



INSTRUCTION MANUAL

MDF-U731

BIOMEDICAL FREEZER



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INTRODUCTION

- Read this manual carefully before using the appliance and follow the instructions for safety operation.
- Sanyo 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 manual.
- Keep this manual in an adequate place to refer to it as necessary.
- The contents of the manual will be subjected to change without notice due to the improvement of performance or functions.
- Contact Sanyo sales representative or agent if any page of the manual is lost or page order is incorrect.
- Contact Sanyo sales representative or agent if any point in this manual is unclear or if there are any inaccuracies.
- No part of this manual may be reproduced in any form without the expressed written permission of Sanyo.

 **CAUTION**

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

PRECAUTIONS FOR SAFE OPERATION

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

Some warning and/or caution labels are attached on the unit. Following shows the description of such labels.

	This label is on the cover in which the electrical components of high voltage are enclosed to prevent the electric shock. The cover should be removed by a qualified engineer or a service personnel only.
	This symbol means attention or refer to document.
	This symbol means earth.
	This symbol means power switch "ON".
○	This symbol means power switch "OFF".















< Label on the unit >



This mark is labeled on the cover in which the electrical components of high voltage are enclosed to prevent the electric shock. The cover should be removed by a qualified engineer or a service personnel only.














PRECAUTIONS FOR SAFE OPERATION

WARNING

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

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.

PRECAUTIONS FOR SAFE OPERATION



CAUTION

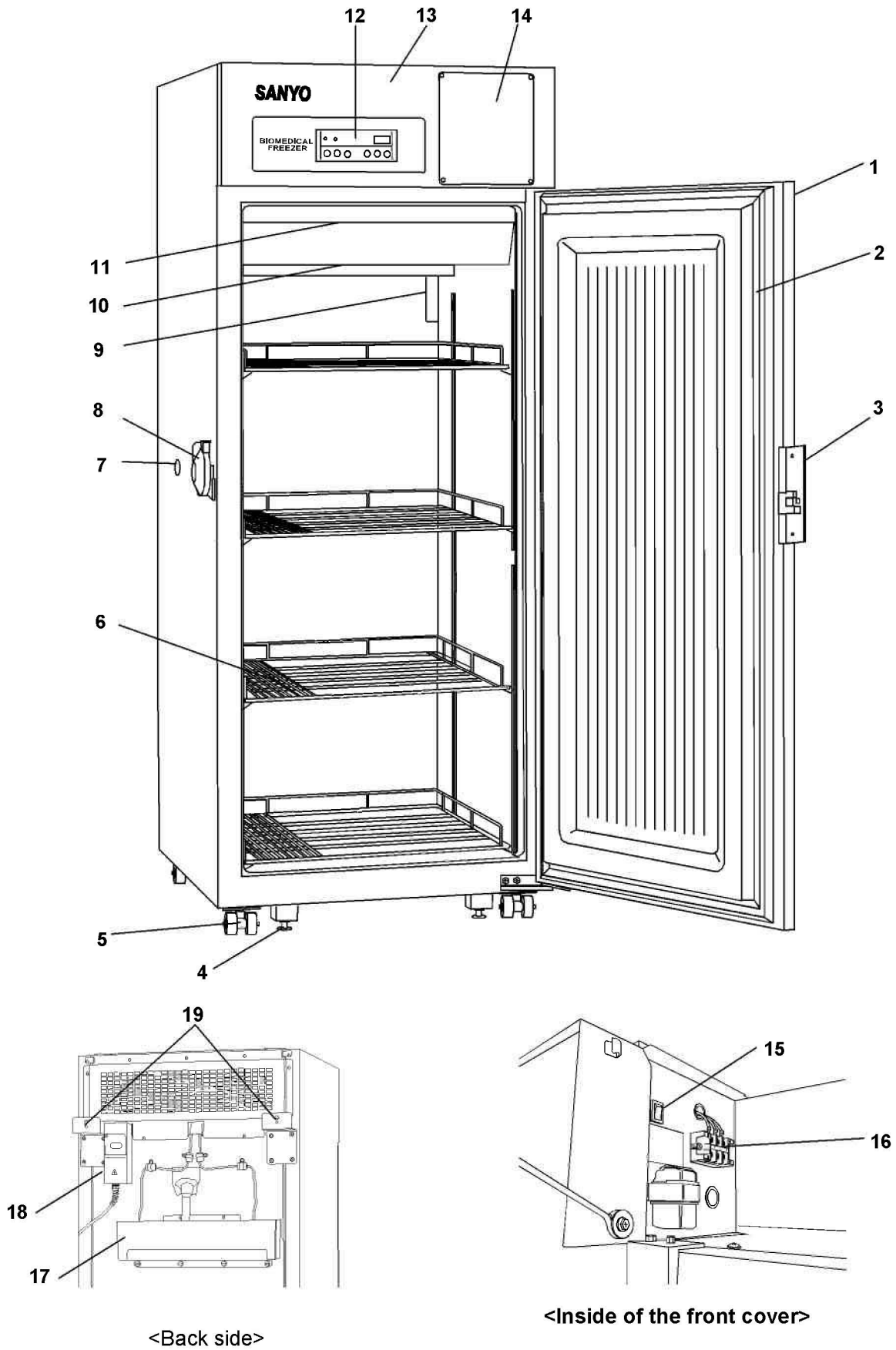
-  **This unit must be plug into a dedicated circuit protected by branch circuit breaker.**
-  **Use a dedicated power source** as indicated on the rating label attached to the unit. A multiple-tap may cause fire resulting from abnormal heating.
-  **Connect the power supply plug to the power source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

ENVIRONMENTAL CONDITIONS

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

- Indoor use;
- Altitude up to 2000 m;
- 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



<Back side>

<Inside of the front cover>

FREEZER COMPONENTS

- 1. Lock:** Turn clockwise to 180° with a key and the outer door is securely locked.
- 2. Magnetic door gasket:** This prevent the cold air from escaping. Always keep clean.
- 3. Handle:** Always grip this handle to open and close the door.
- 4. Leveling foot:** The height of the freezer can be adjusted by this screw type foot. Keep the unit in level at the installation.
- 5. Caster:** four casters are provided to facilitate moving of the cabinet. For the installation, adjust the leveling foot so that the front two casters cannot contact with the floor.
- 6. Shelf:** Items to be stored in the chamber must be placed on the shelves. The maximum storage weight for each shelf is 50 kg.



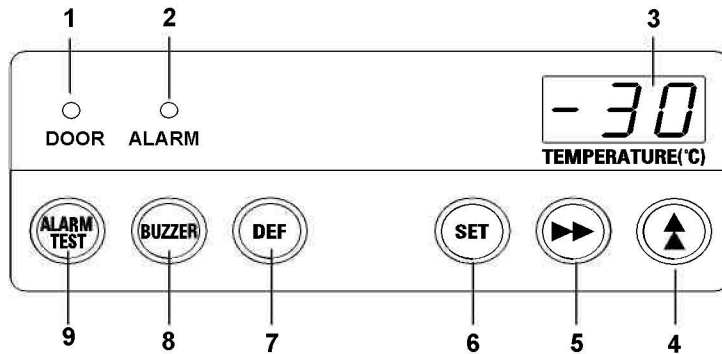
WARNING

Fix the shelf supports and shelves securely. Incomplete installation may cause injury or damage. Never touch the storage items with wet hands. Touching with the wet hands may cause frostbite

- 7. Access port:** This is used for leading the measuring cable from the chamber to the outside. A total of two (2) are provided. ; left side and top of the freezer.
- 8. Door latch:** Turn clockwise to lock the door and also add the lock too.
- 9. Temperature sensor:** Located on the rear of the chamber.
- 10. Cold air exhaust vent:** Ensure this vent is never blocked. If this vent is blocked, temperature regulation become unstable. Do not place stored item in the path of cold air.
- 11. Air intake vent:** Ensure this vent is never blocked. Failure to do so will result in unstable temperature distribution in the chamber.
- 12. Control panel:** The operation status is displayed on this panel. And the temperature setting is available through this panel. Refer to page 10 for details.
- 13. Front cover:** Open this cover when connecting the remote alarm or using the power supply outlet.
- 14. Space for temperature recorder:** Space for an automatic temperature recorder (optional component) is available separately. See page 26 “TEMPERATURE RECORDER (OPTION)”.
- 15. Battery switch:** Switch for battery used for power failure alarm. Always keep ON. Turn the switch OFF when the unit is in no use for a long period (more than one month).
- 16. Remote alarm terminal:** Used to notify an alarm condition of the unit to remote location. See page 14 for details.
- 17. Evaporating tray (back side):** Defrost water from the evaporator accumulates in the evaporating tray and evaporates into the atmosphere. See page 17 for cleaning.
- 18. Power switch (back side):** This is for turning ON/OFF the power to the unit. ON – “I” OFF – “O”
- 19. Fixture (back side):** These keep the adequate apace between the unit and wall, and also can be used for fixing the unit.

FREEZER COMPONENTS

Control panel



- 1. Door check lamp (DOOR):** This lamp is lit when the door is open.
- 2. Alarm lamp (ALARM):** This lamp is flashed during alarm condition.
- 3. Temperature display:** This indicator shows the chamber temperature, set temperature, or error code.
- 4. Numerical value shift key (▲):** Pressing this key in the setting mode causes the numerical value to change. ON-OFF of key lock can be selected by pressing this key in the key lock mode.
- 5. Digit shift key (▶▶):** Pressing this key in setting mode causes the changeable digits to move. Key lock is activated by pressing this key for more than five seconds in the temperature display mode. See “Key lock function” on page 14.
- 6. Set key (SET):** Pressing this key activates temperature set mode and the digit which can be set is flashed. By pressing the key again after setting, the set value is accepted.
- 7. Defrost key (DEF):** Defrost will be started by pressing this key for more than five seconds..
- 8. Alarm buzzer stop key (BUZZER):** Press this key to silence the buzzer in the event that the alarm operates and buzzer sounds. See page 15, 16 for the details.
- 9. Alarm test key (ALARM TEST):** The lamp is blinks and buzzer will sound and remote alarm will be activated by pressing this key.

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 fixed metal fittings (the side of the left) (Fig. 1) and tapes. Open the doors and ventilate the unit. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the panels with a dry cloth.

Note: Be careful of the shelf and the container of the chamber because it gets hurt when you fall onto the foot.

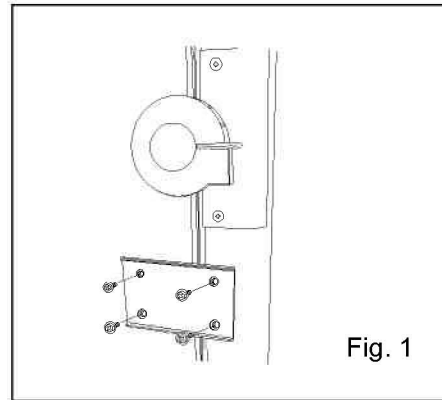


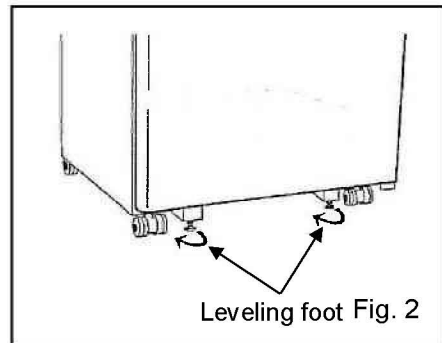
Fig. 1

2. Removal of the door fixed plate

The door of the product is fixed by the door fixed plate. A screw hole should fix an attached plastic screw on the product. (Four places) (Fig. 1)

2. Adjusting the leveling foot

Extend the leveling feet by rotating them counterclockwise to contact them to the floor. Ensure the unit is level. (Fig. 2)



Leveling foot Fig. 2

3. Fixing the unit

Two fixtures are attached to the rear of the frame. Fix the frame to the wall with these fixtures and rope or chain. (Fig. 3)

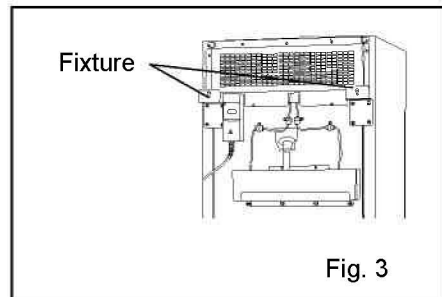


Fig. 3

4. 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. A plug is connected with the power supply without putting samples in the product.
2. A power switch and a battery switch are turned on.
3. Push an alarm buzzer stop key (BUZZER), and stop an alarm buzzer though an alarm buzzer may ring.
4. Set up chamber temperature.
5. Check that chamber temperature gets cold to setup temperature.
6. An alarm test key (ALARM TEST) is pushed, and an alarm lamp blinks, and it is checked that an alarm buzzer rings. At this time, a remote alarm works, too. (When a remote alarm terminal is being used.)
7. Put the storage samples by the above inspection so that chamber temperature may not rise when it is completely normal.

《 Important 》

Do not block the air intake vent or air exhaust vent in the freezer. Arrange the storage items with adequate space to keep the air circulation.

A sample deteriorates when chamber temperature rises.

Operation after power failure

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

Note:

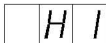

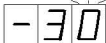




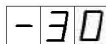
As for the after power failure, a product may not start by the voltage descent and so on so that all machines may start at the same time. Be sure to check the operation conditions of the product.

TEMPERATURE SETTING

Table 1 shows the basic operation method. Perform key operations in the sequence indicated in the table. The example in the table is based on the assumption that the freezer temperature is -25°C.

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

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

	Description of operation	Key operated	Indication after operation
1	Connect the power source and turn on the power switch.	---	The current chamber temperature is displayed. Chamber temperature higher than 1°C to be displayed "HI", lower than -41°C to be displayed "LO".  
2	Press set key.	SET	The first digit of the temperature displayed flashes. 
3	Set the temperature to -25 with the digit shift key and the numerical value shift key.		Pressing the digit shift key leads the flash of the second digit. 
			When pressed, the figure of settable digit increases. 
4	Press set key.	SET	The value is stored in memory and the current chamber temperature is displayed. 

Note:

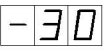





- The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, any setting before pressing the set key (SET) is not memorized.
- The freezer temperature can be set in the range between -20 and -35°C. Remember that the guaranteed temperature with no load at an ambient temperature of 35°C is -30°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
L o 0	Key lock is OFF	Enable to change of temperature setting
L o 1	Key lock is ON	Disable to change of temperature setting

Table 3 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 increases. 
4	Press set key.	SET	The key lock is set to ON. The current chamber temperature is displayed. 

Note:

The key lock only works with the chamber temperature setting and the defrost key (DEF).
A key lock function becomes on when it is changed to Lo1 with a process 3.

REMOTE ALARM TERMINAL

 **WARNING**

Always turn off the power switch and 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 lower left side of the unit. The alarm is outputted from this terminal. Contact capacity is DC 30 V, 2 A.

Contact output: At normal condition "Open".
 At abnormal condition "Close".

Note:

Note: The alarm status of remote alarm terminal and audible alarm are cancelled by pressing the alarm buzzer stop key (BUZZER) since the remote alarm is operated in conjunction with alarm buzzer (except for power failure alarm status). The visual alarm will remain active until the alarm condition is rectified.

Use a twisted sealed wire for the connection.
Type UL2343, UL2448, UL2464, UL2552, UL 2623
Length: 30 m max.

ALARMS FUNCTIONS

This unit has the alarm functions shown below.

Contact Sanyo sales representative or agent after moving the storage items to other refrigerator or freezer if the alarm status continues because there is a possibility of any failure.

Alarm & Safety	Situation	Indication	Buzzer	Remote alarm terminal
High temperature alarm	If the chamber temperature deviates by +10°C (factory set) from setting.	Alarm lamp is blinks. Temperature indicator is flashed.	Intermittent tone after a delay of 15 minutes.	Remote alarm is activated after a delay of 15 minutes.
Low temperature alarm	If the chamber temperature deviates by -10°C (factory set) from setting.	Alarm lamp is blinks. Temperature indicator is flashed.	Intermittent tone after a delay of 15 minutes.	Remote alarm is activated after a delay of 15 minutes.
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 blinks.	Intermittent tone	Remote alarm is activated.
Door alarm	When the door is open.	Door check lamp is lit.	Intermittent tone after a delay of 2 minutes.	-----



- The remote alarm terminal is in alarm status in conjunction with the alarm buzzer. However, the alarm status of the remote alarm terminal is cancelled by pressing the alarm buzzer stop key (BUZZER).

SAFETY FUNCTIONS

This unit has the safety functions shown below.

Alarm & Safety	Situation	Indication, Buzzer	Safety operation
Auto return	If a key operation is not performed for about 90 seconds in each setting mode.	-----	The setting mode is returned to the temperature display mode.
Key lock	When the key lock is ON (Lo1).	-----	Key input is unable.

SELF DIAGNOSTIC FUNCTIONS

This unit has the self diagnostic functions shown below.

Contact Sanyo sales representative or agent if an error code (ex. E01) is displayed resulting from the self diagnostic.

Alarm & Safety	Situation	Indication	Buzzer	Remote alarm terminal
Sensor Abnormality	If the thermal sensor goes open circuit.	Alarm lamp is flashed. E01 and LO are displayed alternately.	Intermittent tone	Alarm status
	If the thermal sensor goes short circuit.	Alarm lamp is flashed. E01 and HI are displayed alternately.		
	If the defrost sensor goes open circuit.	Alarm lamp is flashed. E02 and chamber temp. are displayed alternately.		
	If the defrost sensor goes short circuit.			
	If the compressor protection temperature sensor is disconnected.	ALARM lamp is flashed. E03 and chamber temp. are displayed alternately.		
	If the compressor protection temperature sensor is short circuited.			
Compressor temp. Abnormality	In case of failure of compressor cooling fan motor. In case of abnormal high ambient temperature. (when the temperature about 103°C.)	----		

Note:

- The remote alarm is cancelled by pressing the alarm buzzer stop key (BUZZER) since the remote alarm is operated in conjunction with the buzzer, except for the power failure alarm status.
- After a power failure, the unit will resume operation with the set value that was in place before power failure occurred.
- The chamber temperature is displayed for five seconds by pressing buzzer stop key (BUZZER) during power failure alarm. Then the buzzer is silenced. The alarm lamp keeps flashing.
- 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 Sanyo sales representative or agent at the time of replacement of the battery.
- About three days operation of a freezer is necessary to full charge the battery.
- Fan motors are expendable supplies. Replace them for about every six years. Contact Sanyo sales representative or agent at the time of replacement of the fan motors.
- Attach the inspection label of the accessories in front of the product, and use the repair time of the battery and the fan motor.
- The remote alarm terminal is in alarm status in conjunction with the alarm buzzer. However, the alarm status of the remote alarm terminal is cancelled by pressing the alarm buzzer stop key (BUZZER).

MAINTENANCE

⚠ WARNING

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

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

⚠ CAUTION

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

Cleaning of cabinet

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

Cleaning of evaporating tray

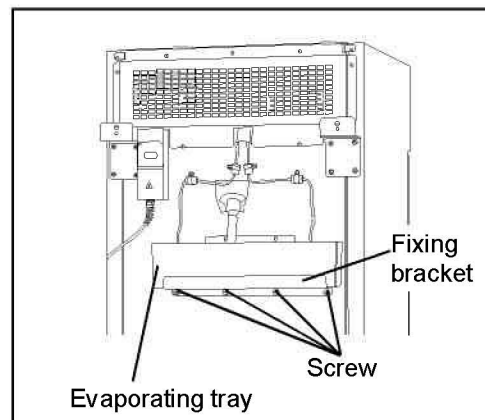
⚠ CAUTION

Dispose of the water in the evaporating tray completely. Spilled water or splashed water may cause current leakage or electric shock.

Clean the evaporating tray regularly. The dusty tray may cause poor evaporation.

This unit is provided with the evaporating tray on the back.

1. Remove four screws of the fixing bracket.
2. Remove the evaporating tray and the fixing bracket.
- 3 Wash the evaporating tray.
4. Fix the tray and the fixing bracket with four screws of the fixing bracket



MAINTENANCE

Defrosting

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

1. When defrosting, move all the contents of containers in the freezer to another low temperature freezer.
2. Pressing the defrost key (DEF) for more than five seconds to stop the refrigerating operation. While the refrigerating operation is stopped, the current chamber temperature and dF is displayed on the control panel alternately.
3. After a several hours, check the visually that all defrost was removed completely.
4. If a defroster is finished, a drain cap at bottom inside the freezer is removed.
Draw drain hose, and drain the water with water inside the freezer in the tray.
Wipe the water left in the freezer, and do the cap.
5. Pressing the defrost key (DEF), the refrigerating operation can be started.
6. 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 is never resumed automatically.
Make sure to press the defrost key (DEF) for more than five seconds to start operation again.

TROUBLESHOOTING

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

Malfunction	Check/Remedy
The chamber is not cooled at all	<ul style="list-style-type: none"> ▪ 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 large amount of articles (load) is stored in the chamber at one time. ▪ The freezer is in defrost condition. ▪ It is used near an electric product which emits an electric wave.
The cooling is poor	<ul style="list-style-type: none"> ▪ The ambient temperature is too high. ▪ The door is not closed firmly. ▪ 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 chamber. ▪ It is used near an electric product which emits an electric wave.
When the unit does not accept changes of set-point temperature	<ul style="list-style-type: none"> ▪ The key lock is set in ON.
Noise	<ul style="list-style-type: none"> ▪ 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. <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 Sanyo sales representative or agent.

Keep an electric product which emits an electric wave away from this product. A noise from an electric wave may cause malfunction to this product.

A compressor is in this product about the top of the product. After the operation of the compressor stops, it has the sound that refrigerant flows after several seconds. This makes the pressure of the compressor decrease, and it is the sound which makes it drive at the time of the next movement with little energy. This sound is not a problem.

CAUTION

The noise of refrigerant flow may be heard due to the characteristic of refrigerating circuit. Especially for several minutes after start-up, the noise of motor compressor or refrigerant flow can be larger. But such noise does not mean malfunction nor failure.

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 doors 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 officials option or proper disposal.



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

Decontamination of unit

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

DISPOSAL OF UNIT

(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 SANYO 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 SANYO 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.

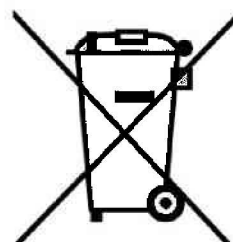
Hinweis:

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 SANYO 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 SANYO 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.

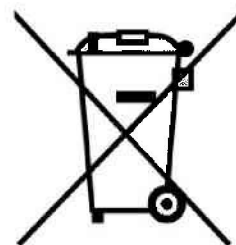
Nota:

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 SANYO 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 SANYO 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.

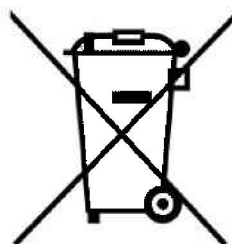
Nota:

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 SANYO 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 inzamelingssystemen voor gebruikte elektrische en elektronische apparatuur, batterijen en accu's.

Wilt u deze op de juiste manier weggooien 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 SANYO-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 ackumulatörer, vid slutet av deras livslängd, inte får slängas som hushållsavfall utan skall slängas separat.

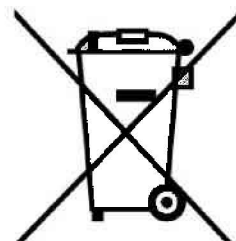
Observera:

Om en kemisk symbol finns tryckt under denna symbolmärkning, betyder denna kemiska symbol att batteriet eller ackumulatören 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 uppsamlingsystem för använd elektrisk och elektronisk utrustning, batterier och ackumulatörer.

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

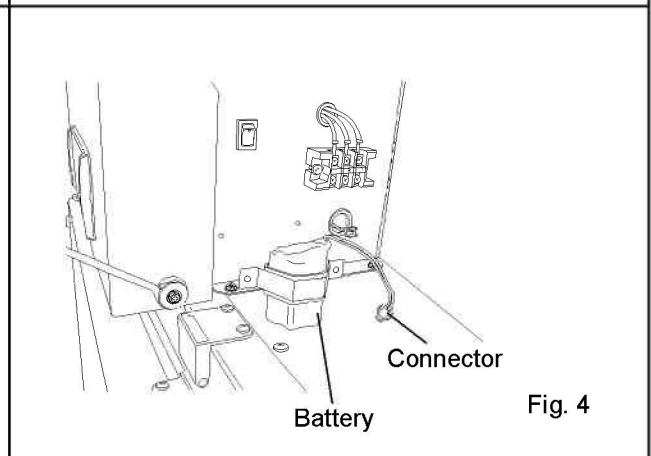
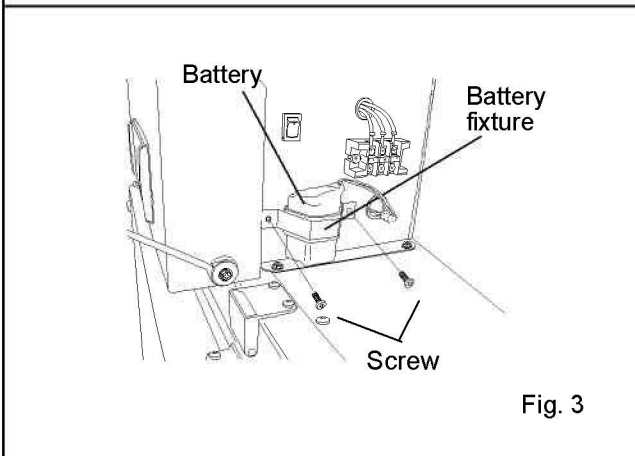
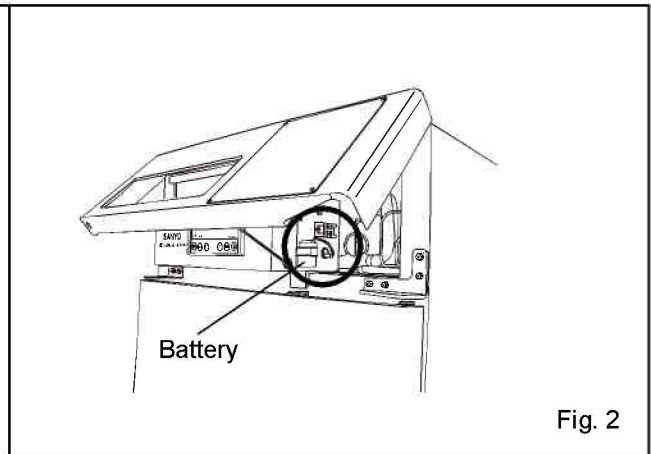
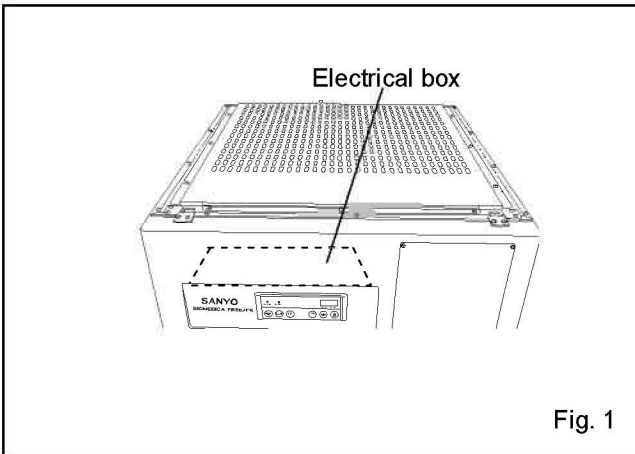
This unit is provided a nickel-metal-hydride battery for the power failure warning device. The battery is located on the side of electrical box. (Fig. 1)



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

Disposal of nickel-metal-hydride battery

1. Turn off the power switch, battery switch and disconnect the power supply plug.
2. Lift the front cover. (Fig. 2)
3. Remove 2 screws fixing the battery fixture with a screw driver. (Fig. 3)
4. Disconnect the connector and take out the battery. (Fig. 4)
5. 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.

An automatic temperature recorder is available for the freezer as an optional component. The type of the temperature recorder is MTR-G85 and MTR-4015LH. For the attachment, the recorder fixture is necessary.

Setting of MTR-4015LH

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

Setting of recording chart

1. The information on the temperature recording chart 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 chart with the “begin” tab placed in the cartridge. Check that the printed side is facing out.

4. Place the recording chart 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 chart.
- Do not bend the recording chart.
- Do not reverse the recording chart manually.

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

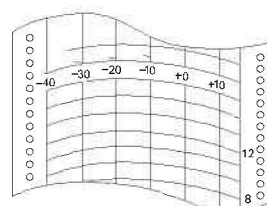


Fig. 1

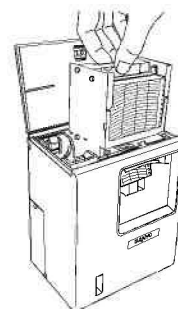


Fig. 2

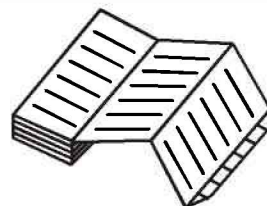


Fig. 3

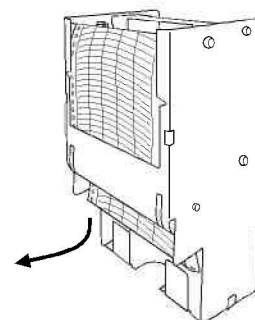


Fig. 4

TEMPERATURE RECORDER (OPTION)

5. Place the recording chart between the guide and the guide plate. Slide the recording chart along the guide plate so that the recording chart 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 chart are locked into the teeth of the sprocket, turn the gear and send the recording chart into the used chart compartment.

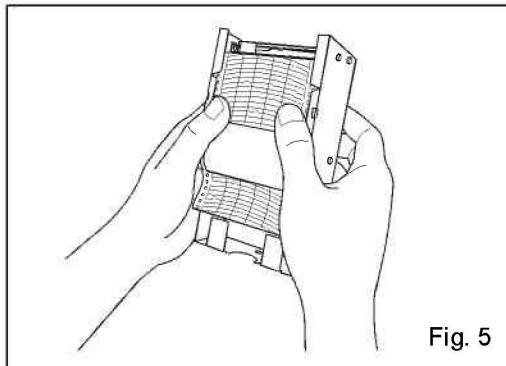


Fig. 5

Setting of time

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

Removing of the used recording chart

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

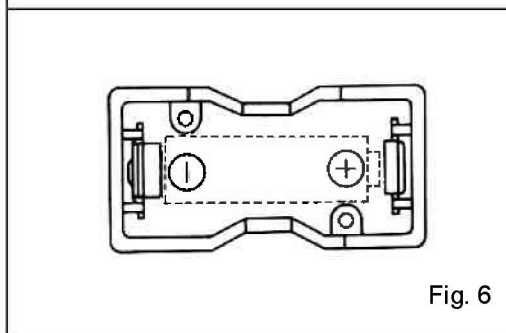


Fig. 6

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.

Note :

This temperature recorder is designed for the manganese dry cell and the alkaline dry cell.

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

Start-up

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

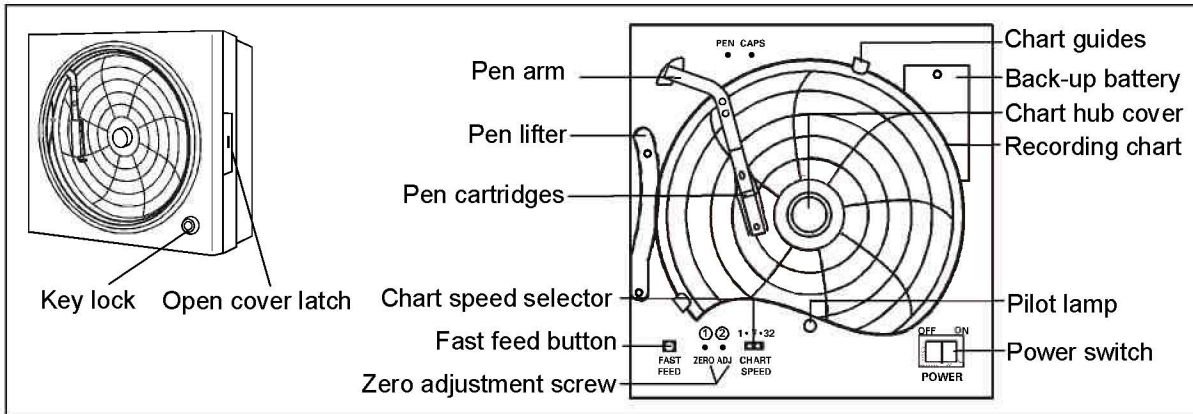
TEMPERATURE RECORDER (OPTION)

Setting of MTR-G85

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 auto temperature recorder (MTR-G85) is available. Install the recorder properly as described below.



Loading the pen cartridge:

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 pen cartridge from the bag and remove its cap. The cap can be conveniently kept on the cap holder located at the upper left corner.

NOTE: Loading a pen, turn the power OFF and then ON again to return to the normal mode. (Refer to Fig. 2 when loading a pen cartridge.)

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 pen cartridge 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 pen cartridge. (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 pen cartridge.

6. After loading the pen cartridge, return the pen lifter to the original position. Confirm that the pen lifter has securely entered the pen lifter stopper.

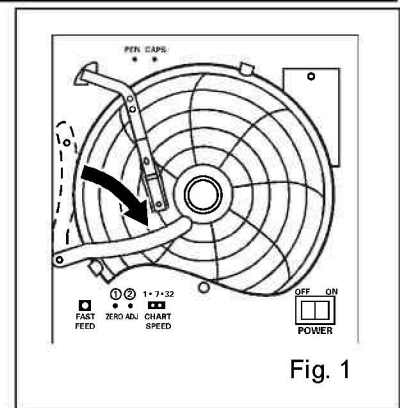


Fig. 1

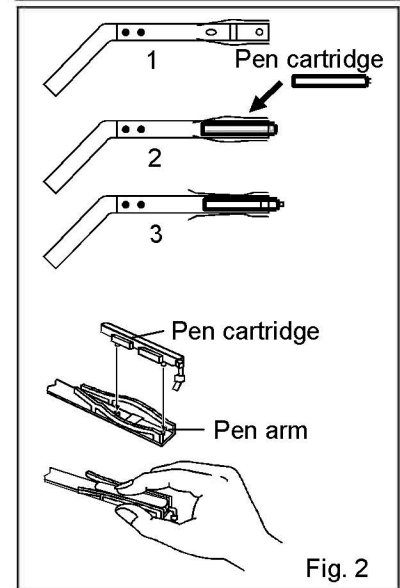


Fig. 2

TEMPERATURE RECORDER (OPTION)

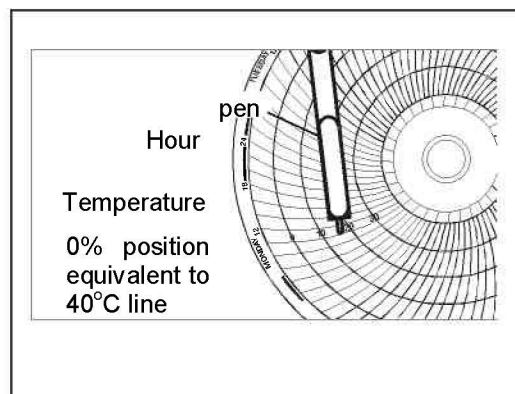
Starting recording and setting the time:

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

Time setting Method:

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

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



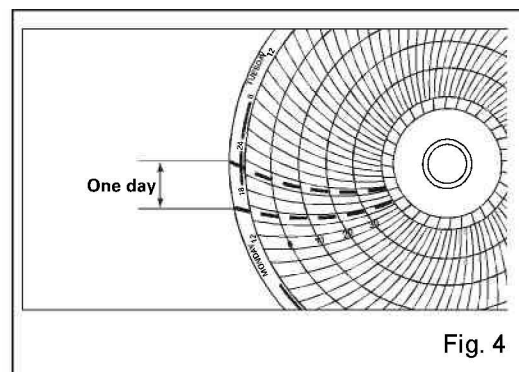
NOTE: There is a difference of approximately 2 mm between the red pen and blue pen during recording. The time difference between the red pen and blue pen changes according to their position on the scale. It is roughly 2 hours for 0% position of chart center and roughly 1 hour for 100% position (when the recording chart speed is set to 7 days).

When the recording chart speed is set to 32 days:

The center of the recording chart is divided into 32 equal sections. The lines extending from these lines serve as the 32-day time scale.

Stopping recording:

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



Replacing the recording chart:

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 chart.
3. Place the chart hub cover. Remove and dispose of the piece of paper. Confirm that the new recording chart is inside of the chart guides.
4. Set the correct time.

SPECIFICATIONS

Name	Biomedical Freezer
Model	MDF-U731
External dimensions	W770 x D830 x H1955 (mm)
Internal dimensions	W650 x D700 x H1370 (mm)
Effective capacity	623 L
Exterior	Painted steel
Interior	Painted steel
Door	Painted steel
Lock	1
Insulation	Rigid polyurethane foamed-in place
Shelf	Polyethylene coated wire 4 pieces Size: W626 x D620 (mm) Max. load: 50 kg/shelf
Access port	Diameter 30 mm, 1 port on left side 1 port on the top of unit
Cooling method	Forced air circulation
Compressor	Hermetic type, 400 W
Evaporator	Fine and tube
Condenser	Skin condenser type
Refrigerant	R-404A
Defrosting	Heater defrosting
Temperature controller	Electronics controller
Temperature display	Digital display (between -40 and +0°C)
Temperature sensor	Thermister sensor
Alarm & safety	High temp. alarm, Low temp. alarm, Power failure alarm, Door alarm, Compressor temperature alarm, Thermal sensor abnormality
Memory backup	Nonvolatile memory
Weight	155 kg
Battery	Nickel-metal-hydride battery, DC 6 V, 1500 mAh, Auto-recharge (DRTB315005)
Accessories	1 set of key, 1 scraper, 1 Inspection label, 4 of plastic screws, 2 large & 2 small nylon clips (for temperature recorder)
Caster	4
Leveling foot	2
Optional component	Temperature recorder (MTR-G85)+Mounting kit (MPR-S7), Temperature recorder (MTR-4015LH)+Mounting kit (MPR-S30)

Note:

Design or specifications will be subject to change without notice.

PERFORMANCE

Cooling performance	-20°C to -30°C (ambient temperature; 5°C to +35°C, no load)
Noise level	40 dB [A] (background noise; 20 dB)
Maximum pressure	2.19 MPa
Rated voltage	AC 115 V
Rated frequency	60 Hz
Rated power consumption	280 W

Note :

- Specifications will be subject to change without notice.

⚠ 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-U731	Serial number:	Date of installation:
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Please decontaminate the unit yourself before calling the service engineer.



SANYO Electric Co., Ltd
Printed in Japan