MCO-19M series/MCO-18AC series



MCO-230SB-PW
Upper unit:
MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series
Lower unit:
MCO-230AIC series
Upper unit:
MCO-230AIC series
Lower unit:
MCO-230AIC series

Roller Bases



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



MCO-170RB-PW
[for MCO-170AC series/
MCO-170AIC series/
MCO-170AICD series/
MCO-170M series]



MCO-5RB-PW
[for MCO-5AC series/
MCO-5M series]

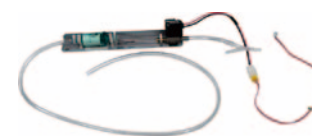
Roller bottle rack mount



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

Other Options (for MCO series)

CO₂ gas tank switcher



*Photo:MCO-21GC-PW

MCO-21GC-PW
[for MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series/
MCO-230AIC series]

MCO-5GC-PW
[for MCO-5AC series/MCO-5M series]
MCO-80GC-PW
[for MCO-80IC]

Gas regulator



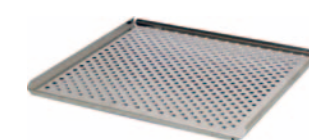
MCO-010R-PW
[except for MCO-80IC]

STD gas auto calibration kit

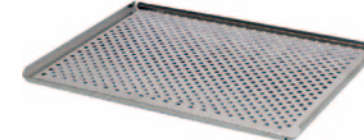


MCO-SG-PW
[for MCO-170AIC series/
MCO-170AICD series/MCO-170M series/
MCO-230AIC series]

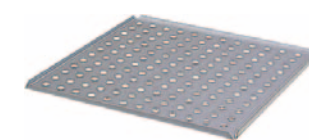
Tray (same as standard accessory)



MCO-170ST-PW
[for MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series]



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

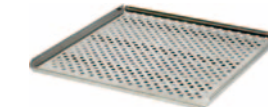


MCO-30ST-PW
[for MCO-5AC series/
MCO-5M series]



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

Tray (Reinforced Tray)

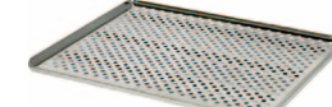


(front) MCO-170RT

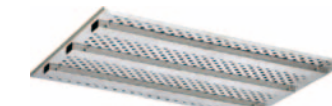


(back) MCO-170RT

MCO-170RT-PW
[for MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series]



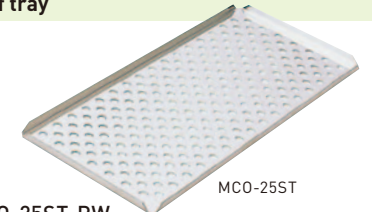
(front) MCO-230RT



(back) MCO-230RT

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

Half tray



MCO-25ST

MCO-25ST-PW
[for MCO-170AC series/MCO-170AIC series/
MCO-170AICD series/MCO-170M series]

MCO-35ST-PW
[for MCO-230AIC series]

UV system set*1



*Photo:MCO-170UVS-PW

MCO-170UVS-PE*2/PA*3
[for MCO-170AC/MCO-170ACL/MCO-170AIC/
MCO-170AICL/MCO-170M/MCO-170ML/
MCO-230AIC/MCO-230AICL]

MCO-170UVSD-PE/PK
[for MCO-170AICD series]



MCO-19UVS-PE*2/PA*3/PK
[for MCO-5AC/MCO-5M]



MCO-80UVS-PE*2/PK
[for MCO-80IC]



MCO-170HB-PE*2/PA*3
[for MCO-170AICUV/
MCO-170AICUVL/MCO-170AIC/
MCO-170AICL/MCO-170M/
MCO-170ML/MCO-230AICUV/
MCO-230AICUVL/MCO-230AIC/
MCO-230AICL]

H₂O₂ generator



MCO-HP-PW*5
[for MCO-170AIC series/
MCO-170M series/MCO-230AIC series]

Electric Lock



MCO-170EL-PW
[for MCO-170AICUV/MCO-170AICUVL/
MCO-170AIC/MCO-170AICL/
MCO-170M/MCO-170ML/
MCO-230AIC/MCO-230AICL/
MCO-230AICUV/MCO-230AICUVL]

Small door



MCO-170ID-PW
[for MCO-170AC/MCO-170ACL/
MCO-170AIC/MCO-170AICL/
MCO-170AICUV/MCO-170AICUVL/
MCO-170AICUVH/MCO-170AICUVHL]



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

H₂O₂ reagent



MCO-H202-PV
[for MCO-HP-PW]

Auto water supply system



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

Interface board*4

MTR-L03-PW or MTR-480-PW

Interface board (4-20 mA Transmitter)

MCO-420MA-PW
[for MCO-170AC series/MCO-170AIC series/MCO-170AICD series/
MCO-170M series/MCO-230AIC series]

*1 MCO-170UVSD is equipped with MCO-170AICUVL/MCO-170AICUVL as standard.
MCO-170UVS is equipped with MCO-170AICUV/MCO-170AICUVL/MCO-170AICUVH/MCO-170AICUVHL and
MCO-230AICUV/MCO-230AICUVL as standard.
*2 For 220 V-240 V 50 Hz-60 Hz *3 For 110 V-120 V 60 Hz *4 Only for MTR-5000 (data acquisition system) users.

*5 The optional components UV system set, MCO-170UVS, and H2O2 decon board,
MCO-170HB must be attached to the unit in order to add the H2O2 decontamination
function, except MCO-170AICUVH/MCO-170AICUVHL

MIR Cooled Incubators

All-round performance

-10°C to 60°C



Model No.	MIR-154	MIR-254	MIR-554
Temperature Control Range	-10°C to 60°C (AT 5°C to 35°C)		
Interior Volume	123 litres	238 litres	406 litres
External Dimensions (W x D x H)*	700 x 580 x 1018 mm	700 x 580 x 1618 mm	800 x 832 x 1810 mm
Internal Dimensions (W x D x H)	620 x 368 x 555 mm	620 x 368 x 1088 mm	640 x 550 x 1160 mm
Net Weight (Approx.)	78 kg	108 kg	195 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

MIR Heated Incubators

Intuitive and easy operable Heated Incubators

Ambient temp. +5°C to 60°C (AT 0 to 20°C)
 Ambient temp. +5°C to 80°C (AT 20 to 35°C)



Model No.	MIR-H163	MIR-H263
Temperature Control Range	Ambient temp. +5°C to 60°C (AT 0°C to 20°C), Ambient temp. +5°C to 80°C (AT 20°C to 35°C)	
Interior Volume	93 litres	153 litres
External Dimensions (W x D x H)*	580 x 595 x 820 mm	730 x 645 x 870 mm
Internal Dimensions (W x D x H)	450 x 460 x 450 mm	600 x 510 x 500 mm
Net Weight (Approx.)	50 kg	67 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

0°C to 50°C (Lamp OFF)
 10°C to 50°C (Lamp ON)

MLR Climate Chambers

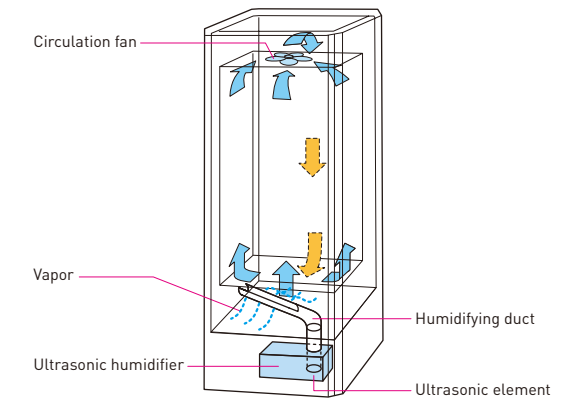
Versatile Climate Chambers



Model No.	MLR-352	MLR-352H
Temperature Control Range	0°C to 50°C (Light OFF) 10°C to 50°C (Light ON)	5°C to 50°C (Light OFF) 10°C to 50°C (Light ON)
Humidity Control Range	—	60 to 90 % RH (Light OFF) 55 to 85 % (Light ON)
Interior Volume	294 litres	
External Dimensions (W x D x H)*	760 x 700 x 1835 mm	
Internal Dimensions (W x D x H)	520 x 490 x 1135 mm	
Net Weight (Approx.)	226 kg	235 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections. H: Humidifier type

Humidity control function (only for H type)
 suited for raising plants



This holds an ultrasound humidifier controlled by a PID controller, making it able to control the humidity of an area of 60 — 90% RH (fluorescent light off). Furthermore, it is able to humidify the chamber with the L-shaped humidifying pipe installed at the bottom of the chamber.

Sterilization

MLS Portable Laboratory Autoclaves

Convenient sterilisation on demand offers great flexibility

45°C to 135°C



Model No.	MLS-3751L	MLS-3781L
Temperature Control Range	45°C to 135°C	
Effective Internal Capacity	50 litres	75 litres
External Dimensions (W x D x H)*	478 x 632 x 748 mm	478 x 632 x 965 mm
Chamber Dimensions (dia. x depth)	370 x 415 mm	370 x 630 mm
Net Weight (Approx.)	61 kg	71 kg

* External dimensions of main cabinet only - see dimension drawings on flyers showing handles and other external projections.

Models MLS-3751L/MLS-3781L are for laboratory use.



* Not all products are available in all countries. Please inquire at the closest dealer for more information

* The information contained in this brochure is as of October 2019.

* Appearance and specifications are subject to change without notice

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