



## TwinGuard

-86°C Ultra-Low Temperature Freezers



575 L / 715 L

PHCbi's **TwinGuard** -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

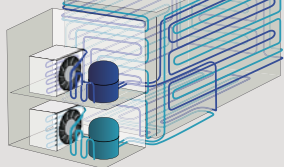
**TwinGuard** chest freezers maintain better temperature stability and uniformity during routine door openings than equivalent upright models as less cold air escapes the freezer while the door is open.

### 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.

## TwinGuard

Dual Cooling Compressors



### Valuable Sample Storage

With two independent systems, each sustaining ultra-low temperatures, your samples remain safe. Optional CO<sub>2</sub> 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.

# TwinGuard

-86°C Ultra-Low Temperature Freezers



MDF-DC500VX

## Filterless Design

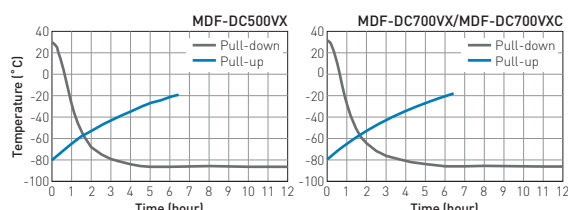
The filterless construction of the freezers reduces routine maintenance time by eliminating the need for regular cleaning of filters.

## 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.

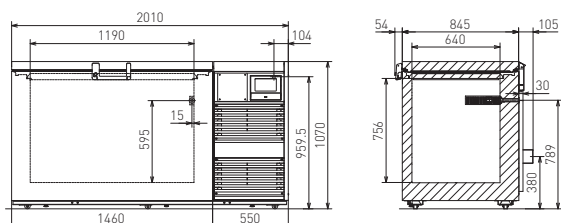
## Performance Data

AT30°C Pull-down & Pull-up Temperature

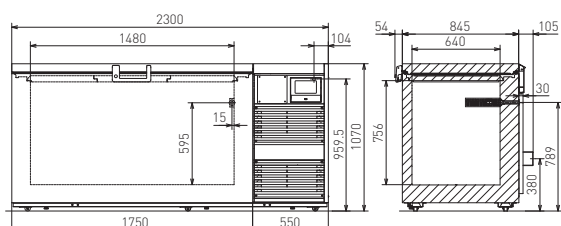


## Dimensions

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) <sup>1)</sup>	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 <sup>2)</sup>	°C	-86		
Temperature setting range	°C	-50 to -90		
Temperature control range <sup>2)</sup>	°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 <sup>3)</sup>	dB (A)	52		
Options				
Liquid CO <sub>2</sub> back-up		MDF-UB5-PW		
Temperature recorders	- Circular type	MTR-G85C-PE — Chart paper: RP-G85-PW — Ink pen: PG-R-PW		
	- 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] <sup>4)</sup>		MTR-L03-PW		
Digital interface [RS232C/RS485] <sup>4)</sup>		MTR-480-PW		
Quality Management System				
Certification		ISO9001		

<sup>1)</sup> External dimensions of main cabinet only, excluding handle and other external projections - See dimensions drawings on website for full details.

<sup>2)</sup> Air temperature measured at freezer centre, ambient temperature +30°C, no load.

<sup>3)</sup> Nominal value - Background noise 20dB[A]

<sup>4)</sup> 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.



Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use  
The management of the design, development, production and servicing of the above.  
PHC Corporation, Biomedical Division  
1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



PHC Corporation Biomedical Division is certified for:  
**Environmental management system: ISO14001**

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## VIP ECO

Natural Refrigerants Ultra-Low Temperature Freezer

-86°C to -40°C



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.

### Natural Refrigerants and Inverter Technology

Naturally occurring 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.



### 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



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.

\* 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.

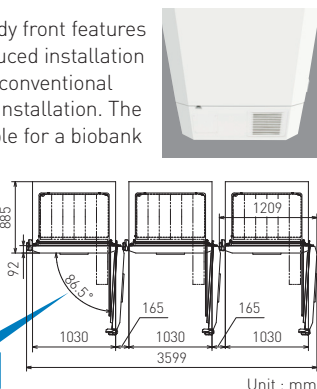
# VIP ECO Natural Refrigerants Ultra-Low Temperature Freezer

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

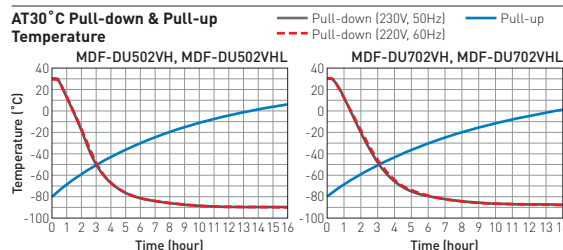
## User friendly for daily operation with newly developed vacuum release port and fivefold gasket

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.



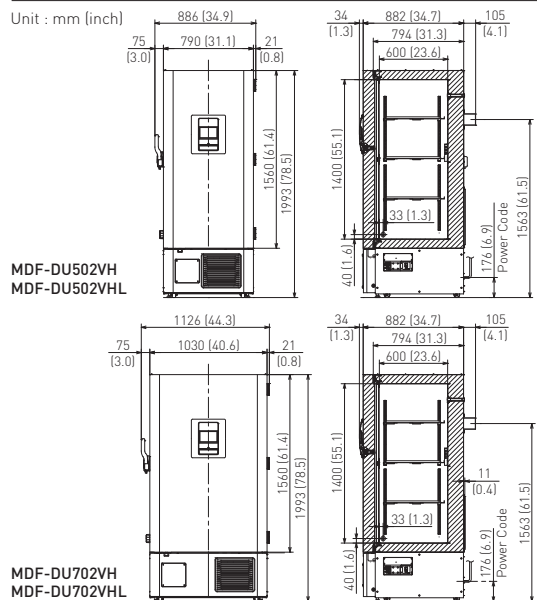
## Performance Data

AT30°C Pull-down & Pull-up Temperature



## Dimensions

Unit : mm (inch)



MDF-DU502VH  
MDF-DU502VHL

MDF-DU702VH  
MDF-DU702VHL



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Model Number <sup>2)</sup>	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) <sup>1)</sup>	mm	790 x 882 x 1993
Internal dimensions (W x D x H)	mm	630 x 600 x 1400
Volume	litres	528
Net weight	kg	246
Capacity <sup>2)</sup>	2" boxes	384
		576
<b>Performance</b>		
Cooling performance <sup>3)</sup>	°C	-86 to -40
Temperature setting range	°C	-90 to -40
Temperature control range <sup>3)</sup>	°C	-86 to -40
<b>Control</b>		
Controller		Microprocessor, non-volatile memory
Display		LCD Touchpanel
Temperature sensor		Pt-1000
<b>Refrigeration</b>		
Refrigeration system		Cascade
Compressors	W	2 x 750
Refrigerant		HC
Insulation material		PUF / VIP PLUS
Insulation thickness	mm	80
<b>Construction</b>		
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 <sup>4)</sup> 515 <sup>4)</sup>
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)
<b>Alarms</b> (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
<b>Electrical and Noise Level</b>		
Power supply	V	PA: 220 / PE: 220/230/240 / PS: 230
Frequency	Hz	PA: 60 / PE: 50 / PS: 50
Noise level <sup>5)</sup>	dB (A)	52
<b>Options</b>		
Small inner door kit	set of 5 set of 4	MDF-5ID5-PW <sup>6)</sup> MDF-7ID5-PW <sup>6)</sup> MDF-5ID4-PW MDF-7ID4-PW
Liquid CO <sub>2</sub> back-up		MDF-UB7-PW
Inventory rack		IR-224U-PW, IR-316U-PW
Temperature recorders	- Circular type - Continuous strip type	MTR-G85C-PE <sup>7)</sup> - Chart paper: RP-G85-PW - Ink pen: PG-R-PW MTR-85H-PW <sup>7)</sup> - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW
<b>Optional Communication Systems</b>		
Digital interface (RS232C/RS485) <sup>8)</sup>		MTR-480-PW
Ethernet interface (LAN) <sup>8)</sup>		MTR-L03-PW
<b>Quality Management System</b>		
Certification		ISO 9001

<sup>1)</sup> Exterior dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Usable storage capacity of 2" boxes when the original 3 trays installed.

<sup>3)</sup> Air temperature measured at freezer centre, ambient temperature 30°C, no load.

<sup>4)</sup> Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.

<sup>5)</sup> Nominal value - Background noise 20 dB(A).

<sup>6)</sup> Installation of small inner door kit may affect usable storage capacity.

<sup>7)</sup> Requires sensor cover MTR-DU700SF-PW.

<sup>8)</sup> Only for MTR-5000 (data acquisition system) users.

<sup>9)</sup> 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.





## VIP ECO SMART

Natural Refrigerants Ultra-Low Temperature Freezer

-86°C to -40°C



528 L / 729 L

**Cost-saving and environmentally friendly sample storage now upgraded with additional features for improved usability.**

The VIP ECO SMART -86°C to -40°C upright freezer, along with conventional Password Protection, now offers Face Recognition, coupled with an Electric Lock for enhanced access control. Energy-saving is also further improved by using natural refrigerants combined with an inverter compressor.

### Natural refrigerants and inverter technology

Naturally occurring 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.

### New & larger control panel with multiple features

Larger display improves visibility, increasing from 7.0 Inches to 10.1 Inches (1.4 times larger in size & 1.6 times higher in resolution), compared to conventional models.



### The ergonomic "EZlatch" now coupled with "Electric Lock"

The ergonomically designed "EZlatch" door handle, as the name suggests, allows for secure door opening / closing with minimal force.

Newly added "Electric Lock" automatically unlocks/locks the door keys, making access to stored samples much easier.



### Energy efficient performance



Natural refrigerants, compressors and integrated electronics combine to lower operating costs compared to existing models by up to 53%\*. Freezer operation is managed by effectively balancing temperature performance and energy management.

\* Compared to conventional model (MDF-DU700VH-PE)  
Power source: AC 220 V/230 V/240 V 50 Hz, AT 23°C

### Intelligent interface



The newly designed control panel with rearranged layout and icons greatly enhances usability. The touchscreen method has also changed from the resistive method to the capacitive method, enabling comfortable use even with lab gloves on.

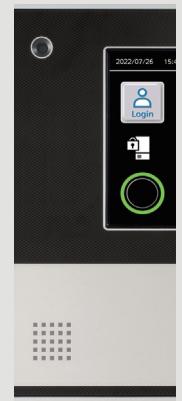
### Various login methods to suit every scenario

#### 1. Password Protection

UP to 100 accounts registrable, each with individual passwords.

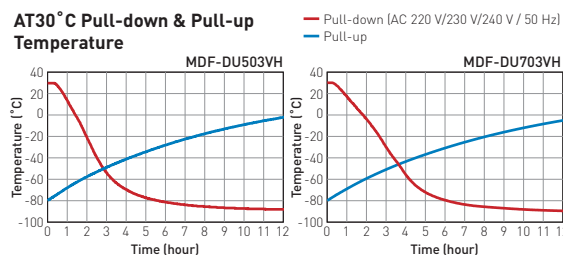
#### 2. Face Recognition

Take a picture of your face and register it. Once the camera recognizes you, you will automatically be logged in.



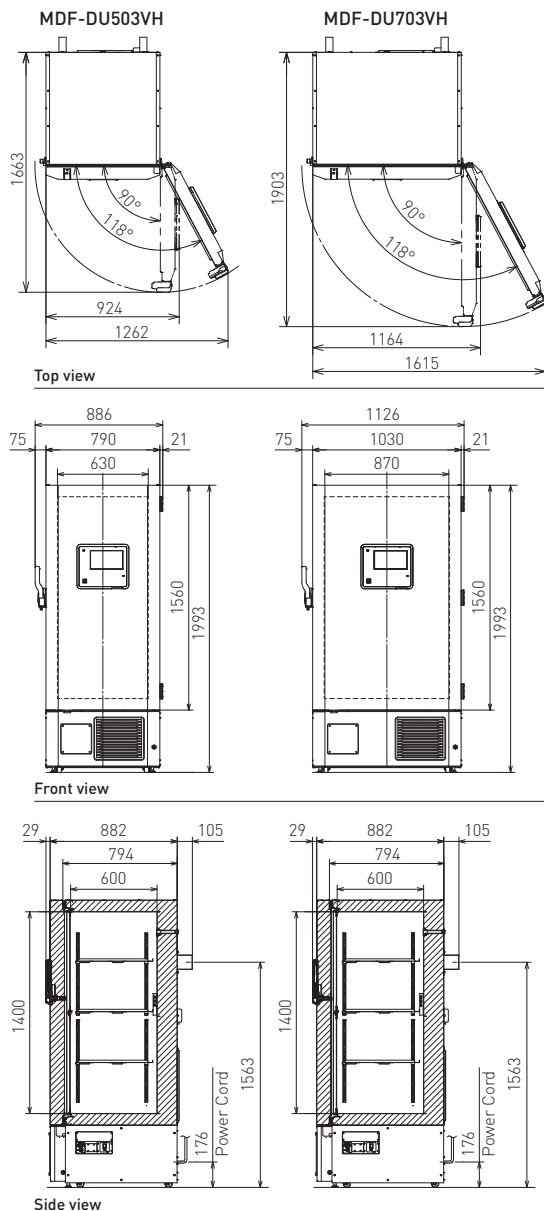
## Performance Data

### AT30°C Pull-down & Pull-up Temperature



## Dimensions

Unit : mm



Model Number <sup>7)</sup>		MDF-DU503VH-PE/-PK MDF-DU503VHA-PA	MDF-DU703VH-PE/-PK MDF-DU703VHA-PA	
External dimensions (W x D x H) <sup>1)</sup>	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	241		276
Capacity <sup>2)</sup>	2" boxes	384		576
Performance				
Cooling performance <sup>3)</sup>	°C	-86 to -40		
Temperature setting range	°C	-90 to -40		
Temperature control range <sup>3)</sup>	°C	-86 to -40		
Control				
Controller		Microcomputer control system		
Display		LCD Digital display		
Temperature sensor		Platinum resistance (Pt 1,000 Ω)		
Refrigeration				
Refrigeration system		Cascade		
Compressors	W	High stage side; Hermetic type, Output: 750 W Low stage side; Hermetic type, Output: 750 W		
Refrigerant		HC		
Insulation		Rigid polyurethane foamed-in place + Vacuum insulation panel		
Construction				
Exterior material		Painted Steel		
Interior material		Painted Steel		
Outer door	qty	1		
Outer door lock		Y		
Inner doors	qty	2		
Shelves	qty	3		
Max. load - per shelf	kg	50		
Vacuum release port		1 (automatic)		
Access port	qty	3		
Access port position		3 (back x1, bottom x2)		
Access port diameter	Ø mm	17		
Casters	qty	4 (2 leveling feet)		
Alarms (V = Visual Alarm, B = Buzzer Alarm, M = Message, R = Remote Alarm)				
Power failure		V-B-M-R		
High temperature		V-B-M-R		
Low temperature		V-B-M-R		
Filter		V-M		
Door open		V-B-M		
Electrical and Noise Level		MDF-DU503VH-PE MDF-DU703VH-PE	MDF-DU503VH-PK MDF-DU703VH-PK	MDF-DU503VHA-PA MDF-DU703VHA-PA
Power supply	V	220/230/240, 220/230	220	115
Frequency	Hz	50 / 60	60	60
Noise level <sup>4)</sup>	dB (A)	52		
Options		MDF-DU503VH-PE/-PK MDF-DU503VHA-PA	MDF-DU703VH-PE/-PK MDF-DU703VHA-PA	
Small inner door kit	set of 5	MDF-5ID5-PW <sup>5)</sup>	MDF-7ID5-PW <sup>5)</sup>	
	set of 4	MDF-5ID4-PW	MDF-7ID4-PW	
Liquid CO <sub>2</sub> back-up		MDF-UB9-PW		
Inventory rack		IR-224U-PW, IR-316U-PW		
Temperature recorders	- Circular type	MTR-G85C-PE/MTR-G85A-PA <sup>6)</sup> - Chart paper: RP-G85-PW - Ink pen: PG-R-PW		
	- Continuous strip type	MTR-85H-PW <sup>6)</sup> - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW		
Recorder sensor cover		MTR-DU700SF-PW		
Optional Communication Systems				
Digital interface (RS232C/RS485)		MTR-480-PW		
Ethernet interface (LAN)		MTR-L03-PW		
Quality Management System		MDF-DU503VH-PE / MDF-DU503VHA-PA MDF-DU703VH-PE / MDF-DU703VHA-PA	MDF-DU503VH-PK MDF-DU703VH-PK	
Certification		ISO9001		ISO13485

- 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) Nominal value - Background noise 20 dB(A).  
5) Installation of small inner door kit may effect usable storage capacity.

- 6) Requires sensor cover MTR-DU700SF-PW.  
7) MDF-DU503VH, MDF-DU703VH are for laboratory use.  
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Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use

The management of the design, development, production and servicing of the above.



Freezers, Refrigerators, Incubators, and Drying and Sterilising Equipment for Medical use

The management of the design, development, production and distribution of the above.



PHC Corporation Biomedical Division is certified for:  
Environmental management system: ISO14001

PHC Corporation, Biomedical Division 1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan

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Printed in Japan 1116-2023-02-AA



MDF-DU302VX

## TwinGuard

-86°C Ultra-Low Temperature Freezer



360 L

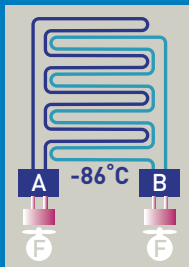
**Ultra-low temperature storage solution for valuable samples. TwinGuard equipped with new Dual Cooling System.**

New TwinGuard 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 such as biobank use.

### Ultimate Sample Protection

New optimised Dual Cooling System "TwinGuard" 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.



### 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 % [240 pcs of 2-inch Cryo boxes can be stored] while maintaining the same footprint as conventional models.



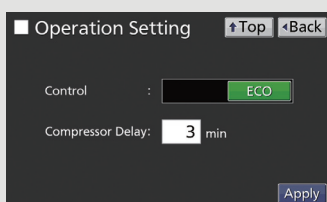
### Intelligent Interface

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

Improved insulating performance cuts power consumption approximately 10 %\* compared to conventional models when the ECO mode is selected, thanks to the effective combination of VIP Plus insulation and the next-generation cabinet.



\* Compared to conventional models. Power consumption per 2 inch box. Power source: 230 V 50 Hz, AT 23°C

### Flexible shelf layout



Multiple shelf configurations allow a variety of storage options. Organise your samples by transferring your current inventory racks.

### Reliable controllability and data log function

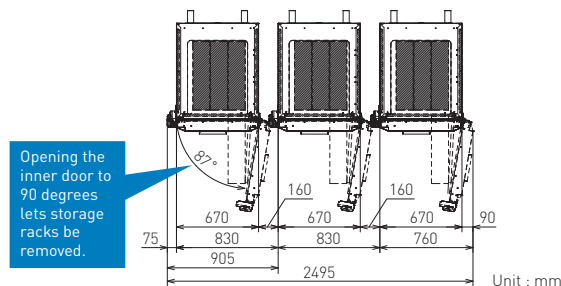


Large colour LCD touchpanel is accurately controlled even with a gloved hand, while the USB port makes transferring logged data of product's operational status to a PC convenient.

# TwinGuard -86 °C Ultra-Low Temperature Freezer

## New Cabinet Design

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



## Filterless Design

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

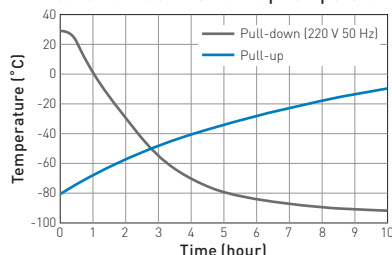
## User friendly for daily operation with newly developed vacuum release port and fivefold gasket

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.

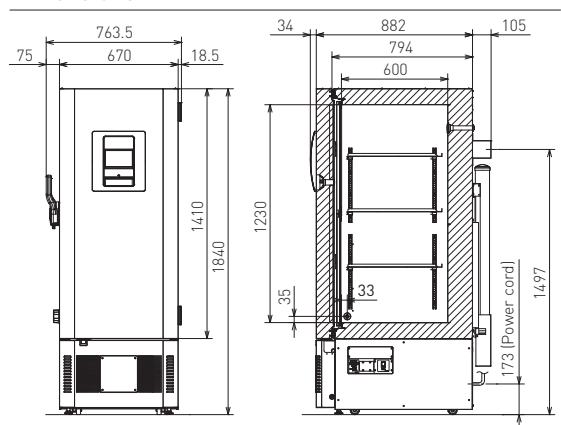


## Performance Data

AT30°C Pull-down & Pull-up Temperature



## Dimensions



Model Number	MDF-DU302VX-PE	MDF-DU302VX-PA
External dimensions (W x D x H) <sup>1)</sup>	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 <sup>2)</sup>	2" boxes	240
<b>Performance</b>		
Cooling performance <sup>3)</sup>	°C	-86
Temperature setting range	°C	-90 to -50
Temperature control range <sup>3)</sup>	°C	-86 to -50
<b>Control</b>		
Controller		Microprocessor, non-volatile memory
Display		LCD Touchpanel
Temperature sensor		Pt-1000
<b>Refrigeration</b>		
Refrigeration system		Independent Dual-Cooling
Compressors	W	2 x 450
Refrigerant		HFC mixed
Insulation material		PUF / VIP PLUS
Insulation thickness	mm	80
<b>Construction</b>		
Exterior material		Painted Steel
Interior material		Painted Steel
Outer door	qty	1
Outer door lock		Yes
Inner doors	qty	2 pieces
Shelves	qty	3 (stainless steel)
Max. load - per shelf	kg	50
Max. load - total <sup>4)</sup>	kg	365
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)
<b>Alarms</b> (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
<b>Electrical and Noise Level</b>		
Power supply	V	220/230/240
Frequency	Hz	50
Noise level <sup>5)</sup>	dB (A)	52
<b>Options</b>		
Liquid CO <sub>2</sub> back-up		MDF-UB7-PW
Inventory rack		IR-220U-PW
Temperature recorders		- Circular type: MTR-G85C-PE <sup>6)</sup> - Chart paper: RP-G85-PW - Ink pen: PG-R-PW - Continuous strip type: MTR-85H-PW <sup>6)</sup> - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW
<b>Optional Communication Systems</b>		
Digital interface (RS232C/RS485) <sup>7)</sup>		MTR-480-PW
Ethernet interface (LAN) <sup>7)</sup>		MTR-L03-PW
<b>Quality Management System</b>		
Certification		ISO 9001

<sup>1)</sup> External dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Usable storage capacity of 2" boxes when the original 3 trays installed.

<sup>3)</sup> Air temperature measured at freezer centre, ambient temperature 30°C, no load.

<sup>4)</sup> Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.

<sup>5)</sup> Nominal value - Background noise 20 dB(A).

<sup>6)</sup> Requires sensor cover MTR-DU700SF-PW.

<sup>7)</sup> 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.



Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use  
The management of the design, development, production and servicing of the above.  
PHC Corporation, Biomedical Division  
1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



PHC Corporation  
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management system:**  
ISO14001

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Printed in Japan 1113-2018-05-BC



MDF-C8V1

**Space Saving  
Personal Size**

**-80°C**  
**84liters/3.0cu.ft.**

**V.I.P. PLUS**  
(Vacuum Insulation Panel)

**Personal size, space saving  
Ultra-Low Temperature Freezer with  
Improved energy consumption**

- V.I.P. PLUS technology maximises storage capacity
- Space-saving design enables effective use of laboratory space
- Filterless structure makes cleaning unnecessary
- Alarms to protect valuable samples
- Low noise design
- Achieves energy savings of approx. 40 %\*

\*Internal comparison

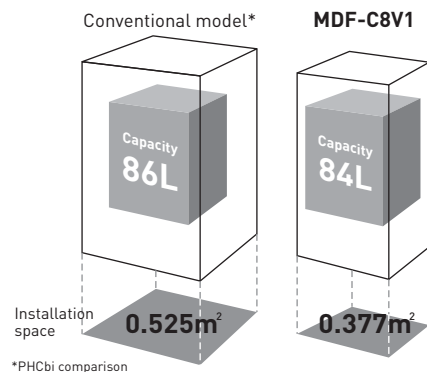


# MDF-C8V1

## Features

### Insulation system: V.I.P. PLUS

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

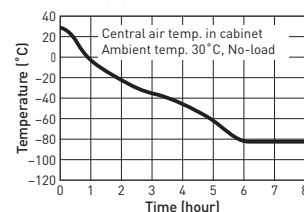


### New cooling circuit enables filterless structure

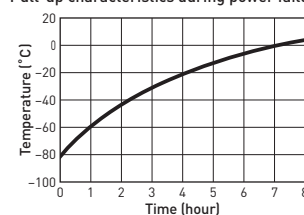
A new cooling circuit makes the inconvenient customer maintenance procedure of filter cleaning unnecessary.

## Performance Data

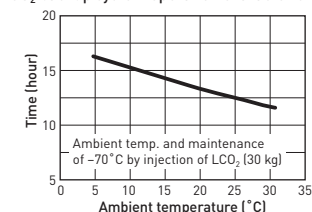
Pull-down characteristics



Pull-up characteristics during power failure



CO<sub>2</sub> backup system operation characteristics



### Newly developed

#### single-compressor system

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

## Specifications

	Model No.
115 V, 60 Hz	MDF-C8V1-PA
220 V, 60 Hz	MDF-C8V1-PK MDF-C8V1-PR
220 V/230 V/240 V, 50 Hz (CE)	MDF-C8V1-PE
Temperature range	-60°C to -80°C (in 1°C increments)
Maximum cooling performance	-80°C (Ambient temperature 30°C)
External dimensions (W x D x H)*1	550 x 685 x 945 (mm) / 21.6 x 27.0 x 37.2 (inch)
Internal dimensions (W x D x H)	405 x 490 x 425 (mm) / 15.9 x 19.3 x 16.7 (inch)
Effective capacity	84 liters (3.0 cu.ft.)
Net weight	Approx. 70 kg (154 lbs.)
Storage capacity	2" box: 42 pcs. (IR-207C x 6 racks)
Outer door/Inner door	Outer Lid: 1piece, Inner Lid: 1piece (PS + PE foam)
Insulation	V.I.P. PLUS + Rigid polyurethane foam (HC)
Cooling system	New mixed refrigerant cooling system
Compressor	Hermetic type, Output: 450 W (MDF-C8V1-PK, MDF-C8V1-PR only)
Refrigerant	HFC
Evaporator	Tube on sheet type
Alarm system	• High / Low temp. alarm (±5°C to ±20°C) • Power failure alarm • Remote alarm contact: DC 30 V, 2 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.

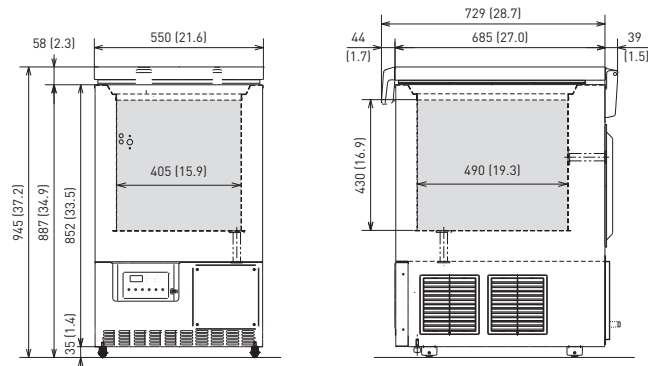
**Caution:** PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content. The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years.

•Appearance and specifications are subject to change without notice.

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

## Dimensions

Unit: mm (inch)



## Options

### Temperature recorders



Circular recorder  
MTR-G85A-PA  
MTR-G85C-PE



Strip chart recorder  
MTR-85H-PW

Recorder mounting bracket  
MDF-S3085-PW  
(for MTR-85H-PW)

Inventory rack  
IR-207C-PW  
IR-305C-PW

Sensor cover  
MTR-C8-PW



LCO<sub>2</sub> Back-up system  
CVK-UB4-PW

Back-up system mounting kit  
MDF-UBK-PW



### Preservation (freezers, refrigerators) and Culturing (incubators) Equipment

The management of the design, development, production, sales support, and servicing of the above.

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PHC Corporation Biomedical Division is certified for:  
Environmental management system: ISO14001

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Printed in Japan 1201-2018-04-CC

# Ultra-low Temperature Freezer | MDF-DU302VX *TwinGuard*

## Ultimate Sample Protection

New optimised Dual Cooling System "TwinGuard" 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) <sup>1)</sup>	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 <sup>2)</sup>	2" boxes	240	
Performance			
Cooling performance <sup>3)</sup>	°C	-86	
Temperature setting range	°C	-90 to -50	
Temperature control range <sup>3)</sup>	°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 <sup>4)</sup>	
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 <sup>5)</sup>	dB [A]	52	
Options			
Liquid CO <sub>2</sub> back-up		MDF-UB7-PW	
Inventory rack		IR-224U-PW, IR-316U-PW	
Temperature recorders	- Circular type	MTR-G85C-PE <sup>6)</sup> - Chart paper: RP-G85-PW - Ink pen: PG-R-PW	
	- Continuous strip type	MTR-85H-PW <sup>6)</sup> - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW	
Optional Communication Systems			
Digital interface [RS232C/RS485] <sup>7)</sup>		MTR-480-PW	
Ethernet interface [LAN] <sup>7)</sup>		MTR-L03-PW	
Quality Management System			
Certification		ISO 9001	

<sup>1)</sup> Exterior dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Usable storage capacity of 2" boxes when the original 3 trays installed.

<sup>3)</sup> Air temperature measured at freezer centre, ambient temperature 30 °C, no load.

<sup>4)</sup> Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.

<sup>5)</sup> Nominal value - Background noise 20 dB(A).

<sup>6)</sup> Requires sensor cover MTR-DU700SF-PW.

<sup>7)</sup> 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.

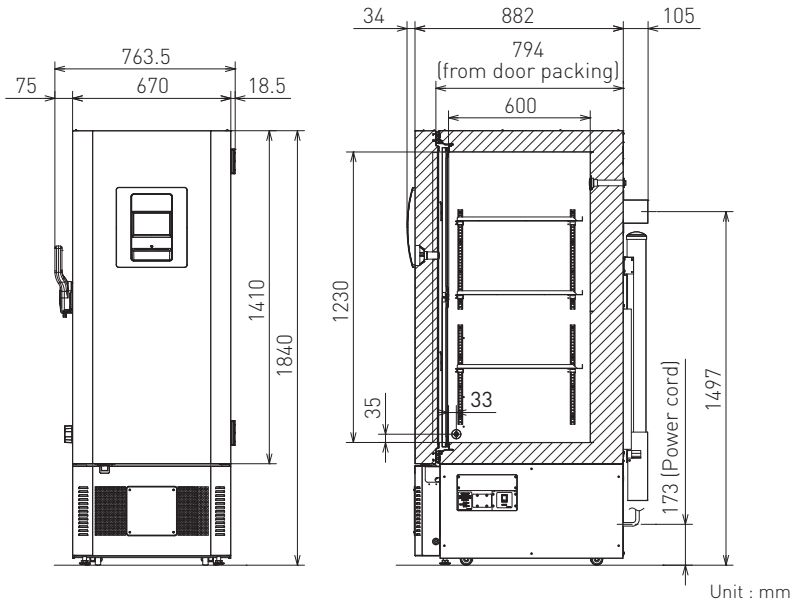


## Reliable control-lability and data log function

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.

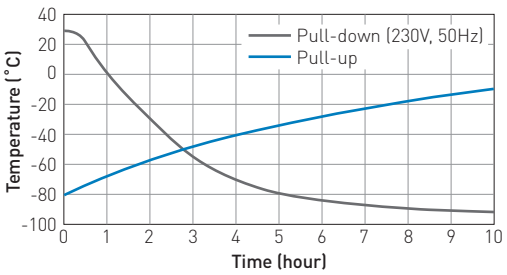


Dimensions

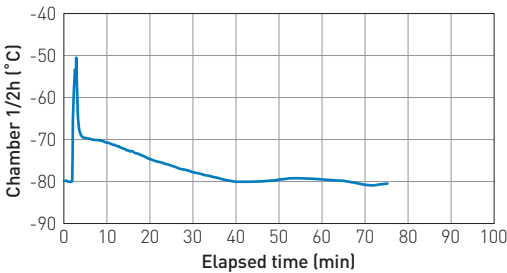


Performance Data

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

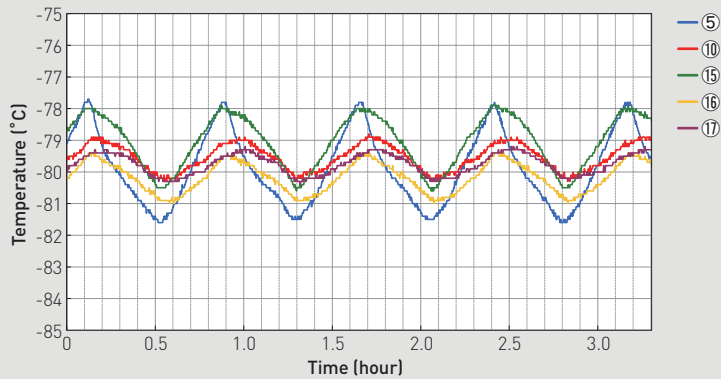


Temperature recovery after top door opened for 60 sec., Conditions: AT23°C, 220V/60Hz, SV-80°C

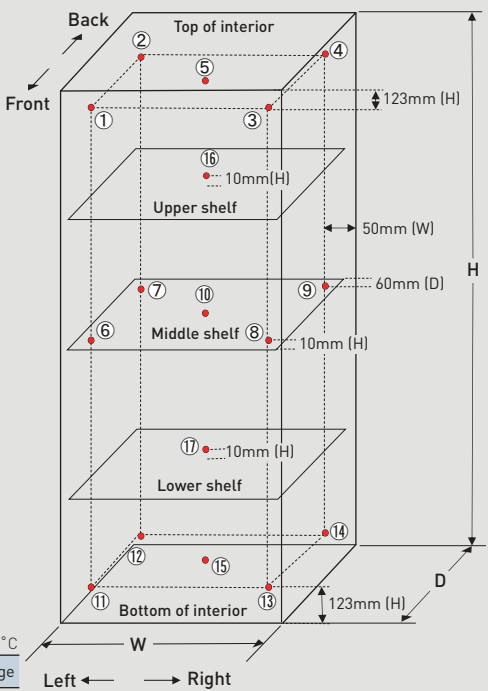


Temperature Stability

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



Temperature uniformity - 17 points measuring



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

	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

Unit: °C

[Note] Disclaimer

- Specification may change without notice.
- The performance data was measured by inhouse test data of PHC.
- The Performance data is a reference data and not guaranteed.
- Not all the products available in all countries.



MDF-DU901VHL

## VIP ECO

Large Volume

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



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 1m<sup>2</sup> for maximum storage.

### Natural Refrigerants and Inverter Technology

Naturally occurring 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 m<sup>2</sup> 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.

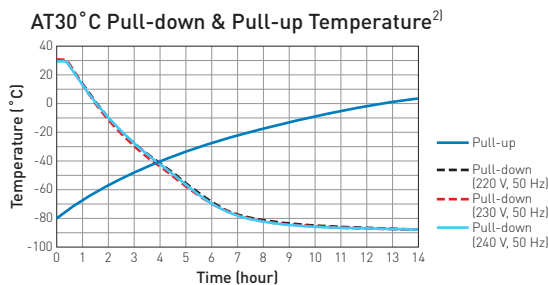
## VIP Plus Insulated Panels

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.

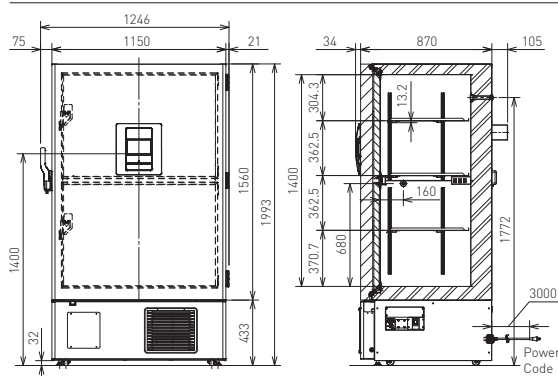
## Temperature Uniformity

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



## Dimensions



Model Number		MDF-DU901VHL-PE	MDF-DU901VHA-PA
External dimensions (W x D x H) <sup>1)</sup>	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 <sup>2)</sup>	°C	-86	
Temperature setting range	°C	-50 to -90	
Temperature control range <sup>2)</sup>	°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 <sup>3)</sup>	dB (A)	52	
Options			
Small inner door kit	set of 2	MDF-9ID-PW (max 2) <sup>4)</sup>	
Liquid CO2 back-up		MDF-UB7-PW	
Inventory rack		IR-224U-PW, IR-220U-PW	
Temperature recorders	- Circular type	MTR-G85C-PE <sup>5)</sup>	MTR-G85A-PA <sup>5)</sup>
		- Chart paper: RP-G85-PW - Ink pen: PG-R-PW	
	- Continuous strip type	MTR-85H-PW <sup>5)</sup>	- Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW
Optional Communication Systems			
Digital interface [RS232C/RS485] <sup>6)</sup>		MTR-480-PW	
Ethernet interface [LAN] <sup>6)</sup>		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.



Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use  
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Printed in Japan 1115-2019-11-AA



# -30°C Biomedical ECO Freezer | MDF-MU339HL

## 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.

## 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

## Height-adjustable Shelf Trays

This unit features fully height adjustable shelf trays accommodating chamber containers of various sizes.

Model Number		MDF-MU339HL-PE	MDF-MU339HL-PA
External dimensions (W x D x H) <sup>1)</sup>		mm	616 x 770 x 1802
Internal dimensions (W x D x H)		mm	472 x 614 x 1262
Volume		litres	369
Net weight		kg	122
Performance			
Cooling performance <sup>2)</sup>		°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
Outer door lock			Yes
Shelves		qty	6
Dimensions		mm	W447 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
Power supply		V	220/230/240 115
Frequency		Hz	50 60
Power Consumption [100-240V / 50/60Hz] SV-30°C		kWh/day	AT30°C: 2.33 AT20°C: 1.58
Noise level <sup>3)</sup>		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
	- Continuous strip type		MTR-4015LH-PE/MTR-4015LH-PA — Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW
Storage Container	Inner dimensions	mm	MDF-035C-PW [2 pcs/set] W420 x D552 x H157
Optional Communication Systems			
Digital interface (RS232C/RS485) <sup>4)</sup>			MTR-480-PW
Ethernet interface (LAN) <sup>4)</sup>			MTR-L03-PW
Quality Management System			
Certification			ISO 9001

<sup>1)</sup> External dimensions of main cabinet only, excluding handles and other external projections.

<sup>2)</sup> Air temperature measured at freezer centre, ambient temperature 35°C, no load.

<sup>3)</sup> Nominal value - Background noise 20 dB(A)

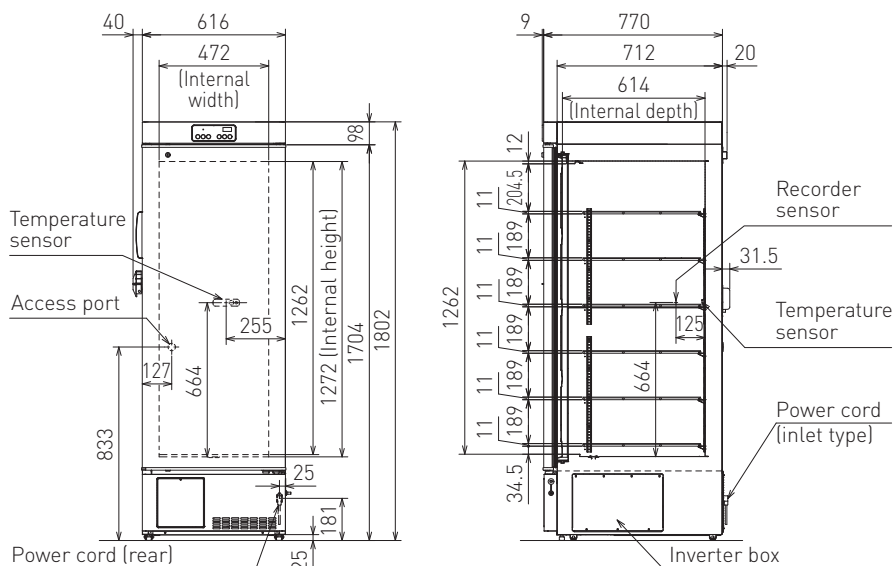
<sup>4)</sup> Only for MTR-5000 [data acquisition system] users.

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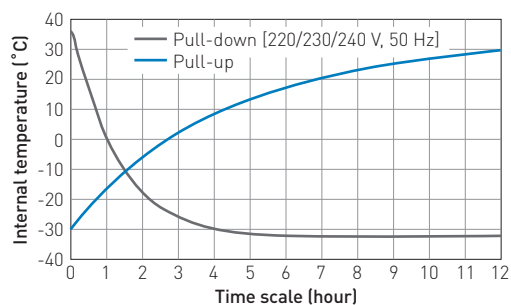
## Dimensions



Unit : mm

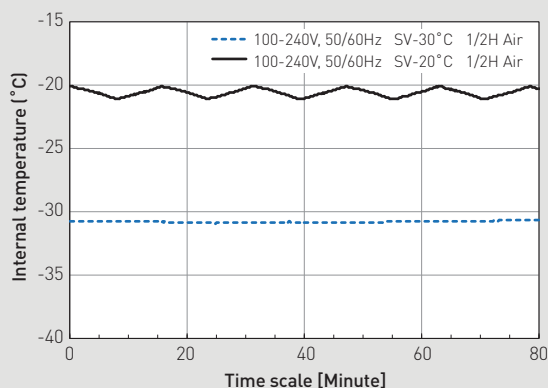
## Performance Data

AT35°C Pull-down &amp; Pull-up Temperature (No load)

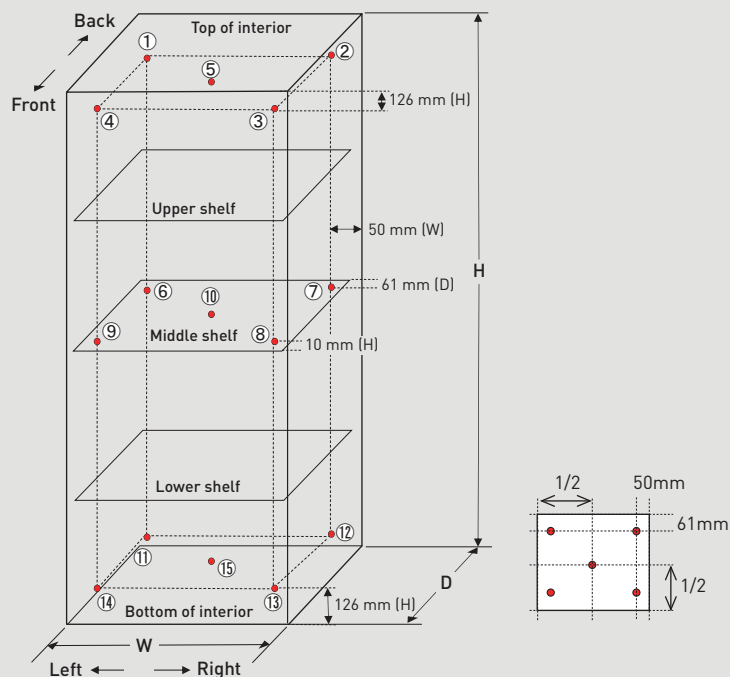


## Cycle running

Condition: SV-30°C &amp; -20°C, AT30°C, no load



## Temperature uniformity -15 points measuring



## Internal Temperature Uniformity (Reference Data)

Distribution data

Temperature of the cycle in each area (SV-30°C, air temperature)

Ambient temperature 30°C 100-240V, 50/60Hz No Load

Unit: °C

	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	Average
Maximum	-28.3	-28.1	-28.2	-28.4	-28.7	-30.6	-30.7	-30.3	-30.3	-30.7	-31.7	-31.8	-31.3	-31.3	-31.8	—
Minimum	-28.8	-28.7	-28.7	-28.9	-29.0	-30.9	-30.9	-30.6	-30.6	-31.0	-32.0	-32.0	-31.6	-31.6	-32.1	—
Middle of cycle	-28.6	-28.4	-28.5	-28.7	-28.9	-30.8	-30.8	-30.5	-30.5	-30.9	-31.9	-31.9	-31.5	-31.5	-32.0	-30.3

## [Note] Disclaimer

- Specification may change without notice.
- The performance data was measured by inhouse test data of PHC.
- The Performance data is a reference data and not guaranteed.
- Not all the products available in all countries.



## -30°C Biomedical ECO Freezers with Natural Refrigerants



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.



### 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



### 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).

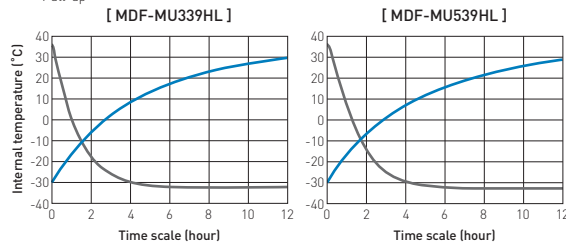
## -30°C Biomedical ECO Freezers with Natural Refrigerants



### Performance Data

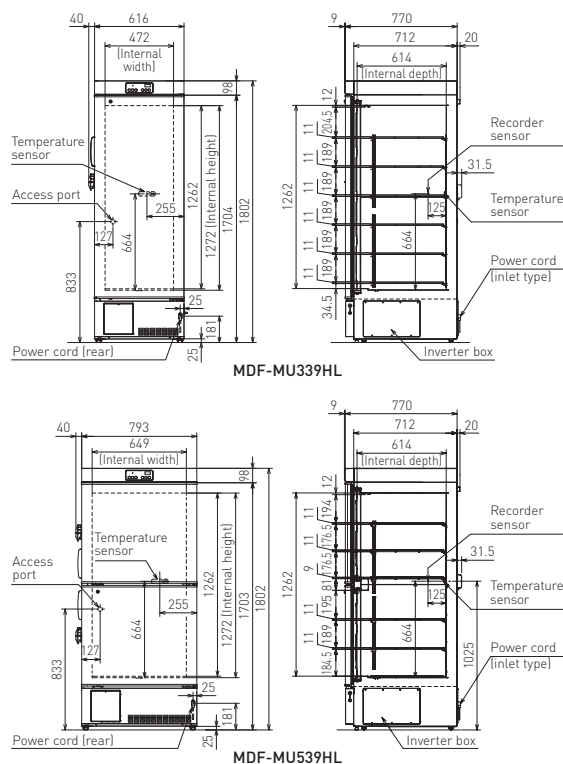
#### AT35°C Pull-down & Pull-up Temperature (No load)<sup>2)</sup>

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



### Dimensions

Unit: mm



Model Number		MDF-MU339HL-PE	MDF-MU339HL-PA	MDF-MU539HL-PE	MDF-MU539HL-PA
External dimensions (W x D x H) <sup>1)</sup>	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 <sup>2)</sup>	°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	Dimensions	qty	6		
		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 <sup>3)</sup>	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			
	- Continuous strip type	MTR-4015LH-PE/MRT-4015LH-PA — Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW			
Storage Container	Inner dimensions		MDF-03SC-PW (2 pcs/set) W420 x D552 x H157	MDF-05SC-PW (2 pcs/set) W280 x D552 x H157	
Optional Communication Systems					
Digital interface [RS232C/RS485] <sup>4)</sup>		MTR-480-PW			
Ethernet interface [LAN] <sup>4)</sup>		MTR-L03-PW			
Quality Management System					
Certification		ISO 9001			

<sup>1)</sup> External dimensions of main cabinet only, excluding handles and other external projections.

<sup>2)</sup> Air temperature measured at freezer centre, ambient temperature 35°C, no load.

<sup>3)</sup> Nominal value - Background noise 20 dB[A]

<sup>4)</sup> 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.



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The management of the design, development, production and servicing of the above.  
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1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



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ISO14001

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Specifications	Model No.		
220 V/230 V/240 V, 50 Hz (CE)	MDF-137-PE	MDF-237-PE	MDF-437-PE
External dimensions (W x D x H)*1	640 x 687 x 881 (mm) 25.2 x 27.0 x 34.7 (inch)	905 x 687 x 881 (mm) 35.6 x 27.0 x 34.7 (inch)	1265 x 807 x 902 (mm) 49.8 x 31.8 x 35.5 (inch)
Internal dimensions (W x D x H)	525 x 440 x 715 (mm) 20.7 x 17.3 x 28.1 (inch)	790 x 440 x 715 (mm) 31.1 x 17.3 x 28.1 (inch)	1140 x 550 x 733 (mm) 44.9 x 21.7 x 28.9 (inch)
Capacity	138 liters (4.9 cu. ft.)	221 liters (7.8 cu. ft.)	425 liters (15.0 cu. ft.)
Net Weight (Approx.)	52 kg (115 lbs.)	60 kg (132 lbs.)	81 kg (179 lbs.)
Cooling performance	-30°C (AT: 35°C, no load)		
Control range	-20°C to -30°C		
Baskets	2	3	4
Access ports	17mm diameter, right-hand side and bottom left		
Compressor	Hermetic, 150 W	Hermetic, 200 W	Hermetic, 250 W
Refrigerant	HFC		HFC and HFO combined
Alarm system	• High/low temperature alarm (SV ±5°C to ±15°C adjustable) • Power failure • Remote alarm contact		
Calibration	Zero adjustment via control panel		
Options	Temperature recorder (MTR-G85C-PE, MTR-4015LH-PE)		
	Baskets	MDF-13B2-PW/13B3-PW	MDF-43B2-PW/43B3-PW

	Model No.		
110 V, 60 Hz	MDF-U5312-PT	MDF-U334-PT	—
220 V, 50 Hz	MDF-U5312-PB	—	MDF-U443-PB
220 V, 60 Hz	MDF-U5312-PK / MDF-U5312-PR	MDF-U334-PK / MDF-U334-PR	MDF-U443-PK / MDF-U443-PR
230 V/240 V, 50 Hz (CE)	MDF-U5312-PE	—	MDF-U443-PE
220 V/230 V/240 V, 50 Hz (CE)	—	MDF-U334-PE	—
External dimensions (W x D x H)*1	804 x 772 x 1802 (mm) 31.7 x 30.4 x 70.9 (inch)	614 x 709 x 1620 (mm) 24.2 x 27.9 x 63.8 (inch)	800 x 832 x 1810 (mm) 31.5 x 32.8 x 71.3 (inch)
Internal dimensions (W x D x H)	658 x 607 x 1272 (mm) 25.9 x 23.9 x 50.1 (inch)	490 x 486 x 1290 (mm) 19.3 x 19.1 x 50.8 (inch)	640 x 615 x 1090 (mm) 25.2 x 24.2 x 42.9 (inch)
Capacity	482 liters (17.0 cu. ft.)	274 liters (9.7 cu. ft.)	426 liters (15.0 cu. ft.)
Net Weight (Approx.)	134 kg (295 lbs.)	81 kg (179 lbs.)	213 kg (470 lbs.)
Cooling performance	-30°C (AT: 35°C, no load)		-40°C (AT: 35°C, no load)
Control range	-20°C to -30°C		-15°C to -40°C
Baskets	Top: 6 small, Bottom: 4 large	4 large, 1 small	—
Access ports	30mm diameter, rear	30mm diameter, left-hand side	40mm diameter, left-hand side
Compressor	Hermetic, 400 W (PT, PB)	Hermetic, 200 W	Hermetic, 450 W/750 W
Refrigerant	HFC		HFC and HFO combined
Alarm system	•High/low temperature alarm (SV ±5°C to ±15°C adjustable) •Power failure •Remote alarm contact •Part replacement notification	•High/low temperature alarm (SV ±5°C to ±15°C adjustable) •Power failure •Part replacement notification •Remote alarm contact •Self diagnostics •Remote alarm contact	•High/low temperature alarm (SV ±5°C to ±20°C adjustable) •Power failure •Filter clogging •Remote alarm contact •Battery/fan motor replacement notification
Calibration	Zero adjustment via control panel		—
Options	Temperature recorder (MTR-G85C-PE/MTR-G85A-PA, MTR-4015LH-PE/PA)		Temperature recorder (MTR-85H-PW, MTR-4015LH-PE/PA)





\*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:** 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.

• Appearance and specifications are subject to change without notice. \*1 External dimensions of main cabinet only - see dimension drawings showing handles and other external projections.

Options		
Storage Baskets		
	For MDF-137/237 <b>MDF-13B2-PW</b> (set of two) <b>MDF-13B3-PW</b> (set of three) Outer dimensions: 255(W) x 420(D) x 205(H)mm Inner dimensions: 210(W) x 370(D) x 200(H)mm	
	For MDF-437 <b>MDF-43B2-PW</b> (set of two) <b>MDF-43B3-PW</b> (set of three) Outer dimensions: 275(W) x 530(D) x 205(H)mm Inner dimensions: 230(W) x 480(D) x 200(H)mm	
Temperature Recorders		
	<b>MTR-G85A-PA</b> (110V—120V) -100°C to +40°C <b>MTR-G85C-PE</b> (200V—240V) -100°C to +40°C <ul style="list-style-type: none"><li>• Recorder fixing for MDF-137/237/437: MDF-S740-PW</li><li>• Recorder fixing for MDF-U334 upper room: MDF-S740T-PW</li><li>• Recorder fixing for MDF-U5312 lower room: MPR-S7-PW</li><li>• Recording paper: RP-G85-W</li><li>• Ink pen: PG-R-PW</li></ul>	
	<b>MTR-4015LH-PE/PA</b> -40°C to +14°C <ul style="list-style-type: none"><li>• Recorder fixing for MDF-137/237/437: MDF-S3040-PW</li><li>• Recorder fixing for MDF-U5312 lower room [no kit required for MDF-U334/MDF-U443]: MPR-S30-PW</li><li>• Recording paper: RP-40-PW</li></ul>	
	<b>MTR-85H-PW</b> (for MDF-U443 only) -100°C to +50°C <ul style="list-style-type: none"><li>• Recording paper: RP-85-PW</li><li>• Ink pen: DF-38FP-PW</li></ul>	
Interface board (For data acquisition system MTR-5000 users only) <b>MTR-L03-PW / MTR-480-PW</b>		

Interface board (For data acquisition system  
MTR-5000 users only)  
**MTR-L03-PW / MTR-480-PW**

	Preservation (freezers, refrigerators) and Culturing (incubators) Equipment The management of the design, development, production, sales support, and servicing of the above. PHC Corporation, Biomedical Division 1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan	  	PHC Corporation Biomedical Division is certified for: <b>Environmental management system: ISO14001</b>
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Biomedical Freezers



PHCbi Biomedical Freezers offer the outstanding reliability and performance required in a wide variety of storage and research applications.



Life Science  
Innovator  
Since 1966

PHC Corporation, Biomedical Division



# Biomedical Freezers

## Chest type

Power to cope with frequent door openings

### Small size suitable for personal use

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



MDF-137  
Effective capacity:  
**138 liters**  
(4.9 cu.ft.)

### Versatile mid-size model

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



MDF-237  
Effective capacity:  
**221 liters**  
(7.8 cu.ft.)

### Large size 400-liter class

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



MDF-437  
Effective capacity:  
**425 liters**  
(15.0 cu.ft.)

## Upright type

Maximum capacity in minimum installation space

### Large-capacity, economical, space-saving model

- Top/bottom twin door design prevents cold air escaping
- Convenient storage drawers



MDF-U5312  
Effective capacity:  
**482 liters**  
(17.0 cu.ft.)

### Easy-to-use, slim & compact design

- Microprocessor digital temperature display
- Convenient storage drawers



MDF-U334  
Effective capacity:  
**274 liters**  
(9.7 cu.ft.)

Powerful fan ensures temperature uniformity throughout the freezer cabinet.

### Forced air circulation & auto defrost

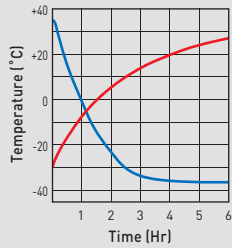
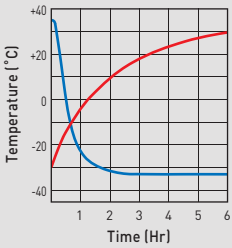
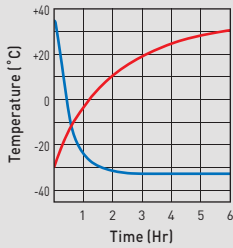
- High freezing power increases temperature uniformity
- Auto defrost for easy maintenance



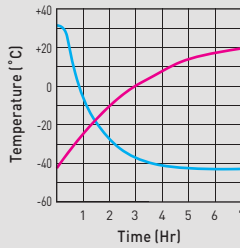
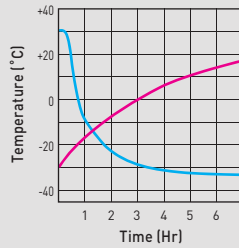
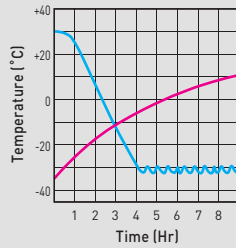
MDF-U443  
Effective capacity:  
**426 liters**  
(15.0 cu.ft.)

### Performance Data

- Pull-down characteristics under no-load condition
- Pull-up characteristics under no-load condition



- Pull-down characteristics
- Pull-up characteristics during power failure



Central air temp.  
in cabinet  
Ambient temp. 35°C,  
No-load

### Features

#### Enhanced Operation

- Front-mounted display/control panel (with microprocessor) located at convenient waist height
- Memory backup
- Temperature display
- Front access calibration for temperature recorder
- The control panel, alarm system and non-volatile memory are the same for all models in the series.



- Single electrical box makes servicing simpler.
- The chamber temperature is displayed for five seconds if BUZZER key is depressed during power failure alarm.
- After a power outage, operation resumes at pre-outage settings (non-volatile memory for temperature and alarm temperature settings)
- Control panel can be reset to zero for validation.
- Two access ports (right-hand side and bottom left) (chest type)
- Four casters and two adjustable feet

#### Recording Features (Optional)

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

- 7-day circular recorder (MTR-G85C-PE) and 32-day strip recorder (MTR-4015LH-PE) are available. (except MDF-U443)
- Front access calibration for temperature recorder

#### Environment-Friendly

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

#### Safety Features

- Alarm & Recording System
- High / low temperature alarm
- Power failure alarm
- Remote alarm contact
- Self diagnostics function. Should an abnormality be picked up, an error code will be displayed in red figures.
- Breaker switch turns power off in event of over current abnormality.
- Balance hinges keep the lid open in any position to make this chest freezer easier to use. This means you have both hands free to work. (chest type)

- Secure lock safeguards the contents of the freezer and keeps hazardous items out of harm's way.



Newly designed lid lock (chest type).

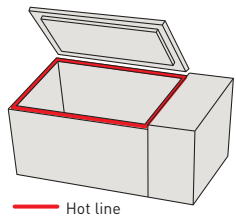


- Door latch can accommodate a pad lock for added protection of valuable samples. (upright type)

- Part replacement notification (MDF-U5312)

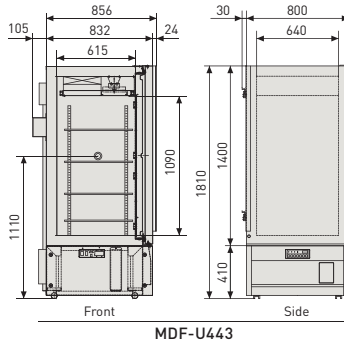
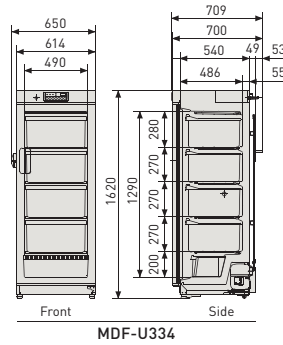
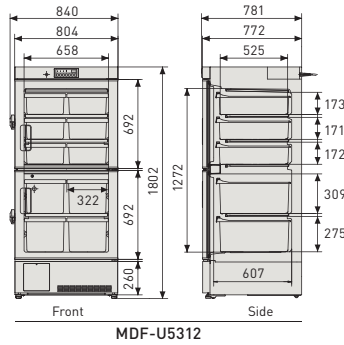
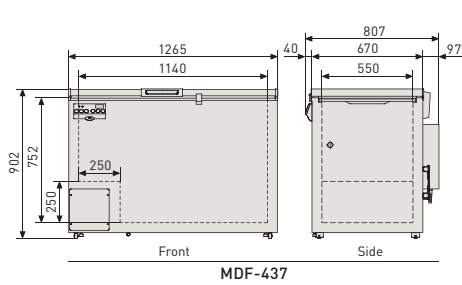
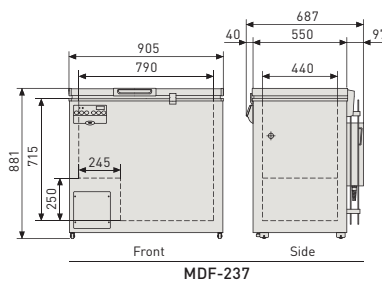
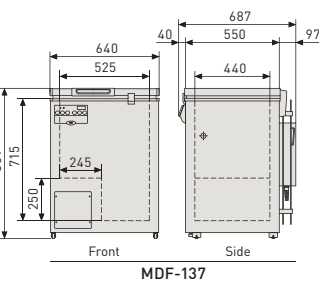
#### Hot line for secure sealing

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.



### Dimensions

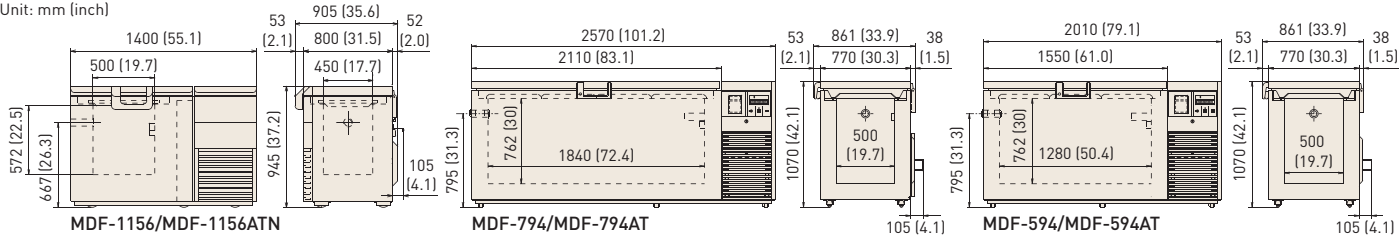
Unit: mm



Specifications		Model No.		
220 V, 50 Hz		MDF-1156-PB / MDF-1156ATN-PB	MDF-794-PB	MDF-594-PB / MDF-594AT-PB
220 V, 60 Hz		MDF-1156-PK / MDF-1156ATN-PK	MDF-794-PK / MDF-794AT-PK	MDF-594-PK
230 V/240 V, 50 Hz (CE)		MDF-1156-PE / MDF-1156ATN-PE	MDF-794-PE / MDF-794AT-PE	MDF-594-PE / MDF-594AT-PE
Temperature Range		-130°C to -152°C		-20°C to -86°C
External Dimensions (W x D x H)*1		1400 x 800 x 945 (mm) 55.1 x 31.5 x 37.2 (inch)	2570 x 770 x 1070 (mm) 101.2 x 30.3 x 42.1 (inch)	2010 x 770 x 1070 (mm) 79.1 x 30.3 x 42.1 (inch)
Internal Dimensions (W x D x H)		500 x 450 x 572 (mm) 19.7 x 17.7 x 22.5 (inch)	1840 x 500 x 762 (mm) 72.4 x 19.7 x 30.0 (inch)	1,280 x 500 x 762 (mm) 50.4 x 19.7 x 30.0 (inch)
Effective Capacity		128 liters (4.5 cu.ft.)	701 liters (24.8 cu.ft.)	487 liters (17.2 cu.ft.)
Exterior Cabinet		Galvanised steel with baked on finish		
Interior Cabinet		Aluminum plate	Stainless steel	
Inner Lid		1	4	3
Insulation		Foamed-in-place rigid polyurethane		
Compressor	High stage side	Hermetic type, 1,100 W		
	Low stage side	Hermetic type, 1,100 W		
Evaporator	High stage side	Cascade condenser		
	Low stage side	Tube on sheet (shared with interior)		
Condenser	High stage side	Fin and tube type		
	Low stage side	Shell and tube type		Cascade condenser
Temperature Control		Microprocessor control system, Non-volatile memory	Microprocessor: Keypad input Set value memory: non-volatile memory	
Temperature Display		Digital display		
Sensor		Platinum resistance (Pt. 100 Ω)		
Safety		Cylinder key on the lid handle		
Alarm system		Selectable high temp. alarm (+10°C & +15°C from set point) Power failure alarm, Filter check lamp, Remote alarm contact		
Net Weight (Approx.)		265 kg (584 lbs.) —1156 272 kg (600 lbs.) —1156ATN	335 kg (739 lbs.) —794 345 kg (761 lbs.) —794AT	291 kg (642 lbs.) —594 301 kg (664 lbs.) —594AT

ATN: LN<sub>2</sub> backup system, temperature recorder    AT: LCO<sub>2</sub> backup system, temperature recorder  
\*1 External dimensions of main cabinet only - see dimension drawings showing handles and other external projections.


Dimensions



Optional Accessories

**Storage Racks (Aluminium)**


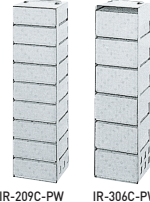
Model No.	MDF-49SC-PW	MDF-59SC-PW
Case Dimensions (W x D x H)	207 x 144 x 539 (mm) 8.1 x 5.7 x 21.2 (inch)	207 x 144 x 665 (mm) 8.1 x 5.7 x 26.2 (inch)
Number of Drawers	4	5
Applicable Model (Rack capacity)	MDF-1156/1156ATN (6)	MDF-594/594AT (18) MDF-794/794AT (24)



**Temperature Recorder**

Model No.	MTR-85H-PW	MTR-155H-PW
Recording Range	-100 to +50°C	-170 to +30°C
Freezer Model	MDF-594 MDF-794	MDF-1156

**ULT-Freezer Backup Kits**




**CVK-UB2-PW:**  
LCO<sub>2</sub> Backup Kit for MDF-794/594




**CVK-UBN2-PW:**  
LN<sub>2</sub> Backup Kit for MDF-794/594

\*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.

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**Environmental management system: ISO14001**

DISTRIBUTED BY:



Cryogenic Freezers  
Ultra-Low Temperature Freezers



PHCbi Cryogenic Freezers and Ultra-Low Temperature Freezers support the forefront of life science research.





# The Ideal -152°C, -86°C Freezing Environment in Capacities from 128 L to 701 L

Ideal for long term preservation of biologicals and various cell line, PHCbi preservation systems employ microprocessor control to maintain a high-precision temperature environment. They are not affected by ambient temperature, minimizing uneven temperature distribution within the chamber, and a temperature rise during door opening.

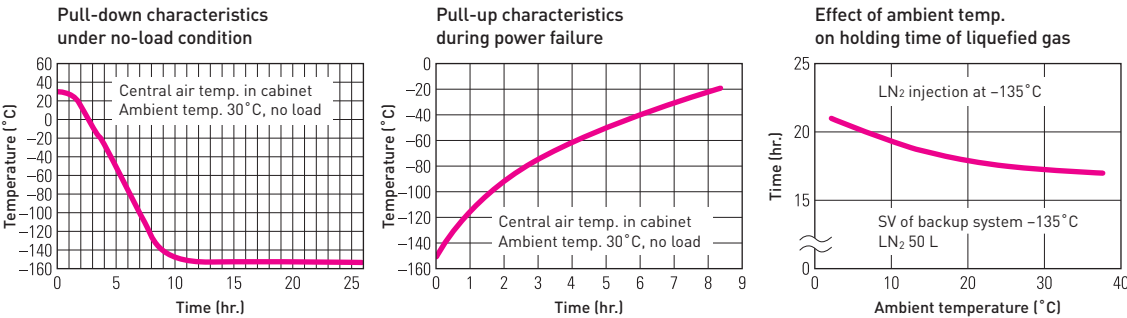
## -152°C Cryogenic Freezers

For stable long-term storage  
**MDF-1156**  
**MDF-1156ATN**

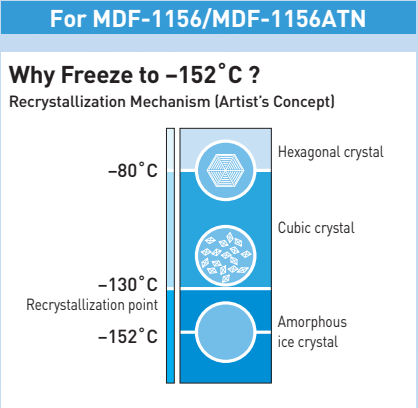


MDF-1156

### Performance Data



Temperature  
**-152°C**  
Effective Capacity  
**128 L**  
**(4.5 cu.ft.)**



**-152°C freezer ensures stable cell and tissue preservation**  
An important factor to consider when preserving cells or tissue at ultra-low temperatures is to prevent amorphous ice crystals from recrystallizing within and outside the cells. Samples that are maintained in a cryogenic freezer at -152°C which is far lower than the recrystallization point (-130°C for pure water) can be preserved semi-permanently. Preservation at ultra-low temperatures maintains vitrification without crystallization occurring inside and outside cells. In contrast to conventional liquid nitrogen preservation containers, freezer preservation has numerous advantages: no sample contamination, no sudden liquid eruptions, as well as low operational costs. PHCbi's MDF-1156 and MDF-1156ATN make long-term storage below the recrystallization point easier and more stable than ever before.

### Advanced Features

**Specially designed compressor and cascade refrigeration system**  
Specially designed for rugged ultra-low temperature applications in a laboratory environment (HFC refrigerants only).

**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 notifies the user of a clogged condenser filter. The condenser filter is situated at the front panel to make filter removing and cleaning easier.

**Note:** The position of the filter check lamp is shown on the control panel (see photo shown at the bottom of this page).

**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.

**Safety Device**  
**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 CO<sub>2</sub> or N<sub>2</sub> which is selfactivated when a power outage occurs are also available separately (comes standard with the AT series). This equipment helps insure that the contents will be protected in the event of any power failure or mechanical trouble.

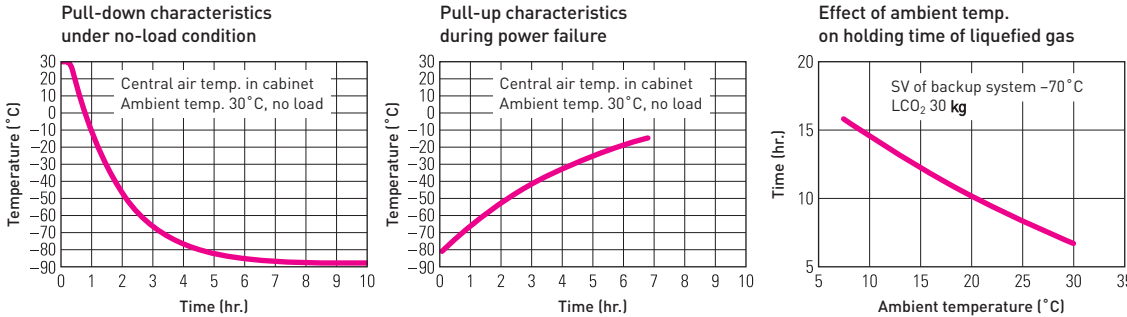
## -86°C Ultra-Low Temperature Freezers

Ideal for middle-sized installation space  
**MDF-594**  
**MDF-594AT**



MDF-594AT

### Performance Data



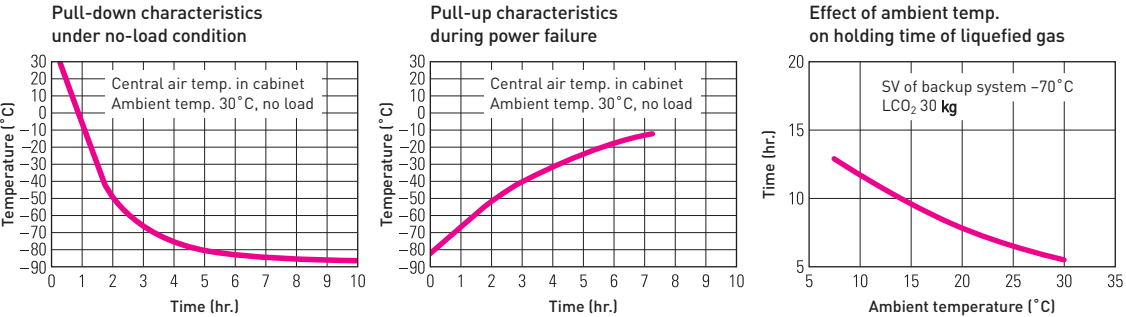
Temperature  
**-86°C**  
Effective Capacity  
**487 L**  
**(17.2 cu.ft.)**

Ideal for large-capacity preservation  
**MDF-794**  
**MDF-794AT**



MDF-794AT

### Performance Data



Temperature  
**-86°C**  
Effective Capacity  
**701 L**  
**(24.8 cu.ft.)**



MDF-DU900V

## -86°C Ultra-low Temperature Freezer



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.

### 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<sup>2</sup> 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.

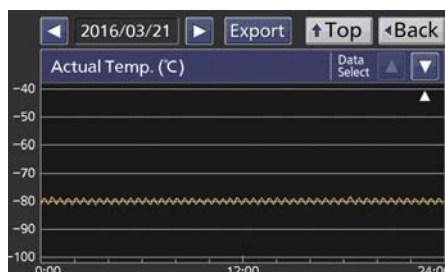
### Enhanced Use & Intelligent Security

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



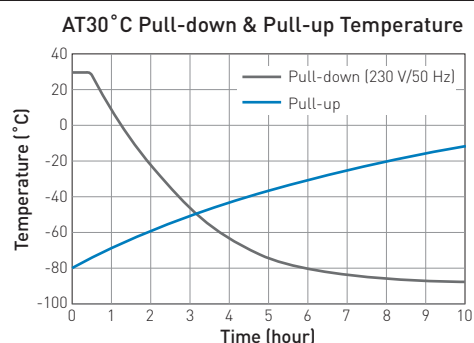
### Application Specific Design

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

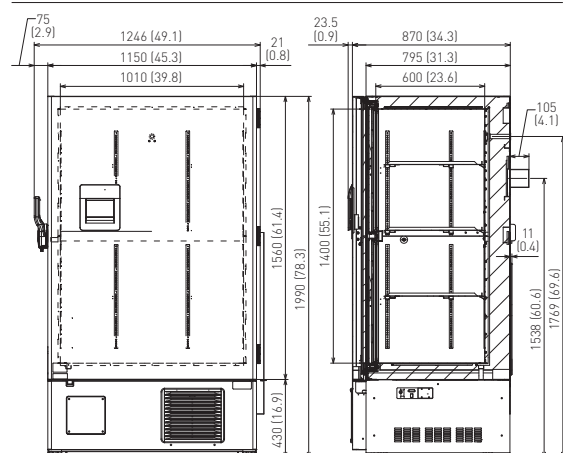
Managed and monitored by an integrated microprocessor controller with a comprehensive alarm system and self-diagnostic functions. Freezer temperature and important status information are clearly displayed and logged, with the possibility to export the data to USB.

### Performance Data



### 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) <sup>1)</sup>	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 <sup>2)</sup>	°C	-86			
Temperature setting range	°C	-50 to -90			
Temperature control range <sup>2)</sup>	°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 <sup>3)</sup>	dB (A)	52			
Options					
Small inner door kit	set of 2	MDF-9ID-PW [max 2] <sup>4)</sup>			
Liquid CO <sub>2</sub> back-up		MDF-UB6B-PW			
Inventory rack		IR-224U-PW, IR-220U-PW			
Temperature recorders	- Circular type	MTR-G85C-PE <sup>5)</sup> - Chart paper: RP-G85-PW			
	- Continuous strip type	MTR-85H-PW <sup>5)</sup> - Chart paper: RP-85-PW			
		- Ink pen: PG-R-PW			
		- Ink pen: DF-38FP-PW			
		- Recorder housing: MDF-S3085-PW			
Optional Communication Systems					
Digital interface (RS232C/RS485) <sup>6)</sup>		MTR-480-PW			
Ethernet interface (LAN) <sup>6)</sup>		MTR-L03-PW			

<sup>1)</sup> Exterior dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Air temperature measured at freezer centre, ambient temperature 30°C, no load.

<sup>3)</sup> Nominal value - Background noise 20 dB(A).

<sup>4)</sup> Installation of small inner door kit may effect usable storage capacity.

<sup>5)</sup> Requires sensor cover MTR-DU700SF-PW.

<sup>6)</sup> Only for MTR-5000 (data acquisition system) users.

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## -30°C Biomedical Freezers

369 L / 504 L

### 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.



MDF-MU539

### 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.



### 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.

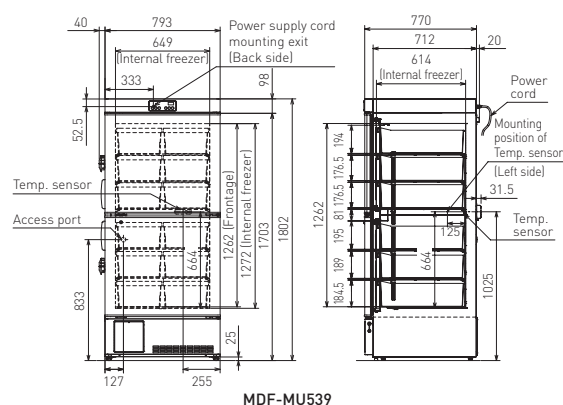
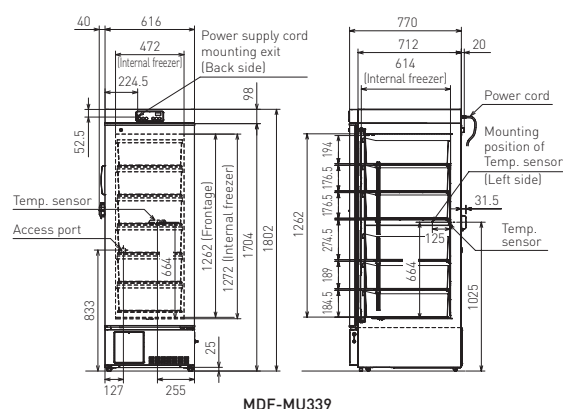
### Storage containers useful for organizing

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



### Dimensions

Unit : mm



Model Number		MDF-MU339-PE	MDF-MU539-PE
External dimensions (W x D x H) <sup>1)</sup>	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 <sup>2)</sup>	°C	-30	
Temperature setting range <sup>2)</sup>	°C	-35 to -18	
Temperature control range <sup>2)</sup>	°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 <sup>3)</sup>	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	
	- Continuous strip type	MTR-4015LH-PE — Chart paper: RP-40-PW — Recorder housing: MPR-S30-PW	
Optional Communication Systems			
Digital interface [RS232C/RS485] <sup>4)</sup>		MTR-480-PW	
Ethernet interface [LAN] <sup>4)</sup>		MTR-L03-PW	
Quality Management System			
Certification		ISO 9001	

<sup>1)</sup> External dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Air temperature measured at freezer centre, ambient temperature 35°C (MDF-MU339) / 30°C (MDF-MU539), no load.

<sup>3)</sup> Nominal value - Background noise 20 dB(A)

<sup>4)</sup> Only for MTR-5000 (data acquisition system) users.

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MDF-MU539D

## -30°C Biomedical Freezer

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.

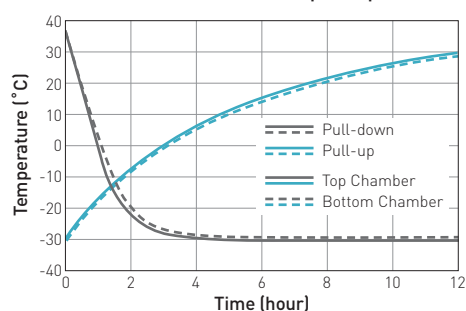
### Storage containers useful for organizing

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



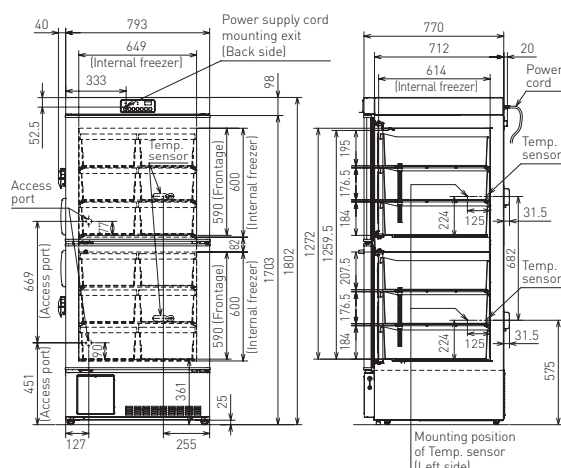
## Performance Data

AT35°C Pull-down & Pull-up Temperature<sup>2)</sup>



## Dimensions

Unit : mm



Model Number		MDF-MU539D-PE
External dimensions (W x D x H) <sup>1)</sup>	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 <sup>2)</sup>	°C	-30
Temperature setting range <sup>2)</sup>	°C	-35 to -18
Temperature control range <sup>2)</sup>	°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 <sup>3)</sup>	dB (A)	42
Options		
Temperature recorders		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)
		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] <sup>4)</sup>		MTR-480-PW
Ethernet interface [LAN] <sup>4)</sup>		MTR-L03-PW
Quality Management System		
Certification		ISO 9001

<sup>1)</sup> External dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Air temperature measured at freezer centre, ambient temperature 35°C, no load.

<sup>3)</sup> Nominal value - Background noise 20 dB(A)

<sup>4)</sup> Only for MTR-5000 (data acquisition system) users.

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Preservation  
sub-zero



MDF-U731M

### Temperature

(Ambient temperature 30°C)

**-20°C to -30°C**

### Effective capacity

**623 liters**  
(MDF-U731)

**690 liters**  
(MDF-U731M)

**Auto defrost or**  
(MDF-U731)

**Manual defrost**  
(MDF-U731M)

### Large-capacity biomedical freezer

- High freezing power
- Large capacity
- Top-mount cooling unit design for usability
- Adjustable wire shelves
- Alarm and safety devices
- Self-diagnosis function



# MDF-U731/MDF-U731M

## Features

### Stable temperature control

The units provide precise and uniform storage temperatures regardless of ambient conditions through microprocessor temperature control.

### Energy-saving operation

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

### Improved security

Standard door lock and independent padlock ensure extra security. [\*padlock not supplied]

### Sturdy cabinet construction with superior insulation

The integral foamed cabinet structure is extra strong and prevents cold air loss.

### 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.

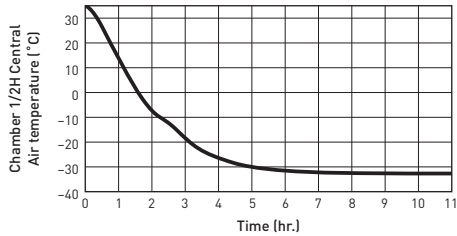
### Movable wire shelves allow free position adjustment

## Control panel



## Performance Data

### Pull-down characteristics



### Pull-up characteristics



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

## Specifications

Model No.	MDF-U731-PA	MDF-U731M-PA	MDF-U731M-PE
Temperature range	-20°C to -30°C (1°C increments)		
Maximum cooling performance	-30°C (Ambient temperature: 35°C)		
External dimensions (W x D x H)* <sup>1</sup>	770 x 830 x 1955 mm		
Internal dimensions (W x D x H)	650 x 700 x 1370 mm	650 x 700 x 1520 mm	
Effective capacity	623 liters	690 liters	
Net weight (approx.)	155 kg	152 kg	
Exterior	Painted steel		
Interior	Painted steel		
Insulation	Rigid polyurethane foamed in-place		
Temperature control	Electronics controller		
Compressor	Hermetic type (450 W)		
Cooling method	Forced air	Cold wall	
Defrosting system	Automatic	Manual	
Refrigerant	HFC and HFO combined		
Shelves (max. load)	4 adjustable wire shelves (50 kg/110 lbs.)		
Access port	ø 30 mm, 2 locations (left and top)		
Casters	4 casters with 2 adjustable feet		
Alarm and safety	High / Low temperature alarm, Power failure alarm, Door alarm, Compressor temperature alarm, Self-diagnosis function, Remote alarm contact (DC 30 V, 2 A), Memory backup		
Accessories	1 scraper, 1 set of key, 2 large & 2 small nylon clips (for temperature recorder)		
Power supply	115 V		230 V/240 V
Frequency	60 Hz		50 Hz

\*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:** PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content. The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years.

•Appearance and specifications are subject to change without notice.

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

## Options



7-day circular recorder  
**MTR-G85A-PA**  
**MTR-G85C-PE**

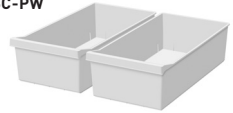
Recorder mounting bracket  
**MPR-S7-PW**



32-day strip chart recorder  
**MTR-4015LH-PA**  
**MTR-4015LH-PE**

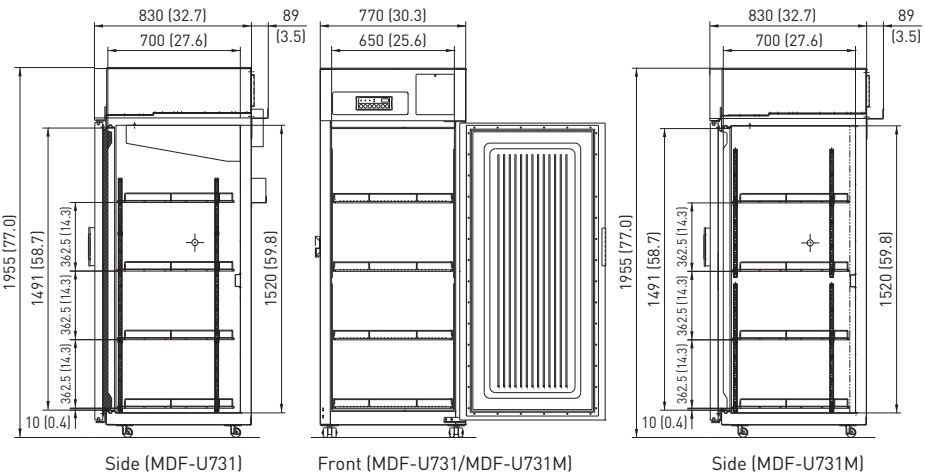
Recorder mounting bracket  
**MPR-S30-PW**

Wire shelf (3 sets)  
**MDF-T07ST-PW**  
Storage case (2 sets)  
**MDF-T07SC-PW**



## Dimensions

Unit : mm (inch)



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Preservation  
sub-zero

## Temperature

(Ambient temperature 30°C)

**-150°C**

## Effective capacity

**231 liters/8.2cu.ft.**

## V.I.P. PLUS

(Vacuum Insulation Panel)

### Ideally suited for cryogenic and long-term storage in laboratories

- V.I.P. PLUS technology maximises storage capacity.
- Comfortable operation via LCD control panel
  1. Chamber temperature recorded for up to 1 month
  2. Warning messages displayed in LCD panel
  3. Records history of door opening/closing (more than 2 minutes)
- Safe operation with status alert continuous condition monitoring
- Equipped with LN<sub>2</sub> backup system as standard
- Can hold up to 14,000 tubes (2 ml)



MDF-C2156VAN



MDF-C2156VAN

Features

Design

- PHCbi V.I.P. PLUS -150°C cryogenic freezers use patented revolutionary vacuum insulation cabinet construction that reduces the wall thickness from 175 mm to 135 mm (6.9" to 5.3") and achieves up to 25 % more storage capacity than a conventionally insulated freezer without increasing the footprint.
- The newly developed refrigeration system and the freezer structure offer a quiet experimental environment.
- Achieves 50 % higher energy conservation than previous model. (For model rated 220 V, 50 Hz)

Reliability

- Status alert monitors ambient and system conditions continuously and notifies of any abnormalities before a problem happens.
- Equipped with LN<sub>2</sub> backup system as standard to prepare for any contingency.

Ideal replacement for LN<sub>2</sub> storage

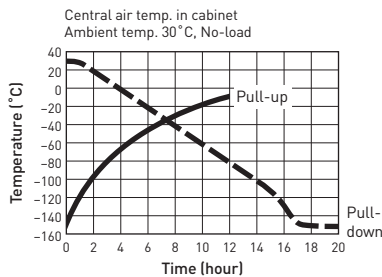
Compared to liquid nitrogen systems, PHCbi MDF-C2156VAN offers the following advantages:

- Lower running cost
- Easy maintenance
- No occurrence of contamination

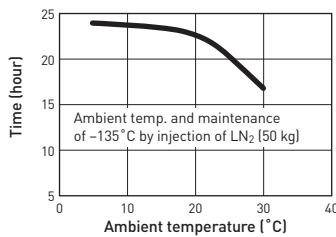
Performance Data

Pull-down characteristics

Pull-up characteristics during power failure



LN<sub>2</sub> back up system operation characteristics



Innovative Control Panel

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

Warning indicator (Lit even when there is a power outage)

Setting input

Pop-up menu selection

Buzzer halt; Alarm test when held pressed for a long time

Graphic display (LCD)

Setting item

Current value

Message

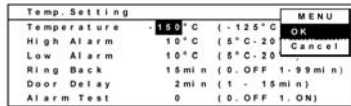
Warning information display

Status display

Door display

Date/time

Setting display

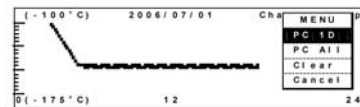


Access control

To prevent unauthorized access to freezer settings, the key lock can only be cancelled by inputting the password.

Data logging function

Recording of internal temperature for 1 month or 1 week period Recording of history of door opening/closing (more than 2 minutes)



Specifications

	Model No.
220 V, 50 Hz	MDF-C2156VAN-PB
220 V, 60 Hz	MDF-C2156VAN-PK
230 V/240 V, 50 Hz (CE)	MDF-C2156VAN-PE
Temperature range	-125°C to -150°C (in 1°C increments)
Maximum cooling performance	-150°C (Ambient Temperature 30°C)
External dimensions (W x D x H)*1	1730 x 765 x 1010 (mm) / 68.1 x 30.1 x 39.8 (inch)
Internal dimensions (W x D x H)	760 x 495 x 615 (mm) / 29.9 x 19.5 x 24.2 (inch)
Net weight	Approx. 318 kg (701 lbs.)
Effective capacity	231 liters (8.2 cu.ft.)
Access port	40 mm diameter, 1 location
Compressor	Hermetic type, Output: 1100 W (high stage side), 1100 W (low stage side)
Refrigerant	HFC
Alarms	High/Low temperature, Power failure, Filter check, Self diagnosis, Door check, Part replacement notification
Remote alarm contact	Allowable contact capacity, DC 30 V, 2 A
Accessories	1 set of keys, 1 scraper, Connecting tube for LN <sub>2</sub> backup system

\*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.

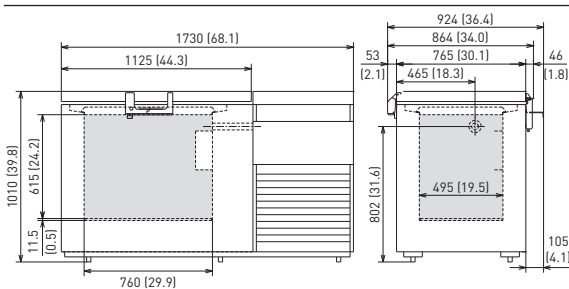
In addition, depending on the usage conditions, it may not be possible to reach the indicated lowest temperature.

**Caution:** PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content. The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years.

• Appearance and specifications are subject to change without notice.

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

Dimensions



Options

Strip chart recorder  
**MTR-155H-PW**  
Recorder mounting bracket (for MTR-155H-PW)  
**MDF-S30150-PW**  
Inventory rack **IR-210C-PW**  
Max capacity: 14pcs Ink pen  
**DF-38FP-PW**  
Chart paper **RP-155**

Interface board  
(For data acquisition system MTR-5000 users only)  
**MTR-L03-PW / MTR-480-PW**



Preservation (freezers, refrigerators) and Culturing (incubators) Equipment

The management of the design, development, production, sales support, and servicing of the above.

PHC Corporation, Biomedical Division

1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



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**Environmental management system: ISO14001**

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MDF-DU502VX

MDF-DU702VX

## TwinGuard

-86°C Ultra-Low Temperature Freezer



528 L / 729 L

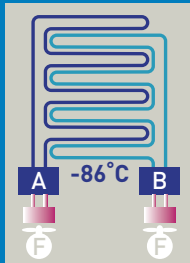
**Ultra-low temperature storage solution for valuable samples. TwinGuard equipped with new Dual Cooling System.**

New TwinGuard 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.

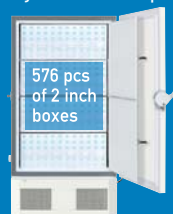
### Ultimate Sample Protection

New optimised Dual Cooling System "TwinGuard" 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.



### 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.



### Intelligent Interface

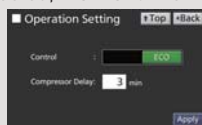
The newly developed ergonomic "EZlatch" door handle makes access to stored samples even easier. Intuitive and intelligible large colour LCD touchpanel is provided.



### 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.

# TwinGuard -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.

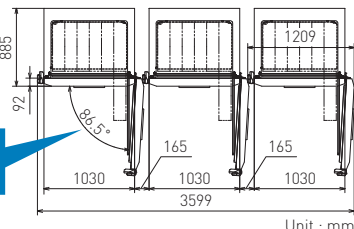
The "Chamfer-design" body front features a chamfered edge for reduced installation space when compared to conventional models in a multiple unit installation. The design is especially suitable for a biobank or similar application.



\*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.



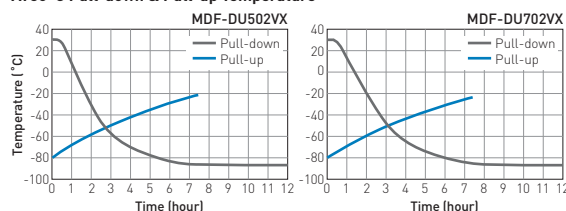
## User friendly for daily operation with newly developed vacuum release port and fivefold gasket

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.



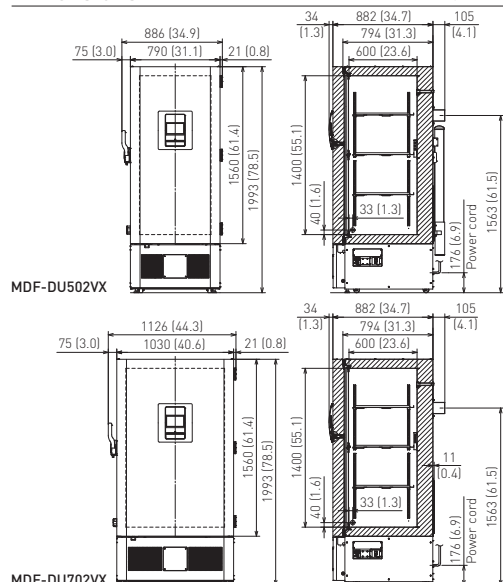
## Performance Data

### AT30°C Pull-down & Pull-up Temperature



## Dimensions

Unit : mm (inch)



MDF-DU502VX

MDF-DU702VX



## Preservation (freezers, refrigerators) and Culturing (incubators) Equipment

The management of the design, development, production, sales support, and servicing of the above.

PHC Corporation, Biomedical Division

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Environmental management system: ISO14001

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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) <sup>1)</sup>	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 <sup>2)</sup>	2" boxes	384		576	
Performance					
Cooling performance <sup>3)</sup>	°C	-86			
Temperature setting range	°C	-50 to -90			
Temperature control range <sup>3)</sup>	°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 <sup>4)</sup>		515 <sup>4)</sup>	
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 <sup>5)</sup>	dB (A)	52			
Options					
Small inner door kit	set of 5	MDF-5ID5-PW <sup>6)</sup>		MDF-7ID5-PW <sup>6)</sup>	
	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 <sup>7)</sup> - Chart paper: RP-G85-PW - Ink pen: PG-R-PW			
	- Continuous strip type	MTR-85H-PW <sup>7)</sup> - Chart paper: RP-85-PW - Ink pen: DF-38FP-PW - Recorder housing: MDF-S3085-PW			
Optional Communication Systems					
Digital interface (RS232C/RS485) <sup>8)</sup>		MTR-480-PW			
Ethernet interface (LAN) <sup>8)</sup>		MTR-L03-PW			

<sup>1)</sup> Exterior dimensions of main cabinet only, excluding handle and other external projections.

<sup>2)</sup> Usable storage capacity of 2" boxes when the original 3 trays installed.

<sup>3)</sup> Air temperature measured at freezer centre, ambient temperature 30°C, no load.

<sup>4)</sup> Max. load allowed for chamber interior — total shelves (3) and chamber bottom, excluding load on casters mounted on product.

<sup>5)</sup> Nominal value - Background noise 20 dB(A).

<sup>6)</sup> Installation of small inner door kit may effect usable storage capacity.

<sup>7)</sup> Requires sensor cover MTR-DU700SF-PW.

<sup>8)</sup> 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.

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MDF-U55V

## Energy Saving

**-86°C**  
**519 liters/18.3 cu.ft.**

**V.I.P. PLUS**  
(Vacuum Insulation Panel)

### Large capacity, space saving Ultra-Low Temperature Freezer with improved energy consumption

- V.I.P. PLUS technology 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 (For EU countries only)

# MDF-U55V

## Features

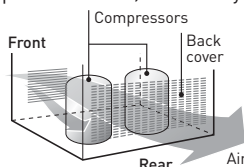
### DESIGN

- PHCbi V.I.P. PLUS -86°C ultra-low temperature freezers use vacuum insulation cabinet construction that reduces the wall thickness from 14 cm to 7 cm (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. 30 %\* compared to the previous model.

\*The data is a measured example (AT 23°C, 230 V 50 Hz, 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 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.

The MDF-U55V is certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) (For EU countries only)

### 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  $\pm 5^{\circ}\text{C}$  to  $\pm 20^{\circ}\text{C}$  (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 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.



### Specifications

	Model No.
230 V/240 V, 50 Hz (CE)	MDF-U55V-PE
Temperature control range	-50°C to -86°C (in 1°C increments)
Cooling performance	-86°C [Ambient temperature 30°C]
External dimensions (W x D x H)*1	770 x 870 x 1990 (mm) / 30.3 x 34.3 x 78.3 (inch)
Internal dimensions (W x D x H)	630 x 600 x 1380 (mm) / 24.8 x 23.6 x 54.3 (inch)
Net weight	Approx. 288 kg (635 lbs.)
Effective capacity	519 liters (18.3 cu.ft.)
Shelves	Stainless steel, 3 shelves
Access port	17mm diameter, 3 locations [back, bottom left/right corners]
Compressor	Hermetic type 450 W (high stage side), Hermetic type 750 W (low stage side)
Refrigerant	HFC
Alarms	High / low temperature, Power failure, Filter check, Self diagnostics, Door check, Part replacement notification
Remote alarm contact	Allowable contact capacity: DC 30 V, 2 A
Accessories	1 set of keys, 1 scraper

\*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.

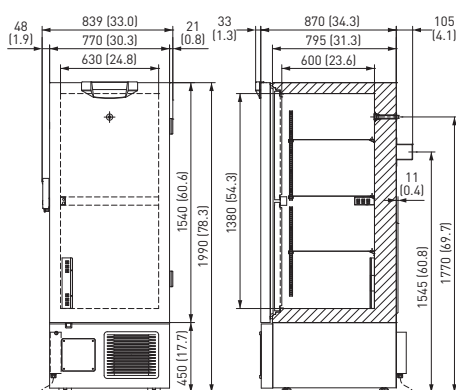
**Caution:** PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content. The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years.

• Appearance and specifications are subject to change without notice.

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

### Dimensions

Unit: mm (inch)



### Options



Inventory rack  
**IR-220U-PW**  
**IR-224U-PW**



Circular recorder  
**MTR-685C-PE**



3 drawers  
(for lower chamber)  
**MDF-50R-PW**

Inner door (small)  
**MDF-51D-PW**

Strip chart recorder  
**MTR-85H-PW**  
Recorder mounting bracket  
**MDF-S3085-PW**  
(for MTR-85H-PW)



LCO2 backup system  
**CVK-UB2-PW**  
LN2 backup system  
**CVK-UBN2-PW**

Interface board (For data acquisition system MTR-5000 users only)  
**MTR-L03-PW** (Except for EU countries)  
**MTR-480-PW**



### Preservation (freezers, refrigerators) and Culturing (incubators) Equipment

The management of the design, development, production, sales support, and servicing of the above.

PHC Corporation, Biomedical Division

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PHC Corporation, Biomedical Division is certified for:  
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Preservation  
sub-zero



MDF-U33V

## Temperature

(Ambient temperature 30°C)

**-86°C**

## Effective capacity

**333litres**

## V.I.P. PLUS

(Vacuum Insulation Panel)

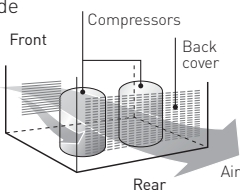
### Ultra slim, space saving Ultra-Low Temperature Freezer with Improved energy consumption

- V.I.P. PLUS technology maximises storage capacity
- Safe operation with status alert continuous condition monitoring
- The inner doors are removable for cleaning and defrosting
- Enhanced security
- Improved accessibility
- Quiet operation
- Improved energy consumption
- Can hold up to 216 pcs of 2-inch boxes or 144 pcs of 3-inch boxes



## DESIGN

- PHCbi V.I.P. PLUS -86°C ultra-low temperature freezers use vacuum insulation cabinet construction that reduces the wall thickness from 14 cm to 9 cm and achieves up to 30 % more storage capacity than a conventionally insulated freezer without increasing the footprint.
- The newly developed refrigeration system and the freezer structure offer a quiet experimental environment.
- The newly developed back cover combined with new aerodynamically designed and placed components in the refrigeration compartment provide superior air flow, making it possible to drastically reduce the stress on the freezer and contributing to excellent 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 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.



## 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  $\pm 5^{\circ}\text{C}$  to  $\pm 20^{\circ}\text{C}$  (adjustable) from the set point.
- Alarm ring-back function ensures that buzzer will resume operation, should alarm conditions continue after it is silenced.
- Microprocessor-controlled filter-clog check function protects the refrigeration circuit.

- The rugged, one-handed outer door latch has a hole to allow a padlock to securely protect valuable samples.
- Control panel with digital display for easy operation.



Model Number		MDF-U33V-PK	MDF-U33V-PB	MDF-U33V-PE
External dimensions (W x D x H)*1	mm	670 x 870 x 1860		
Internal dimensions (W x D x H)	mm	490 x 600 x 1140		
Effective capacity	litres	333		
Net weight	kg	Approx. 255		
Performance				
Temperature range	°C	-50 to -86 [in 1°C increments]		
Maximum cooling performance	°C	-86 [Ambient temperature 30°C]		
Storage capacity		2" box: 216 pcs. / 3" box: 144 pcs.		
Construction				
Shelves	qty	Stainless steel, 3		
Access port		17mm diameter; 3 locations (back, bottom left/right corner)		
Compressor		Hermetic type 450 W (high stage side), Hermetic type 750 W (low stage side)		
Refrigerant		HFC		
Alarms		High / low temperature, Power failure, Filter check, Self diagnostics, Door check, Remote alarm contact, Part replacement notification		
Remote alarm contact		Allowable contact capacity: DC 30 V, 2 A		
Accessories		1 set of keys, 1 scraper		
Electrical and Noise Level		MDF-U33V-PK	MDF-U33V-PB	MDF-U33V-PE
Power supply	V	220	220	230/240
Frequency	Hz	60	50	50
Noise level*2	dB [A]	49		
Quality Management System				
Certification		ISO13485	ISO9001	

\*Cooling performance is indicated by the temperature reached at the center of the freezer (at ambient temperature of  $30^{\circ}\text{C}$  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  $5^{\circ}\text{C}$  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:** PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content. The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years. Fan motors are expendable supplies. Exchange it for about every 6 years.

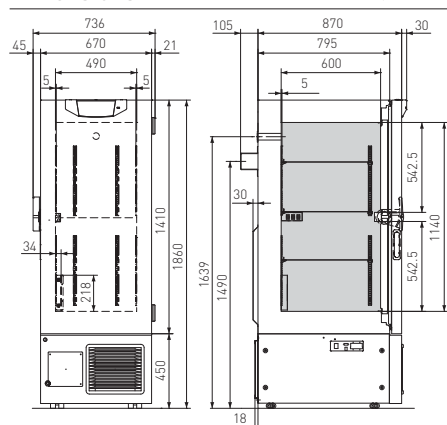
• Appearance and specifications are subject to change without notice.

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

\*2 Nominal value - Background noise 20 dB[A].

## Dimensions

Unit : mm



## Options

### Temperature recorder



Circular recorder  
**MTR-G85C-PE**  
Strip chart recorder  
**MTR-85H-PW**  
Recorder mounting bracket  
**MDF-S3085-PW**  
(for MTR-85H-PW)

### Rack



Inventory rack  
**IR-220U-PW**  
For 3-inch box  
IR-312UN-PW 12

### Liquid CO<sub>2</sub> / N<sub>2</sub> Backup Kits



LCO<sub>2</sub> backup system  
**CVK-UB2-PW**  
LN<sub>2</sub> backup system  
**CVK-UBN2-PW**

### Individual inner doors MDF-SID-PW



Preservation Equipment, Experimental Environment Equipment, Dispensary Equipment, Culturing Equipment and Drying & Sterilising Equipment for General Laboratory use

The management of the design, development, production and servicing of the above.



Freezers, Refrigerators, Incubators, and Drying and Sterilising Equipment for Medical use

The management of the design, development, production and distribution of the above.



PHC Corporation Biomedical Division is certified for:  
Environmental management system:  
ISO14001

PHC Corporation, Biomedical Division 1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan

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MDF-U54V



## Energy Saving

**-86°C**  
**519 liters/18.3 cu.ft.**

**V.I.P. PLUS**  
(Vacuum Insulation Panel)

### Large capacity, space saving Ultra-Low Temperature Freezer with improved energy consumption

- V.I.P. PLUS technology 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
- Improved energy consumption
- Can hold up to 352 pcs of 2-inch boxes or 224 pcs of 3-inch boxes



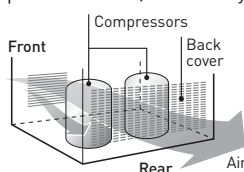
## Features

### DESIGN

- PHCbi V.I.P. PLUS -86°C ultra-low temperature freezers use vacuum insulation cabinet construction that reduces the wall thickness from 14 cm to 7 cm (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 improved energy efficiency by approx. 10 %\* more than previous models, for quieter environment.

\*Based on data measured using the JIS-determined method.

- 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 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.



### 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  $\pm 5^{\circ}\text{C}$  to  $\pm 20^{\circ}\text{C}$  (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.
- 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.



### Specifications

	Model No.
220 V, 50 Hz	MDF-U54V-PB
220 V, 60 Hz	MDF-U54V-PK MDF-U54V-PR
Temperature control range	-50°C to -86°C (1°C increments)
Maximum cooling performance	-86°C (Ambient temperature 30°C)
External dimensions (W x D x H)*1	770 x 870 x 1990 (mm) / 30.3 x 34.3 x 78.3 (inch)
Internal dimensions (W x D x H)	630 x 600 x 1380 (mm) / 24.8 x 23.6 x 54.3 (inch)
Net weight	Approx. 296 kg (653 lbs.)
Effective capacity	519 liters (18.3 cu.ft.)
Shelves	Stainless steel, 3 shelves
Access port	17mm diameter, 3 locations (back, bottom left/right corners)
Compressor	Hermetic type, Output: 1100 W (high stage side), 1100 W (low stage side)
Refrigerant	HFC
Alarms	High/low temperature, Power failure, Filter check, Self diagnostics, Door check, Part replacement notification
Remote alarm contact	Allowable contact capacity: DC 30 V, 2 A
Accessories	1 set of keys, 1 scraper

\*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.

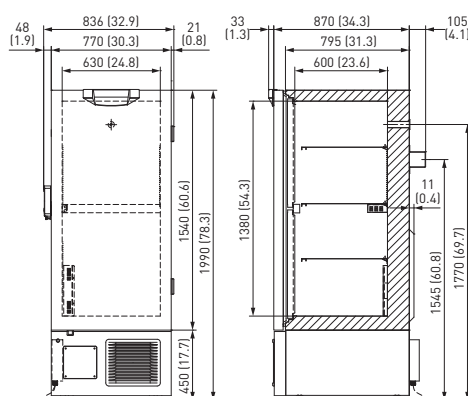
**Caution:** PHC Corporation guarantees this product under certain warranty conditions. However, please note that PHC Corporation shall not be responsible for any loss or damage to the contents of the product.

• Appearance and specifications are subject to change without notice.

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

### Dimensions

Unit: mm (inch)



### Options



Inventory rack  
IR-220U-PW  
IR-224U-PW



3 drawers  
(for lower chamber)  
MDF-50R-PW



Circular recorder  
MTR-685C-PE



Strip chart recorder  
MTR-85H-PW



LCO<sub>2</sub> backup system  
CVK-UB2-PW  
LN<sub>2</sub> backup system  
CVK-UBN2-PW

Interface board (For data acquisition system MTR-5000 users only)  
MTR-L03-PW / MTR-480-PW



### Preservation (freezers, refrigerators) and Culturing (incubators) Equipment

The management of the design, development, production, sales support, and servicing of the above.

PHC Corporation, Biomedical Division

1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



PHC Corporation, Biomedical Division is certified for:  
Environmental management system: ISO14001

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**Energy Saving**

**-86°C**  
**728 litres**

**V.I.P. PLUS**  
(Vacuum Insulation Panel)

**Extra-large capacity, space saving  
Ultra-Low Temperature Freezer with  
improved energy consumption**

- V.I.P. PLUS technology 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 528 pcs 2-inch boxes or 336 pcs 3-inch boxes
- Class IIa Medical Device (For EU countries only)



MDF-U74V



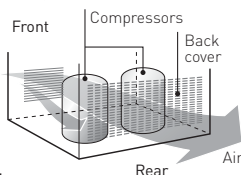
## DESIGN

- PHCbi V.I.P. PLUS -86°C ultra-low temperature freezers use vacuum insulation cabinet construction that reduces the wall thickness from 14 cm to 7 cm 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, 230 V 50 Hz, 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 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.



The MDF-U74V is certified as a Class IIa Medical Device (93/42/EEC and 2007/47/EC) (For EU countries only)

## 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  $\pm 5^{\circ}\text{C}$  to  $\pm 20^{\circ}\text{C}$  (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 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.

Model Number		MDF-U74V-PK	MDF-U74V-PB	MDF-U74V-PE
External dimensions (W x D x H)*1	mm	1010 x 870 x 2010		
Internal dimensions (W x D x H)	mm	870 x 600 x 1400		
Effective capacity	litres	728		
Net weight	kg	Approx. 346		
Performance				
Temperature control range	°C	-50 to -86 (in 1°C increments)		
Cooling performance	°C	-86 (Ambient temperature 30°C)		
Storage capacity		2" box: 528 pcs. / 3" box: 336 pcs.		
Construction				
Shelves	qty	Stainless steel, 3		
Access port		17mm diameter, 3 locations (back, bottom left/right corner)		
Compressor		Hermetic: 1100 W (high stage side), 1100 W (low stage side)		
Refrigerant		HFC		
Alarms		High / low temperature, Power failure, Filter check, Self diagnostics, Door check, Part replacement notification		
Remote alarm contact		Allowable contact capacity: DC 30 V, 2 A		
Accessories		1 set of keys, 1 scraper		
Electrical and Noise Level		MDF-U74V-PK	MDF-U74V-PB	MDF-U74V-PE
Power supply	V	220	220	230/240
Frequency	Hz	60	50	50
Noise level*2	dB [A]	51		
Quality Management System				
Certification		ISO13485		

\*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:** PHC Corporation guarantees the product under certain warranty conditions. PHC Corporation is in no way shall be responsible for any loss of content or damage to content. The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years. Fan motors are expendable supplies. Exchange it for about every 6 years.

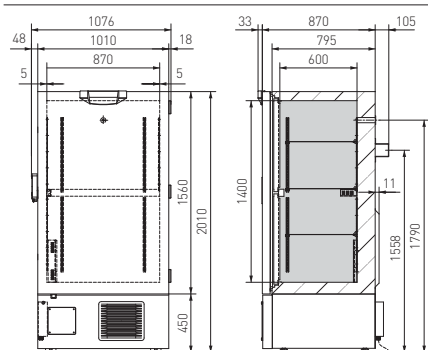
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\*1 External dimensions of main cabinet only - see dimension drawings showing handles and other external projections.

\*2 Nominal value - Background noise 20 dB[A].

## Dimensions

Unit : mm



## Options

### Temperature recorders



Circular recorder  
**MTR-G85C-PE**  
Strip chart recorder  
**MTR-85H-PW**  
Recorder mounting bracket  
**MDF-S3085-PW**  
(for MTR-85H-PW)

### Racks



Inventory rack  
**IR-220U-PW**  
**IR-224U-PW**

### Liquid CO<sub>2</sub> / N<sub>2</sub> Backup Kits



LCO<sub>2</sub> backup system  
**CVK-UB2-PW**  
LN<sub>2</sub> backup system  
**CVK-UBN2-PW**

### Individual inner doors MDF-71D-PW

Interface board  
(For data acquisition system MTR-5000 users only)  
**MTR-L03-PW** (Except for EU countries)  
**MTR-480-PW**



### Freezers, Refrigerators, Incubators, and Drying and Sterilising Equipment for Medical use

The management of the design, development, production and distribution of the above.

PHC Corporation, Biomedical Division

1-1-1 Sakada, Oizumi-machi, Ora-gun, Gunma 370-0596, Japan



PHC Corporation  
Biomedical Division is  
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Environmental  
management system:  
ISO14001

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