

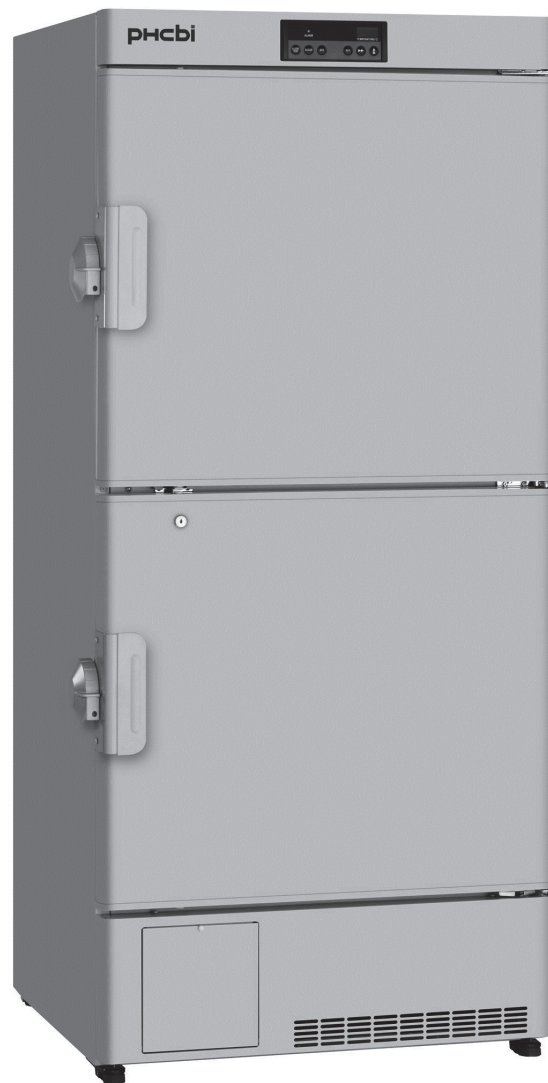


# Operating Instructions

Biomedical Freezer

**MDF-MU500H**

**MDF-MU300H**



**MDF-MU500H**

Please read the operating instructions carefully before using this product, and keep the operating instructions for future use.

See page 32 for all model numbers.



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# INTRODUCTION

- Read the operating instructions carefully before using the product and follow the instructions for safe operation.
- PHC Corporation takes no responsibility for safety if the product is not used as intended or is used with any procedures other than those given in the operating instructions.
- Keep the operating instructions in a suitable place so that they can be referred to as necessary.
- The operating instructions are subject to change without notice for improvement of performance or function.
- Contact our sales representative or agent if any page of the operating instructions is lost or the page order is incorrect, or if the instructions are unclear or inaccurate.
- No part of the operating instructions may be reproduced in any form without the express written permission of PHC Corporation.

## **IMPORTANT NOTICE**

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.

# PRECAUTIONS FOR SAFE OPERATION

**It is imperative that the user complies with the operating instructions as it contains important safety advice.**

Items and procedures are described so that you can use this unit correctly and safely. If the precautions advised are followed, this will prevent possible injury to the user and any other person.

Precautions are illustrated in the following way:




## **WARNING**

Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.

## **CAUTION**

Failure to observe CAUTION signs could result in injury to personnel and damage to the unit and associated property.

Symbol shows;

-  this symbol means caution.
-  this symbol means an action is prohibited.
-  this symbol means an instruction must be followed.

Be sure to keep the operating instructions in a place accessible to users of this unit.

< Label on the unit >


















This mark is labeled on the cover in which the electrical components of high voltage are enclosed to prevent the electric shock.

The cover should be removed by a qualified engineer or a service personnel only.
















# PRECAUTIONS FOR SAFE OPERATION

## **WARNING**

-  **Do not use the unit outdoors.** Current leakage or electric shock may result if the unit is exposed to rain water.
-  **Only qualified engineers or service personnel should install the unit.** The installation by unqualified personnel may cause electric shock or fire.
-  **Install the unit on a sturdy floor and take an adequate precaution to prevent the unit from turning over.** If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.
-  **Never install the unit in a humid place or a place where it is likely to be splashed by water.** Deterioration of the insulation may result which could cause current leakage or electric shock.
-  **Never install the unit in a flammable or volatile location.** This may cause explosion or fire.
-  **Never install the unit where acid or corrosive gases are present** as current leakage or electric shock may result due to corrosion.
-  **Always ground (earth) the unit to prevent electric shock.** If the power supply outlet is not grounded, it will be necessary to install a ground by qualified engineers.
-  **Never ground the unit through a gas pipe, water main, telephone line or lightning rod.** Such grounding may cause electric shock in the case of an incomplete circuit.
-  **Connect the unit to a power source as indicated on the rating label attached to the unit.** Use of any other voltage or frequency other than that on the rating label may cause fire or electric shock.
-  **Never store volatile or flammable substances** in this unit if the container cannot be sealed. These may cause explosion or fire.
-  **Do not insert metal objects such as a pin or a wire into any vent, gap or any outlet on the unit.** This may cause electric shock or injury by accidental contact with moving parts.
-  **Use this unit in safe area when treating the poison, harmful or radiate articles.** Improper use may cause bad effect on your health or environment.
-  **Turn off the power switch (if provided) and disconnect the power supply to the unit prior to any repair or maintenance** of the unit in order to prevent electric shock or injury.
-  **Do not touch any electrical parts (such as power supply plug) or operate switches with a wet hand.** This may cause electric shock.
-  **Do not place this unit in a location where it is difficult to disconnect the power supply plug.** Failure to disconnect the power supply plug may cause fire in the event of a problem or malfunction.








# PRECAUTIONS FOR SAFE OPERATION

## **WARNING**

-  **Ensure you do not inhale or consume medication or aerosols** from around the unit at the time of maintenance. These may be harmful to your health.
-  **Never splash water directly onto the unit** as this may cause electric shock or short circuit.
-  **Never put containers with liquid on the unit** as this may cause electric shock or short circuit when the liquid is spilled.
-  **Never bind, process, or step on the power supply cord, or never damage or break the power supply plug.** A broken supply cord or plug may cause fire or electric shock.
-  **Do not use the supply cord if its plug is loose.** Such supply cord may cause fire or electric shock.
-  **Never disassemble, repair, or modify the unit yourself.** Any such work carried out by an unauthorized person may result in fire, or electric shock or injury due to a malfunction.
-  **Disconnect the power supply plug if there is something wrong with the unit.** Continued abnormal operation may cause electric shock or fire.
-  **When removing the plug from the power supply outlet, grip the power supply plug, not the cord.** Pulling the cord may result in electric shock or fire by short circuit.
-  **Disconnect the power supply plug** before moving the unit. Take care not to damage the power cord. A damaged cord may cause electric shock or fire.
-  **Disconnect the power plug when the unit is not used for long periods.** Keeping the connection may cause electric shock, current leakage, or fire due to the deterioration of insulation.
-  If the unit is to be stored unused in an unsupervised area for an extended period, **ensure that children do not have access and that doors cannot be closed completely.**
-  **The disposal of the unit should be accomplished by appropriate personnel.** Remove doors to prevent accidents such as suffocation.
-  **Do not put the packing plastic bag within reach of children** as suffocation may result.
-  **Flammable and explosive product.** This product contains flammable refrigerant. Do not damage or break the pipework.
-  **This product contains flammable refrigerant.** Well ventilate the room to prevent refrigerant accumulation.

# PRECAUTIONS FOR SAFE OPERATION

## CAUTION

-  This unit must be plugged into a dedicated circuit protected by branch circuit breaker.
-  Use a dedicated power source as indicated on the rating label attached to the unit. A multiple-tap may cause fire resulting from abnormal heating.
-  **Connect the power supply plug to the power source firmly after removing the dust on the plug.**  
A dusty plug or improper insertion may cause a heat or ignition.
-  **Never store corrosive substances such as acid or alkali** in this unit if the container cannot be sealed. These may cause corrosion of inner components or electric parts.
-  **Check the setting when starting up of operation after power failure or turning off of power switch.** The stored items may be damaged due to the change of setting.
-  **Be careful not to tip over the unit** during movement to prevent damage or injury.
-  **Prepare a safety check sheet** when you request any repair or maintenance for the safety of service personnel.

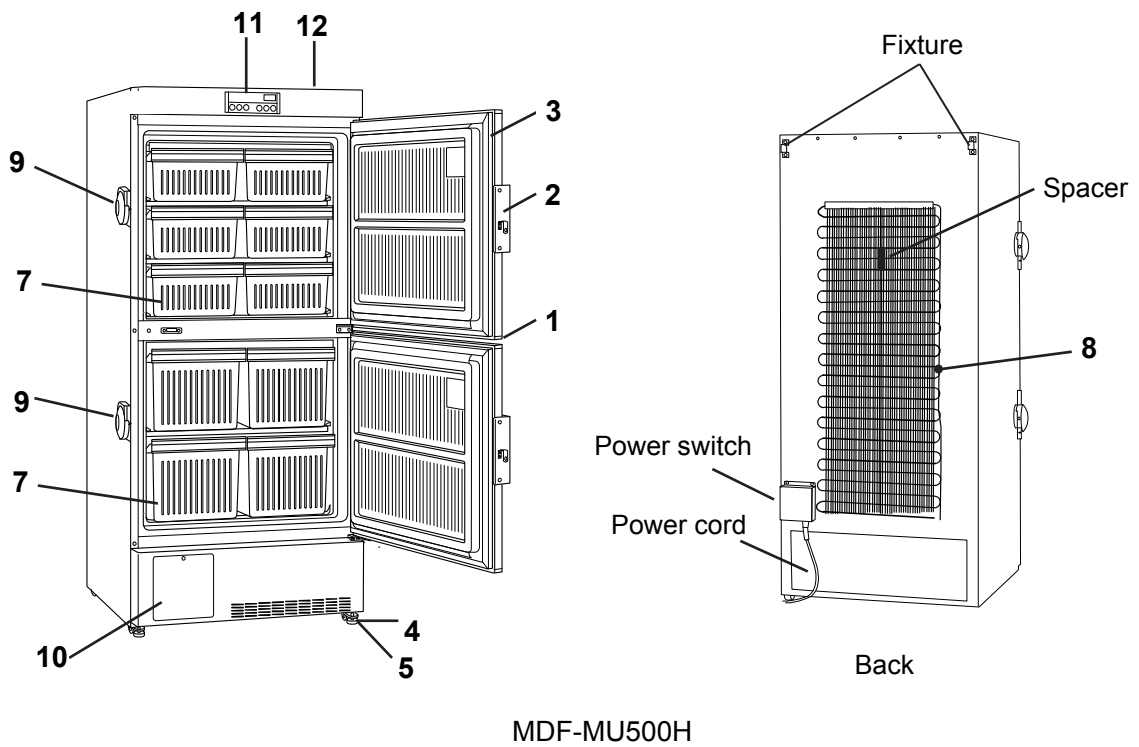
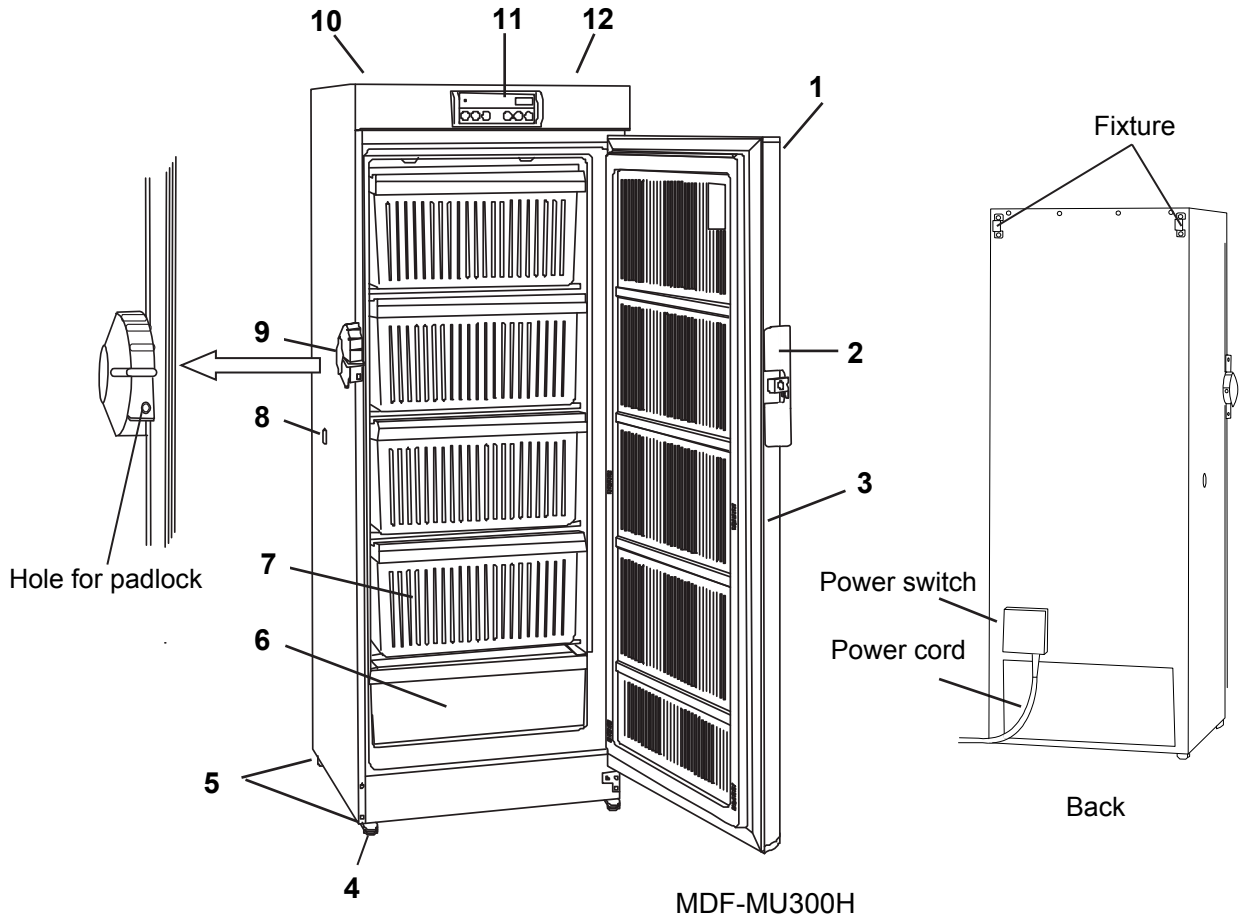


# ENVIRONMENTAL CONDITIONS

This equipment is designed to be safe at least under the following conditions (based on the IEC 61010-1):

- Indoor use;
- Altitude up to 2000 m;
- Ambient temperature 5°C to 40°C;
- Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C;
- Mains supply voltage fluctuations up to  $\pm 10\%$  of the nominal voltage;
- Transient overvoltages up to the levels of OVERVOLTAGE CATEGORY II;
- Temporary OVERVOLTAGES occurring on the mains supply;
- Applicable pollution degree of the intended environment (POLLUTION DEGREE 2 in most cases)

# FREEZER COMPONENTS



# FREEZER COMPONENTS

**1. Keyhole:** By turning to 180 degree to counterclockwise with a key, the door can be locked.

**2. Handle:** To open the door, grip the handle.

**3. Door:** Always grip the handle to open the door.

**4. Leveling foot:** Serves to adjust the height and to settle the frame evenly.

**5. Caster:** 4 casters are provided for easy movement. Separate the front two casters from the floor by adjusting the leveling feet at the time of installation.

**6. Defrost water vessel & storage container (MDF-MU300H only):** The storage container can be used to collect the defrosted water when defrosting.

**Note:** Move the storage items in the storage container when defrosting since the storage container is used as a defrost water vessel.

**7. Storage container:** Made of styrol resin. Be careful not to damage the storage container by a metal scraper at the time of defrosting.

**Note:** Do not pull the storage container excessively. The storage container may fall down.

**8. Access port:** This is used for leading a sensor or a cable of the measuring equipment to the chamber.

**9. Door latch:** To lock the door, turn the door latch downward. A padlock is also available.

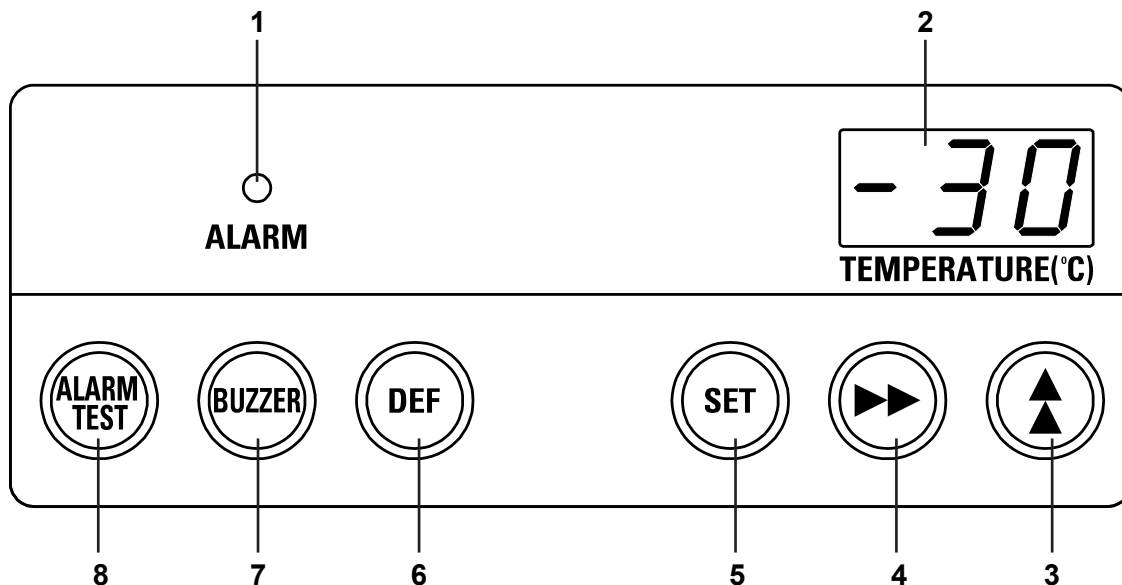
**10. Space for temperature recorder:** A temperature recorder (optional component) can be attached here. See page 26 "Temperature recorder".

**11. Control panel:** To display the temperature setting and running condition. See page 10 for details.

**12. Space for battery mounting box:** A battery mounting box (optional component) can be attached here.

# FREEZER COMPONENTS

## Control panel



**1. Alarm lamp (ALARM):** This lamp is flashed when unit is in alarm status. See page 18.

**2. Digital temperature indicator:** Normally, the current chamber temperature or set temperature is displayed. In alarm status, an error code and chamber temperature is displayed alternately. See page 18.

**3. Numerical value shift key (▲):** Pressing this key in the setting mode causes the numerical value to shift. ON-OFF of key lock can be selected by pressing this key in the key lock setting mode.

**4. Digit shift key (▶▶):** Pressing this key in the setting mode causes the changeable digit to shift. Key lock setting mode is led by pressing this key for more than 5 seconds in the temperature display mode. Refer to page 14 for the key lock.

**5. Set key (SET):** Chamber temperature setting mode is led by pressing this key. The changeable digit is flashed. Pressing this key again after temperature setting memorizes the setting.

**6. Defrost key (DEF):** By pressing this key for 5 seconds, the refrigerating operation is stopped. Pressing this key again after defrosting leads resumption of the refrigerating operation. See page 19 for the details.

**Note:** The refrigerating operation never resume automatically after defrosting.

**7. Alarm buzzer stop key (BUZZER):** To silence the audible alarm, press this key.

**8. Alarm test key (ALARM TEST):** Test key for alarm device. By pressing this key, the alarm lamp blinks, remote alarm is activated and buzzer sounds. This means all alarm function operate correctly.

**Note:** The remote alarm terminal is not provided with the freezer. It is enclosed in the battery mounting box (MPR-48B1) offered as an optional component.

# INSTALLATION SITE

To operate this unit properly and to obtain maximum performance, install the unit in a location with the following conditions:

■ **A location not subjected to direct sunlight**

Do not install the unit under direct sunlight. Installation in a location subjected to direct sunlight cannot obtain the intended performance.

■ **A location with adequate ventilation**

Leave at least 10 cm around the unit for ventilation. Poor ventilation will result in a reduction of the performance and consequently the failure.

For MDF-MU500H, avoid the direct air flow by the air conditioner to the back side because the wire condenser is on the back.

■ **A location away from heat generating sources**

Avoid installing the unit near heat-emitting appliances such as a heater or a boiler etc. Heat can decrease the intended performance of the unit.

■ **A location with little temperature change**

Install the unit under stable ambient temperature. The allowable ambient temperature is between 5°C and 30°C.

■ **A location with a sturdy and level floor**

Always install the unit on a sturdy and level floor. The uneven floor or tilted installation may cause failure or injury. Install the unit in stable condition to avoid the vibration or noise. Unstable condition may cause vibration or noise.

 **WARNING**

**Install the unit on a sturdy floor.** If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.

**Select a level and sturdy floor for installation.** This precaution will prevent the unit from tipping. Improper installation may result in water spillage or injury from the unit tipping over.

■ **A location not prone to high humidity**

Install the unit in the ambient of 80% R.H. or less humidity. Installation under high humidity may cause current leakage or electric shock.

 **WARNING**

**Do not use the unit outdoors.** Current leakage or electric shock may result if the unit is exposed to rain water.

**Never install the unit in a humid place or a place where it is likely to be splashed by water.** Deterioration of the insulation may result which could cause current leakage or electric shock.

■ **A location without flammable or corrosive gas**

Never install the unit in a flammable or volatile location. This may cause explosion or fire or may result in the current leakage or electric shock by the corrosion of the electrical components.

■ **A location without the possibility of anything fall**

Avoid installing the unit in the location where anything can fall down onto the unit. This may cause the breakdown or failure of the unit.

# INSTALLATION

## 1. Removing the packaging materials and tapes

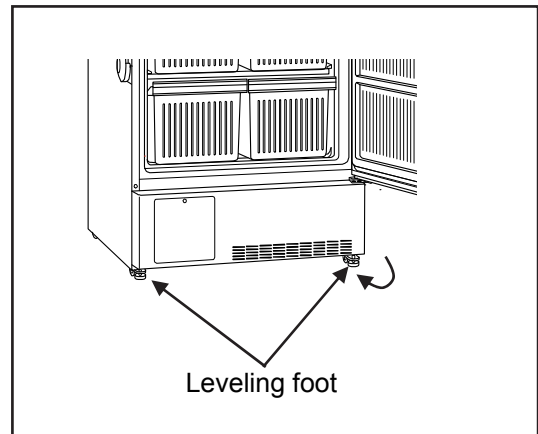
Remove all transportation packaging materials and tapes. Open the doors and ventilate the unit. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the panels with a dry cloth.

### Note:

Remove the cable tie banding the power supply cord. Prolonged banding may cause the corrosion of the cord coating.

## 2. Adjusting the leveling foot

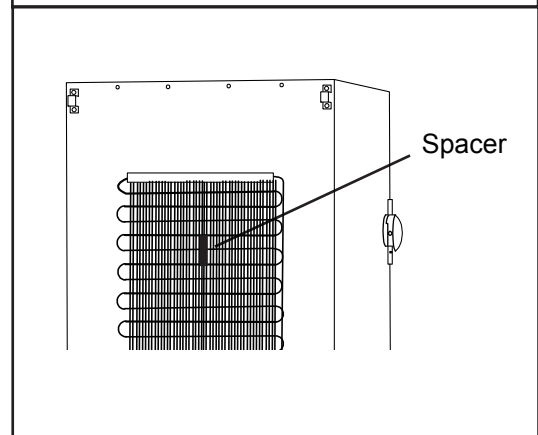
Extend the leveling feet by rotating them as shown in the figure until the front casters are separate from the floor. Ensure the unit is level.



## 3. Keeping the space (MDF-MU500H only)

Keep the adequate space at the back of the unit by using the spacer on the back. To fix the spacer, follow the procedure below.

- Press the spacer to the condenser.
- Pull up the lower edge to the horizontal position.
- Push in the spacer between the condenser.



## 4. Fixing the unit

Two fixtures are attached to the rear of the frame. Fix the frame to the wall with these fixtures and rope or chain.

## 5. Ground (earth)

The ground (earth) is for preventing the electric shock in the case of the electrical insulation is somehow degraded. Always ground the unit at the time of installation.

### **WARNING**

**Use a power supply outlet with ground (earth) to prevent electric shock.** If the power supply outlet is not grounded, it is necessary to install a ground by qualified engineers.

**Never ground the unit through a gas pipe, water main, telephone line or lightning rod.** Such grounding may cause electric shock in the case of an incomplete circuit.

# START-UP OF UNIT

Follow the procedures for the initial and consequent operations of the unit.

1. Connect the power cord to the dedicated outlet with appropriate rating with the chamber empty and turn on the power switch.
2. Turn on the battery switch when the battery mounting box (optional component) is installed.
3. The alarm buzzer sometimes operates. In this case, silence the buzzer by pressing the alarm buzzer stop key (BUZZER).
4. Set the chamber temperature to the desired temperature.
5. Allow the chamber temperature to fall to the desired temperature. Check the chamber temperature on the digital temperature indicator.
6. Press the alarm test key (ALARM TEST) and check that the alarm lamp blinks and alarm buzzer activates. Also, the remote alarm is activated when the battery mounting box (optional component) is installed.

**Note:**

The alarm lamp blinks and E09 is displayed on the digital temperature indicator when the battery switch is OFF.

7. Begin slowly placing items into the chamber to minimize the temperature rise. The temperature alarm activates by the temperature rise when the large amount of items are stored in the chamber at one time.

## Operation after power failure

The chamber temperature setting and alarm temperature setting are backed-up by nonvolatile memory. Accordingly, the freezer resumes the operation with setting before power failure.

### CAUTION

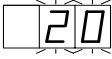
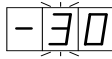


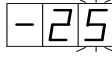
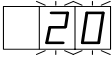
The start-up after power failure is subject to adverse affection such as voltage drop because all electrical appliance start to operate simultaneously. Always check the running status.

# CHAMBER TEMPERATURE SETTING

Table 1 shows the basic procedure for setting the chamber temperature. Perform key operations in the sequence indicated in the table. The example in the table is based on the assumption that the desired temperature is -25°C.

**Note:** The unit is set at the factory that the set temperature is -30°C.

**Table 1 Basic operation sequence (Example: Chamber temperature -25°C)**

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed. 
2	Press set key.	SET	The second digit of the digital temperature indicator flashes. 
3	Set the temperature to 25 with the digit shift key and the numerical value shift key.		By pressing the key, settable digits is shifted.
			By pressing the key, the figure of settable digit changes. 
4	Press set key.	SET	Set temperature is memorized and the current chamber temperature is displayed. 

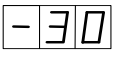



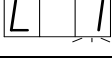
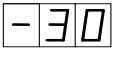
◇ The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing set key (SET) is not memorized.

# KEY LOCK FUNCTION

This unit is provided with the key lock function. When the key lock is ON, change of temperature setting through the key pad is not available. The defrost key (DEF) is also ineffective. The key lock is set in OFF at the factory.

Display	Mode	Function
L 0	Key lock is OFF	Enable to change of temperature setting
L 1	Key lock is ON	Disable to change of temperature setting

**Table 2 Procedure for key lock setting (change from key lock OFF to key lock ON)**

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed. 
2	Press digit shift key for 5 seconds.		The first digit is flashed. 
3	Press numerical value shift key and scroll the figure to 1.		When pressed, the figure of settable digit changes. 
4	Press set key.	SET	The key lock is set to ON. The current chamber temperature is displayed. 

◇ The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing set key (SET) is not memorized.



# ALARM TEMPERATURE SETTING

This unit is provided with both high and low temperature alarms. The temperature at which the alarm is activated can be changed.

**Note:** The temperature alarm is set at  $\pm 10^{\circ}\text{C}$  of the chamber set temperature at the factory.

Display	Mode	Available set range
F01	High temperature alarm set	between $5^{\circ}\text{C}$ and $15^{\circ}\text{C}$ higher than the chamber set temperature
F02	Low temperature alarm set	between $5^{\circ}\text{C}$ and $15^{\circ}\text{C}$ lower than the chamber set temperature

As an example, Table 3 shows the procedure to set the high temperature alarm so that the alarm can activate when the chamber temperature is  $5^{\circ}\text{C}$  higher than the set temperature.

Table 4 shows the procedure to set the low temperature alarm so that the alarm can activate when the chamber temperature is  $5^{\circ}\text{C}$  lower than the set temperature.

**Table 3 Procedure for setting high temperature alarm**

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed.
2	Press numerical value shift key for 5 seconds.		The first digit is flashed.
3	Press numerical value shift key and scroll the figure to 1.		When pressed, the figure of settable digit changes.
4	Press set key.	SET	The first digit is flashed.
5	Set the temperature to 005 with the digit shift key and numerical value shift key.		When pressed, the changeable digit is shifted.
			When pressed, the figure of settable digit changes.
6	Press set key.	SET	Alarm temperature is memorized and the current chamber temperature is displayed.

**Table 4 Procedure for setting low temperature alarm**

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed.
2	Press numerical value shift key for 5 seconds.		The first digit is flashed.
3	Press numerical value shift key and scroll the figure to 2.		When pressed, the figure of settable digit changes.
4	Press set key.	SET	The first digit is flashed.
5	Set the temperature to -05 with the digit shift key and numerical value shift key.		When pressed, the changeable digit is shifted.
			When pressed, the figure of settable digit changes.
6	Press set key.	SET	Alarm temperature is memorized and the current chamber temperature is displayed.

◇ The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing set key (SET) is not memorized.

# SETTING OF ALARM RESUME TIME

The alarm buzzer and remote alarm are stopped by pressing alarm buzzer stop key (BUZZER) on the control panel during alarm condition. The buzzer and remote alarm will be activated again after certain suspension if the alarm condition is continued. The suspension time can be set by following the procedure shown in the Table 5 below.

The example in the table is based on the assumption that the desired duration is 20 minutes.

**Note:** The duration is set in 30 minutes at the factory.

**Table 5 Setting procedure for alarm resuming time (change from 30 minutes to 20 minutes)**

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed.
2	Press numerical value shift key for 5 seconds.		The first digit is flashed.
3	Set the figure to F25 with the digit shift key and numerical value shift key.		When pressed, the changeable digit is shifted.
			When pressed, the figure of settable digit changes.
4	Press set key.	SET	The current resume time is displayed. The second digit is flashed.
5	Set the figure to 020 with the numerical value shift key.		When pressed, the figure of settable digit changes.
6	Press set key.	SET	The setting is memorized and the current chamber temperature is displayed.

◇ The settable alarm resume time are 10, 20, 30, 40, 50, or 60 minutes (The setting is 010, 020, 030, 040, 050, or 060). The buzzer and remote alarm would not resume if the resume time is set in 000.

◇ The setting of alarm resume time cannot be changed during the defrosting.

◇ The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing set key (SET) is not memorized.

# SETTING OF COMPRESSOR DELAY TIME

The delay time of low stage side compressor can be set to reduce the load on the power line and to facilitate the start-up (reset) of the freezer after power failure.

The example in the table is based on the assumption that the delay time is changed to 4 minutes. The delay time is set to 1 minutes at the factory.

**Note:**

■ The setting range for delay time is between 1 and 15 minutes. The cool down of chamber temperature may be slow when the setting of delay time is over 5 minutes, depending on the installation environment. There is no need of changing the delay time when the capacity of power source is enough.

**Table 6 Changing procedure for delay time (change from 1 minutes to 4 minutes)**

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed.
2	Press numerical value shift key for 5 seconds.		The first digit is flashed.
3	Set the figure to F05 with the numerical value shift key.		When pressed, the figure of settable digit changes.
4	Press set key.	SET	The current delay time is displayed. The first digit is flashed.
5	Set the figure to 004 with the numerical value shift key.		When pressed, the figure of the first digit changes.
6	Press set key.	SET	The delay time is memorized and the current chamber temperature is displayed.

◇ The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing set key (SET) is not memorized.

# ALARMS & SAFETY FUNCTIONS

This unit has the alarms and safety functions shown in Table 7, and also self diagnostic functions.

**Table 7 Alarms and safety functions**

Alarm & Safety	Situation	Indication	Buzzer	Safety operation
High temperature alarm	If the chamber temperature is higher than the temperature at which the high temperature alarm is activated.	Alarm lamp is flashed. Digital temperature indicator is flashed.	Intermittent tone with 15 minutes delay.	Remote alarm with 15 minutes delay.
Low temperature alarm	If the chamber temperature is lower than the temperature at which the low temperature alarm is activated.	Alarm lamp is flashed. Digital temperature indicator is flashed.	Intermittent tone with 15 minutes delay.	Remote alarm with 15 minutes delay.
Auto-return	When there is no key pressing in each setting mode for 90 seconds.	Chamber temperature is displayed.	-----	Finishing of each setting mode.
Key lock	When the key lock is "ON".	-----	-----	Change of setting is disable. Defrost key is ineffective.
Thermal sensor abnormality	If the thermal sensor is disconnected.	Alarm lamp is flashed. E01 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Continuous running.
	If the thermal sensor is short-circuited.	Alarm lamp is flashed. E02 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Continuous running.
Power failure alarm (MPR-48B1 installed)	In the case of power failure. When the power to the unit is disconnected.	Alarm lamp is flashed.	Intermittent tone	Remote alarm.
Battery check (MPR-48B1 installed)	When about 3 years has passed with the power cord is connected to the outlet.	F1 and chamber temp. are displayed alternately.		
Battery switch check (MPR-48B1 installed)	When battery switch is OFF at the time of alarm test.	Alarm lamp is flashed. E09 is flashed.	-----	Remote alarm.

✧ The above power failure alarm, battery check and battery switch check are available when the battery mounting box (optional component) is installed. The operation is as follows:

- The power failure alarm is available when the battery switch is ON and the battery is charged. Only the remote alarm is activated when the battery switch is OFF or the battery is discharged.
- The power failure alarm can be kept about twelve hours with the battery charged completely. 2-day operation of the freezer is needed to charge the battery full with the battery switch ON.
- The remote alarm is stopped by pressing the alarm buzzer stop key (BUZZER) as the remote alarm is operated in conjunction with the buzzer, except for the power failure alarm.
- During power failure, the alarm buzzer is stopped by pressing the alarm buzzer stop key (BUZZER) but the alarm lamp keeps blinking.

✧ The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every three years. Contact our sales representative or agent at the time of replacement of the battery for recycling.

# ROUTINE MAINTENANCE

## **WARNING**

**Always disconnect the power supply to the unit prior to any repair or maintenance** of the unit in order to prevent electric shock or injury.

**Ensure you do not inhale or consume medication or aerosols** from around the unit at the time of maintenance. These may be harmful to your health.

## **CAUTION**

**Always put on the dry gloves to protect the hands** at the time of maintenance. No gloves may cause cut of the finger by the edge or corner.

## Cleaning of cabinet

- Clean the unit once a month. Regular cleaning keeps the unit looking new.
- Use a dry cloth to wipe off small amounts of dirt on the outside and inside of the unit and all accessories. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the cabinet or accessories with a dry cloth.
- Never pour water onto or into the unit. Doing so can damage the electric insulation and cause failure.
- The compressor and other mechanical parts are completely sealed. This unit requires absolutely no lubrication.
- Clean or defrost the chamber once a month.

## Defrosting

This product is refrigerated by the direct cooling. When it uses for a long time, frost appears on the chamber wall side. It cannot be cooled down when there is much amount of frost. The defrost is mentioned in the following.

Use the scraper provided for removing the frost if the freezer operation must be continued. Pay attention not to impact or damage the inner wall.

### ■ **Forced defrost**

1. When defrosting, temporarily move all the contents of containers in the freezer to another low-temperature freezer.
2. Remove all storage containers other than the empty defrost water vessel & storage container (MDF-MU300H) or the bottom storage container (MDF-MU500H).
3. Press the defrost key (DEF) for 5 seconds to stop the refrigerating operation. While the refrigerating operation is stopped, the current chamber temperature and dF is displayed on the control panel alternately.
4. After a several hours, check visually that all defrost was removed completely.
5. Throw out the water that has accumulated in the container, then wipe the container and the chamber.
6. Replace all containers and press the defrost key (DEF) so that the refrigerating operation can be started.
7. Once the chamber temperature has dropped to the desired temperature, place the original contents back in the chamber.

# TROUBLE SHOOTING

If the unit malfunctions, check out the following before calling for service.

Malfunction	Check/Remedy
The chamber is not cooled at all	<ul style="list-style-type: none"> <li>■ The power cord is not connected to the outlet.</li> <li>■ The circuit breaker of power source is active.</li> <li>■ The voltage is too low? (In this case, call an electrician.)</li> </ul>
When the unit does not accept the key operation	<ul style="list-style-type: none"> <li>■ The key lock is set in ON.</li> </ul>
The alarm system works	<ul style="list-style-type: none"> <li>■ Investigate the following cause when an alarm lamp and buzzer are working.</li> <li>■ When use starts. Does the chamber temperature match the set value?</li> <li>■ When it is using. Were not you taking the condition that opened the change of the temperature command and a door for a long time? Did not you put the sample whose temperature was high in the freezer chamber? An alarm is canceled naturally when it is left in these cases.</li> </ul>
The cooling is poor	<ul style="list-style-type: none"> <li>■ You put too many unfrozen articles into the freezer compartment.</li> <li>■ The large amount of frost is built on the chamber wall.</li> <li>■ The door is opened frequently.</li> <li>■ The set temperature is not inputted properly.</li> <li>■ The freezer is in the direct sunlight.</li> <li>■ The freezer is not installed properly.</li> </ul>
Dew condensation is settled in the appearance of the freezer.	<ul style="list-style-type: none"> <li>■ When a stifling day lasts, or it sometimes dews in the exterior of the freezer by the installation features. When humidity is high, it touches the thing that water in the air is cold, and this is to the benefit that dew condensation is settled, and it is not a trouble.</li> </ul>

◇ If the malfunction is not eliminated after checking the above items, or the malfunction is not shown in the above table, contact our sales representative or agent.

# DISPOSAL OF UNIT



## **WARNING**

**Flammable and explosive product.** This product contains flammable refrigerant. Be sure to follow the below instructions when servicing or recycling.

- Well ventilate the room to prevent refrigerant accumulation.
- Keep fire away when the refrigerant is contained in the product.
- Do not damage or break the pipework.

## **Decontamination of unit**

Before disposal of unit with biohazardous danger, decontaminate the unit to the extent possible by the user.

# DISPOSAL OF UNIT

(English)

## Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)



This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.

Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise

from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

## For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

## Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.

If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

(German)

## Benutzerinformationen zur Entsorgung von elektrischen und elektronischen Geräten (private Haushalte)



Dieses Symbol auf Produkten und/oder begleitenden Dokumenten bedeutet, dass verbrauchte elektrische und elektronische Produkte nicht mit gewöhnlichem Haushaltsabfall vermischt werden sollen.

Bringen Sie zur ordnungsgemäßen Behandlung, Rückgewinnung und Recycling diese Produkte zu den entsprechenden Sammelstellen, wo sie ohne Gebühren entgegengenommen werden. In einigen Ländern kann es auch möglich sein, diese Produkte beim Kauf eines entsprechenden neuen Produkts bei Ihrem örtlichen Einzelhändler abzugeben.

Die ordnungsgemäße Entsorgung dieses Produkts dient dem Umweltschutz und verhindert mögliche schädliche Auswirkungen auf Mensch und Umgebung, die aus einer unsachgemäßen Handhabung von Abfall entstehen können. Genauere Informationen zur nächstgelegenen Sammelstelle erhalten Sie bei Ihrer Gemeindeverwaltung. In Übereinstimmung mit der Landesgesetzgebung können für die unsachgemäße Entsorgung dieser Art von Abfall Strafgebühren erhoben werden.

## Für Geschäftskunden in der Europäischen Union

Bitte treten Sie mit Ihrem Händler oder Lieferanten in Kontakt, wenn Sie elektrische und elektronische Geräte entsorgen möchten. Er hält weitere Informationen für sie bereit.

## Informationen zur Entsorgung in anderen Ländern außerhalb der Europäischen Union

Dieses Symbol ist nur in der Europäischen Union gültig.

Bitte treten Sie mit Ihrer Gemeindeverwaltung oder Ihrem Händler in Kontakt, wenn Sie dieses Produkt entsorgen möchten, und fragen Sie nach einer Entsorgungsmöglichkeit.



# DISPOSAL OF UNIT

(French)

## Informations relatives à l'évacuation des déchets, destinées aux utilisateurs d'appareils électriques et électroniques (appareils ménagers domestiques)



Lorsque ce symbole figure sur les produits et/ou les documents qui les accompagnent, cela signifie que les appareils électriques et électroniques ne doivent pas être jetés avec les ordures ménagères.

Pour que ces produits subissent un traitement, une récupération et un recyclage appropriés, envoyez-les dans les points de collecte désignés, où ils peuvent être déposés gratuitement. Dans certains pays, il est possible de renvoyer les produits au revendeur local en cas d'achat d'un produit équivalent.

En éliminant correctement ce produit, vous contribuerez à la conservation des ressources vitales et à la prévention des éventuels effets négatifs sur l'environnement et la santé humaine qui pourraient survenir dans le cas contraire.

Afin de connaître le point de collecte le plus proche, veuillez contacter vos autorités locales.

Des sanctions peuvent être appliquées en cas d'élimination incorrecte de ces déchets, conformément à la législation nationale.

### Utilisateurs professionnels de l'Union européenne

Pour en savoir plus sur l'élimination des appareils électriques et électroniques, contactez votre revendeur ou fournisseur.

### Informations sur l'évacuation des déchets dans les pays ne faisant pas partie de l'Union européenne

Ce symbole n'est reconnu que dans l'Union européenne.

Pour vous débarrasser de ce produit, veuillez contacter les autorités locales ou votre revendeur afin de connaître la procédure d'élimination à suivre.

(Spanish)

## Información sobre la eliminación para los usuarios de equipos eléctricos y electrónicos usados (particulares)



La aparición de este símbolo en un producto y/o en la documentación adjunta indica que los productos eléctricos y electrónicos usados no deben mezclarse con la basura doméstica general.

Para que estos productos se sometan a un proceso adecuado de tratamiento, recuperación y reciclaje, llévelos a los puntos de recogida designados, donde los admitirán sin coste alguno. En algunos países existe también la posibilidad de devolver los productos a su minorista local al comprar un producto nuevo equivalente.

Si desecha el producto correctamente, estará contribuyendo a preservar valiosos recursos y a evitar cualquier posible efecto negativo en la salud de las personas y en el medio ambiente que pudiera producirse debido al tratamiento inadecuado de desechos. Póngase en contacto con su autoridad local para que le informen detalladamente sobre el punto de recogida designado más cercano.

De acuerdo con la legislación nacional, podrían aplicarse multas por la eliminación incorrecta de estos desechos.

### Para empresas de la Unión Europea

Si desea desechar equipos eléctricos y electrónicos, póngase en contacto con su distribuidor o proveedor para que le informe detalladamente.

### Información sobre la eliminación en otros países no pertenecientes a la Unión Europea

Este símbolo sólo es válido en la Unión Europea.

Si desea desechar este producto, póngase en contacto con las autoridades locales o con su distribuidor para que le informen sobre el método correcto de eliminación.

# DISPOSAL OF UNIT

(Portuguese)

## Informações sobre a eliminação de resíduos para utilizadores de equipamentos eléctricos e electrónicos (utilizadores particulares)



Este símbolo nos produtos e/ou documentos anexos significa que os produtos eléctricos e electrónicos usados não devem ser misturados com os resíduos urbanos indiferenciados.

Para efectuar um tratamento, recuperação e reciclagem correctos, leve estes produtos para pontos de recolha próprios para o efeito, onde serão aceites gratuitamente. Em alternativa, em alguns países, poderá devolver os produtos ao seu revendedor local, aquando da compra de um produto novo equivalente.

A eliminação correcta deste produto ajudará a poupar recursos valiosos e evitar quaisquer potenciais efeitos negativos na saúde humana e no ambiente, que poderiam resultar de um tratamento incorrecto de resíduos. Contacte as autoridades locais para obter mais informações sobre o ponto de recolha mais perto de si.

Poderão ser aplicadas multas pela eliminação incorrecta deste resíduo, de acordo com as leis locais.

### Para utilizadores não particulares na União Europeia

Se pretender eliminar equipamento eléctrico e electrónico, contacte o seu revendedor ou fornecedor para obter mais informações.

### Informações sobre a eliminação noutros países fora da União Europeia

Este símbolo apenas é válido na União Europeia.

Se pretender eliminar este produto, contacte as suas autoridades locais ou revendedor e peça informações sobre o método de eliminação correcto.

(Italian)

## Informazioni per gli utenti sullo smaltimento di apparecchiature elettriche ed elettroniche obsolete (per i nuclei familiari privati)



Questo simbolo sui prodotti e/o sulla documentazione di accompagnamento significa che i prodotti elettrici ed elettronici usati non devono essere mescolati con i rifiuti domestici generici.

Per un corretto trattamento, recupero e riciclaggio, portare questi prodotti ai punti di raccolta designati, dove verranno accettati gratuitamente. In alternativa, in alcune nazioni potrebbe essere possibile restituire i prodotti al rivenditore locale, al momento dell'acquisto di un nuovo prodotto equivalente.

Uno smaltimento corretto di questo prodotto contribuirà a far risparmiare preziose risorse ed evitare potenziali effetti negativi sulla salute umana e sull'ambiente, che potrebbero derivare, altrimenti, da uno smaltimento inappropriato. Per ulteriori dettagli, contattare la propria autorità locale o il punto di raccolta designato più vicino.

In caso di smaltimento errato di questo materiale di scarto, potrebbero venire applicate delle penali, in base alle leggi nazionali.

### Per gli utenti aziendali nell'Unione Europea

Qualora si desideri smaltire apparecchiature elettriche ed elettroniche, contattare il rivenditore o il fornitore per ulteriori informazioni.

### Informazioni sullo smaltimento in nazioni al di fuori dell'Unione Europea

Questo simbolo è valido solo nell'Unione Europea.

Qualora si desideri smaltire questo prodotto, contattare le autorità locali o il rivenditore e chiedere informazioni sul metodo corretto di smaltimento.

# DISPOSAL OF UNIT

(Dutch)

## Informatie over het weggooien van elektrische en elektronische apparatuur (particulieren)



Dit symbool betekent in Europa dat gebruikte elektrische en elektronische producten niet bij het normale huishoudelijke afval mogen.

Lever deze producten in bij de aangewezen inzamelingspunten, waar ze gratis worden geaccepteerd en op de juiste manier worden verwerkt, teruggewonnen en hergebruikt. In Nederland kunt u uw producten bij uw winkelier inleveren bij de aanschaf van een vergelijkbaar nieuw product.

Wanneer u dit product op de juiste manier als afval inlevert, spaart u waardevolle hulpbronnen en voorkomt u potentiële negatieve gevolgen voor de volksgezondheid en het milieu, die anders kunnen ontstaan door een onjuiste verwerking van afval. Neem contact op met uw gemeente voor meer informatie over het dichtstbijzijnde inzamelingspunt of raadpleeg [www.nvmp.nl](http://www.nvmp.nl), [www.ictoffice.nl](http://www.ictoffice.nl) of [www.stibat.nl](http://www.stibat.nl).

## Voor zakelijke gebruikers in de Europese Unie

Neem voor het weggooien van elektrische en elektronische apparatuur contact op met uw leverancier voor verdere informatie.

## Informatie over verwijdering van afval in landen buiten de Europese Unie

Dit symbool is alleen geldig in de Europese Unie.

Neem wanneer u dit product wilt weggooien, contact op met de lokale overheid of uw leverancier en vraag wat de juiste verwijderingsmethode is.

(Swedish)

## Information om kassering för användare av elektrisk & elektronisk utrustning (privata konsumenter)



Om denna symbol finns på produkterna och/eller medföljande dokumentation, betyder det att förbrukade elektriska och elektroniska produkter inte ska blandas med vanliga hushållssopor.

För korrekt hantering, inhämtning och återvinning, ska dessa produkter lämnas på återvinningscentraler, där de tas emot utan kostnad. I vissa länder kan du som ett alternativ lämna in dina produkter hos återförsäljaren, när du köper en motsvarande, ny produkt.

Om denna produkt avyttras korrekt sparas värdefulla resurser och eventuellt negativa effekter på den mänskliga hälsan och miljön förhindras, vilket kan bli fallet vid felaktig avyttring. Kontakta din lokala myndighet för mer information om var din närmsta återvinningsstation finns. Böter kan tillämpas vid felaktig avyttring av dessa sopor, i enlighet med lagstiftningen i landet.

## För företagsanvändare inom den Europeiska gemenskapen

Om ni vill kassera elektrisk eller elektronisk utrustning, vänligen kontakta er återförsäljare eller leverantör för mer information.

## Information om kassering i övriga länder utanför den Europeiska gemenskapen

Denna symbol gäller bara inom den Europeiska gemenskapen.

Om du vill kassera denna produkt ska du kontakta de lokala myndigheterna eller din återförsäljare, och fråga om korrekt avyttringsmetod.

# TEMPERATURE RECORDER (OPTION)

A temperature recorder is available for the freezer as an optional component. The type of the temperature recorder is MTR-4015LH or MTR-G85C. For the attachment, the recorder fixing is necessary.

Following shows the combination of recorder and the recorder fixing:

Freezer	Attachment location	Temperature recorder	Recorder fixing
MDF-MU500H	Lower front	MTR-4015LH	MPR-S30
		MTR-G85C	MPR-S7
MDF-MU300H	Top	MTR-4015LH	---
		MTR-G85C	MDF-S740T

## Setting of MTR-4015LH

The used recording paper left in the used recording paper storage can cause a malfunction. Be sure to remove it.

### Setting of recording paper

1. The information on the temperature recording paper is shown in Fig. 1.
2. Pull the cartridge up after opening the cover. (See Fig. 2) The cover can be opened by turning the knob counterclockwise.
3. Put the recording paper into the cartridge with the printed surface out, from the leading end as shown in Fig. 3
4. Pass the recording paper under the arm through between the guide plate. (See Fig. 4)

### Note:

- Do not scratch or put pressure on the recording paper.
- Do not bend the recording paper.
- Do not reverse the recording paper manually.

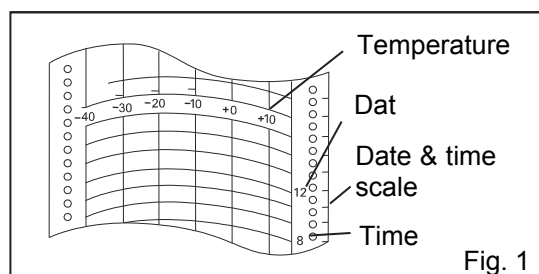


Fig. 1

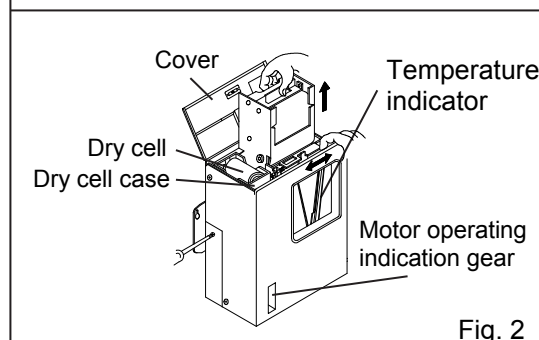


Fig. 2

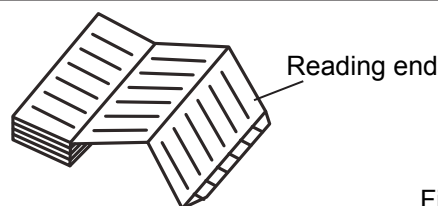


Fig. 3

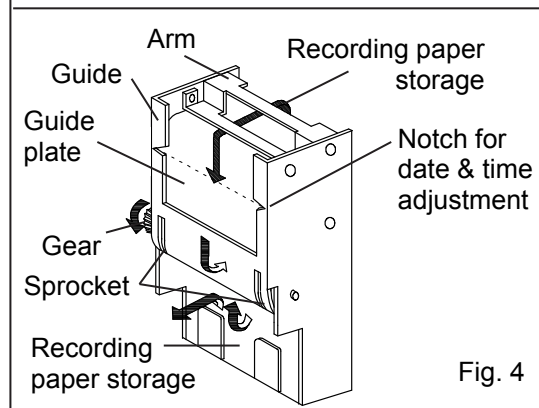


Fig. 4

# TEMPERATURE RECORDER (OPTION)

5. Slide the recording paper along the guide plate so that the recording paper will not be forced out of the date & time adjustment slot. See Fig. 5.

6. After ascertaining that the holes on the side of the recording paper are locked into the teeth of the sprocket, turn the gear and send the recording paper into the used recording paper storage.

## Setting of time

1. Turn the gear on the date/hour slot to the desired time.
2. After properly folding the recording paper in the used or unused recording paper storage, replace the cartridge.

## Removing of the used recording paper

After recording, take out the cartridge and remove the recording paper from the recording paper outlet. If not all of the recording paper has been fed into the used recording paper storage, send all the recording paper in the recording paper storage first turning the gear.

## Battery replacement

To replace the battery, turn the knob counterclockwise to open the cover. Place the battery in the dry cell case according to the plus-minus indications on the bottom of the dry cell case. See Fig. 6. Replace the battery once a year.

## Note :

This temperature recorder is designed for the manganese dry cell and the alkaline dry cell. Do not use a rechargeable battery because the initial voltage of such battery is low. The rechargeable battery may cause the malfunction of temperature recorder or shorten the battery life significantly.

## Start-up

1. The quartz motor is started by placing a "R14" or size "C" dry cell in the dry cell case.
2. Check the operation of the temperature recorder using the quartz motor rotation check gear.

## Stopping

The temperature recorder is stopped by taking the dry cell out of the dry cell case.

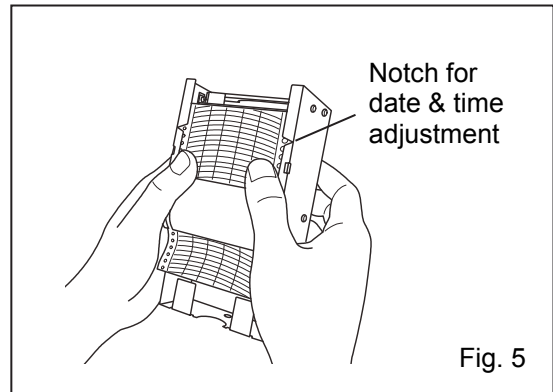


Fig. 5

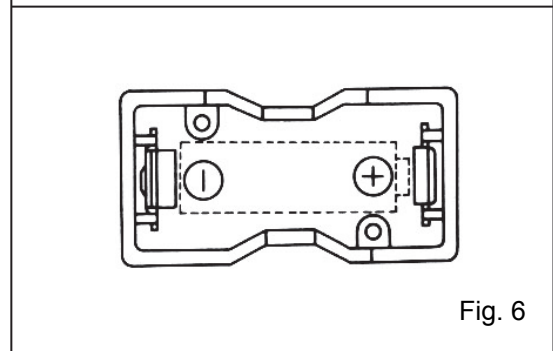
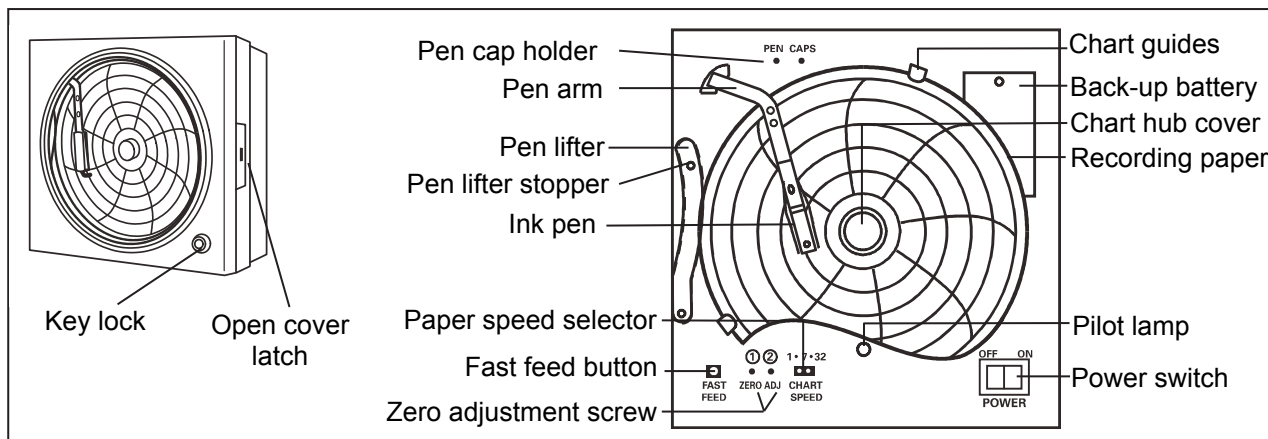


Fig. 6

# TEMPERATURE RECORDER (OPTION)

## Setting of MTR-G85C

If the warning is required for the internal temperature record or the interior temperature deviates from the target temperature, an optional temperature recorder (MTR-G85C) is available. Install the recorder properly as described below.



### Loading the ink pen:

1. Turn the power switch off for temperature recorder.
2. Slightly raise the end of the pen lifter and remove from the pen lifter stopper. Then rotate clockwise as shown in Fig. 1.
3. Remove the ink pen from the bag and remove its cap. The cap can be conveniently kept on the pen cap holder located at the upper left corner.
4. Press both sides of the pen arm as indicated by the arrows to open the head clamp at A and B. (See to Fig. 2 illustration 1)
5. Position the ink pen so that the guide pins fit into the guide holes on the pen arm. (See to Fig. 2 illustration 2)
6. Press the two sides of the head clamp as indicated by the arrows to secure the ink pen. (See to Fig. 2 illustration 3) From the side view, the cartridge should fit perfectly on the arm. Confirm that the pen arm is attached to both sides of the ink pen.
7. After loading the ink pen, return the pen lifter to the original position. Confirm that the pen lifter has securely entered the pen lifter stopper.
8. Turn the power switch on for temperature recorder.

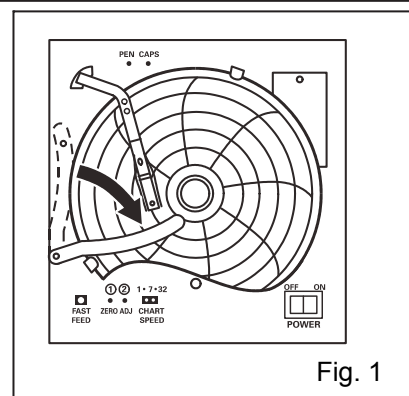


Fig. 1

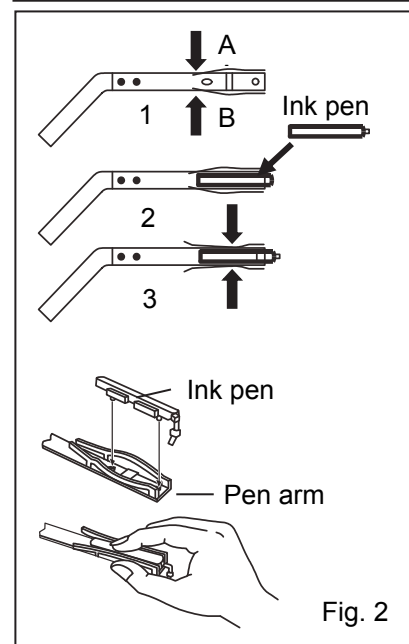


Fig. 2

# TEMPERATURE RECORDER (OPTION)

## Starting recording and setting the time:

Turn the power switch ON. The ink pen will move inward on the recording paper and stop temporarily at the 0% position (equivalent to the 40°C line). Then the ink pen will move to the position which indicates the measured temperature. (Fig. 3)

## Time setting method:

Place the recording paper at a position slightly in front of the desired time (the recording paper is rotated to the left). Set the time by using the fast feed button to quickly rotate the recording paper.

The fast feed button can be used to accurately set the time.

## When the recording paper speed is set to 32 days:

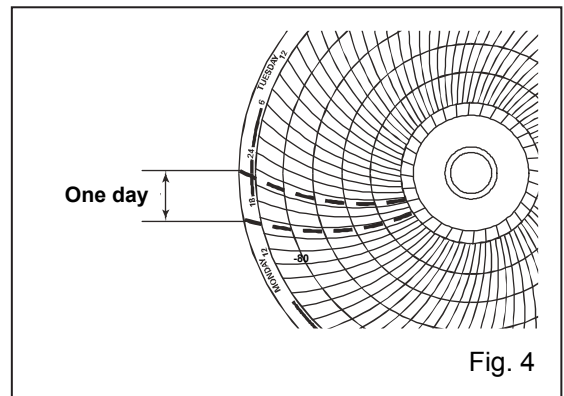
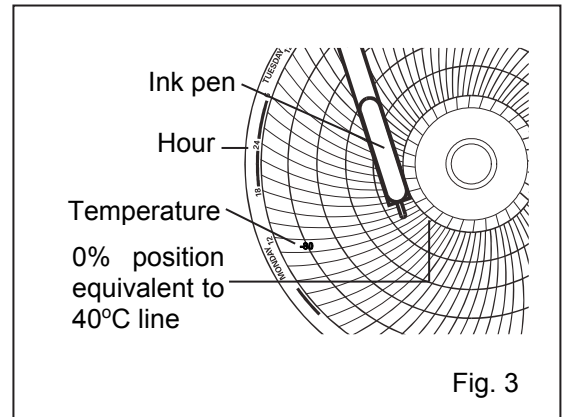
The center of the recording paper is divided into 32 equal sections. The lines extending from these lines serve as the 32-day time scale. (Fig. 4)

## Stopping recording:

1. Turn OFF the power switch.
2. When recording is stopped for a prescribed period, place the caps back on the ink pen to prevent the ink from evaporating.

## Replacement the recording paper:

1. Slightly raise the end of the pen lifter and remove from the pen lifter stopper. Then rotate clockwise as shown in Fig. 1 (page 28).
2. Remove the chart hub cover, and then replace the recording paper.
3. Place the chart hub cover. Confirm that the new recording paper is inside of the chart guides.
4. Set the correct time.



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## BATTERY MOUNTING BOX (OPTION)

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The alarm indicator blinks and the alarm buzzer sounds to notice the power failure when a battery for power failure alarm is installed. In addition, the remote alarm is available. For the installation of the battery for power failure alarm, a battery mounting box (MPR-48B1), an optional component is necessary. A battery for power failure alarm and remote alarm terminal are included in the battery mounting box.

✧ Contact our sales representative or agent for the installation of the battery mounting box.

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## INTERFACE BOARD (OPTION)

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The running log of the freezer can be sent to a personal computer by using an interface board (MTR-480).

**<Important>**

For the installation of an interface board, the battery mounting box is needed since the interface board should be attached to the battery mounting box.

✧ Contact our sales representative or agent for the installation of a interface board.



# SPECIFICATIONS

Product name	Biomedical Freezer MDF-MU300H	Biomedical Freezer MDF-MU500H
External dimensions	W610 mm x D598 mm x H1620 mm	W800 mm x D772 mm x H1802 mm
Internal dimensions	W490 mm x D486 mm x H1290 mm	W658 mm x D607 mm x H1272 mm
Effective capacity	274 L	482 L
Exterior	Painted steel	
Interior	ABS resin	Styrol resin
Door	Painted steel	
Access port	Diameter 30 mm, 1 location	
Insulation	Rigid polyurethane foamed-in place	
Compressor	Hermetic type, 250 W	
Evaporator	Tube on sheet type (also used as a shelf)	
Condenser	Skin condenser	Wire and tube type
Refrigerant	R-600a	
Temperature controller	Electronics controller	
Temperature display	Digital display (between -50 and +50°C)	
Temperature sensor	Thermistor sensor	
Alarm	High temperature alarm, Low temperature alarm, Thermal sensor abnormality, Power failure alarm (with optional MPR-48B1 installed)	
Accessories	4 storage containers (W446 mm x D369 mm x H220 mm) 1 defrost water vessel & storage container (W487 mm x D221 mm x H155 mm) 1 set of key, 1 scraper 1 sensor cover, 2 binders, 4 screws (for attachment of temperature recorder)	4 storage containers (W290 mm x D536 mm x H238 mm) 6 storage containers (W290 mm x D536 mm x H136 mm) 1 set of key, 1 scraper 1 sensor cover, 2 binders (for attachment of temperature recorder)
Weight	76 kg	124 kg
Optional component	Temperature recorder (MTR-4015LH or MTR-G85C) Recorder fixing (MPR-S30): for MTR-4015LH in MDF-MU500H Recorder fixing (MDF-S740T): for MTR-G85C in MDF-MU300H Recorder fixing (MPR-S7): for MTR-G85C in MDF-MU500H Battery mounting box (MPR-48B1) Interface board (MTR-480)	

- Design or specifications will be subject to change without notice.
- Refer to the updated catalog when ordering an optional component.

# PERFORMANCE

Product name	Biomedical Freezer MDF-MU300H	
Model No.	MDF-MU300H-PE	
Cooling performance	-30°C (ambient temperature; 30°C, no load)	
Temperature control range	-20°C to -30°C	
Rated voltage	AC 230 V	AC 240 V
Rated frequency	50 Hz	50 Hz
Rated power consumption	80 W	80 W
Noise level	40 dB [A] (background noise; 20 dB)	
Maximum pressure	1060 kPa	

Product name	Biomedical Freezer MDF-MU500H	
Model No.	MDF-MU500H-PE	
Cooling performance	-30°C (ambient temperature; 30°C, no load)	
Temperature control range	-20°C to -30°C	
Rated voltage	AC 230 V	AC 240 V
Rated frequency	50 Hz	50 Hz
Rated power consumption	85 W	85 W
Noise level	40 dB [A] (background noise; 20 dB)	
Maximum pressure	710 kPa	

**Note** :The unit with CE mark complies with EU directives.

**⚠ CAUTION**

**Please fill in this form before servicing.  
Hand over this form to the service engineer to keep for his and your safety.**

## Safety check sheet

1. Freezer contents :

- Risk of infection: Yes No  
Risk of toxicity: Yes No  
Risk from radioactive sources: Yes No

(List all potentially hazardous materials that have been stored in this unit.)

Notes :

2. Contamination of the unit

Unit interior

- No contamination Yes No  
Decontaminated Yes No  
Contaminated Yes No

Others:

3. Instructions for safe repair/maintenance/disposal of the unit

- a) The unit is safe to work on Yes No  
b) There is some danger (see below) Yes No

Procedure to be adhered to in order to reduce safety risk indicated in b) below.

Date :

Signature :

Address, Division :

Telephone :

Product name: Biomedical Freezer	Model: MDF-	Serial number:	Date of installation:
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Please decontaminate the unit yourself before calling the service engineer.

# PHC Corporation

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

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Printed in Japan  
LDCL034000-0  
S0418-0