Ultra Low Temperature Freezer

USER MANUAL

Product model 1: MD-86L358

for after sales use

Midea Biomedical Co., Ltd
No. 88 Yulan Main Road, Hi-Tech Development Zone, Hefei,
230088 Anhui, P.R. China

Warning notices: Before using this product, please read this manual carefully and keep it for future reference.
The design and specifications are subject to change without prior notice for product improvement.
Consult with your dealer or manufacturer for details.

CONTENTS

Product Features ---- 3

Product Function ---- 3

Safety Precautions ---- 4

Usage Precautions ---- 7

Handling ---- 8

Door Space Requirements ---- 8

Product Installation ---- 9

Product Composition and Overview ---- 14

Operating Instructions ---- 15

Maintenance and Care ---- 22

Troubleshooting and Maintenance Services ---- 26

Specifications ---- 27

Packing List ---- 27

Electrical Schematic Diagram ---- 28

for after sales use



Warning; flammable material

WARNING: Ensure all ventilation openings are not obstructed.

WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.

WARNING: Do not damage the refrigerant circuit.

WARNING: The packaging base at the bottom of this series of products must be removed before use.

WARNING: When moving this series of products, take care that the bottom foot does not touch the power cord.

WARNING: The bottom front wheel brake of this series of products need to be locked after moving to the designated position.

WARNING: This series of products need to be left to stand for 12 hours before initial power-up.

WARNING: When this series of products are just connected to the power supply, do not immediately put the items in to it. After running for a period of time, when the temperature inside the product drops to the set temperature, then put the items in batches.

Refrigerant and cyclopentane foaming material used for the appliance are flammable.

Therefore, when the appliance is scrapped, it shall be kept away from any fire source and be recovered by a special recovering company with corresponding a qualification other than being disposed of by combustion, so as to prevent damage to the environment or any other harm.

The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

IMPORTANT:

Flammable gas and refrigerant used. It is the consumer's responsibility to comply with Federal and Local regulations when disposing of this product.

Suggestion: Cut off the pipe line and drain the refrigerant without any open fire around.

WARNING: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

for after sales use

	**Warning:** flammable material
	**Warning:** low temperature/freezing conditions, frost-bite HAZARD(MOD)
	**Warning:** electrocution Hazard
	**Warning:** crushing of hands
	The product with the symbol reads “frostbite warning”
	The product with the symbol reads “warning terms”
CYCLOPENTANE	The product with this symbol reads “cyclopentane blowing”

for after sales use

PRODUCT FEATURES

Scope of application: applicable to low-temperature storage of human examination samples, drugs, vaccines, biological products, reagents, etc.

PRODUCT FUNCTION

Accurate Temperature Control Data can be traced

- High accuracy temperature control, with display accuracy of 0.1°C.
- The temperature range in the ULT is adjustable from -40℃ to -86 °C.
- It is equipped with USB interface, enabling temperature data tracking, data querying, and temperature data storage.

High-efficiency refrigeration system Good thermal insulation effect

- Environmental friendly refrigerant, high efficiency and energy saving.
- Optimized refrigeration system provides strong refrigeration capacity, safety, and reliability.
- VIP technology + High-performance thermal insulation layer has good thermal insulation
- Multi-layer 3D seal design effectively reduces refrigerating capacity loss and frosting.

With multiple alarms Safe and stable use

- Perfect acoustic and optical alarm function allowing high and low-temperature alarms, power failure alarm, sensor fault alarm, etc. with alarm values adjustable on demand.
- Safety door lock design.
- Padlock design.

Introduction to Other Functions

- SUS 304 shelf design with adjustable height, maximizing space utilization.
- Wide voltage design to ensure stable operation of the equipment.
- Temperature and ambient temperature can be displayed, while allowing users to set high and temperature alarms.
- Remote alarm function ensures real-time controllability and safe and stable operation of the equipment.

Note: The above features are not available for all models of products, and the detailed configuration should be subject to the specific functions of each model.

Due to the continuous optimization of the product, the product you obtained may not be exactly consistent with the instructions. We sincerely apologize for this.

for after sales use

SAFETY PRECAUTIONS

Dear User :

Hi! Thank you for using the ULT freezer. To help you better understand this manual and use this product, and to prevent personal injuries and damage to items, please be sure to read the following content carefully.

Safety Precautions



Documents need to be consulted in all cases marked with ⚠ in order to ascertain the nature of the hazard beforehand and any countermeasures that must be taken.



WARNING

Failure in complying matters highlighted in warning signs may cause serious casualties.



CAUTION

Failure in complying matters highlighted in caution signs may cause casualties, or damages to the freezer and related property losses.



Behaviors or operations that must be prohibited.



Behaviors or operations that must be followed.

⚠ WARNING



- Please use a grounded power socket to prevent electric shock. If the power socket is not grounded, the grounding wire must be installed by professional technicians.
- Always place the ULT freezer firmly on the flat floor of the room with appropriate care to prevent overturning. If the ground is not stable or the place is not suitable, the freezer might be overturned or people will be injured.
- If the power cord needs to be extended, the cross-sectional area of the extension cord must be at least 2.5 mm^2 , and the length must not exceed 3 m. Otherwise, it may cause a fire or electric shock.
- In the event of a flammable gas leak, close the gas leak valve, and open the doors and windows for ventilation. Do not plug in or unplug the power cord of the ULT freezer; otherwise, it may result in an explosion or fire.
- Only professional technicians or after-sales service personnel can repair this ULT freezer. Otherwise, electric shock and fire may be caused
- Please use the dedicated power supply specified on the ULT freezer's nameplate. Otherwise, fire or electric shock may be caused.

for after sales use

- If the voltage is below 198 V or above 264 V, an automatic voltage stabilizer of 8000 W or more suitable for motor load should be installed for use.
- The power cord of this ULT freezer is equipped with a three-prong (grounded) plug that complies with the standard 15A three-prong (grounded) socket. Under no circumstances should the grounding pin of the power cord be removed. Make sure that the power plug and socket are plugged firmly and reliably, otherwise it may lead to fires.
- When unplugging from the power socket, grip the power plug securely and do not pull the power cord wire. If you pull the wire by hand, it may cause electric shock or fires due to short circuit.
- If the ULT freezer does not operate normally, unplug the power plug. It may cause electric shock or fires if it continues to operate under abnormal conditions.
- Before performing any repairs or maintenance on the ULT freezer, always disconnect the ULT freezer from the power source to prevent electric shock or personal injury.
- During maintenance and care, make sure that you do not inhale the medicines or suspended particles inside and around the ULT freezer; otherwise, it may be harmful to your health.
- When the ULT freezer is not used for a long time, unplug the power plug to prevent electric shock, leakage or fire caused by aging of the power cord.
- If the ULT freezer is left idle for a long time in an unsupervised area, please ensure that child do not approach the freezer. The disposal of the ULT freezer should be carried out by the appropriate personnel. The door should be removed to prevent accidents such as suffocation.
- If using a CO_2/LN_2 backup system, the installation and use site must have good ventilation. Elevated carbon dioxide concentrations in the air can cause asphyxiation and threaten life. If ventilation is poor, alternative methods must be considered. For detailed operation, please refer to the backup system instruction manual.

> Do not store flammable, explosive hazardous materials or volatile substances in the ULT freezer.

> Do not use combustible sprays near the ULT freezer; otherwise, it may result in an explosion or fire.

> Do not store acid, alkali, and other corrosive items in the ULT freezer. Otherwise, the internal components or electrical parts of the freezer may be damaged.

> Don't put the plastic bags in the place where child come into contact, so as to prevent suffocation accidents.

> Do not climb on the ULT freezer or put items on the ULT freezer, otherwise it may tip over and cause personal injury or damage to the ULT freezer.

> Do not use the ULT freezer in an open environment. When the freezer is wet by rain, it may cause electric leakage or electric shock.

> Do not place the ULT freezers in damp places or locations prone to water splashes. Otherwise, electric leakage or electric shock will occur due to reduced insulation.

> Do not pour water directly on the ULT freezer; otherwise, it may cause an electric shock or short circuit.

> Users cannot disassemble, repair, or modify the ULT freezer by themselves. Otherwise, it may cause fires or personal injuries due to improper operations.

> Do not ground the ULT freezer through gas pipe, power supply pipe, telephone line or lightning rod. The above grounding may cause electric shock or other hazards.

> Do not touch any electrical parts such as power plugs or any switches with wet hands; otherwise, it may cause electric shock.

> Do not place containers filled with water or heavy objects on the top of the ULT freezer. If the object falls, it may cause personal injuries, and the outflow of water will reduce the insulation and cause leakage or electric shock.

> Do not insert metal objects such as nails or wires into any openings and gaps of the ULT freezer or any vents used for internal air circulation; otherwise, these objects may come into contact with moving parts and cause electric shock or injury.

for after sale use

> Do not drag, wrap, or tie up the power cord, and do not damage the power cord plug. Damaged power cords or plugs may cause fire or electric shock

> Do not use a power cord with a loose plug, as it may cause fire or electric shock.

> Do not put glass bottles or canned items into the ULT freezer, as they may freeze and break, causing injury.

⚠ CAUTION



- There should be no obstruction around the freezer, and the ventilation should be smooth.
- It is necessary to check the freezer setting when restarting the freezer after power failure or power off. Changes in settings may damage stored items.
- Once the power of the freezer is cut off the power, it will take more than five minutes to turn it on again to avoid damage to the compressor or system.
- Make sure to check the filter in a timely manner and clean it at least once a month. A filter that accumulates dust can cause the temperature of the ULT freezer to rise or lead to malfunctions.
- When a power failure occurs or the power switch is turned off, check the set value when restarting; otherwise, the stored items may be damaged due to the setting change.
- If there is dust in the power plug, it should be cleaned up in time. Dusty plugs or improper plugs may cause heat or ignition.
- Wear gloves during maintenance to avoid touching sharp edges or corners, preventing personnel injuries.
- Do not take storage items directly by hand, direct hand contact with frozen items or the inside of storage boxes may cause frostbite.
- Hold the handle to close the door so that the door will not catch your fingers.
- When moving the ULT freezer, the inclination angle should not exceed 30 degrees.



> When moving the ULT freezer, take care not to trip over it to prevent damage to the ULT freezer or personal injury.

> Please do not use the door handle to lift or carry the equipment to prevent damage to the ULT freezer or personal injury.

> The refrigeration circuit shall not be damaged.

> Do not use electrical appliances inside the ULT freezer, other than those recommended by the manufacturer.

Warning: Please abandon the ULT freezer according to local regulators for it use flammable blowing gas and refrigerant.

for after sales use

USAGE PRECAUTIONS

* When the ULT freezer is running, the front part of the ULT freezer that contacts the outer door may become hot. This is not a malfunction; it is because the anti-condensation components are installed to prevent condensation around the outer shell of the cabinet.
* Before putting items into the device, please ensure that the temperature in the ULT freezer has reached the set temperature, and then put the items into the ULT freezer in batches. The volume of the articles in the box should not exceed 1/3 of its volume at a time to prevent the temperature from rising too much.
* The temperature display value of the equipment is to show the temperature at the temperature sensor in the storage room. There is a certain gap between the displayed temperature and the actual temperature at the center of the equipment when the equipment just runs, but as the equipment enters a stable state, the displayed temperature will gradually approach the actual temperature.
* The equipment box body is provided with a detection hole so as to lead out the test line in the box during the test. After the test line is led out, it is necessary to plug the test hole with insulating material again, otherwise the temperature in the box may not reach the set temperature value, and condensation will appear around the outside of the through hole (applicable to the test hole items).
* Please use diluted neutral cleaner to clean the equipment, and do not use brushes, acid, gasoline, soap powder, polishing agent or hot water to clean the equipment, otherwise the painted surface and plastic rubber parts may be damaged. Attention: Do not use volatile solvents such as gasoline to clean plastic and rubber parts.
* When the equipment is not used for a long time, the power should be cut off and the battery switch should be turned off at the same time (for projects with backup batteries).
* Each time you access the items, please try to reduce the time to open the door to avoid large effects in temperature inside the box.
* After the door is opened, the temperature inside the box will rise sharply for a short time. This is a normal phenomenon, and this situation will return to the set temperature after normal operation after the door is closed.
* After the freezer is operated for a period of time, a layer of frost is formed on the inner wall of the freezer and the evaporator. If the frost layer is too thick, it will affect the cooling effect of the freezer and increase the power consumption. Therefore, at intervals, when the frost layer reaches 5 mm, apply the attached shovel to defrost.
* Before defrosting, please remove the frozen items from the freezer and place them in an environment suitable for storage, so as not to raise the temperature and damage the items.
* There are many refrigeration coils in the freezer, do not use sharp instruments such as knives, ice chisels or screwdrivers to remove the frost on the inner wall. When defrosting, be careful not to scratch the inner wall, otherwise it will cause the freezer to fail.

for after sales use

HANDLING

❶ Protect the product in moving it, please move it by handcart with cushion.

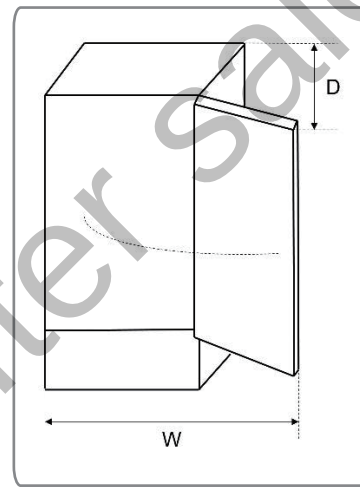
❷ Remove all packing materials and bottom cushion, then move into house for placement.

❸ After moving it to appropriate location, wait for 24 hours before power on.

DOOR SPACE REQUIREMENTS

The unit's door must be able to open fully as shown.

W×D ≥ 1180mm*1460 mm



for after sales use

PRODUCT INSTALLATION

Installation environment

- When used indoors, it is prohibited to install the freezer in an open environment.
- Ambient temperature: 10°C to 32°C, with an ideal temperature of 18°C to 25°C, and an air conditioning system should be used if necessary.
- Environmental humidity: lower than 80%Rh. If the maximum ambient temperature is 32 °C, the humidity should be below 60% Rh.
- Pollution degree: (2), a large amount of dust environment should be avoided.
- Avoid mechanical sway or vibration.
- The altitude of working position of freezer is lower than 2000 m.
- Input voltage: within 220-240 V ± 10%/50 Hz.
- The ULT freezer is sensitive to ambient temperature. When installed in other environments than the one aforesaid, the ULT freezer can't operate normally. Please improve the environment before use.
- The freezer is sensitive to ambient temperature. When installed in other environments than the one aforesaid, the freezer can't operate normally. Please improve the environment before use.
- Operating and storage conditions: ambient temperature -40 °C ~+55 °C, humidity 10~90%Rh

Installation site

- It cannot be installed in a narrow and confined space, and the door body of the room where it is placed cannot be smaller and lower than this equipment. At least the normal entry and exit of the equipment should be ensured to avoid difficulties in maintenance when the equipment fails. If the equipment cannot be repaired in time, it may cause damage to the stored items.
- The installation floor must be solid, flat, non-combustible and able to bear the weight of the equipment during operation.
- Provide the good ventilation condition and avoid direct sunlight.
- Each device must use an independent power socket; please ensure that the power socket can withstand 15A and above current and that the plug is firmly connected to the socket.
- Check the working voltage before use. In areas with unstable voltage, a voltage stabilizer suitable for device load should be considered. The power of the voltage stabilizer should be greater than 10 KW to ensure that the input voltage requirements in the installation environment can be met.
- The device should be reliably grounded. If the power socket is equipped with a grounding wire, check whether the grounding is good before use. If the power socket is not equipped with a grounding wire, it must be installed by professional engineering technicians.

for after sales use

WARNING

Do not ground the freezer through gas pipe, water supply pipe, telephone line or lightning rod.

After installation, the power plug must be accessible, so that the power cord can be unplugged in time in case of emergency. Nothing should cover the vent of the freezer.

WARNING

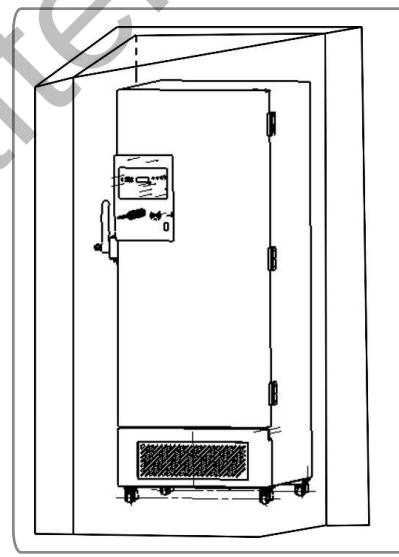
The ambient temperature has a significant impact on the device; If the above environmental requirements are not met, the device may not operate normally. Please improve the environment before using the device. The device is designed for intermittent operation.

Preparation before use

1. Remove all transportation packaging materials and packaging straps (including protective foam inside the packaging box).

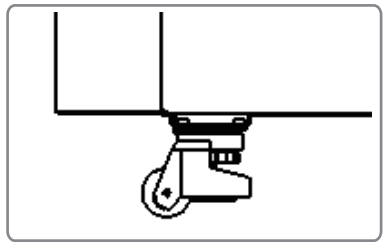
2. Check the random accessories; please check the contents in the box according to the packing list. If there is any discrepancy, please contact the after-sales service in time.

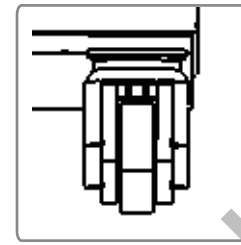
3. Placement conditions: leave at least 30 cm of space around the ULT freezer to facilitate ventilation and heat dissipation.



for after sales use

4. This equipment uses Foma wheels for moving and fixing. Before moving and fixing, please rotate the knob in the middle of the Foma wheel to adjust the wheel to lower or raise. When fixing, please support it on the ground to ensure the ULT freezer does not move during use.





5. Open the outer door 90° or more. Take out the shelves from the bottom of the cabinet, then remove the protective film from the shelves before placing them one by one on the shelf support bars.

⚠ WARNING

Don't put the plastic bags in the place where children come into contact, so as to prevent suffocation accidents.

for after sales use

First power on

When using the device for the first time, please follow these steps:

After the device is placed, leveled and cleaned, it needs to be left for more than 24 hours before it is connected to the power supply to ensure the normal operation of the device

Under no-load condition, connect the power cord to a special socket with appropriate specifications

After connecting the power supply. If the equipment is equipped with batteries, turn on the battery switch (located at the bottom of the back side of the ULT freezer). After powering on, modify the time according to the operating instructions on page 18 of this manual

Set the required temperature, do not put items in the empty freezer, turn on the power, check whether the operating temperature of the equipment can reach the set temperature, and observe the normal operation of the equipment for more than 24 hours to ensure that the performance of the freezer is normal

Please store items in batches, which is not exceeding 1/3 of the box volume at a time. The next batch of goods can only be put in after the device can be shut down normally for more than 8 hours

Try not to open the door during the cooling process, otherwise it will cause the temperature to rise

for after sales use

Operation after power failure

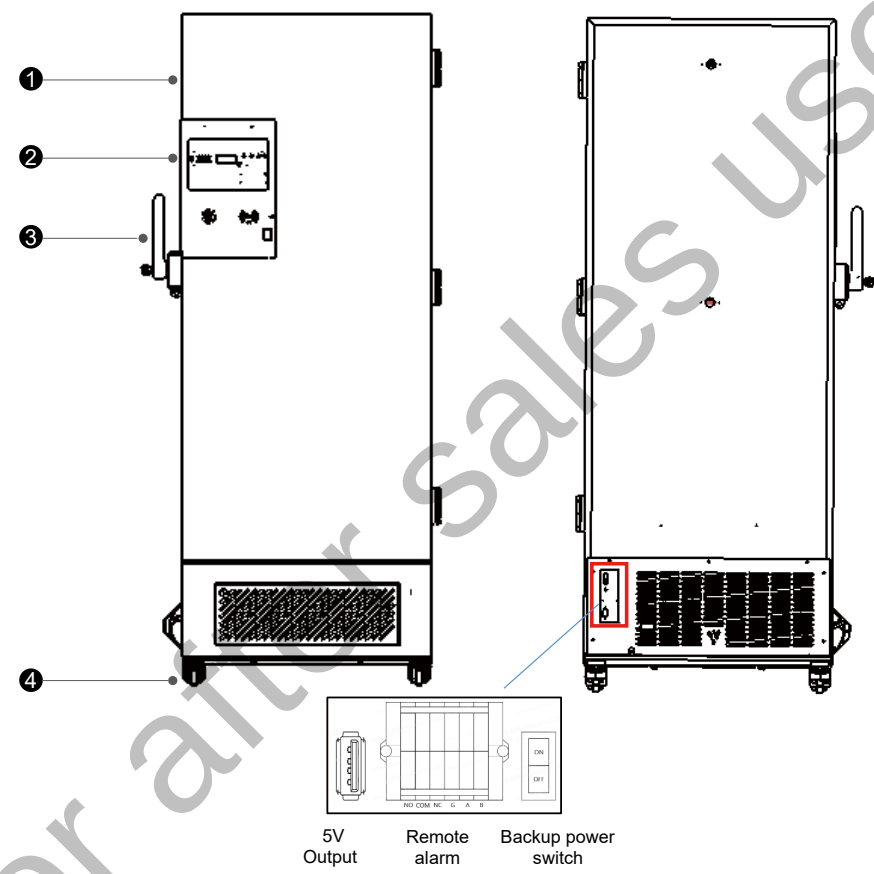
The device has the memory function for the set value. When the power is restored after the power failure, the device will continue the operation according to the parameters set before the last power failure.

⚠WARNING	• Once the power of the freezer is cut off, it will take more than five minutes to turn it on again to avoid damage to the compressor or system. • When the freezer is not used for a long time, unplug the power plug and turn off the battery switch (applicable to battery items) to prevent electric shock, leakage or fire caused by aging of the power cord. • If the freezer is left idle for a long time in an unsupervised area, please ensure that child do not approach the freezer and the door cannot be completely closed.
	• This product should be managed by a designated person, who should check and record the operation status every day (it is recommended to record and check every 2 to 4 hours). In case of malfunction or shutdown, the temperature in the ULT freezer will rise. If it cannot be repaired quickly, you should transfer the items to other locations that meet the temperature requirements for storage to avoid damage to the items. • This product is an Ultra Low Temperature Freezer. Please make sure that the required temperature of the stored items is consistent with the temperature range inside the cabinet, so as to avoid damage to the items and economic losses.
	• Due to the refrigeration inertia, the display temperature and humidity of this product are different from the actual temperature and humidity in the box, which is a normal phenomenon. • All freezers are for preservation. Hence, it is strictly forbidden to put too many relatively hot items at one time, which will cause the compressor not to stop for a long time, the temperature drops slowly and affects the service life of the compressor. Stuff must be put in batches, and the temperature should be lowered step by step until it falls to the required temperature! • The refrigeration circuit shall not be damaged. • Unlicensed electrical appliances are not allowed to use inside the freezer. • Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.

for after sales use

PRODUCT COMPOSITION AND OVER-VIEW

Exterior Schematic Diagram



Product Model 1 Schematic Drawing (Front/Rear & Partial View)

1	Door body	3	Outer door handle
2	Control panel	4	Foma wheel

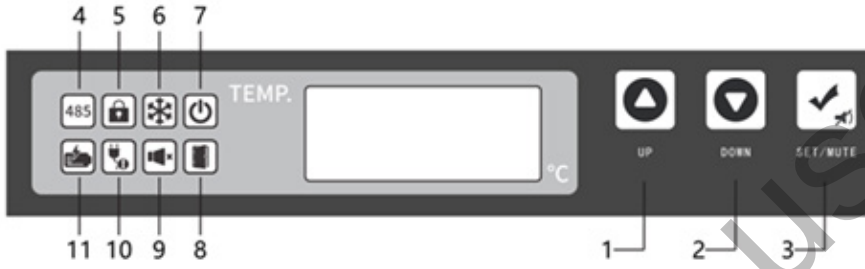
Due to the improvement of products and different models, the actual products may be different from the schematic drawings. Please refer to the real objects!

The sketch is only used for a brief illustration of the functional parts.

for after sales use

OPERATING INSTRUCTIONS

Display panel



Key and icon description

Key 1	Key 2	Key 3	Icon 4	Icon 5	Icon 6
UP key	DOWN key	SET/MUTE key	485 interface	Key lock	Compressor running
Icon 7	Icon 8	Icon 9	Icon 10	Icon 11	
Power on	Door opening	Alarm mute	Power abnorma	Low battery (all above are lighted status)	

Key operation

1. Key lock function

- When the key is unlocked, if there is no key operation for 60 seconds or if press the “UP” and “DOWN” keys at the same time until the buzzer sounds twice and then release them, the key will be locked and the Icon 5 will light up.
- Under the key lock status, press the “UP” and “DOWN” keys at the same time until the digital tube displays “0000” and then release them. Adjust the display to “0005” using the “UP” key, and then press the “SET/MUTE” key to return to the normal display. The buzzer will sound once and the Icon 5 will go off.

2. Check the ambient temperature

Press the “SET/MUTE” key, the digital tube will display the ambient temperature. If there is no key operation for 5 seconds, it will return to normal display.

3. User parameter setting

When the key is unlocked, long press the “SET/MUTE” key until the digital tube

for after sales use

displays “MAX” and then release it. Press the “UP” or “DOWN” key to switch to other menus (menu items are listed in the table below). Press the “SET/MUTE” key to switch to the corresponding menu parameter setting. If there is no key operation for 60 seconds or if long press the “SET/MUTE” key until the buzzer sounds once, save the parameters and exit.

User menu - Temperature setting value “SET”: When the key is unlocked, long press the “SET/MUTE” key until the digital tube displays “MAX” and then release it. Press the “UP” or “DOWN” key to switch to the “SET” menu. Press the “SET/MUTE” key to switch to the parameter setting. The default menu parameter is “-86℃”. Set the desired temperature value by pressing the “UP” or “DOWN” key. If there is no key operation for 60 seconds or if long press the “SET/MUTE” key until the buzzer sounds once, save the parameters and exit. (Remarks: For other user menus, please follow the above steps)

The user menu is as follows:

Menu	Description	Setting Range	Default	Unit
MAX	Maximum temperature in the current time period	——	——	℃
MIN	Minimum temperature in the current time period	——	——	℃
CLR	Clear the record of the maximum and minimum temperature in the current time period	0: Clear 1: Do not clear	1	/
SET	Temperature setting	-40.0--86.0	-86	℃
H	Upper deviation on high temperature alarm	0.0-10.0 0: cancel the alarm	10.0	℃
L	Lower deviation on low temperature alarm	0.0-10.0 0: cancel the alarm	10.0	℃
n	Check the current date - year	——	——	/
y	Check the current date - month	——	——	/
r	Check the current date - day	——	——	/
S	Check the current date - hour	——	——	/
F	Check the current date - minute	——	——	/
Pt	Printing interval	0-240	10	min
tH1	High ambient temperature alarm	20-80	36	℃
PS1	Password setting of user menu	0000-9999	0005	/
b1	Hardware version	——	2.0	/
b2	Software version	——	2.1	/

for after sales use

User menu parameters description:

> Maximum and minimum temperature query function:

"MAX" indicates the maximum temperature from the last power-on to the current time period.

"MIN" indicates the minimum temperature from the last power-on to the current time period.

"CLR" indicates whether to clear the record of the maximum and minimum temperature in the current time period. "0" indicates "Clear", and "1" indicates "Do not clear". After clearing, the record of "MAX" and "MIN" will restart from the current time.

> High and low temperature alarm deviations description:

"H" indicates the upper deviation on high-temperature alarm, setting range: 0.0 to 10.0°C, default is 10.0°C."Set" indicates the set temperature. If the temperature in the freezer is higher than "Set+H", it will prompt the high-temperature alarm, alarm code "H1". "L" indicates the Lower deviation on low temperature alarm. Setting range: 0.0 to 10.0°C, default is 10.0°C."Set" indicates the set temperature. If the temperature in the freezer is lower than "Set-L", it will prompt the low-temperature alarm, alarm code "L1".

> High ambient temperature alarm value description:

"tH1" indicates the high ambient temperature alarm value, setting range: 20.0 to 80.0°C, default is 36.0°C. When the actual ambient temperature > "tH1", it will prompt the high ambient temperature alarm, alarm code "H2".

4. Activate the recorder

If the digital tube blinks and displays "LoF", it indicates that the recorder needs to be activated. At this time, first unlock the keys (please refer to "1) Key lock function"). Then, long press the "UP" key and "SET/MUTE" key at the same time until the buzzer sounds three times. The digital tube will stop displaying "LoF", indicating that the recorder has been successfully activated.

5. Export the USB data

- When the USB flash disk is connected to the USB port, the buzzer will sound once and the digital tube will display the upload data code "on" (when the data volume is large). The USB flash disk will generate a PDF file of the temperature data from the last export time to the current time. When the data transmission is complete, the buzzer will sound once and the digital tube will display "End". After 6 seconds, the digital tube will return to normal display.

Note: When the data volume is small, the digital tube will not display "on" and "End".

- When the USB flash disk is connected to the recorder module, data is imported to the USB flash disk every month to generate a PDF file of the month's data. The buzzer will sound once and the digital tube will display the upload data code "on" (when the data volume is large). When the data transmission is complete, the buzzer will sound once and the digital tube will display "End". After 3 seconds, the digital tube will return to normal display.

Note: The USB flash disk must be formatted before use. The USB flash disk file system is FAT32 format, the capacity is not larger than 32GB, and the USB flash disk cannot be partitioned. Please use mainstream brands of USB flash disks, such as SanDisk, Kingston, Samsung, etc.

6. Manually generate PDF files

When the key is unlocked, insert the USB flash disk without generating the file (the

for after sales use

digital tube is not in the USB data exporting state, i.e., it does not display “on” and “End”), long press the “UP” key and the digital tube will display “d01”. Press the “UP” or “DOWN” key to adjust from “d00” to “d12”. Press the “SET/MUTE” key, the USB flash disk will generate a PDF file of the recorded data from the previous (1 to 12) months to the current time. Adjust the display to “d00”, and the file generation will be canceled.

7. Time setting function

In the unlocked state, press and hold the combination key “Set/Mute” + “Down” key for 3 seconds to enter the time setting mode. The digital tube displays n, and pressing the “Up” key or “Down” key will sequentially display the corresponding parameters in the table below.

n	Year	/
y	Month	/
r	Day	/
s	Hour	/
F	Minute	/
Pt	Printing interval	10
SCY	Data recording interval	10

Modify the Year (n)

Steps	Operation	Digital tube display
1	Digital tube displays n	n
2	Press Set / Mute Key	/
3	Press the Up key and Down key to adjust the parameter value to the target year	For example, in 2023, you want to adjust it to 23
4	Press the Set / Mute Key to save the parameters	/

Modify the Month (y) (To modify r, s, F, Pt, and SCY, please follow the below steps)

Steps	Operation	Display shows
1	Digital tube displays n	n
2	Press the Up key and Down key to select the parameter “y”	y
3	Press Set / Mute Key	/
4	Press the Up key and Down key to adjust the parameter value to the target year	/

for after sales use

5	Press the Set / Mute Key to save the parameters	/

Remarks:

1. The above operation must be completed within 2 minutes. If you don't need to change the time, long press the "SET/MUTE" key for 3 seconds to exit, or automatically exit after 2 minutes to return to the normal display interface.

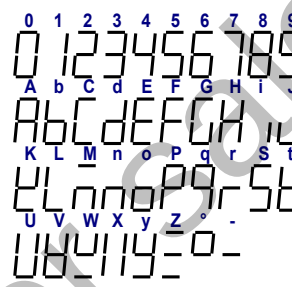
2. Please export the previous data records before the machine is powered off, otherwise the data records will be lost or the time will be disordered.

3. Please export the previous data records before changing the recorder time and recording interval settings; otherwise, the data records will be lost.

4. After the above operation, the device will display the "LOF" alarm. To eliminate the alarm, please refer to the "Operating Instructions" chapter.

The meaning corresponding to the character code is shown on the below.

Character set



8. Temperature recording

By default, the temperature data is stored every 10 minutes.

Note: The battery switch must be turned on during product use. The product function configuration may vary, please refer to the physical configuration.

9. Max-Min query

Operation in key lock state:

- Short press the "Up" key, "MAX" will flash three times, followed by the value
- corresponding to "MAX" flashing three times;
- Short press the "Down" key, "MIN" will flash three times, followed by the value corresponding to "MIN" flashing three times;
- Long press the combination key "Set/Mute + Up" for 3 seconds, the buzzer will beep twice, clearing the values corresponding to "MAX and MIN", and the values will be re-recorded.

Note: The functional configuration of the product varies. Please refer to the actual configuration.

for after sales use

10. Printer (optional)

- Automatic printing

If the printing interval “Pt” is not 0, the printer will automatically print the current data every “Pt” minutes.

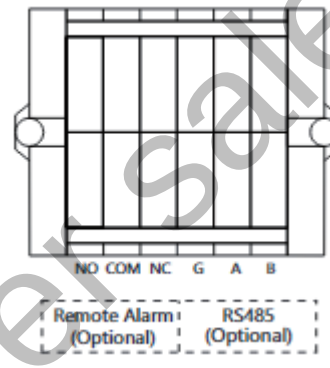
Note: The printing interval “Pt” must be an integer multiple of the data recording interval “SCY” (currently both “Pt” and “SCY” are 10 minutes by default).

- Manual printing

When the key is unlocked, long press the “DOWN” key until the digital tube displays “P01”. Press the “UP” or “DOWN” key to adjust the setting range from “P01” to “P07”. Press the “SET/MUTE” key, and the printer will print the recorded data from the previous (1 to 7) days to the current time.

Remote alarm function

This product has a remote alarm function. When the product has an alarm, it can output an alarm signal through the remote alarm connector.



The connector is located in the lower area under the back top cover of the product and has a load capacity of DC 30V/2A.

The remote alarm connector has normally open NO, common COM and other contacts. It is recommended that the length of the remote alarm cable should not exceed 3 meters.

Note 1: The remote alarm function requires the user to install the alarm device by himself, which is used in conjunction with the remote alarm interface;

Note 2: Pressing the mute button on the display can only cancel the alarm sound, and the remote alarm status remains unchanged.

for after sales use

Remote communication function

This product can optionally be equipped with RS485 remote communication function, which can output temperature data, alarm information and other signals in the cryogenic chamber to the user monitoring software terminal through the remote communication connector terminal. The RS485 connector terminal is located in the lower area of the back top cover of the product.

The telecommunication connector has RS485_A, RS485_B, GND and other contacts. Where RS485_A and RS485_B are a pair of differential signals, the user can use twisted pair cable to connect the above signals.

5V power output function

This product can optionally be equipped with 5V power output function. The power output connector terminal is a USB socket located in the back top cover of the product, which can provide a 5V power supply for external devices. The output capacity of this power supply is 5V/0.5A. It is recommended not to exceed the output capacity of the power supply when connecting external devices, otherwise the control board may be damaged.

Note: Due to product improvement or contract agreement, the actual function configuration of the ULT freezer you receive may differ. Please refer to the physical configuration.

Alarm description

Code	Alarm code	Meaning
1	H1	Alarm for high temperature in the cabinet
2	L1	Alarm for low temperature in the cabinet
3	H2	High ambient temperature alarm
4	H3	Alarm for high temperature of condenser
5	Do	Door opening alarm
6	PF	Power failure alarm
7	bL	Low battery alarm
8	E1-E4	Sensor fault alarm
9	Er	USB data recorder fault alarm
10	LOF	Recorder not activated fault alarm

for after sales use

MAINTENANCE AND CARE

WARNING

To prevent electric shock or personal injuries, the power supply should be cut off before performing any repairs or maintenance on the device.

During maintenance, make sure that you do not inhale the medicines or suspended particles around the equipment; otherwise, it may be harmful to your health.

WARNING

Do not pour water directly on the cabinet, so as to avoid the degradation of insulation performance of electrical components and rust of metal parts.

Do not use hot water, corrosive cleaners, or organic solvents to clean the cabinet.

Do not place heavy objects on the top of the equipment to prevent the equipment from being deformed by pressure.

Clean the ULT freezer

Use a dry cloth to wipe off a small amount of dust on the outer shell of the freezer as well as that on all accessories. If the ULT freezer is very dirty,

Use a cleaning cloth soaked with neutral detergent to remove the dirt, wipe off the residual detergent with a wet cloth, and then wipe it again with a dry cloth.

Do not pour water on the outer shell of the ULT freezer or inside the ULT freezer, otherwise it may damage the electrical insulation and cause malfunctions.

The compressor and other mechanical parts are completely sealed and do not require lubrication.

Clean the ULT freezer once a month. Regular cleaning will keep the ULT freezer looking new.

Remove frost or ice from the inner wall and clean the condenser filter once a month.

for after sales use

Clean the condenser filter

Remove the front side bottom vent cover and take out the filter.

Clean the filter with water.

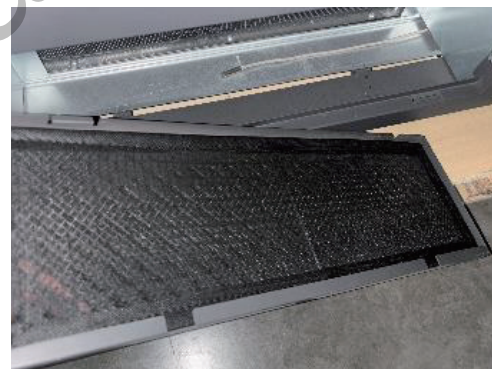
Use compressed air to blow off the dust on the condenser.

After the filter has dried, put it back in place and install the vent cover.

The filter should be cleaned once a month under normal use.

If the filter is blocked, it will affect the cooling effect of the ULT freezer and reduce the product's service life.

Note: The configuration of different product models may vary, please refer to the actual product. The Product model 1 filter cleaning diagram is as follows:



for after sales use

Defrosting inside the freezer

Frosting can be a gap between the freezer and the door seal, which can lead to poor cooling. Defrost the inner door with the ice shovel supplied with the ULT freezer. The following steps are for natural defrosting.

Take out the contents inside the freezer and transfer them to an environment suitable for their storage

↓

Cut the power

↓

Open the inner and outer doors and leave the ULT freezer open for a while to naturally defrost

↓

Dry the bottom of the freezer with a dry cloth

↓

After cleaning the cabinet and the inner door, restart the ULT freezer

↓

Return the item to the adequately cooled freezer

⚠ WARNING

Do not use sharp-edged tools such as knives or screwdrivers to defrost.

for after sales use

Component Replacement Cycle

Part	Suggested replacement cycles
Battery (SN12001.3 12V 1.3AH/20HR)	3 years
Condensing fan (12V, 3.5W)	5 years

Device deactivation

Discontinuation:

If the equipment is stored in an unsupervised area for a long time and is not used, the power supply should be cut off and the inner and outer surfaces of the box should be wiped clean with a warm and wet soft cloth, and then dried and sealed; It is necessary to ensure that the equipment is locked, and that child cannot open the door to prevent accidents such as suffocation.

End-of-life:

When the equipment reaches the end of its service life, it should be scrapped and must be handed over to qualified professional recycling organizations for scrapping and disposal in accordance with local regulations and ordinances; non-professionals should not disassemble or disassemble the equipment without authorization; Scrapped equipment should be placed in designated areas that are inaccessible to child to avoid danger.

for after sales use

TROUBLESHOOTING AND MAINTENANCE SERVICES

Any product has the possibility of failure. Please observe the operation of the equipment in time during use. If there is any abnormality, please check and deal with it according to the table below. If you still can't change the situation, you should inform our service center in time, we will serve you wholeheartedly so as not to cause any loss to you.

Malfunctions	Troubleshooting
The freezer doesn't work	• Whether the power circuit breaker is activated
	• Whether the power supply voltage is too low
	• Whether the power switch is turned off
	• Whether the fuse is blown
Poor cooling	• Whether the ambient temperature is too high
	• Whether the inner and outer doors are closed tightly (The frost between the cabinet and door seal may compromise the sealing of the door)
	• Whether the air intake is dirty or clogged
	• Whether the condenser and filter are dirty or clogged
	• Whether temperature is set correctly
	• Whether the ULT freezer is kept away from direct sunlight
	• Whether the ULT freezer is near a heat source
	• Whether the rubber covers and insulating material of the test holes are properly placed
	• Whether a large number of hot items have been placed in the ULT freezer for a short period of time
Excessive noise	• Whether the ULT freezer is installed on a solid and flat floor
	• Whether the outer shell of the ULT freezer is in contact with other objects
	• Whether the bottom feet of the ULT freezer are leveled

⚠ NOTE

If the fault cannot be eliminated after checking the above items, or if the fault is different from the above list, please contact the after-sales service personnel.

for after sales use

SPECIFICATIONS

Name	Ultra Low Temperature Freezer
Model	Product model 1
Electric shock resistance type	Type I
Power supply	220V-240V-/50Hz
Shelves	3 shelves(max 35kg)
Temperature in the freezer	-40°C--86°C
Refrigerant	R601a/100g R290/10g R1150/25g
Cooling mode	Direct cooling
Volume	358L
Rated current	5.3A
Operating power	610W
Product dimensions (W×D×H)	795*885*1855mm
PS(High/Low)	3.8/1.5
Noise	50dB(A)

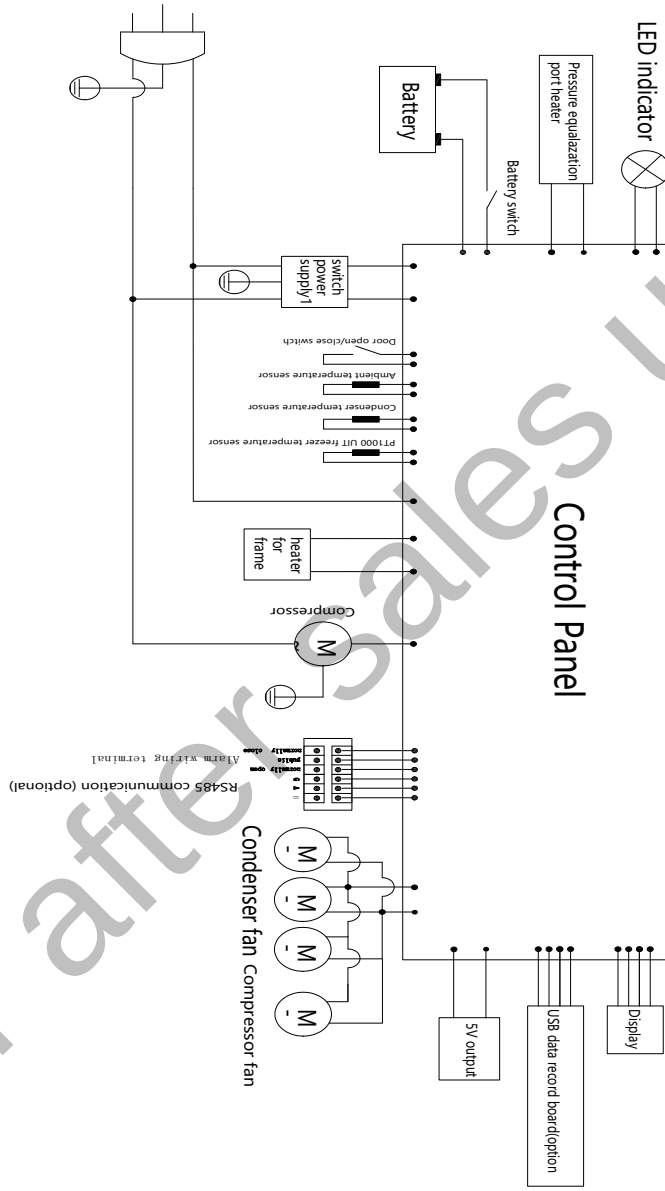
PACKING LIST

Name	Manual	Key	Limit bracket	Ice shovel
Quantity	One	Two	Two	One

Note: For external padlocks and handle options, etc., please refer to the physical configuration.

for after sales use

ELECTRICAL SCHEMATIC DIAGRAM



for after sales use

Note: Some models do not have running capacitors and condensing fans, please refer to the actual product.



Protection of the environment

This symbol attached to the product means that it is an appliance whose disposal is subject to the directive on waste from electrical and electronic equipment (WEEE). This appliance may not in any way be treated as household waste and must be subject to a specific type of removal for this type of waste. Recycling and recovery systems are available in your area (waste removal) and by distributors. By taking your appliance at its end of life to a recycling facility, you will contribute to environmental conservation and prevent any harm to your health.

for after sales use

Product model 1: MD-86L358