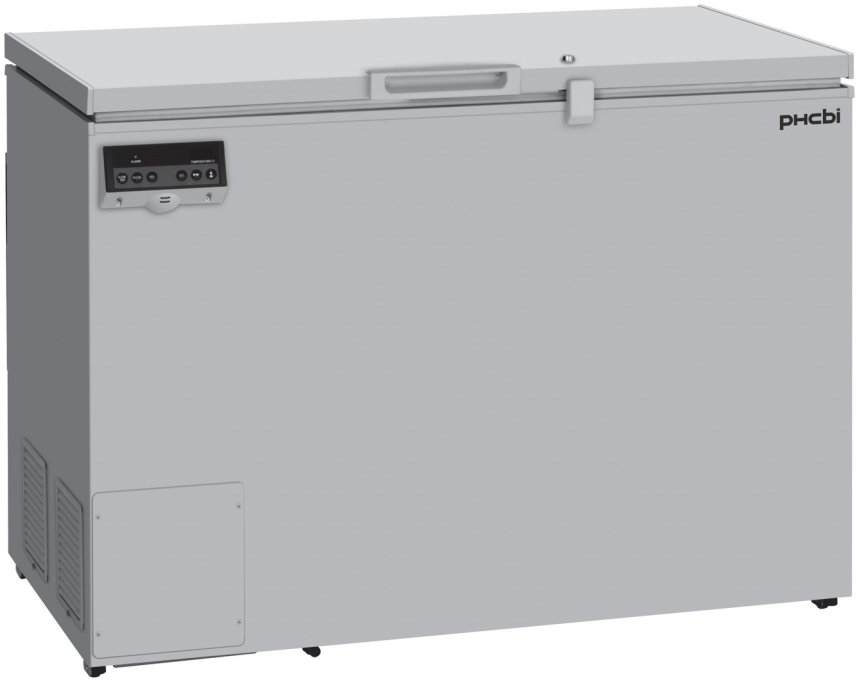
PHCbi

Operating Instructions

Biomedical Freezer

MDF-137
MDF-237
MDF-437 Series



MDF-437

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

See page 33 for all model numbers.

CONTENTS

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.

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 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.

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 power supply cord if its power supply plug is loose. Such power 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 power supply 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 supply cord. A damaged cord may cause electric shock or fire.

Disconnect the power supply 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 door cannot be closed completely with a key.**

The disposal of the unit should be accomplished by appropriate personnel. Remove door to prevent accidents such as suffocation.

Do not put the packing plastic bag within reach of children as suffocation may result.

Do not position this unit and the other unit so that it is difficult to operate the disconnection of the power supply plug. Failure to disconnect the power supply plug may cause fire if there is something wrong with the unit.

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.
- **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;

■ Temperature 5 ºC to 40 ºC

■ Maximum relative humidity 80% for temperature up to 31 ºC decreasing linearly to 50% relative humidity at 40 ºC;

■ Mains supply voltage fluctuations up to ±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);

LABELS ON UNIT

Warning safety labels applied to the biomedical freezer
Users are advised to avoid accidents by carefully reading the warnings and cautions contained on warning labels at key locations on the interior and exterior of the biomedical freezer.

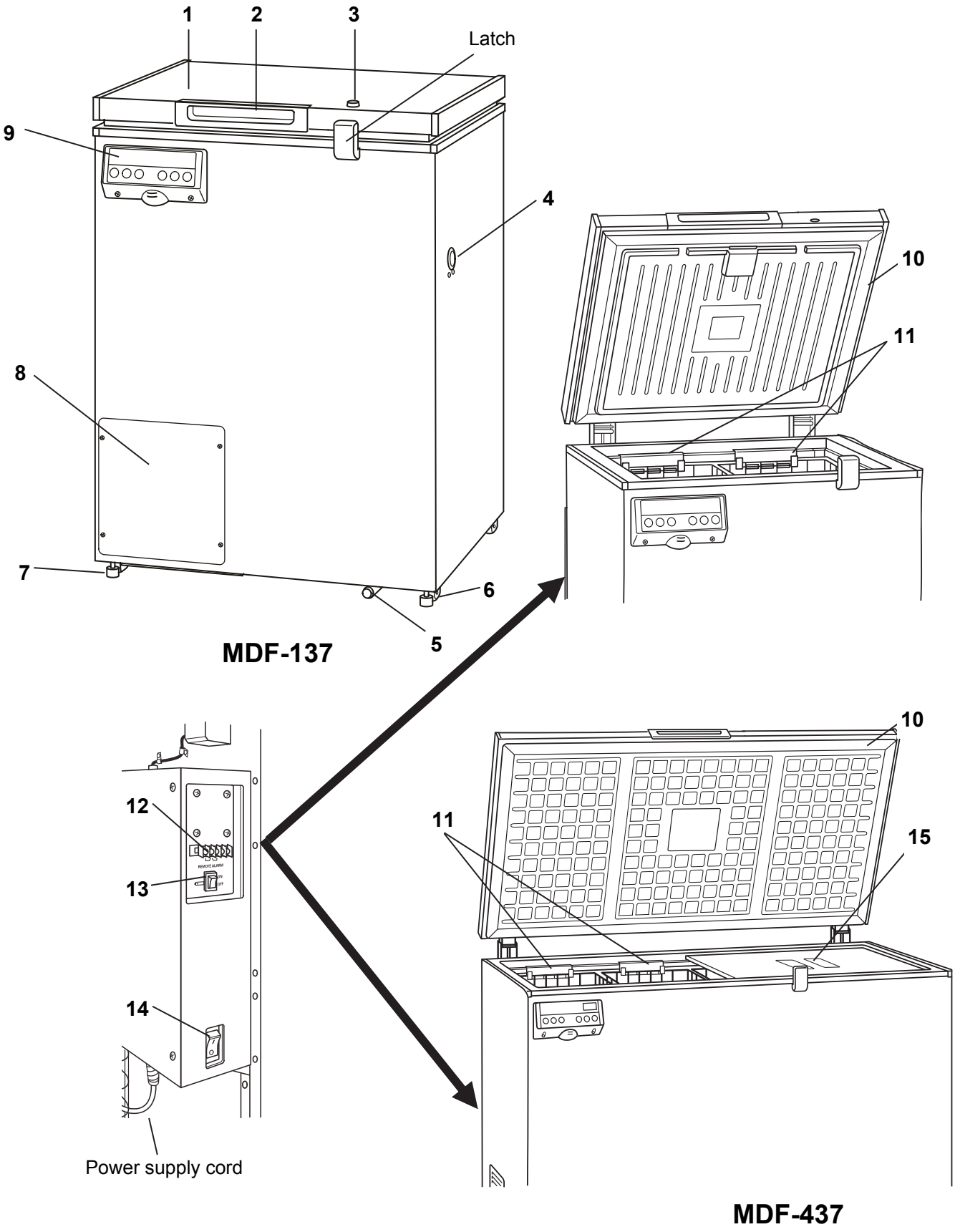
Possible Danger	**Warning/Caution Type** Location of Danger	Warning/Caution Label	Description of Danger
Personal injury	**Hazardous Latch** Exterior		When closing the door, take care not to get caught your hand in the latch, or may result in injury.

SYMBOLS ON UNIT

The symbols are attached to the ultra-low temperature freezer. The following table describes the symbols.

	This symbol is attached to covers that access high-voltage electrical components to prevent electric shock. Only a qualified engineer or service personnel should be allowed to open these covers.
	This symbol indicates that caution is required. Refer to product documentation for details.
	This symbol indicates a hot surface.

FREEZER COMPONENTS



FREEZER COMPONENTS

1. Door: To open the door, grip the handle.

2. Handle: Always grip this handle to open and close the door.

3. Lock: Turn counterclockwise to 180° with a key and the door is securely locked.

4. Access port: This is used for leading the measuring cable from the chamber to the outside.

5. Drain port: The water accumulated on the bottom of the chamber can be drained through this port.

6. Caster: 4 casters are provided to facilitate moving of the cabinet. At the time of installation, make sure that the 2 front casters are not contact with the floor, by adjusting the leveling feet.

7. Leveling foot: 2 leveling feet are provided on the front side (right and left). Keep the unit in level by adjusting these feet at the installation.

8. Space for temperature recorder: A temperature recorder (optional component) can be attached here. See page 27 “Temperature recorder (OPTION)”.

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

10. Door gasket: This provides a tight door seal and prevents cold air leak. Keep clean.

11. Basket: Used for storing the materials in the chamber.

12. Remote alarm terminal (on back side): This is used to notice an alarm condition of the unit to remote location. Refer to page 13 “Remote alarm terminal”.

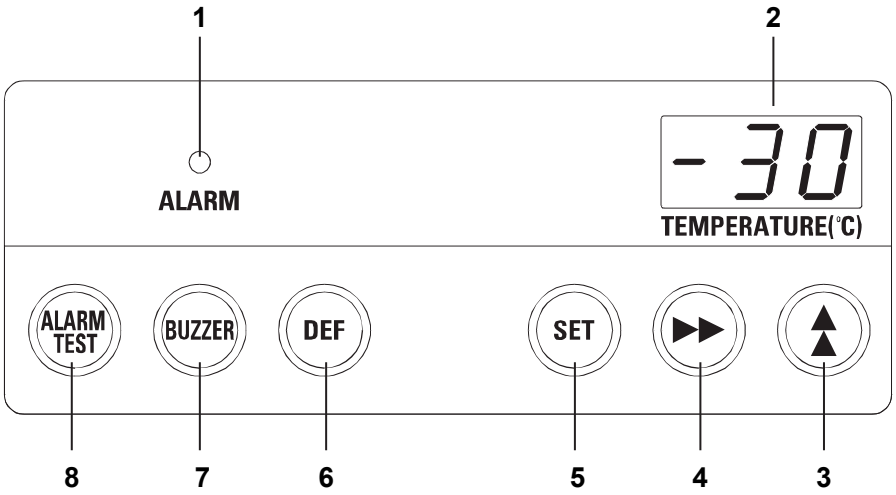
13. Battery switch: This is a switch of the battery for power failure alarm. Always set the switch in ON position. Be sure to turn off this switch to save the battery if the freezer is not in operating for the long period (more than 1 month).

14. Power switch: This is for turning ON/OFF the power to the unit. ON – “I” OFF – “○”. This has a function as an over-current protection breaker (15 A).

15. Inner lid: Serves as a means of reducing cold air leakage when the door is open. Remove the frost regularly. (MDF-437 only)

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 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 set 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 set 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): Temperature setting mode is led by pressing this key. Once the key is pressed, the changeable digit is flashed. Pressing this key again after setting desired temperature, the setting is stored into computer memory.

6. Defrost key (DEF): When removing the frost, press this key for 5 seconds. The freezer operation is stopped. After removing the frost, press this key again. The freezer operation is resumed. See page 19 for details.
Note: The freezing operation never resumes automatically after defrosting.

7. Buzzer stop key (BUZZER): Buzzer stop key. Should a further abnormality occur, the buzzer will sound automatically.

8. Alarm test key (ALARM TEST): Test key for alarm device. By pressing this key, the alarm lamp is flashed, remote alarm is activated and buzzer sound. This means all alarm function operate correctly. This key is available only during normal running.

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.

■ 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 35 °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 location where it will be exposed to flammable or corrosive gas. 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

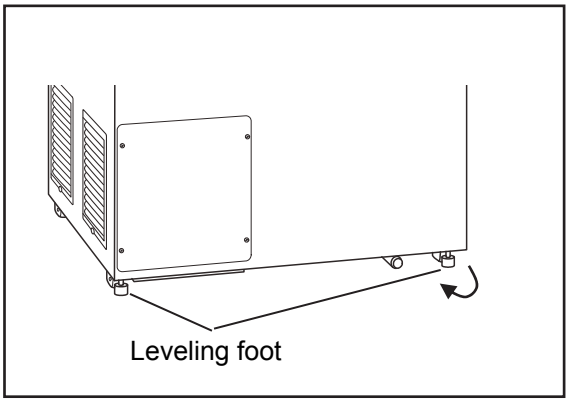
Remove all transportation packaging materials and tapes. Open the door and ventilate the unit. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) 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. Adjust the leveling foot

Stretch the leveling feet by rotating them to contact them to the floor as shown in the figure. Ensure the unit is installed horizontally.



3. Ground (earth)

The ground (earth) is for preventing the electric shock in the case of unexpected deterioration of the electrical insulation. 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

Use the following procedure to start trial operation or actual operation of the unit.

1. Turn the power switch ON with the chamber empty.
2. Turn ON the battery switch.
3. Set the chamber temperature to a desired value.
4. Allow the unit to achieve the desired chamber temperature.
5. Check that the alarm lamp is flashed and the buzzer is activated by pressing alarm test key (ALARM TEST). The remote alarm is also operated. E09 is displayed on the control panel if the battery switch is OFF.
6. Now you can put articles into the chamber gradually to minimize the temperature rise.

Note:

■ When starting the operation of the freezer for the first time, the alarm lamp (ALARM) is flashed. When the chamber temperature reaches around the set temperature, then the alarm lamp goes out (The remote alarm is not activated).

■ If the battery switch is turned ON before turning ON the power of the freezer, the power failure alarm is activated and the buzzer sounds and the remote alarm is also activated after the start of operation. Check that the battery switch is OFF before turning ON the freezer.

Operation after power failure

The set value is memorized by nonvolatile memory. Accordingly, the freezer resumes the operation with setting before power failure.

When the freezer is recovered from power failure with the chamber temperature higher than the preset temperature, then the high temperature alarm is activated and the buzzer sounds and the remote alarm is also activated.

REMOTE ALARM TERMINAL

⚠WARNING

Always disconnect the power supply cord before connecting an alarm device to the remote alarm terminal.

The terminal of the remote alarm is installed at the back of the unit. The alarm is outputted from this terminal. Contact capacity is DC 30 V, 2 A.

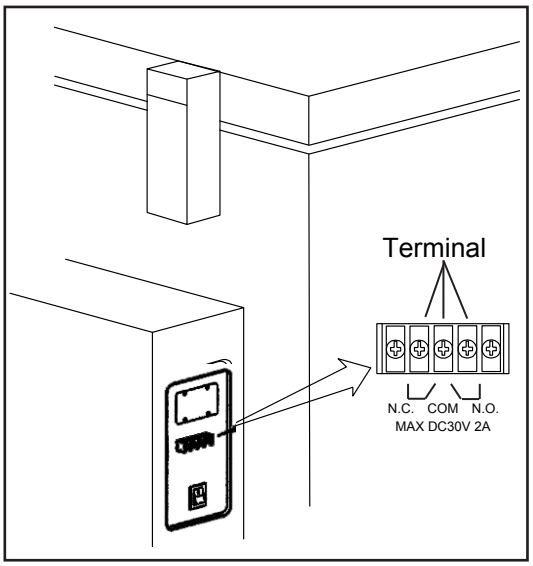
Contact output:

	between COM. and N.O.	between COM. and N.C.
At normal	Open	Close
At abnormal	Close	Open

Note:

■ The buzzer is silenced by pressing buzzer stop key (BUZZER) on the control panel during alarm condition. (A remote alarm is continuing the operation.)
The buzzer will be activated again after certain suspension if the alarm condition is continued.

■ The alarm is actuated when the power supply cord is disconnected from the outlet or the power switch is OFF. (The remote alarm is also operated.)

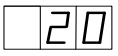
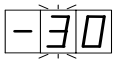
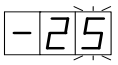
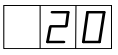


CHAMBER TEMPERATURE SETTING

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 ºC.

Note: The chamber temperature is set to -30ºC at the factory.

Table 1. Basic operation sequence (Example: Chamber temperature -25 ºC)

	Description of operation	Key operated	Indication after operation
1	Switch on the freezer.	----	The current chamber temperature is displayed. 
2	Press set key.	SET	The current setting is displayed and the second digit is flashed. 
3	Set the temperature to -25 with the digit shift key and the numerical value shift key.	▲▲	When pressed, the figure of settable digit changes.
		▶▶	When pressed, the changeable digit is shifted. 
4	Press set key.	SET	Set temperature is memorized and the current chamber temperature is displayed. 

■ The set 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.

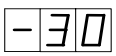
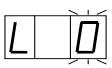
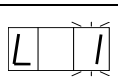
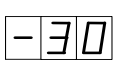
■ Although the value of the chamber temperature setting can range between -18 ºC and -35 ºC, the guaranteed temperature without load is -30 ºC at ambient temperature of 35 ºC.

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 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 current setting is displayed and 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 set 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 may be changed.

The available set range for high temperature alarm is between +5 ºC and +15 ºC, and -5 ºC and -15 ºC for low temperature alarm against the chamber temperature.

Note: The temperature alarm is set at ±10 ºC of the set temperature at the factory.

Display	Mode	Set range
F01	High temperature alarm set	between 5 ºC and 15 ºC higher than the chamber set temperature
F02	Low temperature alarm set	between 5 ºC and 15 ºC 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 ºC 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 ºC lower than the set temperature.

Table 3. Procedure for setting high temperature alarm (change from 10 ºC to 5 ºC)

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed. -30
2	Press numerical value shift key for about 5 seconds.	▲▲	F00 is displayed and the first digit is flashed. F00
3	Press numerical value shift key and scroll the figure to 1.	▲▲	When pressed, the figure of settable digit changes. F01
4	Press set key.	SET	The current setting is displayed and the first digit is flashed. 010
5	Scroll the figure to 005 by using digit shift key and numerical value shift key.	▶▶	When pressed, the changeable digit is shifted.
		▲▲	When pressed, the figure of settable digit changes. 005
6	Press set key.	SET	Alarm temperature is memorized and the current chamber temperature is displayed. -30

Table 4. Procedure for setting low temperature alarm (change from -10 ºC to -5 ºC)

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed. -30
2	Press numerical value shift key for about 5 seconds.	▲▲	F00 is displayed and the first digit is flashed. F00
3	Press numerical value shift key and scroll the figure to 2.	▲▲	When pressed, the figure of settable digit changes. F02
4	Press set key.	SET	The current setting is displayed and the first digit is flashed. -10
5	Scroll the figure to -05 by using digit shift key and numerical value shift key.	▶▶	When pressed, the changeable digit is shifted.
		▲▲	When pressed, the figure of settable digit changes. -05
6	Press set key.	SET	Alarm temperature is memorized and the current chamber temperature is displayed. -30

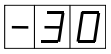
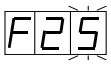
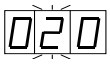
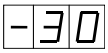
■ The set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing set key (SET) is not memorized.

SETTING OF ALARM RESUME TIME

The alarm buzzer is silenced by pressing alarm buzzer stop key (BUZZER) on the control panel during alarm condition.
However, if the alarm condition is continued after the “alarm resume time” has passed, the buzzer sounds again.
It is possible to change the alarm resume time by the procedure shown in the Table.5.

Note: Factory setting; 30.

Table 5. Setting procedure for alarm resume 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 about 5 seconds.	▲▲	F00 is displayed and 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 setting is displayed and the second digit is flashed. 
5	Scroll the figure to 020 with the numerical value shift key.	▲▲	When pressed, the figure of settable digit changes. 
6	Press set key.	SET	Alarm resume time is memorized and the current chamber temperature is displayed. 

■ The set 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.
■ The settable alarm resume time are 10, 20, 30, 40, 50, or 60 minutes. The buzzer would not resume if the resume time is set in 000.

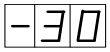
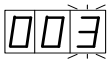
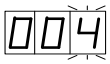
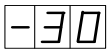
CHANGE OF COMPRESSOR DELAY TIME

The compressor delay time can be changed to reduce the load on the power line and to facilitate the start-up (resume) 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 in 3 minutes at the factory.)

Note:
■ The set range for delay time is between 3 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 adequate.

Table 6. Changing procedure for delay time (change from 3 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 about 5 seconds.	▲▲	F00 is displayed and 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 setting is displayed and the first digit is flashed. 
5	Set the figure to 004 with the numerical value shift key.	▲▲	When pressed, the figure of settable digit changes. 
6	Press set key.	SET	The delay time is memorized and the current chamber temperature is displayed. 

■ The set 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.
■ The compressor starts to run with the delay time when the power supply cord is connected to the outlet, the power switch is turned on or after power failure.

ALARMS & SAFETY FUNCTIONS

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

Table 7. Alarms, safety functions and self diagnostic functions

Alarm	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.
Power failure alarm	In the case of power failure. When power switch is turned OFF. When the power to the unit is disconnected.	Alarm lamp is flashed.	Intermittent tone	Remote alarm.
Auto-return	When there is no key pressing in each setting mode for 90 seconds.	Chamber temperature is displayed.	-----	Finishing of each set mode.
Key lock	When the key lock is “ON”.	-----	-----	Change of setting is disable.
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 operation.
	If the thermal sensor is short-circuited.	Alarm lamp is flashed. E02 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Continuous operation.
Protective sensor for compressor abnormality (MDF-437 only)	If the protective sensor for compressor is disconnected.	Alarm lamp is flashed. E05 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Normal operation.
	If the protective sensor for compressor is short-circuited.	Alarm lamp is flashed. E06 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Normal operation.
Battery switch check	When the battery switch is OFF at the time of alarm test.	E09 is displayed.	Intermittent tone	Remote alarm.
Compressor temp. abnormality (MDF-437 only)	In the case of failure of compressor cooling fan motor. If the temperature goes up abnormally by the accumulation of dust on the condenser In the case of abnormal high ambient temperature.	Alarm lamp is flashed. E10 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Compressor stops.
Battery check	When about 3 years have passed with the power supply cord connected to the outlet. (time to replace the battery)	F-1 and chamber temp. is displayed alternately.	-----	-----
Fan motor check (MDF-437 only)	When about 6 years have passed with the power supply cord connected to the outlet. (time to replace the fan motor)	F-2 and chamber temp. is displayed alternately.	-----	-----

Note:

■ The above power failure alarm is available when the battery switch is ON and the battery is charged. If the battery switch is OFF or the battery is discharged, only the remote alarm is activated.

■ The power failure alarm can be kept about 12 hours with the battery charged completely. 2-day operation of the freezer is needed to charge the battery full.

■ The chamber temperature is displayed for 5 seconds if the alarm buzzer stop key (BUZZER) is depressed during the power failure alarm. After that, the alarm buzzer stops.

■ The remote alarm is not silenced by pressing alarm buzzer stop key (BUZZER).

■ At the recovery from power failure, the operation is resumed with the condition before power failure since the temperature setting and alarm temperature setting are memorized in a nonvolatile memory.

■ The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years. Contact our sales representative or agent at the time of replacement of the battery.

■ Fan motor is an expendable supplies (MDF-437 only). Replace the fan motor about every 6 years. Contact our sales representative or agent at the time of replacement of the fan motor.

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.

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.

Defrosting

This freezer is direct-cooling type and the frost is built on the chamber wall during long term operation. The excessive frost possibly make some gap between the cabinet and door gasket, which may cause poor cooling. Remove the frost inside the chamber once a month. Following shows the procedure for removing the chamber frost.

1. Temporarily move all the contents of chamber to another freezer.

2. Press the defrost key (DEF) for 5 seconds to stop the freezing operation. While the freezing operation is stopped, the current chamber temperature and dF is displayed on the digital temperature indicator alternatively.

3. After several hours, check visually that all defrost was removed completely.

4. Remove the cap of drain port on the bottom of the chamber and drain the accumulated water.

5. Wipe up the water remaining in the chamber and then replace the cap of drain port.

6. Press the defrost key (DEF) so that the freezing operation can be started.

7. Once the chamber temperature has dropped to the desired temperature, place the original contents back in the chamber.

Note:

After the defrosting, the freezing operation is never resumed automatically. Make sure to press the defrost key (DEF) to start the freezing operation after defrosting.

While the freezer stops freezing operation for defrosting, neither high temperature alarm nor low temperature alarm is effective.

TROUBLESHOOTING

Malfunction	Check/Remedy
The chamber is not cooled at all	■ The circuit breaker of power source is active. ■ The voltage is too low. (In this case, call an electrician.) ■ The power switch is not ON.
The cooling is poor	■ The large amount of articles (load) is stored in the chamber at one time. ■ The freezer is in defrost condition. ■ The ambient temperature is too high. ■ The inner lid is not closed firmly (MDF-437 only). ■ The large amount of frost is built on the chamber wall. ■ The set temperature is not inputted properly. ■ The freezer is in the direct sunlight. ■ There is any heating source near the freezer. ■ A rubber cap and insulation for the access port are not set correctly. ■ You put too many unfrozen articles into the freezer compartment.
When the unit does not accept the changes of temperature setting	■ The key lock is set in ON mode.
Noise	■ The freezer is not installed on the sturdy floor. ■ The freezer is not leveled with the leveling feet. ■ There is anything touching the frame. ■ The freezer is in the status immediately after start up. The unit sometimes causes a noise when the chamber temperature is high due to the large load. The noise gets less and less accompanying with the cooling of the chamber.

Note:

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

If the unit is to be stored unused in an unsupervised area for an extended period **ensure that children do not have access and door cannot be closed completely.**

The disposal of the unit should be accomplished by appropriate personnel. Always remove lids to prevent accidents such as suffocation.

Recycle of battery

The unit contains a rechargeable battery. The battery is recyclable. At the end of it is useful life, check with you local solid officials option or proper disposal.

Ni-MH

■ Label indication is obliged to comply with Japanese battery regulation.

■ Label indication is obliged to comply with Taiwanese battery regulation.

Decontamination of unit

Before disposing a biomedical freezer with biohazardous danger, decontaminate the biomedical freezer to the extent possible by the user.

DISPOSAL OF UNIT

(English)

Disposal of Old Equipment and Batteries
Only for European Union and countries with recycling systems

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.

For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points in accordance with your national legislation.

By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.

For more information about collection and recycling, please contact your local municipality.

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

Note for the battery symbol (bottom symbol):
This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

(German)

Entsorgung von Altgeräten und Batterien
Nur für die Europäische Union und Länder mit Recyclingsystemen

Dieses Symbol, auf den Produkten, der Verpackung und/oder den Begleitdokumenten, bedeutet, dass gebrauchte elektrische und elektronische Produkte sowie Batterien nicht in den allgemeinen Hausmüll gegeben werden dürfen.

Bitte führen Sie alte Produkte und verbrauchte Batterien zur Behandlung, Aufarbeitung bzw. zum Recycling gemäß den gesetzlichen Bestimmungen den zuständigen Sammelpunkten zu.

Indem Sie diese Produkte und Batterien ordnungsgemäß entsorgen, helfen Sie dabei, wertvolle Ressourcen zu schützen und eventuelle negative Auswirkungen auf die menschliche Gesundheit und die Umwelt zu vermeiden.

Für mehr Informationen zu Sammlung und Recycling, wenden Sie sich bitte an Ihren örtlichen Abfallentsorgungsdienstleister.

Gemäß Landesvorschriften können wegen nicht ordnungsgemäßer Entsorgung dieses Abfalls Strafgelder verhängt werden.

Hinweis für das Batteriesymbol (Symbol unten):
Dieses Symbol kann in Kombination mit einem chemischen Symbol abgebildet sein. In diesem Fall erfolgt dieses auf Grund der Anforderungen derjenigen Richtlinien, die für die betreffende Chemikalie erlassen wurden.

DISPOSAL OF UNIT

(French)

L'élimination des équipements et des batteries usagés
Applicable uniquement dans les pays membres de l'Union européenne et les pays disposant de systèmes de recyclage.

Apposé sur le produit lui-même, sur son emballage, ou figurant dans la documentation qui l'accompagne, ce pictogramme indique que les piles, appareils électriques et électroniques usagés, doivent être séparées des ordures ménagères.

Afin de permettre le traitement, la valorisation et le recyclage adéquats des piles et des appareils usagés, veuillez les porter à l'un des points de collecte prévus, conformément à la législation nationale en vigueur.

En les éliminant conformément à la réglementation en vigueur, vous contribuez à éviter le gaspillage de ressources précieuses ainsi qu'à protéger la santé humaine et l'environnement.

Pour de plus amples renseignements sur la collecte et le recyclage, veuillez vous renseigner auprès des collectivités locales.

Le non-respect de la réglementation relative à l'élimination des déchets est passible d'une peine d'amende.

Note relative au pictogramme à apposer sur les piles (pictogramme du bas) :
Si ce pictogramme est combiné avec un symbole chimique, il répond également aux exigences posées par la Directive relative au produit chimique concerné.

(Spanish)

Eliminación de Aparatos Viejos y de Pilas y Baterías
Solamente para la Unión Europea y países con sistemas de reciclado.

Estos símbolos en los productos, su embalaje o en los documentos que los acompañen significan que los productos eléctricos y electrónicos y pilas y baterías usadas no deben mezclarse con los residuos domésticos.

Para el adecuado tratamiento, recuperación y reciclaje de los productos viejos y pilas y baterías usadas llévelos a los puntos de recogida de acuerdo con su legislación nacional.

Si los elimina correctamente ayudará a preservar valuosos recursos y evitará potenciales efectos negativos sobre la salud de las personas y sobre el medio ambiente.

Para más información sobre la recogida u reciclaje, por favor contacte con su ayuntamiento.

Puede haber sanciones por una incorrecta eliminación de este residuo, de acuerdo con la legislación nacional.

Nota para el símbolo de pilas y baterías (símbolo debajo):
Este símbolo puede usarse en combinación con el símbolo químico. En este caso, cumple con los requisitos de la Directiva del producto químico indicado.

DISPOSAL OF UNIT

(Portuguese)

Eliminação de Equipamentos Usados e Baterias
Apenas para a União Europeia e países com sistemas de reciclagem

Estes símbolos nos produtos, embalagens, e/ou documentos que os acompanham indicam que os produtos elétricos e eletrónicos e as baterias usados não podem ser misturados com os resíduos urbanos indiferenciados.

Para um tratamento adequado, reutilização e reciclagem de produtos e baterias usados, solicitamos que os coloque em pontos de recolha próprios, em conformidade com a respetiva legislação nacional.

Ao eliminar estes produtos corretamente estará a ajudar a poupar recursos valiosos e a prevenir quaisquer potenciais efeitos negativos sobre o ambiente e a saúde humana.

Para mais informações acerca da recolha e reciclagem, por favor contacte a sua autarquia local.

De acordo com a legislação nacional podem ser aplicadas contraordenações pela eliminação incorreta destes resíduos.

Nota para o símbolo da bateria (símbolo na parte inferior):
Este símbolo pode ser utilizado conjuntamente com um símbolo químico. Neste caso estará em conformidade com o estabelecido na Diretiva referente aos produtos químicos em causa.

(Italian)

Smaltimento di vecchie apparecchiature e batterie usate
Solo per Unione Europea e Nazioni con sistemi di raccolta e smaltimento

Questi simboli sui prodotti, sull'imballaggio e/o sulle documentazioni o manuali accompagnanti i prodotti indicano che i prodotti elettrici, elettronici e le batterie usate non devono essere buttati nei rifiuti domestici generici.

Per un trattamento adeguato , recupero e riciclaggio di vecchi prodotti e batterie usate vi invitiamo a portarli negli appositi punti di raccolta secondo la legislazione vigente nel vostro paese.

Con uno smaltimento corretto, contribuirete a salvare importanti risorse e ad evitare i potenziali effetti negativi sulla salute umana e sull'ambiente.

Per ulteriori informazioni su raccolta e riciclaggio, vi invitiamo a contattare il vostro comune.

Lo smaltimento non corretto di questi rifiuti potrebbe comportare sanzioni in accordo con la legislazione nazionale.

Note per il simbolo batterie (simbolo sotto):
Questo simbolo può essere usato in combinazione con un simbolo chimico. In questo caso è conforme ai requisiti indicati dalla Direttiva per il prodotto chimico in questione.

DISPOSAL OF UNIT

(Dutch)

Het ontdoen van oude apparatuur en batterijen.
Enkel voor de Europese Unie en landen met recycle systemen.

Deze symbolen op de producten, verpakkingen en/of begeleidende documenten betekenen dat gebruikte elektrische en elektronische producten en batterijen niet samen mogen worden weggegooid met de rest van het huishoudelijk afval.

Voor een juiste verwerking, hergebruik en recycling van oude producten en batterijen, gelieve deze in te leveren bij de desbetreffende inleverpunten in overeenstemming met uw nationale wetgeving.

Door ze op de juiste wijze weg te gooien, helpt u mee met het besparen van kostbare hulpbronnen en voorkomt u potentiële negatieve effecten op de volksgezondheid en het milieu.

Voor meer informatie over inzameling en recycling kunt u contact opnemen met uw plaatselijke gemeente.

Afhankelijk van uw nationale wetgeving kunnen er boetes worden opgelegd bij het onjuist weggooien van dit soort afval.

Let op: het batterij symbool (Onderstaand symbool).
Dit symbool kan in combinatie met een chemisch symbool gebruikt worden. In dit geval volstaan de eisen, die zijn vastgesteld in de richtlijnen van de desbetreffende chemische stof.

(Swedish)

Avfallshantering av produkter och batterier
Endast för Europeiska Unionen och länder med återvinningssystem

Dessa symboler på produkter, förpackningar och/eller medföljande dokument betyder att förbrukade elektriska och elektroniska produkter och batterier inte får blandas med vanliga hushållssopor.

För att gamla produkter och använda batterier ska hanteras och återvinnas på rätt sätt ska dom lämnas till passande uppsamlingsställe i enlighet med nationella bestämmelser.

Genom att ta göra det korrekt hjälper du till att spara värdefulla resurser och förhindrar eventuella negativa effekter på människors hälsa och på miljön.

För mer information om insamling och återvinning kontakta din kommun.

Olämplig avfallshantering kan beläggas med böter i enlighet med nationella bestämmelser.

Notering till batterisymbolen (nedanför):
Denna symbol kan användas i kombination med en kemisk symbol. I detta fall uppfyller den de krav som ställs i direktivet för den aktuella kemikalien.

DISPOSAL OF BATTERY

Location of a nickel-metal-hydride battery

This unit is provided a nickel-metal-hydride battery for the power failure alarm. The battery is located in the control box at the back of the product. (Fig. 1)

The high voltage components are enclosed in the control box. The cover should be removed by a qualified engineer or service personnel only to prevent the electric shock.

Removal of nickel-metal-hydride battery

1. Turn off the power switch and disconnect the power supply plug.
2. As shown in the Fig. 2, remove 6 fixing screws on the control box and remove the control box cover.
3. Remove 2 screws for mounting plate fixing the battery. (Fig. 3)
4. Disconnect the battery connector.
5. Take out the battery. (Fig. 4)

Handling of battery

Cover the battery terminal with an insulating tape to avoid the short circuit. Then follow the procedure for recycling or proper disposal.

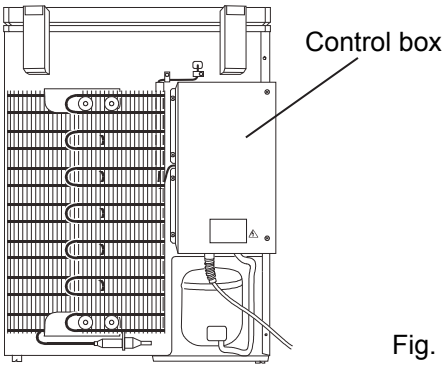


Fig. 1

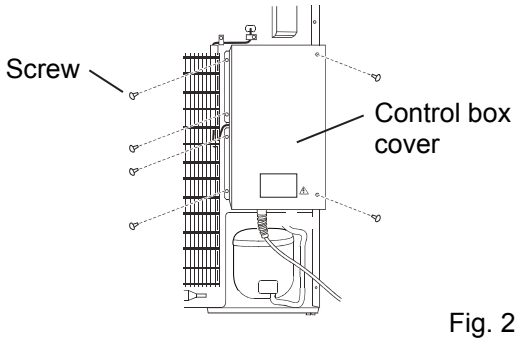


Fig. 2

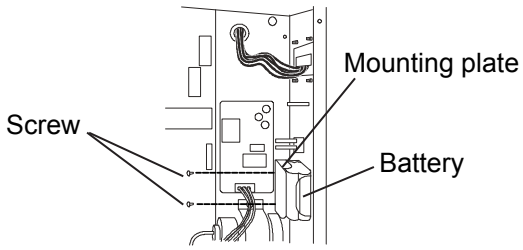


Fig. 3

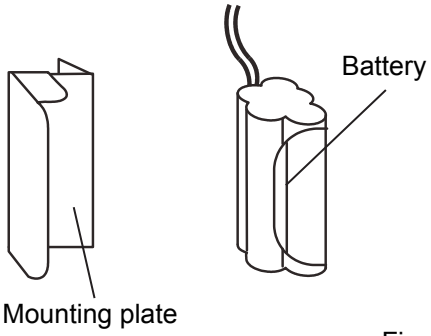


Fig. 4

TEMPERATURE RECORDER (OPTION)

Installation of MTR-4015LH and MTR- G85C

The chamber temperature is recorded and maintained by attaching a temperature recorder available as an optional component. For the attachment, the recorder fixing is necessary. Contact our sales representative or agent for the temperature recorder installation.

Temperature recorder	Recorder fixing
MTR-4015LH	MDF-S3040
MTR-G85C	MTR-S740

⚠WARNING

Always disconnect the power supply to the unit prior to attachment of a temperature recorder in order to prevent electric shock or injury.

Setting of MTR-4015LH

Pull the knob on the upper part of the recorder forward to change the recording paper or battery.

Setting of recording paper

1. The information on the recording paper is shown in Fig. 1.

2. Pull the cartridge up after opening the top lid. The lid can be opened by turning the knob counterclockwise. See Fig. 2.

3. As shown in Fig. 3, insert the recording paper with the "begin" tab placed in the cartridge. Check that the printed side is facing out.

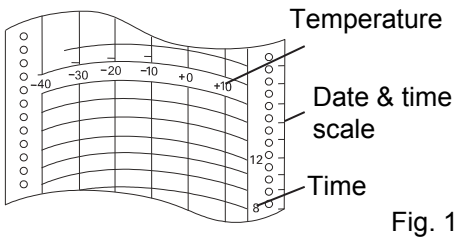


Fig. 1

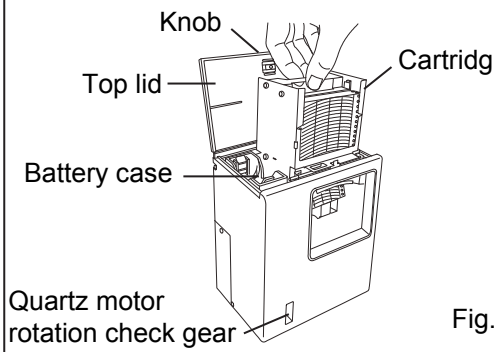


Fig. 2

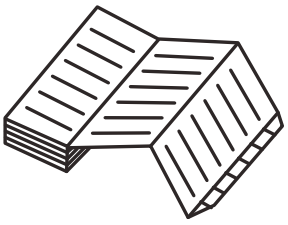


Fig. 3

TEMPERATURE RECORDER (OPTION)

4. Place the recording paper beneath the arm and between the plate spring and guide plate in the direction of the arrow.

Note:
■ Do not scratch or put pressure on the recording paper.
■ Do no bend the recording paper.
■ Do not reverse the recording paper manually.

The used paper left in the used recording paper compartment can cause a malfunction. Be sure to remove it. See Fig. 4.

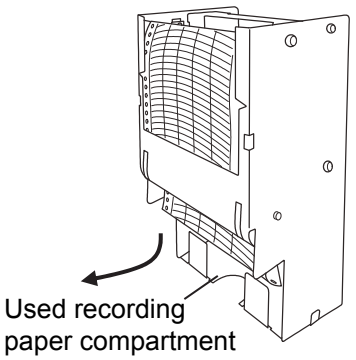


Fig. 4

5. Place the recording paper between the guide and the guide plate. Slide the recording paper along the guide plate so that the recording paper will not be forced out of the date/hour slot. See Fig. 5.

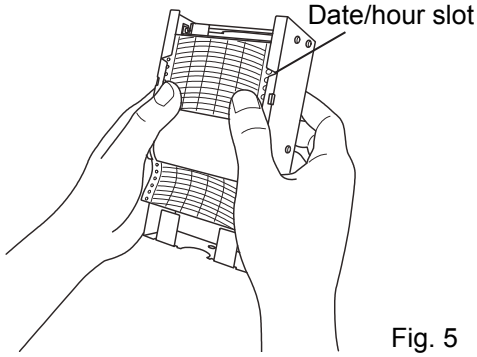


Fig. 5

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

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 paper compartment, replace the cartridge.

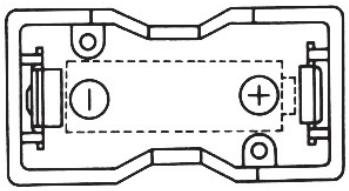


Fig. 6

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 compartment, send all the recording paper in the compartment first turning the gear.

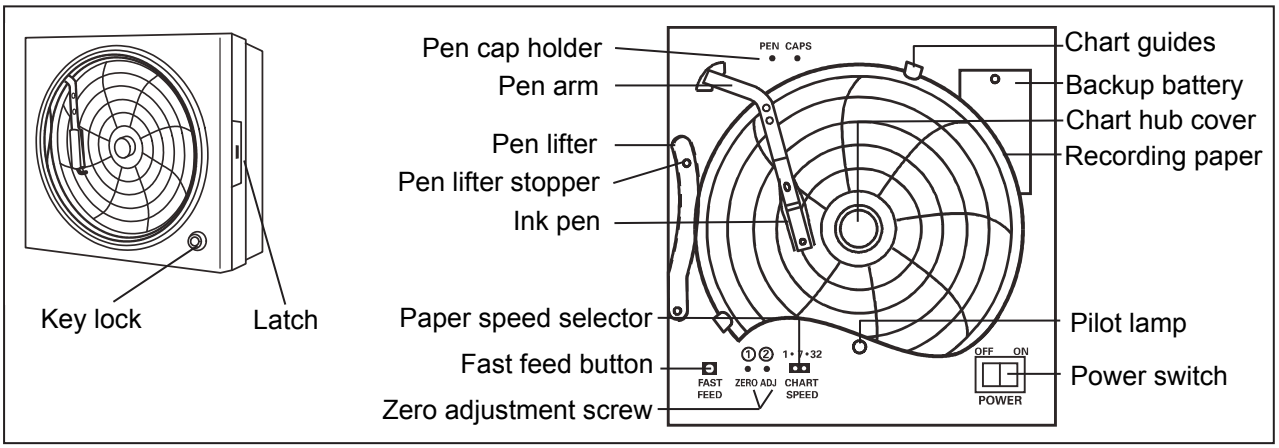
Battery replacement
To replace the battery, turn the knob counterclockwise to open the lid. Place the battery in the battery case according to the plus-minus indications on the bottom of the battery case. See Fig. 6. At the time of the first use the battery.

Start-up
1. The quartz motor is started by placing a “R14” or size “C” dry cell battery in the battery case.
2. Check the operation of the recorder using the quartz motor rotation check gear.
3. Replace the battery once a year.

Stopping
The temperature recorder is stopped by taking the battery out of the battery case.

TEMPERATURE RECORDER (OPTION)

Setting of MTR-G85C



Loading the ink pen:

1. Slightly raise the end of the pen lifter and remove from the pen lifter stopper. Then rotate clockwise as shown in Fig. 1.

2. 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.

3. 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)

4. Position the ink pen so that the guide pins fit into the guide holes on the pen arm. (See to Fig. 2 illustration 2)

5. 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.

6. 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.

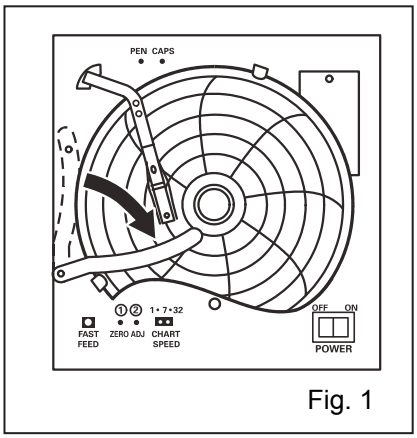


Fig. 1

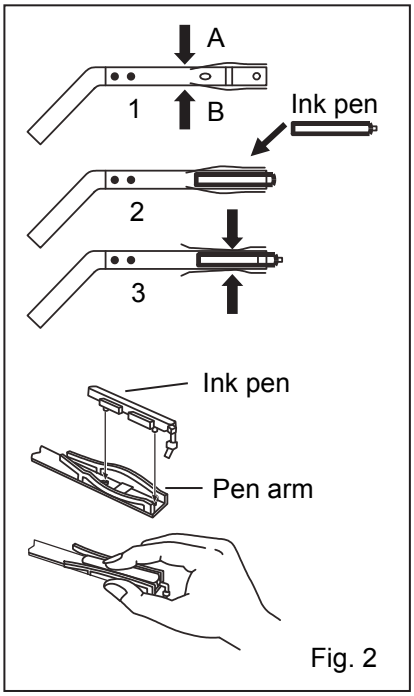


Fig. 2

TEMPERATURE RECORDER (OPTION)

Starting recording and setting the time:

Turn the power switch ON. The ink pen will move inward on the circular 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)

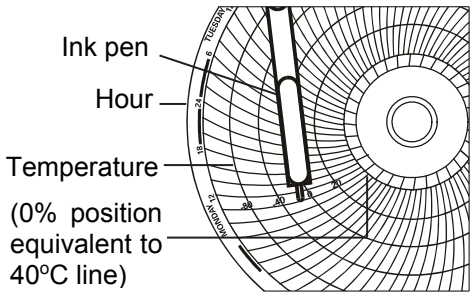


Fig. 3

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)

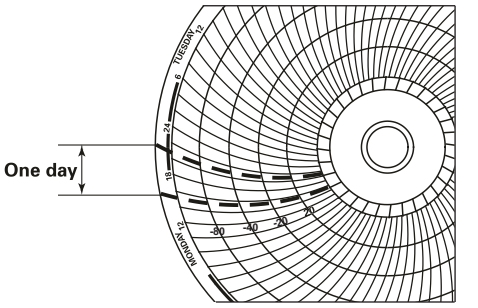


Fig. 4

Stopping recording:

1. Turn OFF the power switch.

2. When recording is stopped for a prescribed period, place the caps back on the ink pens to prevent the ink from evaporating.

Replacing the recording paper:

1. Slightly raise the end of the pen lifter and remove from the pen lifter stopper. Then rotate the pen lifter clockwise until the pen tip rests on the pen lifter.

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.

INTERFACE BOARD (OPTION)

Two kinds of interface board are available as an optional component. MTR-480 has a connector for RS232C and a connector for RS485. MTR-L03 has a connector for LAN.

■ The interface board (MTR-480) and LAN interface board (MTR-L03) cannot used at the same time.

■ Contact our sales representative or agent for the purchase of interface board.

SPECIFICATIONS

Product name	Biomedical Freezer MDF-137	Biomedical Freezer MDF-237	Biomedical Freezer MDF-437
External dimensions	W640 mm x D687 mm x H881 mm	W905 mm x D687 mm x H881 mm	W1265 mm x D807 mm x H902 mm
Internal dimensions	W525 mm x D440 mm x H715 mm	W790 mm x D440 mm x H715 mm	W1140 mm x D550 mm x H733 mm
Effective capacity	138 L	221 L	425 L
Exterior	Painted steel		
Interior	Colored aluminum plate		
Door	Painted steel		
Insulation	Rigid polyurethane foamed-in place		
Baskets	Polyethylene coated steel wire		
Access port	Diameter 17 mm, Right side and bottom left		
Compressor	Hermetic type, 150 W	Hermetic type, 200 W	Hermetic type , 250 W
Condenser	Wire and tube type		Fin and tube + wire and tube type
Evaporator	Aluminum tube on sheet type		
Refrigerant	R-134a		R-404A
Temperature controller	Electronics controller (between -18 °C and -35 °C)		
Temperature display	Digital display (between -50 °C and +50 °C)		
Temperature sensor	Thermistor sensor		
Alarm	High temperature alarm, Low temperature alarm, Power failure alarm		
Accessories	1 set of key, 1 Scraper, 2 Baskets	1 set of key, 1 Scraper, 3 Baskets	1 set of key, 1 Scraper, 4 Baskets
Weight	52 kg	60 kg	81 kg
Battery	For power failure alarm, Nickel-metal-hydride battery, DC 6 V, 1100 mAh Automatic charge		
Optional component	Temperature recorder + Recorder fixing (MTR-4015LH + MDF-S3040) Temperature recorder + Recorder fixing (MTR-G85C + MDF-S740) 2 storage baskets (MDF-13B2), 3 storage baskets (MDF-13B3) (for MDF-137/237) 2 storage baskets (MDF-43B2), 3 storage baskets (MDF-43B3) (for MDF-437) Interface board (MTR-480* (for RS-485 or RS-232C)), LAN Interface board (MTR-L03)* for LAN		

Note:

■ Design or specifications will be subject to change without notice.

■ Refer to the updated catalog when ordering an optional component.

■ The battery for power failure alarm is an article for consumption. It is recommended that the battery will be replaced about every 3 years. Contact our sales representative or agent at the time of replacement of the battery.

■ Fan motor is an expendable supplies (MDF-437 only). Replace the fan motor about every 6 years. Contact our sales representative or agent at the time of replacement of the fan motor.

*: For the data acquisition system MTR-5000 user only. Contact our sales representative or agent for purchase.

PERFORMANCE

Name	Biomedical Freezer MDF-137	Biomedical Freezer MDF-237	Biomedical Freezer MDF-437
Model number	MDF-137-PE	MDF-237-PE	MDF-437-PE
Cooling performance	-30 ºC (ambient temperature; 35 ºC, no load)		
Temperature control range	-20 ºC to -30 ºC		
Rated voltage	AC 220 V/230 V/240 V		
Rated frequency	50 Hz		
Rated power consumption	95 W/100 W/100 W	115 W/115 W/120 W	162 W/167 W/180 W
Noise level	35 dB [A] (background noise; 20 dB)	41 dB [A] (background noise; 20 dB)	42 dB [A] (background noise; 20 dB)
Maximum pressure	1.64 MPa	1.55 MPa	2.51 MPa

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:	Model:	Serial number:	Date of installation:
Biomedical Freezer	MDF-		

Please decontaminate the unit yourself before calling the service engineer.

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