

# Panasonic®

## Operating Instructions

Biomedical Freezer

MDF-237

**MDF-237**



Please read these instructions carefully before using this product, and save this operating instructions for future use.

See page 32 for all Model numbers.

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# INTRODUCTION

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- Read this operating instructions carefully before using the appliance and follow the instructions for safety operation.
- Our company never guarantee any safety if the appliance is used for any objects other than intended use or used by any procedures other than those mentioned in this operating instructions.
- Keep this operating instructions in an adequate place to refer to it as necessary.
- The contents of the operating instructions will be subjected to change without notice due to the improvement of performance or functions.
- Contact our sales representative or agent if any page of the operating instructions is lost or page order is incorrect.
- Contact our sales representative or agent if any point in this operating instructions is unclear or if there are any inaccuracies.
- No part of this operating instructions may be reproduced in any form without the expressed written permission of our company.

## **CAUTION**

Our company guarantees the product under certain warranty conditions. Our company in no way shall be responsible for any loss of content or damage of content.

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# PRECAUTIONS FOR SAFE OPERATION

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**It is imperative that the user complies with this 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 this operating instructions in a place accessible to users of this unit.














# 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 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.







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# PRECAUTIONS FOR SAFE OPERATION

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## CAUTION

-  **Use a dedicated power source** (a dedicated circuit with a breaker) as indicated on the rating label attached to the unit. A branched circuit 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.

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# ENVIRONMENTAL CONDITIONS

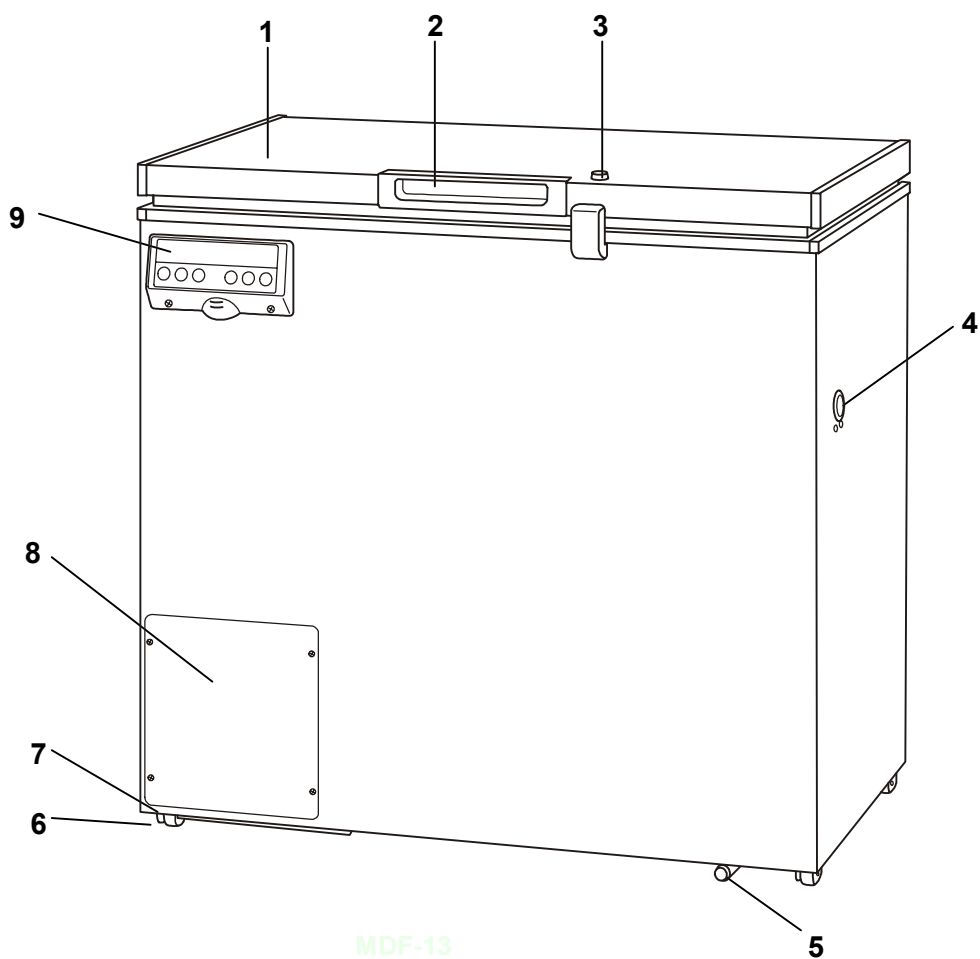
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This equipment is designed to be safe at least under the following conditions (based on the IEC 61010-1):

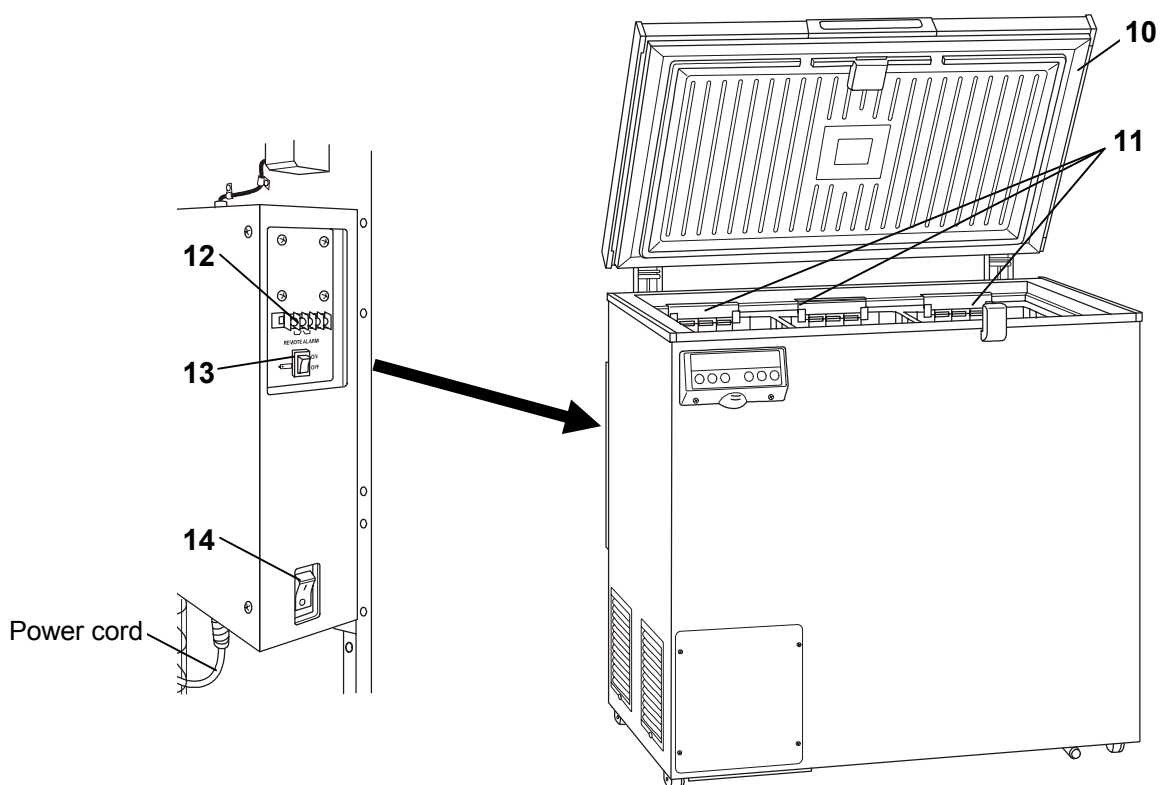
- Indoor use;
- Altitude up to 2000 m;
- Ambient temperature 5°C to 40°C;
- Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C;
- Mains supply voltage fluctuations up to  $\pm 10\%$  of the nominal voltage;
- Transient overvoltages up to the 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



MDF-13



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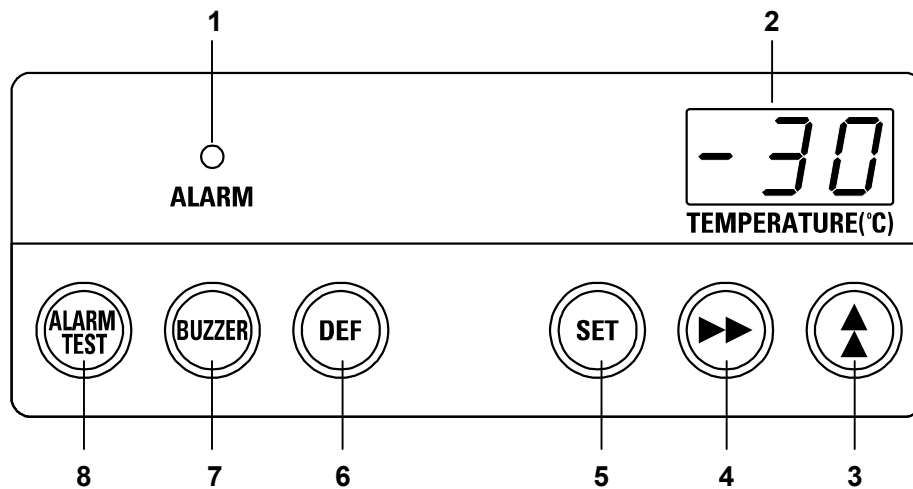
# FREEZER COMPONENTS

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- 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 front 2 casters are not contact with the floor, by adjusting the leveling feet.
- 7. Leveling foot:** 2 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 part) 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 for power failure. 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 – “O”. This has a function as an over-current protection breaker (15 A).

# FREEZER COMPONENTS

## Control panel



**1. Alarm lamp (ALARM):** This lamp will flash when the unit is in alarm condition.

**2. Digital temperature indicator:** This indicator shows the current chamber temperature or set temperature.

**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 mode.

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

**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. If there is no key operation for 90 seconds during the setting mode, the setting mode is invalid automatically. See page 14 for the details..

**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.

**Note:** The refrigerating 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 sounds. 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 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 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

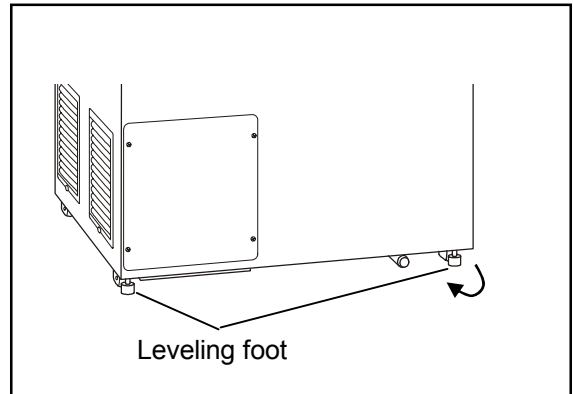
Remove all transportation packaging materials and tapes. Open the lids and ventilate the unit. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.)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

Extend the leveling feet by rotating them counterclockwise to contact them to the floor. Ensure the unit is level.



## 3. 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. 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) blinks after the start of operation. 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.**

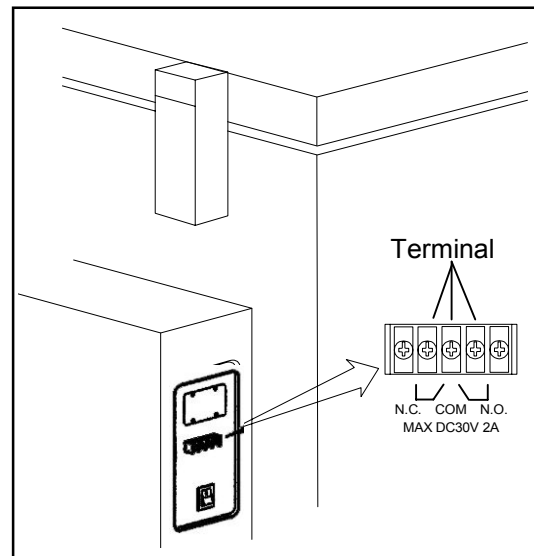
The terminal of the remote alarm is installed at the back of the unit. The alarm is outputted from this terminal. Contact capacity is DC 30 V, 2 A.

Contact output:

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

**Note:**

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

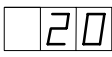
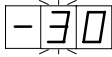
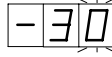
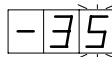
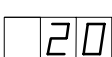


# CHAMBER TEMPERATURE SETTING

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 -35°C.

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

**Table 1. Basic operation sequence (Example: Chamber temperature -35°C)**

	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 second digit is flashed. 
3	Press digit shift key.	▶▶	When pressed, the settable digit moves. 
4	Press numerical value shift key and scroll the figure to 5.	▲	When pressed, the figure of settable digit changes. 
5	Press set key.	SET	Set temperature is memorized and the current chamber temperature is displayed. 



**Note:**

- The temperature set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation.

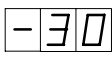


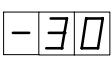
Although the value of the chamber temperature setting can range between -18°C and -35°C, the guaranteed temperature without load is -30°C at ambient temperature of 35°C.

## 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
	Key lock is OFF	Enable to change of temperature setting
	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 key lock set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation.

# ALARM TEMPERATURE SETTING

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

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

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

Display	Mode	Function
F01	High temperature alarm set	See Table 3 on page 15
F02	Low temperature alarm set	See Table 4 on page 15

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°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°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.	▶▶	Pressing the key shifts the digit which can be set.
		▲	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.	▶▶	Pressing the key shifts the digit which can be set.
		▲	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 alarm temperature set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation.



# 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 alarm 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.	▶▶	Pressing the key shifts the digit which can be set.
		▲	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	Alarm resume time is memorized and the current chamber temperature is displayed.

- The settable alarm resume time are 10, 20, 30, 40, 50, or 60 minutes. 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 buzzer and alarm lamp during power failure or alarm testing cannot be stopped.
- The alarm resume time set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation.

# 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 setting 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 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 compressor starts to run with the delay time when the power cord is connected to the outlet or after power failure.
- The compressor delay time set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation.

# 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.
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 setting 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 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.
Battery switch check	When the battery switch is OFF at the time of alarm test.	E09 is flashed.	Intermittent tone	Remote alarm
Battery check	When about 3 years has passed with power switch ON.	F-1 and chamber temp. are 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.
- The remote alarm is stopped by pressing alarm buzzer stop key (BUZZER) as the remote alarm is operated in conjunction with the buzzer, except for the power failure alarm.
- After 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.

# 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 freezer chamber to another freezer.
2. 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 alternatively.
3. Open the door. Leave the freezer as it is.
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 refrigerating operation can be started.
7. Once the chamber temperature has dropped to the desired temperature, place the original contents back in the freezer chamber.

### **Note:**

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

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

# TROUBLE SHOOTING

Malfunction	Check/Remedy
The chamber is not cooled at all	<ul style="list-style-type: none"> <li>▪ The circuit breaker of power source is active.</li> <li>▪ The voltage is too low. (In this case, call an electrician.)</li> <li>▪ The power switch is not ON.</li> <li>▪ The large amount of articles (load) is stored in the chamber at one time.</li> <li>▪ The freezer is in defrost condition.</li> </ul>
The cooling is poor	<ul style="list-style-type: none"> <li>▪ The ambient temperature is too high.</li> <li>▪ The door is not closed firmly.</li> <li>▪ The large amount of frost is built on the chamber wall.</li> <li>▪ The set temperature is not inputted properly.</li> <li>▪ The freezer is in the direct sunlight.</li> <li>▪ There is any heating source near the freezer.</li> <li>▪ A rubber cap and insulation for the access port are not set correctly.</li> <li>▪ You put too many unfrozen articles into the chamber.</li> </ul>
When the unit does not accept changes of setup temperature	<ul style="list-style-type: none"> <li>▪ The key lock is set in ON mode.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>▪ The freezer is not installed on the sturdy floor.</li> <li>▪ The freezer is not leveled with the leveling feet.</li> <li>▪ There is anything touching the frame.</li> <li>▪ The freezer is in the status immediately after start up.</li> </ul> <p>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.</p>

**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 doors cannot be closed completely.**

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

## Recycle of battery



The unit contains a rechargeable battery. The battery is recyclable. At the end of its useful life, check with your local solid waste officials for options or proper disposal.



\* 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.

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# DISPOSAL OF UNIT

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## (English)

FOR EU USERS

The symbol mark and recycling systems described below apply to EU countries and do not apply to countries in other areas of the world.

Your Panasonic product is designed and manufactured with high quality materials and components which can be recycled and/or reused.

The symbol mark means that electrical and electronic equipment, batteries and accumulators, at their end-of-life, should be disposed of separately from your household waste.

Note:

If a chemical symbol is printed beneath the symbol mark, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows: Hg: mercury, Cd: cadmium, Pb: lead

In the European Union there are separate collection systems for used electrical and electronic equipment, batteries and accumulators.

Please, dispose of them correctly at your local community waste collection/recycling centre.

Please, help us to conserve the environment we live in!

## (German)

Für EU-Staaten

Das Symbol und das erwähnte Wiederverwertungssystem gelten nur für die Länder der EU und nicht für andere Länder oder Gebiete in der Welt.

Die Produkte von Panasonic werden aus hochwertigen Materialien und Komponenten gefertigt, die sich wieder verwenden lassen.

Das Symbol bedeutet, dass elektrische oder elektronische Geräte, Batterien und Akkus am Ende ihrer Lebensdauer nicht im Haushaltsmüll entsorgt werden dürfen.

Hinweis:

Ein chemisches Zeichen unter dem Symbol bedeutet, dass die Batterie bzw. der Akku Schwermetalle in gewissen Konzentrationen enthält. Die Metalle werden wie folgt bezeichnet: Hg: Quecksilber, Cd: Kadmium, Pb: Blei

In der Europäischen Union gibt es separate Sammelstellen für elektrische und elektronische Geräte, Batterien und Akkus.

Entsorgen Sie solche Geräte bitte richtig in der kommunalen Sammelstelle bzw. im Recyclingzentrum.

Helfen Sie mit, die Umwelt in der wir leben, zu schützen.



# DISPOSAL OF UNIT

## (French)

### POUR LES UTILISATEURS DE UE

Le symbole et les systèmes de recyclage évoqués ci-dessous s'appliquent uniquement aux pays de UE.

Votre produit Panasonic est conçu et fabriqué avec des composants et des matériaux de hautes qualités qui peuvent être recyclés et/ou réutilisés.

Le symbole signifie que les équipements électriques et électroniques, les batteries et les accumulateurs ne doivent pas être mis au rebut avec les déchets domestiques à l'issue de leur durée de vie.

#### Remarque:

Si un symbole chimique est imprimé sous le symbole, le symbole chimique indique que la batterie ou l'accumulateur contient une certaine concentration de métaux lourds. Les métaux sont indiqués de la manière suivante: Hg: mercure, Cd: cadmium, Pb: plomb.

Il existe différents systèmes de collecte pour les équipements électriques et électroniques, les batteries et les accumulateurs usagés au sein de l'Union européenne.

Veuillez mettre les équipements au rebut de manière correcte, auprès de votre centre de recyclage/de collecte des déchets local.

Aidez-nous à préserver l'environnement dans lequel nous vivons!

Les machines ou appareils électriques et électroniques contiennent fréquemment des matières qui, si elles sont traitées ou éliminées de manière inappropriée, peuvent s'avérer potentiellement dangereuses pour la santé humaine et pour l'environnement.

Cependant, ces matières sont nécessaires au bon fonctionnement de votre appareil ou de votre machine. Pour cette raison, il vous est demandé de ne pas vous débarrasser de votre appareil ou machine usagé avec vos ordures ménagères.

## (Spanish)

### PARA USUARIOS DE LA UNION EUROPEA

El símbolo y los sistemas de reciclado descritos a continuación se aplican para países de la Unión Europea y no se aplica para países en otras áreas del mundo.

Su producto Panasonic fue diseñado y fabricado con materiales de alta calidad y componentes que pueden ser reciclados y/o vueltos a usar.

El símbolo significa que los equipos eléctricos y electrónicos, baterías y acumuladores, al final de su vida útil, debe ser desechados separadamente de sus residuos domiciliarios.

#### Nota:

Si hay un símbolo químico impreso debajo del símbolo, este símbolo químico significa que la batería o acumulador contiene una cierta concentración de un metal pesado. Esto es indicado de la siguiente manera: Hg: mercurio, Cd: cadmio, Pb: plomo

En la Unión Europea hay sistemas de recolección separados para equipos eléctricos y electrónicos, baterías y acumuladores usados.

Por favor, disponga de ellos correctamente en el centro de recolección de residuos/reciclado de la comunidad de su localidad.

Por favor, ayúdenos a proteger el medio ambiente en que vivimos!





# DISPOSAL OF UNIT

## (Portuguese)

PARA UTILIZADORES DA UE

O símbolo e os sistemas de reciclagem descritos abaixo aplicam-se aos países da UE e não se aplicam aos países noutras áreas do mundo.

O seu produto Panasonic foi concebido e fabricado com materiais e componentes de elevada qualidade que podem ser reciclados e/ou reutilizados.

O símbolo significa que o equipamento eléctrico e electrónico, baterias e acumuladores, em final de vida, não devem ser deitados fora juntamente com o lixo doméstico.

Atenção:

Se estiver impresso um símbolo químico debaixo do símbolo de , este símbolo químico significa que a bateria ou acumulador contém um metal pesado numa determinada concentração. Estará indicado da seguinte forma: Hg: mercúrio, Cd: cádmio, Pb: chumbo

Na União Europeia existem sistemas de recolha separados para equipamento eléctrico e electrónico, baterias e acumuladores.

Por favor, entregue-os no seu centro de reciclagem/recolha de lixo local.

Por favor, ajude-nos a conservar o ambiente!

## (Italian)

PER UTENTI UE

Il simbolo e i sistemi di riciclaggio descritti di seguito si applicano esclusivamente ai paesi dell'UE.

Questo prodotto Panasonic è stato progettato e realizzato con materiali e componenti di elevata qualità che possono essere riciclati e/o riutilizzati.

Il simbolo di riciclaggio mostrato di seguito indica che i dispositivi elettrici ed elettronici, le batterie e gli accumulatori, una volta esauriti, devono essere smaltiti separatamente rispetto ai rifiuti domestici.

Nota:

Se sotto il simbolo di riciclaggio appare un simbolo chimico, esso sta ad indicare che la batteria o l'accumulatore contengono metalli pesanti a determinate concentrazioni. Questo viene specificato come segue: Hg: mercurio, Cd: cadmio, Pb: piombo.

Nell'Unione europea esistono diversi sistemi per la raccolta dei rifiuti speciali quali i dispositivi elettrici ed elettronici, le batterie e gli accumulatori.

Si raccomanda di provvedere allo smaltimento di tali rifiuti secondo quanto previsto dalle normative vigenti in materia.

Aiutaci a conservare l'ambiente!



# DISPOSAL OF UNIT

## (Dutch)

### VOOR GEBRUIKERS IN DE EU

Het symbool en de recycleersystemen die hieronder beschreven worden, zijn van toepassing op de landen in de EU en zijn niet van toepassing op landen in andere delen van de wereld.

Uw Panasonic product is ontworpen en gemaakt met materialen en onderdelen van hoge kwaliteit, die gerecycleerd en opnieuw gebruikt kunnen worden.

Het symbool betekent dat elektrische en elektronische apparatuur, batterijen en accu's aan het eind van hun leven apart van uw huisafval weggegooid moeten worden.

Let op:

Indien een chemisch symbool afgedrukt staat onder het symbool, betekent dit chemisch symbool dat de batterij of accu een zwaar metaal met een bepaalde concentratie bevat. Dit wordt als volgt aangegeven: Hg: kwik, Cd: cadmium, Pb: lood

In de Europese Unie zijn afzonderlijke inzamelingsystemen voor gebruikte elektrische en elektronische apparatuur, batterijen en accu's.

Wilt u deze op de juiste manier weggooiden bij uw plaatselijk afvalinzameling-/recyclingcentrum in uw buurt?

Help ons het milieu waarin wij leven in stand te houden!

## (Swedish)

### FÖR ANVÄNDARE INOM EU

Den symbolmärkning och de återvinningssystem som beskrivs här nedan gäller länder inom EU och gäller inte länder i någon annan del av världen.

Din Panasonic-produkt har konstruerats och tillverkats med delar och material av hög kvalitet, som kan återvinnas och/eller återanvändas.

Symbolmärkningen innebär att elektrisk och elektronisk utrustning, batterier och ackumulatorer, vid slutet av deras livslängd, inte får slängas som hushållsavfall utan skall slängas separat.

Observera:

Om en kemisk symbol finns tryckt under denna symbolmärkning, betyder denna kemiska symbol att batteriet eller ackumulatorm innehåller en tungmetall med en viss koncentration. Detta indikeras på följande sätt: Hg: kvicksilver, Cd: kadmium, Pb: bly

I den Europeiska Unionen finns det separata uppsamlingssystem för använd elektrisk och elektronisk utrustning, batterier och ackumulatorer.

Gör dig av med sådana saker på rätt sätt på den speciella lokala platsen för återsamling/återanvändning.

Hjälp oss att bevara den miljö vi lever i!



# 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)



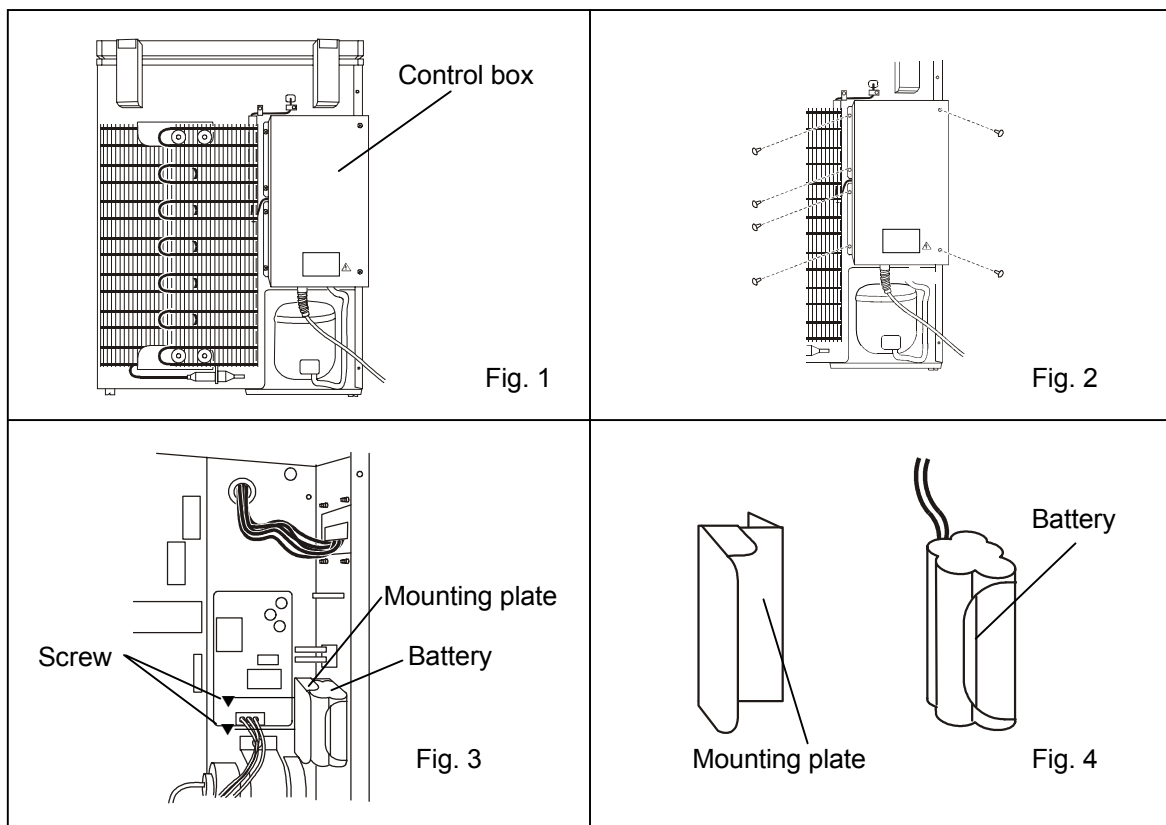
The high voltage components are enclosed in the control box. The cover should be removed by a qualified engineer or a service personnel only to prevent the electric shock.

## 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 six fixing screws on the control box and remove the control box cover.
3. Remove two 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.



# TEMPERATURE RECORDER (OPTION)

## WARNING

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

If the warning is required for the internal temperature record or the interior temperature deviates from the target temperature an optional temperature recorder (MTR-4015LH or MTR-G85C) is available. For the attachment, the recorder fixing (MDF-S740 or MDF-S3040) is necessary. Consult our sales representative or agent for the temperature recorder installation.

## 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.

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 not 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.

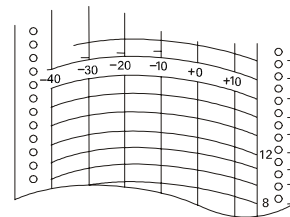


Fig. 1

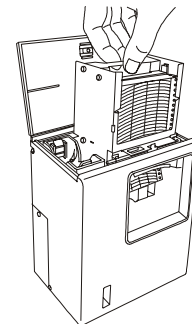


Fig. 2

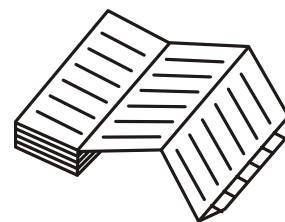


Fig. 3

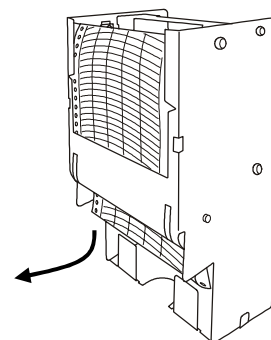


Fig. 4

# TEMPERATURE RECORDER (OPTION)

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.

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 compartment.

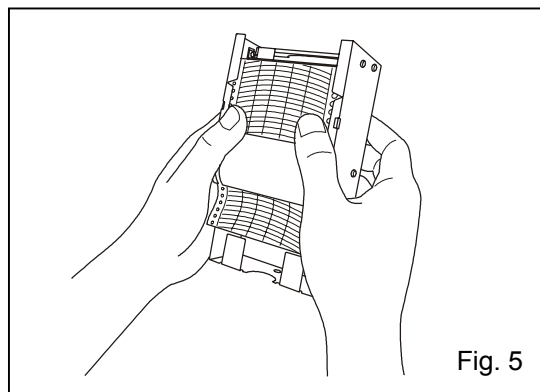


Fig. 5

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

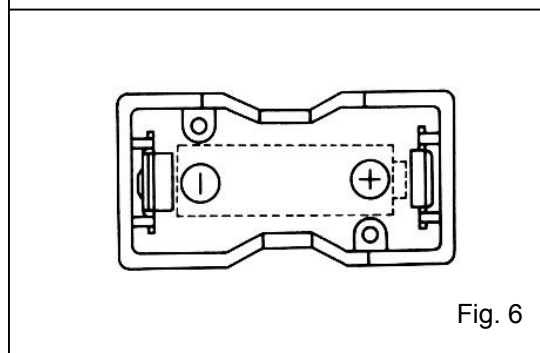


Fig. 6

## 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.

## Note :

This temperature recorder is designed for the manganese battery and the alkaline battery.

Do not use a rechargeable battery because the initial voltage of such battery is low. The rechargeable battery may cause the malfunction of recorder or shorten the battery life significantly.

## Start-up

1. The quartz motor is started by placing a "R14" or size "C" battery 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

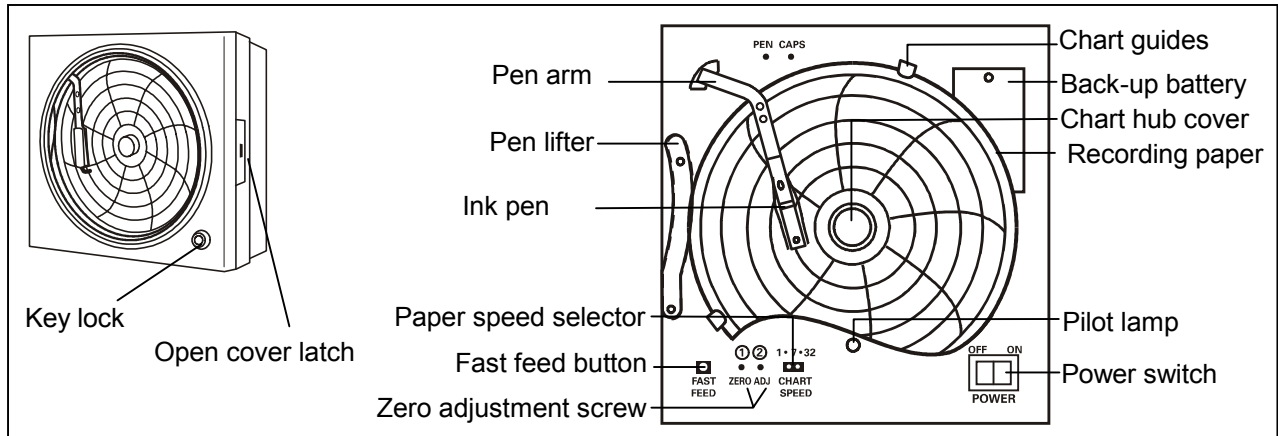
The temperature recorder is stopped by taking the battery out of the battery case.

# TEMPERATURE RECORDER (OPTION)

## WARNING

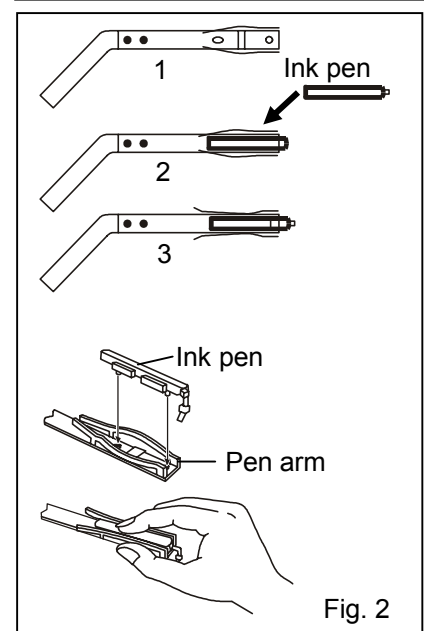
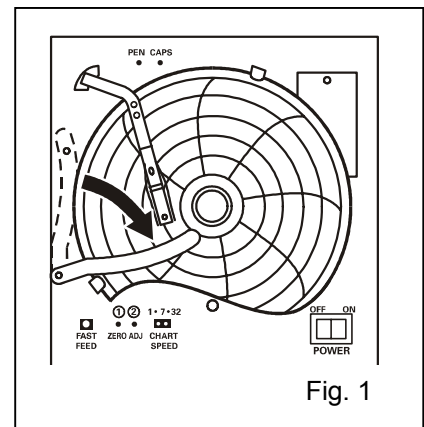
Always disconnect the power supply to the unit prior to attachment of a temperature recorder in order to prevent electric shock or injury.

## Setting of MTR-G85C



### Loading the ink pen:

1. Slightly raise the end of the pen lifter and remove from the 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 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 ink pen 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.



# 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.

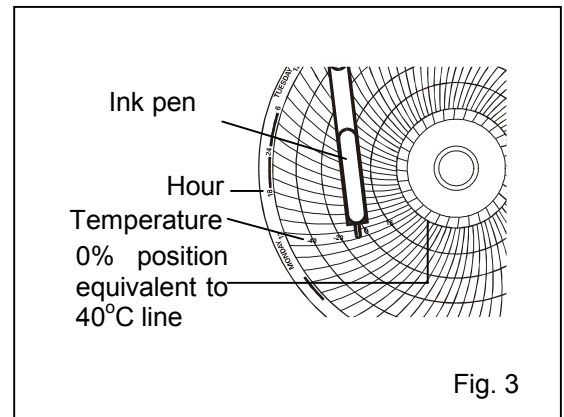


Fig. 3

## 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.

## Replacing the recording paper:

1. Slightly raise the end of the pen lifter and remove from the pen lifter stopper. Rotate the tip of the pen clockwise until it rests on top of the pen lifter.
2. Remove the chart hub cover, and then replace the recording paper.
3. Place the chart hub cover. Remove and dispose of the piece of paper. Confirm that the new recording paper is inside of the chart guides.
4. Set the correct time.

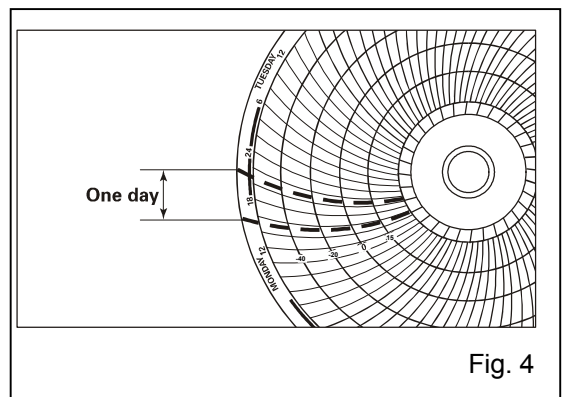


Fig. 4

# SPECIFICATIONS

Product name	Biomedical Freezer MDF-237
External dimensions	W905 mm x D687 mm x H881 mm
Internal dimensions	W790 mm x D440 mm x H715 mm
Effective capacity	221 L
Exterior	Painted steel
Interior	Colored aluminum plate
Door	Painted steel
Insulation	Rigid polyurethane foamed-in place
Storage baskets	Polyethylene coated steel wire
Access port	Diameter 17 mm, Right side and bottom left
Compressor	Hermetic type, 200 W
Condenser	Wire and tube type
Evaporator	Aluminum tube on sheet type
Refrigerant	R-134a
Temperature controller	Electronics controller (between -18 and -35°C)
Temperature display	Digital display (between -50 and +50°C)
Temperature sensor	Thermister sensor
Temperature alarm	Flash of digital indicator and alarm lamp, Buzzer, (Remote alarm)
Accessories	1 set of key, 1 scraper, 3 storage baskets
Weight	60 kg
Battery	For power failure alarm, Nickel-metal-hydride battery, DC 6 V, 1100 mAh Automatic charge
Optional component	Temperature recorder (MTR-G85C, MTR-4015LH) Recorder fixing (MDF-S740, MDF-S3040) 2 storage baskets (MDF-13B2), 3 storage baskets (MDF-13B3) Interface board (MTR-480, MTR-L03), Data acquisition system (MTR-5000)

**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 three years. Contact our sales representative or agent at the time of replacement of the battery for recycling.



# PERFORMANCE

Product name	Biomedical Freezer MDF-237
Model No.	MDF-237-PE
Cooling performance	-30°C (ambient temperature; 35°C, no load)
Temperature control range	-20°C to -30°C
Rated voltage	AC 220V/230 V/240 V
Rated frequency	50 Hz
Rated power consumption	115 W/115 W/120 W
Noise level	41 dB [A] (background noise; 20 dB)
Maximum pressure	1.55 MPa

**Note** : The unit with CE mark complies with EC 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 :  Yes  No  
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  Yes  No  
No contamination  Yes  No  
Decontaminated  Yes  No  
Contaminated  Yes  No  
Others:

3. Instructions for safe repair/maintenance 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 :

Please decontaminate the unit yourself before calling the service engineer.

**Panasonic Healthcare Co., Ltd.**

1-1-1 Sakata, Oizumi-Machi, Ora-Gun, Gunma 370-0596 Japan

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