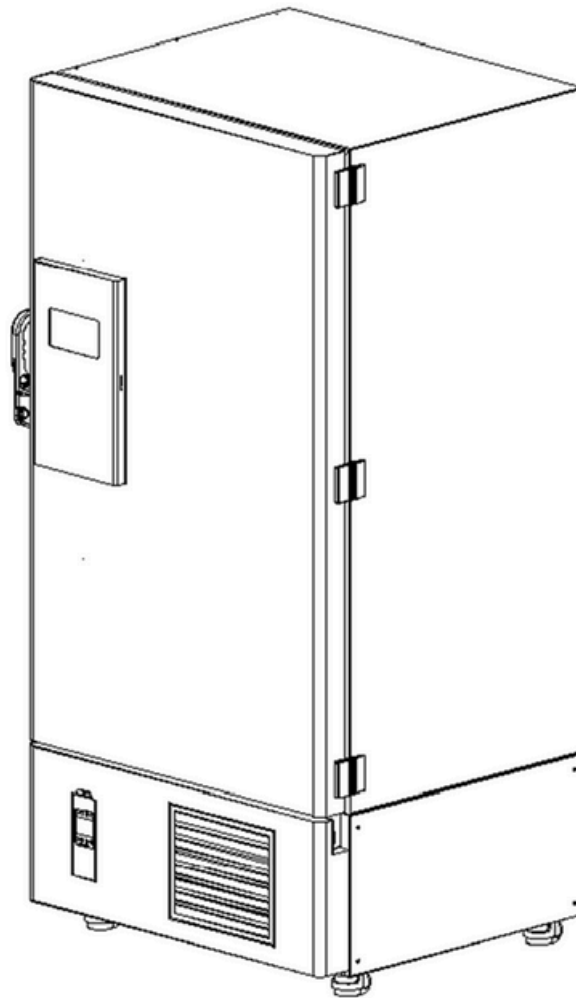




Instruction Manual

-86°C Ultra Low Freezer



EL-U-4K

Thanks for selecting EL-U-4K Series Ultra Low Temperature Freezer. We would provide the best product and service to you. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance.



CAUTION!

All internal adjustments and maintenance must be performed by qualified service personnel. This appliance can be used by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.



Important operating and/or maintenance instructions. Read the accompanying text carefully.



Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



Hot surface(s) present which may cause burns to unprotected skin or to materials which may be damaged by elevated temperatures.



Extreme temperature hazards: hot or cold. Use special handling equipment or wear special protective clothing.

Always use the proper protective equipment (clothing, gloves, etc).

Always use dissipate extreme cold or heat and wear protective clothing.

Always follow good hygiene practices. Each individual is responsible for his or her own safety.

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The -86°C Freezers described in this manual are high performance units which can be used for research and in situations that directly support medical applications. If the user's manual is lost or damaged, you can through our website to download or contact us by E-mail.

1. Installation and operation

1.1 Safety Information

All electrical work must be executed by suitably qualified persons. When using any electrical appliance, safety precautions must always be observed.

- ☐ Do not use this appliance for other than its intended use. This product is intended for use as a beverage Low Temperature Freezer. Consult your supplier for alternatives.
- ☐ Do not cover the front grille or block the rear air entry by placing object up against the cabinet.
- ☐ Please close attention, when used by or near children, infirm persons.
- ☐ Ensure adequate ventilation.
- ☐ Do not probe any openings.
- ☐ Do not touch any moving parts or hot surfaces.
- ☐ Regulations require that all electrical work be carried out by authorized persons. For your own safety and that of others please ensure this is done.
- ☐ Do not overload the power supply. Always ensure on the rating label. The rating label is located.

If have any problem, please consult a qualified electrician. Caution: Never use extension leads or multiple adaptors.

- ☐ If the mains supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified and skilled persons in order to avoid hazard.
- ☐ Disconnect the mains power supply before attempting any cleaning, removal of any covers, or maintenance work.
- ☐ Do not store explosive substances, such as aerosol cans with flammable propellant.
- ☐ Warning: Do not use mechanical devices or other means to accelerate the defrosting process. Defrosting is performed automatically.
- ☐ Warning: Do not damage the refrigeration circuit.
- ☐ Warning: Do not use electrical appliances inside the storage compartment of this appliance.

1.2 Assembly

Remove the appliance from the packaging and peel off any protective film from all surfaces.

Fit the shelf support clips onto the shelf support strips, making sure that the clips for each shelf are of the same height and that they are securely engaged on the support strip.

Unwrap each shelf carefully, to prevent damaging their protective coating or surface finish.

Position the shelves onto the clips.



Please dispose of all waste packaging appropriately and in accordance with all local recycling laws.



WARNING

Do not overload the power supply. Always ensure that the power supply is adequate for the electrical requirements specified on the rating label and never use extension leads or multiple adaptors.

1.3 Positioning the product

Please position the cabinet carefully being careful not to bump it.

The power supply flex exits the product at the bottom right hand side (as viewed from the front). For ease of access; the flex should be retrieved prior to positioning the product in its final location.

The maximum recommended ambient temperature for this product is 32°C

Avoid positioning the appliance in direct sunlight or damp areas.

Allow adequate space for the door(s) to fully open.

Ensure that this product is positioned on a level surface, so as to allow the door(s) to shut and seal correctly, as well as to allow proper drainage from the evaporator tray, to prevent any

Note: The refrigerator is not with close contact the wall; the need to maintain a gap of 50mm to wall. This is conducive to the freezer cooling.

overflow. If necessary, adjust the screw feet of the appliance to make it level.

1.4 Ventilation

All models must have clear and unobstructed ventilation from the entire surface area of the front grille.

The 2 and 3 door models may be built into an enclosure without the need for ventilation other than at the front.

The single door Low Temperature Freezers must have a minimum ventilation space of 50mm at sides and rear.



WARNING: Failure to provide the minimum ventilation space will harm the performance of your Low Temperature Freezer could cause fire and will invalidate the warranty.



WARNING: Keep clear of obstruction all ventilation openings in the appliance enclosure or in the structure for building in.



WARNING: You must not store volatile, flammable and explosive materials inside this Refrigerator.

Setting Temperature




1.5 Temperature controller


1.5.1 Digital display panel

Digital controller is used for medical and laboratory uses to design for simple refrigeration equipment controller. It measures the temperature in the cabinet, with temperature control (can be set to cooling or heating mode), the defrost control, over-temperature alarm, power failure detection alarm, remote alarm, maximum and minimum temperature records and other functions.



1.5.2 Indicator light status description

Indicator Light	Symbol	Status	Meaning
Setting	Set	ON	Parameter setting
		OFF	Status of temperature measuring and controlling
High temperature compressor work indicator light		ON	High temperature compressor work
		OFF	High temperature compressor stop
		FLASH	High temperature compressor time delay
Low-temperature compressor work indicator light		ON	Low-temperature compressor work in non-forced refrigeration mode
		OFF	Low temperature compressor is closed in non-forced refrigeration mode
		FLASH	Forced refrigeration mode
Capillary heating indicator light		ON	Capillary heating starts
		OFF	Capillary heating is closed
High temperature alarm lamp for condenser (high temperature press circuit)	E2H	ON	High temperature alarm of secondary system condenser

High temperature protection indicator for condenser (high temperature press circuit)	E2P	ON	High temperature protection of secondary system condenser
The door opens alarm indicator light	Erd	ON	Door open alarm
Power light		ON	Grid power supply anomaly
		OFF	Normal power supply

1.5.3 Button Description

Button	Function
SET	Enter the status of parameter setting
▲(UP)	Switch between menu and parameter
	Adjust menu and parameters
	After 3s, upload the setting parameters to the copy card
	Adjust menu and parameters
▼(DOWN)	Continue to press down for 3s, download setting parameters from copy card
RST	Exit from parameter setting
	Continue to press for 3s to force the stop capillary heating output
NO BUZZER	Clear alarm
	When the main power supply is not out of power, the mandatory cooling mode will be activated for 10s

1.5.4 Functions and Parameters

1.5.4.1 In the status of temperature measuring and controlling, press Set key for 3s to enter user menu, it display the code St, then press Set key again, display the value of St. it could be modified by pressing the key UP or DWON. **1.5.4.2** When the St code displays, press the UP button to display the A8 code, and the A8 parameter value is displayed after the SET key, which can be modified by manipulating UP or DWON keys. **1.5.4.3** When the A8 code is displayed, press the UP button to display the A9 code, and the A9 parameter value is displayed after the SET key, which can be modified by manipulating UP or DWON keys. **1.5.4.4** When the A9 code is displayed, press the UP key, display the Po code, press the SET key to display 00, and then enter the control menu password through the UP or DOWN key. Once again, press SET to confirm the password entry, the controller automatically verifies the correctness of the password, and when the password is verified, it is entered into the management menu. At this time, the UP or DOWN key can be used to select other parameters including St, A8, A9 and Po, otherwise, the controller will only stay in the parameters of St, A8, A9 and Po, and cannot display other parameter items. After selecting the menu item, press the SET key to enter the current menu item parameter setting, adjust the parameter value according to the UP or DOWN key, and then press the SET key to return menu selection.

1.5.4.5 Under the status of parameter setting, press RST key or no key operation within 30s, it will exit from parameter setting and automatically save the current parameter value.

1.5.4.6 The password entry of the administration menu is valid. After the parameter setting is set, the correct password must be entered again after the adjustment.

1.5.4.7 When the controller is in normal measurement and control status, it can be forced to start the capillary heater relay by pressing the RST key for 3s.

1.5.4.8 When the main power supply is not without power, press NO BUZZER button to activate the forced cooling mode for 10s.

1.5.4.9 When the controller appears, the buzzer calls, and there are two situations where the buzzer stops chirping:

1.5.4.9.1 After all the alarms are lifted, the buzzer stops chirping.

1.5.4.9.2 Press the NO BUZZER key and the BUZZER will stop ringing for ten minutes (if the fault is not removed within ten minutes, the alarm will ring after ten minutes). If a new alarm comes up after all the alarm is lifted in ten minutes, the buzzer will call again immediately. It can be modified by modifying the value of the A4 (10 minutes by default) to stop the BUZZER when the NO BUZZER key is pressed.

1.5.5 Temperature parameter setting

Parameters	Description	Min	Max	Unit	Default
St	Temperature set value	C13	C14	oC/oF	-80
A8	Over temperature alarm upper deviation	0.1	20	oC/oF	10
A9	Over temperature alarm lower deviation	0.1	20	oC/oF	10
C13	Set Minimum temperature	-95	C14	oC/oF	-90
C14	Set Maximum temperature	C13	85	oC/oF	-50
C1	Temperature difference	0.1	20	oC/oF	0.4

Parameter description:

St Set temperature

User set the shutdown point temperature.

C13 The minimum set temperature

Permissible the minimum set temperature (St)

C14 The maximum set temperature

Permissible the maximum set temperature (St)

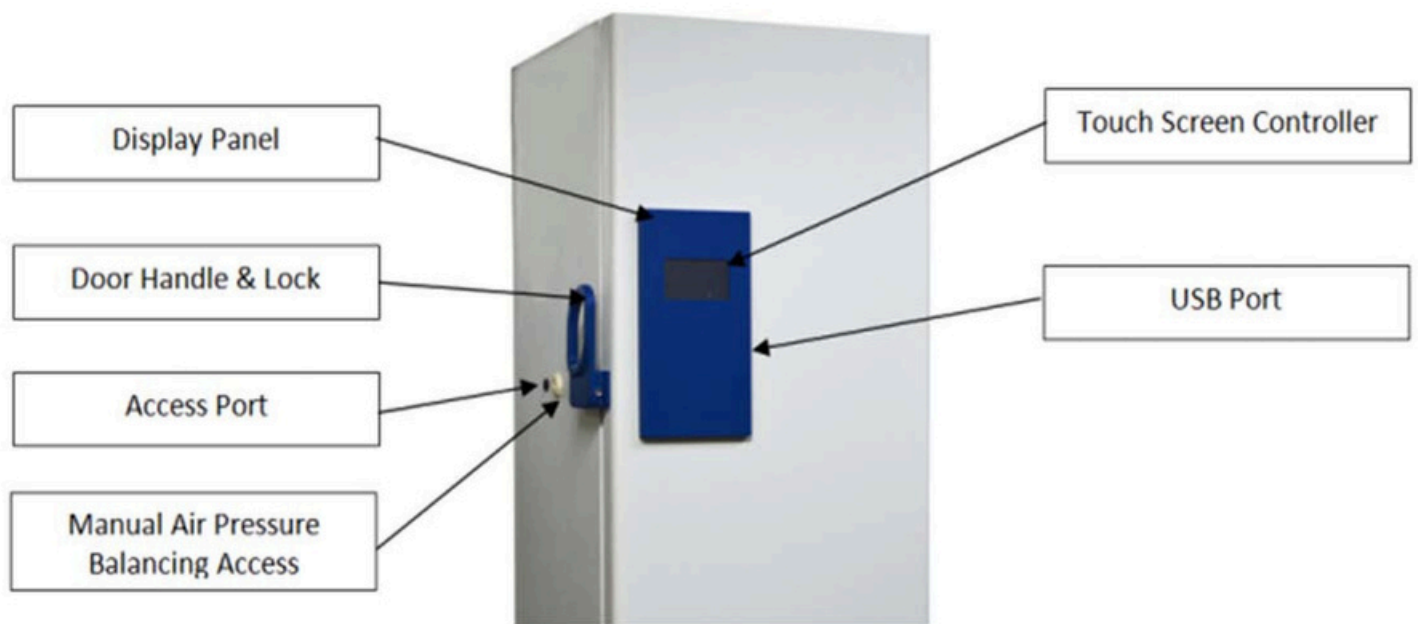
C1 Difference in temperature

When the temperature \leq St, the compressor stops working; when the temperature $>$ St + C1, The compressor work.

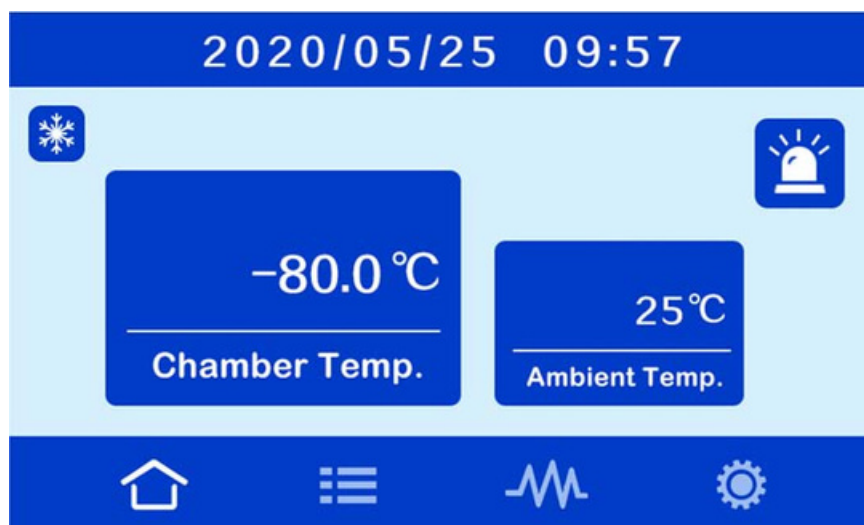
1.5.6 Alarm Code

Alarm code	Fault Description
E1	Chamber temperature sensor failure alarm
E2	Condensing sensor fails
E3	Ambient temperature sensor failure alarm
E4	Evaporator sensor failure alarm
E1H	High chamber temperature alarm
E1L	Low chamber temperature alarm
E3H	High ambient temperature alarm
E3L	Low ambient temperature alarm
E2H	Hot condenser alarm
E2P	High temperature protection of condenser
Erd	Door open alarm

1.6.Touch screen panel product



Main information of touch screen

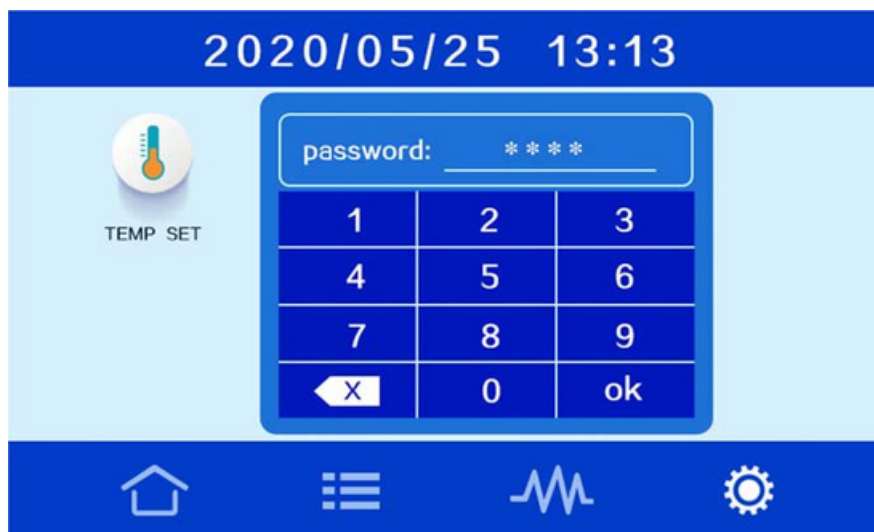


The home page can display the real-time temperature, ambient temperature, setting temperature, temperature curve

The logo reflects the health status of the storage box through the color change. When the system is in normal operation, the color is green. When the system has a strict alarm that affects the temperature in the box, such as power-off alarm, the color shows red.

Click to enter the save box setting interface

Icon of real time temperature and ambient temperature in the box



Temperature setting. The password 1000 can be adjusted.



Set temperature regulation.







High and low temperature alarm settings.

Restore default settings, etc.



Time setting

1.6.1 Description Control Board

Control Panel	1		To Enter and Esc from the menu
	2		Event log
	3		Inner temperature date log
	4		Setting
	5		Alarm Indicator
	6		Running state: Cooling, defrosting

1.6.2 Functioning Standard Control Introduction

The refrigerator/freezer is equipped with a latest generation Electronic Controller, with a LCD alphanumeric display, to display temperature and working operations with an accuracy of 0.1 °C. The controller gives maximum safety in case of alarms and fault conditions, signaling critical conditions and recording every event in order to help the service engineer to speed up the analysis and thus the fixing of any problems. Safety is at the highest level with alarms for High and Low temperature, power-failure,

door open as well as auto-test. What is more, the STANDARD Control is equipped with an internal clock to catalogue all the events.

1.6.3 Switching On

After positioning the equipment, stand for it at least 12 hours, then connecting the power cord of the equipment, and turn on the switch of backup battery.

1.6.4 Switching Off

Turn power off.

1.6.5 Temperature Settings

The Ultra-Low Temperature Freezer set point ranges from -40°C to -86°C. The default factory temperature set point is -80°C.

To change temperature settings, you need to access SETTINGS menu. All menu options under SETTINGS menu are used to configure the settings for temperature chamber only.

Note: *If the set point is changed, the high and low alarm limit will change automatically. For example: initial temperature set point: -30°C; low alarm limit: -40°C; high alarm limit: -20°C. If the temperature set point is subsequently changed to -33°C, then the high and low alarm limit will adjust automatically to -23°C and -43°C.*

1.6.6 Product Loading

Loading of warm product into the freezer should be done in batches. Do not fill the freezer with product of more than 20 percent of the volume at one time as this process might introduce too much heat load into the freezer. Allow freezer to stabilize. Once the temperature of the freezer returns to the set point, another batch of product can be loaded in. Fill an upright freezer by starting at the bottom near the temperature probe and add product to shelves, one shelf at a time. Allow freezer to recover to set point or temperature between shelves. Fill empty shelves with pre-cooled samples to help reducing the temperature rise during loading.

At any time, to ensure not more than 10 kg product be loaded in at one time.

Always make sure the vacuum relief port is free of frost and ice, to allow for timely re-opening of the main door. The Refrigerator/Freezer are designed for long term storage. It is recommended that only pre-frozen products be placed in the unit as it will reduce the amount of heat load that must be absorbed by the freezer at one time.

1.6.7 Opening and Closing Doors

Main door and inner doors should be closed tightly at all times. When taking the samples out, open the main door and then open only one inner door at a time. "DOOR OPEN" message will be displayed as soon as the main door is open. If the main door is left

open for more than the pre-determined time (MAIN MENU > ADMIN > DOOR ALARM TIME), the audible alarm will ring to remind user to close the door.

1.6.8 Locking the Main Door

Main door can be locked with the standard key set provided.

1.6.9 High/Low Temperature Alarm

This alarm is activated when the actual temperature inside the chamber has reached the temperature set point and for some reason exceeds high/low alarm temperature set point. The message “HIGH ALARM” or “LOW ALARM” will be displayed on the 4th row of the LCD. The High/Low Temp LED indicator will light and an audible alarm will ring. The audible alarm can be muted by pressing the MUTE key.

1.6.9.2 Hot Condenser

This alarm is activated when the sensed temperature at condenser outlet is 15°C higher than the sensed ambient temperature displayed on LCD. The message “HOT CONDENSER” will be shown on the 4th row of the LCD. No audible alarm will ring but the Hot Condenser LED indicator will light. This alarm will not stop the freezer operation.

1.6.9.3 Low Battery

This alarm is activated whenever the battery voltage is lower than 11.5 VDC or the battery switch behind the right bottom door is turned off or the battery is not properly installed. “LOW BATTERY” message will appear on the 4th row of the main display of the LCD. Low Battery LED indicator will light. Audible alarm will ring. The audible alarm can be muted by pressing the MUTE key.

1.6.9.4 Other Alarms

All of the below alarms will cause Other Alarms LED indicator to light.

1.6.9.5 Power Failure

This alarm is activated whenever there is a power failure and the Refrigerator/Freezer control system is still running on battery power. “POWER FAILURE” message will appear on the 4th row of the LCD. Audible alarm will ring. The audible alarm can be muted by pressing the MUTE key.

1.6.9.6 Sensor Failure

This alarm is activated when the sensor for chamber temperature (CHAMBER) is defective or not properly connected. The compressor will not start to cool down the chamber. “XX SENSOR FAILURE” message will appear on the 4th row of the LCD. Audible alarm will ring. The audible alarm can be muted by pressing the MUTE key.

1.6.9.7 Door Open

“DOOR OPEN” message will appear on the 4th row of the LCD as soon as the main door is opened. Audible alarm will ring after pre-determined time set in the menu DOOR ALARM TIME under ADMIN menu. The audible alarm can be muted by pressing the MUTE key. Please refer to section 3.5.4 to set the ALARM TIME.

1.6.9.8 High Ambient

“HIGH AMBIENT” message will appear on the 4th row of the LCD as soon as the ambient temperature displayed on the LCD is above 32°C. Audible alarm will ring immediately. The audible alarm cannot be muted. This alarm will not stop the freezer operation.

2. Operation

This product is designed to operate at a recommended ambient temperature of 32 °C and as such, is categorized as a climate class 3 product.

2.1 Access to power

- ☐ Close the door of the appliance.

2.2 Setting Temperature

- ☐ ☐ Press down to decrease the set temperature.

Press up to increase the set temperature.

3. Cleaning



- ☐ WARNING: You must disconnect the plug before cleaning or maintenance.
- ☐ Do not use abrasive cleaning agents which may scratch and harm the delicate interior finishes of your appliance.
- ☐ Always wipe dry after cleaning.
- ☐ The agent or qualified technician must carry out repair if required.

3.1 Clean the filter of single door Low Temperature Freezer

- ☐ The filter must be kept clean and free of dust at all times. It is recommended that the cleaning routine be conducted at intervals appropriate to the speed of accretion of dust on the filter and in any event at least every month. Failure to keep the filter clean will damage the refrigeration system and invalidate the warranty.

3.2 Clean the condenser

- ☐ The condenser must be kept clean and free of dust at all times. It is recommended that the cleaning routine be conducted at intervals appropriate to the speed of accretion of dust on the condenser. Failure to keep the condenser clean will damage the refrigeration system and invalidate the warranty.
- ☐ The condenser should be cleaned once per year, minimum. Using a vacuum cleaner, exercising care to not damage the condenser fins, clean the condenser.
- ☐ Depending upon environmental conditions, the condenser may need to be cleaned more frequently.



WARNING: The condenser is a delicate component and is easily damaged. Never use a stiff brush or sharp objects to clean it. Never use water.

4. Maintenance

If your appliance develops a fault, please check the following table before making a call to the helpline.

Fault	Probable Cause	Action
The appliance is not working	The unit is plugged in correctly	Check the unit is plugged in correctly
	Plug or lead is damaged	Call our agent or qualified technician
	Power supply	Check power supply
	Internal wiring fault	Call our agent or qualified technician
The appliance turns on, but the temperature is too high or too low	Filter or condenser blocked with dust	Clean filter or condenser
	Doors are not shut properly	Check doors are shut and seals are not damaged
	Appliance is located near a heat source or air flow to the condenser is being interrupted	Move the appliance to a more suitable location
	Ambient temperature is too high	Increase ventilation or move appliance to a Low Temperature Freezer position
	Insufficient airflow to the fans	Remove any blockages to the fans
	Appliance is overloaded	Reduce the amount stored in the appliance
	Factory default parameters adjusted	Call our agent or qualified technician
The appliance is unusually loud	The appliance is touching a neighboring object	Check installation position and change if necessary
	The appliance has not been installed in a level or stable position	Check installation position and change if necessary

5. Disposal

If in any doubt, please consult your Local Authority, contact us or contact the reseller from whom you purchased the appliance.

Certificate of Quality

Checker: