Ultra-low Temperature Freezer

USER MANUAL

Product model 1: MD-86L860BS
Product model 2: MD-86L720BS
Product model 3: MD-86L580BS

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.

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Warning; flammable material

This unit is intended for use in commercial, industrial, or institutional occupancies as defined in the Safety Standard for Refrigeration Systems, ANSI/ASHRAE 15”

Replacement components and servicing

This installation and operating instructions indicate that component parts shall be replaced with like components and that servicing shall be done by the manufacturer’s authorized personnel, so as to minimize the risk of possible ignition due to incorrect parts or improper service.

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

WARNING: In order to reduce flammability HAZARDS the installation of this equipment shall only be carried out by a suitably qualified person.

DANGER – Risk of Fire or Explosion. Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing.

CAUTION – Risk of Fire or Explosion. Flammable Refrigerant Used. Consult Repair Manual / Owner’s Guide before attempting to install or Service This Equipment. All Safety Precautions Must be Followed.

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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

"Cet appareil est destiné à une utilisation commerciale, industrielle ou institutionnelle, comme défini dans la norme de sécurité des systèmes frigorifiques, ANSI/ASHRAE 15."

AVERTISSEMENT: S'assurer que toutes les ouvertures de ventilation ne soient pas obstruées.

AVERTISSEMENT: Ne pas utiliser de dispositifs mécaniques ou d'autres moyens pour accélérer le processus de dégivrage, autres que ceux recommandés par le fabricant.

AVERTISSEMENT: Ne pas endommager le circuit FRIGORIFIQUE.

AVERTISSEMENT: Afin de réduire les DANGERS d'incendie, l'installation de cet appareil doitêtre effectuée uniquement par une personne dûment qualifiée.

AVERTISSEMENT: La base de l'emballage au bas de cette série de produits doit être retirée avant utilisation.

AVERTISSEMENT: Lorsque vous déplacez cette série de produits, veillez à ce que le pied inférieur ne touche pas le cordon d'alimentation.

AVERTISSEMENT: Le frein inférieur de la roue avant de cette série de produits doit être verrouillé après s'être déplacé dans la position désignée.

AVERTISSEMENT: Cette série de produits doit être laissée au repos pendant 12 heures avant la mise sous tension initiale.

AVERTISSEMENT: Lorsque cette série de produits est juste connectée à l'alimentation électrique, n'y mettez pas immédiatement les éléments. Après avoir fonctionné pendant un certain temps, lorsque la température à l'intérieur du produit descend à la température définie, placez les articles par lots.

Le réfrigérant et le matériau moussant cyclopentane utilisés pour l'appareil sont inflammables.

Par conséquent, lorsque l'appareil est mis au rebut, il doit être tenu à l'écart de toute source d'incendie et être récupéré par une entreprise spéciale de récupération ayant une qualification correspondante autre que l'élimination par combustion, afin d'éviter les dommages à l'environnement ou tout autre dommage.

La sécurité de tout système incorporant l'équipement est de la responsabilité de l'assembleur du système

RISQUE d'incendie ou d'explosion. Utilisation de FLUIDE FRIGORIGENE INFLAMMABLE. Ne pas utiliser de dispositifs mécaniques pour dégivrer les APPAREILS DE REFRIGERATION. Ne pas percer les tubes FRIGORIFIQUES".

"ATTENTION – RISQUE d'incendie ou d'explosion. Utilisation de FLUIDE FRIGORIGENE INFLAMMABLE. Consulter le manuel de réparation/guide d'entretien avant de tenter d'installer ou d'entretenir cet appareil. Toutes les précautions de sécurité doivent être suivies."

IMPORTANT:

Gaz inflammable et réfrigérant utilisés. Il est de la responsabilité du consommateur de se conformer aux réglementations fédérales et locales lors de l'élimination de ce produit.

Suggestion : Coupez la conduite et vidangez le réfrigérant sans feu ouvert autour

AVERTISSEMENT: Si l'équipement est utilisé d'une manière non spécifiée par le fabricant, la protection fournie par l'équipement peut être altérée

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	**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”

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PRODUCT OVERVIEW

Structure

Primarily consists of refrigeration system, electrical control and alarm system, cabinet, and door body.

Scope of application

Applicable to the low-temperature storage of human examination samples, drugs, vaccines, biological products, reagents, plasma and other samples stored in medical institutions, blood stations, scientific research institutions and other departments under low temperature conditions.

Refrigeration system

Mainly composed of compressor, condenser, dryer filter, capillary tube, and evaporator.

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SAFETY PRECAUTIONS

Dear Customer :

Greetings! Thank you for using the low temperature freezer. Please carefully read the following information to better understand the Operating Instructions and use this product, so as to prevent personal injury and damage to items.

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

Ignoring WARNING items may result in serious casualties.



CAUTION

Ignoring CAUTION items may result in casualties or damage to the product and related properties.



Acts or operations that must be prohibited.



Actions or operations that must be followed.

⚠ WARNING



- Please use a power socket with a grounding wire to prevent electric shock. If the power socket is not grounded, a professional technician must install a grounding wire.
- This product must be firmly placed on a solid and flat ground and proper care is taken to prevent overturning. Floor instability or improper placement may cause the product to overturn, leading to personal injury.
- If the power cord needs to be extended, the cross-sectional area of the extension cord shall not be less than 2.5mm^2 and the length shall not be longer than 3m. Failure to comply may result in fire or electric shock.
- In case of flammable gas leakage, close the valve with gas leakage, and open the doors and windows to ventilate and exhaust gas. Do not plug or unplug the power plug of the refrigeratorfreezer, otherwise it may cause an explosion and fire.
- Only professional technicians or after-sales service personnel may repair this product. Failure to comply may result in electric shock or fire.
- Use only the dedicated power source specified on the product's nameplate; otherwise, fire or electric shock may occur.
- If the applied voltage is lower than 90 V or higher than 264 V, an automatic voltage regulator of over 10 KW suitable for the motor load needs to be installed for assistance.

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- The power cord of this product is equipped with a three-wire (grounded) plug to mate with a standard three-wire (grounded) 10 A socket. Under no circumstances should the grounding pin of the power cord be cut off or removed. Ensure that the power plug and socket are securely and reliably connected; otherwise, fire may occur.
- When unplugging the plug from the power socket, hold the plug tightly instead of pulling the wire of the plug. If the wire is pulled, an electric shock or a fire due to a short circuit may occur.
- If the product is not operating properly, unplug the power plug. Continued operation under abnormal conditions may cause an electric shock or fire.
- Before any repair or maintenance of the product, always disconnect the product from the power supply to prevent electric shocks or personal injuries.
- Make sure that the drugs or suspended particles inside and around the product will not be inhaled during repairs and maintenance, otherwise it may cause harm to human health.
- Disconnect the power plug when the product is not in use for a long period, so as to prevent electric shock, electric leakage, or fire due to the deterioration of the power cord.
- If the product is to be stored unused in an unsupervised area for a long period, ensure that children do not have access to the product. The disposal of the product shall be accomplished by the appropriate personnel. The doors shall be removed to prevent accidents such as suffocation.
- If CO_2 /LN_2 standby system is used, a good ventilation environment must be provided at the installation and use site. Increased carbon dioxide concentrations in the air can asphyxiate and endanger life safety. If ventilation is poor, other methods must be considered. For details of operation, please refer to the backup system instruction manual.



> Neither store flammable, explosive, or volatile substances in the product nor use flammable sprays near the product; otherwise, an explosion or fire may occur.
> Never store corrosive substances such as acids or alkalis in the product. Otherwise, these substances may cause damage to internal components or electrical parts of the product.
> Do not leave the plastic packing bags in a place accessible to children, as this may result in suffocation accidents.
> Do not climb onto this product or place objects on it, otherwise the product will tip over and cause personal injury or damage of objects.
> Do not use this product in the open air. Exposure to rain may cause an electric leakage or electric shock.
> Do not place the product in a humid location or a place where the biomedical freezer is easy to be splashed with water. Otherwise, an electric leakage or electric shock may occur due to reduced insulation.
> Do not pour water directly onto the product; otherwise, it may cause an electric shock or short circuit.
> Never disassemble, repair, or modify the product yourself. Otherwise, fire or personal injuries may occur due to improper operation.
> Do not connect the grounding wire to a gas pipe, power supply pipe, telephone line, or lightning rod when grounding the product. The above grounding may cause an electric shock or other hazards.
> Do not touch any electrical parts such as the power plug or operate any switch with a wet hand; otherwise, an electric shock may occur.
> Do not put water containers or heavy objects on the product. Falling objects may cause personal injuries, and spilled water may cause reduced insulation, resulting in an electric leakage or electric shock.
> Never insert metal objects such as iron nails and wires into any vent, gap, or air outlet on the product. This may cause electric shocks or injuries by accidental contact of these objects with moving parts.
> It is not allowed to drag, pull, wind and bind the power cord, or damage the power cord plug.

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Damaged power cords or plugs may cause fire or electric shock.

> The power cord with a loose plug is not allowed, because it may cause fire or electric shock.

> It is not allowed to put glass bottles or canned items in the product, which may be frozen and cracked, causing injury to personnel.

⚠ CAUTION

- Keep the product clear of obstruction around it to ensure smooth ventilation.
- When it needs to restart the biomedical freezer after power outage or the product is turned off, check the settings of the product. Changes in settings may deteriorate the items being kept.
- Once the power is cut off, the product can only be powered on again after more than five minutes to avoid damage to the compressor or the system.
- Check the filter screen in time and clean it at a frequency of not less than once a month. A dusty filter screen will cause the product temperature to rise or product malfunction.
- After the power is cut off or the power switch is off, the setpoint shall be checked when the power switch is restarted; otherwise, the stored items may be damaged due to setting change.
- If the power plug has dust, it needs to be cleaned in time. Improper connection or plug filled with dust may cause heating or ignition.
- Gloves shall be worn during maintenance to avoid directly touching sharp edges or corners and causing injuries to personnel.
- The stored items shall not be contacted directly by hand. Direct contact with the frozen items or the inner wall of the product may cause frostbite.
- Hold the handle to close the doors for fear of finger pinching.
- Tilt the product for 30° or less when handling or moving it.

> During product handling, care should be taken not to trip over it to prevent damage to the product or personal injury.

> Do not use the door handle to lift or carry the product to avoid damage to it or personal injuries.

> Do not damage the refrigeration circuit.

> Do not use appliances inside the product except for those recommended by the manufacturer.

NOTICE! Risk of damage:

Vacuum insulation panels are used in the construction of these ULT freezers. Inspect the cabinet panels for punctures or other damage that compromises the integrity of the product

These panels are mounted in the cavity against the steel outer wall of the freezer. Any drilling or puncture to the outer wall could release the vacuum from the panel, resulting in impaired freezer performance

Any unauthorized punctures or other damage deliberately made to the cabinet walls will invalidate the warranty Warning: Please abandon the refrigerator according to local regulation for it use flammable blowing gas and refrigerant.

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PRECAUTIONS FOR USE

* When the product is running, the front part in contact with the outer door may heat up. This is not a fault. It's because anti-condensation components are installed to prevent condensation around the freezer housing.

* Before putting items into the product, confirm that the temperature in the storage compartment has reached the setpoint, and then put the items in batches. Each time you put items in, make sure that the items account for 1/3 or less of the compartment volume, for fear of excessive temperature rise.

* The displayed temperature of the equipment is the temperature at the temperature sensor in the cabinet. When the equipment just starts to run, the displayed temperature is somewhat different from the actual temperature at the center of the equipment. However, after the equipment enters a stable status, the displayed temperature will gradually approach the actual value.

* The product cabinet is designed with a testing hole so that the testing line of the cabinet can be led out for testing. After the testing line is pulled out, it is necessary to plug the testing hole again with thermal insulation material, otherwise the temperature in the refrigerator may not reach the set temperature and cause condensation around the outside of the hole (applicable to refrigerators with testing holes).

* Please use diluted neutral cleaner to clean the equipment. Do not use brushes, acid, gasoline, soap powder, polish or hot water to clean the equipment; otherwise, the painted surface and plastic/rubber parts may be damaged. Special care must be taken not to use volatile solvents such as gasoline to wipe plastic/rubber parts.

* When the refrigerator is not in use for a long period, cut off the power supply and turn off the battery switch (applicable to refrigerators with batteries).

* Try to minimize the opening time of the door each time you take out or put in items to avoid a large impact on the compartment temperature.

* After the door is opened, the compartment temperature will rise sharply in a short time, which is normal, and it will return to the setpoint for normal operation after the door is closed.

* After this product has been running for a period of time, a layer of frost will form on the inner wall of the box. If the frost layer is too thick, it will affect the cooling effect of the product and increase power consumption. Therefore, after a period of time, when the frost layer reaches about 5mm, it should be defrosted with the attached shovel.

* Before defrosting, the frozen items in the product shall be taken out and placed in an environment suitable for storage, so as not to damage the items due to temperature rise.

* There are many refrigerating coils in the product. The frost from the inner wall shall not be removed by sharp tools such as knife, ice chisel or screwdriver. The inner wall shall not be scratched during defrosting, or the product will fail.

* The enclosure requires open by tools.

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HANDLING

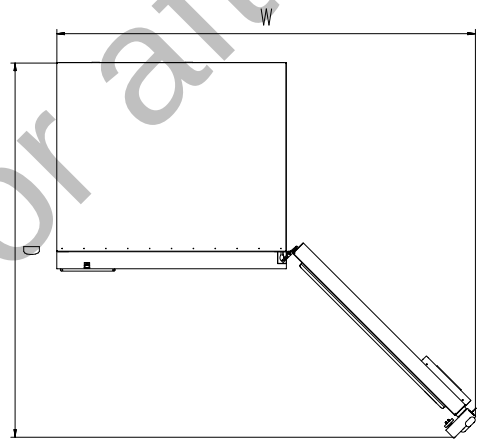
❶ Protect the product in moving it, please move it by Manual hydraulic truck.
❷ Remove all packing materials and bottom cushion, then move into house for placement.
❸ After moving it to appropriate location, wait for 24 hours before power on.



DOOR SPACE REQUIREMENTS

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

W×D≥1750mm*1950mm (for Product model 1)
W×D≥1670mm*1600mm (for Product model 2)
W×D≥1395mm*1500mm (for Product model 3)



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PRODUCT INSTALLATION

Installation Environment

- This product should be used indoors and is prohibited from being installed in the open air.
- **Ambient temperature:** 10°C-32°C. The optimal temperature range is 18°C-25°C. Use an air conditioning system if necessary.
- **Ambient humidity:** below 80%Rh. The humidity shall be less than 60% Rh if the maximum ambient temperature is 32 °C.
- **Pollution degree:** (2), environment with large amount of dust shall be avoided.
- **Power supply environment:** overvoltage class II.
- Avoid mechanical swinging or vibration.
- **Altitude of working position of the power strip:** lower than 2,000m.
- **Input voltage:** within AC 100-240V±10%/50/60Hz.
- The product is sensitive to ambient temperature. If installed in an environment other than the above, the product cannot operate normally. Please use it after improving the environment.
- **Transportation and storage conditions:** ambient temperature of -40°C to +55°C, humidity of 10 to 90%Rh.

Installation Site

- This product shall not be installed in a narrow and closed space. The door body of the room where the biomedical freezer is placed shall not be smaller than or lower than the biomedical freezer, or at least the normal access of the equipment shall be ensured, so as to avoid maintenance difficulties in the event of equipment failure and causing damage to the stored items due to failure of repairing the equipment in time.
- The ground for installation must be solid and flat, non-combustible and able to withstand the weight of the equipment during operation.
- Good ventilation, no exposure to direct sunlight.
- Each equipment shall be provided with an independent power socket. Please ensure that the power socket carries a current of 10A or more for 220V and 14A or more for 115V.What's more, the plug should be firmly connected to the socket.
- Check the working voltage before use. For areas with unstable voltage, use a voltage stabilizer suitable for the equipment's load with a power rating above 10KW to ensure compliance with input voltage requirements in the installation environment.
- The equipment shall be grounded securely. If the power cord socket is equipped with a grounding wire, check that the grounding is good before use. If the socket is not equipped with a grounding wire, be sure to have a professional engineer install the grounding wire.

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WARNING

Do not connect the grounding wire to a gas pipe, water pipe, telephone line, or lightning rod when grounding the product, otherwise it may cause an electric shock.

The power plug must be accessible after installation to facilitate timely unplugging of the power cord in case of an emergency. Do not block the vent of the product.

CAUTION

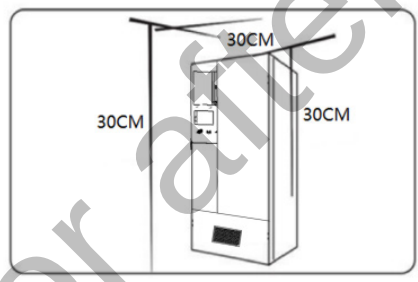
Since the ambient temperature has a large impact on the equipment, the equipment may not operate normally if the above environmental requirements cannot be met. Please improve the environment before using the equipment, and please note that the equipment has an intermittent operation system.

Preparations before Use

1. Remove all transport packaging materials and packaging straps (including protective foam in the packaging box).

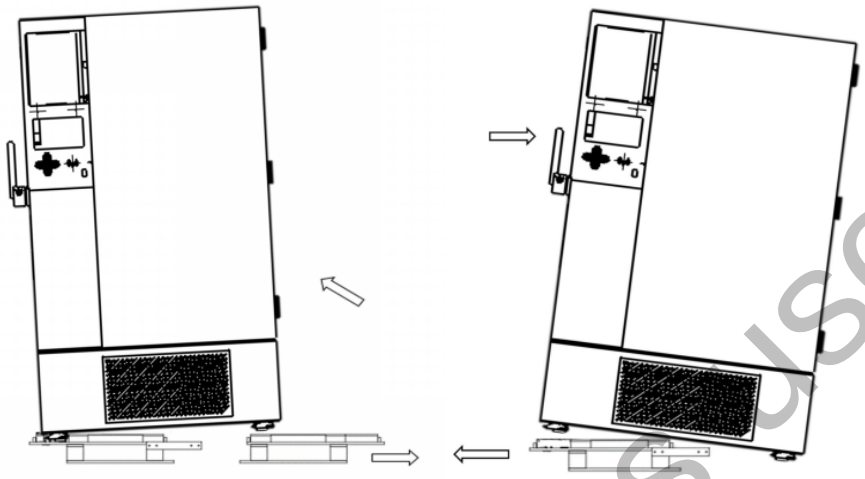
2. Check the accompanying accessories. Please check the items inside with reference to the packing list. If there is any discrepancy, please contact the after-sales service center in time.

3. Placement conditions: Ensure at least 30cm clearance around all sides of the product for proper ventilation and heat dissipation.

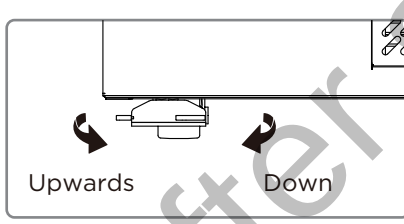


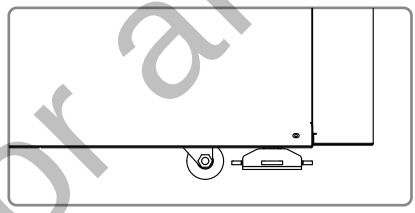
4. Scheme for removing the product from the wooden support: Remove 16 screws (8 screws on each side of the front and back) on the left and right wooden support connecting plates, push the side of the ultra-low temperature refrigerator to separate one side of the ultra-low temperature refrigerator from the wooden support, then pull out the wooden support to make one side fall to the ground, push the other side to separate it from the wooden support, and pull out the wooden support to complete the product landing action.

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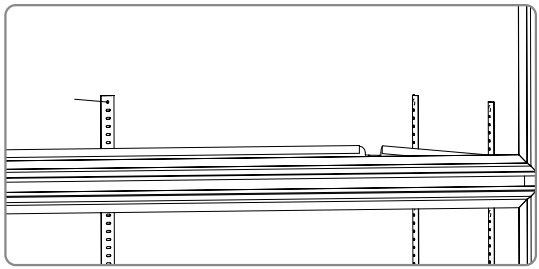
5. This product uses universal wheels to move forward, backward, left and right. Please ensure that the product is in the correct position when fixing it, and then fix it by rotating the leveling feet.





6. Open the outer door by more than 90°, take out the rack from the bottom of the freezer, remove the rack protective film, and place the rack one by one on the rack support strip.

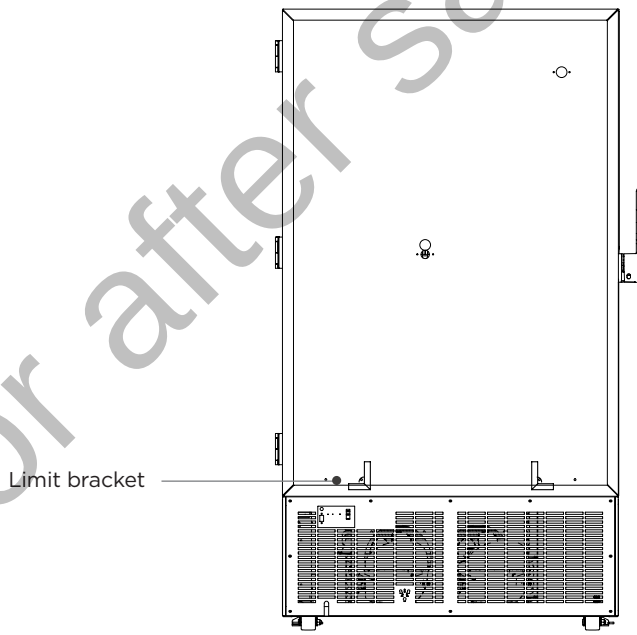
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WARNING

Place the plastic packing bag in a place not accessible to children to avoid suffocation accidents.

7. Take out the back limit bracket in the cabinet and fix it to the back plate with screws.



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First Power-on

When using the product for the first time, follow these steps:

After the product is placed, leveled and cleaned, it shall be left to stand for more than 24 hours before it is powered on to ensure normal operation

Connect the power cord to a dedicated socket of appropriate specifications under no-load conditions

After turning on the power, first turn on the product's small circuit breaker. If the product is equipped with a battery, then turn on the backup battery switch (located at the bottom of the rear side of the product. Once the battery switch is turned on after power-on, the battery will start charging automatically). After powering on, refer to page 23 of this Manual to create a user and refer to the operating instructions on page 28 of this Manual to modify the time

Set the required temperature (default temperature -81°C). Do not put anything inside the product. Power on and start up. Check whether the operating temperature of the product can reach the set temperature. Observe that the equipment operates normally for more than 24 hours to ensure normal performance of the product

Set the required temperature (default temperature -81°C). Do not put anything inside the product. Power on and start up. Check whether the operating temperature of the product can reach the set temperature. Observe that the equipment operates normally for more than 24 hours to ensure normal performance of the product

Put items in batches, not exceeding 1/3 of the freezer volume at a time. Ensure that the equipment can be shut down normally for more than 8 hours before putting in the next batch of articles

Avoid opening the door during the cooling process whenever possible; otherwise, the temperature may rise

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- No alarm for overtemperature within 8 hours after the first power-on

*__Backup battery:__ The product has a backup battery, and the switch is located at the lower left of the back; when the switch is turned on, the complete machine will automatically charge the battery when it is powered on. When the switch is turned off, the complete machine cannot charge the battery when it is powered on; after the battery is fully charged, it stops charging automatically without user operation.

*__Box frame heating function:__ This product has a box frame heating function, which is enabled as the ambient humidity changes to prevent condensation without user operation

Precautions after Power Failure

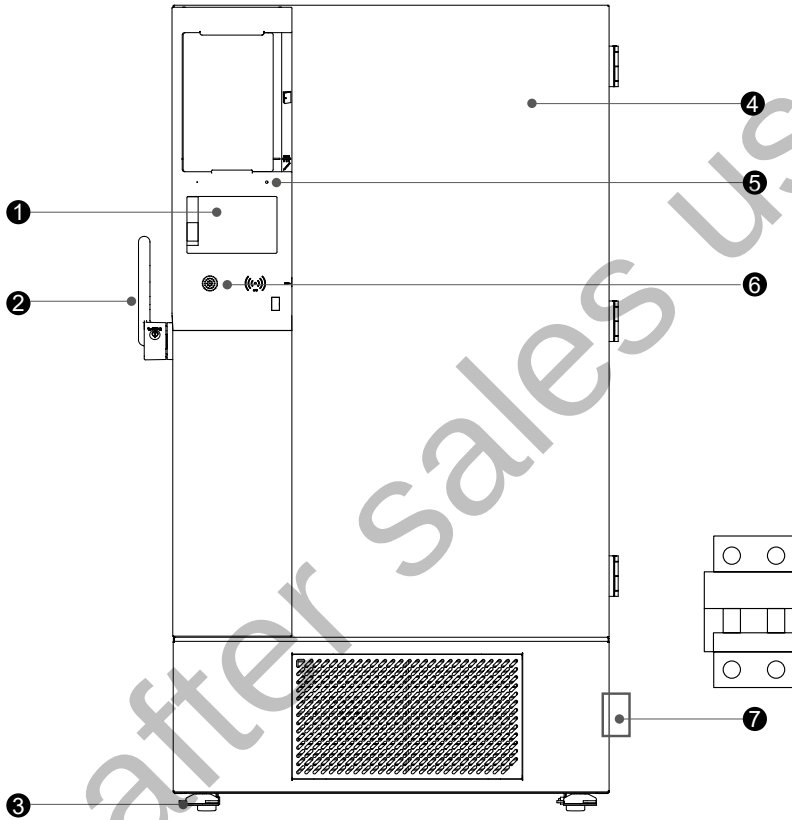
The setpoint is memorized by the product. After power resumption from a power failure, the product will resume operation with the set parameters before the power failure.

⚠WARNING	• If the product is unplugged or the power to the biomedical freezer is interrupted, do not restart the biomedical freezer for at least 5 minutes to avoid damage to the compressor or system. • When the product is going to be left unused for a long time, unplug the power plug and turn off the battery switch (applicable to products with batteries) to prevent electric shocks, electric leakages, or fire due to aging of the power cord. • If the product is to be stored unused in an unsupervised area for a long period, ensure that children do not have access to the product and that doors cannot be closed completely.
	• The product shall be managed by a specially-assigned person to check the operation and make records every day (it is recommended to record the inspection once every 2-4 hours). In case of failure or shutdown, the temperature in the freezer will rise. If it cannot be repaired in a short time, the articles shall be transferred to other places that meet the temperature requirements for storage to avoid damage to the articles. • This product is an ultra-low temperature freezer. Please confirm that the temperature required for stored items is consistent with the temperature range in the freezer, so as to avoid damage to items and economic losses due to mismatched temperature ranges. • Due to the inertia of refrigeration, the temperature displayed on this product may differ from the actual temperature inside the freezer, which is normal.
	• Since the product is storage equipment, it is strictly prohibited to put too many relatively hot items at one time, which will cause the compressor to not stop for a long time, the temperature will drop slowly and affect the service life of the compressor. The items must be put in batches to allow the temperature to decrease by steps until the required temperature is reached! • Do not damage the refrigeration circuit. • Do not use electrical appliances without production permits inside the product. • No mechanical tools or other means without the manufacturer's permission shall be used to accelerate the defrosting process.

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PRODUCT COMPOSITION & OVEVIEW

Schematic Diagram of Appearance



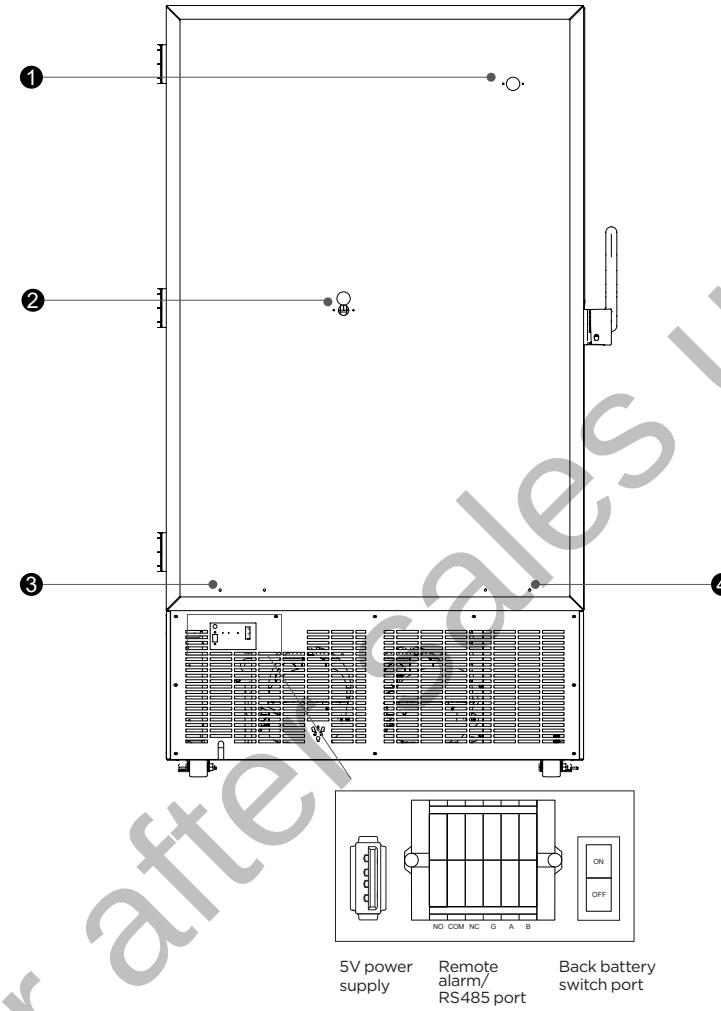
Product model 1 Schematic Diagram (front view and partial view)

1	Control Panel	5	State indicator
2	Outer door handle	6	Balance valve
3	Universal wheel	7	Miniature circuit breaker
4	Door assembly		

Due to product improvement and differences among models, the actual product may be different from the diagram. Please refer to the actual product!

The diagrams are only for a brief description of functional parts.

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Product model 1 Schematic Diagram (rear view and partial view)

1	Testing hole 1	**3**	Limit bracket mounting hole 1
2	Testing hole 2	**4**	Limit bracket mounting hole 2

Due to product improvement and differences among models, the actual product may be different from the diagram. Please refer to the actual product!

The diagrams are only for a brief description of functional parts.

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OPERATING INSTRUCTIONS

Create a User

1. Create a user

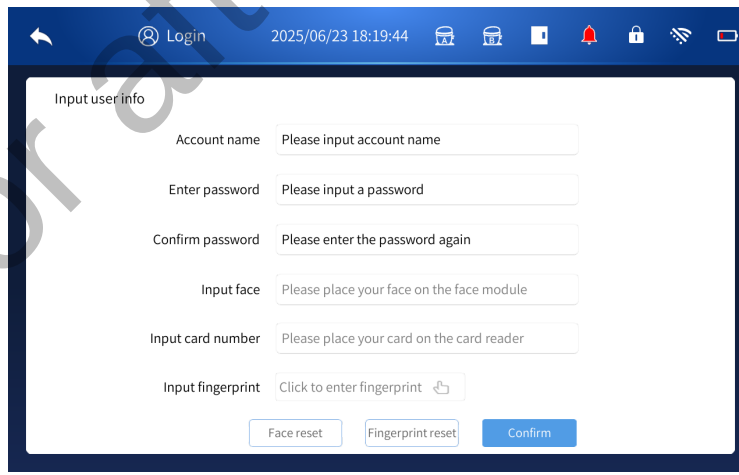
- In using a new machine, it is necessary to create users, including an administrator account (Level 1 accounts) and an ordinary user account (Level 2 accounts).

1.1 Add administrator

After startup, click the “Settings” icon at the bottom of the homepage to enter the new user interface, and select the new administrator in the permission area Account number, as shown in following figure:



(Figure 1)



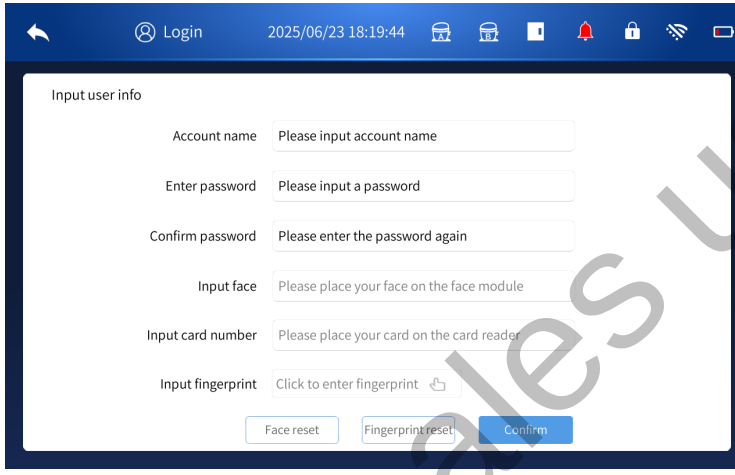
(Figure 2)

for after sales use

1.2 Adding common user

You must log in to the administrator account before adding an ordinary user account (multiple ordinary user accounts can be created).

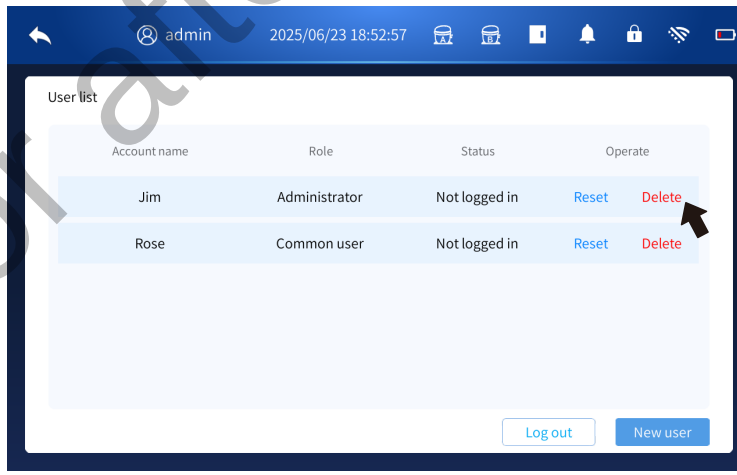
Note: The password length is limited to 8-16 characters.



(Figure 3)

1.2 Delete user

After logging in to the administrator account, on the user settings page, select the account you want to delete and click the corresponding “Delete” button to remove it. Note that common user accounts do not have the permission to delete other ordinary user accounts.



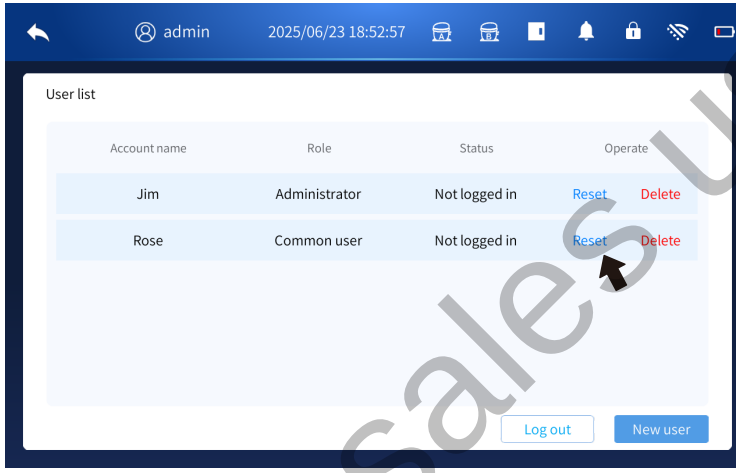
(Figure 4)

for after sales use

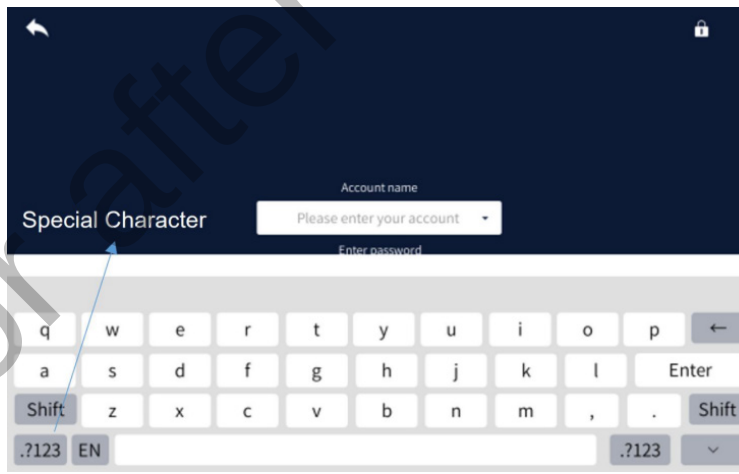
1.3 Modify/reset password

All users can enter the user list page in the login state to modify/reset their passwords:

- In the administrator login mode, click the “Reset” button after the common user name to reset the password of the corresponding common user. After resetting, the password will be 12345678;
- When logged in with any account, you can click the “Edit” button after the user name to modify the password of the current login account. The characters that can be used for password editing are letters, numbers and symbols;

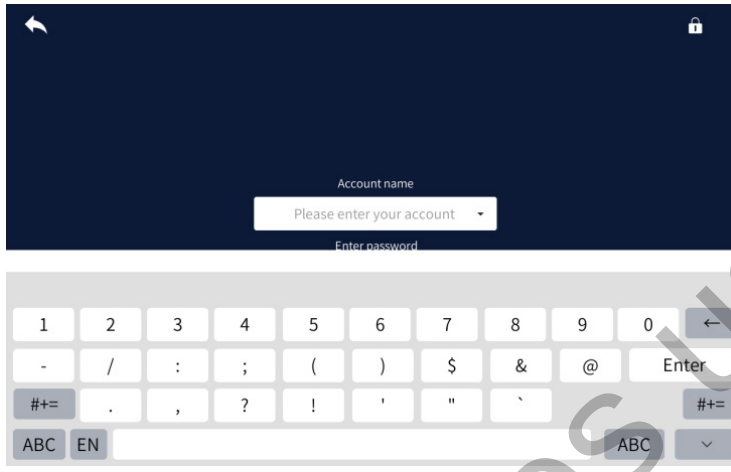


(Figure 5)

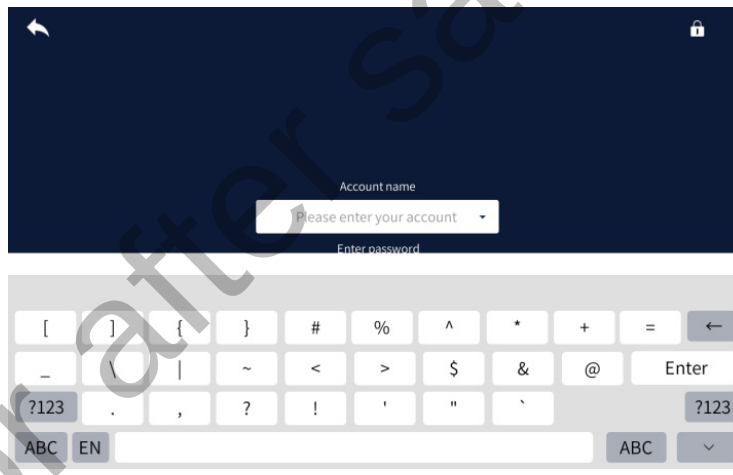


(Figure 6)

for after sales use



(Figure 7)



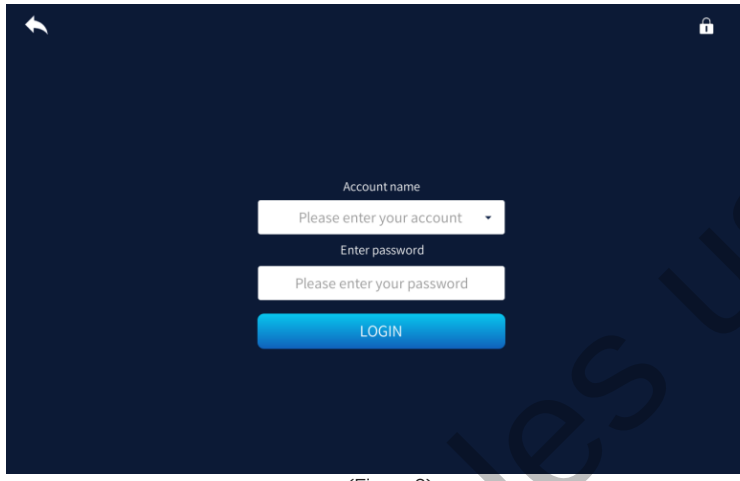
(Figure 8)

Note: Password modification/reset must be done in a logged-in state.

for after sales use

1.4 Log in

You can log in with the newly created account and password.

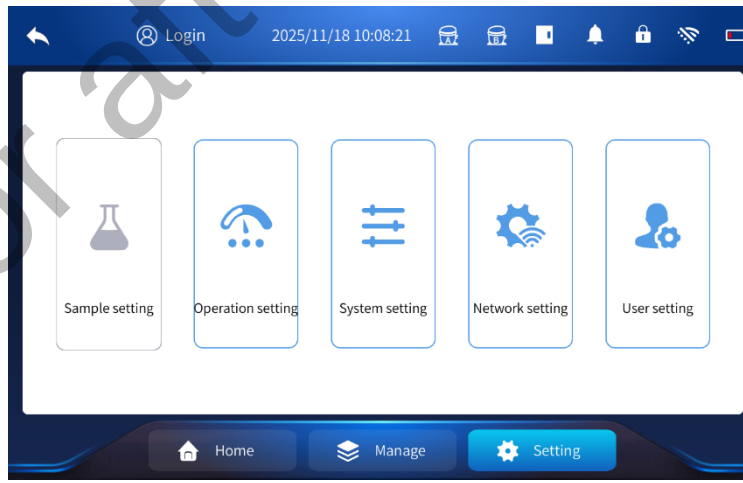


(Figure 9)

Setting

2. Setting

- Click “Setting” on the homepage to enter the following interfaces, including sample setting, operation setting, system setting, network setting and user setting. The gray interfaces represent the unopened function of the current freezer, and the blue interfaces represent the available function.

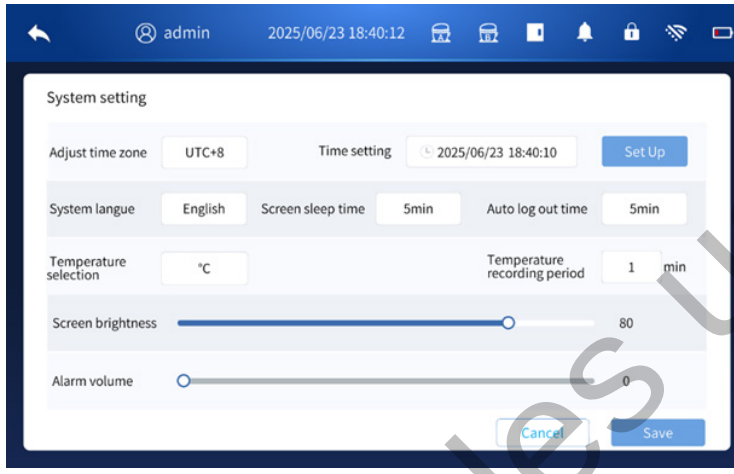


(Figure 10)

for after-sales use

2.1 System settings

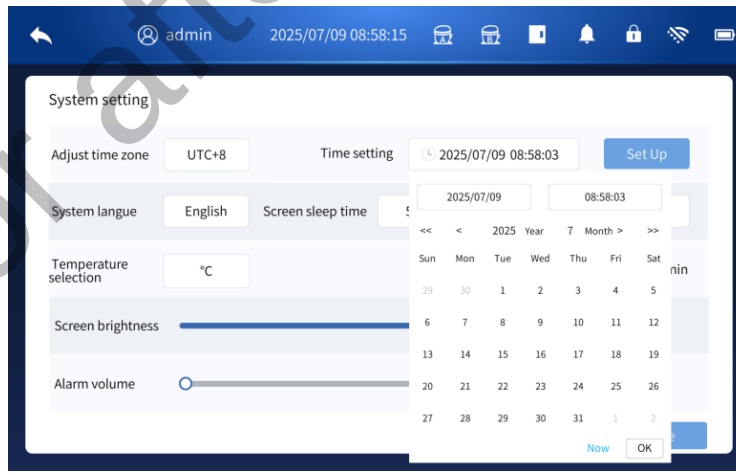
Enter the system setting interface, as shown in Figure 7 below, and you can set the following functions



(Figure 11)

2.1.1 Time setting

- Manually update the time: “Setting” - “System Setting”. Click the time option to adjust it to the current time (set time = current time - current time zone), confirm and click ““Set Up”. After the time is set successfully, a pop-up window will appear asking whether to confirm the restart. Click Confirm Restart to complete the setting successfully. If you are in the time zone UTC+8, set the time to 16:58:03. You need to select 08:58:03 in the time setting bar and click ““Set Up”. After confirming the restart, the time will be 16:58:03.
- Automatic time update: The system will automatically calibrate the time when connected to the network. For connection methods, please refer to the description in section 2.4.



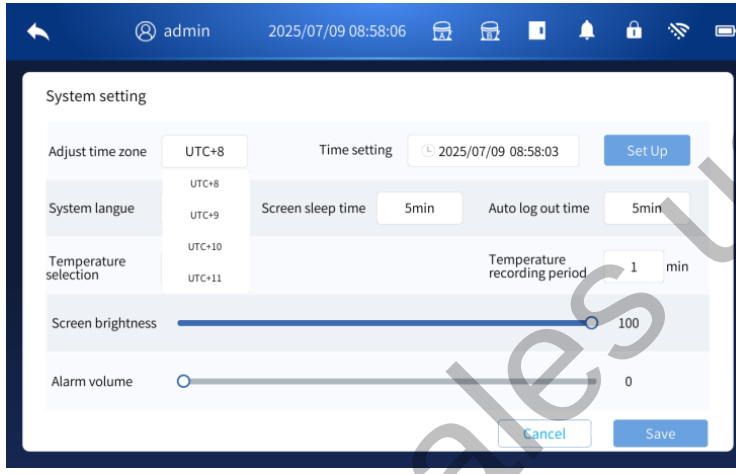
(Figure 12)

for after sales use

2.1.2 Time zone setting

> The description of time zone setting is added: The default time zone is UTC+8. Click ““Set Up” - “System Setting”, and click Time Zone Option to adjust

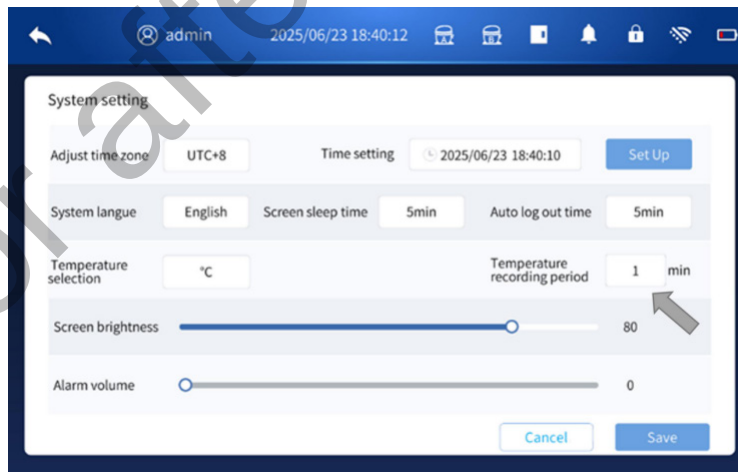
> Current time zone: After selecting the corresponding time zone from UTC-12-UTC+12, click “Setting”. After the time zone is successfully set, a pop-up window will appear asking whether to confirm restart. Click “Confirm Restart” to complete the setting.



(Figure 13)

2.1.3 Temperature recording period setting

> Description of temperature recording cycle setting: ““Set Up” - “System Setting”. Enter the corresponding time (range 1-240min) in the temperature recording cycle setting, click “Save”, and the setting is successful.

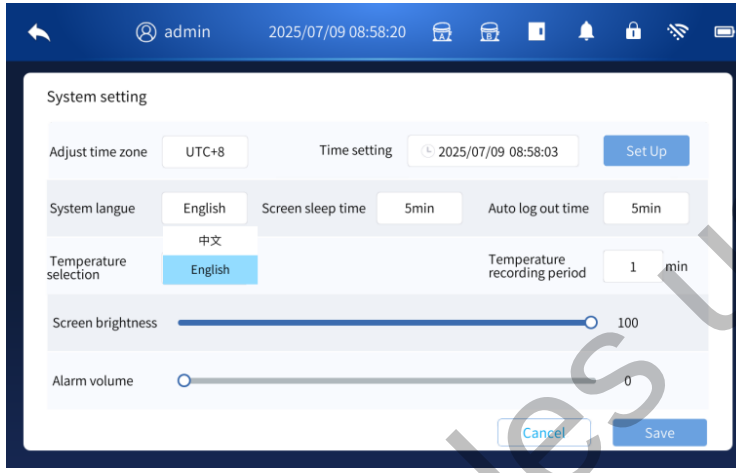


(Figure 14)

for after sales use

2.1.4 Language setting

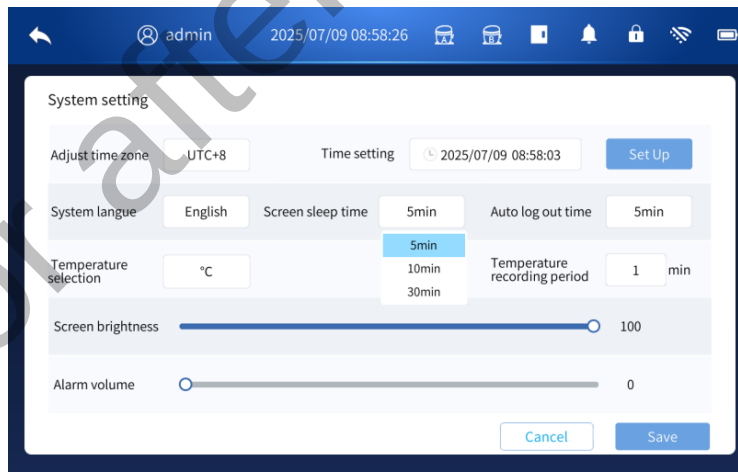
> Language setting description: “Setting” - “System Setting”. Select the corresponding language in the language settings, click “Save”, and the setting is successful.



(Figure 15)

2.1.5 Screen sleep time setting

> Screen sleep time setting description: “Setting” - “System Setting”. Select the corresponding time in the screen sleep time setting, “Save”, and the setting is successful.

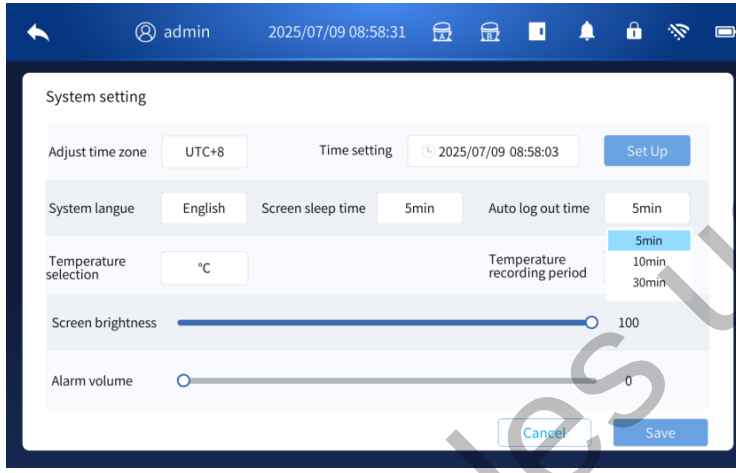


(Figure 16)

for after sales use

2.1.6 Auto log out time setting

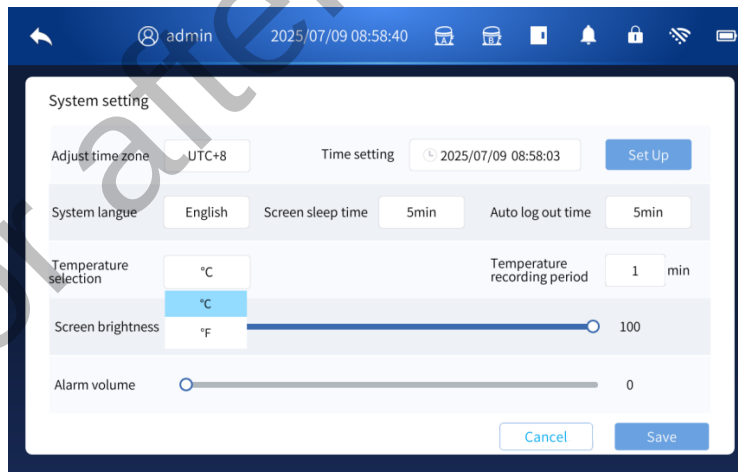
> Auto log out time setting description: “Setting” - “System Setting”. Select the corresponding time in the screen sleep time setting, click “Save”, and the setting is successful.



(Figure 17)

2.1.7 Temperature unit setting

> Temperature unit setting description: “Setting” - “System Setting”. Select the corresponding temperature unit in the temperature selection settings, such as °C/°F, etc., click “Save”, and the setting is successful.

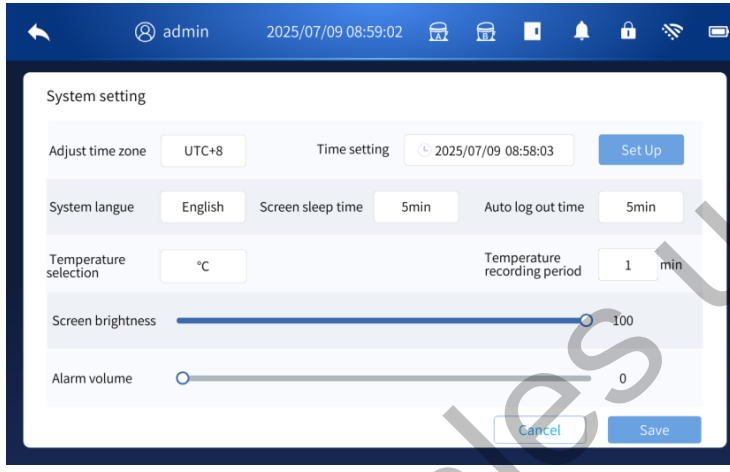


(Figure 18)

for after sales use

2.1.8 Screen brightness setting

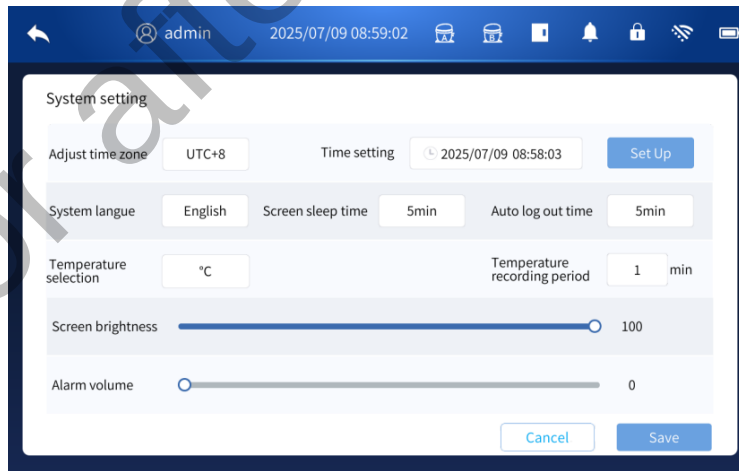
> Screen brightness setting description: “Setting” - “System Setting”. Slide to adjust the corresponding brightness level in the screen brightness setting, click “Save”, and the setting is successful.



(Figure 19)

2.1.9 Alarm volume setting

> Alarm volume setting description: “Setting” - “System Setting”. Slide to adjust the corresponding volume level in the alarm volume setting, click “Save”, and the setting is successful.



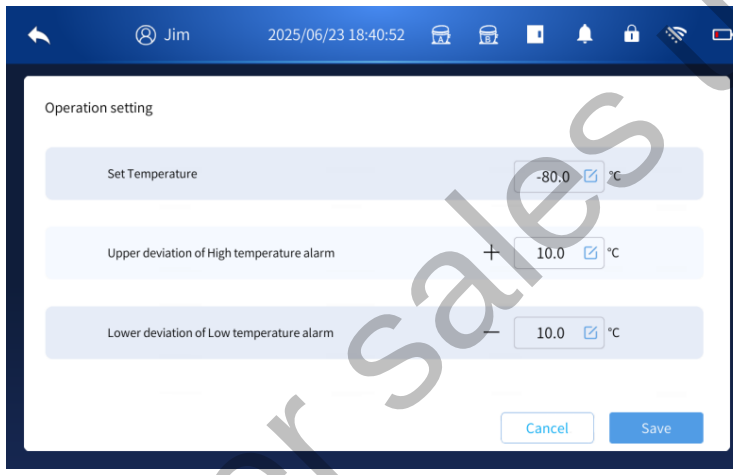
(Figure 20)

for after sales use

2.2 Operation parameter settings

After logging in to the account, enter the “Setting” - “Operation Setting” page where you can set the “Set temperature, Upper deviation of high temperature alarm, Lower deviation of low temperature alarm”. Click Save after setting. If the setting values of “Upper deviation of high temperature alarm and lower deviation of low temperature alarm” are out of range, click Save and a prompt will appear indicating that they are out of range. To cancel the high and low temperature alarm, set the deviation value to 0°C.

Note: Both common user and administrator user accounts can set it.



(Figure 21)

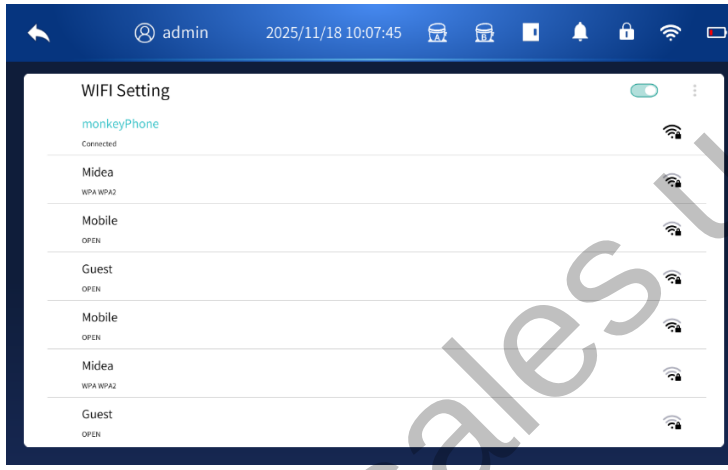
2.3 User Settings

See the description of creating a user in Chapter 1.

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2.4 Network Settings

On the “Settings” - “Network Settings” page, click the network settings switch icon to “turn on/off” the network. After turning on the network, select the network name to connect to and enter the correct password. Once the network is connected, the Wi-Fi icon at the top will change to the connected status. Attached: Image of successful network connection.



(Figure 22)

for after sales use

3. Homepage Display

- The homepage status under normal conditions is shown in the figure below. The homepage display parameters include:

> "Ambient temperature" (temperature at the location where the product is located)

> "Set temperature" (the temperature value of the product set by the user)

> "Input voltage" (input the voltage value of the product)

> "Operating status" (whether the current operation status of the product is normal)

> "Temperature in the product cabinet" (real-time display of the temperature value in the product)

> "Home" (displaying the homepage status)

> "Manage" (viewing alarm information, message system, temperature record, event record, operation status and local information)

> "Setting" (setting system parameters, operation parameters and user accounts)



(Figure 23)

3.1 Top icon display

- **Door opening and closing status:** indicates door-opening, indicates door-closing.
- **Alarm icon status:**

indicates normal state (no alarm);

Indicates mute;

Indicates the alarm state. At this time, the buzzer sounds. When an alarm occurs, click the alarm icon to temporarily mute it. The icon changes to . If the alarm still exists after 10 minutes, it will automatically unmute.

for after sales use

- **Network status:** is non-networking status, and is networking status.
- **Compressor status:**
  / is the normal state of system A/B,
  / is the system A/B compressor fault state.
- **Battery status:** means that the battery is fully charged, and means that the battery is low-charged. It needs to be charged as soon as possible.

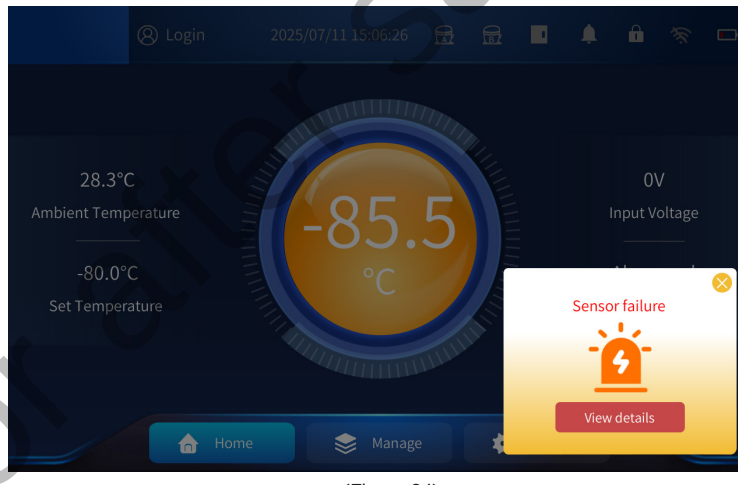
3.2 Alarm status

3.2.1 Alarm Status

> When the refrigerator is not operating normally (high temperature alarm, low temperature alarm, door open alarm, system failure alarm, etc.), the central operation status of the display screen is displayed in orange (normal display is blue), and there is an alarm pop-up window and the buzzer sounds for alarm.

> When an alarm occurs, you can close the alarm pop-up window or click “Alarm Bell” to turn off the alarm prompt sound.

3.2.2 Alarm view



(Figure 24)

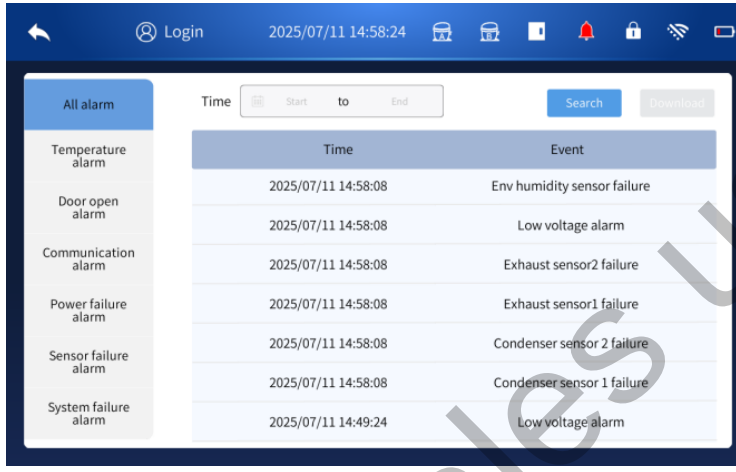
> Click “View Details” in the alarm window to view relevant alarm information, or click the upper right corner of the alarm window to close the pop-up window. If the alarm still exists after 10 minutes, the alarm pop-up window will appear again and the buzzer give an alarm.

> Manually click the “Manage” - “All alarm” page to query alarm records.

> In the login state, after selecting “Start - End”, click the “Search” button to display the alarm information within the corresponding time period. Insert a USB flash drive and click the “Download” button to export the corresponding alarm records to the USB flash drive.

for sales use

Note: Both common user and administrator user accounts can set it.

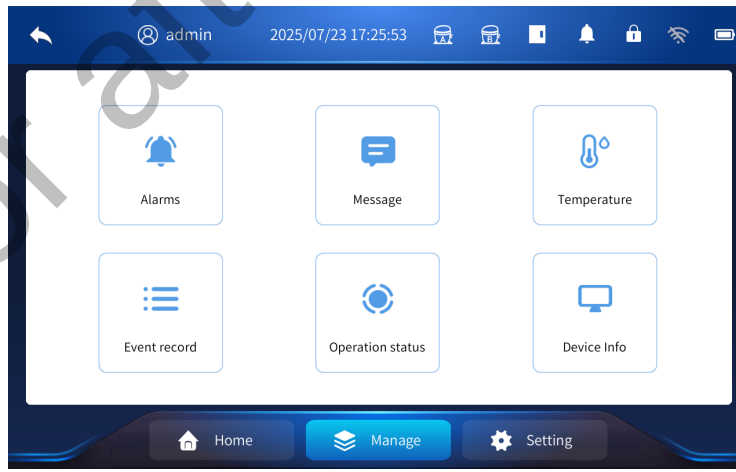


(Figure 25)

Management Page

4. Management Page

- Click the "Management" icon at the bottom to enter the management page, where you can view alarm information, message system, temperature records, event records, running status and local information.



(Figure 26)

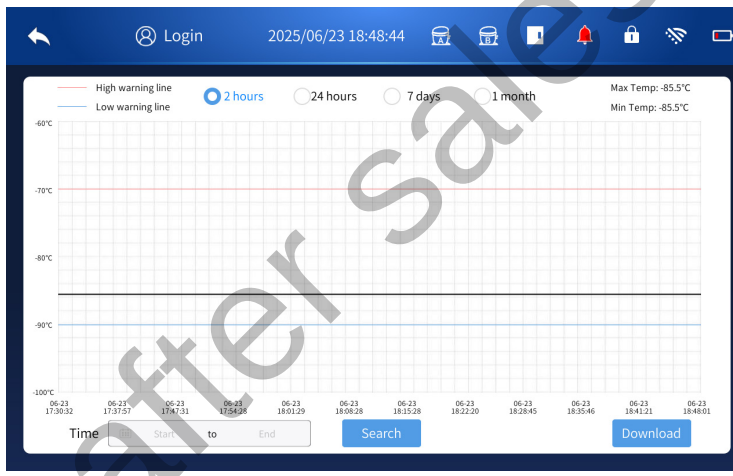
for after sales use

4.1 Alarm information

See the description in Article 2 of Section 3.2.2.

4.2 Temperature

- The temperature page can display the high temperature alarm upper limit, low temperature alarm lower limit, maximum temperature and minimum temperature. The maximum/minimum temperature prompted in the upper right corner of the page is the maximum and minimum values recorded by the sensor in the cabinet at each temperature recording interval during the selected time period.
- In the login state, insert a USB flash disk, click “2 hours”, “24 hours”, “7 days” and “1 month” to select the corresponding time period, and then click “Download” to export the temperature data of different time periods to the USB flash disk;
- You can select “Start - End” and click the “Search” button to download the data records (table data in PDF format) of the corresponding time period (no longer than 1 month) to a USB flash drive.



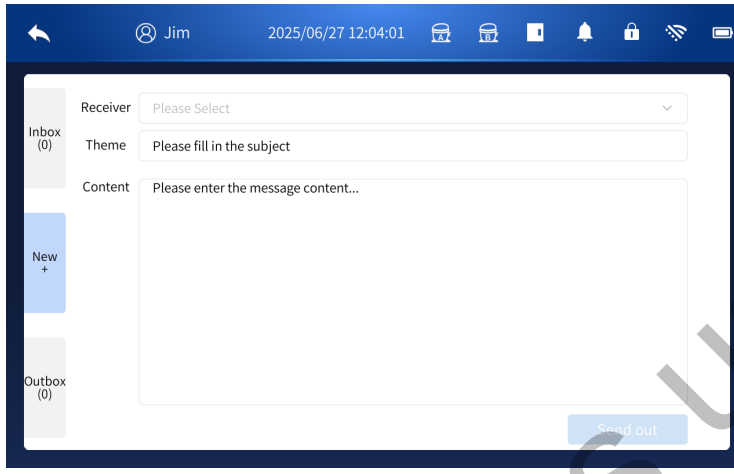
(Figure 27)

4.3 Message System

Different users can leave messages to other users of this machine by logging into their own accounts. The user who is left a message will receive the corresponding message after logging into his/her account. The specific description is as follows:

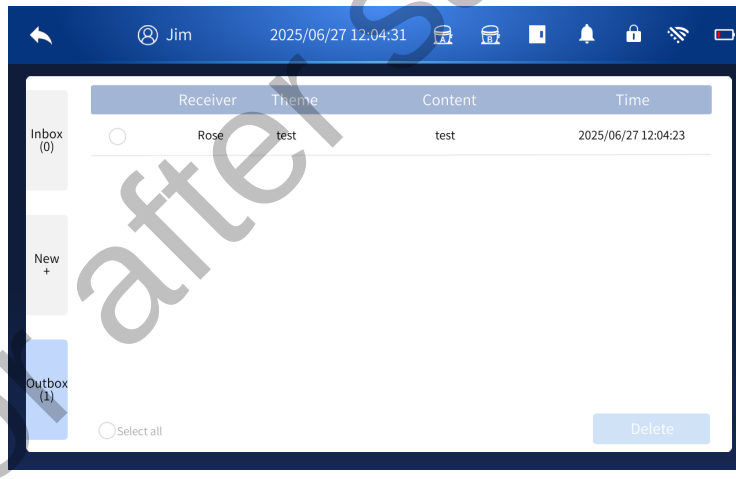
1. **Create a new message:** in the logged-in state. Click “New +”, select the receiver and enter the corresponding content. After completion, send it. You can click “Outbox” to confirm the sending status.

for after sales use



(Figure 28)

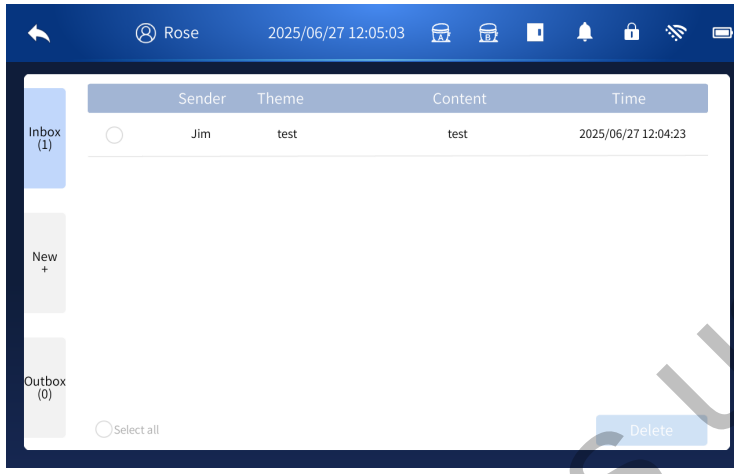
2. **Confirm to send:** After sending, you can click the "Outbox" to confirm the sending status.



(Figure 29)

3. **Inbox:** When the account is logged in, click the inbox to view the message details.

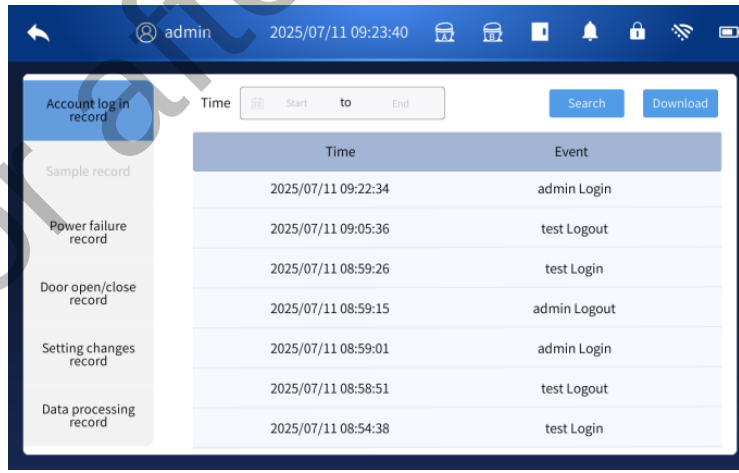
for after sales use



(Figure 30)

4.4 Event log

- On the event record page, you can view the details of account login, power outage records, door opening and closing records, and setting change data export records.
- In the login state, after selecting “Start - End”, click the “Search” button to display the event information within the corresponding time period. Insert a USB flash drive and click the “Download” button to export the corresponding event records to the USB flash drive.



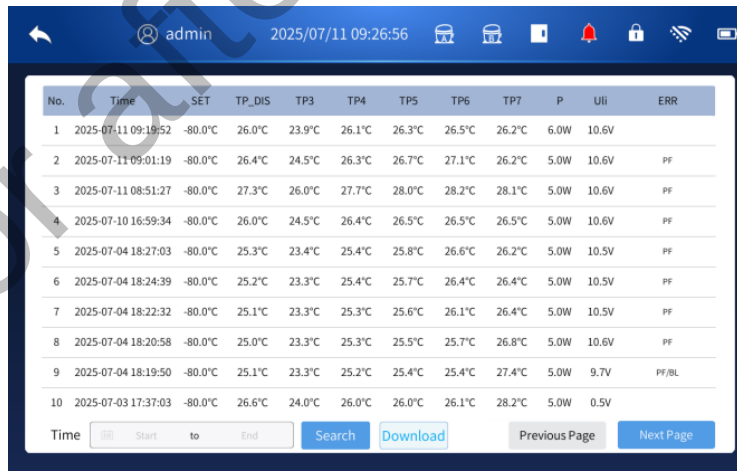
(Figure 31)

for after sales use

4.5 Running status

1. In the logged-in state, you can click the “View details” button to query the corresponding sensor values, internal temperature value, system A exhaust temperature value, system B exhaust temperature value, system A condenser temperature value, system B condenser temperature value; click “View details” to display the temperature monitoring value of the corresponding sensor. The recording interval can be set from “Temperature Recording Period” in “System Setting”, where “SET” is the set temperature, “TP_DIS” is the displayed temperature, “TP3” is the ambient temperature, “TP4” is the condenser 1 temperature, “TP5” is the condenser 2 temperature, “TP6” is the exhaust 1 temperature, and “TP7” is the exhaust 2 temperature. “P” is the power of the complete machine, “Uli” is the lithium battery voltage, and “ERR” is the fault alarm code. The details are as follows:

Fault alarm codes	Fault/alarm name	Fault alarm codes	Fault/alarm name
H1	High temperature alarm	EP	Power supply overvoltage alarm
L1	Low temperature alarm	BL	Low battery alarm
H2	High ambient temperature alarm	EVL	Alarm for low voltage
H3	Alarm for high condenser 1 temperature	EVH	Alarm for high voltage
H4	Condenser 2 high temperature alarm	ESA	System A compressor fault alarm
E1-E8	Sensor fault alarm	ESB	System B compressor fault alarm
do	Door open alarm	PF	Power failure alarm
Eb	Battery overvoltage alarm	EE	Communication abnormality alarm



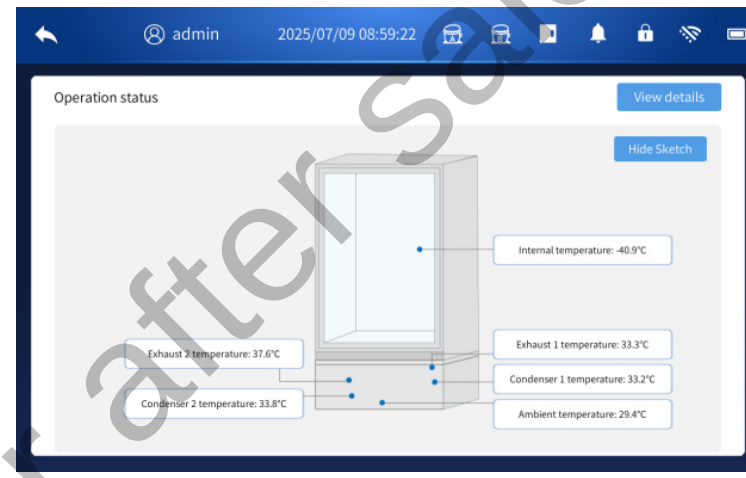
(Figure 32)

for after sales use

2. During operation, there are two states: dual compressor and single compressor running alternately. When the compressor is running, the exhaust temperature will rise. By checking whether the exhaust temperature values of system A and system B are much higher than the ambient temperature, it can be judged whether the compressor is in operation;

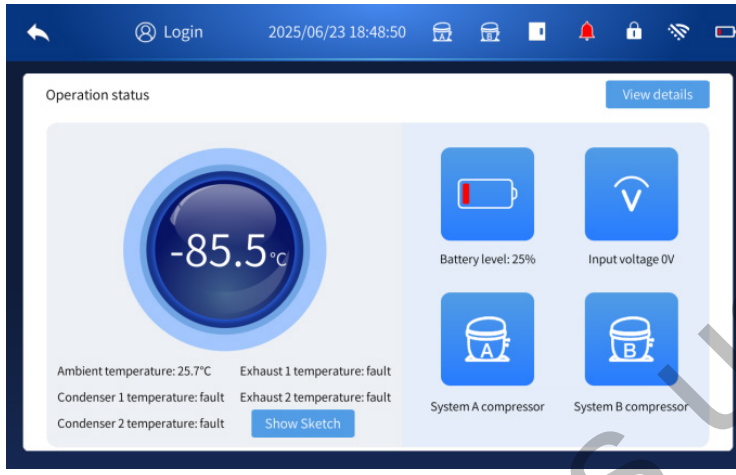
3. When the temperature is abnormal, a high temperature alarm will occur: when the ambient temperature exceeds the default value, an ambient temperature high temperature alarm will be issued; when the condenser sensor temperature exceeds the default value, a condenser high temperature alarm will be issued;

4. In the logged-in state, you can click the “View details” button to view system operation information (set temperature, various sensor values, etc.), and select the corresponding time period to query and download relevant content.



(Figure 33)

for after sales use

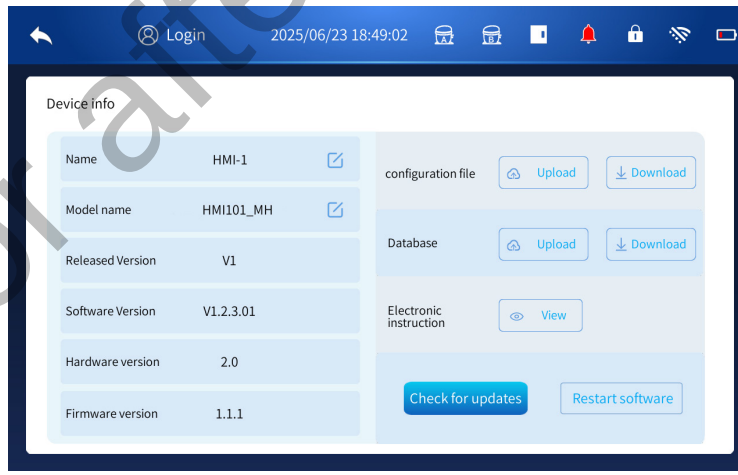


(Figure 34)

4.6 Device information

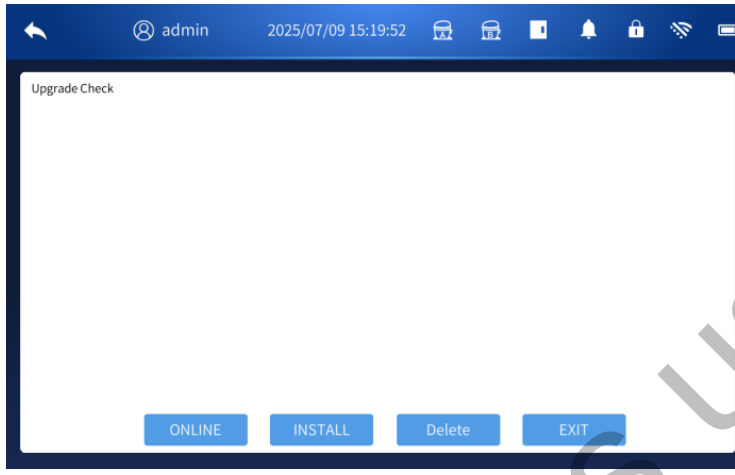
- In the logged-in state, click the “Restart software” button to complete the system restart function. Click the “Check for updates” button, insert a USB flash drive, select the upgrade file and click the Upgrade button to complete the system software upgrade function.

*The system update function can only be used after the upgrade file is obtained



(Figure 35)

for after sales use



(Figure 36)



(Figure 37)

Notes:

1. It is necessary to turn on the battery switch during product use;

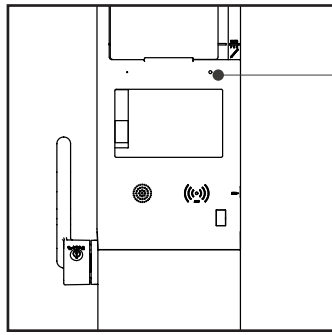
2. The USB flash disk shall be formatted before use. Its file system is in FAT32 format, with a capacity of not more than 32GB and the USB flash disk is non-partitionable. Please use main brand USB flash drives such as sandisk, Kingston, sansung, etc.

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5. Other

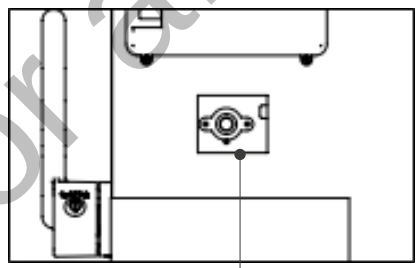
5.1 State indicator

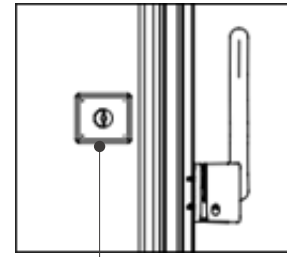
When the refrigerator is in different states, its panel operation indicator will show different states: when normal operation after power-on, the indicator turns green; when it fails, the indicator turns red.



5.2 Balance valve

When the interior of the biomedical freezer is in a low-temperature state for opening and closing the door, there is a pressure difference between the inside and outside of the biomedical freezer, which makes it difficult to open the door. At this time, the balance valve is opened for ventilation to balance the internal and external pressure difference, so as to facilitate quick opening of the door. At the same time, the heating wire of the balance valve behind the door is opened to heat and defrost around the valve port, so it is normal for the heating block at the balance port to heat up.

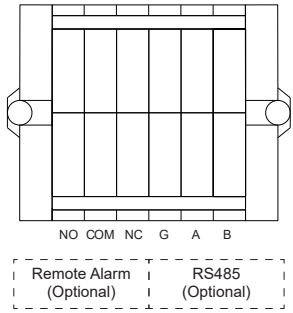


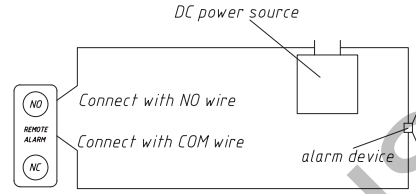


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Remote Alarm Function

The product is equipped with remote alarm function. When the product gives an alarm, it can output an alarm signal through the remote alarm connector.





- The connector is located in the lower area of the top cover on the back of the product, and its bearing capacity is DC 30V/2A.
- The remote alarm connector has normally open NO, common COM and other contacts. It is recommended that the length of remote alarm connecting line shall not exceed 3m.

Notes:

1. Regarding the remote alarm function, users need to install the alarm device themselves in conjunction with the remote alarm interface;

2. Pressing the “Mute” key on the display screen can only cancel the alarm sound, and the remote alarm status remains unchanged.

3. All alarms can trigger the remote alarm function.

Remote Communication Function

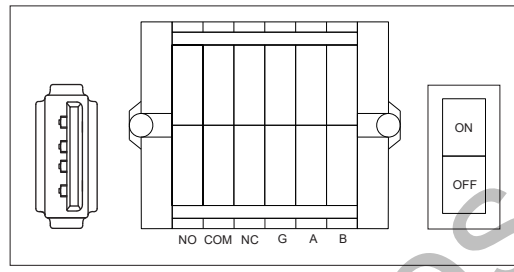
This product can be equipped with RS485 remote communication function, which can output the temperature data, alarm information and other signals in the cryostat to the user monitoring software end through the remote communication connector terminal. The RS485 connector terminal is located in the lower cover area of the product’s rear panel.

The remote communication connector has contacts such as RS485_A, RS485_B and GND. Among them, RS485_A and RS485_B are a pair of differential signals, which can be connected by users using twisted pairs.

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5V Power Output Function

This product can be equipped with an optional 5V power output function. The power output connector terminal is a USB socket located in the lower left area of the product, which can provide 5V power for external equipment. 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 external equipment are connected, otherwise it may damage the control board.



5V power output

Notes:

Due to product improvements or contract agreement, the actual functional configuration of the product you received may be different from that described in the instructions. The actual configuration will depend on the physical product.

MAINTENANCE

WARNING

In order to prevent electric shocks or injuries, the power supply must be cut off before any repair and maintenance of the equipment.

Make sure that drugs or suspended particles from the surrounding environment will not be inhaled during equipment maintenance. Otherwise, they may cause harm to human health.

CAUTION

Do not spill water directly on the refrigerator body to avoid reduced insulation performance of electrical components and rusting of metal parts.

Do not use hot water and corrosive cleaners or organic solvents to clean the refrigerator body.

Do not put heavy objects on top of the equipment to avoid deformation of the equipment due to pressure.

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Clean this product

Use a dry cloth to wipe off light dust from the housing and all accessories. If the product is dirty inside, use a clean cloth soaked in neutral detergent to remove dirt, wipe off residual detergent with a wet cloth, and finish with a dry cloth

Do not pour water on the housing or inside the chamber, otherwise it may damage the electrical insulation and lead to faults

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

Clean it once a month. Regular cleaning can keep the product in a brand new appearance
Clean the frost or ice on the inner wall and the condenser filter screen once a month

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Cleaning of Condenser Filter Screen

Remove the front bottom hood and the filter screen

Clean the filter screen with water

Clean the dust and dirt on the condenser

After the filter screen is dried, put it back to its original position and install the hood

The filter screen shall be cleaned once a month under normal use.

If the filter screen is blocked, the refrigeration effect of the freezer will be affected and the service life of the product will be reduced

Note: *The configuration of different product models is different, which is subject to the physical object.*

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Defrosting Inside Biomedical Freezer

Excessive frosting may cause poor cooling effect of this product. It is recommended to defrost once a month, and the interval is not more than three months. The inner door shall be defrosted with the ice shovel attached. The following steps are natural defrosting.

Take out items from the ULT freezer and transfer them to an environment suitable for storage

↓

Unplug the power plug or turn on the miniature circuit breaker switch

↓

Open the inner and outer doors and let the product open naturally for a period of time to allow defrosting

↓

Dry the accumulated water at the bottom of the ULT freezer with a piece of dry cloth

↓

After cleaning the freezer and inner door, restart the product

↓

Put the items back into the fully cooled ULT freezer

⚠ CAUTION

Do not use knife, screwdriver or any other tool with a sharp edge to defrost.

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Replacement Cycle of Parts and Components

Parts and components	Suggested replacement cycle
Condenser fan (12V, 3.5W)	5 years

Equipment Out of Service

Out of service:

Cut off the power supply if the equipment is about to stay unused for a long time and be stored in an unsupervised area. Clean the inside and outside surfaces of the compartment with a wet, soft cloth, let it dry, and then seal it. Make sure to lock the equipment to prevent children from opening the door against accidents such as asphyxiation.

Scrap:

When the equipment reaches its service life, it shall be scrapped for disposal. It must be handed over to qualified professional recycling organizations for disposal in accordance with local regulations and ordinances. Non-professional personnel shall not disassemble or dismantle the equipment without authorization. Scrapped equipment shall be placed in a designated area inaccessible to children to avoid danger.

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TROUBLESHOOTING AND REPAIR SERVICE

Any product may fail. Please observe the operation of the equipment in time during use. If there is any abnormality, please check and handle it according to the table below. If the problem cannot be solved, inform our Service Center in time, and we will do our best to help you and avoid any loss.

Fault	Troubleshooting
The product does not work.	• Is the power circuit breaker normal?
	• Is the power voltage too low?
	• Is the power switch off?
	• Is the fuse blown?
Poor cooling	• Is the ambient temperature too high?
	• Whether the inner and outer doors are closed tightly (The frost between the biomedical freezer and the door sealing strip may damage the door sealing performance)
	• Is the air inlet dirty and blocked?
	• Are the condenser and filter screen dirty and blocked?
	• Is the temperature set correctly?
	• Are the condenser and filter screen dirty and blocked?
	• Is the temperature set correctly?
	• Whether the product is kept away from direct sunlight
	• Whether the product is close to a heat source
	• Are the rubber hole cover and insulation material of the test through hole properly placed?
Excessive noise	• Is the product installed on a solid and flat ground?
	• Are other items contacted to the product housing?
	• Whether the footing of the product is leveled

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Fault		Troubleshooting
Alarm fault	Door open alarm	• Whether the product door is closed
	Power failure alarm	• Whether the power cord is unplugged or the miniature circuit breaker switch is disconnected
	High ambient temperature alarm	• Check whether the indoor temperature is too high
	Exhaust sensor fault alarm	• Check whether the exhaust sensor is disconnected
	Low battery alarm	• Check the battery voltage status and power on in time
	Condensation sensor fault alarm	• Check whether the condensate sensor is disconnected
	Alarm for abnormal input voltage	• Check whether the voltage value is too large or too small
	System A/B compressor fault alarm	• Check whether there is any problem with the corresponding refrigeration system
	Communication fault alarm	• Check whether the communication line is inserted or whether the main control board/display and control board is damaged

⚠ CAUTION

If the fault cannot be eliminated after the above items are checked, or the fault is different from those listed above, please contact the after-sales personnel.

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SPECIFICATION

Name	Low-temperature freezer		
Model	Product model 1	Product model 2	Product model 3
Electrical shock protection class	Class I		
Power supply	100V-240V~/50/60Hz		
Compartment temperature	-40℃--86℃		
Refrigerant	Mixed refrigerant		
Cooling mode	Direct cooling		
Volume	860L	720L	580L
Rated current	7.0A(at 240V) 14.0A(at 100V)	6.5A(at 240V) 14.0A(at 100V)	6.5A(at 240V) 14.0A(at 100V)
Operating power	495W(at 240V) 850W(at 100V)	450W(at 240V) 720W(at 100V)	360W(at 240V) 550W(at 100V)
Weight	344kg	320kg	288kg
Product dimensions (W * D * H)	1175*995*1980 mm	1030*995*1980 mm	885*995*1980 mm
Noise (sound pressure level)	46 dB(A)	46 dB(A)	46 dB(A)
Shelf weight capacity	87 kg	75 kg	49 kg

Description of technical parameters:

The technical parameters in this table are measured under standard conditions. After the parameters are changed due to product improvement and technical update, no further notice will be given, which shall be subject to the nameplate attached to the refrigerator.

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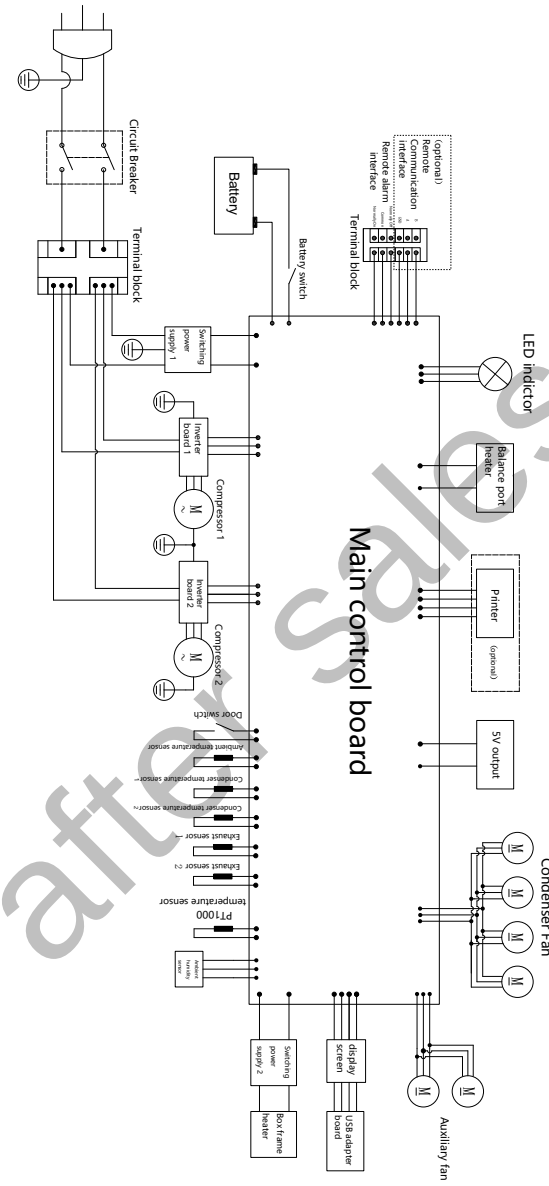
PACKING LIST

Name	Instructions for use	Key (as provided for lock)	Defrosting shovel	Limit bracket
Quantity	1 copy	2 pcs.	1 pc.	2 pcs.

Note: Optional accessories such as an external padlock and a handle shall be subject to physical configuration.

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ELECTRICAL SCHEMATIC DIAGRAM



Product model 1/ Product model 2/ Product model 3

Note: Some models do not include a running capacitor or condenser fan. Please refer to the actual product.

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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-86L860BS

model 2: MD-86L720BS

model 3: MD-86L580BS