

Haier Biomedical

Ultra Low Temperature (ULT) Freezer Operation Manual



Model
DW-80WZ15

Certificate of Quality

checker:



Manufacturer:
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- Please read this manual carefully before use.
- The company reserves the right to interpret this manual.
- Please keep it with your invoice after reading.
- Product technology or software is subject to upgrade without prior notice.
- The product appearance depends on the actual product.
- This product need to be operated by professionals, and there are risks for home use.

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Technical Data

Model	Ambient temperature (°C)	Electric shock protection type	Temperature range (°C)	Rated voltage (Vac/Vdc)	Rated Frequency (Hz)	Certificated
DW-80WZ15	10~32	I	-60~-80	220-240/24	50	CE
DW-80WZ15 (120V 60Hz)	10~32	I	-60~-80	120/24	60	UL

Packing list

Packing list	DW-80WZ15
Power cord (AC and DC)	2
Operating manual	1
Plastic bag	1

Safety precautions

Dear users:

Thank you for use of Haier ULT Freezer. For a better understanding of this operating manual and use of this product, and for preventing personal injury and damage to articles, please read the manual carefully and observe the contents marked with the following signs in this manual. For your convenience of reading, the ULT Freezer is hereinafter referred to as the ULT freezer.

Safety label



Safety Precautions



Under all conditions marked with ⚠, it is necessary to refer to the documentation, so as to clarify the nature of potential risks and any countermeasures that must be taken.



Warning

Failure to observe the matters under the warning signs may cause serious casualty accidents.



Caution

Failure to observe the matters under the caution signs may cause casualties or freezer damage and associated property loss.



Conduct or operation that must be forbidden



Conduct or operation that must be observed

- ! It is very important to read this instruction when using this machine for the very first time. The protections provided by the device may be damaged if it is not used in accordance with the methods specified in this instruction.
- ! Only professional Haier technicians or after-sales maintenance personnel authorized by Haier can install and maintain the ULT freezer, or it may cause electric shock or fire.
- ! Be sure to place the ULT freezer firmly on a solid flat surface or a transport vehicle. If the ULT freezer is not firmly fixed or placed in an appropriate place, it will cause the ULT freezer to turn over or any personnel to be injured.
- ! The ULT freezer can only be operated by trained and authorized personnel.
- ! Please use the special power supply indicated on the nameplate of the ULT freezer; otherwise, it may cause fire or electric shock.
- ! If the voltage being used is 10% higher or lower than the rated voltage, it is required to additionally provide an automatic voltage regulator, to ensure that the voltage meets the use requirements.
- ! If the power line needs to be extended, the section area of the extension line shall not be less than 2mm² and its length shall not be longer than 3m, otherwise, fire or electric shock may be caused.

- ! The power line of the ULT freezer is equipped with a three-wire (grounded) plug which matches with the standard three-wire (grounded) socket of 10A. The grounding pin of the power cord can be cut or removed under no circumstances. Be sure that the power plug and socket are tightly and reliably connected, otherwise may cause a fire.
- ! Please use a power socket which has a grounding wire, so as to prevent electric shock. If the power socket is not grounded, be sure to install the grounding wire by a professional technician.
- ! When using a battery to supply power to the ULT freezer, pay attention not to connect the positive and negative terminals reversely. Ensure the safety of the place where the battery is located and avoid short-circuiting the positive and negative poles.
- ! In case of gas or other flammable gas leakage, the valve with gas leakage shall be closed, and the doors and windows shall be opened for ventilation and exhaust. Do not connect or disconnect the power plug of ULT freezer, or it may cause an explosion and fire.
- ⊘ When disconnecting the plug of ULT freezer from the power socket, hold the power plug firmly and do not pull the lead of the power plug. Pulling the cord with hands may cause electric shock or fire due to a short circuit.
- ⊘ If ULT freezer is not operating properly, please disconnect the power plug. Keeping the refrigerator operating in an abnormal state may cause electric shock or fire.
- ! Before performing any repair or maintenance on the ULT freezer, be sure to disconnect the power supply to prevent any electric shock or injury.
- ⊘ Ensure that no drugs or suspended particles in or around the ULT freezer are inhaled during maintenance. Otherwise, it may cause damage to your health.
- ⊘ If the ULT freezer will not be used for a long period of time, be sure to disconnect its power plug and turn off the switch of the standby battery to prevent electric shock, leakage or fire caused by the aging of the power line.
- ⊘ If the ULT freezer is left unused in an unattended area for a long period of time, make sure that any child will not get close to the freezer and that the door is not completely closed.
- ! Disposal of the ULT freezer shall be carried out by the relevant personnel. Dismantle the door to avoid accidents such as suffocation.
- ! When restarting ULT freezer in case of any power failure or the power is off, it is necessary to check the settings of the freezer. Change of settings may lead to changes in the culture results.
- ⊘ Wear gloves when repairing it to avoid personal injury caused by sharp edges or corners.
- ! When handling ULT freezer, be careful not to trip over the freezer to prevent the freezer from being damaged or to prevent any person from being injured.
- ! There shall be no obstruction around ULT freezer to keep it well-ventilated.
- ⊘ Any tissue, material or liquid substance that is flammable or may explode shall not be used; otherwise, the vapors emitted from them or fragments of explosives may release toxic substances.
- ⊘ Do not place ULT freezer in a damp place or a place that is prone to be splashed by water, or it may lead to leakage or electric shock due to reduced insulation.
- ⊘ Do not pour water directly onto the ULT freezer, or it may cause electric shock or short circuit.

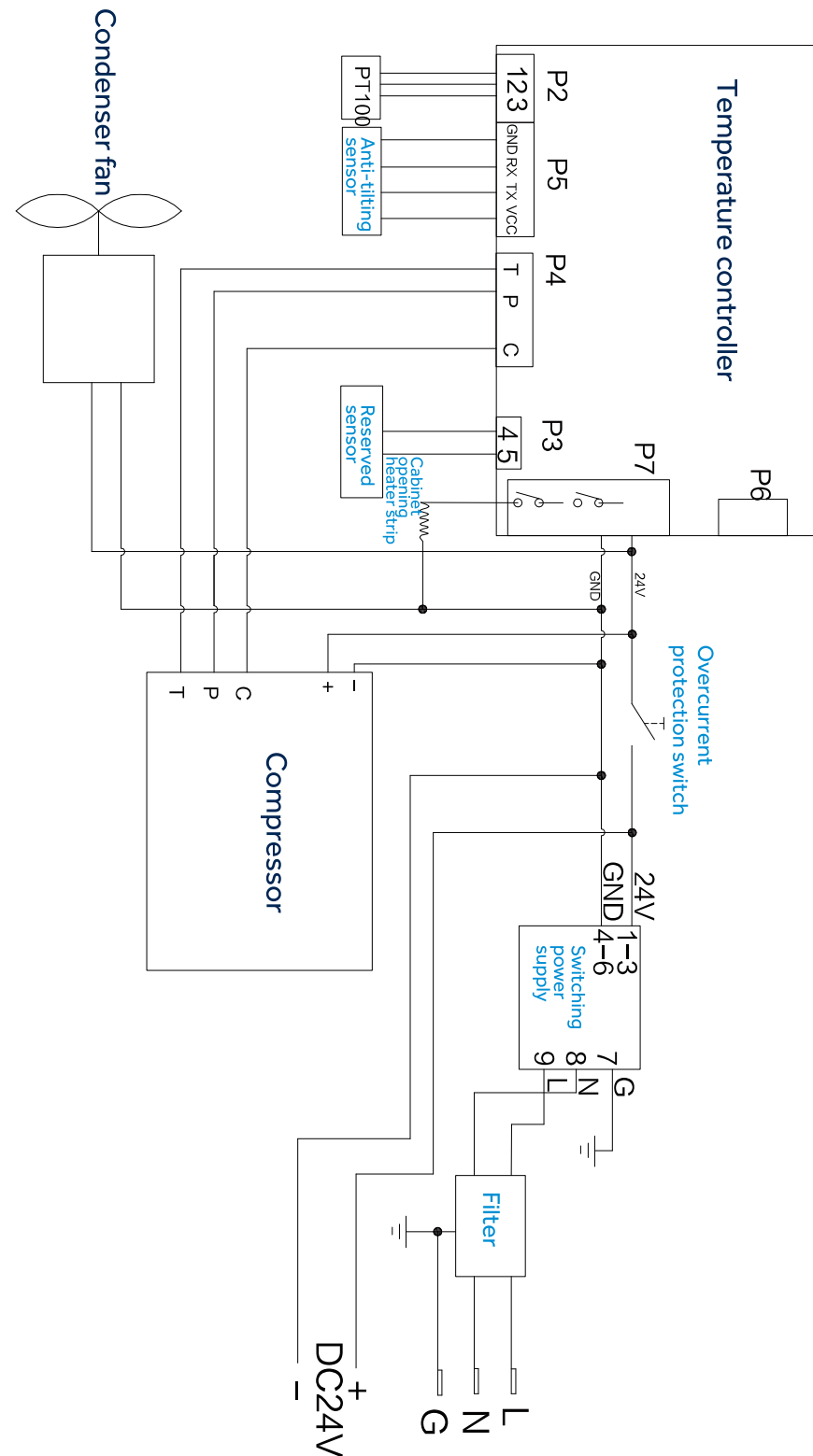
Specification

Specification

Name	Ultra Low Temperature (ULT) Freezer	
Model	DW-80WZ15	DW-80WZ15 (120V 60Hz)
Certificated	CE	UL
External dimensions (W x D x H) (mm)	690 x 320 x505	
Internal dimensions (W x D x H) (mm)	260 x 180 x330	
Foam material	Polyurethane foaming	
Cooling mode	Compressor refrigeration	
Casing/liner	Aluminum alloy	
Temperature control mode	Computer control system	
Net weight	27kg	
Gross weight	33kg	
Effective volume (L)	15	
Maximum power (W)	280W	
Firm power (W)	220W	
Power consumption	3.6Kw·h/24h	
Alarm type	High-temperature and low-temperature alarm, sensor fault alarm, power off alarm, and case body tilting alarm	
Production date/Software release version	See bar code on the case body/V1	
Expected service life	10 years	
Electric shock protection grade	I	

Note: Our company lays emphasis on technological innovation, and the product parameters are subject to changes without prior notice.

Circuit diagram



- ⊘ Do not place any container or heavy object filled with water on the ULT freezer. If an object falls, it may cause injury and the water overflowed may reduce insulation and cause leakage or shock.
- ⊘ Do not ground the ULT freezer by gas pipe, power supply line, telephone wire or lightning rod. The above grounding methods can cause electric shock or other dangers.
- ⊘ Do not touch any electrical parts of the ULT freezer, such as the power plug, or any switch with wet hands, otherwise electric shock may be caused.
- ⊘ The user shall not disassemble, repair or modify the ULT freezer by himself. Otherwise may cause fire or personal injury due to improper operation.
- ⊘ Do not place inflammable, explosive, dangerous or volatile articles in the ULT freezer, and do not use flammable sprays near the freezer; otherwise, it may cause an explosion or fire.
- ⊘ Do not insert metal objects, such as nails or wires, into any opening or gap on the ULT freezer or into any vent for internal air circulation; otherwise, the objects mentioned above may contact with moving parts and cause electric shock or injury.
- ⊘ Do not pull or handle the ULT freezer by its door handle, in order to prevent the freezer from being damaged or to prevent any person from being injured.
- ⚠ Do not use electrical appliances in the work room of the ULT freezer except for the types recommended by the manufacturer.

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.

CAUTION – Risk Of Fire Or Explosion. Dispose Of Properly In Accordance With Federal Or Local Regulations. Flammable Refrigerant Used.

CAUTION – RISK Of Fire Or Explosion due to Flammable Refrigerant Used. Follow Handling Instructions Carefully in Compliance with U.S. Government Regulations.

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

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

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CAUTION – RISK Of Fire Or Explosion due to Flammable Refrigerant Used. Follow Handling Instructions Carefully in Compliance with U.S. Government Regulations.

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

Caution – RISK Of Fire Or Explosion due to **FLAMMABLE REFRIGERANT** Used. Follow Handling Instructions Carefully in Compliance with U.S. Government Regulations.

Precautions for Use

- When running, the front part of the ULT freezer that comes in contact with the outer door may feel warm. This phenomenon is not a fault. It is a result of the heater strip installed to prevent condensation around the casing.
- Before articles are loaded into the ULT freezer, make sure the temperature inside the ULT freezer has reached the set point and then load the articles in batches. Each batch shall not exceed 1/3 of the unit capacity in case of temperature rise.
- Temperature display of the ULT freezer shows the value of the temperature probe in freezer. Although the temperature displayed is sometimes different from the actual value at the center of the freezer, it will gradually approach the real temperature. Clean the ULT freezer with diluted neutral cleaners. Brush, acid, gasoline, soap powder, polishing powder or hot water shall not be used to clean the freezer, as these materials may damage the painted surfaces and plastic and rubber parts. Be aware that do not use volatile solvents such as gasoline to wipe plastic and rubber parts.
- Before defrosting, please take out the frozen articles in the ULT freezer and place them in a suitable environment to avoid damaging the items due to the temperature rise inside the freezer.
- Aluminum parts inside the ULT freezer are not acid-resistant, so please pay attention to take anti-corrosion measures. Never use acidic media in the freezer.
- Cut off the power of the ULT freezer when it will be out of service for a long time
- Every time when putting in and taking out the articles, please try to reduce the door opening time so as not to cause relatively large fluctuations of the temperature and humidity inside the ULT freezer.
- There are many cooling coils behind and on the side of the inner wall. Do not use a knife, an ice chisel, a screwdriver, or any other sharp tool to remove the frost on the inner wall. Pay attention not to scratch the inner wall while defrosting; otherwise, failure of the ULT freezer may be caused.
- There shall be certain gaps around the ULT freezer to facilitate heat dissipation and power-off in emergencies.
- Basic EMC performance claimed:

The refrigeration system operates properly to achieve cooling function for the temperature inside the ULT freezer; the data recording system (if any) operates properly to achieve data recording and transmission functions; the electronic door lock operates properly to achieve corresponding functions.

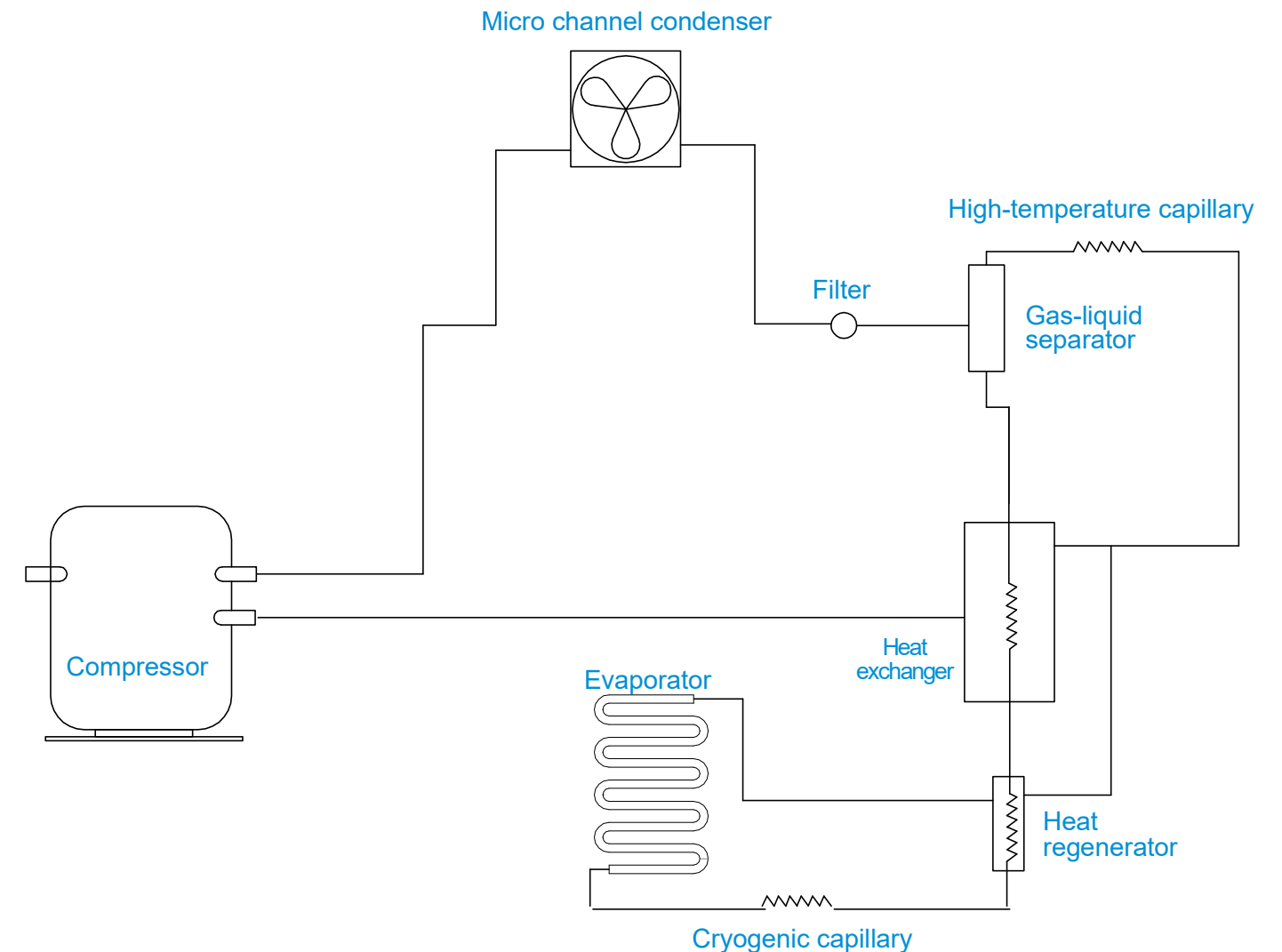
Alarms shall be audible and/or visual.

EMC requirements:

- a) It is recommended to evaluate the electromagnetic environment before using the equipment;
- b) It is prohibited to use the equipment in the surroundings of strong radiation sources (such as unshielded video sources). Otherwise, the normal operation of the equipment may be disturbed.

Refrigeration principle and circuit diagram

Refrigeration principle



Q&A



Any questions during use? Do you suspect there is something wrong with the ULT freezer? Please check here first. This chapter provides answers to various possible faults and solutions. If the problem is still not solved after following these operations, please call for Haier after-sales service. Do not repair and remove the ULT freezer by yourself.

Fault	Troubleshooting
The ULT freezer does not work	Whether the power cable is inserted into place?
	Are the plug and the socket poorly connected?
	Is there any voltage input from the outside?
Poor refrigeration effect	Is the ambient temperature too high? Is the ULT freezer close to a heat source?
	Are the doors closed properly? (Has any ice or frost damaged the seals between the door and the frame?)
	Is the temperature setting correct?
	Has the ULT freezer been loaded with too many non-frozen samples within the last few hours?
The ULT freezer is noisy	Is the unit set on a firm and level floor?
	Is the exterior of the unit touching any objects?
	Is the unit leveled with the leveling legs?

Product Features

•Intended use: this product is suitable to be used by pharmacies, pharmaceutical factories, epidemic prevention stations, hospitals, health centers, and other medical institutions to temporarily store or transport articles that are sensitive to temperatures, such as pharmaceuticals, reagents, vaccines, blood and blood products, and biological products.

- The product has no absolute contraindication.
- Structure and composition: this product is composed of the case body, door body, refrigeration system, control system, as well as related accessories and used to provide a -60 °C to -80° C storage environment.

1. Temperature Control

- The temperature range of the product: -60°C to -80°C.
- Computer control and digital temperature display with a temperature display accuracy of 0.1°C.

2. Safety System

- Multiple fault alarms (high-temperature and low-temperature alarm, sensor fault alarm, and power off alarm).
- Multiple alarm modes: sound and buzzer alarm.
- The independent mechanical lock and anti-tilting design make the transport of samples safer.
- The overload protection function makes the equipment safer to use.
- All individual components are safely grounded.

3. Refrigeration System

- Deeply optimized compressor refrigeration system and imported compressor achieve better refrigeration performance.
- High-performance thermal insulation layers enable long thermal insulation.
- Unique double-layer door sealing structure effectively reduces frost formation.

4. Humanized design

- Humanized design and computer board control, which is intelligent, worry-free, and easy to adjust.
- Wide climate zone design to enable operation in a temperature range of 10°C ~32°C.
- Optional compact caster design, flexible and convenient.

Due to the product improvement, the Haier ULT Freezer you get may not be completely consistent with the illustration in the manual. We sincerely apologize for this. The contents of this manual are subject to changes without notice.



The ULT freezer shall not be used beyond its expected performance.

Product Installation

Product unpacking and handling

•Cut open the packing tape with appropriate unpacking tools, such as scissors or wallpaper knife, remove the screws from the outer packing case with a cross screwdriver, and then remove the packing; finally, check if the accessories are complete.



- Avoid collision and scratches on the appearance of the equipment. For the sake of safety, please have at least two adults for unpacking.
- Since the ULT freezer body is heavy, please choose suitable mechanical handling tools.

Installation Environment

- Indoor or vehicle compartment.
- Used in a room or a vehicle compartment
- Ambient temperature: 10°C ~ 32 °C, The ideal temperature is 18°C to 25°C. If necessary, use an air conditioning system to achieve the required ambient condition.
- Ambient humidity: Lower than 80%RH. For the maximum operating temperature of 32 °C, the humidity shall be less than 57%RH;
- Atmospheric pressure: 80kPa~106kPa;
- No direct sunlight or direct radiation from other heat sources;
- Class of pollution: Class 2; no explosive gas, high-density dust, or corrosive gas around;
- There is no strong vibration and airflow around;
- Rated voltage: AC 220-240V, 50Hz / DC 24V(CE Certificated);
AC 120V, 60Hz / DC 24V(UL Certificated);
- The intended location should be low in dust count.
- The highest elevation for proper operation of the freezer is 2,000 above sea level.
- Input voltage: Within rated voltage ±10 %.
- Overvoltage category: The transient state is Category II facility.
- Pollution Degree:2.



- The ULT freezer shall not be installed and operated in a place without ventilation. If there are several the freezer in the same room or vehicle compartment, auxiliary ventilators shall be added.



- If the ULT freezer is used outside the working environment of the product, its expected performance cannot be ensured.

Space spacing

- There shall be a certain safe distance between the ULT freezer and the adjacent walls or object surfaces to ensure heat dissipation of the cabin.

Periodic maintenance

The expected service life of this series of the ULT freezer is 10 years. During the expected service life, please follow the following regular maintenance recommendations:

- It is suggested that a routine test shall be carried out on the ULT freezer every year to ensure the operation accuracy and working safety of the freezer. Each ULT freezer has passed strict ex-factory debugging and inspection to ensure high accuracy of cultivation environment parameters. If you still want the ULT freezer to work with the highest accuracy, please contact the engineers of Haier;
- During daily repair and maintenance, only the organization of Haier or the organization designated by Haier can check or provide the parts for the maintenance of the ULT freezer;
- Users shall clean and disinfect the ULT freezer before notifying the maintenance engineer.
- Haier reserves the right to update and improve the ULT freezer.

Cleaning and maintenance



- To prevent electric shock or injury to operators, the power supply to the ULT freezer must be disconnected completely before any repair and maintenance work is to be performed.
- During any repair maintenance work, do not inhale medical particles or aerosols near the equipment as they might be harmful to your health.

Cleaning the ULT freezer

- Clean the ULT freezer once a month. This can help the exterior look new.
- Use a dry cloth to wipe away the loose dust inside and outside of the ULT freezer and on the accessories. If the ULT freezer is rather dirty, use a clean doth soaked with a neutral detergent to clean the unit. Then use a wet cloth to wipe away any residual detergent solution and a dry cloth to wipe.
- Do not spray cleaning agents and other liquids onto the touch screen and the electric cabinet on the side of the ULT freezer. During wiping, make sure no moisture enters the electrical components.



- Most parts of the ULT freezer are made of aluminum. Strong acid or corrosive solution will corrode the parts, reducing the overall strength and service life of the ULT freezer.

Defrost the interior

Frost and ice can form in between the door gasket and frame to form an air gap, which can decrease the refrigeration effect of the unit. Please use the provided defrosting shovel to defrost the interior of the ULT freezer.

The following steps show how to conduct natural defrosting:

1. Remove the samples from the unit, and move them to another appropriate environment for temporary storage.
2. Turn off the power supply.
3. Open the outer door and inner doors to let the unit thaw for a period of time.
4. Use a dry doth to soak up and remove any water on the floor of the unit
5. After defrosting the unit and cleaning up the water, restart the unit.
6. Load the samples back into the unit after it reaches the set temperature.
7. Turn on the backup refrigeration system if there is one.



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

Scrap disposition

- If the ULT freezer is left unused in an unattended area for a long period of time, make sure that any child will not get close to the ULT freezer and that the door is not completely closed.
- The disposal of the ULT freezer shall be accomplished by the appropriate personnel. Remove doors to prevent accidents such as suffocation.

Connect the main power supply

- Before connecting the main power supply, ensure that the power matches the power consumption indicated on the nameplate and the requirements of the power supply for the machine.
- Accessories of the ULT freezer include a grounded power cable, and the quick connector of the power cable shall be inserted into the power interface of the freezer. A power cord shall be selected accordingly depending on the power supplies.
- Keep it away from the radiated area. Avoid the use of radiation-sensitive devices at its periphery.
- It shall be guaranteed that the ULT freezer is reliably grounded.
- If the socket is not equipped with a grounding wire, make sure that it will be installed by professional engineering technical personnel.



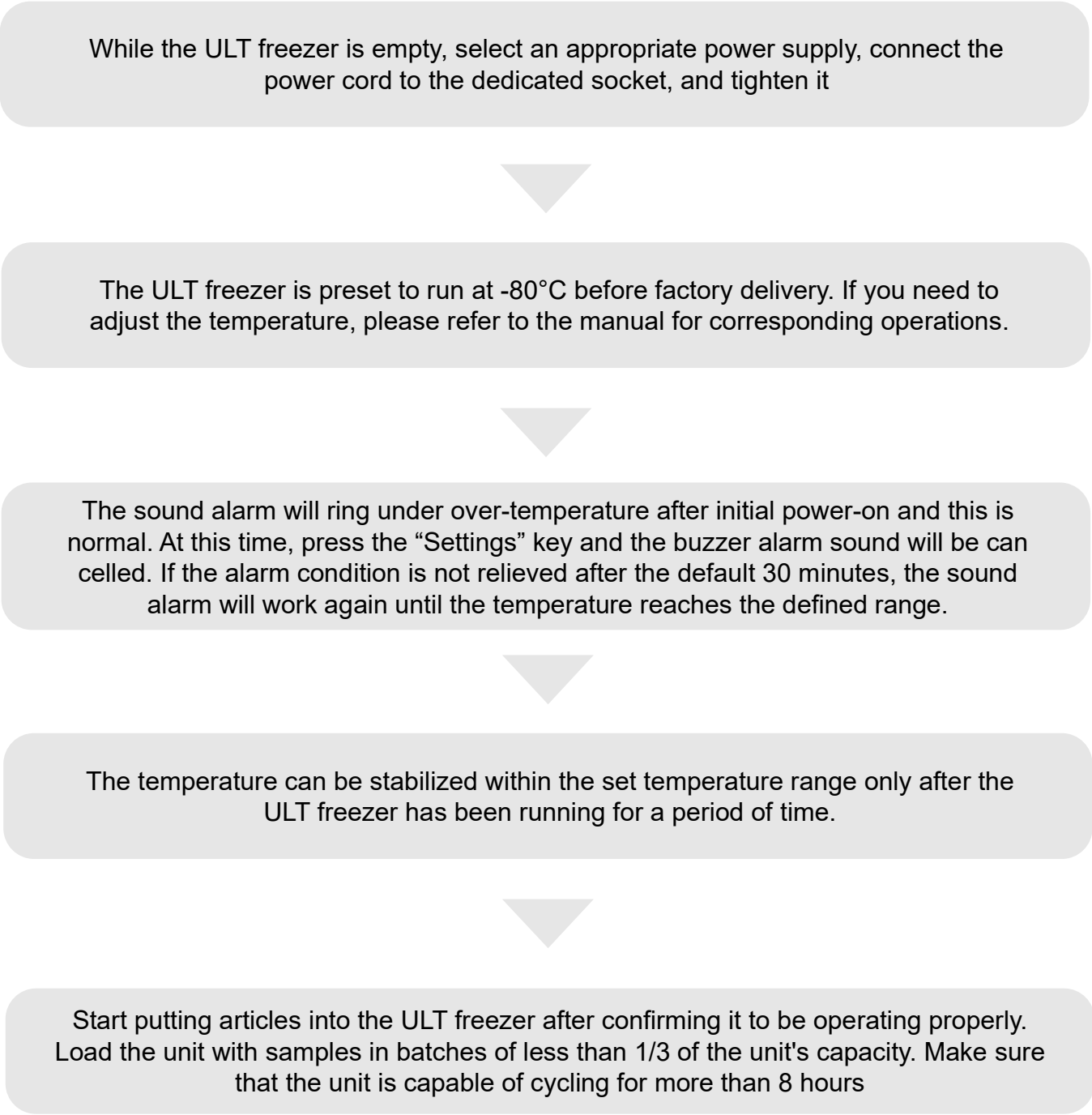
- The power cable shall be inserted into place. The aviation plug of the ULT freezer shall be tightened. The power unit of the main power supply shall be well grounded, in order to ensure that the power cable of the ULT freezer is well grounded after being connected. When a battery is used to supply power, ensure that the positive and negative terminals are connected correctly and pressed tightly to avoid poor contact.

Pre-use preparation

1. Take down all the packing material and packing straps
 - Take down all the packing material and packing straps used for transportation.
2. Check the accessories delivered with the product
 - Please check the articles inside the packing box as per the packing list, and contact the after-sale service in time in case of any discrepancy.
3. Installation environment
 - Set aside at least 30cm gaps around the ULT freezer for ventilation and heat dissipation.
4. Adjust support legs
 - Rotate the leveling legs clockwise with a wrench to extend them out to support the unit to the floor to ensure that the unit does not move while in usage.
5. Placement
 - After adjusting and cleaning the unit, do not connect the power cord immediately. The freezer needs to be placed in its intended location for at least 24 hours before connecting the power to make sure it will operate normally.
6. Power-on
 - Select an appropriate power cable based on the actual power supply. The machine is accompanied by an AC power cable and a DC power cable when delivered.
 - Insert the male aviation plug of the selected power cable into the female aviation plug reserved on the back of the case body, and tighten the fastening ring to ensure solid insertion.
 - Connect the main power supply.

Initial power-on

Please observe the following rules when conducting initial start-up and continuous running:



Operation after a Power Outage

The ULT freezer stores its settings in the memory system. Should there be a power outage and recovery, the unit can resume its operation based on the previous settings.

Alarm

Alarm type

Alarm code	Code description	Triggering conditions
E10	Main temperature sensor PT100 failure	Communication failure or sensor failure
E00	High-temperature alarm	Over-temperature
E01	Low-temperature alarm	Under-temperature
E30	Power failure alarm	After the power supply (DC24V, AC220-240V/50Hz) of the ULT freezer is cut off, the buzzer shall alarm (sounding for 0.5s and stopping for 0.5s) and displays the code E30 at the same time; After the power supply is restored, the buzzer alarm is canceled and the code E30 is not displayed.
E50	Case body tilting alarm	When the tilt angle of the case body is detected to be ≥ 30°, the buzzer will sound constantly, which cannot be canceled temporarily by pressing the "SET" key, and the code E50 is displayed. When the tilt angle of the case body is detected to be < 28°, the buzzer will stop sounding constantly, and the code E50 disappears.

Automatic alarm recovery

This series of the ULT freezer have an automatic alarm recovery function:

- In the case of an over-temperature alarm, press the “SET” key to stop the buzzer alarm;
- If the alarm condition still exists, the buzzer alarm will automatically restore after the buzzer alarm delay time is over.

USB (optional)

Exporting USB data

1. Insert a jump drive, and the control will export the data automatically. The screen displays uP, indicating that the data is being exported, and displays Ed, indicating that the data export is completed;
 2. The temperature data record of the USB export is in the format of .CSV. The exported data records consist of serial number, time, set temperature, and actual temperature.
 3. CL2: Data clearing of USB board, which is 0 by default and can set as 0 or 1.
- After you select the parameter CL2 from the list of parameters and press the "SET" key, the display screen will flicker and display 0. If you change the value from 0 to 1 and press the "SET" key to execute the command, the data clearing process will be initiated. During the clearing, the parameter CL2 keeps flickering. However, after the data clearing is completed, the parameter CL2 will stop flickering, and the CL2 value will change to 0 automatically.

Format of the exported temperature data:

Data	Time	Inner Temp.	Setting Temp.
20210826	11:40	-74.9	-75
20210826	11:46	-74.8	-75
20210826	11:52	-75	-75
...	...	...	...

 Caution

The system memory can save data for 10 years.

When exporting data to USB disk, please use an USB disk with a file format of FAT32.

If the FAT32 USB disk cannot export data, please backup the file of the USB disk first and then reformat the USB disk or try another brand FAT32 USB disk.

Setting the USB storage time

1. In normal mode, press and hold the "SET" and the ▼ key for 5 seconds to enter the time setting interface, and the display screen shows "P1". Then, press the ▲ key or the ▼ key to switch between "P1" (year)、"P2" (month)、"P3" (day)、"P4" (hour), and "P5" (minute), and press the "SET" key to set the corresponding time. After that, press and hold the "SET" key for 3 seconds to save the settings and exit. During the setting of P1~ P5, if other parameters do not need to be adjusted after setting any one parameter, press and hold the "SET" key for 3 seconds to save and exit.

 Caution

When the connection between the controller and USB board is faulty, the time is displayed as "--".

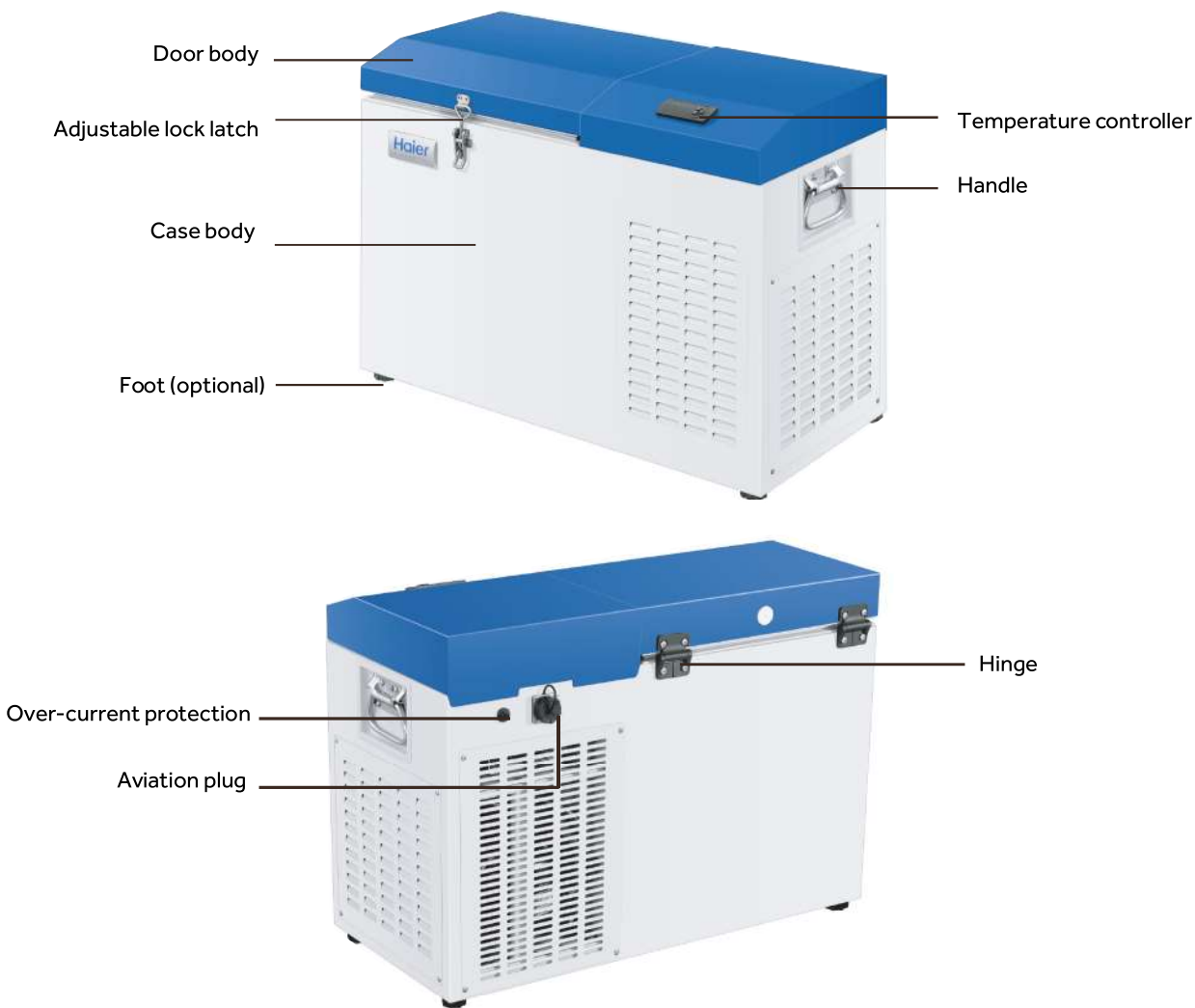
USB board time:

Parameter	Description	Minimum	Maximum	Unit
P1	Usb time (Year)	21	99	Year
P2	Usb time (Month)	1	12	Month
P3	Usb time (Day)	1	31	Day
P4	Usb time (Hour)	0	23	Hour
P5	Usb time (Minute)	0	59	Minute

The temperature data record of the USB export is in the format of .CSV. The exported data records consist of serial number, time, set temperature, and actual temperature.

Name of parts • Control panel

Name of parts



Name of parts



 Caution

- Generally, the set temperature of the ULT freezer needs no be adjusted if it is in normal use. An adjustment of the temperature may cause product high-temperature (AH) or low-temperature (AL) alarm. In this case, the high-temperature and low-temperature alarm (AH and AL) thresholds shall be adjusted accordingly.
- Generally, the threshold of high and low temperature alarms is within the range of the set temperature $\pm 5^{\circ}\text{C}$.

Method of use

Panel display

- 1) Three digital tubes: used to display temperature with a display range of -99.0°C ~85.0 °C and a minimum display resolution of 0.1;
- 2) Three keys: Three keys, “SET”, “▼”, and “▲” respectively, are designed and used to set parameters.

Basic operations

- A) “SET” key
- Press and hold it for more than 1s to display the set temperature value and for more than 3 seconds to access the menu of parameters.
 - When setting the set temperature, press this key to save settings.
 - In parameter setting mode, press the SET key to enter the parameter. Press and hold the key for 3 seconds after modifying the parameter to save the parameter and exit the setting.
 - When the buzzer beeps, press the SET key to delay the alarm (except tilting alarm).
- B) “▲” key
- When setting the set temperature, press this key to increase the temperature value.
 - In parameter setting mode, press the key to navigate to the next parameter or increase the value of the parameter.
- C) “▼” key
- When setting the set temperature, press this key to decrease the temperature value.
 - In parameter setting mode, press the key to navigate to the previous parameter or decrease the value of the parameter.

Setting general menu parameters

1. Press and hold "SET" key for more than 3s, and the display screen shows the parameter code "PS" (password).
2. Press "▲" and "▼" key to scroll parameters;
3. Press "SET" key to confirm the parameter, and the value of the parameter will be displayed.
4. Press “▲” or “▼” to increase or decrease the value of this parameter;
5. Press "SET" key to temporarily store the value of the modified parameter ad return to the parameter display;
6. To change other parameters, repeat step 3 to step 5
7. Press "SET" key for more than 3 seconds to save the value of the modified parameter and return to normal.

General parameter description

Parameter	Description	Minimum value	Maximum value	Unit	Default value
AH	Temperature difference of high-temperature alarm	0	50	°C	10
AL	Temperature difference of low-temperature alarm	0	50	°C	10
Ad1	Over-temperature alarm time delay	0	99	Min	10
Ae	Buzzer time delay	0	99	Min	30

Caution

If no key is pressed within 3 minutes, the system will exit the setup interface automatically, the controller will be locked, and the Settings will not be saved.