Operating Instructions

1. Ultra-Low Temperature Freezer

MDF-DU702VH
MDF-DU502VH

MDF-DU702VH

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

See page 58 for all model numbers.

CONTENTS

INTRODUCTION

■ Read the operating instructions carefully before using the product and follow the instructions for safe operation.

■ PHC Corporation takes no responsibility for safety if the product is not used as intended or is used with any procedures other than those given in the operating instructions.

■ Keep the operating instructions in a suitable place so that they can be referred to as necessary.

■ The operating instructions are subject to change without notice for improvement of performance or function.

■ Contact our sales representative or agent if any page of the operating instructions is lost or the page order is incorrect, or if the instructions are unclear or inaccurate.

IMPORTANT NOTICE

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

PRECAUTIONS FOR SAFE OPERATION

It is imperative that the user complies with the operating instructions as they contain important safety advice.

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

Precautions are illustrated in the following way:

⚠WARNING

Warning indicates a potentially hazardous situation which, if not avoided, could result 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.

Symbols have the following meanings:

△This symbol means caution.

⃠This symbol means an action is prohibited.

●This symbol means an instruction must be followed.

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

PRECAUTIONS FOR SAFE OPERATION

⚠WARNING

Do not use the unit outdoors. Exposure to rain may cause leakage and/or electric shock.

Only qualified engineers or service personnel should install the unit. Installation by unqualified personnel may cause electric shock or fire.

Install the unit in a location capable of bearing the total combined weight (product + optional accessories + stored items). After installing the unit, be absolutely sure to take precautions to prevent the unit from falling over. If the unit is installed in a location which is not strong enough or if the proper precautions are not taken, the unit may fall over and cause injuries.

Do not install the unit where there are high levels of moisture or where it may be splashed with water. Installing the unit where there are high levels of moisture or where it may be splashed with water may cause the insulation to deteriorate and give rise to leakage and/or electric shock.

Do not install the unit in a location where flammable or volatile substances are present. Installing the unit in a location where flammable or volatile substances are present may cause explosions and/or a fire.

Do not install the unit in a location where corrosive gases such as acids are present. Installing the unit in a location where corrosive substances are present may cause electrical components to corrode, leading to leakage and/or electric shock due to the deterioration of insulation resulting from corroded electrical components.

Do not place this unit in a location where it is difficult to disconnect the power supply plug. Failure to disconnect the power supply plug may cause fire in the event of a problem or malfunction.

Be absolutely sure to earth (ground) the unit to prevent electric shock. Failure to earth the product may give rise to electric shock. If necessary, ask a qualified contractor to do this work.

Do not connect the earth wire to a gas pipe, water pipe or lightning rod when earthing the unit. Earthing the unit improperly may give rise to electric shock.

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 except in a sealed container. Such substances may cause explosion or fire if they leak.

Never insert metal objects such as pins and wires into any vent, gap, or outlet on the unit. This may cause electric shock or injury by accidental contact with moving parts.

PRECAUTIONS FOR SAFE OPERATION

⚠WARNING

When handling harmful samples (for example, those which consist of toxic, pathogenic or radioactive substances), install the unit inside a designated isolation facility. If the unit is installed in a location which is not an isolation facility, there may be detrimental effects on both people and the natural environment.

Before proceeding with maintenance or checking the unit, set the power switch to OFF, and disconnect the power supply plug. Performing the work while power is still flowing to the product or while the power supply plug is still connected may give rise to electric shock and/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.

Wear protective gloves and mask during maintenance. Touching or inhaling chemicals or aerosols from around the unit may be detrimental to health.

Never splash water directly onto the unit as this may cause electric shock or short circuit.

Never put containers with liquid on top of the unit as this may cause electric shock or short circuit if the liquid is spilled.

Never damage the power supply cord or power supply plug (by breaking, adapting, placing near a source of heat, bending with force, twisting, pulling, adding weight, or binding). A damaged power supply cord or power supply plug may cause electric shock, short circuit, or fire

Never disassemble, repair, or modify the unit yourself. A high-voltage area is located inside the unit. Any work carried out by unauthorized personnel may result in electric shock. Contact our sales representative or agent for maintenance or repair.

Make sure the power supply plug is pushed fully in. Faulty insertion of the power supply plug may cause electric shock or fire due to generation of heat. Never use a damaged power supply plug or loose power outlet

Disconnect the power supply plug if there is anything wrong with the unit. Continued abnormal operation may cause electric shock or fire.

Grip the power supply plug when disconnecting the power supply cord from the outlet. Pulling the power supply cord may cause electric shock or short circuit.

Remove dust from the power supply plug periodically. Dust on the power supply plug may cause insulation failure due to moisture and thus cause a fire. Disconnect the power supply plug and wipe it with a dry cloth

PRECAUTIONS FOR SAFE OPERATION

⚠WARNING

Disconnect the power supply plug before moving the unit. Take care not to damage the power supply cord. A damaged power supply cord may cause electric shock or fire**.**

Disconnect the power supply cord when the unit is not in use for long periods. Keeping the unit connected may cause electric shock, leakage, or fire due to the deterioration of insulation.

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

Ask a qualified contractor to carry out disassembly and disposal of the unit. Leaving the unit in a location that can be accessed by third parties may result in unexpected accidents (e.g. the unit may be used for unintended purposes).

Do not leave the plastic bags used for packing in a place where they can be reached by small children as this may result in unexpected accidents such as suffocation.

Never replace the battery for the power-failure alarm yourself. Only qualified engineers or service personnel should replace the battery.

When moving the unit, be sure to take precautions to prevent it from falling over. Moving the unit with too much force may cause it to fall over, possibly resulting in injury. A qualified individual must be assigned to supervise the safe movement and relocation of the unit.

Install the unit in a well-ventilated (airy) location to prevent the accumulation of flammable refrigerant. The flammable refrigerant may cause fire if it leaks.

Never damage the chamber wall or pipework in the chamber when removing frost. The refrigerant is flammable and may cause a fire if it leaks.

Flammable and explosive product. The unit contains flammable refrigerant. When repairing or recycling, only trained service personnel will repair and follow the procedure below.

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

As with any equipment that uses CO_2 gas, there is a likelihood of oxygen depletion in the vicinity of the equipment. It is important that you assess the work site to ensure there is suitable and sufficient ventilation. If lack of ventilation is suspected, then other methods of ensuring a safe environment must be considered. These may include atmosphere monitoring systems and warning devices with alarms.

Do not touch the condenser directly when the filter is removed for cleaning. Touching the condenser may cause injury due to its hot surface.

PRECAUTIONS FOR SAFE OPERATION

⚠ CAUTION

Never install the unit in a location where corrosive materials such as sulphur compounds are likely to be generated (e.g. near a drainage facility). Corrosion of the copper pipes may result in the deterioration and consequently the failure of the cooling unit.

This unit must be plugged into a dedicated circuit protected by branch circuit breaker.

Use a dedicated power source as indicated on the rating label attached to the unit. A multiple-tap may cause fire resulting from abnormal heating.

Do not climb on top of the unit or put any objects on the unit. Falling from the unit may cause injury; falling objects may cause damage to the unit.

Never store corrosive substances such as acids or alkalis in this unit except in a sealed container. These may be harmful to your health and may cause corrosion of internal components or electrical parts.

Check the settings when restarting operation after a power failure or after turning the power off. The settings may have changed as a result of stopping the unit. Stored items inside the unit may be adversely affected when operation is resumed if the settings have changed.

To ensure the safety of the service engineer, submit a safety check sheet with the required items filled out. This is provided as the photocopiable “Safety Check Sheet” at the end of these operating instructions

Use designated parts for parts replacement. Using an incorrect part may cause fire.

Do not give strong shock or vibration during movement or use. The piping may be damaged, causing a fire.

Turn the leveling feet to separate the casters from the floor and secure the unit. If they are left touching the floor, the unit may inadvertently move out of position when its door is opened or closed. It may cause injury.

24. Pasukite išlyginamąsias kojeles, kad ratukai atsiskirtų nuo grindų, ir užfiksuokite įrenginį. Jei jie paliekami liečia grindis, įrenginys gali netyčia pajudėti iš vietos, kai atidaromos jo durelės arba uždarant duris. Tai gali sukelti sužalojimų.

LABELS ON UNIT

<Labels applied to the unit>
To avoid accidents, users are advised to read carefully the hazard labels found at key locations on the interior and exterior of the unit.

Possible Danger	**Warning/Caution Type** Location of Danger	Warning/Caution Label	Description of Danger
Personal injury Sample damage	**Frostbite** **Rise in chamber temperature** Interior		To prevent frostbite, wear protective gloves when handling frozen items in the chamber. Too much frost may cause chamber temperature rise resulting from incomplete door close.
Personal injury	**Electric shock** Electric box		Attached to covers that access high-voltage electrical components to prevent electric shock. Only a qualified engineer or service personnel should be allowed to open these covers.
Personal injury	**Flammable and explosive product** Interior		This product contains flammable refrigerant. Please follow the instructions when recycling.
Sample damage	**Chamber temperature** Interior		Clean the filter about every once a month. A dusty filter may cause poor cooling performance.
Damage of outer door latch	**Negative pressure release** Interior		Ice should be removed from the air intake port using the designated frost removal stick.

SYMBOLS ON UNIT

The following symbols are attached to the unit. The table describes the meaning of the symbols.

	This symbol is attached to covers that access high-voltage electrical components to prevent electric shock. Only a qualified engineer or service personnel should be allowed to open these covers.
	This symbol indicates that caution is required. Refer to product documentation for details.
	This symbol indicates Incorrect usage could lead to a fire hazard.
	This symbol indicates an earth.
	This symbol means “ON” for a power switch.
	This symbol means “OFF” for a power switch.

ENVIRONMENTAL CONDITIONS

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

■ Indoor use;

■ Altitude up to 2000 m;

■ Temperature 5 ºC to 40 ºC;

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

■ Mains supply voltage fluctuations up to ±10 % of the nominal voltage;

■ Transient overvoltages up to the levels of OVERVOLTAGE CATEGORY II;

■ Temporary OVERVOLTAGES occurring on the mains supply;

■ Applicable pollution degree of the intended environment (POLUTION DEGREE 2 in most cases);

INTENDED USE AND PRECAUTIONS

This equipment is designed for low temperature storage of human cells, organs, plasma and DNAs.

Temperature and duration of storage:

cells: 1month - 1year at -80 °C

organs: 11months at -80 °C

DNA: Long term (8 years) at -80 °C - -70 °C

plasma: 2-3 months at -80 °C

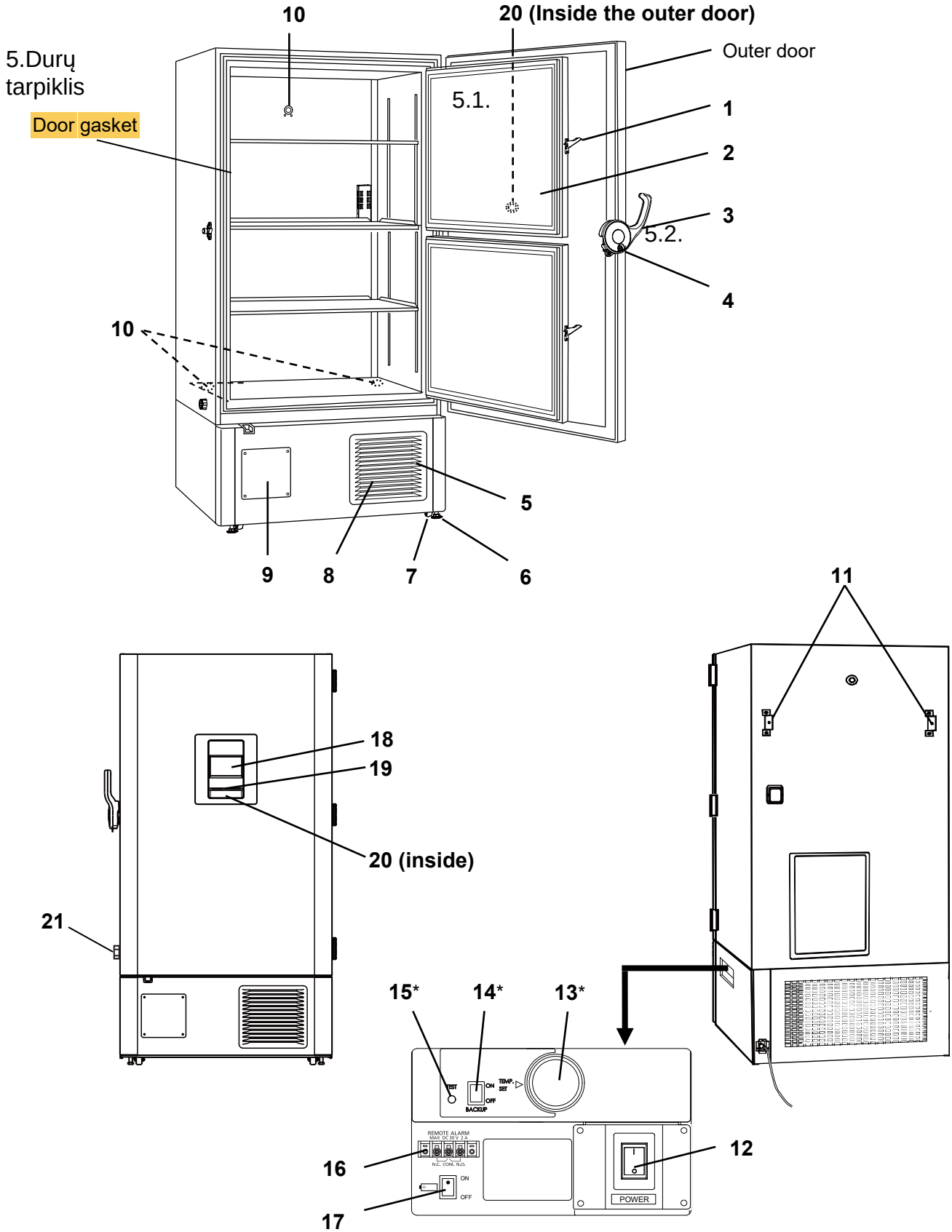
■ The effective storage period depends on the sample condition and storage temperature. It is necessary to determine the storage temperature and period suitable for the purpose.

■ For the live cells, the lower storage temperature should be required for long term storage. It is recommended to store the live cells at -130 ºC or lower.

FREEZER COMPONENTS

Main body

The model below is the MDF-DU702VH. However, the MDF-DU502VH is also equivalent structures.



* When an optional backup cooling kit is installed.

FREEZER COMPONENTS

1. Inner door latch: Always lock the inner door latch when the inner door is closed.

2. Inner door: This prevents cold air from escaping when the outer door is opened. Always be sure to close the inner door securely before closing the outer door. The inner door can be removed for cleaning or defrosting [page 52].

3. Outer door latch: Always lock the outer door latch when the outer door is closed. Provision has been made for use of an additional padlock (not included).

5.3. Rakto skylė: Pasukite raktą pagal laikrodžio rodyklę į 180 ° kampą, o išorinės durys yra patikimai užrakintos.

4. Keyhole: Turn clockwise to 180° with a key and the outer door is securely locked.

5. Air intake vent (grille): Do not block this vent to keep the proper cooling performance.

6. Leveling foot These are screw bolts used to install and fix the unit. Adjust the height of the leveling feet by turning the screw bolts until 2 front casters are away from the floor.

Ratukai: kad būtų lengviau perkelti šaldiklį, yra 4 ratukai. Montuodami sureguliuokite išlyginamąsias kojas taip, kad priekiniai 2 ratukai negalėtų liestis su grindimis.

24. **7. Caster:** 4 casters are provided to facilitate moving of the cabinet. For the installation, adjust the leveling feet so that the front 2 casters cannot contact with the floor.

8. Condenser filter (behind the grille): This filter prevents the dust from accumulating on the condenser. A dusty condenser filter may cause failure of refrigerating device. Clean the condenser filter once a month [page 51].

9. Space for temperature recorder: A temperature recorder (optional) can be mounted here so that the chamber temperature can be recorded automatically [page 55].

10. Access port (rear and bottom): These ports are used to pass the sensor or cable of measuring equipment, the sensor of a temperature recorder (optional), or the nozzle of a back-up cooling kit (optional) to the chamber.

11. Fixture (on back side): Use the fixtures and secure the unit to a wall with a strong rope or chain [page 17].

12. Power switch: This is the power switch of the unit. **(**ON="I",OFF="○"**)**

13. Temperature setting knob (TEMP. SET)*: It is the knob which adjusts injection set temperature of the backup cooling kit [page 56].

14. Backup power switch (BACK UP)*: Power switch of the backup cooling kit [page 56].

15. Backup test switch (TEST)*: It is the switch to confirm that the backup cooling kit can inject liquid CO_2 [page 56].

16. Remote alarm terminal: A remote alarm device (separately available) can be connected to this terminal. The remote alarm relays the alarm to an operator in a remote location if the unit is un attended [page 15].

23. **17. Battery switch:** This is an ON-OFF switch for the battery for the power-failure alarm. Always turn this switch on when the unit is operating to ensure that the power-failure alarm is working. Turn this switch off when the unit is not used for a long period in order to protect the battery.

23. Akumuliatoriaus jungiklis: Tai akumuliatoriaus įjungimo ir išjungimo jungiklis, skirtas įjungti elektros energijos tiekimo sutrikimo signalizaciją. Visada įjunkite šį jungiklį, kai įrenginys veikia, kad įsitikintumėte, jog maitinimo sutrikimo aliarmas veikia. Išjunkite šį jungiklį, kai įrenginys ilgą laiką nenaudojamas, kad apsaugotumėte akumuliatorių.

18. LCD touch panel: [pages 13 - 14]

19. USB port: Insert USB memory to export operations and alarms log [pages 36 - 43].
Note: It is impossible to use USB memory which is required password input.

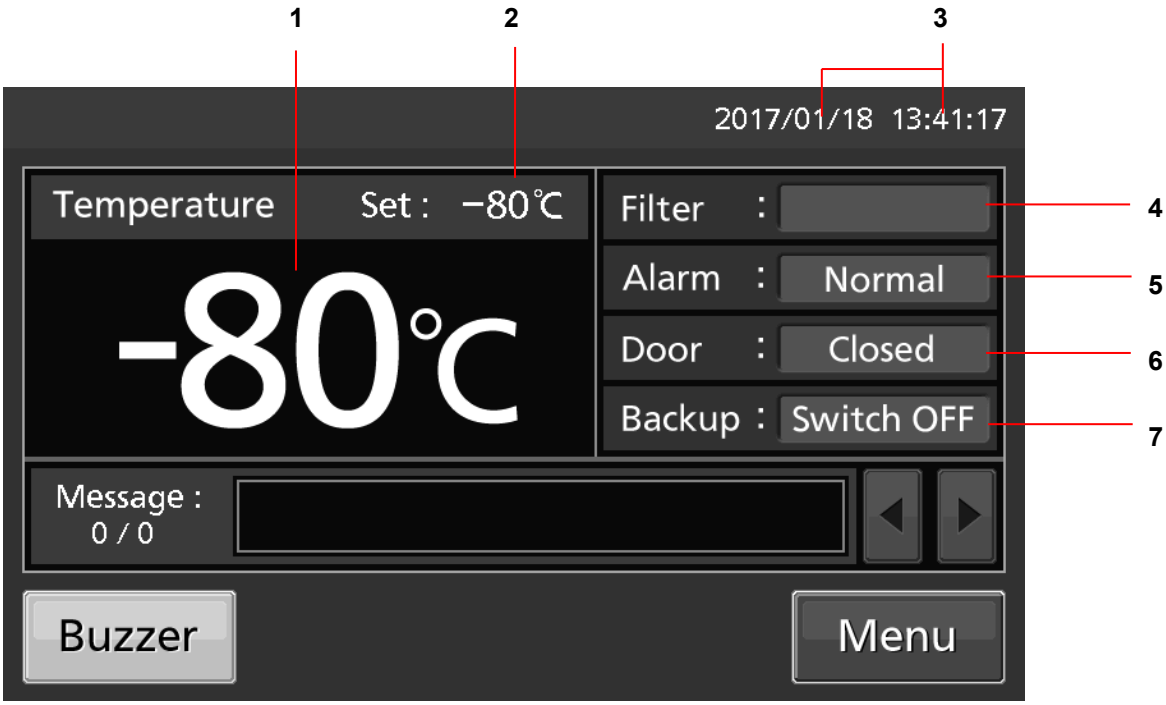
20. Air intake port: This operates automatically when the outer door is closed. The outer door can be opened easily because this port intakes the outer air and the pressure difference between the chamber and outside is deleted. During the operation of this port, the suction noise arises, but this is not a malfunction.

21. Air intake port (Manual): Adjust the pressure difference inside and outside the chamber manually to open the outer door smoothly [page 15].

* When an optional backup cooling kit is installed.

LCD touch panel

The following display (called the Top screen) will appear when the power switch is turned ON.
Note: It takes approximately 20 seconds until Top screen is displayed.



1. Present temperature display field: The current chamber temperature is displayed.
Note: An integer rounded off below a decimal point is displayed.

2. Set temperature value display field: The set value of chamber temperature is displayed. Default setting: -80 ºC.

3. Present date/time display field: Normally, this indicator shows date and time. The date and time is simply set when the freezer is shipped from the factory [page 44].

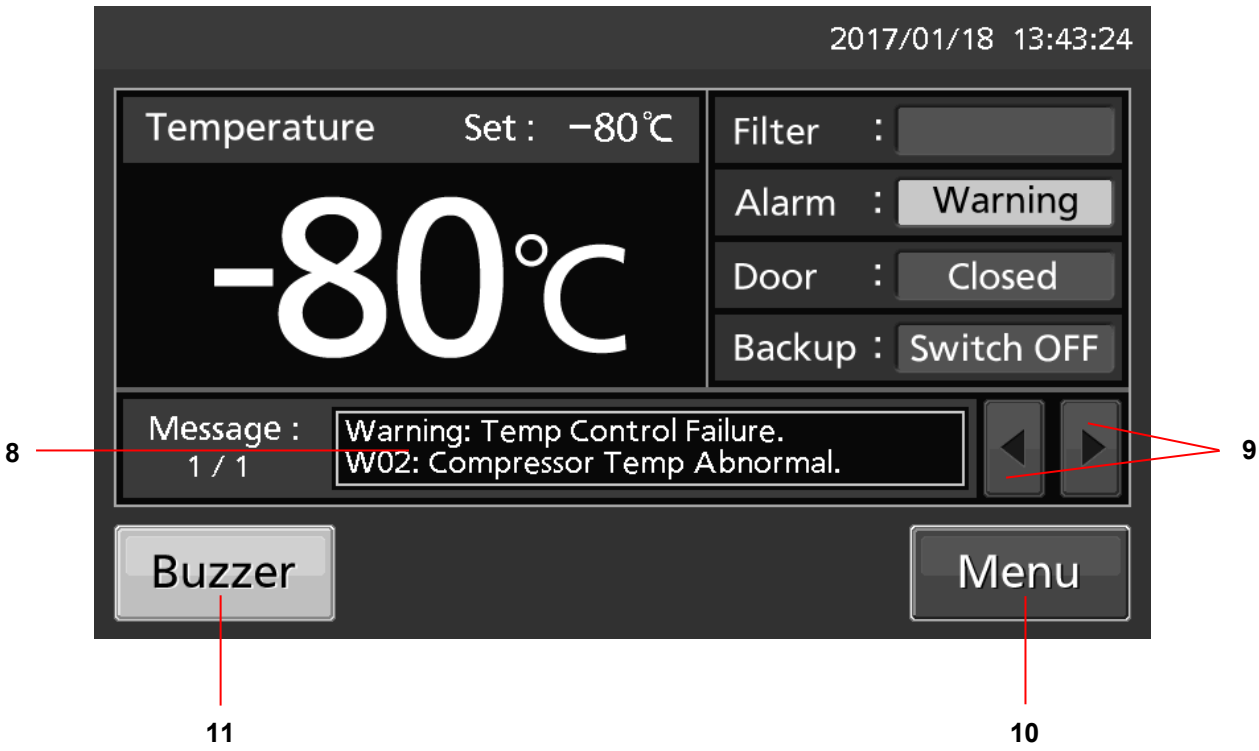
4. Filter alarm indicator: This indicator is lit when the excessive dust is accumulated on the condenser filter. When this indicator is lit, clean the condenser filter following the procedure [page 51].

5. Alarm display: [pages 47 - 48]
Normal condition: “Normal” is displayed.
Alarm-activated, buzzer-delayed: “Alarm” is displayed alternately in normal characters and reverse video.
Alarm-activated, buzzer-sounding: “Warning” is displayed alternately in normal characters and reverse video.

6. Door (opening/closing) display:
Open: “Open” is displayed alternately in normal characters and reverse video.
Close: “Closed” is displayed.

7. Backup display: (It is displayed only when an optional backup cooling kit is installed) ON/OFF of the backup power switch is displayed [page 56].
ON: “Switch ON” is displayed.
OFF: “Switch OFF” is displayed.

FREEZER COMPONENTS



8. Message display field: The information of the operation monitor system, alarms or status are displayed when fault occurs [pages 47 -48].

9. Message select key: When there are a number of alarm, status or information of the operation monitor system, the message on the screen is changeable.

10. Menu key: Press this key to lead the Menu screen. It is possible to set various setting on the Menu screen [page 21].

11. Buzzer key: Press this key to silence the buzzer. However, when the ring back is ON, the buzzer will sound again when the ring back passed and the alarm state still continues [pages 30 - 31 and 49].

22.2. Apie šio įrenginio aliarmą galima pranešti nuo įrenginio nutolusioje vietoje, prijungiant išorinį aliarmo įrenginį prie nuotolinio aliarmo terminalo. Nuotolinio aliarmo išėjimo tipas ir elgsena [47–48 puslapiai]

FREEZER COMPONENTS

Remote alarm terminal

22.2. The alarm of this unit can be informed at a remote location from this unit by connecting the external alarm device to the remote alarm terminals. For the type and behavior of remote alarm output [pages 47 - 48].

The terminal of the remote alarm is installed at the right side of the unit (See the figure on the point). The alarm is outputted from this terminal. Contact capacity is DC 30 V, 2 A.
When Buzzer key is pressed, the behavior of the remote alarm is showed in Table.1.
Note: In the door alarm, the remote alarm does not work [page 48].

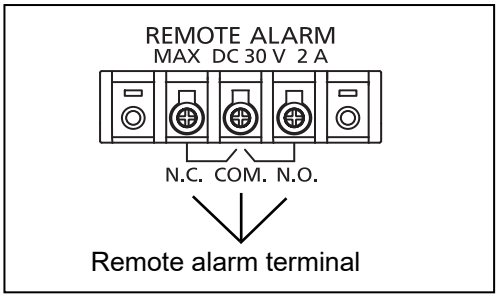


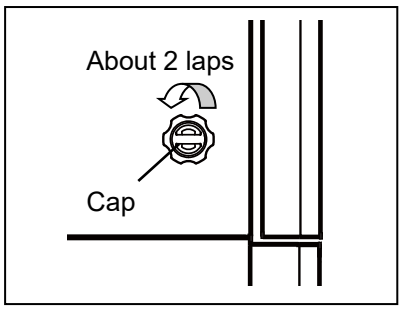
Table 1 The behavior of the remote alarm when pressing Buzzer key

Remote Alarm setting [pages 30 – 31]	Connecting terminal	Normal condition	Abnormal condition (Including in the cases of power outage and of where the power plug is pulled out.)	
				When pressing Buzzer key
ON: Non-interlock with Buzzer key	COM.-N.C.	Close	Open	Open (Maintain in abnormality)
	COM.-N.O.	Open	Close	Close (Maintain in abnormality)
OFF: Interlock with Buzzer key	COM.-N.C.	Close	Open	Close (Return to normal)
	COM.-N.O.	Open	Close	Open (Return to normal)

Use a twisted shielded wire for the connection.
Type; UL 2343, UL 2448, UL 2464, UL2552, UL2623.
Length: 30 m max.

Air intake port (Manual)

It may be difficult to open the outer door immediately after closing the outer door. This is due to the difference in presssure inside and outside of the chamber.
To open the outer door smoothly, follow the procedure below:



1. Loosen the cap on the air intake port by 2 turns, or remove the cap.
2. Allow about twenty seconds before opening the outer door.
3. Open the outer door.
4. Replace and fasten the cap firmly after closing the outer door.
✧Improper replacement may cause the temperature to rise or condensation around the air intake port.

The outer door may still not open even if the cap on the air intake port is removed. In this case, remove the cap and check for frost inside the air intake port. If excessive frost has built up in the air intake port, remove with the enclosed " stick for air intake port cleaning ". Check and remove excessive frost once a month. Refer to page 50 for details.
✧Do not use any tools with sharp edges (such as knives or screw-drivers) to remove the frost in the air intake port.

INSTALLATION SITE

This unit must be installed in a location which meets all the conditions described below.
✧If the unit is installed in a location which does not meet the conditions, its specified performance may not be achieved or malfunctions and accidents may occur.

■ A location not exposed to direct sunlight
Avoid any location which is exposed to direct sunlight. Installing the unit in a location exposed to direct sunlight may reduce its cooling performance.

■ A well-ventilated (airy) location
In order to ensure ventilation, leave clearances of at least 10 cm around the unit (at the left, right, top and back). Blocking the ventilation may reduce the unit's cooling performance or cause malfunctions.

■ A location away from sources of heat
Avoid any location which is close to a major source of heat (such as a heater or boiler). Installing the unit near a major source of heat may reduce the unit's cooling performance.

■ A location with minimal changes in temperature
Avoid any location where the ambient temperature is subject to sudden changes. If the unit is installed in a location where the ambient temperature is subject to sudden changes, it will not be possible to achieve a stable cooling performance.

■ A flat surface where the floor is also capable of bearing the total combined weight (product + optional accessories + stored items)
Install the unit on a flat surface which is even and which is capable of bearing the total combined weight (product + optional accessories + stored items). If the unit is installed where the surface is uneven or where the unit will be inclined at an angle, the unit will be unstable, and accidents or injuries may occur and/or unnecessary vibration or noise may be generated.

■ A location with minimal humidity
Install the unit in a location where the relative humidity is less than 80 %R.H. Installing the unit in a very humid location may cause earth faults and/or electric shock.

■ A location free of flammable or corrosive gases
Avoid any location exposed to flammable or corrosive gases. Flammable or corrosive gases can cause explosions and/or a fire. Furthermore, corrosion of the electrical parts may cause the insulation to be reduced and result in earth faults and/or electric shock.

■ A location where nothing can fall onto the unit
Avoid locations where objects may fall onto the unit. Objects falling and hitting the unit may cause it to break down or fail.

INSTALLATION

When installing the unit, follow the steps below to secure the unit properly, and also be absolutely sure to earth the unit.

✧In addition, install an earth leakage circuit breaker (on the unit's power supply side), which is mandatory under the applicable laws and regulations.

1. Preparations after unpacking

Remove all the tape used to secure the doors and interior parts, and leave the doors open for a short while for ventilation.

If any surfaces of the outer cabinet are dirty, wipe the surface using a cloth moistened with a diluted neutral dish-washing detergent.

✧Using an undiluted solution of detergent may cause the unit's plastic areas to crack. Follow the directions on the detergent for details of dilution.

✧After wiping the unit using the diluted detergent, be absolutely sure to wipe the surfaces with a cloth dipped in clean water to remove traces of the detergent. After this, be absolutely sure to wipe the surfaces with a dry cloth, allowing the surfaces of the outer cabinet to dry out completely, and then proceed with the installation.

Note:

Remove the cable tie that bands the power supply cord. Prolonged contact with the tie may cause corrosion of the cord coating.

2. Securing and levelling the unit using the levelling feet

Rotate the front levelling feet clockwise until the casters are raised 5 mm to 10 mm above the floor surface. (Fig. 1)

In addition, rotate the levelling feet slightly clockwise or anticlockwise, and adjust them so that the unit is completely level.

✧When the casters are raised from the floor surface, the unit will be secured. If they are left touching the floor, the unit may accidently move when its door is opened or closed.

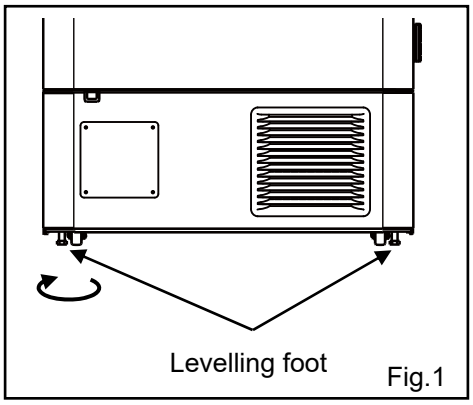


Fig.1

3. Securing the unit by using the fixtures

Use the fixtures on the rear panel of the unit, and secure the unit to a wall with a strong rope or chain. (Fig. 2)

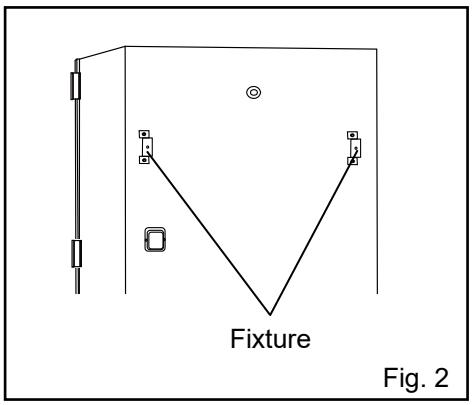


Fig. 2

INSTALLATION

4. Preventing electric shock by earthing the unit

When installing the unit, be absolutely sure to earth (ground) it. Earthing is necessary to prevent electric shock resulting from deterioration of electrical insulations

✧This unit comes with a 3-pin plug having one earth pin. Earthing work is not required in the case of a 3-pin power outlet equipped with an earth contact.

✧If the power outlet is not a 3-pin outlet equipped with an earth contact, ask a qualified contractor to do the earthing work.

5. Setting up the shelves

Three shelves are packaged at the bottom of the chamber. Set the shelves firmly in place on the shelf stoppers at the standard locations. (Fig. 3)

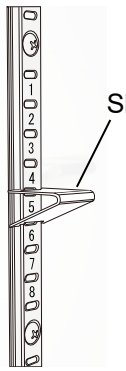


Fig. 3

6. Installing an earth leakage circuit breaker

Install an earth leakage circuit breaker (on the unit's power supply side), which is mandatory under the applicable laws and regulations.

✧Contact our sales representative or agent to arrange the installation of an earth leakage circuit breaker.

START-UP PROCEDURE

Follow this procedure for the initial operation of the unit and for consequent operations (after temporary stoppage for cleaning, maintenance or moving).
✧After a power failure, the unit will restart operation automatically with the same settings as before the power failure. [page 20],

1. Check that the following switches are turned off: [power switch, battery switch, switch of the optional back-up cooling kit (if installed)].

2. Connect the power supply cord to the dedicated power source with the appropriate rating with the chamber empty.

3. Turn on the power switch.

4. Turn on the battery switch.
Note: When the battery switch for power failure alarm is OFF, “S20: Battery Inactive, SW may be OFF.” is displayed in the message display field. By turning ON the battery switch for power failure alarm, this message disappears.

5. Set the desired chamber temperature [pages 24 - 25].
✧The factory setting of chamber temperature is -80 ºC.

6. Using the temperature display, check that the chamber temperature has cooled to the set temperature.
✧Check that the chamber temperature falls to the set temperature when the start-up after cleaning, maintenance or moving.

7. Turn on the switch of the optional back-up cooling kit (if installed).

8. Test the alarm system. Make sure that the buzzer sounds by pressing the Buzzer key for 5 seconds. Press the Buzzer key again to stop the buzzer and complete the alarm test.

9. Press the test switch of the optional back-up cooling kit (if installed) to check it is working.

10. Gradually place the material inside the chamber.
✧Putting a large amount of material into the chamber at one time causes the temperature to rise.

11. Set all parameters (alarm setting, log setting, etc.) as necessary.

Note:
• When closing the outer door push the latch until the latch is locked in place. Insufficient pushing can lead to temperature rise in the chamber.
• In case some optional inventory racks are in the chamber, be careful not to drop inventory rack when pulling out it.

START-UP PROCEDURE

Operation during power failure

When the battery switch for power failure is ON during a power failure the following will occur:

●The power failure alarm is activated [page 47].
Press Buzzer key to silence the buzzer of the power failure alarm. In case the ring back is turned ON, the buzzer will sound again if the power has not resumed after the ring back set time has elapsed [page 31].

●LCD touch panel is turned OFF [page 47].
By touching the LCD touch panel, the LCD touch panel becomes brighter for 5 seconds.

●The High/Low Alarm is ready to activate during a power failure [pages 24 - 25 and 47].
An alarm message is displayed on the message display field. Alarm display, the buzzer and the remote alarm as the power failure alarm are being activated.

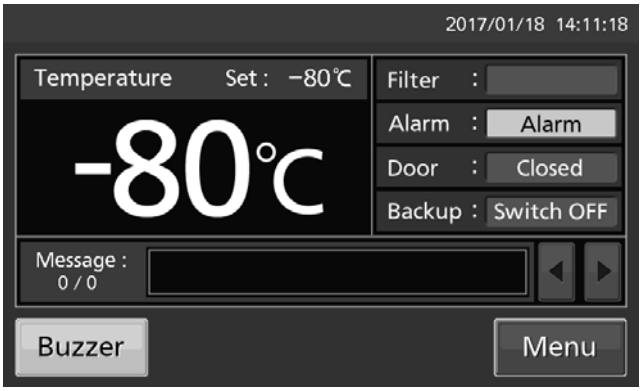
●The clock will continue.

●Operation log data and alarm log data is saved during a power failure.
Note: If the battery for power failure alarm is flat during a power failure, subsequent operation log data and alarm log data will not be saved.

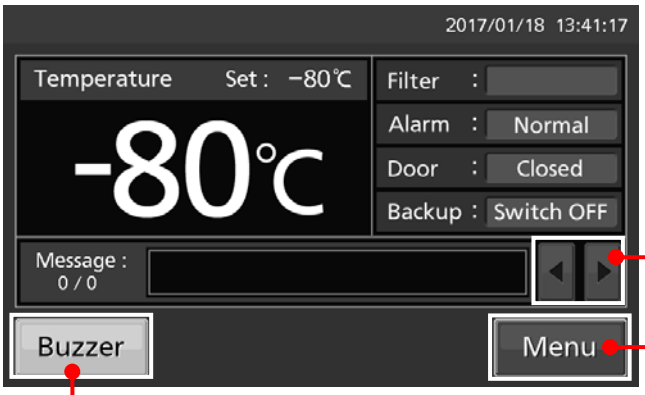
Operation after recovery from power failure

The set value is memorized by nonvolatile memory. The chamber will resume operation with settings from before the power failure.
Note:
• It may take up to 1 minute for the LCD touch panel to light up after recovery from power failure.
• All products connected to a power source will start at the same time after recovery from a power failure. This can cause a voltage fluctuation will could affect the starting of the unit. To prevent this situation, set the appropriate compressor delay time of each unit [pages 25 - 26].

Although the power failure alarm will be cancelled after recovery from a power failure, the buzzer will continue to sound and “Alarm” will be displayed alternately in normal characters and reverse video in the alarm display [page 49]. By pressing the Buzzer key, the alarm display will return to “Normal” and the buzzer will stop.
Note: It is possible to see the past alarms in the “Displaying alarm log” [pages 39 - 40].



BASIC OPERATION ON LCD TOUCH PANEL



♦Message select key:
(Operate) Changing some messages

♦Buzzer key: (Operate) Silencing the buzzer
(Alarm is not canceled except for some alarms; page 49)

●Operation from Menu key

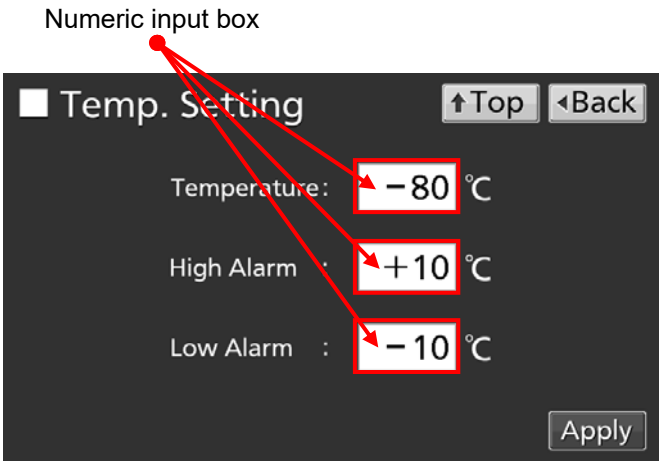
■Menu screen				Page
♦Set →	■Temp. Setting screen	(Setting)	Temp., High Alarm, Low Alarm	24~25
♦Log →	■Log screen			
	♦Chart → ■Chart screen			
	♦Actual Temp.	(Display)	Chamber temp. log graph (can be exported)	33~35
	♦Door Opening	(Display)	Door opening log graph (can be exported)	33~35
	♦Data Export → ■Export screen			
	♦Actual Temp.	(Export)	Chamber temperature log	36~38
	♦Door Opening	(Export)	Door opening log	36~38
	♦Setting	(Setting)	Log interval, Unique ID	32~33
	♦Alarm	(Display)	Alarm log (can be exported)	39~40
	♦Alarm Export	(Export)	Alarm log	41~42
♦Key Lock →	■Key Lock screen	(Setting)	Key lock ON/OFF, password	26~29
♦Tools →	■Tools screen			
	♦Operation Setting	(Setting)	Comp. delay time	25~26
	♦Alarm Setting	(Setting)	Alarm delay, ring back, remote alarm etc.	30~31
	♦DAQ Setting		Do not press (It is not possible to set.)	
	♦Date & Time	(Setting)	Date, time	44
	♦Brightness/Sleep	(Setting)	Brightness, sleep ON/OFF etc.	45~46

How to input numerical values and alphanumeric characters

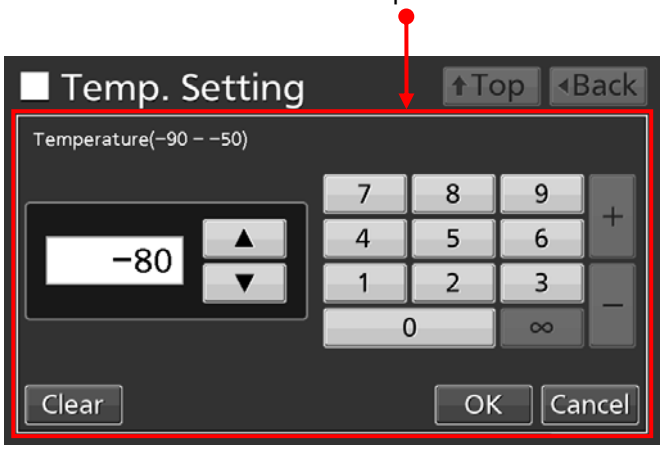
On each screen in the LCD touch panel, it may be necessary to input numerical value or alphanumeric characters.

●When inputting a numerical value

1. Pressing a numeric input box, causes a numeric input window to be displayed.



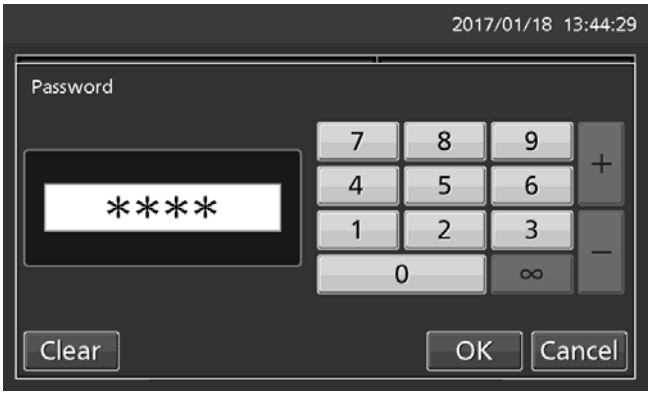
2. Press a numeric key or use the Up/Down keys to input a numerical value, and press the OK key.



●Key description

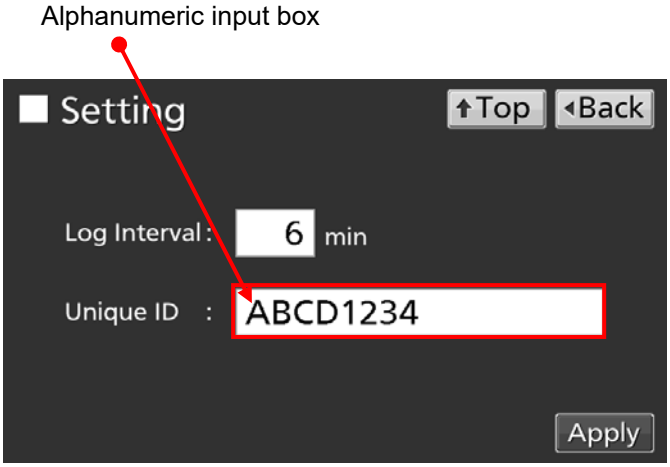
- Numeric key (0~9): Inputs the numerical value.
- Up/Down key (▲/▼): Increases or decreases the numerical value displayed in the numeric input box.
- Clear key: Deletes the numerical value displayed on the numeric input box.
- Cancel key: Stops inputting on the numeric input box and closes the input window.

Note: Up/Down key may not always be displayed.

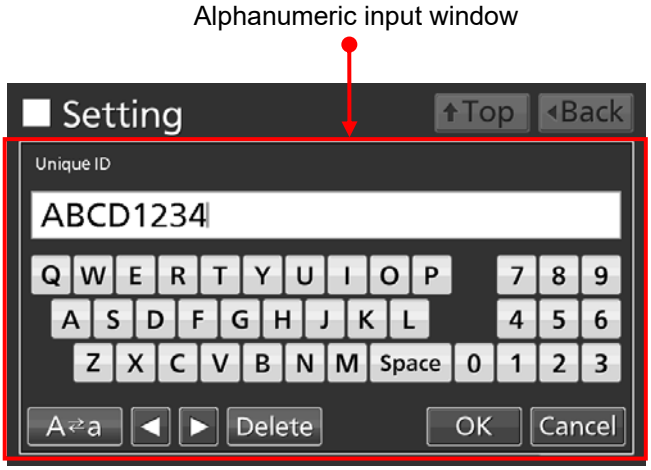


●When inputting alphanumeric characters

1. Pressing an alphanumeric input box, causes an alphanumeric input window to be displayed.



2. Press an alphabetic or numeric key to input alphanumeric characters, and press the OK key.



●Key description

• Alphabetic key (A~Z, Space): Inputs alphabetic characters or spaces.
• Numeric key (0~9): Inputs numerical values.
• UC/LC key (A⇄a): Changes UC/LC of alphabetic key.
• Left/Right key (◀ / ▶): Moves the cursor to left/right.
• Delete key: Deletes an alphanumeric character on the left side of the cursor.
• Cancel key: Stops inputting on the alphanumeric input box and closes the alphanumeric input window.

Note: While the alphanumeric input window is open, it is not possible to operate the Top key or Back key.

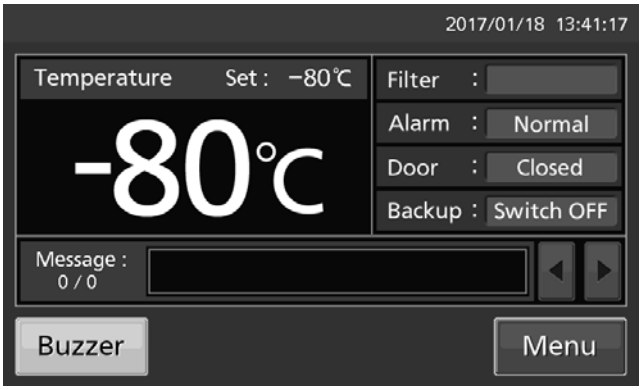
[Auto return function]
When there is no key operation for about 90 seconds on the screen excluding the top screen: Exit the setting mode and return to the top screen.
< When the sleep function is on >
When there is no key operation for about 90 seconds without alarm / error after sleep state: Exit the setting mode and return to the top screen.

BASIC PARAMETERS

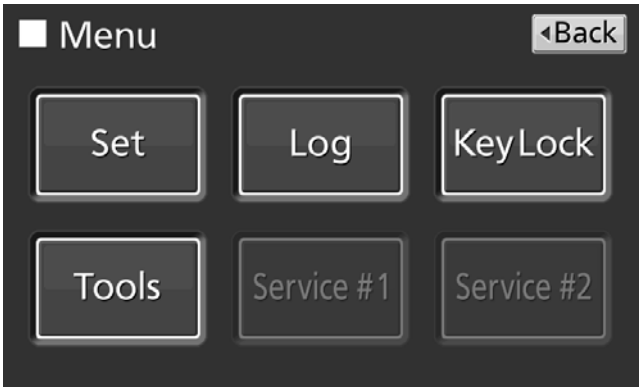
Setting Temperature and temperature alarms

Set the Temperature, High Temperature Alarm and Low Temperature Alarm for normal operation using the following procedure. The unit automatically starts operation using these settings after the power is switched on

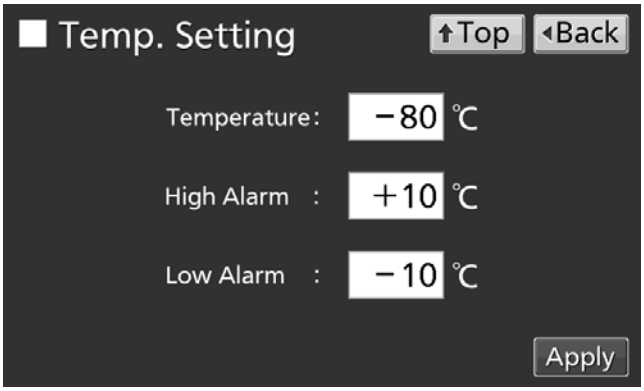
1. Press Menu key to access the Menu screen.



2. Press Set key to access the Temp. Setting screen.



3. Enter the required settings. Press Apply to save the settings. The display returns to the Menu screen.



●Parameter settings

• Temperature: Set value for chamber temperature.

Settable range: -90 ºC~-50 ºC, Control range: -86 ºC~-50 ºC, factory setting: -80 ºC.

• High Alarm: When the chamber temperature exceeds the set temperature (= the set chamber temperature plus the set value for the High Alarm)*, the High Temperature Alarm is activated.

Settable range: +5 ºC~+40 ºC, factory setting: +10 ºC.

• Low Alarm: When the chamber temperature falls below the set temperature (= the set chamber temperature minus the set value for the Low Alarm)*, the Low Temperature Alarm is activated.

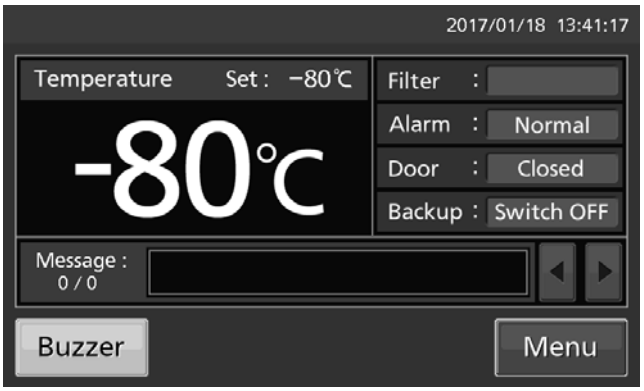
Settable range: -40 ºC~-5 ºC, factory setting: -10 ºC.

* The current chamber temperature is the value rounded to the nearest integer, so the alarms may be activated when the value of the current chamber temperature is equal to the High/Low Alarm set temperature.

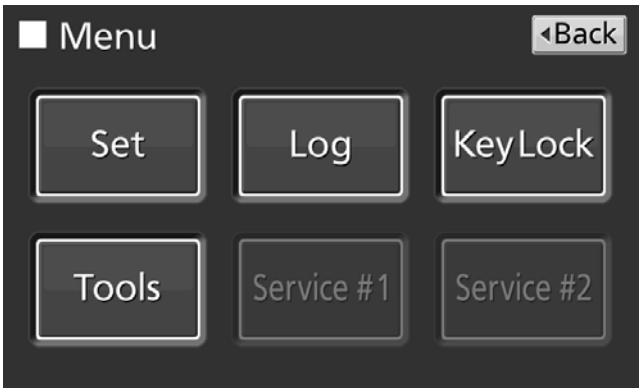
4. On the Menu screen, press Back to return to the Top screen.

Setting operation control mode

1. Press Menu key to access the Menu screen.

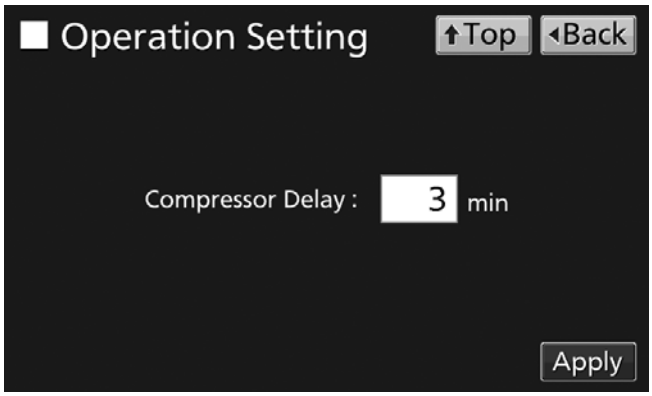


2. Press Tools key to access the Tools screen.



3. Press Operation Setting key to access the Operation Setting screen.

4. Enter the required settings. Press Apply to save the settings. The display returns to the Tools screen.



●Settings

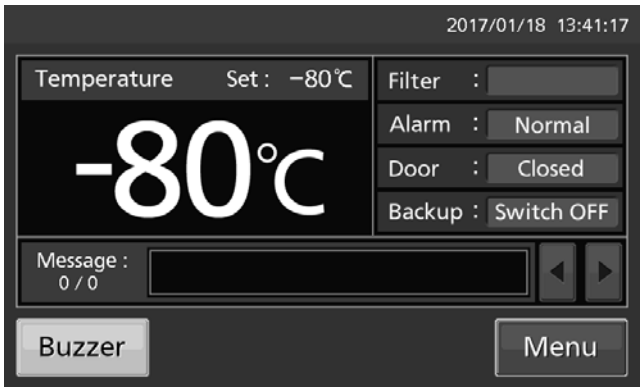
• Compressor Delay:

This controls the time from turning the unit ON until starting its compressor. This unit requires a lot of electrical power at the moment its compressor starts. When several units are kept in the same room, adjust this setting so that the compressor delay times of the different units are staggered as this will prevent the simultaneous restart of all compressors after a power failure. Settable range: 3 minutes~15 minutes, factory setting: 3 minutes.

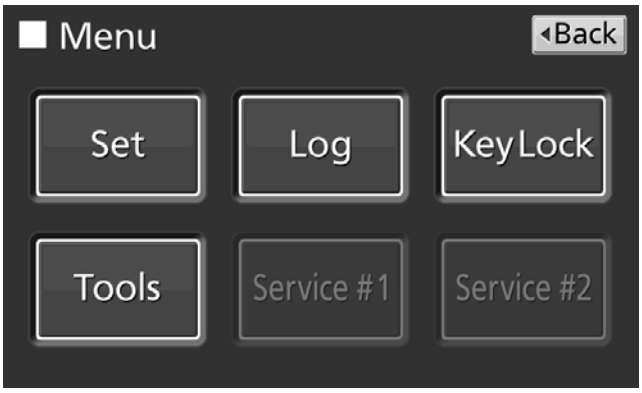
5. Press Top key to return to the Top screen.

Setting key lock

1. Press Menu key to access the Menu screen.



2. Press Key Lock key to access the Key Lock screen.



15. **3.** On the Key Lock screen, it is possible to enter each setting for the key lock.

21. Klaviatūros užrakto ekrane galima įvesti kiekvieną klaviatūros užrakto nustatymą.

• Key Lock: By holding Key Lock slide key and sliding it to the right, Key Lock turns to ON.

Slaptažodis nr. 1

• Password #1: The number (Max. 6 digits) entered here is registered the release password for Key Lock.

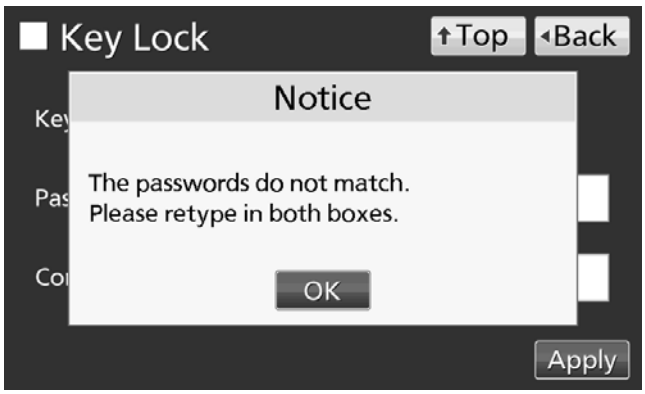
• Confirm Password #1:
To prevent erroneous input, enter the same password as in the Password #1 input box. If a different password is entered, a dialog box is displayed. Press OK and enter the correct password.

• By pressing Apply key, Key Lock turns to ON, password #1 is saved, and Confirm dialog box is displayed.

Yes: On the Key Lock screen, it is possible to set the release password #2.

No: The display returns to the Menu screen. Select [No] when it is no need to set the password #2.

Note: Two release passwords of Key Lock are settable. To release it, you can unlock by entering one of the passwords.



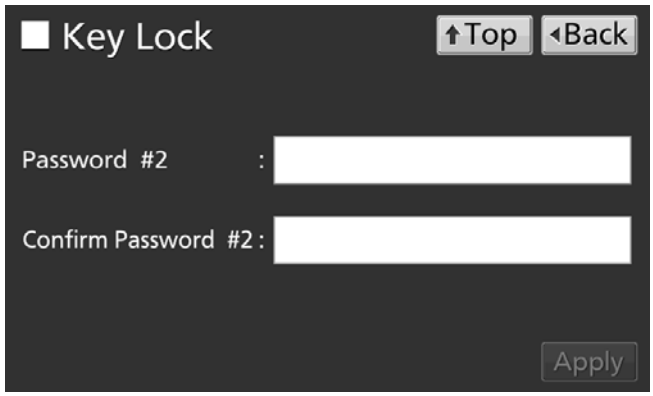
Slaptažodis nr. 2

4. Set the password #2.

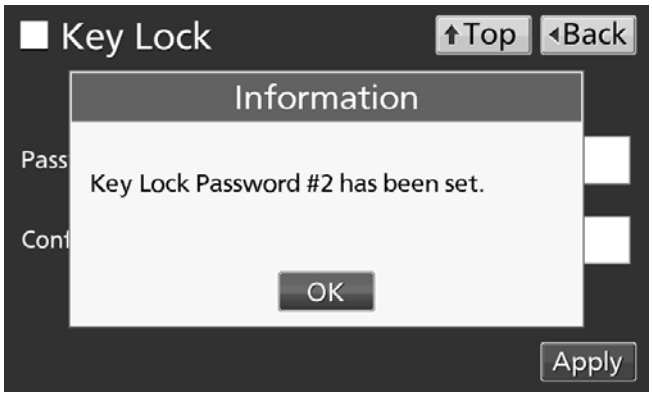
• Password #2: The number (Max. 6 digits) inputted here are registered the release password of Key Lock.

Confirm Password #2:
To prevent erroneous input, input the same password as Password #2 input box. When inputting different password, Notice dialog box is displayed. Press OK key and input the correct password.

• By pressing Apply key, the password #2 is saved and Information dialog box is displayed.



5. On the Information screen, press OK key to return to the Menu screen.



6. On the Menu screen, press Back to return to the Top screen.

Note: Manage the release password of Key Lock properly.

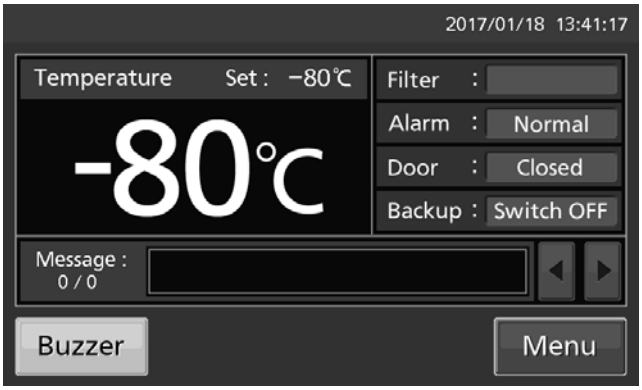
●Operation when Keylock is ON

• When pressing Menu key, a password input box is displayed, and entry of the release password is required. If two passwords are registered, you can unlock by entering one of the passwords

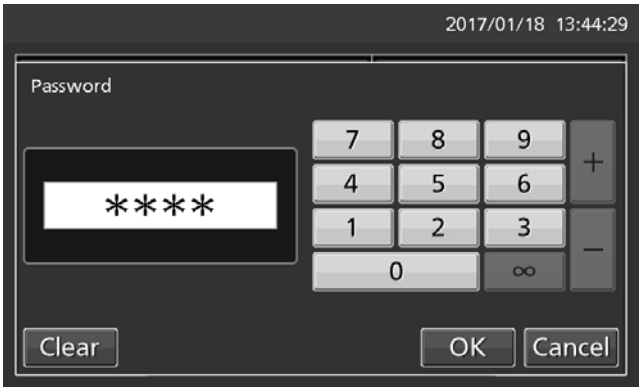
• When the entered password is incorrect, a dialog box is displayed. Press OK, and enter the correct password.

Turning off key lock

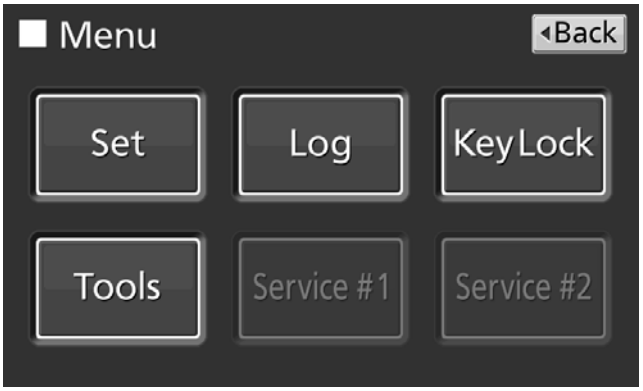
1. By pressing Menu key, the Password input window is displayed.



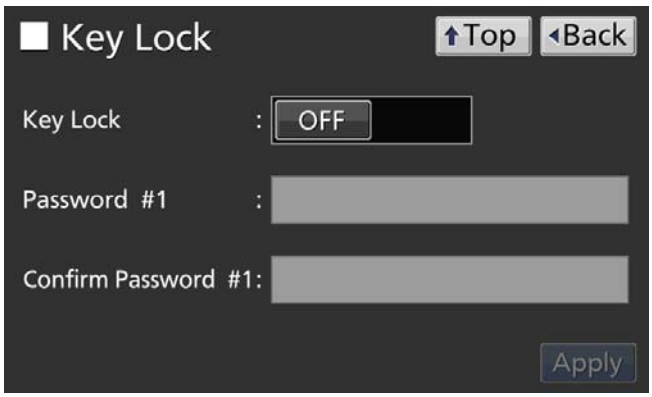
2. On Password input box, input the set release password (#1 or #2) of Key Lock, and press OK key to access the Menu screen.



3. Press Key Lock key to access the Key Lock screen.



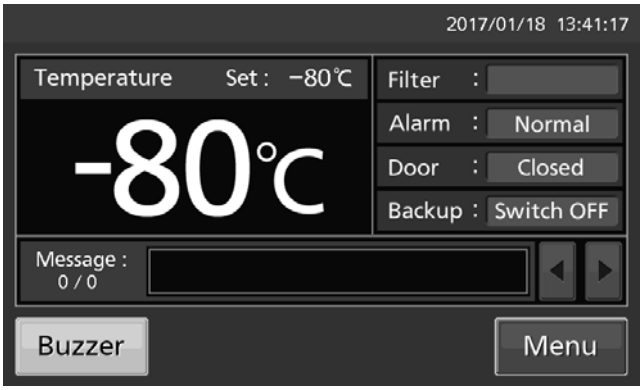
4. On the Key Lock screen, hold the Key Lock slide key and slide it to the left, to change the setting to OFF. Press Apply key to turn the key lock OFF. The display returns to the Menu screen.
Note: The release password of key Lock is deleted.



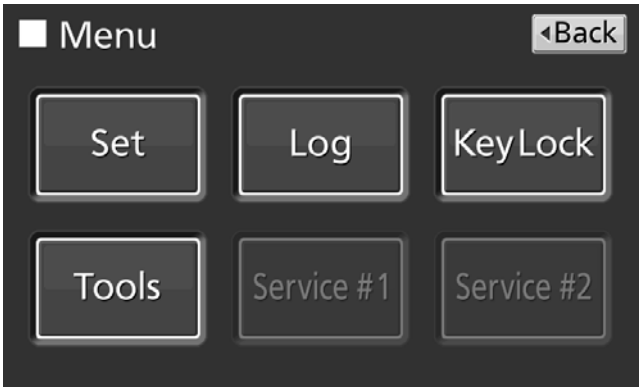
5. On the Menu screen, press Back to return to the Top screen.

ALARM PARAMETERS

1. Press Menu key to access the Menu screen.



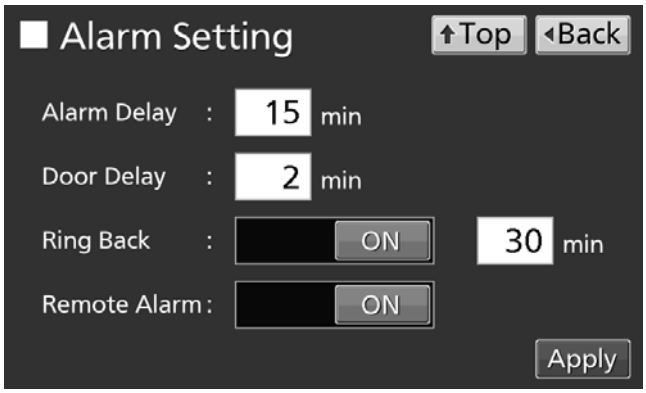
2. Press Tools key to access the Tools screen.



3. Press Alarm Setting key to access the Alarm Setting screen.

ALARM PARAMETERS

4. Enter the required settings. Press Apply to save the settings. The display returns to the Tools screen.



22.1.a. **Pasiekus aukšto ar žemo temperatūros pavojaus signalo sąlygas, aliarmo garsinis signalas pasigirs po to, kai pavojaus signalo atidėjimo laikas jai pasibaigė. Nustatymo ribos: 0-15 min.**

●Settings

• Alarm Delay:

22.1.a. When the conditions for the High or Low Temperature Alarm are reached, the alarm buzzer will sound after the alarm delay time set her as elapsed.

Settable range: 0 minute~15 minutes, factory setting: 15 minutes.

Note: When conditions return to normal within the alarm delay time, the buzzer does not sound after the elapse of the alarm delay.

• Door Delay:

When the conditions for the door alarm are reached, the alarm buzzer will sound after the alarm delay time set here has elapsed. Settable range: 0 minute~15 minutes, factory setting: 2 minutes.

Note: When conditions return to normal within the door alarm delay time, the buzzer does not sound after the elapse of the door alarm delay.

• Ring Back:

If the alarm buzzer is stopped by pressing the “Buzzer” key, the buzzer will sound again when the conditions that activated the alarm continue after the time set here has elapsed.

Settable range: 1 minute~99 minutes, factory setting: 30 minutes.

Note: For the Door alarm, the alarm is deactivated by pressing the Buzzer key and so the buzzer will not sound again [page 49].

• Remote Alarm:

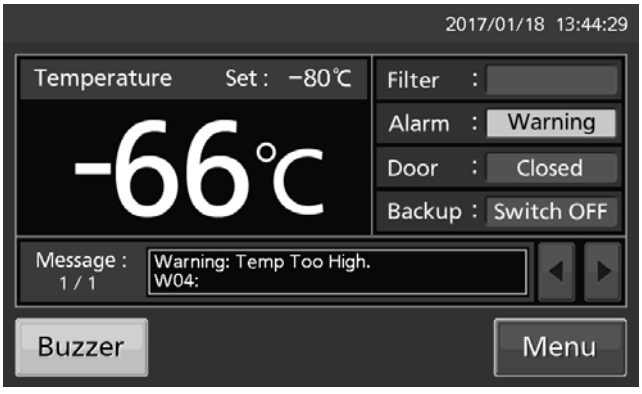
The remote alarm continues even though the buzzer is stopped by pressing the Buzzer key if Remote Alarm function is turned ON (not in conjunction with the Buzzer key). Factory setting: ON.

5. Press Top to return to the Top screen.

● In the alarm state

• When the unit’s alarm has been activated and the buzzer is sounding, the buzzer can be silenced by pressing the Buzzer key. For the behavior at the time of pressing the Buzzer key and the re-activation of the alarm, under each condition, refer to Table 2-3 on page 49.

Resolve the cause of the alarm referring to pages 47~49 The alarm itself is not deactivated by pressing the Buzzer key (except in a few cases)



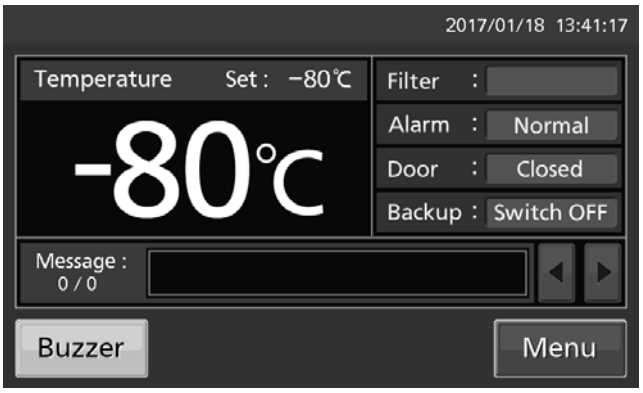
OPERATION/ALARM LOG

Setting log interval

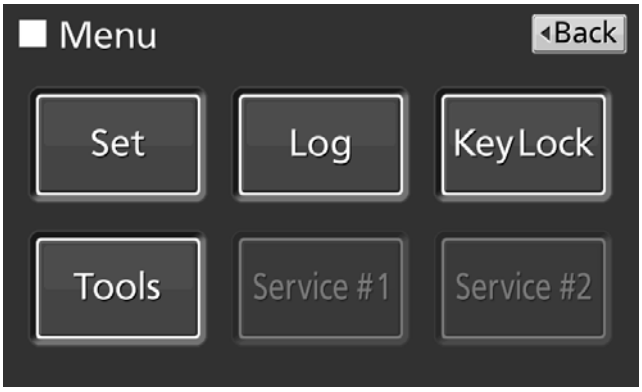
The unit can save operation log data (chamber temperature and open/close state of door).
Note: When the battery switch for power failure alarm is ON, operation log is saved during a power failure.

Use the following procedure to set the log interval (interval of acquiring the operation log).

1. Press Menu key to access the Menu screen.



2. Press Log key to access the Log screen.



3. Press Setting key to access the Setting screen.

22.3. **4.** Enter the required value for Log Interval. Press Apply to save the setting. The display returns to the Log screen.
Settable range: 2 minutes~30 minutes.
Factory setting: 6 minutes.
Note: Only an even number can be entered. When an odd number is entered and the OK key is pressed, it changes the value to an even number which is 1 less than that the number entered.
Note: It is possible to register 8-digit alphanumeric characters as the Unique ID [page 38].

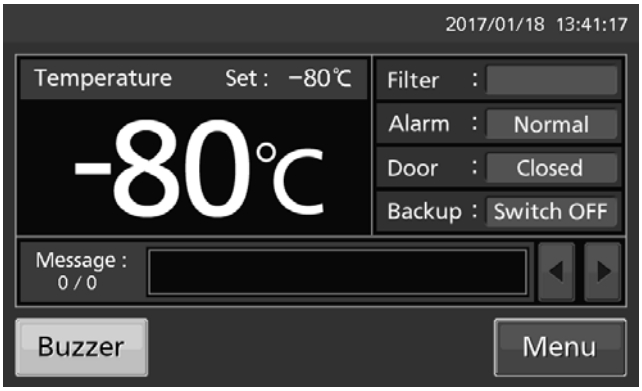
Note: Relation between log interval and the estimated amount of data that can be saved
Log interval=2 minutes: Approx. 46 days
Log interval=6 minutes: Approx. 135 days
Log interval=30 minutes: Approx. 664 days
When the amount of data saved exceeds the maximum, the oldest data is deleted and overwritten.

5. Press Top to return to the Top screen.

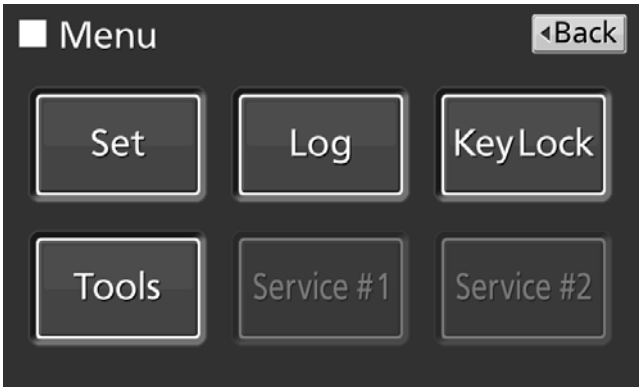
Displaying operation log

Operation log data can be displayed graphically on the LCD touch panel.
15. **Operacijų žurnalo duomenis galima grafiškai rodyti LCD jutikliniame ekrane.**

1. Press Menu key to access the Menu screen.



2. Press Log key to access the Log screen.

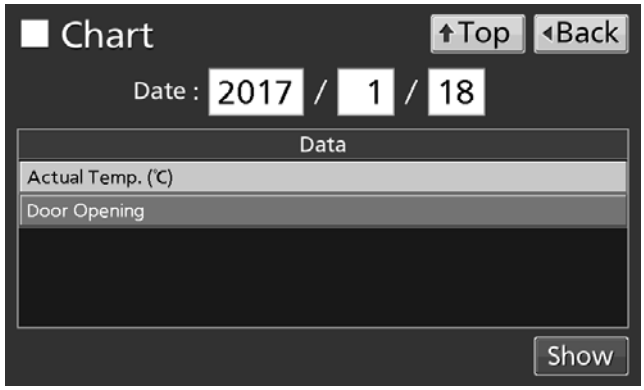


3. Press Chart key to access the Chart screen.

4. Enter the date (year / month / day) of the operation log you want to display graphically.

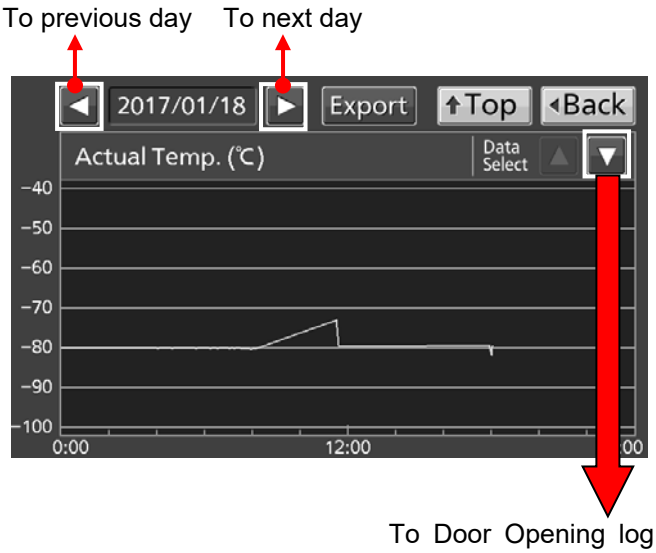
5. Press the variable you want to display and press Show. The graph of the operation log is displayed.

• Actual Temp.:
Chamber temperature log graph
(Go to procedure **6**)
• Door Opening: 15. Durų atidarymo atvaizdavimas
Open/close state of door log graph
(Go to procedure **7**)



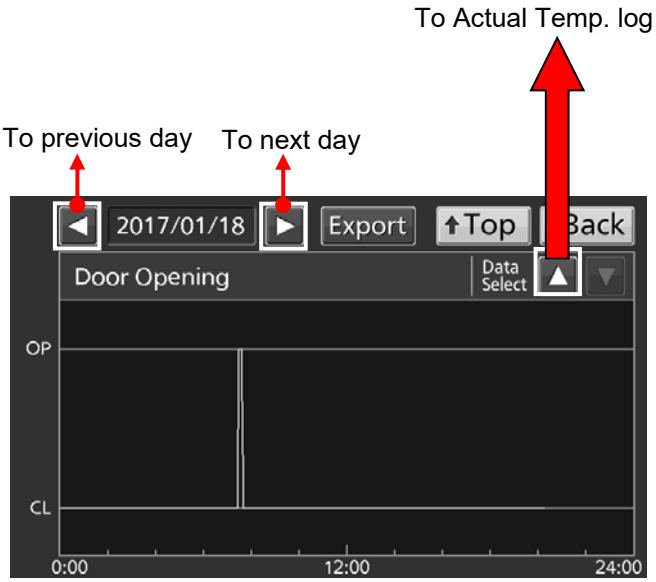
6. Actual Temp. log graph is displayed.

• Press Back key to return to the Chart screen.
• Press Top key to return to the Top screen.



7. Door Opening log graph is displayed.

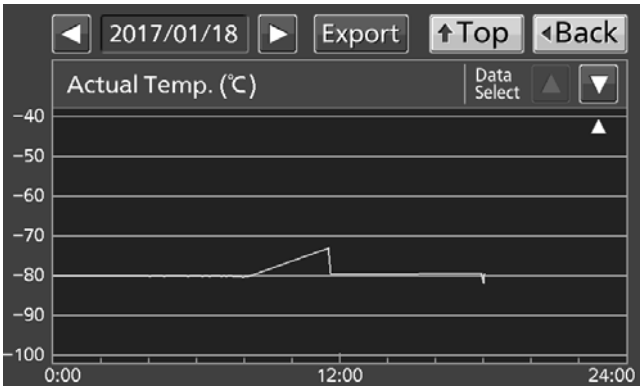
• Press Back key to return to the Chart screen.
• Press Top key to return to the Top screen.



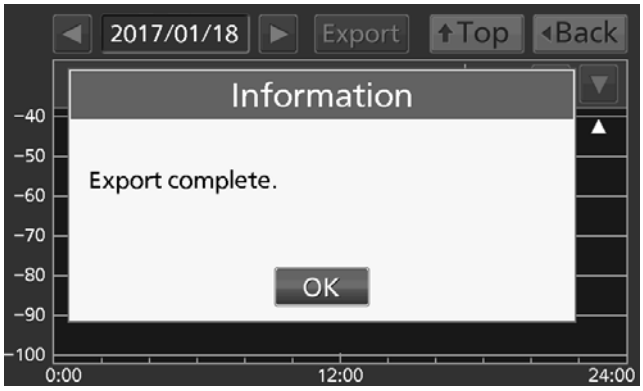
●On the Chart screen of procedure **6** or **7** log data can be exported in CSV format to the USB memory inserted into the USB port.

8. Insert the USB memory device into the USB port.
Note: It is not possible to use a USB memory device with a security function that requires entering a password.

9. Press Export key.



10. When the export is completed, a dialog box is displayed. Press OK. Press OK key. Refer to pages 37 and 38 for the details about abnormal export or exported file name.



11. Press Top to return to the Top screen.

Exporting operation log

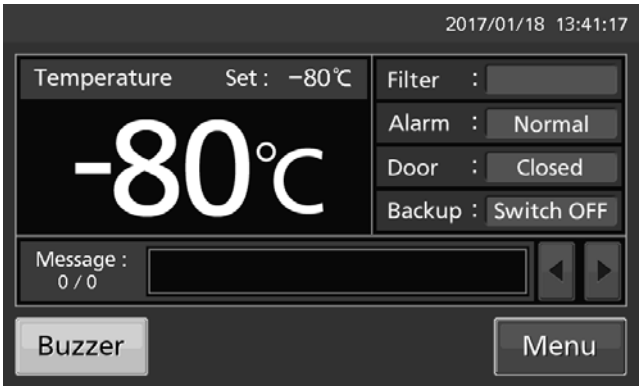
20. Operation log data can be exported in CSV format to the USB memory device inserted into the USB port.

Operacijų žurnalo duomenis galima eksportuoti CSV formatu į USB atminties įrenginį, įdėtą į USB prievadą.

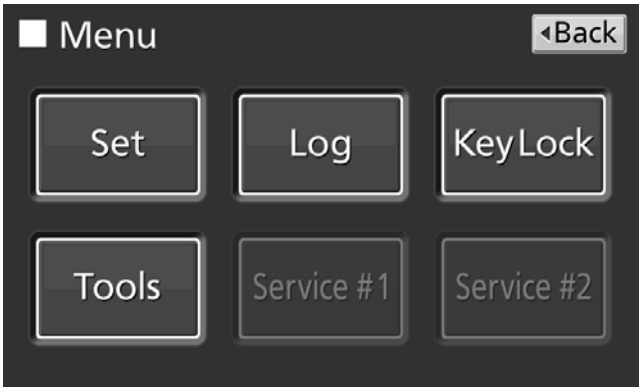
1. Insert the USB memory device into the USB port.

Note: It is not possible to use a USB memory device with a security function that requires entering a password.

2. Press Menu key to access the Menu screen.



3. Press Log key to access the Log screen.



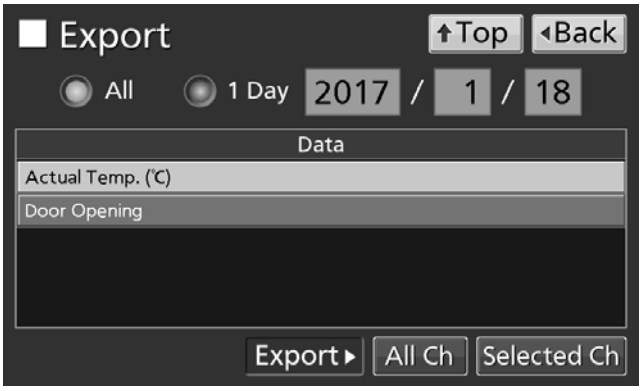
4. Press Data Export key to access the Export screen.

5. Select the time period you want to be exported.

• To export the saved operation log data for the entire period, press the All button.

• To export the operation log data for a specified date, press the 1 Day button and enter the date (year / month / day) of the operation log data you want to export.

Note: Accurate to about 1 minute per month. Refer to page 44 for the procedure of setting time.

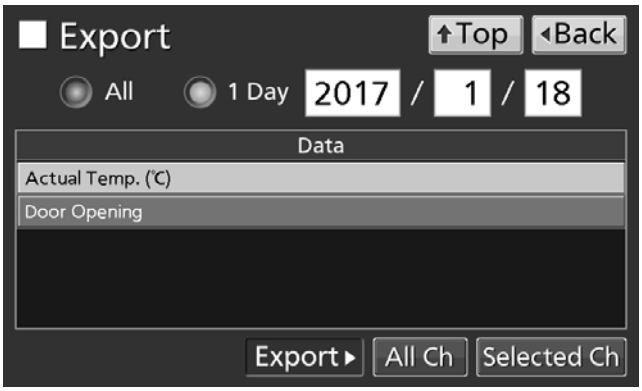


22.3. **6.** Select the type of operation log data you want to be exported.

Pasirinkite operacijų žurnalo duomenų tipą, kuriuos norite eksportuoti.

• To export all types of operation log data, press All Ch key.

• To export only selected log data press the variable to be exported and then press the Selected Ch key.



22.3. • Actual Temp.: Chamber temperature log data

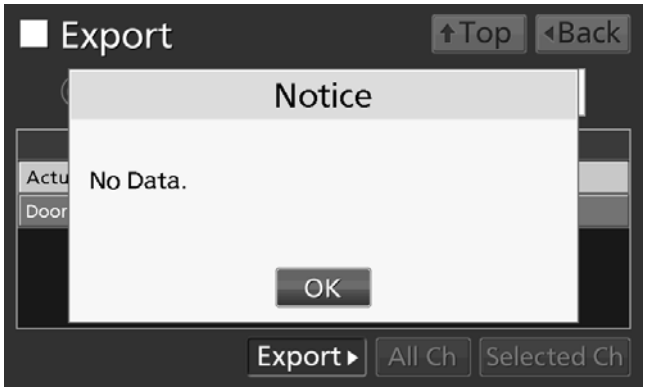
• Door Opening: Open/closed state of outer door log data

22.3. Faktinė temperatūra: kameros temperatūros žurnalo duomenys

Durų atidarymas: atidarymo/uždarymo durų būsenos duomenys

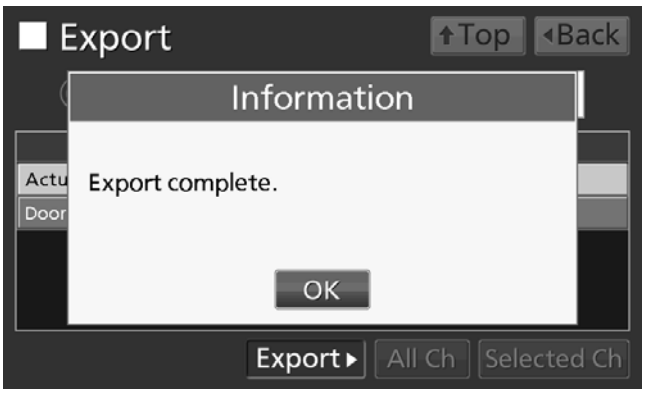
Note: When no USB memory device is inserted into the USB port, a dialog box is displayed. Press OK, and then insert a USB memory device into the USB port.

Note: When the specified operation log data does not exist, a dialog box is displayed. Press OK, and select a new period following the procedure **5** and **6**.



7. When the export is complete, a dialog box is displayed. Press OK key.

Note: Even after the export is completed, operation log data saved in the unit is not deleted.



8. Remove the USB memory device from the USB port.

Note:

• A log folder is created in the USB memory device, and the exported file is saved in this folder in CSV format. The name of the exported file is in the format; date (8 digits) - type of data.

(e.g.) When exporting all types of data using All (from Jan. 1st, 2017 to Oct. 1st, 2017):

20170101-20171001_AllCh.csv

20170101-20171001_Door.csv

(e.g.) When exporting Actual Temp. using 1 Day (Jan. 1st, 2017):

20170101_Temp.csv

✧If the file name is duplicated, A sequential number such as "-1" is added to the end of the file name to be output later.

• At the beginning of the exported file name, product name (“MDF-DU502VH” or “MDF-DU702VH”) is written. However when the Unique ID is registered [page 33], the product name and the Unique ID (8-digit) are written.

(e.g.) When “RoomA001” is set as the Unique ID of MDF-DU702VH the file name begins:

MDF-DU702VH, RoomA001

9. Press Top to return to the Top screen.

OPERATION/ALARM LOG

Displaying alarm log

The unit can save alarm log data (Max. 256 logs).

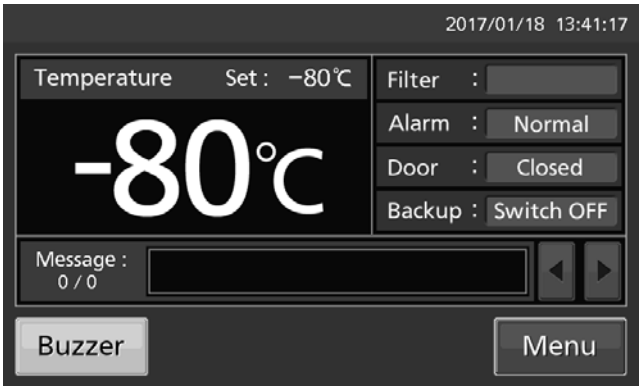
Note:

• When the number of alarm logs exceeds 256, the oldest log is deleted, and overwritten.

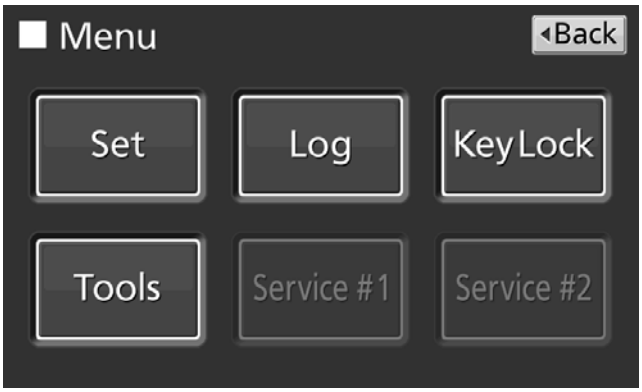
• When the battery switch for the power failure alarm is ON, operation log is saved even during a power failure.

Alarm log data can be displayed graphically on the LCD touch panel.

1. Press Menu key to access the Menu screen.



2. Press Log key to access the Log screen.



3. Press Alarm key to access the Alarm screen.

4. Alarm logs from the last 7 days (including current day) are displayed.
Note: When the number of alarm log exceeds 6, pressing the top (▲) or the bottom (▼) log scrolls the log table and hidden alarm logs can be seen.

• Press Back key to return to the Log screen.
• Press Top to return to the Top screen.

5. Change the number in the Last XX Days input box to display alarm logs for specified days (including current day)
Settable range: 1 day~45 days.
Note: Accurate to about 1 minute per month. Refer to page 44 for the procedure of setting time.

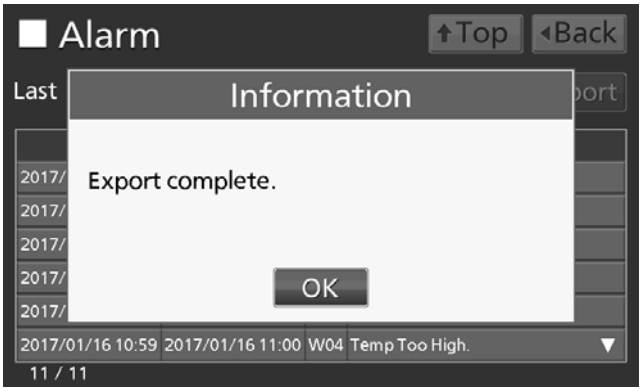
• Press Back to return to the Log screen.
• Press Top to return to the Top screen.

22.3. • From the Alarm screen, alarm log data can be exported in CSV format to the USB memory device.
Iš aliarmo ekrano aliarmo žurnalo duomenis galima eksportuoti CSV formatu į USB atminties įrenginį.

6. Insert the USB memorydevice into the USB port.
Note: It is not possible to use a USB memory device with a security function that requires entering a password.

7. Press Export.

8. When the export is completed, a dialog box is displayed. Press OK. Refer to pages 42 and 43 for the details about abnormal export or name of exported file.



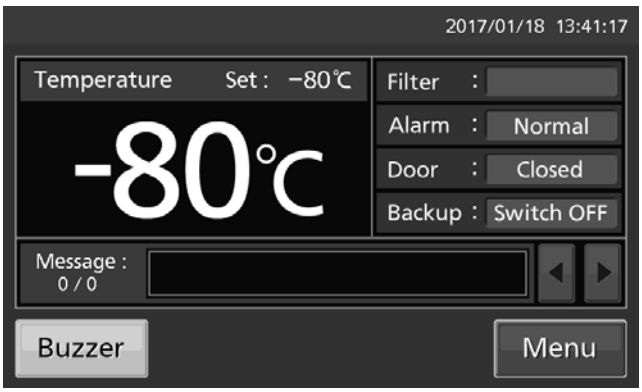
9. Press Top to return to the Top screen.

Exporting alarm log

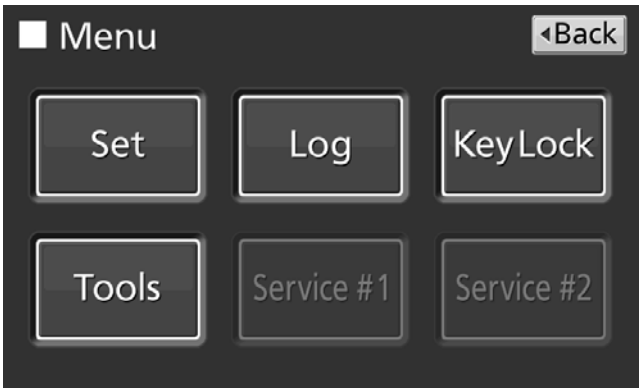
It is also possible to export alarm log data in CSV format to a USB memory device.

1. Insert a USB memory device in the USB port.
Note: It is not possible to use a USB memory device with a security function that requires entering a password.

2. Press Menu key to access the Menu screen.



3. Press Log key to access the Log screen.



4. Press Alarm Export key to access Alarm Export screen.

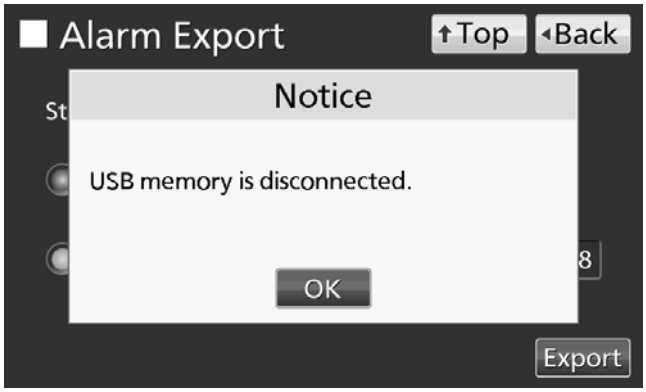
5. Select the period to export.

• To export the saved alarm log data over the entire period, press All radio button.

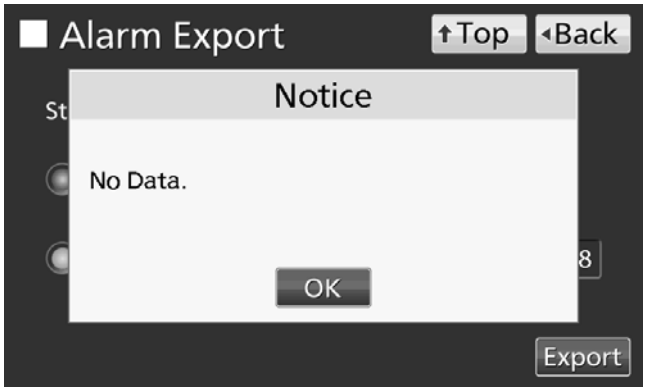
• To export data for the specified days (including current day), press Last XX Days button and enter the required number of days.
Settable range: 1 day~45 days.
Note: Accurate to about 1 minute per month. Refer to page 44 for the procedure of setting time.

6. Press Export.

Note:
• When no USB memory device is inserted into the USB port, a dialog box is displayed. Press OK and insert a USB memory device into the USB port.

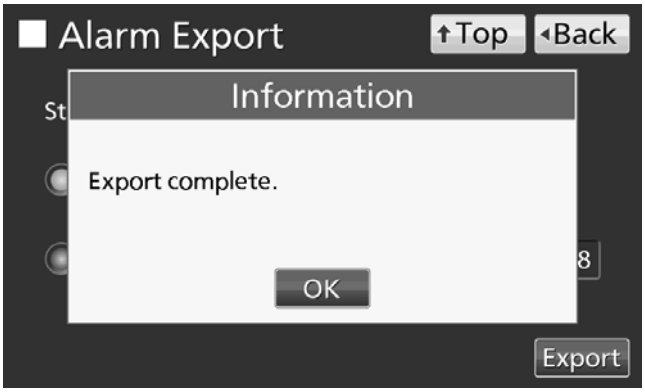


• When the specified operation log data do not exist, a dialog box is displayed. Press “OK” and select a new period following the procedure **5**.



7. When the export is completed, a dialog box is displayed. Press “OK”.

Note: Even after the export is completed, operation log data saved in the unit is not deleted.



8. Remove a USB memory device from the USB port.

Note: A log folder is created in the USB memory device, and the exported file is saved in this folder in CSV format.

Exported file name; The first date during exported period (8 digits) + the last date (8 digits) + AlarmLog

Example) When exporting alarm log data for 7 days on January 7, 2017;

20170101-20170107_AlarmLog.csv

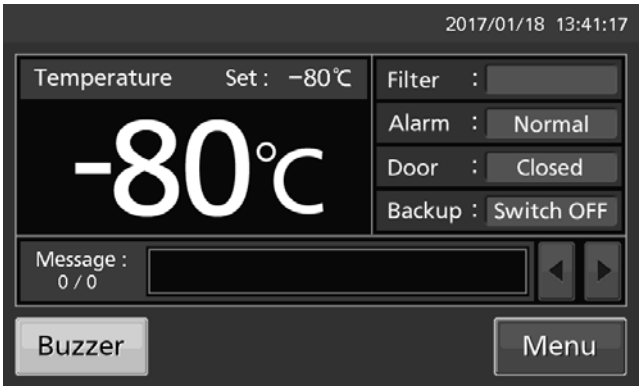
✧If the file name is duplicated, A sequential number such as "-1" is added to the end of the file name to be output later.

9. Press Top to return to the Top screen.

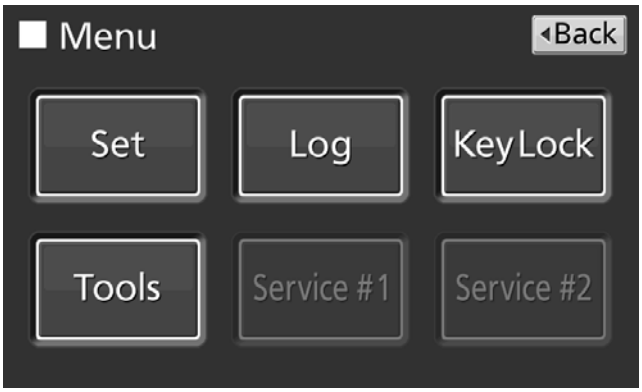
OTHER PARAMETERS

Setting date and time

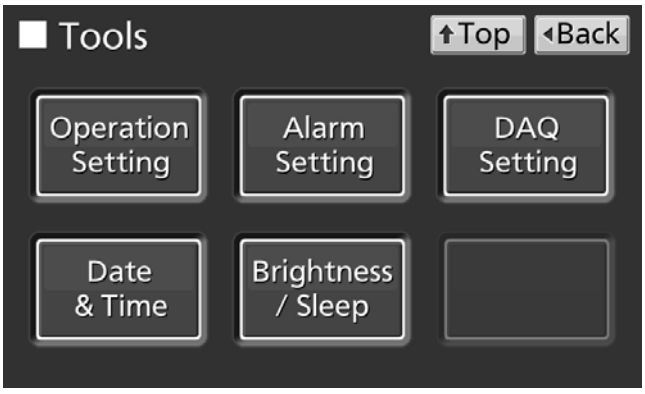
1. Press Menu key to access the Menu screen.



2. Press Tools key to access the Tools screen.



3. Press Date & Time key to access the Date & Time screen.

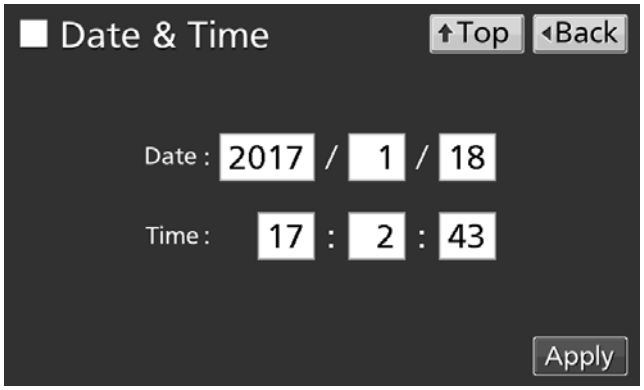


4. Enter the present date and time. Press Apply to save the entered value. The display returns to the Tools screen.

Note:

• 24-hour clock.

• It is recommended that the time is reset as the clock is accurate only to about 1 minute per month.

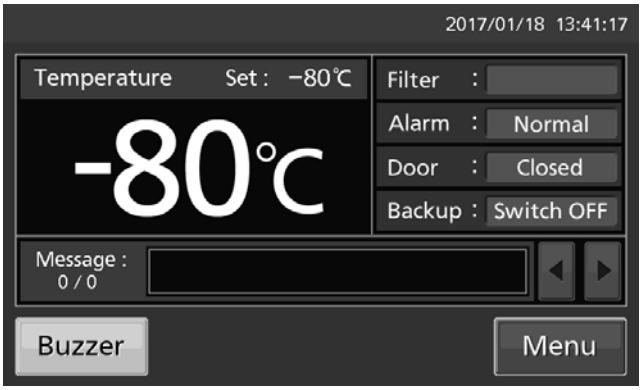


5. Press Top to return to the Top screen.

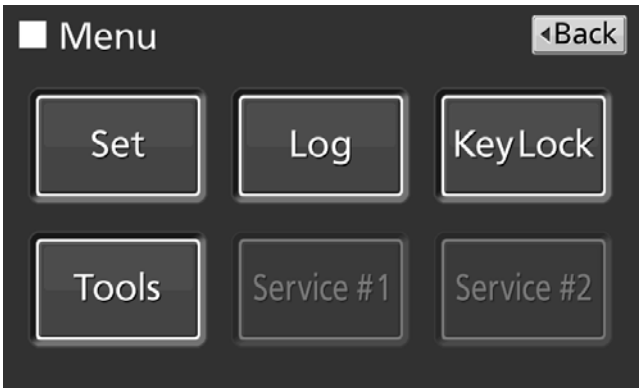
OTHER PARAMETERS

Setting brightness and sleep function

1. Press Menu key to access the Menu screen.

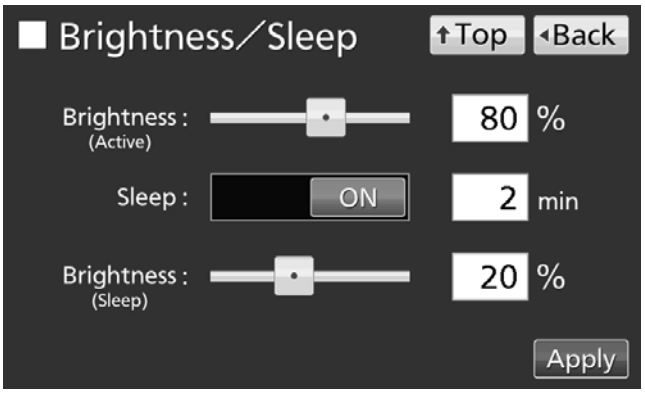


2. Press Tools key to access the Tools screen.



3. Press Brightness/Sleep key to access the Brightness/Sleep screen.

4. Select the required settings for brightness and sleep. Press Apply to save the settings. The display returns to the Tools screen.



●Settings

• Brightness(Active):

Brightness of LCD touch panel in the normal state. Adjust Brightness(Active) using the slide bar or enter a numerical value into the Brightness(Active) input box. Settable range: 50~100, factory setting: 80.

• Sleep:

This lowers the brightness of LCD touch panel to save electricity, during periods of inactivity.

The Sleep function is turned to ON by pressing the slide key and sliding it to the right. Enter a value to set the time before Sleep mode occurs. Settable range: 1 minute~5 minutes, factory setting: 2 minutes.

Note: It is not possible to operate any key when the unit is in Sleep mode. Touching the LCD panel releases, the Sleep mode and the LCD panel returns to the normal state so that key operations become available.

• Brightness(Sleep):

Brightness of LCD touch panel during Sleep mode. Adjust Brightness(Sleep) using the slide bar or enter a numerical value into the Brightness(Sleep) input box. Settable range: 0~50, factory setting: 20.

5. Press Top to return to the Top screen.

ALARMS AND SELF-DIAGNOSIS

Warning: The cooling performance is significantly reduced. The chamber temperature may get higher considerably. Take some precautions for the storage items immediately (transferring the storage items to another freezer or placing of dry ice wrapped in newspaper in the chamber) except when the cause is clear and the chamber temperature can be recovered soon.
Contact our sales representative or agent after turning off the power switch.

Ekranas LCD touch panel Message display field	Situation	Garsinis signalas Buzzer	Remote alarm	Alarm & safety
Warning: Temp Control Failure. W01: Power Failure. 22.1.b Aliarmas sutrikus elektros energijos tiekimui	The battery switch for power failure alarm is ON, and under any of the following conditions. ・During a power failure ・Power switch is OFF ・Power supply cord is disconnected.	Intermittent tone	Distancinis aliarmas Alarm mode	Power failure alarm
Warning: Temp Control Failure. *1 W02: Compressor Temp Abnormal. 19.	Kompresoriaus temp. anomalija Compressor Temp Abnormality.			Compressor Temp Abnormality *1
Warning: Temp Too High. 22.1.a. W04: Per aukšta temp.	If the chamber temperature exceeds the set temp. + the set value of High Alarm.			High Alarm
Warning: Temp Too Low. 22.1.a. W05 Per žema temp.	If the chamber temperature falls below the set temp. - the set value of Low Alarm.			Low Alarm
Warning: Temp Control Failure. W06: Compressor 'H' Control Failure.	Compressor control failure due to communication failure of H side inverter			Communication error
Warning: Temp Control Failure. W07: Compressor 'L' Control Failure.	Compressor control failure due to communication failure of L side inverter			Communication error
Warning: Temp Control Failure. *3 W08: Temperature Controller Failure.	When communication between LCD touch panel and control substrate is died out or unstable.		—	Communication error
Warning: Temp Control Failure. *2 W09: Temperature Sensor Error.	If the thermal sensor is disconnected.		Alarm mode	Temperature Sensor disconnected *2
Warning: Temp Control Failure. *2 W10: Temperature Sensor Error.	If the thermal sensor is short-circuited.			Temperature Sensor short-circuited *2

19. *1:The compressor stops in the case of W02. *1: Kompresorius išsijungs W02 aliarmo atveju.
*2:The compressor runs continuously in the case of W09 or W10.
The compressor stop has a priority over the continuous running if the above two errors come up at one time.
*3:The chamber temperature is not displayed in the case of W08. Moreover, the LCD touch panel cannot be operated.

Alarm: Cooling performance may decline and the temperature of the chamber may rise. Wait for the recovery of chamber temperature if the temperature change is temporary resulting from user operation. For other cases, failure or chamber temperature rise may cause if this status continues.
Take some precautions for the storage items (transferring the storage items to another freezer or placing of dry ice wrapped in newspaper in the chamber).
Contact our sales representative or agent.

LCD touch panel Message display field	Situation	Buzzer	Remote alarm	Alarm & safety
Alarm: Temp Too High. A04	If the chamber temperature exceeds the set temp. + the set value of High Alarm.	—	—	High Alarm
Alarm: Temp Too Low. A05	If the chamber temperature falls below the set temp. - the set value of Low Alarm.			Low Alarm

ALARMS AND SELF-DIAGNOSIS

Status: There is a possibility of failure other than the cooling performance. The chamber temperature is under control. The alarm may not be triggered in the case of any failure if this status continues Contact our sales representative or agent.

Ekranas LCD touch panel Message display field	Situation	Signalas Buzzer	Remote alarm	Alarm & safety
Status: Temp Control Risk. *4 S01: Cooling Circuits Overload.	When the chamber temp. does not reach the set temp. for approx. 5 days or more.	—		Overload operation *4
Status: Temp Under Control. *5 S02: Ambient Temp Abnormal.	When the ambient temp. is over 35 °C or lower than 0 °C.			Abnormal ambient temperature *5
22.1.e. Išorinės temperatūros ribų pažeidimas Status: Temp Under Control. S03: Air Intake Port Heater Failure.	Heater failure.	Intermittent tone		Air Intake Port Heater Failure
Status: Temp Under Control. S10: Cascade Sensor Error.	When the cascade sensor disconnected.	—	—	Cascade Sensor disconnected
Status: Temp Under Control. S11: Cascade Sensor Error.	When the cascade sensor short-circuited.			Cascade Sensor short-circuited
Status: Temp Under Control. S12: Filter Sensor Error.	When the filter sensor disconnected.			Filter Sensor disconnected
Status: Temp Under Control. S13: Filter Sensor Error.	When the filter sensor short-circuited.			Filter Sensor short-circuited
Status: Temp Under Control. S14: Ambient Temp Sensor Error.	When the ambient temp. sensor disconnected.			Ambient Temp Sensor disconnected
Status: Temp Under Control. S15: Ambient Temp Sensor Error.	When the ambient temp. sensor short-circuited.			Ambient Temp Sensor short-circuited
Status: Temp Under Control. S16: Main Battery Charging Failure.	When the battery voltage does not increase after certain period.			Main Battery Charging Failure
Status: Temp Under Control. S17: Backup Battery Charging Failure.				Backup Battery Charging Failure
22.1.d. Vidinės baterijos keitimo įspėjimas Status: Temp Under Control. S18: Exchange a Main Battery.	When the cumulative operating time exceeds about 3 years.			Battery for power failure alarm replacement
Status: Temp Under Control. S19: Exchange a Backup Battery.	When about 3 years passed after installing backup cooling kit.			Battery for backup cooling kit replacement
Status: Temp Under Control. S20: Battery Inactive, SW may be OFF.	When the battery switch for power failure alarm is OFF.			Battery switch check
22.1.c. Door Open. Atidarytų durų aliarmas	When door is open.	Intermittent tone (After door delay time has elapsed.)		Door alarm

*4: In the case of S01, check the following:
(1) There are too many items stored inside the chamber at a time.
(2) The door is frequently opened. The door seal is damaged.
(3) The set chamber temperature is higher than -80 °C.

*5: Check the air conditioning at the installation site in the case of S02.
The ambient temperature should be 5 °C~30 °C.

ALARMS AND SELF-DIAGNOSIS

●Table 2~3 show the behavior of the alarm (buzzer) and Ring Back function when pressing Buzzer key.

Table 2 In the cases of other than the door alarm and communication error.

Remote Alarm setting	Ring Back setting	Buzzer from unit		Remote Alarm	
		When pressing Buzzer key	When the Ring Back set time passes	When pressing Buzzer key	When the Ring Back set time passes
ON: Non-interlock with Buzzer key	ON	OFF (Alarm is not canceled)	ON	ON	ON (Under continuation)
	OFF		OFF		
OFF: Interlock with Buzzer key	ON		ON	OFF (Alarm is not canceled)	ON
	OFF		OFF		OFF

Note: Resolve the cause of the alarm with reference to pages 47 − 48 as the alarm itself is not deactivated by pressing the Buzzer key.

Table 3 In the cases of the door alarm.

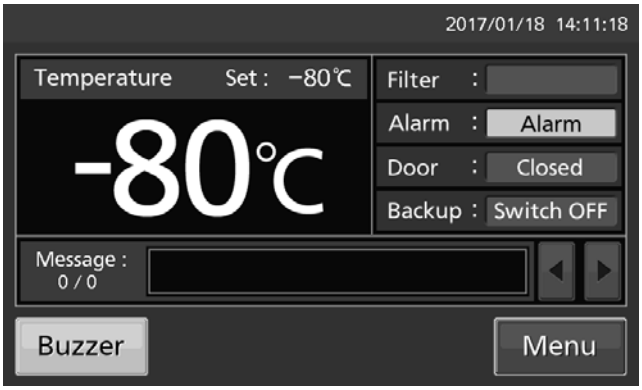
Remote Alarm setting	Ring Back setting	Buzzer from unit		Remote Alarm setting
		When pressing Buzzer key	When the Ring Back set time passes	
ON: Non-interlock with Buzzer key	ON	OFF (Alarm is canceled)	OFF (Alarm is already canceled)	OFF
	OFF			
OFF: Interlock with Buzzer key	ON			
	OFF			

●Table 4 shows the situation after the high or low temperature alarm is cancelled and after recovery from a power failure.

Table 4 The situation after being canceled the High/Low Alarm and recovery from a power failure with no operation

Canceled alarm	LCD touch panel		Buzzer	Remote alarm	Safety operation
	Message display field	Alarm display			
High Temp. Alarm Low Temp. Alarm	—	"Alarm" is displayed alternately in normal characters and reverse video	Intermittent tone	—	—
Power failure alarm	—	"Alarm" is displayed alternately in normal characters and reverse video	Intermittent tone	—	—

Note: By pressing Buzzer key, the alarm display returns to "Normal" and buzzer stops.



ROUTINE MAINTENANCE

Cleaning the exterior, interior, and accessories

Use a dry cloth to wipe down the outside and inside of the unit and all accessories. If the outside panels are dirty, clean them with a diluted neutral dish-washing detergent.
Wipe off condensation from the exterior of the cabinet with a dry, soft cloth.
✧Using an undiluted solution of detergent may cause the unit's plastic areas to crack. Follow the directions on the detergent for details of dilution.
✧After the wiping the cabinet or accessories with a diluted detergent, be absolutely sure to wipe the surfaces with a cloth dipped in clean water to remove traces of the detergent. After this, be absolutely sure to wipe the surfaces with a dry cloth.

<Important>
■ Do not use a brush, an acid, a thinner, laundry soap, a powder detergent, or boiling water for cleaning. These may cause damage to painted surfaces or cause perishing of plastic and rubber components. Moreover, do not wipe plastic and rubber components with a volatile material.
■ In order to maintain the unit's intended level of performance, always replace accessories that have been removed for cleaning.

Defrosting the air intake port (Manual)

Using the cap for air vent is likely to build a frost in/around the air intake port. Clean it in the case shown below.

Condition	Check / Remedy
When frost and ice can be seen in the air intake port.	The pipe of the air intake port is thrust with a stick for air intake port cleaning of the accessories, and frost is taken.
The outer door does not open even if the cap of the air intake port is opened.	The pipe of the air intake port is thrust with a stick for air intake port cleaning of the accessories, and frost is taken.
Frost and ice can be seen in the chamber.	Frost and ice inside the chamber are taken with scraper of the accessories.

⚠ WARNING
For removing the frost in the air intake port, do not use a tool with sharp edge such as a knife or a screw driver.

ROUTINE MAINTENANCE

Cleaning the condenser filter

18. This unit is provided with the filter alarm indicator on the LCD touch panel. Clean the condenser filter when this indicator is lit. Clean the condenser filter once a month even if the filter alarm indicator is not on. A dusty condenser filter may cause shorter compressor life as well as the poor cooling.
Clean the condenser filter by the procedure below.

Filtras lengvai keičiamas, su priėjimu iš priekio.

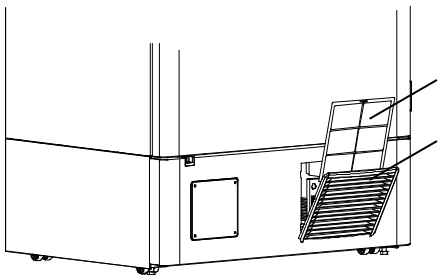
1. Open the grille by pulling it to you as shown in the figure.

2. Take out the condenser filter.

3. Wash the condenser filter with water.

4. Replace the condenser filter and the grille. (Set the handle of the condenser filter at the front.)

5. Check that the filter alarm indicator is off in the event the filter alarm indicator was ON.



⚠WARNING

Do not touch the condenser directly when the filter is removed for cleaning. This may cause injury by hot surface.

ROUTINE MAINTENANCE

Defrosting the chamber

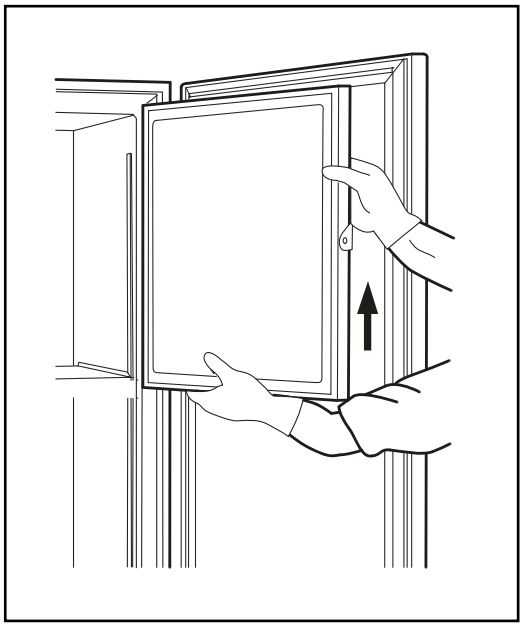
Frost may accumulate near the top of the chamber, near the door in the chamber, or near the air intake port (Auto). Excessive accumulation of frost is likely to create gaps between the door and the door gasket, which can reduce the cooling performance. Remove the frost from the chamber and the inner door with the scraper enclosed with the unit. Use the following procedure for defrosting when excessive frost builds up in the chamber.

Note:

Do not use tool with a sharp edge (such as a knife or screw-driver) to remove the frost.

1. Turn off the switch for the back-up cooling kit (if installed).

2. Take out all contents from the freezer and transfer them to another freezer or a container which is refrigerated by liquid carbon dioxide or dry ice.



3. Turn off the power switch and battery switch of the freezer.

4. Open the outer door and inner door. Remove the inner door by lifting up as shown in the figure.

5. Leave the freezer in this state until the frost in the chamber melts.

6. Wipe up the water that accumulates at the bottom of the chamber with a dry cloth.

7. After cleaning the chamber, replace the inner door and start up the unit according to the procedure on page 19.

8. Check that the chamber temperature reaches the set temperature and then replace the contents.

9. Turn on the switch for the back-up cooling kit (if installed).

⚠WARNING

Always wear gloves when mounting and/or removing the inner door to prevent injury.

CALIBRATION

During continuous operation, the following service tasks must be performed:

• Perform a temperature calibration at least once a year.

For temperature calibration, contact our sales representative or agent.

REPLACEMENT OF WORN-OUT PARTS

Replacement of the battery for power failure alarm

Replace the battery for power failure alarm about every 3 years. Contact our sales representative or agent for the replacement of battery when “S18: Exchange a Main Battery.” is displayed in the message display field.

✧The replacement of the battery for power failure alarm is a paid service.

✧The alarm function (message display, sound of buzzer and remote alarm) will not operate when the battery for power failure alarm is flat.

✧“W01: Power Failure.” is displayed and the buzzer sounds by the battery for power failure alarm.

⚠**WARNING**	The replacement of the battery for power failure alarm should be executed by a qualified engineer or service personnel only. ➢ The replacement of the battery for power failure alarm involves the risk of electric shock.

«Important» The used battery is a recyclable resource. Do not dispose of the battery. Always follow the procedure for recycling.

Replacement of the battery for back-up cooling kit

Replace the battery for backup cooling kit about every 3 years. Contact our sales representative or agent for the replacement of battery when “S19: Exchange a Backup Battery.” is displayed in the message display field.

✧The replacement of the battery for backup cooling kit is a paid service.

✧The backup cooling kit will not operate when the battery for backup cooling kit is flat.

✧When the chamber temperature rises, the backup cooling kit is activated by the battery for backup cooling kit even during a power failure. The regular replacement of the battery for backup cooling kit is important to prevent the rise of chamber temperature in the case of unexpected situation.

⚠**WARNING**	The replacement of the battery for backup cooling kit should be executed by a qualified engineer or service personnel only. ➢ The replacement of the battery for backup cooling kit involves the risk of electric shock.

«Important» The used battery is a recyclable resource. Do not dispose of the battery. Always follow the procedure for recycling.

TROUBLESHOOTING

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

<Attention>
If the malfunction is not resolved after checking the following items or if the malfunction is not shown in the table below, contact our sales representative or agent.

Malfunction	Check/Remedy
Nothing operates even when the power supply plug is plugged in	□ The unit is not connected to the power supply properly. □ The capacity and voltage of the power supply is not sufficient. □ There is a power failure. □ The circuit breaker on the supply circuit is activated. □ The fuse on the supply circuit is blown.
The compressor does not operate at all when turning ON the power switch. (LCD touch panel is turned ON)	□ The capacity of power supply is not sufficient. When the capacity of power supply is not sufficient to start the compressor, compressor may not start.
The alarm is activated during operation	□ The chamber temperature setting has been changed. □ The door has been kept open for a long time. □ Containers with a high temperature (load) have been put in the chamber.
	□ If the LCD touch panel cannot be operated, turn the power off and then on again.
Excessive noise	□ The floor is not stable. □ The installation site is not level. □ The freezer is tilted. □ The cabinet is touching the surrounding wall.
The chamber does not get cold enough	□ Warm material has been put in the chamber. □ The door is frequently opened. □The set value of the chamber temperature is lower than -86 ºC. The temperature settable range is between -90 ºC~-50 ºC. However, the temperature control range is between -86 ºC~-50 ºC. □ The unit is in direct sunlight. □ The ventilation around the unit is blocked. □ There is a nearby heat source. □ The ambient temperature is too high. □ There are too many items stored inside the chamber. □ The access port is not covered. → The access port should be covered with insulation and rubber caps when not in use. □ The door seal is damaged. → If it is damaged, contact our sales representative or agent for replacement. □ A foreign substance is located between door gaskets.
The outside of the unit is wet with condensation.	In case of sultriness or bad location, the exterior of the unit may be wet with dew. Under a high humidity environment, the cold exterior of the unit condenses the moisture in the air, so that it is not malfunction. Wipe the dew with a dry cloth.
There is excessive noise from the motor or the sound of flowing liquid.	As a result of the nature of the cooling circuit, the sound of the motor or of flowing refrigerant may be heard during operation. In particular, a few hours after starting operation, the sound of the compressor or of flowing refrigerant may be loud. However, this is part of the normal operation.

Note:
• Keep an electric product which emits an electromagnetic wave away from this unit. A noise from an electromagnetic wave may cause malfunction to this unit.

OPTIONAL COMPONENTS

Temperature recorder

The chamber temperature can be recorded and checked by installing an optional temperature recorder MTR-85H or MTR-G85C.

✧Contact our sales representative or agent to arrange purchase of the temperature recorder.

Main specifications of temperature recorder

	MTR-85H	MTR-G85C
Recording range	-100 ºC~+50 ºC	-100 ºC~+40 ºC
Feed speed of recording paper	2-month/batch	1-day/1 turn, 7-day/1 turn 32-day/1 turn changeable
Recording paper	Strip type	Circular type
Power source	Dry cell	Supplied from the freezer

✧For the installation of the temperature recorder MTR-85H, the recorder mounting bracket MTR-S3085 and recorder sensor cover MTR-DU700SF are necessary.

✧For the installation of the temperature recorder MTR-G85C, the recorder sensor cover MTR-DU700SF is necessary.

Small inner doors

For MDF-DU502VH, small inner doors (MDF-5ID4 (4 doors), MDF-5ID5 (5 doors)) are available as an optional component.

For MDF-DU702VH, small inner doors (MDF-7ID4(4 doors), MDF-7ID5(5 doors)) are available as an optional component.

✧Contact our sales representative or agent to arrange the purchase of the small inner door.

Note:

✧The cooling performance stated on page 58 cannot be obtained when the small inner doors are installed.

Cooling performance : -82 ºC at the center of the chamber (ambient temperature; 30 ºC, no load)

✧For stable long-term use, we recommend setting it to + 5 ºC degrees from the minimum attained temperature.

✧If you attach the small inner door (MDF-5ID5, MDF-7ID5), you cannot use the inventory racks (IR-224U, IR-316U).

Inventory rack

Optional inventory racks (IR-224U, IR-316U) are useful to store important items in the chamber effectively. When these racks are used, it is necessary to change the location of the shelves.

✧Contact our sales representative or agent to arrange purchase of an inventory rack.

OPTIONAL COMPONENTS

Back-up cooling kit

By installing an optional backup cooling kit MDF-UB7 and a liquid CO_2 cylinder, liquid CO_2 injection into the chamber prevent to rise the chamber temperature for a few hours, even when this unit stops operation by a power failure and so on.

✧Contact our sales representative or agent to arrange purchase of the back-up cooling kit.

⚠WARNING

As with any equipment that uses CO_2 gas, there is a likelihood of oxygen depletion in the vicinity of the equipment. It is important that you assess the work site to endure there is suitable and sufficient ventilation. If restricted ventilation is suspected, then other methods of ensuring a safe environment must be considered. These may include atmosphere monitoring and warning devices.

The injection set temperature of the backup cooling kit can be set by the temperature setting knob [page 12]. Since the control method of injection is ON/OFF type, the actual injection temperature deviates from the injection set temperature.

Note:

• Set the injection set temperature of the backup cooling kit to 10 ºC higher than the set temperature. Otherwise, continuous injection of liquid CO_2 may reduce the retention time of liquid CO_2 cylinder.

• When the injection set temperature of the backup cooling kit is -70 ºC;
ON: -67 ºC~-65 ºC, OFF: -75 ºC~-74 ºC.

The behavior of the back-up cooling kit

Backup power switch [Page 12]	Backup display [Page 13]	Condition of the backup cooling kit	Chamber temperature	Liquid CO_2
ON	Switch ON	Ready to inject	Less than the injection set temperature of the backup cooling kit.	Does not inject
			The injection set temperature of the backup cooling kit or higher.	Injects
OFF	Switch OFF	Not ready to inject (Not ready to activate the backup test switch)	Less than the injection set temperature of the backup cooling kit.	Does not inject
			The injection set temperature of the backup cooling kit or higher.	

• Duration of backup cooling**:**
MDF-DU502VH **:** Approx. 10 hours, MDF-DU702VH **:** Approx. 9 hours,
(ambient temp.; 30 ºC, set temp.; -70 ºC, no load, liquid CO_2 gas cylinder of 30 kg)

SPECIFICATIONS

	Product name	Ultra-Low Temperature Freezer MDF-DU502VH	Ultra-Low Temperature Freezer MDF-DU702VH
	External dimensions	W790 mm x D882 mm x H1993 mm	W1030 mm x D882 mm x H1993 mm
	Internal dimensions	W630 mm x D600 mm x H1400 mm	W870 mm x D600 mm x H1400 mm
	Effective capacity	528 L	729 L
	Exterior	Painted steel	
	Interior	Painted steel	
	Outer door	Painted steel	
	Inner door	2 doors	
	Shelf	Stainless steel, 3 shelves (adjustable) Inner dimension; W615 mm x D534 mm Load; 50 kg/shelf	Stainless steel, 3 shelves (adjustable) Inner dimension; W855 mm x D534 mm Load; 50 kg/shelf
	Access port	Inner diameter: 17 mm, 3 locations (back x 1, bottom x 2)	
10.	Insulation Termo izoliavimas	Rigid polyurethane foamed-in place + Vacuum insulation panel vakuuminė ~~termoizoliacinė~~ plokštė	
	Compressor	High stage side; Output; 750 W Low stage side; Output; 750 W	
	Evaporator	High stage side; Cascade type, Low stage side; Tube on sheet type	
	Condenser	High stage side; Fin and tube type, Low stage side; Shell and tube type	
	Refrigerant	High stage side; R-290, Low stage side; R-170	
	Temperature controller	Microcomputer control system	
	Temperature display	LCD Digital display	
	Thermal sensor	Platinum resistance (Pt 1000 Ω) Filtro keitimo įspėjimas	
22.	Alarm	High Alarm, Low Alarm, Power failure alarm, Door alarm, Filter alarm	
	Remote alarm contact	Allowable contact capacity: DC 30 V, 2 A *1	
23.	Battery	Lead storage battery, DC 6 V, 7200 mAh, Auto-recharge	
	Weight	246 kg	278 kg
	Accessories	1 set of key, 1 scraper, 1 stick for air intake port cleaning	
	Optional component	Temperature recorder (MTR-85H, MTR-G85C) Recorder fixing (MDF-S3085; MTR-85H) Recorder sensor cover (MTR-DU700SF) Back-up cooling kit (MDF-UB7); For Liquid CO_2	
		Small inner door (MDF-5ID4, MDF-5ID5)	Small inner door (MDF-7ID4, MDF-7ID5)
		Drawers (MDF-50R)	—
		Storage rack (MDF-70SC) Inventory rack (IR-224U, IR-316U) Interface board (MTR-L03) *1, *2; For LAN Interface board (MTR-480) *1, *2; For RS-232C/RS-485	

*1: It is recommended to use standard signal and interface cables with a maximum length of 30 meters.

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

Note:

• Design or specifications are subject to change without notice.

• Refer to the updated catalogue when ordering an optional component.

PERFORMANCE

Product name	Ultra-Low Temperature Freezer MDF-DU502VH	Ultra-Low Temperature Freezer MDF-DU702VH
Model number	MDF-DU502VH-PE	MDF-DU702VH-PE
Cooling performance	-86 ºC at the center of the chamber (ambient temperature; 30 ºC, no load) *1	
Temperature settable range	-90 ºC to -50 ºC	
Temperature control range	-86 ºC to -50 ºC (ambient temperature; 30 ºC, no load)	
Rated voltage	AC 220 V / 230 V / 240 V	
Rated frequency	50 Hz	
Rated power consumption	420 W (Max. 820 W/830 W/840 W)	545 W (Max. 930 W/945 W/960 W)
Noise level	52 dB [A] (background noise; 20 dB)	
Maximum pressure	2200 kPa	2200 kPa
Usable environment condition	Temperature; 5 ºC to 30 ºC Humidity; equal or less than 80 %R.H.	

*1**:** Maximum cooling performance.
The chamber temperature can be reached at -86 ºC at ambient temperature 30 ºC with no load.

Note:

• The unit with CE mark complies with EU directives.

EMC PERFORMANCE

Emission: EN 61326-1
Immunity: EN 61326-1

This product is intended for use in a basic electromagnetic environment.

⚠ CAUTION

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

Safety check sheet

1. Freezer contents :
   Risk of infection: ☐Yes ☐No
   Risk of toxicity: ☐Yes ☐No
   Risk from radioactive sources: ☐Yes ☐No

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

2. Contamination of the unit
   Unit interior
   No contamination ☐Yes ☐No
   Decontaminated ☐Yes ☐No
   Contaminated ☐Yes ☐No
   Others:

3. Instructions for safe repair/maintenance/disposal of the unit
   a) The unit is safe to work on ☐Yes ☐No
   b) There is some danger (see below) ☐Yes ☐No
   Procedure to be adhered to in order to reduce safety risk indicated in b) below.

Date :
Signature :
Address, Division :
Telephone :

Product name:	Model:	Serial number:	Date of installation:
Ultra-low temperature freezer	MDF-		

Please decontaminate the unit yourself before calling the service engineer.

DISPOSAL OF UNIT

Recycle of battery

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

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

Decontamination of unit

Before disposal of unit with biological hazards, decontaminate the unit as much as possible.

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

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

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

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

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

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

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

Original Operating Instructions

< EU countries only >

CE 0123

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