MDF
Технические характеристики

Ultra-low Temperature Freezer | MDF-DU302VX Twin*Guard*

Ultimate Sample Protection

New optimised Dual Cooling System "Twin*Guard*" comprised of independent dual cooling circuits realises -86˚C and one side of the cooling circuits maintains chamber temperature at -70˚C.

Efficient Sample Storage

New cabinet design combines an insulated outer door with superior storage efficiency and an inner door designed for uniform temperature distribution.

Intelligent Interface

The newly developed ergonomic "**EZlatch**" door handle makes access to stored samples even easier. Intuitive and intelligible large colour LCD touchpanel is provided.

Model Number		MDF-DU302VX	
External dimensions (W x D x H) [1]	mm	670 x 882 x 1840	
Internal dimensions (W x D x H)	mm	490 x 600 x 1230	
Volume	litres	360	
Net weight	kg	225	
Capacity [2]	2" boxes	240	
Performance			
Cooling performance [3]	°C	-86	
Temperature setting range	°C	-90 to -50	
Temperature control range [3]	°C	-86 to -50	
Control			
Controller		Microprocessor, non-volatile memory	
Display		LCD Touchpanel	
Temperature sensor		Pt-1000	
Refrigeration			
Refrigeration system		Independent Dual-Cooling	
Compressors	W	2 x 450	
Refrigerant		HFC mixed	
Insulation material		PUF / VIP PLUS	
Insulation thickness	mm	80	
Construction			
Exterior material		Painted Steel	
Interior material		Painted Steel	
Outer door	qty	1	
Outer door lock		Y	
Inner doors	qty	2 pieces	
Shelves	qty	3 (stainless steel)	
Max. load - per shelf	kg	50	
Max. load - total	kg	365 [4]	
Vacuum release port		2 (1 automatic, 1 manual)	
Access port	qty	3	
Access port position		3 locations (rear x 1, bottom x 2)	
Access port diameter	Ø mm	17	
Casters	qty	4 (2 leveling feet)	
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)	
Power failure		V-B-R	
High temperature		V-B-R	
Low temperature		V-B-R	
Filter		Filterless design	
Door open		V-B	
Electrical and Noise Level		**MDF-DU302VX-PE**	**MDF-DU302VX-PA**
Power supply	V	220 / 230 / 240	220
Frequency	Hz	50	60
Power Consumption (230V/50Hz) SV-80°C	kWh/day	AT23°C: 9.67 (Normal) / 8.27 (ECO) AT30°C: 10.66 (Normal) / 10.40 (ECO)	
Noise level [5]	dB (A)	52	
Options			
Liquid CO$_2$ back-up		MDF-UB7-PW	
Inventory rack		IR-224U-PW, IR-316U-PW	
Temperature recorders - Circular type		MTR-G85C-PE [6] - Chart paper: RP-G85-PW - Ink pen: PG-R-PW	
Temperature recorders - Continuous strip type		MTR-85H-PW [6] - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW	
Optional Communication Systems			
Digital interface (RS232C/RS485) [7]		MTR-480-PW	
Ethernet interface (LAN) [7]		MTR-L03-PW	
Quality Management System			
Certification		ISO 9001	

[1] Exterior dimensions of main cabinet only, excluding handle and other external projections.
[2] Usable storage capacity of 2" boxes when the original 3 trays installed.
[3] Air temperature measured at freezer centre, ambient temperature 30˚C, no load.
[4] Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.

[5] Nominal value - Background noise 20 dB(A).
[6] Requires sensor cover MTR-DU700SF-PW.
[7] Only for MTR-5000 (data acquisition system) users.

Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.
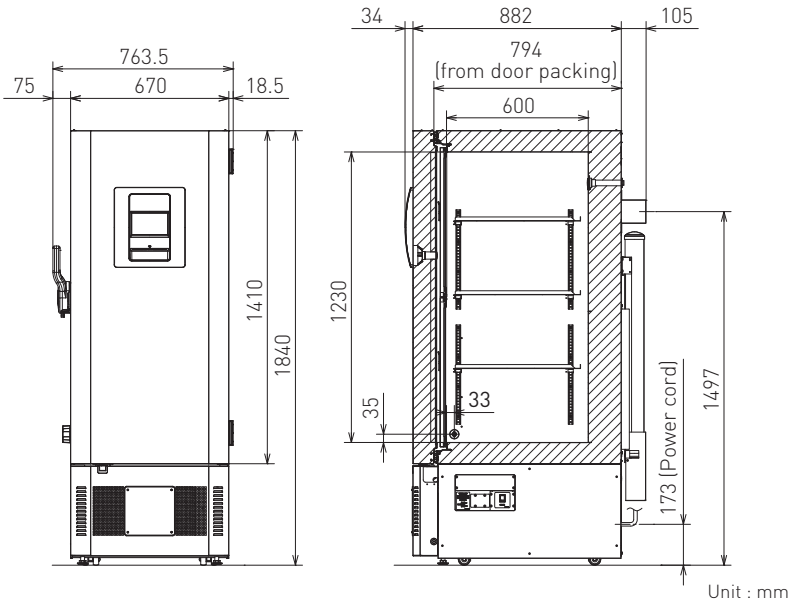
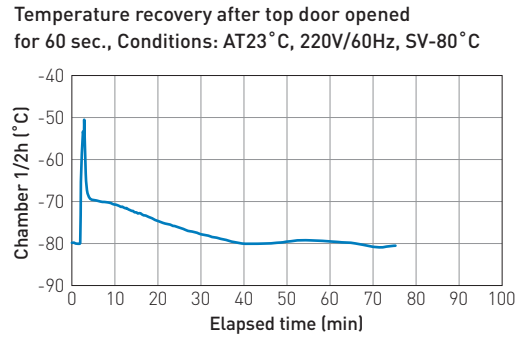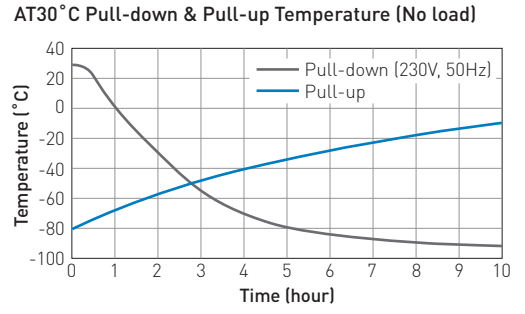## Reliable control-lability and data log function

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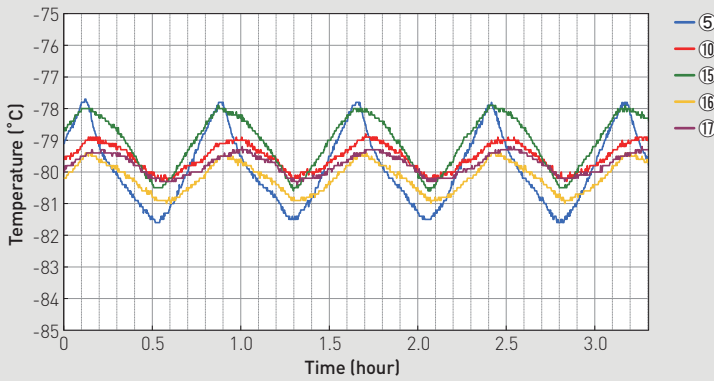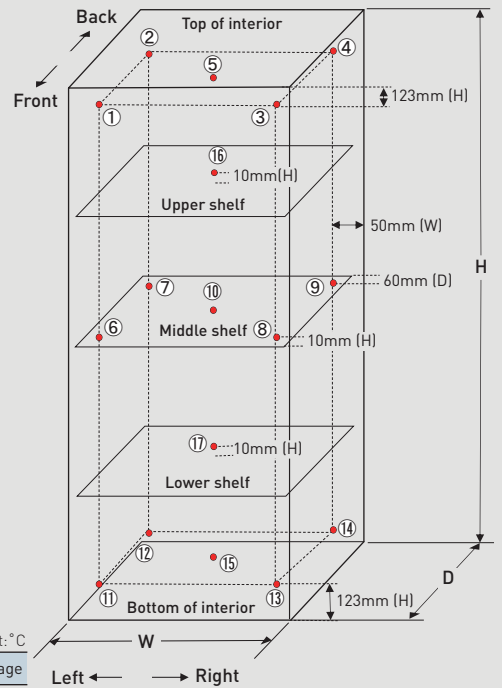
Dimensions

763.5
670
75
18.5

34
882
105
794
(from door packing)
600

1410
1840

1230
35
33
1497
173 (Power cord)

Unit : mm

Performance Data

AT30˚C Pull-down & Pull-up Temperature (No load)

Temperature (°C) / Time (hour)

— Pull-down (230V, 50Hz)
— Pull-up

Temperature recovery after top door opened for 60 sec., Conditions: AT23˚C, 220V/60Hz, SV-80˚C

Chamber 1/2h (°C) / Elapsed time (min)

Temperature Stability

Condition: SV-80˚C, AT23˚C Normal-mode 230V/50Hz, no load

Temperature (°C) / Time (hour)

⑤ ⑩ ⑮ ⑯ ⑰

Temperature uniformity – 17 points measuring

Back
Front
Top of interior
123mm (H)
10mm(H)
Upper shelf
50mm (W)
60mm (D)
Middle shelf
10mm (H)
10mm (H)
Lower shelf
Bottom of interior
123mm (H)
H
D
W
Left ← → Right

Internal Temperature Uniformity (Reference Data)

Distribution data
Temperature of the cycle in each area (SV-80˚C, air temperature)

Conditions
Load: Unloaded

Ambient temperature 23˚C Normal-mode 230V/50Hz

Unit:˚C

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰	Average
Maximum	-76.1	-76.9	-75.7	-77.1	-77.8	-78.4	-78.8	-77.9	-78.5	-78.8	-77.1	-77.7	-77.2	-77.8	-77.9	-79.4	-79.2	—
Minimum	-81.4	-82.6	-80.9	-82.8	-81.6	-80.2	-81.0	-79.7	-81.0	-80.3	-80.1	-80.7	-80.6	-81.2	-80.6	-81.0	-80.4	—
Middle of cycle	-78.8	-79.8	-78.3	-80.0	-79.7	-79.3	-79.9	-78.8	-79.8	-79.6	-78.6	-79.2	-78.9	-79.5	-79.3	-80.2	-79.8	-79.4

Twin*Guard*

-86˚C Ultra-Low Temperature Freezer

DUAL cooling system

VIP PLUS vacuum insulation

EZlatch door handle

528 L / 729 L

MDF-DU502VX

MDF-DU702VX

Ultra-low temperature storage solution for valuable samples. Twin*Guard* equipped with new Dual Cooling System.

New Twin*Guard* adopts optimised Dual Cooling System and new cabinet design with enhanced insulation performance and storage capacity.

Superior cooling performance focused on reliability and safety suitable even for mass sample storage like biobank use.

Ultimate Sample Protection

New optimised Dual Cooling System "Twin*Guard*" comprised of independent dual cooling circuits realises -86˚C and one side of the cooling circuits maintains chamber temperature at -70˚C.

The freezer can minimise risk of compromising valuable samples.
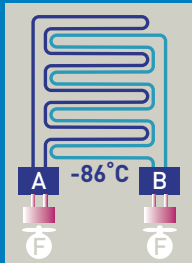
-86˚C
A
B

Efficient Sample Storage

New cabinet design combines an insulated outer door with superior storage efficiency and an inner door designed for uniform temperature distribution. This improves storage efficiency approximately 10 % (576 pcs of 2-inch Cryo boxes can be stored in the MDF-DU702VX) while maintaining the same footprint as conventional models.

576 pcs of 2 inch boxes

Intelligent Interface

The newly developed ergonomic "EZlatch" door handle makes access to stored samples even easier. Intuitive and intelligible large colour LCD touchpanel is provided.

ECO operation and energy saving

Model Number	Operation mode	Energy-saving rate*1	Conventional Model No.
MDF-DU502VX	Normal	18%	MDF-U500VX
	ECO	22%	
MDF-DU702VX	Normal	19%	MDF-U700VX
	ECO	22%	

Improved insulating performance cuts power consumption approximately 22 %*2 compared to conventional models when the ECO mode is selected, thanks to the effective combination of VIP Plus insulation and the next-generation cabinet.
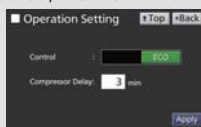
*1 Power consumption per 2 inch box.
  Power source: 230 V 50 Hz, AT 23°C
*2 Compared to conventional models. Power consumption per 2 inch box. Power source: 230 V 50 Hz, AT 23°C

Flexible shelf layout

The inner space offers flexible storage, allowing either three or four shelves*3 and chamber bottom to be used. Also, an inner door with four or five small doors (optional) is available.

(5 pcs)

*3 Three shelves equipped as standard.

Reliable controllability and data log function

Large colour 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.

Twin*Guard* -86°C Ultra-Low Temperature Freezer

Approximately 110 mm*[1] installation width can be reduced when installing 3 units in line compared to conventional units.
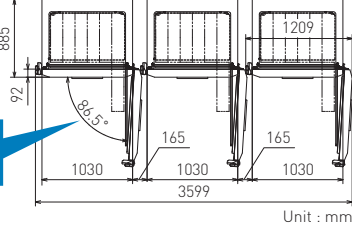
The "Chamfer-design" body front features a chamfered edge for reduced installation space when compared to conventional models in a multiple unit installation. The design is especially suitable for a biobank or similar application.

*[1] Comparison of MDF-DU702VX and the conventional MDF-U700VX product. Comparison condition: Minimum width required when installing 3 units in line. This prevents outer doors from contacting each other for door openings/closings.

Opening the inner door to 90 degrees lets storage racks be removed.

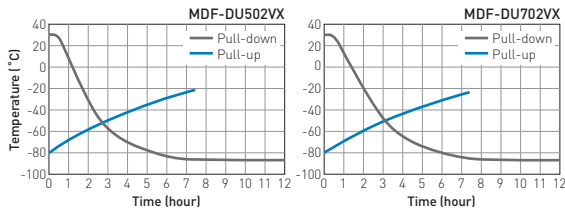1209 · 885 · 92 · 88.5° · 165 · 165 · 1030 · 1030 · 1030 · 3599

Unit : mm

User friendly for daily operation with newly developed vacuum release port and fivefold gasket

Newly developed automatic vacuum release port and fivefold gasket are adopted. Automatic release of negative pressure and reduced frost realise user friendliness even for frequent door opening.
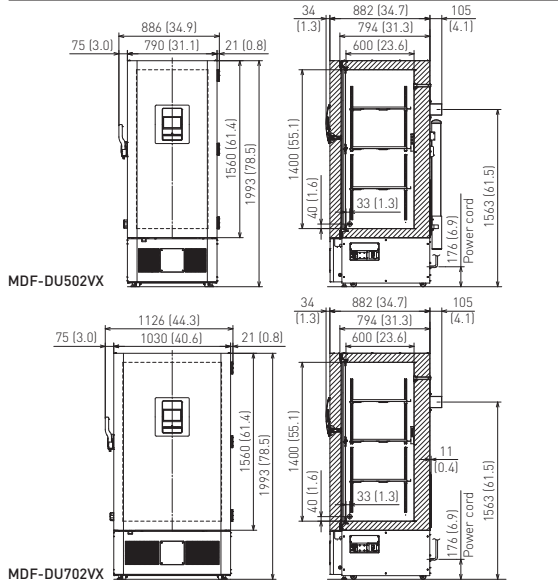
Performance Data

AT30°C Pull-down & Pull-up Temperature

MDF-DU502VX — Pull-down / Pull-up
Temperature (°C) · Time (hour)

MDF-DU702VX — Pull-down / Pull-up
Temperature (°C) · Time (hour)

Dimensions

Unit : mm (inch)

MDF-DU502VX
886 [34.9] · 790 [31.1] · 75 [3.0] · 21 [0.8] · 1560 [61.4] · 1993 [78.5]
34 [1.3] · 882 [34.7] · 794 [31.3] · 105 [4.1] · 600 [23.6] · 1400 [55.1] · 40 [1.6] · 33 [1.3] · 176 [6.9] · 1563 [61.5] · Power cord

MDF-DU702VX
1126 [44.3] · 1030 [40.6] · 75 [3.0] · 21 [0.8] · 1560 [61.4] · 1993 [78.5]
34 [1.3] · 882 [34.7] · 794 [31.3] · 105 [4.1] · 600 [23.6] · 1400 [55.1] · 40 [1.6] · 11 [0.4] · 33 [1.3] · 176 [6.9] · 1563 [61.5] · Power cord

Model Number		MDF-DU502VX-PE	MDF-DU502VX-PB MDF-DU502VXC-PA	MDF-DU702VX-PE	MDF-DU702VX-PB MDF-DU702VXC-PA
External dimensions (W x D x H) [1]	mm	790 x 882 x 1993		1030 x 882 x 1993	
Internal dimensions (W x D x H)	mm	630 x 600 x 1400		870 x 600 x 1400	
Volume	litres	528		729	
Net weight	kg	285	285 294	328	328 338
Capacity [2]	2" boxes	384		576	
Performance					
Cooling performance [3]	°C	-86			
Temperature setting range	°C	-50 to -90			
Temperature control range [3]	°C	-50 to -86			
Control					
Controller		Microprocessor, non-volatile memory			
Display		LCD Touchpanel			
Temperature sensor		Pt-1000			
Refrigeration					
Refrigeration system		Independent Dual-Cooling			
Compressors	W	2 x 1100			
Refrigerant		HFC mixed			
Insulation material		PUF / VIP PLUS			
Insulation thickness	mm	80			
Construction					
Exterior material		Painted Steel			
Interior material		Painted Steel			
Outer door	qty	1			
Outer door lock		Y			
Inner doors	qty	2 pieces			
Shelves	qty	3 (stainless steel)			
Max. load – per shelf	kg	50			
Max. load – total	kg	415 [4]		515 [4]	
Vacuum release port		2 (1 automatic, 1 manual)			
Access port	qty	3			
Access port position		3 locations (rear x 1, bottom x 2)			
Access port diameter	Ø mm	17			
Casters	qty	4 (2 leveling feet)			
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)			
Power failure		V-B-R			
High temperature		V-B-R			
Low temperature		V-B-R			
Filter		Filterless design			
Door open		V-B			
Electrical and Noise Level		MDF-DU502VX-PE	MDF-DU502VX-PB MDF-DU502VXC-PA	MDF-DU702VX-PE	MDF-DU702VX-PB MDF-DU702VXC-PA
Power supply	V	230 / 240	220	230 / 240	220
Frequency	Hz	50	50 (VX) / 60 (VXC)	50	50 (VX) / 60 (VXC)
Noise level [5]	dB (A)	52			
Options					
Small inner door kit	set of 5	MDF-5ID5-PW [6]		MDF-7ID5-PW [6]	
	set of 4	MDF-5ID4-PW		MDF-7ID4-PW	
Liquid CO2 back-up		MDF-UB7-PW			
Inventory rack		IR-224U-PW, IR-316U-PW			
Temperature recorders – Circular type		MTR-G85C-PE [7] - Chart paper: RP-G85-PW - Ink pen: PG-R-PW			
Temperature recorders – Continuous strip type		MTR-85H-PW [7] - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW			
Optional Communication Systems					
Digital interface (RS232C/RS485) [8]		MTR-480-PW			
Ethernet interface (LAN) [8]		MTR-L03-PW			

[1] Exterior dimensions of main cabinet only, excluding handle and other external projections.
[2] Usable storage capacity of 2" boxes when the original 3 trays installed.
[3] Air temperature measured at freezer centre, ambient temperature 30°C, no load.
[4] Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.

[5] Nominal value - Background noise 20 dB(A).
[6] Installation of small inner door kit may effect usable storage capacity.
[7] Requires sensor cover MTR-DU700SF-PW.
[8] Only for MTR-5000 (data acquisition system) users.

Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

TwinGuard ULT Freezers (-86°C)
MDF-U500VX

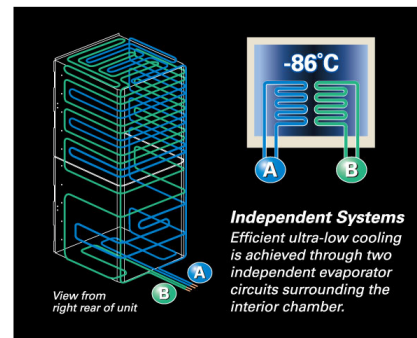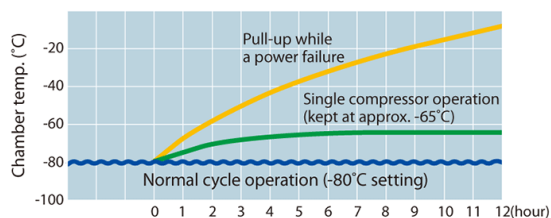| Effective capacity | 519L |
| Cooling Performance | -86℃ |

Features

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 designed 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 -65˚C.

-86˚C

Independent Systems
Efficient ultra-low cooling is achieved through two independent evaporator circuits surrounding the interior chamber.

View from right rear of unit

*Any unexpected failure on either of the single compressor will be alerted.

*The data is a measured example (AT23˚C, 230V/ 50Hz, no load.) Actual power consumption will vary depending on set and ambient conditions loading and local voltage.

Intelligent ECO mode operation
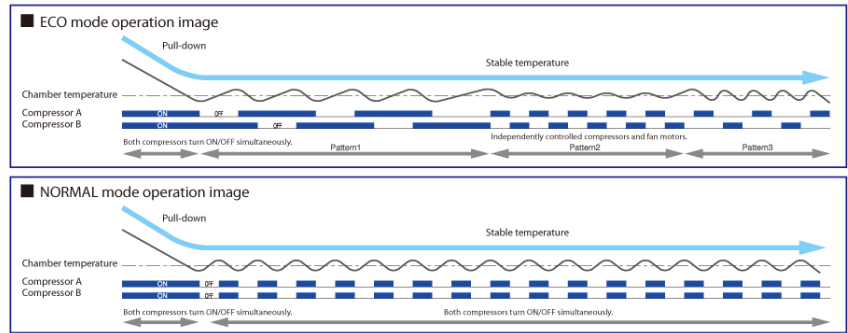
"ECO mode" is an industry first feature. The two compressors, A and B, are independently controlled to optimise operation efficiently to minimise energy consumption by monitoring freezer load status.

*Ambient temperature at 30˚C (-80˚C) *ECO mode's wave doesn't settle into pattern. It draws various pattern depends

Graphic control panel

Central LCD display control panel enhances operability and visibility. Data log function retains operation data for a preset period and the data can be directly transmitted to a PC via MTR-480-PW interface.
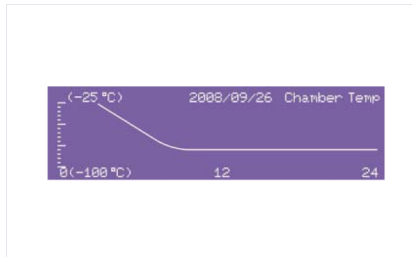
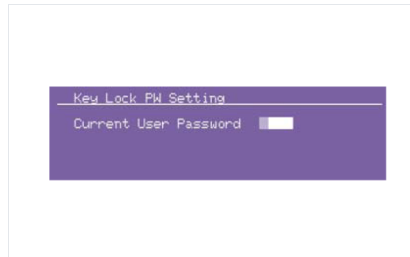*A software must be installed on PC to receive the log data transmission.

on SV, AT, and usage condition. *The data is a measured example (AT23°C, 230V/ 50Hz, no load.) Actual power consumption will vary depending on set and ambient conditions loading and local voltage.

■ ECO mode operation image

■ NORMAL mode operation image

The microprocessor has a memory back-up so after a power failure, operation resumes at pre-outage settings. The self diagnostics function will display an error code in the case of abnormality
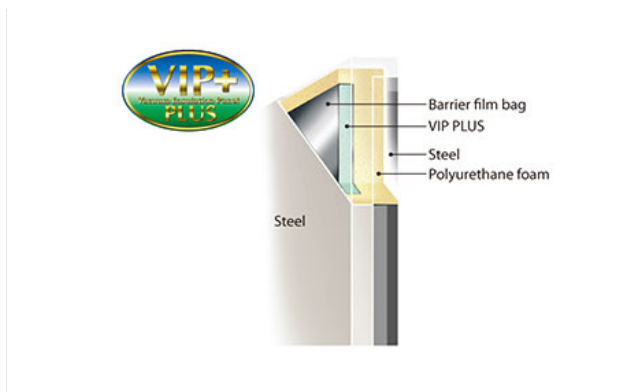

Data management by logging function

Pass word access

Error messages

High efficiency insulation using V.I.P. technology

MDF-U500VX is equipped with a 6 times stronger thermal resistance VIP PLUS while keeping the same wall thickness but with more rigid foam polyurethane.

User-friendly design

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

Status Alert

Installation space

Example of MDF-DU700VH

The VIP panel reduced the cabinet wall thickness from 140mm to 70mm and achieved nearly 30% more storage capacity than conventionally insulated freezers, all without increasing its footprint.

Improved air seal heat resistance structure

To allow the eco mode, and to reduce the frosting, the chamber has a well sealed structure.

Unconventional operation can cause malfunctions. Function control monitor notifies the unconventional operation to prevent the problems and helps the safe operation.

It always monitors the operation, and the flash lamp notifies the drops in the voltage, an abnormality of the temperature rise when the ambient temp is over 35°C, lower than approximately 0°C,and overload operation. It also notifies the time of battery replacement, and the door status.

The status of these alarms and indicators will be shown on the control panel.

Product Photos

Specfications

External Dimensions (W x D x H)	770 x 870 x 1990 mm
Internal Dimensions (W x D x H)	630 x 600 x 1380 mm
Volume	519 litres
Net Weight	320 kg
Capacity (2" Boxes in Stainless Steel Racks)	352 (2" boxes)
Capacity (3" Boxes in Stainless Steel Racks)	224 (2" boxes)
Cooling Performance	-86 °C
Temperature Setting Range	-50 to -90 °C
Temperature Control Range	-50 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LCD digital display with numerical keys
Temperature Sensor	Pt-1000
Refrigeration System	Independent Dual-Cooling

Compressors	2 x 1100 W
Refrigerant	HFC
Insulation Material	PUF / VIP Plus
Insulation Thickness	-
Exterior Material	Painted Steel
Interior Material	Painted Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	2
Shelves	3
Max. Load - Per Shelf	50 kg
Max. Load - Total	-
Vacuum Release Port	1 (manual)
Access Port	3
Access Port Position	back x 1, bottom x 2
Access Port Diameter	17
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	N/A (filter-less)
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	53 dB [A]

Accessories

Options

Small Inner Door Kit	MDF-5ID-PW
Liquid CO_2 back-up	CVK-UB2-PW
Temperature recorders	
- Circular type	MTR-G85C-PE, MTR-G85A-PA

- Continuous strip type	MTR-85H-PW
- Recorder housing	MDF-S3085-PW (for MTR-85H)

Price

MDF-U500VX	Price Upon Inquiry. Please contact your local dealers.

Dimensions

Unit : mm
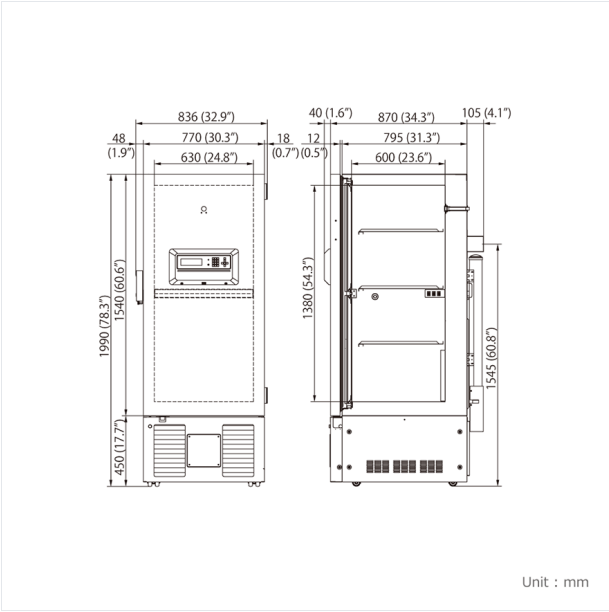
TwinGuard ULT Freezers (-86°C)

MDF-U700VX

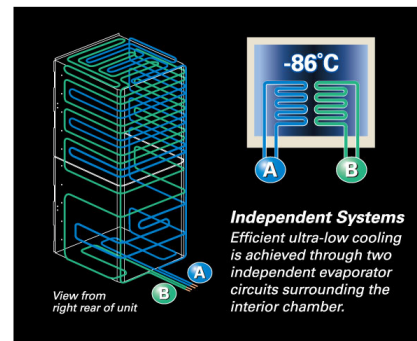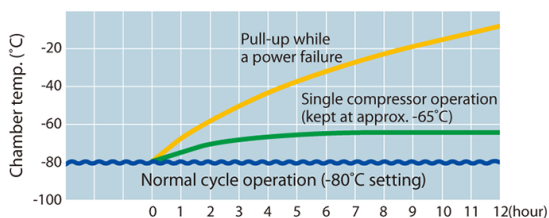| Effective capacity | 728L |
| Cooling Performance | -86℃ |

Features

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 designed 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 -65°C.

*Any unexpected failure on either of the single compressor will be alerted.

*The data is a measured example (AT23°C, 230V/ 50Hz, no load.) Actual power consumption will vary depending on set and ambient conditions loading and local voltage.

Intelligent ECO mode operation

"ECO mode" is an industry first feature. The two compressors, A and B, are independently controlled to optimise operation efficiently to minimise energy consumption by monitoring freezer load status.

*Ambient temperature at 30°C (-80°C) *ECO mode's wave doesn't settle into pattern. It draws various pattern depends

Graphic control panel

Central LCD display control panel enhances operability and visibility. Data log function retains operation data for a preset period and the data can be directly transmitted to a PC via MTR-480-PW interface.

*A software must be installed on PC to receive the log data transmission.

on SV, AT, and usage condition. *The data is a measured example (AT23˚C, 230V/ 50Hz, no load.) Actual power consumption will vary depending on set and ambient conditions loading and local voltage.

- ■ ECO mode operation image
- ■ NORMAL mode operation image

The microprocessor has a memory back-up so after a power failure, operation resumes at pre-outage settings. The self diagnostics function will display an error code in the case of abnormality

Data management by logging function

Pass word access

Error messages

High efficiency insulation using V.I.P. technology

- Barrier film bag
- VIP PLUS
- Steel
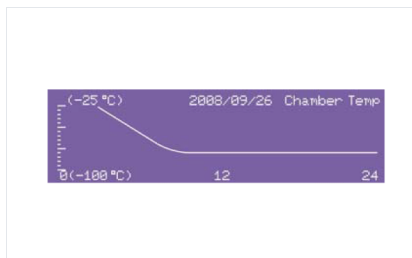- Polyurethane foam

Steel

MDF-U500VX is equipped with a 6 times stronger thermal resistance VIP PLUS while keeping the same wall thickness but with more rigid foam polyurethane.

User-friendly design

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

Status Alert

Installation space

Example of MDF-DU700VH

The VIP panel reduced the cabinet wall thickness from 140mm to 70mm and achieved nearly 30% more storage capacity than conventionally insulated freezers, all without increasing its footprint.

Improved air seal heat resistance structure

To allow the eco mode, and to reduce the frosting, the chamber has a well sealed structure.

Unconventional operation can cause malfunctions. Function control monitor notifies the unconventional operation to prevent the problems and helps the safe operation.

It always monitors the operation, and the flash lamp notifies the drops in the voltage, an abnormality of the temperature rise when the ambient temp is over 35˚C, lower than approximately 0˚C,and overload operation. It also notifies the time of battery replacement, and the door status.

The status of these alarms and indicators will be shown on the control panel.

Vacuum release port

The vacuum release port allows smooth door openings. The door seal is tightened by a negative pressure generated from the temperature difference between inside the chamber and the ambient environment.
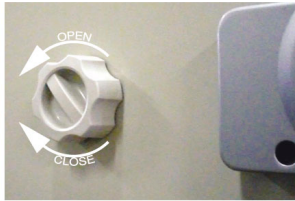
Door latch

The outer door latch closes smoothly with a single-hand action over a cam action bearing. The outer door can be secured with an independent padlock provided by customer.

Maintenance-free filterless design

Filterless Construction eliminates bothersome filter cleaning.

*If the port is kept open, the air intake hole get frozen and clogged, and will not allow the door to open smoothly. We recommend to keep it closed unless it is neccessory.

Features

· Dual cooling system

· Intelligent ECO mode operation

· Maximised capacity with VIP PLUS Technology

· Maintenance-free Filterless design

Product Photos

MDF-DC700VX
MDF-DC700VXC

Twin*Guard*

-86°C Ultra-Low Temperature Freezers

DUAL cooling system

VIP PLUS vacuum insulation

575 L / 715 L

PHCbi's Twin*Guard* -86°C chest freezers deliver the unsurpassed level of safety and sample security that is critical for valuable biological sample storage alongside exceptional ease of use and data monitoring.

Ultimate Sample Protection

The Dual Cooling System "TwinGuard" comprised of independent dual cooling circuits delivers -86°C, and one side of the cooling circuits maintains a chamber temperature at -65°C. The freezer minimises the risk of compromising valuable samples.

Improved Temperature Performance

Twin*Guard* chest freezers maintain better temperature stability and uniformity during routine door openings than equivalent upright models as less cold air escapes the freezer while the door is open.

Enhanced Use & Intelligent Security

A colour LCD touch panel allows full user control, even with gloved hands, while the USB port makes transferring logged data to a PC convenient. The filterless design of the freezers reduces routine maintenance.

Twin*Guard*

Dual Cooling Compressors
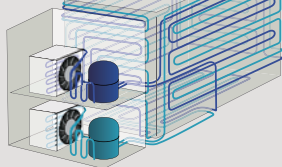
Valuable Sample Storage

With two independent systems, each sustaining ultra-low temperatures, your samples remain safe. Optional CO_2 backup provides an extra layer of protection.
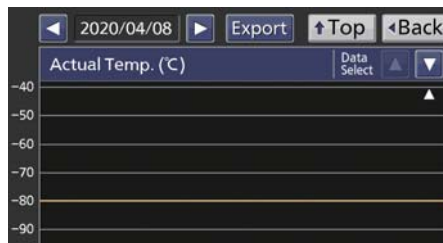
Predictive Maintenance

Performance monitoring ensures the freezer is operating within specifications. This protects the compressors and condenser fans. External stress on the compressors or fans, due to ambient temperature abnormality or excess load, is displayed for immediate notification.

Restricted Access Laboratories

Significantly extended critical time to react to any sudden mechanical failure. Ideal for high security applications.

Twin*Guard*

-86°C Ultra-Low Temperature Freezers

MDF-DC500VX

Filterless Design

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

Improved Temperature Performance

The TwinGuard -86°C chest freezer design provides optimal temperature stability and uniformity during routine lid openings, minimizing the loss of cold air even when the freezer lid is open.

Performance Data

AT30˚C Pull-down & Pull-up Temperature

Dimensions

Unit : mm

MDF-DC500VX

MDF-DC700VX
MDF-DC700VXC

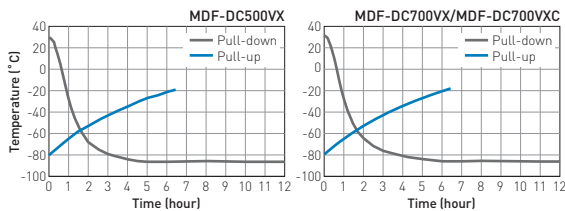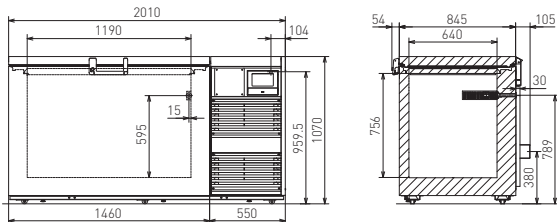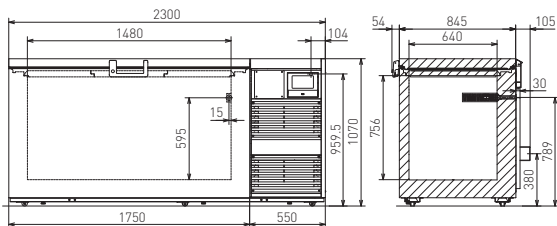| Model Number		MDF-DC500VX-PE	MDF-DC700VX-PE	MDF-DC700VXC-PA
External dimensions (W x D x H) [1]	mm	2010 x 845 x 1070	2300 x 845 x 1070	
Internal dimensions (W x D x H)	mm	1190 x 640 x 756	1480 x 640 x 756	
Volume	litres	575	715	
Net weight	kg	328	358	366
Capacity	2" boxes	416	520	
Performance				
Cooling performance [2]	°C	-86		
Temperature setting range	°C	-50 to -90		
Temperature control range [2]	°C	-50 to -86		
Control				
Controller		Microprocessor, non-volatile memory		
Display		LCD Touch Screen		
Temperature sensor		Pt-1000		
Refrigeration				
Refrigeration system		Independent Dual-Cooling		
Compressors	W	2 x 1100		
Refrigerant		HFC mixed		
Insulation material		PUF / VIP PLUS		
Construction				
Exterior material		Painted Steel		
Interior material		Stainless Steel		
Outer doors/lid	qty	1		
Outer door lock		Y		
Inner doors/lid		3 pieces (Styrofoam)		
Access port	qty	1		
Access port position		Back		
Access port diameter	Ø mm	17		
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)		
Power failure		V-B-R		
High temperature		V-B-R		
Low temperature		V-B-R		
Filter		Filterless design		
Door open		V-B		
Electrical and Noise Level		MDF-DC500VX-PE	MDF-DC700VX-PE	MDF-DC700VXC-PA
Power supply	V	230 / 240		220
Frequency	Hz	50		60
Noise level [3]	dB (A)	52		
Options				
Liquid CO₂ back-up		MDF-UB5-PW		
Temperature recorders — Circular type		MTR-G85C-PE — Chart paper: RP-G85-PW — Ink pen: PG-R-PW		
Temperature recorders — Continuous strip type		MTR-85H-PW — Chart paper: RP-85-PW — Ink pen: DF-38FP-PW — Recorder housing: MDF-S3085-PW		
Optional Communication Systems				
Ethernet interface (LAN) [4]		MTR-L03-PW		
Digital interface (RS232C/RS485) [4]		MTR-480-PW		
Quality Management System				
Certification		ISO9001		

[1] External dimensions of main cabinet only, excluding handle and other external projections - See dimensions drawings on website for full details.
[2] Air temperature measured at freezer centre, ambient temperature +30ºC, no load.
[3] Nominal value - Background noise 20dB(A)
[4] Only for MTR-5000 (data acquisition system) users.

Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.

MDF-DU901VHL

VIP ECO

Large Volume
-86°C Ultra-Low Temperature Freezers with Natural Refrigerants

ECO natural refrigerants **IC+** inverter compressor **VIP PLUS** vacuum insulation **EZlatch** door handle

845 L

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

Both **VIP ECO** models are large volume high performance -86°C upright freezers ideal for use in biorepositories or facilities where bulk storage of sensitive biological is managed. Natural refrigerants minimise its energy consumption to reduce environmental impact. **VIP ECOs** allow a footprint of just 1m² for maximum storage.

Natural Refrigerants and Inverter Technology

Naturally occuring hydrocarbon [HC] refrigerants have minimal effect on the environment and are compliant with environmental legislation for climate control. Combined with inverter technology, these refrigerants also provide more efficient cooling without compromising cooling performance, ambient tolerance and recovery speeds following door openings.

Maximum Sample Storage

The use of space-saving patented VIP PLUS insulated panels within the freezer cabinet allows a capacity of up to 616 2" boxes inside a footprint of just 1 m² for maximum storage. The freezer's conventional depth allows for easy installation.

Ergonomic Design

The computer designed EZlatch is central to an overall freezer access system. This is comprised of the outer and inner doors, door gaskets, positive inner and outer door latches and a vacuum relief port. These individual components together assure comfortable operation, sample security, temperature integrity and control of frost build-up.

Energy efficient performance

Natural refrigerants, compressors and integrated electronics combine to lower operating costs by up to 45%*. Freezer operation is managed by effectively balancing temperature performance and energy management.

* Compared to conventional models.
  Power source: 220V/230V/240V 50Hz, Ambient temperature 30°C

High capacity sample storage

As sample volumes in biorepositories and biobanks increase exponentially, the high capacity storage chamber offers space for expansion and overflow from crowded smaller freezers.

Reliable controllability and data log function

The large colour 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 ECO

-86°C Ultra-Low Temperature Freezers with Natural Refrigerants

Inverter Compressors

While conventional freezers use a single-speed compressor's on/off cycle, our **VIP ECO** ultra-low temperature freezers use inverter compressors that can run at different speeds to maximise cooling performance under different conditions. Combined with hydrocarbon refrigerants, these compressors ensure the most efficient energy use and reduced heat output.

VIP Plus Insulated Panels

Inside-out engineering starts with a VIP Plus insulation composite which results in an efficient, thin-wall cabinet. Insulated inner doors improve temperature uniformity and cold air loss during door openings and extended warm-up times during power outages.

Temperature Uniformity

As interior air temperature stabilises at the desired set point, large mass storage volume sustains tight temperature uniformity of the load inside the insulated cabinet.
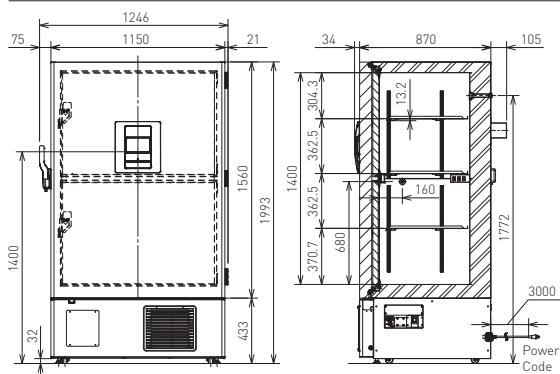
Performance Data

AT30°C Pull-down & Pull-up Temperature [2]

Pull-up
Pull-down (220 V, 50 Hz)
Pull-down (230 V, 50 Hz)
Pull-down (240 V, 50 Hz)
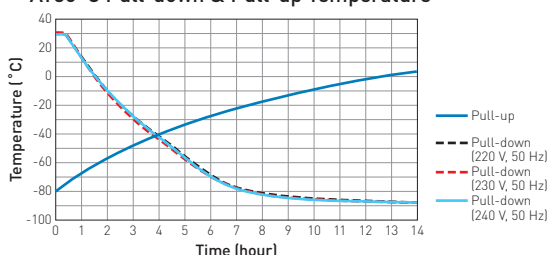
Dimensions

Unit : mm

CE (220/230/240 V, 50 Hz)

Model Number		MDF-DU901VHL-PE	MDF-DU901VHA-PA
External dimensions (W x D x H) [1]	mm	1150 x 870 x 1993	
Internal dimensions (W x D x H)	mm	1010 x 600 x 1400	
Volume	litres	845	
Net weight	kg	328	
Capacity	2" boxes	616	
Performance			
Cooling performance [2]	°C	-86	
Temperature setting range	°C	-50 to -90	
Temperature control range [2]	°C	-50 to -86	
Control			
Controller		Microprocessor, non-volatile memory	
Display		LCD Touchpanel	
Temperature sensor		Pt-1000	
Refrigeration			
Refrigeration system		Cascade	
Compressors	W	2 x 1000	
Refrigerant		HC	
Insulation material		Rigid polyurethane foam (PUF) / VIP PLUS	
Insulation thickness	mm	70	
Construction			
Exterior material		Painted Steel	
Interior material		Painted Steel	
Outer door	qty	1	
Outer door lock		Y	
Inner doors	qty	2 pieces (insulated)	
Shelves	qty	3 (stainless steel)	
Max. load - per shelf	kg	50	
Vacuum release port		Y	
Access port	qty	2	
Access port position		Back, Bottom	
Access port diameter	Ø mm	17	
Casters	qty	4 (2 leveling feet)	
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)	
Power failure		V-B-R	
High temperature		V-B-R	
Low temperature		V-B-R	
Filter		V	
Door open		V-B	
Electrical and Noise Level		MDF-DU901VHL-PE	MDF-DU901VHA-PA
Power supply	V	220/230/240	115
Frequency	Hz	50	60
Noise level [3]	dB (A)	52	
Options			
Small inner door kit	set of 2	MDF-9ID-PW (max 2) [4]	
Liquid CO₂ back-up		MDF-UB7-PW	
Inventory rack		IR-224U-PW, IR-220U-PW	
Temperature recorders - Circular type		MTR-G85C-PE [5]	MTR-G85A-PA [5]
		- Chart paper: RP-G85-PW	
		- Ink pen: PG-R-PW	
Temperature recorders - Continuous strip type		MTR-85H-PW [5] - Chart paper: RP-85-PW	
		- Ink pen: DF-38FP-PW	
		- Recorder housing: MDF-S3085-PW	
Optional Communication Systems			
Digital interface (RS232C/RS485) [6]		MTR-480-PW	
Ethernet interface (LAN) [6]		MTR-L03-PW	
Quality Management System			
Certification		ISO 9001	

[1] Exterior dimensions of main cabinet only, excluding handle and other external projections.
[2] Air temperature measured at freezer centre, ambient temperature 30°C, no load.
[3] Nominal value - Background noise 20 dB(A).
[4] Installation of small inner door kit may effect usable storage capacity.
[5] Requires sensor cover MTR-DU700SF-PW.
[6] Only for MTR-5000 (data acquisition system) users.

• Appearance and specifications are subject to change without notice.

Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

VIP ECO

Natural Refrigerants Ultra-Low Temperature Freezer

-86ºC to -40ºC

ECO natural refrigerants · **IC+** inverter compressor · **VIP PLUS** vacuum insulation · **EZlatch** door handle

528 L / 729 L

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

The **VIP ECO** -86°C to -40°C upright freezer provides maximum sample storage capacity within an optimum footprint. When combined with natural refrigerants to minimise energy consumption, environmental impact is reduced.

MDF-DU502VH
MDF-DU502VHL

MDF-DU702VH
MDF-DU702VHL

Natural Refrigerants and Inverter Technology

Naturally occuring hydrocarbon [HC] refrigerants have minimal effect on the environment and are compliant with environmental legislation for climate control. Combined with inverter technology, these refrigerants also provide more efficient cooling without compromising cooling performance and ambient tolerance and recovery speeds following door openings.

Efficient Sample Storage

New cabinet design combines an insulated outer door with superior storage efficiency and an inner door designed for uniform temperature distribution. This improves storage efficiency approximately 10 % (576 pcs of 2-inch Cryo boxes can be stored in the MDF-DU702VH, MDF-DU702VHL) while maintaining the same footprint as conventional models.

576 pcs of 2 inch boxes

Intelligent Interface

The newly developed ergonomic "EZlatch" door handle makes access to stored samples even easier. Intuitive and intelligible large colour LCD touchpanel is provided.

Energy efficient performance

PERFORMANCE $

Natural refrigerants, compressors and integrated electronics combine to lower operating costs by up to 30%*. Freezer operation is managed by effectively balancing temperature performance and energy management.

* Compared to conventional models.
  Power source: 230V/240V 50Hz, AT 30°C

Flexible shelf layout

The inner space offers flexible storage, allowing either three or four shelves* and chamber bottom to be used. Also, an inner door with four or five small doors (optional) is available.

(4 pcs)

* Three shelves equipped as standard.

Reliable controllability and data log function

-80℃

Large colour 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.
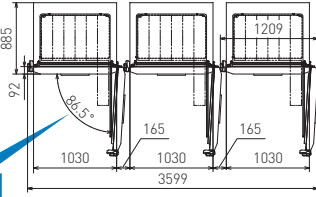
VIP ECO
Natural Refrigerants
Ultra-Low Temperature Freezer

Approximately 110 mm*[1] installation width can be reduced when installing 3 units in line compared to conventional units.

The "Chamfer-design" body front features a chamfered edge for reduced installation space when compared to conventional models in a multiple unit installation. The design is especially suitable for a biobank or similar application.

*[1] Comparison of MDF-DU702VH, MDF-DU702VHL and the conventional MDF-DU700VH product. Comparison condition: Minimum width required when installing 3 units in line. This prevents outer doors from contacting each other for door openings/closings.

Opening the inner door to 90 degrees lets storage racks be removed.
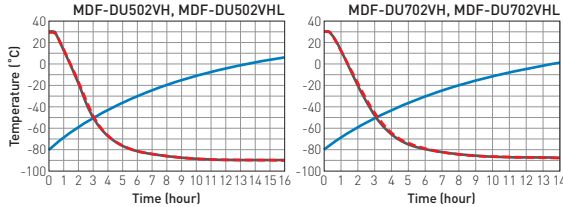
Unit : mm

User friendly for daily operation with newly developed vacuum release port and fivefold gasket

Newly developed automatic vacuum release port and fivefold gasket are adopted. Automatic release of negative pressure and reduced frost realise user friendliness even for frequent door opening.
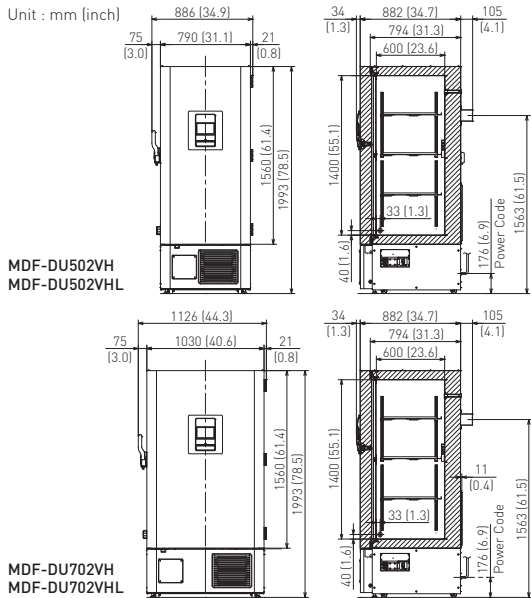
Performance Data

AT30˚C Pull-down & Pull-up Temperature

— Pull-down (230V, 50Hz) — Pull-up
-- Pull-down (220V, 60Hz)

MDF-DU502VH, MDF-DU502VHL

MDF-DU702VH, MDF-DU702VHL

Dimensions

Unit : mm (inch)

MDF-DU502VH
MDF-DU502VHL

MDF-DU702VH
MDF-DU702VHL

Model Number [9]		MDF-DU502VHL-PS MDF-DU502VH-PA MDF-DU502VH-PE	MDF-DU702VHL-PS MDF-DU702VH-PA MDF-DU702VH-PE
External dimensions (W x D x H) [1]	mm	790 x 882 x 1993	1030 x 882 x 1993
Internal dimensions (W x D x H)	mm	630 x 600 x 1400	870 x 600 x 1400
Volume	litres	528	729
Net weight	kg	246	278
Capacity [2]	2" boxes	384	576
Performance			
Cooling performance [3]	°C	-86 to -40	
Temperature setting range	°C	-90 to -40	
Temperature control range [3]	°C	-86 to -40	
Control			
Controller		Microprocessor, non-volatile memory	
Display		LCD Touchpanel	
Temperature sensor		Pt-1000	
Refrigeration			
Refrigeration system		Cascade	
Compressors	W	2 x 750	
Refrigerant		HC	
Insulation material		PUF / VIP PLUS	
Insulation thickness	mm	80	
Construction			
Exterior material		Painted Steel	
Interior material		Painted Steel	
Outer door	qty	1	
Outer door lock		Y	
Inner doors	qty	2 pieces	
Shelves	qty	3 (stainless steel)	
Max. load - per shelf	kg	50	
Max. load - total	kg	415 [4]	515 [4]
Vacuum release port		2 (1 automatic, 1 manual)	
Access port	qty	3	
Access port position		3 locations (rear x 1, bottom x 2)	
Access port diameter	Ø mm	17	
Casters	qty	4 (2 leveling feet)	
Alarms		**(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)**	
Power failure		V-B-R	
High temperature		V-B-R	
Low temperature		V-B-R	
Filter		V	
Door open		V-B	
Electrical and Noise Level			
Power supply	V	PA: 220 / PE: 220/230/240 / PS: 230	
Frequency	Hz	PA: 60 / PE: 50 / PS: 50	
Noise level [5]	dB (A)	52	
Options			
Small inner door kit	set of 5	MDF-5ID5-PW [6]	MDF-7ID5-PW [6]
	set of 4	MDF-5ID4-PW	MDF-7ID4-PW
Liquid CO₂ back-up		MDF-UB7-PW	
Inventory rack		IR-224U-PW, IR-316U-PW	
Temperature recorders - Circular type		MTR-G85C-PE [7] - Chart paper: RP-G85-PW - Ink pen: PG-R-PW	
Temperature recorders - Continuous strip type		MTR-85H-PW [7] - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW	
Optional Communication Systems			
Digital interface (RS232C/RS485) [8]		MTR-480-PW	
Ethernet interface (LAN) [8]		MTR-L03-PW	
Quality Management System			
Certification		ISO 9001	

1) Exterior dimensions of main cabinet only, excluding handle and other external projections.
2) Usable storage capacity of 2" boxes when the original 3 trays installed.
3) Air temperature measured at freezer centre, ambient temperature 30˚C, no load.
4) Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.
5) Nominal value - Background noise 20 dB[A].
6) Installation of small inner door kit may effect usable storage capacity.
7) Requires sensor cover MTR-DU700SF-PW.
8) Only for MTR-5000 (data acquisition system) users.
9) MDF-DU502VH, MDF-DU502VHL, MDF-DU702VH, MDF-DU702VHL are for laboratory use.

• Appearance and specifications are subject to change without notice.

Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

-86°C Ultra-low Temperature Freezer

VIP PLUS vacuum insulation

EZlatch door handle

845 L

PHCbi's MDF-DU900V -86°C Upright Freezer provides maximum sample storage capacity within an optimum footprint combined with industry leading cooling performance and reliability for an ideal long-term preservation solution.

MDF-DU900V

Maximum Sample Storage

The use of space saving VIP PLUS panels within the freezer cabinet allows a capacity of up to 616 2" boxes inside a footprint of just 1m^2 for maximum storage. The freezer's conventional depth allows for easy installation.

Reliable PHCbi Technologies

The compressors that are specifically designed for ultra-low temperature applications are employed in the proven PHCbi cascade refrigeration system ensuring high levels of performance and reliability.

Enhanced Use & Intelligent Security

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

High Capacity Sample Storage
Ideal for high volume and long term sample storage in biobanks and biorepositories.
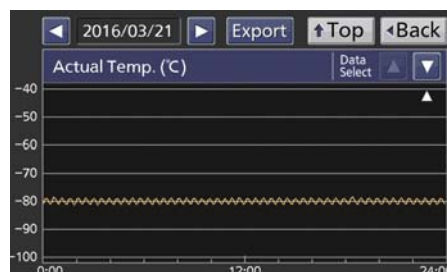
Dependable Preservation
Quality of design and manufacture ensures trusted and reliable storage that maintains the integrity of precious samples.

Easy Data Monitoring
Important information such as freezer temperature, door opening times and alarm history is logged for monitoring in GLP applications.

-86°C Ultra-Low Temperature Freezer

Application Specific Design

Refrigeration components are carefully selected and matched for optimum and efficient operation under demanding laboratory environments. This improves temperature recovery after door openings and sample placement, while ensuring lower internal temperatures for increased durability.

Microprocessor Control with Touch Screen Display

Managed and monitored by an integrated microprocessor controller with a comprehensive alarm system and self-diagnostic functions. Freezer temperature and important status information are clearly displayed and logged, with the possibility to export the data to USB.
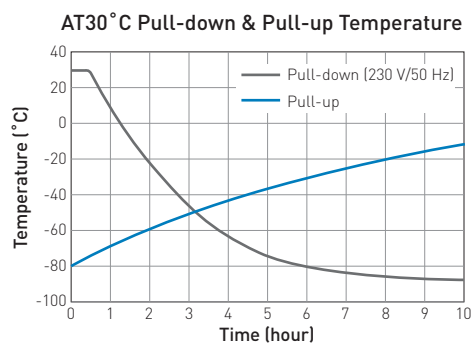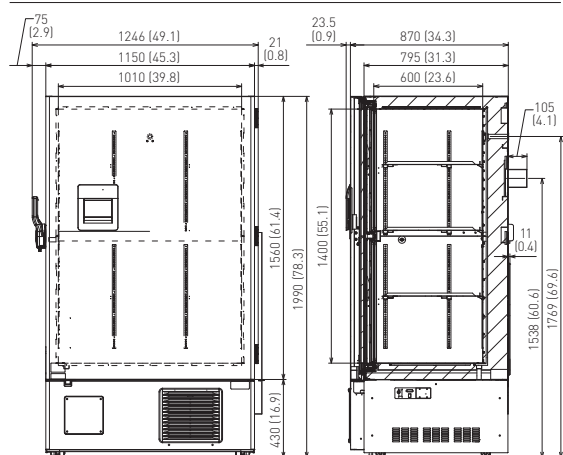
Performance Data

AT30°C Pull-down & Pull-up Temperature

- Pull-down (230 V/50 Hz)
- Pull-up

Dimensions

Unit : mm (inch)

Model Number		MDF-DU900V-PB	MDF-DU900V-PE	MDF-DU900VC-PA	MDF-DU900V-PK
External dimensions (W x D x H) [1]	mm	1150 x 870 x 1990			
Internal dimensions (W x D x H)	mm	1010 x 600 x 1400			
Volume	litres	845			
Net weight	kg	376		382	
Capacity	2" boxes	616			
Performance					
Cooling performance [2]	°C	-86			
Temperature setting range	°C	-50 to -90			
Temperature control range [2]	°C	-50 to -86			
Control					
Controller		Microprocessor, non-volatile memory			
Display		LCD Touch Screen			
Temperature sensor		Pt-1000			
Refrigeration					
Refrigeration system		Cascade			
Compressors	W	2 x 1100			
Refrigerant		HFC			
Insulation material		PUF / VIP PLUS			
Insulation thickness	mm	70			
Construction					
Exterior material		Painted Steel			
Interior material		Painted Steel			
Outer door	qty	1			
Outer door lock		Y			
Inner doors	qty	2 pieces (insulated)			
Shelves	qty	3 (stainless steel)			
Max. load – per shelf	kg	50			
Max. load – total	kg	574.2			
Vacuum release port		Y			
Access port	qty	2			
Access port position		Back, Bottom			
Access port diameter	Ø mm	17			
Casters	qty	4 (2 leveling feet)			
Alarms		**(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)**			
Power failure		V-B-R			
High temperature		V-B-R			
Low temperature		V-B-R			
Filter		V-B			
Door open		V-B			
Electrical and Noise Level		MDF-DU900V-PB	MDF-DU900V-PE	MDF-DU900VC-PA	MDF-DU900V-PK
Power supply	V	220	230 / 240	220	220
Frequency	Hz	50	50	60	60
Noise level [3]	dB (A)	52			
Options					
Small inner door kit	set of 2	MDF-9ID-PW (max 2) [4]			
Liquid CO$_2$ back-up		MDF-UB6B-PW			
Inventory rack		IR-224U-PW, IR-220U-PW			
Temperature recorders – Circular type		MTR-G85C-PE [5]	– Chart paper: RP-G85-PW		
			– Ink pen: PG-R-PW		
Temperature recorders – Continuous strip type		MTR-85H-PW [5]	– Chart paper: RP-85-PW		
			– Ink pen: DF-38FP-PW		
			– Recorder housing: MDF-S3085-PW		
Optional Communication Systems					
Digital interface (RS232C/RS485) [6]		MTR-480-PW			
Ethernet interface (LAN) [6]		MTR-L03-PW			

[1] Exterior dimensions of main cabinet only, excluding handle and other external projections.
[2] Air temperature measured at freezer centre, ambient temperature 30°C, no load.
[3] Nominal value - Background noise 20 dB[A].
[4] Installation of small inner door kit may effect usable storage capacity.
[5] Requires sensor cover MTR-DU700SF-PW.
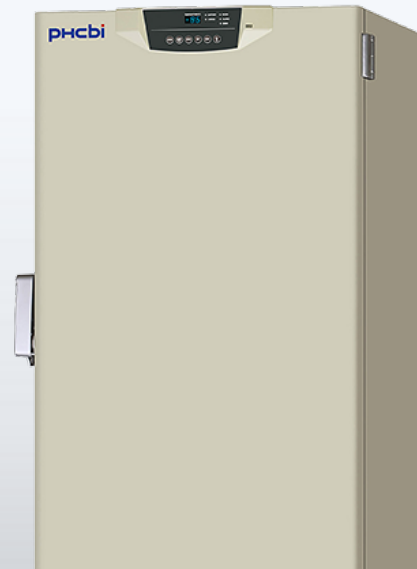[6] Only for MTR-5000 (data acquisition system) users.
Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

MDF-U55V VIP ULT Freezer

| Effective capacity | 519L |
| Cooling Performance | -86℃ |

VIP PLUS vacuum insulation

Features

Excellent reliability and uniformity within an optimal footprint

The VIP ULtra Low Freezer MDF-U55V is an Ultra Low Temperature freezer, which uses VIP PLUS. This makes the MDF-U55V VIP Ultra Low Temperature Freezer (and the whole VIP range) the most complete combination of refrigeration, control, alarm, monitoring and accessibility for product safety at -86°C.

The microprocessor control system assuress a secure, easy to use and comprehensive. Set point, alarm parameters and self-diagnostic functions are accessed through a tamper-resistant keypad protocol. Control inputs are managed with convenient push-ad buttons on a unitized, sealed control overlay. The panel is door-mounted and angled for easy access.

PHC offers three other sizes of the VIP ULT freezers:

- MDF-C8V1 (84 litres)
- MDF-U33V (333 litres)

Benefits

- VIP vacuum insulation maximises storage capacity
- New refrigeration system enables more energy efficient operation
- Safe operation with Status Alert continuous condition monitoring
- Inner doors removable for cleaning and defrosting
- Enhanced security with new rugged outer door latch
- Improved accessibility
- Quiet operation
- Can hold up to 352 pcs 2-inch boxes or 224 pcs 3-inch boxes
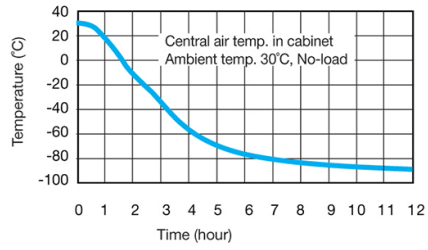- Class IIa Medical Device

Features

- Status Alert Condition monitor
- Two independent and insulated inner doors with gaskets prevent cold air leakage.
- Alarm lamp and buzzer
- High and low temperature warning
- Alarm ring-back function
- Microprocessor-controlled blocked filter alarm
- Quiet operation
- Inner doors removable for cleaning and defrosting

Performance

Performance data MDF-U55V

Pull-down characteristics
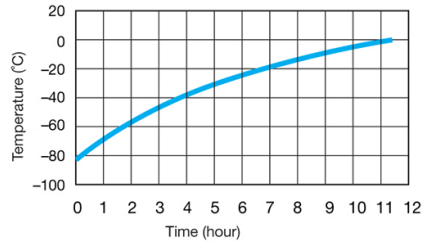
Central air temp. in cabinet
Ambient temp. 30°C, No-load

Pull-up characteristics during power failure

CO₂ backup system operation characteristics

Ambient temp. and maintenance of −70°C by injection of LCO₂ (30kg)
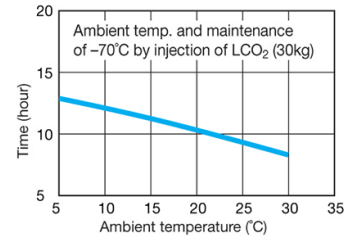
Product Photos

Specifications

External Dimensions (W x D x H)	770 x 870 x 1990 mm
Internal Dimensions (W x D x H)	630 x 600 x 1380 mm
Volume	519 litres
Net Weight	290 kg
Capacity (2" Boxes in Stainless Steel Racks)	352 (2" boxes)
Capacity (3" Boxes in Stainless Steel Racks)	-
Cooling Performance	-86 °C
Temperature Setting Range	-50 to -90 °C
Temperature Control Range	-50 to -86 °C
Controller	Microprocessor, non-volatile memory

Display	LED
Temperature Sensor	Pt-1000
Refrigeration System	Cascade
Compressors	450/750 W
Refrigerant	
Insulation Material	PUF / VIP Plus
Insulation Thickness	70 mm
Exterior Material	Painted Steel
Interior Material	Painted Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	2 pieces (insulated)
Shelves	
Max. Load - Per Shelf	50 kg
Max. Load - Total	415 kg
Vacuum Release Port	N
Access Port	3
Access Port Position	Back, Bottom x 2
Access Port Diameter	17
Casters	17
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	V-B
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	52 dB [A]

Accessories

Drawers	MDF-50R (Max 1)
Small inner door kit	MDF-5ID (Max 2)

Temperature recorders	
- Circular type	MTR-G85
- Continuous strip type	MTR-85H
- Recorder housing (if required)	MDF-S3085
RS485 interface module	MTR-480
Liquid CO2 Back-up	CVK-UB2
Liquid N2 Back-up	CVK-UBN2

Price

MDF-U55V	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

Unit : mm
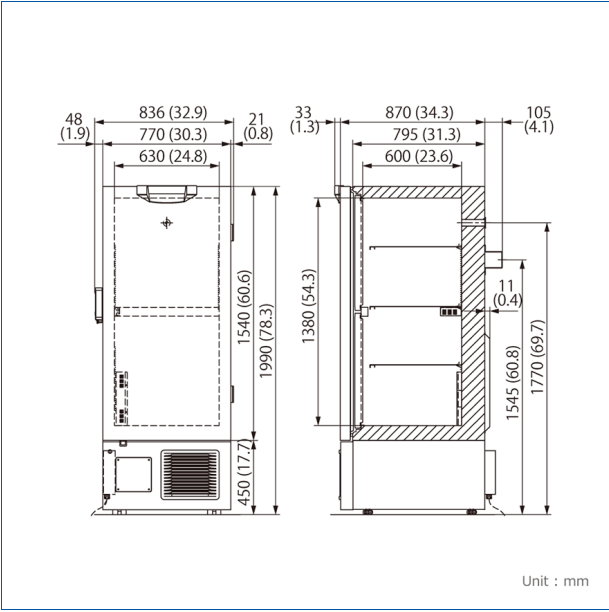
VIP ULT Freezers (-86°C)

MDF-U54V

| Effective capacity | 519L |
| Cooling Performance | -86℃ |

VIP PLUS vacuum insulation

Features

Extra-Large Capacity, Space Saving Ultra-Low Freezer with Improved Energy Consumption

Evolutionary design

· PHCbi V.I.P. Series -86°C ultra-low temperature freezers use patented revolutionary vacuum insulation cabinet construction that reduces the wall thickness from 14cm to 7cm (5.5" to 2.7") and achieves up to 30% more storage capacity than conventionally insulated freezers, without increasing its footprint.

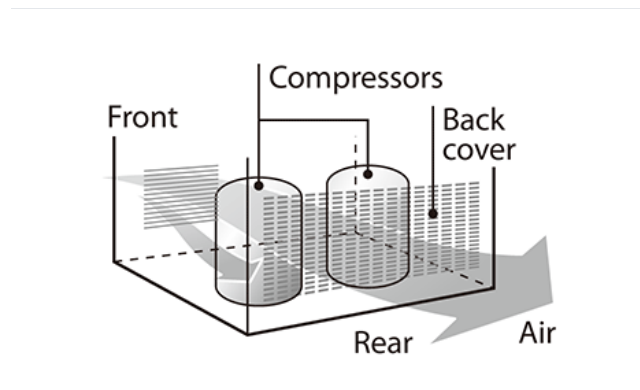· The newly developed refrigerating circuit regulates high stage compressor ON-OFF cycles, resulting in jumped energy efficiency by approx. 10%* more than previous models, for quieter environment.(MDF-U54V)
and energy consumption of approx. 30%** compared to the previous model.(MDF-U55V) *Based on data measured using the JIS-determined method.
**The data is a measured example (AT 23°C, 230V 50Hz, no load). Actual power consumption will vary depending on set and ambient conditions, loading and local voltage.

· The rear ventilation cover combines with the aerodynamically designed and positioned components in the refrigeration compartment to provide superior air flow, drastically reducing the load on the freezer and contributing to improved durability.

· Two independent and insulated inner doors with gaskets prevent cold air leakage.

Reliability

· Status Alert (Condition monitor) monitors ambient and system conditions continuously and notifies of any abnormalities before a problem happens.

Safety

· Alarm lamp and buzzer offer secure warning of power failure or abnormal temperature increase.

· High and low temperature warning provides an audible and visual alarm when the temperature deviates more than ±5°C

Accessibility

· A beak style inner door latch tightly closes the inner door against the freezer frame. It also helps make opening and closing the door smoother.

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

to ±20˚C (adjustable) from the set point.

· Alarm ring-back function ensures the buzzer will resume operation, should alarm conditions continue after it is silenced.

· Microprocessor-controlled filter-clog check function protects the refrigeration circuit.(MDF-U54V)(MDF-U55V)

· The rugged, one-handed outer door latch allows a padlock to be used to securely protect valuable samples.

· Control panel with digital display for easy operation.

Features

· Maximised capacity with VIP technology

· Safe operation with status alert condition monitoring

· Enhanced security

· Energy saving

Product Photos

Specfications

External Dimensions (W x D x H)	770 x 870 x 1990 (mm)
Internal Dimensions (W x D x H)	630 x 600 x 1380 (mm)
Volume	519 Liters
Net Weight	Approx. 296 kg
Capacity (2" Boxes in Stainless Steel Racks)	352
Capacity (3" Boxes in Stainless Steel Racks)	224

Cooling Performance	-86 °C
Temperature Setting Range	-50 to -90 °C
Temperature Control Range	-50 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-1000
Refrigeration System	Cascade
Compressors	1100W (high stage)/1100 W(low stage)
Refrigerant	HFC
Insulation Material	PUF / VIP Plus
Insulation Thickness	-
Exterior Material	Painted steel
Interior Material	Painted steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	2 pieces (insulated)
Shelves	3 shelves (adjustable)
Max. Load - Per Shelf	50 kg
Max. Load - Total	-
Vacuum Release Port	N
Access Port	3
Access Port Position	Back, Bottom x 2
Access Port Diameter	17 mm
Casters	4
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	V-B
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	51dB [A]

*Cooling performance is indicated by the temperature reached at the center of the freezer (at ambient temperature of 30°C with no load). In order to use the freezer at a stable

temperature for a long time, it is recommended that the temperature be set to at least 5°C higher than the indicated lowest temperature.

In addition, depending on the usage conditions, it may not be possible to reach the indicated lowest temperature.

Caution: We guarantees the product under certain warranty conditions. We are no way shall be responsible for any loss of content or damage to content.

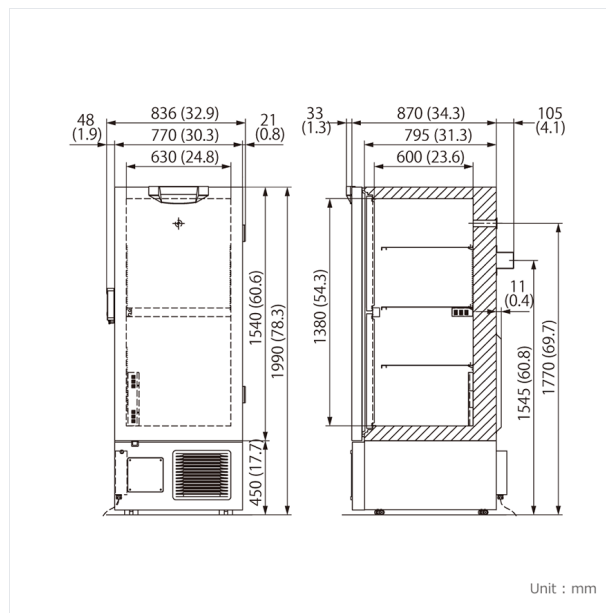•Appearance and specifications are subject to change without notice.

*1 Exterior dimensions of main cabinet only - see dimension drawings showing handles and other external projections.

Price

MDF-U54V	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

Unit : mm

VIP ULT Freezers (-86°C)

MDF-U74V

| Effective capacity | 728L |
| Cooling Performance | -86℃ |

VIP PLUS vacuum insulation

Features

Extra-Large Capacity, Space Saving Ultra-Low Freezer with Improved Energy Consumption

Evolutionary design

· Panasonic V.I.P. Series -86˚C ultra-low temperature freezers use patented revolutionary vacuum insulation cabinet construction that reduces the wall thickness from 14cm to 7cm (5.5" to 2.7") and achieves up to 30% more storage capacity than conventionally insulated freezers, without increasing its footprint.

· The newly developed refrigeration circuit regulates high stage compressor ON- OFF cycles, resulting in a reduction in energy consumption of approx. 14%* compared to the previous model. *The data is a measured example (AT 23˚C, 230V 50Hz, no load). Actual power consumption will vary depending on set and ambient conditions, loading and local voltage.

· The rear ventilation cover combines with the aerodynamically designed and positioned components in the refrigeration compartment to provide superior air flow, drastically reducing the load on the freezer and contributing to improved durability.

· Two independent and insulated inner doors with gaskets prevent cold air leakage.

Reliability

· Status Alert (Condition monitor) monitors ambient and system conditions continuously and notifies of any abnormalities before a problem happens.

Accessibility

· A beak style inner door latch tightly closes the inner door
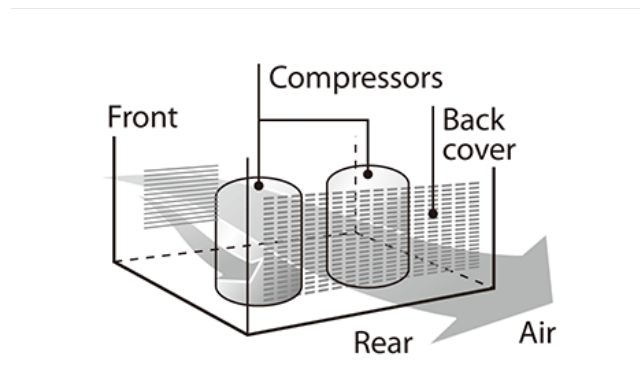
Safety

· Alarm lamp and buzzer offer secure warning of power failure or abnormal temperature increase.

· High and low temperature warning provides an audible and visual alarm when the temperature deviates more than ±5˚C to ±20˚C (adjustable) from the set point.

· Alarm ring-back function ensures the buzzer will resume operation, should alarm conditions continue after it is

against the freezer frame. It also helps make opening and closing the door smoother.

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

silenced.

· Microprocessor-controlled blocked filter alarm protects the refrigeration circuit.

· The rugged, one-handed outer door latch allows a padlock to be used to securely protect valuable samples.

· Control panel with digital display for easy operation.

· A battery and fan motor replacement notification is provided.

Features

· Maximised capacity with VIP technology

· Safe operation with status alert condition monitoring

· Enhanced security

· Energy saving

Product Photos

Specfications

External Dimensions (W x D x H)	1010 x 870 x 2010 (mm)
Internal Dimensions (W x D x H)	870 x 600 x 1400 (mm)
Volume	728 Liters
Net Weight	Approx. 346 kg
Capacity (2" Boxes in Stainless Steel Racks)	528
Capacity (3" Boxes in Stainless Steel Racks)	336
Cooling Performance	-86 °C

Temperature Setting Range	-50 to -90 °C
Temperature Control Range	-50 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-1000
Refrigeration System	Cascade
Compressors	1100W (high stage)/1100 W(low stage)
Refrigerant	HFC
Insulation Material	PUF / VIP Plus
Insulation Thickness	-
Exterior Material	Painted steel
Interior Material	Painted steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	2 pieces (insulated)
Shelves	3 shelves (adjustable)
Max. Load - Per Shelf	50 kg
Max. Load - Total	-
Vacuum Release Port	N
Access Port	3
Access Port Position	Back, Bottom x 2
Access Port Diameter	17 mm
Casters	4
Power Failure	Visual alarm - Buzzer alarm - Remote alarm
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	V-B
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	51dB [A]

*Cooling performance is indicated by the temperature reached at the center of the freezer (at ambient temperature of 30°C with no load). In order to use the freezer at a stable temperature for a long time, it is recommended that the temperature be set to at least 5°C higher than the indicated lowest temperature.
In addition, depending on the usage conditions, it may not be possible to reach the indicated lowest temperature.

Caution: We guarantees the product under certain warranty conditions. We are no way shall be responsible for any loss of content or damage to content.

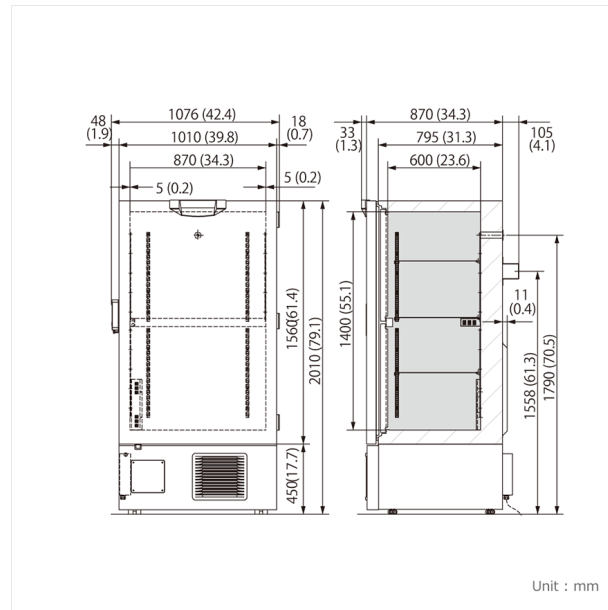•Appearance and specifications are subject to change without notice.

*1 Exterior dimensions of main cabinet only - see dimension drawings showing handles and other external projections.

Price

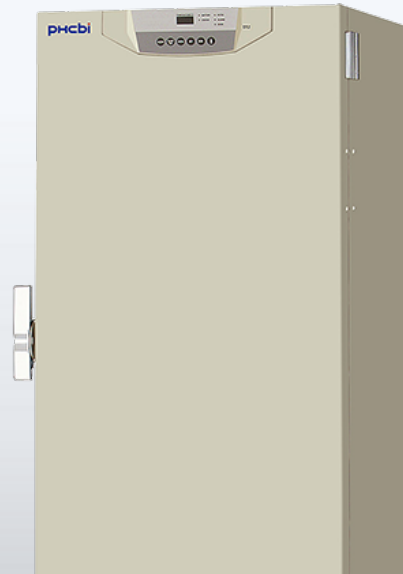| MDF-U74V	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

Unit : mm

VIP ULT Freezers (-86°C)

MDF-U33V VIP ULT Freezer

| Effective capacity | 333L |
| Cooling Performance | -86℃ |

VIP PLUS

Features

Excellent reliability and uniformity within an optimal footprint

The VIP ULtra Low Freezer MDF-U33V is an Ultra Slim, space saving Ultra Low Temperature Freezer. It has improved energy consumption The VIP MDF-U33V has a microprocessor control system, which is secure, easy to use and comprehensive. Set point, alarm parameters and self-diagnostic functions are accessed through a tamper-resistant keypad protocol. Control inputs are managed with convenient push-ad buttons on a unitized, sealed control overlay. The panel is door-mounted and angled for easy access.

With a capacity of up to 216 pieces of two inch boxes (or 144 3 inch boxes), the energy-saving advantages of this efficient VIP MDF-U33V Ultra Low Temperature Freezer system extend to lower per-unit storage costs regardless of the preferred inventory configuration.

PHC offers three other sizes of the VIP ULT freezers:

· MDF-C8V1 (84 litres)

· MDF-U55V (519 litres)

Benefits

· PHCbi VIP technology achieves up to 30% more storage capacity.

· A newly developed refrigeration system and the Freezer structure offer a quiet experimental environment.

· Two independent and insulated inner doors with gaskets prevent cold air leakage.

Features

· VIP technology maximises storage capacity

· Safe operation with Status Alert continuous

· The inner doors are removable for cleaning and

· Enhanced security

· Improved accessibility

· Quiet operation

· Improved energy consumption

· Can hold up to 216 pcs of 2in boxes

Performance

Performance data MDF-U33V

Pull-down characteristics

Central air temp. in cabinet
Ambient temp. 30°C, No-load

Pull-up characteristics during power failure

CO₂ backup system operation characteristics

Ambient temp. and maintenance of –70°C by injection of LCO₂ (30kg)
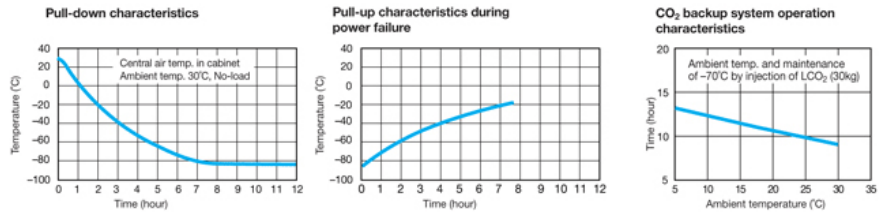
Product Photos

Specifications

External Dimensions (W x D x H)	670 x 867 x 1860 mm
Internal Dimensions (W x D x H)	490 x 600 x 1140 mm
Volume	333 litres
Net Weight	255 kg
Capacity (2" Boxes in Stainless Steel Racks)	216 (2" boxes)
Capacity (3" Boxes in Stainless Steel Racks)	-
Cooling Performance	-86 °C
Temperature Setting Range	-50 to -90 °C
Temperature Control Range	-50 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-1000

Refrigeration System	Cascade
Compressors	450/750 W
Refrigerant	
Insulation Material	PUF / VIP Plus
Insulation Thickness	70 mm
Exterior Material	Painted Steel
Interior Material	Painted Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	2 pieces (insulated)
Shelves	
Max. Load - Per Shelf	50 kg
Max. Load - Total	355 kg
Vacuum Release Port	N
Access Port	3
Access Port Position	Back, Bottom x 2
Access Port Diameter	17
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	V-B
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	49 dB [A]

Accessories

Drawers	MDF-30R (Max 2)
Temperature recorders	
-Circular type	MTR-G85
-Continuous strip type	MTR-85H

-Recorder housing (if required)	MDF-S3085
RS485 interface module	MTR-480
Liquid CO2 Back-up	CVK-UB2
Liquid N2 Back-up	CVK-UBN2

Price

MDF-U33V	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

105 (4.1) 897 (35.3) 733 (28.9)
867 (34.1)
795 (31.3) 45 670 (26.4) 18 (0.7)
(1.8)
600 (23.6) 490 (19.3)

30
(1.2)
1140 (44.9) 1410 (55.5)
1639 (64.5) 1860 (73.2)

450 (17.7)

Unit : mm
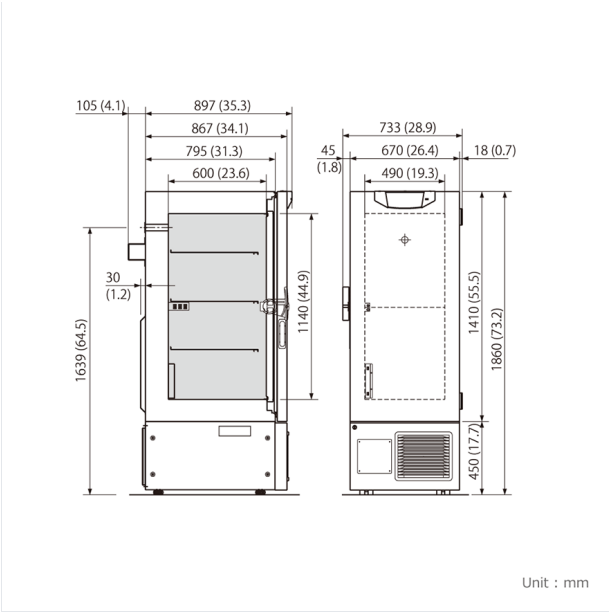
VIP ULT Freezers (-86°C)

MDF-C8V1 VIP ULT Freezer

| Effective capacity | 84L |
| Cooling Performance | -80℃ |

VIP PLUS vacuum insulation

Features

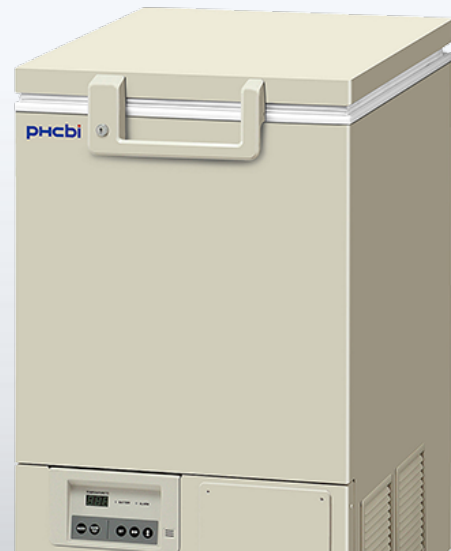### Excellent reliability and uniformity within an optimal footprint

The MDF-C8V1 VIP Ultra Low Temperature Freezer is ideal -80°C freezing environment using VIP PLUS technology maximizes storage capacity. The newly developed single-compressor system achieves higher energy efficiency and space saving construction.

PHCbi's most advanced insulation system VIP PLUS for Ultra Low Temperature Freezers enables reduced thickness of insulation to approximately one half compared to conventional systems. Patented revolutionary vacuum insulation cabinet construction reduces wall thickness and achieves greater storage capacity.

Use of VIP PLUS material on the front, left, and right sides enables a smaller installation space with exceptional storage capacity to foot print ratio.

PHC offers three other sizes of the VIP ULT freezers:

- MDF-U33V (333 litres)
- MDF-U55V (519 litres)

Benefits

- Personal sized ult chest freezer
- User-friendly filterless design: makes cleaning unnecessary
- Quiet operation
- PHCbi designed refrigeration system ensures the highest levels of performance and reliability.
- VIP insulation maximizes storage capacity

Features

- LED Display with Microprocessor Controls
- Power failure alarm lamp and buzzer
- High temperature audible and visual alarm
- Low temperature audible and visual alarm
- Alarm ring back function
- New refrigeration circuit without filter

Performance

Pull-down characteristics
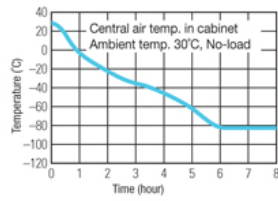
Central air temp. in cabinet
Ambient temp. 30°C, No-load

Pull-up characteristics during power failure

CO$_2$ backup system operation characteristics

Ambient temp. and maintenance of −70°C by injection of LCO$_2$ (30kg)
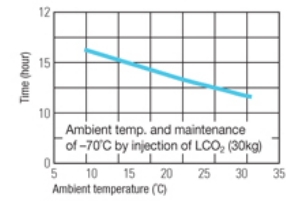
Product Photos

Specifications

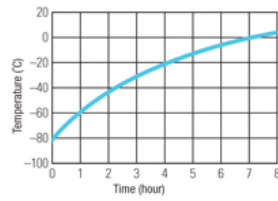|	
External Dimensions (W x D x H)	550 x 685 x 945 mm
Internal Dimensions (W x D x H)	405 x 490 x 425 mm
Volume	84 litres
Net Weight	67 kg
Capacity (2" Boxes in Stainless Steel Racks)	42 (2" boxes)
Capacity (3" Boxes in Stainless Steel Racks)	-
Cooling Performance	-80 °C
Temperature Setting Range	-55 to -90 °C
Temperature Control Range	-60 to -80 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-1000

Refrigeration System	Auto-cascade
Compressors	400 W
Refrigerant	
Insulation Material	PUF / VIP Plus
Insulation Thickness	70 mm
Exterior Material	Painted Steel
Interior Material	Stainless Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	1 (Styrofoam)
Shelves	
Max. Load - Per Shelf	-
Max. Load - Total	-
Vacuum Release Port	-
Access Port	2
Access Port Position	Back/Bottom
Access Port Diameter	17
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	Filterless design
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	47 dB [A]

Accessories

Small inner door kit	MDF-7ID (Max 2)
Temperature recorders	
-Circular type	MTR-G85
-Continuous strip type	MTR-85H

-Recorder housing (if required)	MDF-S3085
RS485 interface module	MTR-480
Liquid N2 Back-up	CVK-UB4

Price

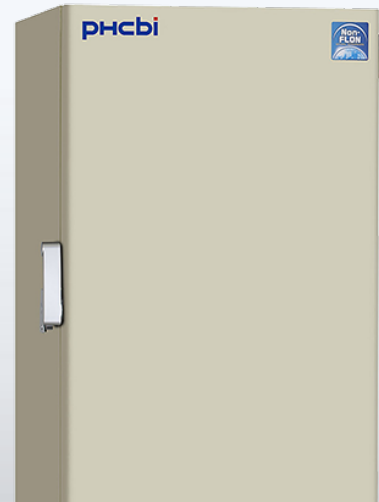| MDF-C8V1	Price Upon Inquiry. Please contact your local dealers.

Dimensions

Unit : mm

PHCbi
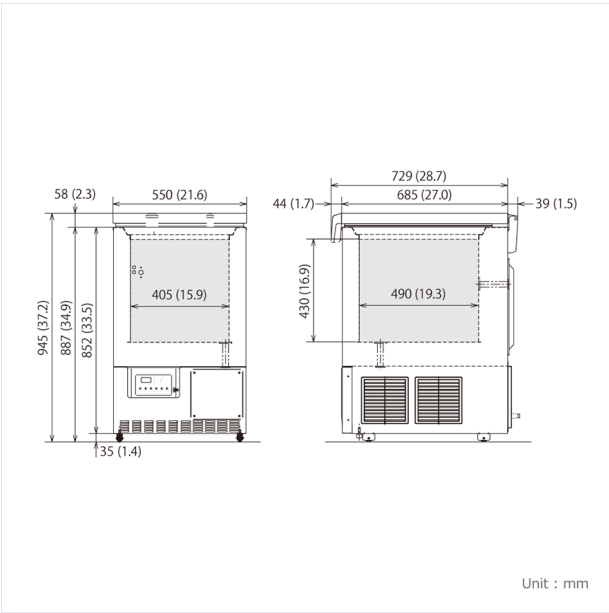
MDF ULT Freezers (-86°C)

MDF-DU300H ECO ULT Freezer

| Effective capacity | 333L |
| Cooling Performance | -86℃ |

Features

Cost-saving and environmentally friendly sample storage

The PRO ECO -86°C Ultra-low Freezer, MDF-DU300H (former KM-DU34H1E), is part of our range ECO ultra-low freezers with natural refrigerants. They minimise energy consumption, reduce environmental impact and save money. Innovative technology and Class IIa medical device certification provide secure storage of valuable research and clinical samples.

Benefits	Features
· Energy efficiency	· Natural Refrigerants
· Lower running costs	· Heat Exchanger Design
· Reduced environmental impact	· PHCbi Designed Refrigeration
· Excellent sample security	· Automatic Compressor Cycling
	· Microprocessor control
	· 333 Litre

Performance

Fast Temperature Pull-down

AT30ºC Pull-down & Pull-up Temperature

Central air temp. in cabinet
Ambient temp. 30ºC, No-load
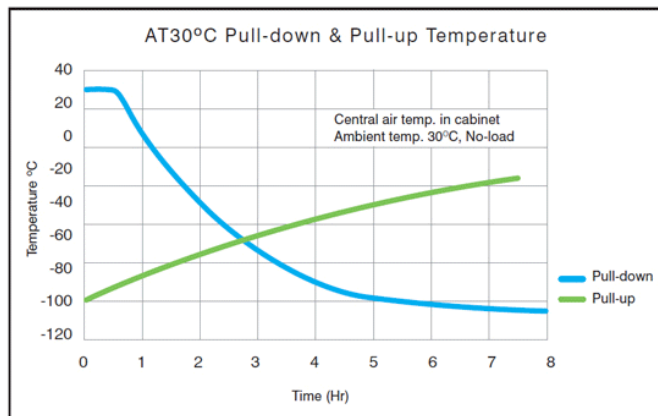
Pull-down
Pull-up

Pull-down time is over 40% faster than equivalent model [5]

5) Model KM-DU34H1E (333 litres) compared to MDF-U3386S at set value -80ºC, 30ºC ambient temperature, unloaded, 230V 50Hz.

Product Photos

Specifications

External Dimensions (W x D x H)	750 x 870 x 1830 mm
Internal Dimensions (W x D x H)	490 x 600 x 1140 mm
Volume	333 litres
Net Weight	241 kg
Capacity (2" Boxes in Stainless Steel Racks)	-
Capacity (3" Boxes in Stainless Steel Racks)	-
Cooling Performance	-86 °C
Temperature Setting Range	-50 to -90 °C
Temperature Control Range	-50 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-1000
Refrigeration System	Cascade
Compressors	450 W
Refrigerant	
Insulation Material	PUF
Insulation Thickness	130 mm
Exterior Material	Painted Steel
Interior Material	Painted Steel
Outer Doors/Lid	-

Outer Door Lock	Y
Inner Doors/Lid	-
Shelves	
Max. Load - Per Shelf	50 kg
Max. Load - Total	150 kg
Vacuum Release Port	-
Access Port	3
Access Port Position	Back / Bottom x 2
Access Port Diameter	17
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	V-B
Door Open	-
Power Supply	Local
Frequency	Local
Noise Level	52 dB [A]

Price

MDF-DU300H	Price Upon Inquiry. Please contact your local dealers.

Dimensions

Unit : mm
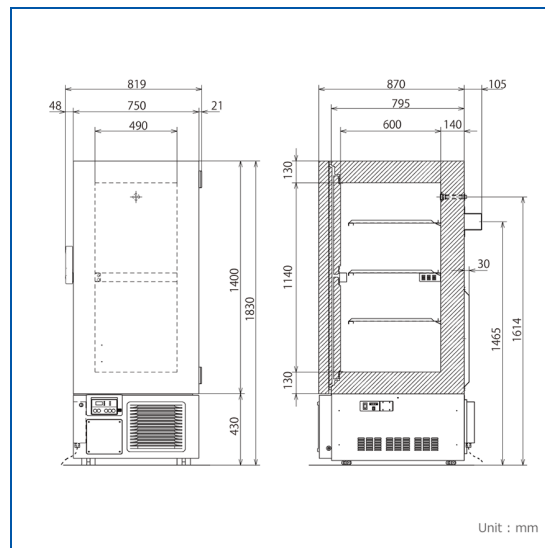
MDF ULT Freezers (-86°C)

MDF-594 ULT Chest Freezer

| Effective capacity | 487L |
| Cooling Performance | -86℃ |

Features

Ideal for Middle-Sized Installation Space

Specially designed compressor and cascade refrigeration system

Specially designed for rugged ultra-low temperature applications in a laboratory environment (HFC refrigerants only).

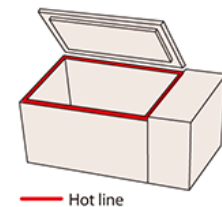**Micro-processor temperature control with LED digital display**

Extremely accurate, easy-to-read display. The temperature inside the freezer can be set and monitored easily by means of a microprocessor temperature control with an LED digital display. The thermostat incorporates a platinum resistor (Pt. 100Ω), precision and durability.

Integrated cabinet design

High-performance refrigeration system with foamed-in-place cabinet insulation maximizes interior temperature uniformity and protects against fluctuating ambient temperatures.

Hot line for secure sealing

Moisture condensation at the top edges of the cabinet due to differences in temperature inside and out causes frost and icing problems that may reduce heat insulation efficiency and obstruct door movements. These problems are prevented by the "hot line" by means of which hot gas from the higher temperature circuit is circulated through the problem areas.

Hot line

Self-diagnostic function

The temperature sensor, filter sensor and cascade sensor monitor operation conditions continuously. Should abnormality be picked up, an error code and the current temperature will be displayed in turn.

Ring back function

The alarm buzzer can be silenced by pressing the BUZZER key on the control panel. (The remote alarm signal is not cancelled.) Should the alarm condition continue after a certain suspension, the alarm buzzer sound will resume.

Easy maintenance

Filter check lamp notifys the user of a clogged condenser filter.The condenser filter is situated at the front panel to make filter removing and cleaning easier.

Standard casters and levelling feet

Standard-equipped heavy duty casters make it easy to move a freezer when necessary. The levelling feet keep a freezer level and firm on the floor.

Steady chamber temperature

The feature of the chest type is the low cold air leakage on door openings, and can keep a steady chamber temperature. Long frozen cell line, DNA, blood, and bone marrow, by high credibility, and precise temperature control.

Features

· Low-profile design for easier lording and unloding

· Ultra-freezing in minimal space

· Alarm and safety devices

Built-in temperature & power failure alarms (lamp / buzzer)

In case of power failure or an irregular rise in temperature, a rechargeable battery-operated indicator lamp and alarm will be activated. A compact recording unit which automatically records the inside temperature, and a backup system with liquefied CO2 or N2 which is selfactivated when a power outage occurs are also available separately. This equipment helps insure that the contents will be protected in the event of any power failure or mechanical trouble.*

*MDF-594AT equipped with LCO_2 injection device for backup and temperature recorder.

Product Photos

* The photo above is MDF-594AT with LCO2 backup kit and Temperature recorder.

Specfications

External Dimensions (W x D x H)	2010 x 770 x 1070 mm
Internal Dimensions (W x D x H)	1280 x 500 x 762 mm
Volume	487 litres
Net Weight	MDF-594: 291 kg, MDF-594AT: 301 kg
Capacity (2" Boxes in Stainless Steel Racks)	-

Capacity (3" Boxes in Stainless Steel Racks)	-
Cooling Performance	-86 °C
Temperature Setting Range	-20 to -95 °C
Temperature Control Range	-20 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-100
Refrigeration System	Cascade
Compressors	1100 W x 2
Refrigerant	HFC
Insulation Material	PUF
Insulation Thickness	-
Exterior Material	Painted Steel
Interior Material	Stainless Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	3
Shelves	-
Max. Load - Per Shelf	-
Max. Load - Total	-
Vacuum Release Port	-
Access Port	Y
Access Port Position	Left
Access Port Diameter	40
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	-
Filter	V-B
Door Open	-
Power Supply	Local
Frequency	Local
Noise Level	50 dB [A]

Options

Liquid N2 back-up Kit	CVK-UBN2-PW
Liquid CO2 back-up Kit (Standard equipment with MDF-594AT)	CVK-UB2-PW
Temperature recorder Strip type (Standard equipment with MDF-594AT)	MTR-85H-PW
Storage racks with 5 drawers (Aluminum)	MDF-59SC-PW (18 pcs storable in MDF-594 series)
Inventory rack for 9 pcs of 3" boxes (Stainless steel)	IR-309C-PW (24 pcs storable in MDF-594 series)

Price

MDF-594	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

Unit : mm
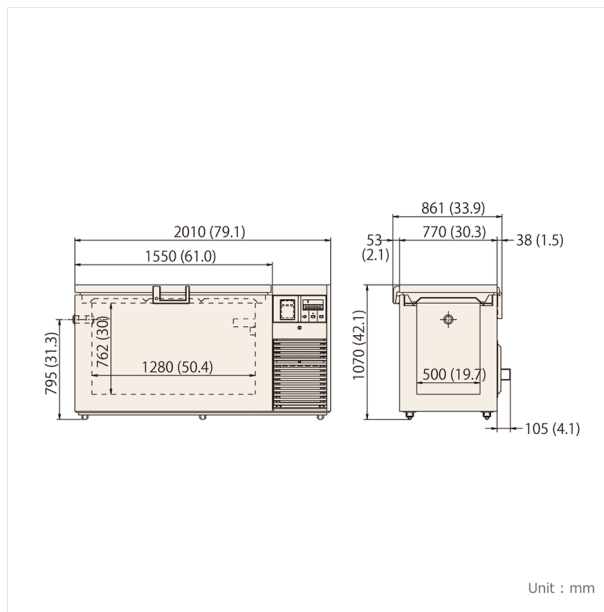
MDF ULT Freezers (-86°C)

MDF-794 ULT Chest Freezer

| Effective capacity | 701L |
| Cooling Performance | -86℃ |

Features

Ideal for Middle-Sized Installation Space

Specially designed compressor and cascade refrigeration system

Specially designed for rugged ultra-low temperature applications in a laboratory environment (HFC refrigerants only).

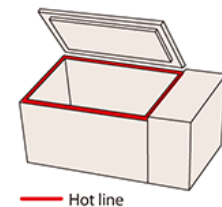**Micro-processor temperature control with LED digital display**

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Hot line for secure sealing

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Hot line

Self-diagnostic function

The temperature sensor, filter sensor and cascade sensor monitor operation conditions continuously. Should abnormality be picked up, an error code and the current temperature will be displayed in turn.

Ring back function

The alarm buzzer can be silenced by pressing the BUZZER key on the control panel. (The remote alarm signal is not cancelled.) Should the alarm condition continue after a certain suspension, the alarm buzzer sound will resume.

Easy maintenance

Filter check lamp notifys the user of a clogged condenser filter.The condenser filter is situated at the front panel to make filter removing and cleaning easier.

Standard casters and levelling feet

Standard-equipped heavy duty casters make it easy to move a freezer when necessary. The levelling feet keep a freezer level and firm on the floor.

Steady chamber temperature

The feature of the chest type is the low cold air leakage on door openings, and can keep a steady chamber temperature. Long frozen cell line, DNA, blood, and bone marrow, by high credibility, and precise temperature control.

Built-in temperature & power failure alarms (lamp / buzzer)

In case of power failure or an irregular rise in temperature, a rechargeable battery-operated indicator lamp and alarm will be activated. A compact recording unit which automatically records the inside temperature, and a backup system with liquefied CO2 or N2 which is selfactivated when a power outage occurs are also available separately. This equipment helps insure that the contents will be protected in the event of any power failure or mechanical trouble.*

*MDF-794AT equipped with LCO_2 injection device for backup and temperature recorder.

Features

· Low-profile design for easier lording and unloding

· Ultra-freezing in minimal space

· Alarm and safety devices

Product Photos

* The photo above is MDF-794AT with LCO2 back-up kit and temperature recoder.

Specfications

External Dimensions (W x D x H)	W2570 x D770 x H1070 mm
Internal Dimensions (W x D x H)	W1840 x D500 x H762 mm
Volume	701 liters
Net Weight	MDF-794: 335 kg, MDF-794AT: 345 kg
Capacity (2" Boxes in Stainless Steel Racks)	-

|	
Capacity (3" Boxes in Stainless Steel Racks)	-
Cooling Performance	-86 °C
Temperature Setting Range	-20 to -95 °C
Temperature Control Range	-20 to -86 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Pt-100
Refrigeration System	Cascade
Compressors	1100 W x 2
Refrigerant	HFC
Insulation Material	PUF
Insulation Thickness	-
Exterior Material	Painted Steel
Interior Material	Stainless Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	4
Shelves	-
Max. Load - Per Shelf	-
Max. Load - Total	-
Vacuum Release Port	-
Access Port	Y
Access Port Position	Left
Access Port Diameter	40 mm
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	-
Filter	V-B
Door Open	-
Power Supply	Local
Frequency	Local
Noise Level	50 dB [A]

Options

Liquid N2 back-up Kit	CVK-UBN2-PW
Liquid CO2 back-up Kit (Standard equipment with MDF-794AT)	CVK-UB2-PW
Temperature recorder Strip type (Standard equipment with MDF-794AT)	MTR-85H-PW
Storage racks with 5 drawers (Aluminum)	MDF-59SC-PW (24 pcs storable in MDF-794 series)
Inventory rack for 13 pcs of 2" boxes (Stainless steel)	IR-213C-PW (36 pcs storable in MDF-794 series)
Inventory rack for 9 pcs of 3" boxes (Stainless steel)	IR-309C-PW (36 pcs storable in MDF-794 series)

Price

MDF-794	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions
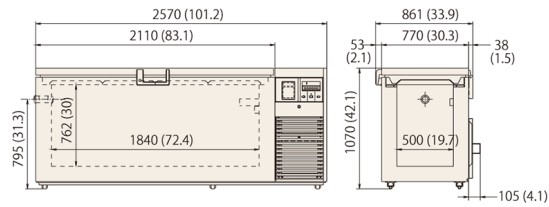
Unit : mm

-30°C Biomedical Freezers

369 L / 504 L

MDF-MU339

MDF-MU539

Stable -30°C environment with extensive storage possibilities.

PHCbi medical freezers are equipped with various features that enable flexibility and maintain the quality of the samples during preservation such as height-adjustable shelf trays and separate top and bottom doors that suppress cold air leakage. Users can choose the model that meets their specific needs.

Height-adjustable shelf trays

By installing the refrigerant piping in the frame of the unit instead of in shelf trays as in conventional models, the unit enabled completely height-adjustable shelf trays.

Maintains the quality of the samples during preservation

Equipped with doors that suppress the leakage of cold air during opening and closing, and manual defrosting that helps avoid temperature impact on the samples.

Superior energy conservation

Improvements in the fan motor (ON/OFF controls) has led to reduction in power consumption compared to our previous models.*

*The actual energy consumption may vary depending on the use.

Adjusts the inside of the chambers according to the size of the samples

By changing the height of the shelf trays, the unit can accommodate chamber containers of various sizes including storage boxes of conventional models. The slim-type allows for the space between equipment to be used effectively.

Security functions that help protect valuable samples

With a temperature control capability that inhibits the change in temperature inside the chamber, and an alarm/security function that prevents errors, the unit maintains the quality of the preserved samples.

MDF-MU539

Reduces energy costs of the facility

Replacing a conventional model with this model can save on energy costs. Save even more by replacing multiple units.

-30°C Biomedical Freezers

Easy disposal of water used for defrosting

Even the cumbersome task of disposing water used for defrosting becomes easy with the drainage hose that is attached to the main unit. (Hose is usually stowed away when not in use)

Easy to operate control panel

Button-type control panel is easy to operate. All inputs including temperature and alarm settings can be selected on the panel.

Lockable door latch

To securely preserve/manage the valuable samples, In addition to a standard-feature door lock, a hole in the latch allows a padlock to be attached.
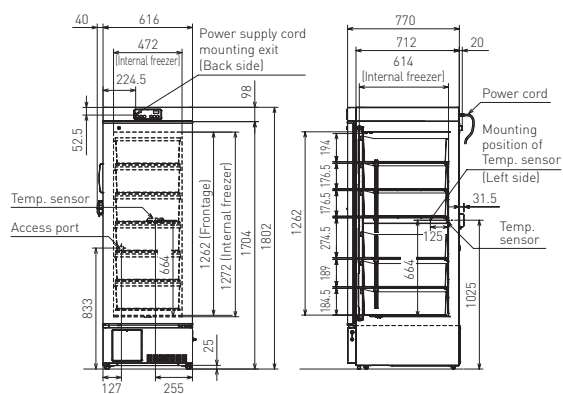
Storage containers useful for organizing

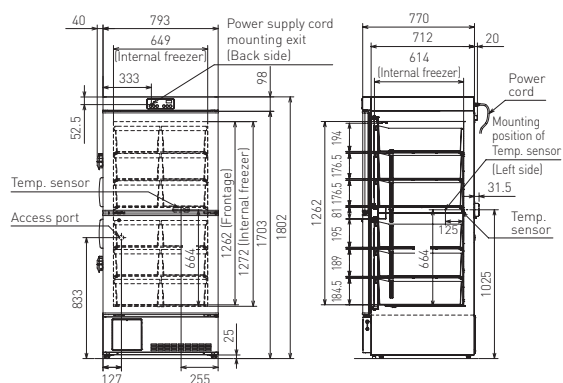The standard storage containers are useful for dividing small items and allow for efficient sample storage.

Dimensions

Unit : mm

MDF-MU339

MDF-MU539

CE

Model Number		MDF-MU339-PE	MDF-MU539-PE
External dimensions (W x D x H) [1]	mm	616 x 770 x 1802	793 x 770 x 1802
Internal dimensions (W x D x H)	mm	472 x 614 x 1262	649 x 614 x 1262
Volume	litres	369	504
Net weight	kg	135	163
Performance			
Cooling performance [2]	°C	-30	
Temperature setting range [2]	°C	-35 to -18	
Temperature control range [2]	°C	-30 to -20	
Control			
Controller		Microprocessor, non-volatile memory	
Display		LED	
Temperature sensor		Thermistor	
Refrigeration			
Cooling method		Direct	
Compressor	W	250	
Refrigerant		HFC	
Insulation material		PUF	
Insulation thickness	mm	70	
Construction			
Exterior material		Painted Steel	
Interior material		Painted Steel	
Outer door	qty	1	2
Outer door lock		Yes	
Shelves	qty	6	
Max. load - per shelf	kg	30	
Access port	qty	1	
Access port position		Back	
Access port diameter	Ø mm	30	
Casters	qty	4 [2 levelling feet]	
Accessories			
Storage containers	qty	6	12
Inner dimension	mm	W420 x D552 x H157	W280 x D552 x H157
Key	set	1	
Defrost spatula	pc	1	
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)	
Power failure		V-B-R	
High temperature		V-B-R	
Low temperature		V-B-R	
Electrical and Noise Level			
Power supply	V	220/230/240	
Frequency	Hz	50	
Noise level [3]	dB (A)	42	
Options			
Temperature recorders - Circular type		MTR-G85C-PE — Chart paper: RP-G85-PW — Ink pen: PG-R-PW — Recorder housing: MPR-S7-PW	
Temperature recorders - Continuous strip type		MTR-4015LH-PE — Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW	
Optional Communication Systems			
Digital interface (RS232C/RS485) [4]		MTR-480-PW	
Ethernet interface (LAN) [4]		MTR-L03-PW	
Quality Management System			
Certification		ISO 9001	

[1] External dimensions of main cabinet only, excluding handle and other external projections.
[2] Air temperature measured at freezer centre, ambient temperature 35ºC (MDF-MU339) / 30ºC (MDF-MU539), no load.
[3] Nominal value - Background noise 20 dB[A].
[4] Only for MTR-5000 (data acquisition system) users.
• Appearance and specifications are subject to change without notice.
Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

MDF-MU339HL   MDF-MU539HL

-30°C Biomedical ECO Freezers with Natural Refrigerants

ECO natural refrigerants   **IC+** inverter compressor

369 L / 504 L

Stable -30°C uniform environment with extensive storage possibilities

Both units provide environmental savings and flexibility while maintaining the quality of the samples during preservation. Such flexibility includes height-adjustable shelf trays and separate top and bottom doors that prevent cold air leakage.

Natural Refrigerants and Inverter Technology

Hydrocarbon [HC] refrigerants have minimal effect on the environment and are compliant with environmental legislation for climate control. Combined with inverter technology, these refrigerants also provide more efficient cooling without compromising cooling performance, ambient tolerance and recovery speeds following door openings.

Safe & Secure Sample Storage

To securely preserve the valuable samples, multiple safety features include 2 separate doors to reduce cold air leakage when handling samples and abnormal temperature alarms (high/low) to prevent samples being exposed to temperature variations.

Height-adjustable Shelf Trays

Both units feature fully height-adjustable shelf trays, accommodating chamber containers of various sizes. Model MDF-MU339HL features a shelf width of just 447 mm, and Model MDF-MU539HL's shelf width is 624 mm.

PERFORMANCE

Energy-efficient Performance

Natural refrigerants, compressors and integrated electronics combine to lower operating costs by up to 28%*. Freezer operation is managed by effectively balancing temperature performance and energy management.

* Compared to conventional models.
  Power source: 220V/230V/240V 50Hz, Ambient temperature: 30°C

Door latch

Versatile Alarm Function

An alarm for high/low temperatures and an error code display with a self-diagnostic function inform users of any abnormalities such as power failures for prompt actions that avoid damaging valuable samples. In addition to a standard door lock, a latch with a padlock is also available.

* Storage containers are available as an option.
  Max. capacity is 6 containers per chamber, 12 in total.

Easy Disposal of Defrosting Water

Manual defrosting becomes an easy task with the drain hose that is attached to the main unit (hose usually stowed away when not in use).

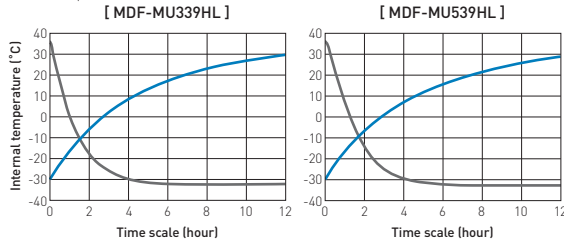# -30°C Biomedical ECO Freezers with Natural Refrigerants
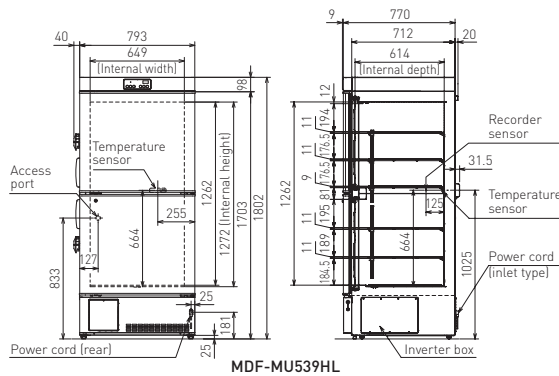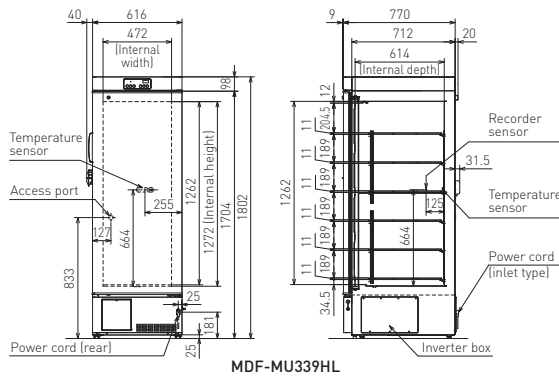

MDF-MU339HL   MDF-MU539HL

Performance Data

AT35˚C Pull-down & Pull-up Temperature (No load) [2]

— Pull-down [220/230/240 V, 50 Hz]
— Pull-up

[MDF-MU339HL]   [MDF-MU539HL]

Dimensions
Unit: mm

MDF-MU339HL

MDF-MU539HL

CE (220/230/240 V, 50 Hz)

Model Number		MDF-MU339HL-PE	MDF-MU339HL-PA	MDF-MU539HL-PE	MDF-MU539HL-PA
External dimensions (W x D x H) [1]	mm	616 x 770 x 1802		793 x 770 x 1802	
Internal dimensions (W x D x H)	mm	472 x 614 x 1262		649 x 614 x 1262	
Volume	litres	369		504	
Net weight	kg	122		144	
Performance					
Cooling performance [2]	°C	-30			
Temperature setting range	°C	-35 to -18			
Temperature control range	°C	-30 to -20			
Control					
Controller		Microprocessor, non-volatile memory			
Display		LED			
Temperature sensor		Thermistor			
Refrigeration					
Compressor	W	400			
Refrigerant		HC			
Insulation material		PUF			
Insulation thickness	mm	70			
Construction					
Exterior material		Painted Steel			
Interior material		Painted Steel			
Outer door	qty	1		2	
Outer door lock		Yes			
Shelves	qty	6			
	Dimensions mm	W447 x D510		W624 x D510	
Max. load – per shelf	kg	30			
Access port	qty	1			
Access port position		Back			
Access port diameter	Ø mm	30			
Casters	qty	4 [2 levelling feet]			
Accessories					
Accessories	qty	1 Key set / 1 Defrost spatula			
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)			
Power failure		V-B-R			
High temperature		V-B-R			
Low temperature		V-B-R			
Electrical and Noise Level		MDF-MU339HL-PE	MDF-MU339HL-PA	MDF-MU539HL-PE	MDF-MU539HL-PA
Power supply	V	220/230/240	115	220/230/240	115
Frequency	Hz	50	60	50	60
Noise level [3]	dB [A]	42			
Options					
Temperature recorders — Circular type		MTR-G85C-PE/MTR-G85A-PA — Chart paper: RP-G85-PW — Ink pen: PG-R-PW — Recorder housing: MPR-S7-PW			
Temperature recorders — Continuous strip type		MTR-4015LH-PE/MRT-4015LH-PA — Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW			
Storage Container		MDF-03SC-PW (2 pcs/set)		MDF-05SC-PW (2 pcs/set)	
	Inner dimensions mm	W420 x D552 x H157		W280 x D552 x H157	
Optional Communication Systems					
Digital interface (RS232C/RS485) [4]		MTR-480-PW			
Ethernet interface (LAN) [4]		MTR-L03-PW			
Quality Management System					
Certification		ISO 9001			

[1] External dimensions of main cabinet only, excluding handles and other external projections.
[2] Air temperature measured at freezer centre, ambient temperature 35ºC, no load.
[3] Nominal value - Background noise 20 dB[A]
[4] Only for MTR-5000 (data acquisition system) users.
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-30°C Biomedical Freezer

MDF-MU539D

479 L

Can store samples at differing preservation temperatures with just this unit. A -30°C biomedical freezer with separate temperature controls for the 2 completely independent chambers.

PHCbi medical freezers are equipped with various features that enable flexibility and maintain the quality of the samples during preservation such as height-adjustable shelf trays, separate top and bottom doors that suppress cold air leakage, and 2 completely independent chambers each with its own temperature control. Users can choose the model that meets their specific needs from the lineup.

Height-adjustable shelf trays

By installing the refrigerant piping in the frame of the unit instead of in shelf trays as in conventional models, the unit enabled completely height-adjustable shelf trays.

Maintains the quality of the samples during preservation

Equipped with separate doors that suppress the leakage of cold air during opening and closing of the doors, and manual defrosting that helps avoid temperature impact on the samples.

2 completely independent chambers with their own temperature controls

Top and bottom chambers are equipped with 2 independent refrigeration circuits. This enables separate temperature settings and defrosting for the two chambers.

Adjusts the inside of the chambers according to the size of the samples

By changing the height of the shelf trays, the unit can accommodate chamber containers of various sizes including storage boxes of conventional models. The slim-type allows for the space between equipment to be used effectively.

Door latch

Security functions that help protect valuable samples

With a temperature control capability that inhibits the change in temperature inside the chamber, and an alarm/security function that prevents errors, the unit maintains the quality of the preserved samples.

Separate temperature controls for top and bottom chambers

Can store samples at differing preservation temperatures with just this unit. With the capability to defrost the top and bottom chambers separately, the unit makes it easy to transfer samples during defrosting.

-30°C Biomedical Freezer

Easy disposal of water used for defrosting

Even the cumbersome task of disposing water used for defrosting becomes easy with the drainage hose that is attached to the main unit. (Hose is usually stowed away when not in use)

Easy to operate control panel

Button-type control panel is easy to operate. All inputs including temperature and alarm settings can be selected on the panel.

Lockable door latch

To securely preserve/manage the valuable samples, In addition to a standard-feature door lock, a hole in the latch allows a padlock to be attached.
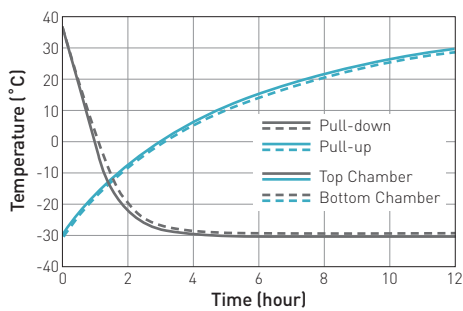
Storage containers useful for organizing

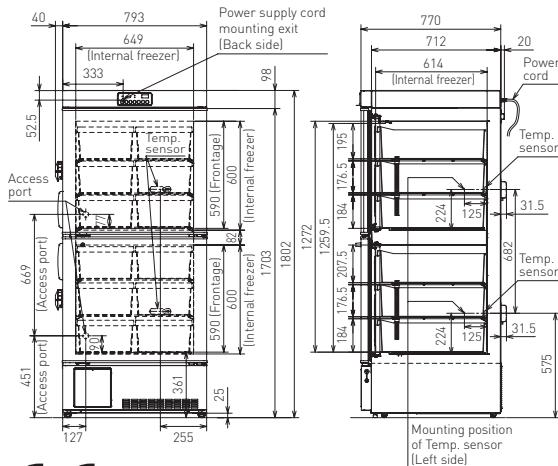The standard storage containers are useful for dividing small items and allow for efficient sample storage.

Performance Data

AT35°C Pull-down & Pull-up Temperature [2]

Legend:
- Pull-down
- Pull-up
- Top Chamber
- Bottom Chamber

Dimensions

Unit : mm

Model Number		MDF-MU539D-PE
External dimensions (W x D x H) [1]	mm	793 x 770 x 1802
Internal dimensions (W x D x H)	mm	649 x 614 x 600 (2 chambers)
Volume	litres	479
Net weight	kg	185
Performance		
Cooling performance [2]	°C	-30
Temperature setting range [2]	°C	-35 to -18
Temperature control range [2]	°C	-30 to -20
Control		
Controller		Microprocessor, non-volatile memory
Display		LED
Temperature sensor		Thermistor
Refrigeration		
Cooling method		Direct
Compressors	W	2 x 250 (Used in upper chamber and lower chamber respectively)
Refrigerant		HFC
Insulation material		PUF
Insulation thickness	mm	70
Construction		
Exterior material		Painted Steel
Interior material		Painted Steel
Outer door	qty	2
Outer door lock		Yes
Shelves	qty	6
Max. load - per shelf	kg	30
Access port	qty	2
Access port position		Back
Access port diameter	Ø mm	30
Casters	qty	4 (2 levelling feet)
Accessories		
Storage containers	qty	12
Inner dimension	mm	W280 x D552 x H157
Key	set	1
Defrost spatula	pc	1
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)
Power failure		V-B-R
High temperature		V-B-R
Low temperature		V-B-R
Electrical and Noise Level		
Power supply	V	220/230/240
Frequency	Hz	50
Noise level [3]	dB (A)	42
Options		
Temperature recorders — Circular type		MTR-G85C-PE — Chart paper: RP-G85-PW — Ink pen: PG-R-PW — Recorder housing: MPR-S7-PW (for lower front) MPR-S740T-PW (for top side)
Temperature recorders — Continuous strip type		MTR-4015LH-PE — Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW (for unit lower front) *Unit left top mounting hardware included in recorder kit
Optional Communication Systems		
Digital interface (RS232C/RS485) [4]		MTR-480-PW
Ethernet interface (LAN) [4]		MTR-L03-PW
Quality Management System		
Certification		ISO 9001

[1] External dimensions of main cabinet only, excluding handle and other external projections.
[2] Air temperature measured at freezer centre, ambient temperature 35ºC, no load.
[3] Nominal value - Background noise 20 dB[A]
[4] Only for MTR-5000 (data acquisition system) users.
•Appearance and specifications are subject to change without notice.
Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

CE

Biomedical -30°C Freezers

MDF-U731M | MDF-U731 Biomedical Upright Freezer

Effective capacity 690L For MDF-U731M | 623L for MDF-U731

Temperature range -20℃ to -30℃

Features

Stable -30°C environment with extensive storage possibilities

The MDF-U731M is a large-capacity Biomedical Freezer, with a direct cooling system and manual defrost. The MDF-U731M Biomedical Freezer is designed with all the features for "Plug-in and Go" laboratory grade freezing of enzymes, vaccines, and other biologics.

But also all the features required for biomedical research and biotechnology applications are onboard of the MDF-U731M Biomedical Freezer: superior uniformity, microprocessor control, and a large flexible storage capacity.

With adjustable shelving and a wide range of storage options available, it offers a flexible solution that can accommodate both the current and future storage needs of growing laboratories. The MDF-U731M also features a digital display, comprehensive alarm system and door lock for the secure storage of valuable samples. Its efficient cooling, durable construction and large capacity make it particularly suitable for use in busy laboratories. The MDF-U731M is an efficient and space-saving professional storage solution for a wide range of applications, including the storage of enzymes, culture media, reagents, vaccines and samples for diagnosis and testing.

The MDF-U731M -30ºC Biomedical Pro Upright freezer, and its predecessor the MDF-U731M, were specifically designed to offer a larger capacity freezer with the uniformity, stability and reliability required in the life science market. A wide range of customers including pharmaceutical and biotechnology companies, research institutes, universities, hospitals and diagnostics laboratories, are opting for the unrivalled performance and design of this advanced biomedical freezer.

Uniform and stable temperatures

The MDF-U731M -30ºC Biomedical Pro Upright Freezer features direct cooling with a full cold wall design. The evaporator pipes, which remove heat from inside the cabinet, are located in the back, sides, top and bottom walls of the freezer to ensure uniform temperatures throughout. To optimise the temperature uniformity even further, the pipes are strategically placed closer together towards the top of the freezer. This produces natural convection of the air inside the freezer as the colder air falls to the bottom, ensuring an even temperature distribution throughout the large chamber. The absence of 'warm' or 'cold spots', typically found in 'domestic style' freezers, ensures that all samples are stored at the desired temperature. Cold wall technology also ensures maximum sample protection by providing a rapid temperature recovery after door opening.

As there is no automatic defrost cycle on the MDF-U731M, the inner chamber offers outstanding temperature stability without any short term temperature increases. Manual defrost is often beneficial for applications in which very constant and stable temperatures

are required - for example, in strict GMP applications or for the storage of temperature sensitive samples.

Forced Air Circulation (MDF-U731 only)

Temperature uniformity throughout the freezer ensures that all samples can be stored in identical conditions. The Forced Air Circulation technology quickly restores temperature uniformity following routine door openings. Coupled with fast-response microprocessor temperature control this ensures a stable environment for precious samples. PHCbi provides options for your best choice in the laboratory. For your best knowledge, also find the difference between Direct Cooling type and Fan Assisted time from here.

Benefits	Features

Benefits

- Stable Temperature Control
- Energy-saving operation
- Improved security
- Sturdy cabinet construction with superior insulation
- Manual defrost
- High freezing power
- Direct cooling system and manual defrost
- Large capacity
- Adjustable wire shelves
- Alarm and safety devices

Features

- Front-mounted display/control panel (with new microprocessor) located at convenient waist height
- Memory backup
- Temperature display
- Front access calibration for 7-day temperature recorder
- 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
- Acces ports
- Four casters and two adjustable feet
- Door locks
- Alarm & Recording System
- High/low temperature alarm (±5°C to ±15°C, adjustable)
- Power failure alarm
- Remote alarm contact
- Self diagnostics
- Breaker switch turns power off in event of over current abnormality
- Balance hinge allows a free choice of opening angle
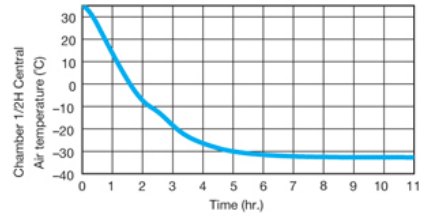- Lockable door latch

Performance

Performance data MDF-U731M

Pull-up characteristics during power failure

Pull-down characteristics under no-load condition
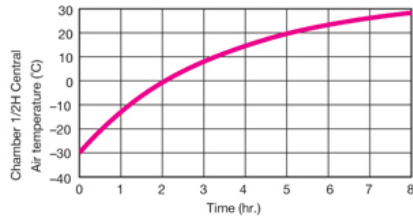
Conditions: AT 35°C, no load, measured at center of chamber

Product Photos

Specifications

External Dimensions (W x D x H)	770 x 830 x 1955 mm
Internal Dimensions (W x D x H)	650 x 700 x 1520 mm For MDF-U731M 650 x 700 x 1370 mm For MDF-U731
Volume	690 litres For MDF-U731M 623 liters For MDF-U731
Net Weight	152 kg For MDF-U731M 155 kg For MDF-U731
Capacity (Aluminium Racks 2" Boxes)	384 (2" boxes)
Capacity (Stainless Steel Racks 2" Boxe)	-
Cooling Performance	-30 °C
Temperature Setting Range	-18 to -35 °C

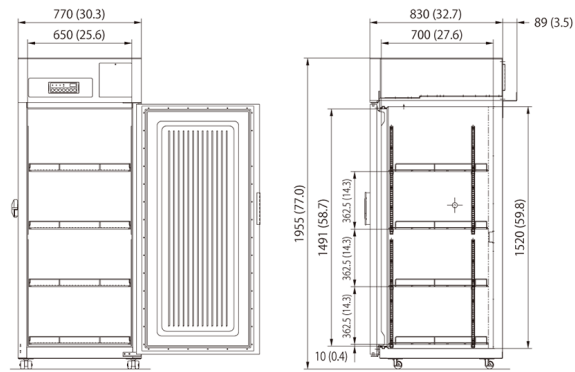|	
Temperature Control Range	-20 to -30 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Thermistor
Refrigeration System	Cold wall with Manual Defrost For MDF-U731M Forced air with Automatic Defrost For MDF-U731
Compressors	450 W
Refrigerant	HFC and HFO combined
Insulation Material	PUF
Insulation Thickness	60 mm
Exterior Material	Painted Steel
Interior Material	Painted Steel
Outer Doors/Lid	1
Outer Door Lock	Y
Inner Doors/Lid	-
Shelves	
Max. Load - Per Shelf	50 kg
Max. load - Total	200 kg
Vacuum Release Port	-
Access Port	1
Access Port Position	Left
Access Port Diameter	30
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	-
Door Open	V-B
Power Supply	MDF-U731M available with 115V & 230/240V MDF-U731 available with 115V
Frequency	MDF-U731M available with 50 & 60Hz MDF-U731 available with 60Hz
Noise Level	42 dB [A]

Accessories

Storage systems	MDF-T07SC-SW
Shelves	MDF-T07ST-SW
Temperature recorders	
-Circular type	MTR-G85C-SE
(-100C to +40C)	
-Chart paper	RP-40-SW
-Ink pen	PG-R-SW
-Recorder housing	MPR-S30-SW
-Continuous strip type	MTR-4015LH-SE
(-40C to +14C)	
RS485 Interface Module	MTR-480-SW

Price

MDF-U731M | MDF-U731	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

770 (30.3)
650 (25.6)
830 (32.7)
700 (27.6)
89 (3.5)
1955 (77.0)
1491 (58.7)
362.5 (14.3)
362.5 (14.3)
362.5 (14.3)
362.5 (14.3)
1520 (59.8)
10 (0.4)

Unit : mm

Biomedical -30°C Freezers

MDF-437 Biomedical -30°C Freezer

| Effective capacity | 425L |
| Temperature range | -20℃ to -30℃ |

PHCbi

Features

Power to counteract frequent door openings

The MDF-437 Biomedical -30°C Freezer offers outstanding reliability and performance required in a wide variety of storage and research applications.

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 as low as -30°C, trust the MDF-437 Biomedical -30°C Freezer.

PHC Europe B.V. also offers the MDF-137 Biomedical -30°C Freezer, with a capacity of 138 litres, and the MDF-237 Biomedical -30°C Freezer, with a capacity of 221 litres.

Benefits

- Large size 400-liter class
- Digital temperature display as standard feature
- Large-capacity, economical size
- Environment friendly

Features

- Enhanced Operation
- Memory backup
- Temperature display
- Front access calibration for temperature
- Single electrical box makes servicing easier
- Control panel can be reset to zero for calibration
- Optional Recording Features
- Environmental friendly HFC Refrigerant
- Alarm & Recording system
- High/low temperature alarm
- Power failure alarm
- Remote alarm contact
- Self diagnostics function

Performance
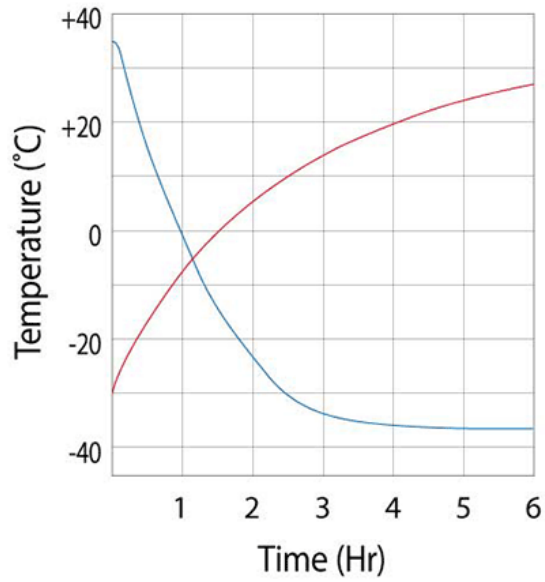
Product Photos

Specifications

|	
External Dimensions (W x D x H)	1265 x 807 x 905 mm
Internal Dimensions (W x D x H)	1140 x 550 x 735 mm
Volume	426 litres
Net Weight	81 kg
Capacity (Aluminium Racks 2" Boxes)	-
Capacity (Stainless Steel Racks 2" Boxe)	-
Cooling Performance	-30 °C

Temperature Setting Range	-18 to -35 °C
Temperature Control Range	-20 to -30 °C
Controller	Electronic
Display	LED
Temperature Sensor	Thermistor
Refrigeration System	Direct
Compressors	250 W
Refrigerant	HFC and HFO combined
Insulation Material	PUF
Insulation Thickness	60 mm
Exterior Material	Painted Steel
Interior Material	Colored aluminum plate
Outer Doors/Lid	-
Outer Door Lock	-
Inner Doors/Lid	-
Shelves	
Max. Load - Per Shelf	-
Max. load - Total	-
Vacuum Release Port	-
Access Port	2
Access Port Position	right / bottom left
Access Port Diameter	17
Casters	-
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	-
Door Open	-
Power Supply	Local
Frequency	Local
Noise Level	42 dB [A]

Accessories

Storage systems	MDF-13B2
Temperature recorders	
- Circular type (recorder housing)	MTR-G85 (MDF-S740)
- Continuous strip type (recorder housing)	MTR-4015LH (MDF-S3040)
RS485 Interface Module	MTR-480

Price

MDF-437	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions
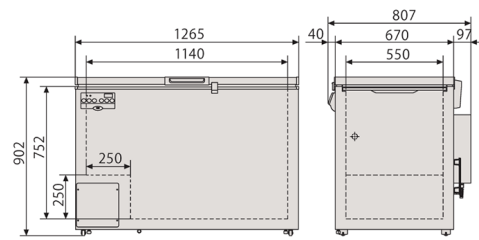
Unit : mm

-40°C Biomedical ECO Freezer with Natural Refrigerant

479 L

-40°C biomedical ECO freezer with separate temperature controls for the 2 completely independent chambers

The unit provides environmental savings and flexibility while maintaining the quality of the samples during preservation. Such flexibility includes height-adjustable shelf trays, separate top and bottom chambers with independent temperature settings and separate doors that prevent cold air leakage.

MDF-MU549DH

Natural Refrigerants and Inverter Technology

Hydrocarbon [HC] refrigerants have minimal effect on the environment and are compliant with environmental legislation for climate control. Combined with inverter technology, these refrigerants also provide more efficient cooling without compromising cooling performance, ambient tolerance and recovery speeds following door openings.

2 independently controlled temperature chambers

Top and bottom chambers are equipped with 2 independent refrigeration circuits. This enables separate temperature settings and defrosting for the two chambers.

Height-adjustable shelf trays

The unit features completely height-adjustable shelf trays, accommodating chamber containers of various sizes.

PERFORMANCE

Energy efficient performance
Natural refrigerants, compressors and integrated electronics combine to lower operating costs. Freezer operation is managed by effectively balancing temperature performance and energy management.

Top chamber
-40°C

Bottom chamber
-30°C
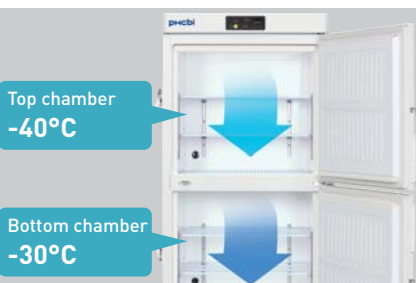
Double chamber allows multi-purpose storage
2 completely independent chambers each with its own temperature control make storage possible of samples with different storage temperature requirements. Moreover, independent temperature control allows for defrosting each chamber separately without having to relocate samples.

Door latch

Safe & Secure Sample Storage
To securely preserve the valuable samples, multiple safety features include 2 separate doors that reduce cold in-chamber air leakage when taking samples in/out and high/low abnormal temperature alarms. In addition to a standard door lock, a latch with a padlock is also available.

-40°C Biomedical ECO Freezer with Natural Refrigerant

Inverter Compressors

While conventional freezers use a single-speed compressor's on/off cycle, the unit uses inverter compressors that can run at different speeds to maximise cooling performance under different conditions. Combined with hydrocarbon refrigerants, these compressors ensure the most efficient energy use and reduced heat output.

Versatile Alarm Functions

Alarms for high/low temperatures and an error code display with self-diagnostic functions inform users of any abnormalities such as power failures for prompt actions that avoid damaging valuable samples.

Easy Disposal of Defrosting Water

Manual defrosting becomes easy using the drain hose that is attached to the main unit (hose usually stowed away when not in use).
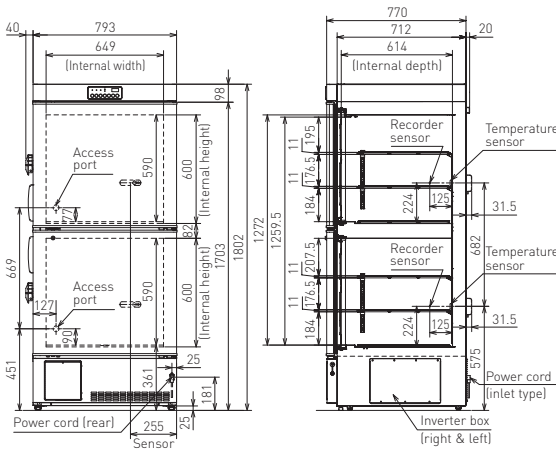
Performance Data

AT35°C Pull-down & Pull-up Temperature[2]

[220/230/240 V, 50 Hz]
- Pull-down
- Pull-up
- Top Room
- Bottom Room
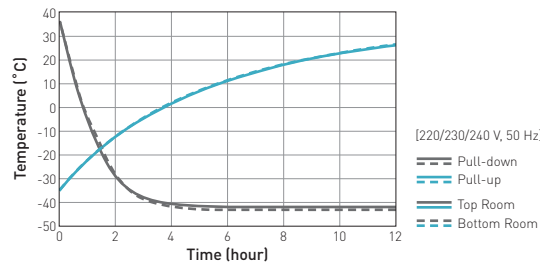
Dimensions

Unit: mm

Model Number		MDF-MU549DH-PE	MDF-MU549DH-PK
External dimensions (W x D x H) [1]	mm	793 x 770 x 1802	
Internal dimensions (W x D x H)	mm	649 x 614 x 600 (per chamber) x 2	
Volume	litres	479	
Net weight	kg	165	
Performance			
Cooling performance [2]	°C	-40	
Temperature setting range [2]	°C	-45 to -18	
Temperature control range [2]	°C	-40 to -20	
Control			
Controller		Microprocessor, non-volatile memory	
Display		LED	
Temperature sensor		Thermistor	
Refrigeration			
Compressors	W	2 x 400 (Used in upper chamber and lower chamber respectively)	
Refrigerant		HC	
Insulation material		PUF	
Insulation thickness	mm	70	
Construction			
Exterior material		Painted Steel	
Interior material		Painted Steel	
Outer door	qty	2	
Outer door lock		Yes	
Shelves	qty/mm	6 (W624 x D510)	
Max. load - per shelf	kg	30	
Access port	qty	2 (1 per chamber)	
Access port position		Back	
Access port diameter	Ø mm	30	
Casters	qty	4 (2 levelling feet)	
Alarms		(V = Visual Alarm, B = Buzzer Alarm, R = Remote Alarm)	
Power failure		V-B-R	
High temperature		V-B-R	
Low temperature		V-B-R	
Electrical and Noise Level		MDF-MU549DH-PE	MDF-MU549DH-PK
Power supply	V	220/230/240	220
Frequency	Hz	50	60
Noise level [3]	dB (A)	42	
Accessories			
Accessories	qty	1 Key set / 1 Defrost spatula	
Options		MDF-MU549DH-PE	MDF-MU549DH-PK

Temperature recorders

- Circular type	MTR-G85C-PE
	— Chart paper: RP-G85-PW — Ink pen: PG-R-PW — Recorder housing: MDF-S740T-PW (for top side) MPR-S7-PW (for lower front)
- Continuous strip type	MTR-4015LH-PE
	— Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW (for unit lower front) *Unit left top mounting hardware included in recorder kit

Storage container		MDF-05SC-PW (2 pcs/set)	
	Inner dimensions	mm	W280 x D552 x H157
Optional Communication Systems			
Digital interface [RS232C/RS485] [4]		MTR-480-PW	
Ethernet interface [LAN] [4]		MTR-L03-PW	
Quality Management System		MDF-MU549DH-PE	MDF-MU549DH-PK
Certification		ISO13485	

[1] External dimensions of main cabinet only, excluding handles and other external projections.
[2] Air temperature measured at freezer centre, ambient temperature 35°C, no load.
[3] Nominal value - Background noise 20 dB(A)
[4] Only for MTR-5000 (data acquisition system) users.

• Appearance and specifications are subject to change without notice.
Caution: PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents stored in the product.

CE (220/230/240 V, 50 Hz)

Biomedical -40°C Plasma Freezers

MDF-U5412 Biomedical Upright Plasma Freezer

| Effective capacity | 482L |
| Temperature range | -20℃ to -40℃ |

Features

Cost-saving and environmentally friendly fresh frozen plasma storage

This MDF-U5412 Biomedical Plasma Freezer provides an ideal freezing environment for the preservation of vaccines, blood plasma, test samples and specimens. The MDF-U5412 Biomedical Plasma Freezer has a storage environment with excellent safety features, easy operability, and a lot of other features. The MDF-U5412 Biomedical Plasma Freezer offers unsurpassed reliability and functionality for short or intermediate term storage at temperatures as low as -40°C.

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.

Large storage capacity

- 300ml Fresh frozen plasma bag x 280 pieces.

The MDF-U5412 is certified as a Class IIa Medical Device.

Benefits	Features
· Built-in door latch for each of the double outer doors	· Stable & Uniform Temperature Design
· Simple calibration via the control panel	· Double outer doors
· Visual and audible alarm system	· Full-height storage containers on each shelf
· A safe, secure and easy to access unit to store your samples	· Cooling tubes under every shelf
· High freezing power	· Direct cooling system for stable temperature control
· Environment friendly	· Fine-controllable refrigeration circuit with valve

- Large Storage Capacity
- 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
- 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)

Product Photos

Specifications

External Dimensions (W x D x H)	804 x 772 x 1802 mm
Internal Dimensions (W x D x H)	658 x 607 x 1272 mm
Volume	482 litres
Net Weight	134 kg
Capacity (Aluminium Racks 2" Boxes)	-
Capacity (Stainless Steel Racks 2" Boxe)	-

Cooling Performance	-40 °C
Temperature Setting Range	-18 to -45 °C
Temperature Control Range	-20 to -40 °C
Controller	Micrprocessor
Display	LED
Temperature Sensor	Thermistor
Refrigeration System	Direct
Compressors	400 W
Refrigerant	
Insulation Material	PUF
Insulation Thickness	70 mm
Exterior Material	Painted Steel
Interior Material	Styrol resin
Outer Doors/Lid	-
Outer Door Lock	Y
Inner Doors/Lid	-
Shelves	
Max. Load - Per Shelf	U:30/L:30 kg
Max. load - Total	100 kg
Vacuum Release Port	-
Access Port	-
Access Port Position	Back
Access Port Diameter	30
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	-
Door Open	-
Power Supply	Local
Frequency	Local
Noise Level	42 dB [A]

Accessories

Temperature recorders	
- Circular type (recorder housing)	MTR-G85 (MPR-S7)
- Continuous strip type (recorder housing)	MTR-4015LH (MPR-S30)
RS485 Interface Module	MTR-480

Price

MDF-U5412	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions
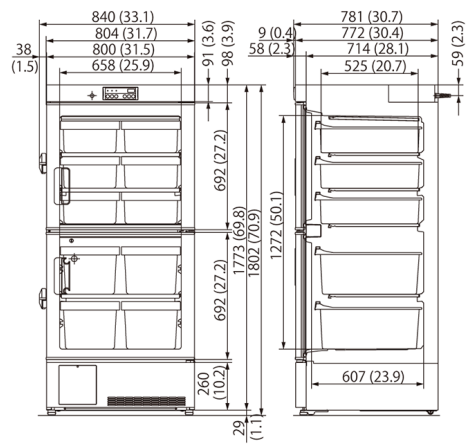
Unit : mm

Biomedical -40°C Plasma Freezers

MDF-U5412H Biomedical ECO -40°C Plasma Freezer

| Effective capacity | 482L |
| Temperature range | -20℃ to -30℃ |

ECO
natural refrigerants

Features

Cost-saving and environmentally friendly fresh frozen plasma storage

The MDF-U5412H Biomedical ECO Plasma Freezer provides an ideal freezing environment for the preservation of blood plasma, vaccines, test samples, and other biological specimens.

The Biomedical ECO Series Freezers with natural refrigerants minimise energy consumption, reduce environmental impact and save money while providing superior stability and uniformity. A comprehensive alarm system and Class IIa Medical Device Certification ensure this freezer provides unsurpassed reliability and sample security.

Reliable and efficient storage for plasma

- Outstanding stability and uniformity
- Natural (HC) refrigerants for a reduced carbon footprint
- Alarm and safety devices for secure storage
- Ideal freezing environment for Fresh Frozen Plasma and blood related products
- Certified as a Class IIa Medical Device

Benefits	Features

Benefits

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

Features

- 300ml Fresh frozen plasma bag x 280 pieces.
- Double outer doors.
- Full-height storage containers on each shelf.
- Cooling tubes under every shelf.
- Direct cooling system for uniform temperature control.
- Manual defrost ensures a stable environment with no large temperature peaks.
- A comprehensive visual and audible alarm system with remote alarm contacts ensures users are aware of any abnormalities and can take appropriate actions.

- Self-diagnostic system.
- Standard door lock allows a padlock to be fitted for extra security.
- An access port allows external temperature monitoring with the use of a probe, or an optional temperature chart recorder can be added.

Product Photos

Specifications

External Dimensions (W x D x H)	804 x 772 x 1802 mm
Internal Dimensions (W x D x H)	658 x 607 x 1272 mm
Volume	482 litres
Net Weight	132 kg
Capacity (Aluminium Racks 2" Boxes)	280 (300ml) FFP packs
Capacity (Stainless Steel Racks 2" Boxe)	-
Cooling Performance	-40 °C
Temperature Setting Range	-40 °C -18 to -45 °C
Temperature Control Range	-20 to -40 °C
Controller	Microprocessor, non-volatile memory
Display	LED
Temperature Sensor	Thermistor
Refrigeration System	Direct

Compressors	450 W
Refrigerant	
Insulation Material	PUF
Insulation Thickness	70 mm
Exterior Material	Painted Steel
Interior Material	Styrol resin
Outer Doors/Lid	2
Outer Door Lock	Y
Inner Doors/Lid	-
Shelves	
Max. Load - Per Shelf	30 kg
Max. load - Total	100 kg
Vacuum Release Port	-
Access Port	1
Access Port Position	Back
Access Port Diameter	30
Casters	4 (2 leveling feet)
Power Failure	V-B-R
High Temperature	V-B-R
Low Temperature	V-B-R
Filter	-
Door Open	V-B
Power Supply	Local
Frequency	Local
Noise Level	42 dB [A]

Accessories

Options

Temperature recorders	
- Circular type (recorder housing)	MTR-G85C-PE
- Chart paper	RP-40-PW
- Ink pen	PG-R-PW

- Recorder housing	MPR-S30-PW
- Continuous strip type	MTR-4015LH-PE
RS485 Interface Module	MTR-480

Price

MDF-U5412H	The price might vary in country. Please send the inquiry form for getting quotation.

Dimensions

Unit : mm