



Ultra Low Temperature Lab Freezer - 510L

User Manual

Welcome

## Notice to Purchasers

**abm**'s products are guaranteed to meet required quality control standards at the time of shipment. Notice of problematic products must be made within 10 days of receipt. This product warranty limits **abm**'s liability to the replacement of the product only.

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## Overview

The Ultra Low Temperature Freezer consists of a door, a chamber, an electric control system, a refrigeration system, and accessories. This product offers a wide variety of research and storage applications, such as the preservation of plasma and biomaterials. It is suitable for blood banks, hospitals, sanitation and anti-epidemic sanitation, research institutes, electronic industries, university laboratories, military industries, and pelagic fishery companies.



# Overview

## **CUTTING-EDGE CONTROL SYSTEMS:**

- High-precision microcomputer temperature control system, platinum resistance temperature sensor, with temperature that can be accurately set between -10°C to -86°C.
- LED/LCD touch screen displays; good man-machine interaction interface, simple operation, and accurate temperature control.

## **REFRIGERATION SYSTEM:**

- High-efficiency compressor and EBM fan with strong power, energy conservation, and high efficiency.
- Double-layer thermal foam insulation on the doors with multi-patented outdoor insulation which effectively prevents the loss of cooling capacity.
- The freezer body is made of high-performance vacuum insulation material, which greatly improves the insulation effect.
- CFC-free refrigerant.

## **HUMANIZED DESIGN:**

- New easy-to-open power-assisted door handle.
- Adjustable multi-level shelves for easy storage of articles.
- Universal wheels with fixed support feet to easily move and set freezer in place.
- Insulated dual compartment doors.

## **SAFETY SYSTEM:**

- A keyboard lock and password protection system which prevents unauthorized changes to the freezer operating parameters.
- Multiple automatic failure alarm systems to ensure safety of the articles stored inside the freezer: sensor failure alarm, high and low temperature alarms, low battery alarm (optional), door open/ajar alarm, filter clogged alarm, system failure alarm.
- Door lock which prevents unauthorized opening.
- Startup delay and shutdown interval to protect functions and ensure reliable freezer operation.

## Contents

1.0 Introduction .....	4
2.0 Precautions .....	5
3.0 Installation .....	8
3.1 Installation Environment.....	8
3.2 Installation Site .....	9
3.3 Caution Before Use.....	10
3.4 Freezer Stabilization Period .....	10
3.5 First Initial Power On.....	10
3.6 Operation After Power Failure.....	11
4.0 Freezer Components.....	12
5.0 Touch Screen Control Panel Functions.....	12
6.0 Defrost/Unused/Maintenance .....	29
6.1 Defrost.....	29
6.2 Unused .....	30
6.3 Maintenance .....	30
6.4 Disposal of Unit.....	31
7.0 Troubleshooting .....	31
8.0 Specifications.....	34
9.0 Equipment Terms and Conditions .....	37

## 1.0 Introduction

- Thank you for choosing **abm**'s Ultra Low Temperature Lab Freezer.
- Read this manual carefully before using this appliance and follow the instructions for safe operation.
- Keep this manual in an appropriate place to refer to as necessary.
- **abm** can not guarantee any safety if the appliance is used for any objects or purposes other than the intended use or used by any procedures other than those mentioned in this manual.
- The contents of the manual are subject to change without notice due to the improvement of the freezer's performance or functions.
- Contact an **abm** sales representative or agent if any instructions in this manual are unclear or if there are any inaccuracies.
- No part of this manual may be reproduced in any form without the expressed written permission of **abm**.
- Please read page 4-8 carefully as it contains the important safety notices.
- Only trained or authorized personnel should operate this Ultra Low Temperature Lab Freezer.
- Only qualified service personnel or authorized agents should install and conduct maintenance on this device.
- Use **abm** spare parts always. **abm** will not be responsible for any adverse consequences as a result of the user using accessories that were not obtained from **abm**. However, users can contact **abm** to verify the suitability of these accessories before using them.
- Users should arrange for regular inspection and maintenance of the device according to the recommended specified time intervals.
- Due to the differences between models and the improvement of products, actual product may differ slightly from the diagrams included in this manual.
- The end user has an obligation to be responsible for his or her own safety.
- Always use appropriate protective equipment such as dry gloves when you take out refrigerated articles from the freezer. Handling frozen contents or touching the freezer's inside walls with bare hands may cause frostbite.
- It is the end user's responsibility to understand the product's proper function and operational characteristics. This unit should be used only for its intended purpose or functions. Any alterations or modifications void the warranty.

## 2.0 Precautions

When using this device for the first time, please pay careful attention to the following warning signs and safety precautions to ensure the equipment is used safely and correctly. Following the advised precautions will prevent possible injury to the user and any other person.

<p><b>WARNING</b></p> <p>Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.</p> 	<p><b>ATTENTION!</b></p> <p>Failure to observe ATTENTION! signs could result in injury to personnel and damage to the unit and associated property.</p> 
<p><b>CAUTION HOT</b></p> <p>This sign informs users of high temperatures and the danger of burns if not handled correctly.</p> 	<p><b>DANGER OF EXPLOSION</b></p> <p>This sign informs users of the presence of dangerous volatile and explosive chemical substances.</p> 
<p><b>DO NOT TILT</b></p> 	<p><b>STAY OUT OF SUN</b></p> 



**WARNING:** Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.

Ultra Low Temperature  
Lab Freezer



As with any equipment that uses CO<sub>2</sub> gas, there is a likelihood of oxygen depletion in the vicinity of the equipment. It is important that you assess the work site to ensure there is suitable and sufficient ventilation. If restricted ventilation is suspected, then other methods of ensuring a safe environment must be considered. These may include atmosphere monitoring and warning devices.



Do not touch any electrical parts such as the power supply plug or any switches with a wet hand. This may cause electric shock.



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



Be sure to install the unit on a sturdy floor. If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.



Be careful with the power cord to avoid short circuits or open circuits. When removing the plug from the power supply outlet, grip the power supply plug, not the cord. Pulling the cord may result in electric shock or fire by short circuit. Do not pack or press the power line with furniture or heavy goods. Also please leave enough ventilation in the areas around the compressor and heat source.



Please insert the power plug firmly.



Use a grounded power supply outlet to prevent electric shock. If the power supply outlet is not grounded, it will be necessary to install a ground by qualified electricians. Do not lengthen the line randomly. If necessary, use a 2.5mm<sup>2</sup> copper line. The 4mm<sup>2</sup> line should be reserved for connection to the electrical outlet. Otherwise, this may cause a fire.



Do not use the power supply that is not specified in the equipment design, so as to avoid overheating, short circuiting and other faults. For example, connecting 110V rated voltage products to 220V power supply may cause faults such as overheating and equipment burning. This equipment adopts a 220V/50HZ AC power supply. If the operating voltage is too low or too high, a suitable automatic voltage stabilizer must be installed for cooperative use.



Be sure to install the unit on solid, flat ground and take due care to prevent tipping, shaking, or tilting of the equipment.



Never install the unit near flammable or volatile items to prevent explosion or fire accidents.



Do not place equipment in areas exposed to the sun or rain so as to prevent dangers such as short circuiting or overheating.



Do not tilt or lay the equipment sideways, and do not impact the equipment body; Refrigeration systems are installed in the equipment, which can easily be damaged from tilting or impact.





Be sure to install the device in a dry dust-free environment to avoid risks such as overheating, short-circuiting and other dangers.



If there is an unexpected sound, smell, or smoke when the power is turned on, unplug the power and contact **abm immediately**. Continued abnormal operation may cause electric shocks or fire.



Please place the equipment in a dry and ventilated environment, and ensure that the equipment vents and instrument surfaces are not blocked or shielded by walls or other objects; Do not use equipment in a poorly ventilated environment to prevent damage caused by heat released from the equipment.



Never disassemble, repair, or modify the unit yourself. Any such work carried out by an unauthorized person may result in fire or injury due to a malfunction. **abm** will not be responsible for any resulting equipment damage or user injuries.



Never store volatile or flammable substances in the unit. This may cause an explosion or fire. Never store corrosive substances in this unit. This may lead to damage to the inner components or electric parts.



When storing toxic, harmful or radioactive materials, please use the equipment in safe areas. Improper use may cause harm to human health or environment.



Never ground the unit through a gas pipe, water main, telephone line or lightning rod. Such grounding may cause an electric shock in the case of an incomplete circuit.



Use a grounded power supply outlet to prevent electric shock. If the power supply outlet is not grounded, it will be necessary to install grounding by qualified electricians.



Use of an ungrounded cord or overloaded circuit **VOIDS** the compressor warranty.



**CAUTION: Failure to observe CAUTION signs could result in injury to personnel and damage to the unit and associated property.**



Do not store living animals, flowers or other items with strict temperature requirements in the Ultra Low Temperature Lab Freezer.









The temperature inside the freezer is very low during its normal operations. Do not touch the interior surface of the chamber or the objects inside without wearing suitable protective gear.



Always disconnect the power plug if the unit will not be in use for an extended period of time.




Make sure to prepare a safety check list when you request any repair or maintenance for the safety of service personnel. Be sure to check the temperature set point of the temperature controller prior to restarting the freezer.

- |   |  |
|---|--|
|  | The Ultra Low Temperature Lab Freezer is a storage device, not a production equipment!   |
|  | Always hold the handle when closing the door. This will reduce the likelihood of a trapped finger.   |
|  | Store the key properly to prevent children from taking it to open the freezer door which may result in unexpected injury.                        |
|  | Select a level and sturdy floor for installation. This precaution will prevent the unit from tipping.  |
|  | Check the filter mentioned in this manual and clean it as necessary. A dusty filter may cause temperatures to rise leading to equipment failure. |
|  | Do not tilt the unit more than 45 degrees when moving the unit. All transportation should be done carefully.                                     |

## 3.0 Installation

### 3.1 INSTALLATION ENVIRONMENT

- Ambient temperature: 16~32°C, optimal ambient temperature : 18~25°C. Air conditioning system is required if necessary.
- Relative humidity: ≤80%RH.
- No strong vibration and no corrosive gases around.
- No large presence of dust.
- No shaking or vibrating of the freezer.
- Elevation of the freezer location: ≤ 2000m
- Input voltage is AC single-phase ≤220V~230V±10%.
- No direct sunlight or any other cooling or heating sources, and no electromagnetic interference that may affect the normal operation of the control system or freezer.
- Keep a minimum 30 cm distance between the freezer and the surrounding wall, and ensure the air outlet is not obstructed. Pay attention to the room's ventilation or turn on the air conditioner during hot summers.

 **CAUTION:** The ambient temperature has a great impact on the operation of the freezer. If the freezer is installed in environments that do not meet the above conditions, the freezer will not run properly.

### 3.2 INSTALLATION SITE

This unit is a precision machine. Select an installation location that meets the following conditions to ensure optimal performance:

- Should not be installed in a small confined space. The door of the room should not be less than the height of the unit.
- Install the unit on a sturdy, flat floor to avoid excessive vibration and noise.
- Installing the unit in direct sunlight may cause malfunctioning and may shorten the life of the unit. Keeping good ventilation is necessary.



- Do not share a socket with other equipment. Plug and socket should be securely connected.
- Socket inputs should be connected to circuit protection systems, such as an air switch, which will trigger when rated current is greater than 45A.
- If an extension cord is needed, be sure to use a copper wire that is more than 2.5mm<sup>2</sup>. The cross-sectional area of the copper wire inside the wall connected with the power outlet must also be more than 4mm<sup>2</sup>.
- Check the working voltage of the installation location before starting the freezer. A voltage stabilizer is recommended in locations where the voltage is not stable. Make sure the normal input voltage remains stable at 220V ± 10%. The power of the voltage stabilizer should be more than 4kW.



- Be sure to ground the unit. Grounding prevents electric shock which occurs when the electrical insulation of the unit becomes insufficient.
- If the power cord socket is equipped with grounding wire, check the connection before use.
- If the power supply outlet is not grounded, it will be necessary to install a ground by qualified electricians.

**WARNING:** Make sure to use a plug with earth provision and to ground the unit to prevent electric shock in the event of current leakage. Substituting a water pipe for the ground terminal will not provide proper grounding in many instances since plastic pipes are often used for water piping. Never ground the unit through a base pipe, as it is very dangerous. Never ground the unit through a telephone line or lightning rod, as large currents flow if lightning strikes, making it very dangerous.

### 3.3 CAUTIONS BEFORE USE


- Remove all package components (including the protection foam inside the unit).  
**Caution:** Do not place plastic packing bags within reach of children as it may cause suffocation.
- Check the device, accessories, and documents as listed in the packing list.
- Clean the device before use.

### 3.4 FREEZER STABILIZATION PERIOD

Once the freezer is installed, user must wait 24 hours before turning it on to ensure all refrigerants and oils have settled in their correct compartments.

### 3.5 FIRST INITIAL POWER ON

Operate as follows for the first power on:

1. Connect the power cord to the appropriate socket.
2. Turn on the power switch located at the bottom right-side of the freezer. (If a back-up cooling system is installed, ensure it is turned off).
-  3. Set the desired temperature between  $-10^{\circ}\text{C}$  to  $-86^{\circ}\text{C}$ . If the user needs to set the temperature below  $-80^{\circ}\text{C}$ , the user should first set the temperature at  $-80^{\circ}\text{C}$ . Once the temperature of the freezer reaches  $-80^{\circ}\text{C}$ , keep it stable at  $-80^{\circ}\text{C}$  for 3.5 hours before further lowering the temperature below  $-80^{\circ}\text{C}$ .
4. The high temperature alarm may be activated once the power is turned on. This is normal. Once the temperature lowers to the set point, the alarm will switch off automatically. Alternatively, user may click the mute button to turn off the alarm.
5. Items can be stored after the freezer has run normally for 24 hours. Store items in batches that do not exceed 1/3 of the freezer volume. Wait 12 hours after addition of each batch to ensure freezer is operating normally before adding a new batch.
6. Avoid opening the door during the cooling process. This will cause the temperature to rise.
7. It is not necessary to turn on the back-up cooling system (if installed) when the freezer is working properly. When the freezer experiences failure, you can turn on the system to maintain the freezer's inside temperature.

**Caution:**

- An authorized person must be assigned to check and record the freezer's operational status every day. The freezer's inside temperature will rise during failure or shutdown. If repairs can not be made within a short time, remove the stored items and transfer them to a suitable location.
- Prior to placing items inside the freezer, the user should check if the freezer's set temperature matches the item's storage requirements.
- Due to thermal inertia, there will be a small difference between the actual display temperature and the set temperature. This is normal.
- **abm's** Ultra Low Temperature Lab Freezers are storage devices. Do not put excessively "hot" samples into the freezers all at one time as this will cause compressor damage due to prolonged periods of working nonstop. Store items in batches to ensure freezer is cooled step by step until the required storage temperature is reached.
- Do not put electronic devices in the freezers without permission.
- Do not change the temperature settings too frequently within a short period of time or the display temperature may not reach the set temperature due to thermal inertia. Do not store items too close to the freezer's sensors and do not pack items too close together. This ensures that the cold air can circulate and prevents instability of the inside temperature and inaccuracy of the display temperature.

### 3.6 OPERATION AFTER POWER FAILURE

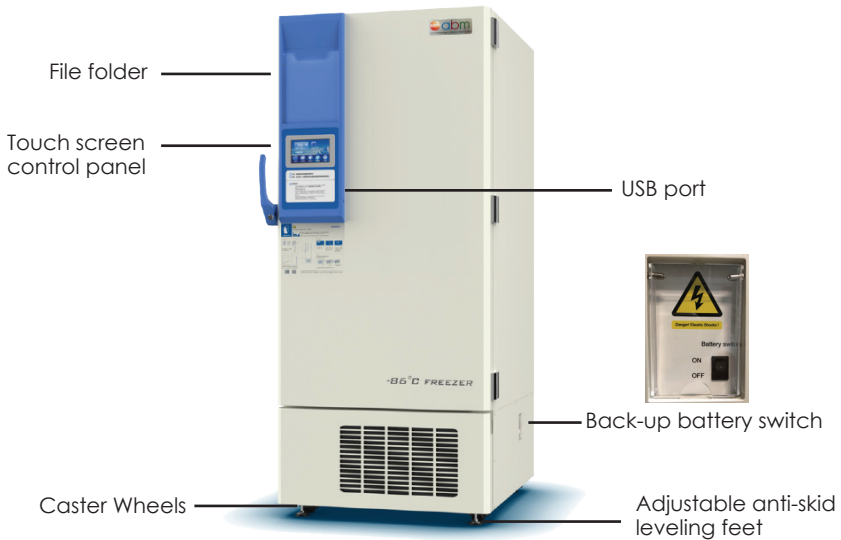
The freezer controller remembers the temperature settings. The freezer will continue to follow the previously set operation parameters once it has been restarted after a power failure. Please wait 5 minutes before restarting the freezer after a power failure to prevent damage to the compressor.



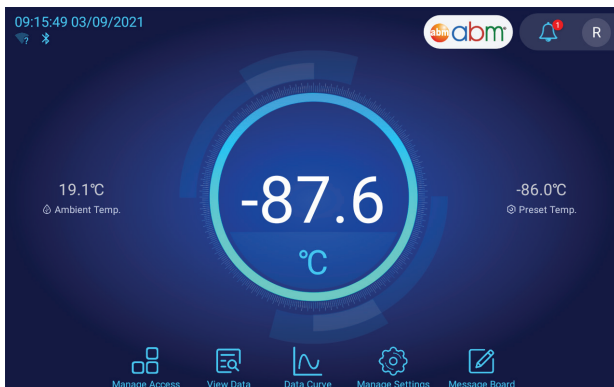
**Note:** **abm** can not be responsible for the loss or damage of any stored items after a power failure.

## 4.0 Freezer Components

The Ultra Low Temperature Lab Freezer - 510L is designed to store materials under very low temperature conditions. The internal temperature in the freezer can be easily adjusted from the control panel. All operations are convenient and reliable.



## 5.0 Touch Screen Control Panel Functions



## 5.1 INTRODUCTION TO HOMEPAGE

09:15:49 03/09/2021



- The first line displays the current time of the system, and the second line displays Wi-Fi and Bluetooth connectivity.



- **Electric Lock.** Click the icon to open the electric lock. Before opening the Freezer door, press the electric lock icon. Users who are not logged in do not have the authority to unlock the electromagnetic lock. The electromagnetic lock will automatically turn on a certain period of time after the freezer door has been opened and lock the freezer's door handle. If the door was still open when the electric lock automatically turned on, please simply click the electric lock icon again to unlock the door handle to close the door.



- **Alarm Status.** If there is any alarm information, an alarm sound will occur and the red status indicator will flash (the alarm flashing cannot be canceled until the fault is eliminated). Click the icon to turn the alarm sound on/off, and long-press the icon to enter the alarm management interface (you do not need to log in before entering the alarm management interface). If there are unread alarm messages, the number of unread messages will be displayed in the upper-right corner of the icon.

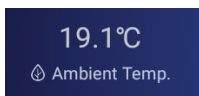


- **User Status.** After the user logs in, the user name will be displayed. If you are not logged in, click the icon and it will jump to the login page. After you have logged in, click the icon again and a shortcut menu will pop up where you can view user information, modify the password, log out, set the fingerprint (optional, not available in North America), set the card wiping (optional, not available in North America), set the face login (optional, not available in North America), etc. The initial user name is set to "user001" and the initial password is set to "123456". You will need to change the password when logging in for the first time.

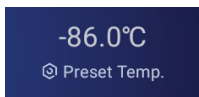
## Ultra Low Temperature Lab Freezer



- Displays the real-time temperature inside the Ultra Low Temperature Lab Freezer as well as the temperature unit. When the temperature in the freezer is between the high-temperature alarm value and the low-temperature alarm value, the outer ring is a blue-green gradient, otherwise, the outer ring will be a red-orange gradient. Click the temperature value to enter the running status interface (you do not need to log in to view the running status interface).



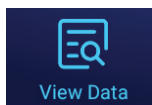
- Displays the ambient temperature.



- Displays the set temperature.



- **Manage Access.** Click to enter the access management interface where you can manage the items in the Ultra Low Temperature Lab Freezer. You will need to be logged in to access this interface.



- **View Data.** Click to view historical running data and operation data for the freezer. You do not need to be logged in to view this interface.



- **Data Curve.** Click to view the historical temperature curves for the freezer. You do not need to be logged in to view this interface.



- **Manage Settings.** Click to view the freezer settings and set various parameters or functions. You will need to be logged in to view this interface.





- **Message Board.** Click to view the message board where you can post and view messages. If there are unread messages, the upper-right corner will show a notification number. You will need to be logged in to view this interface.

## 5.2 ALARM MANAGEMENT

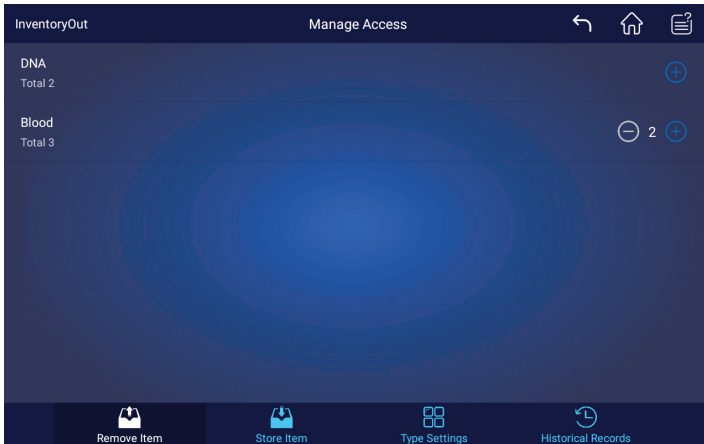
Alarm Manage					
Num	Alarm Content	Alarm Time	Release Time	Check Time	Operate
1	Door Open Long Alarm	2019-08-17 13:32:00			
2	Condenser Sensor Fault	2019-08-17 13:32:00			
3	Low Power	2019-08-17 13:32:00			

- **Alarm management.** View the alarm type, alarm occurrence, release and check times. Click the filter icon in the upper-left corner to filter the alarm time by date.
- Click the icon to identify that the alarm entry has been viewed.
- Click the icon to return to the previous interface, click the icon to return to the main interface, and click the icon to pop-up the help panel.

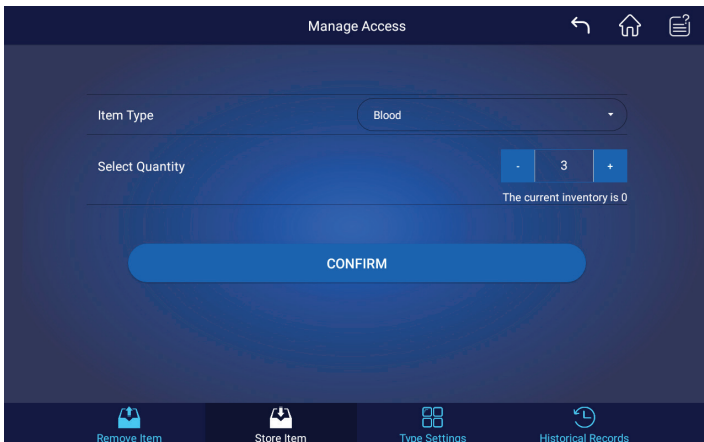
- The alarm types available for this freezer are as follows:

Alarm Type	Alarm description
Communication failure with the mainboard	Triggers when the transmission signal between the display screen and the main control board is interrupted.
Door is open for too long	Triggers when the door has been open for longer than 1 minute.
Ambient temperature sensor failure	Triggers when the ambient temperature sensor fails.
Condenser sensor failure	Triggers when the condenser sensor fails.
Pt1000 sensor failure	Triggers when the Pt1000 sensor fails.
Pt1000 high-temperature alarm	Triggers when the temperature in the freezer is higher than the temperature that was set for the high temperature alarm.
Pt1000 low temperature alarm	Triggers when the temperature in the freezer is lower than the temperature set for the low temperature alarm.
Alarm for high condenser temperature	Triggers when the condenser temperature is too high due to blockage of the condenser filter screen or high ambient temperatures.
Alarm for high ambient temperature	Triggers when the ambient temperature is too high.
Low battery	Triggers when the battery is too low.
Battery power detection failure	Triggers when the battery power detection fails.
Power failure	Triggers when the main power supply fails.

### 5.3 MANAGE ACCESS



- **Removing an item from your inventory.** Click the +/- buttons on the right side of the item type to indicate how many of that item type you want to take out of the freezer. Click the "InventoryOut" button in the upper-left corner to confirm removal.




- **Adding an item to your inventory.** Select the item type you want to store from the drop down menu, then set the storage quantity, and then click the "Confirm" button to confirm addition.

## Ultra Low Temperature Lab Freezer

Num	Type Name	Status	Manage
1	DNA	Yes	Manage
1	Blood	Yes	Manage

- **Item type settings.** Click the “Add” button in the upper-left corner to add a new item type, and click the “Manage” button to the right of an item type to edit the name of the item type.

Num	Type	Num	Operator	Time	Manage
1	Blood	2	admin	2021-09-04 09:54:45	Take
2	DNA	2	admin	2021-09-04 09:54:29	Store
3	Blood	3	admin	2021-09-04 09:54:22	Store

- **Historical records.** Click the  filter icon in the upper-left corner to filter records by date.

## 5.4 VIEW DATA

Num	Time	Internal Temp	Ambient Temp	Condenser Temp
1	2021-09-03 09:20:00	-87.6°C	18.9°C	Error
2	2021-09-03 09:18:00	-87.6°C	19.0°C	Error
3	2021-09-03 09:16:00	-87.6°C	19.1°C	Error
4	2021-09-03 09:14:00	-87.6°C	19.1°C	Error

- **Temperature records.** View historical running data. Click the filter button in the upper-left corner to filter records by date.

Num	Time	Operator	Primary Op	Secondary Op
1	2021-09-03 09:17:11	admin	Authority	Login
2	2021-09-03 09:16:20	admin	Authority	Logout
3	2021-09-03 09:15:38	admin	Authority	Login
4	2021-09-03 09:15:26	admin	Authority	Logout
5	2021-09-03 09:15:10	admin	权限	登录
6	2021-09-03 09:06:42	admin	权限	登录

- **Operational records.** View historical operation records, and click the filter button to filter records by date. The types of operational records include: logins, logouts, additions or modifications of user information, data exports, modifications to temperature settings, alarm events, door unlocking events, printing events, door opening events, door closing events.

## Ultra Low Temperature Lab Freezer


View Data ← 🏠 📄

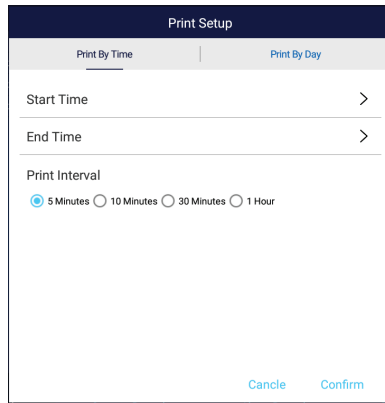
Num	Alarm Type	Alarm Time	Alarm Disabled Time
1	Door Opening Timeout	2021-09-03 09:16:00	
2	Condenser Sensor Fault	2021-09-03 09:14:01	


Temp Records   Operational Records   Alarm Records   Detailed Records

- **Alarm records.** View historical alarm records.

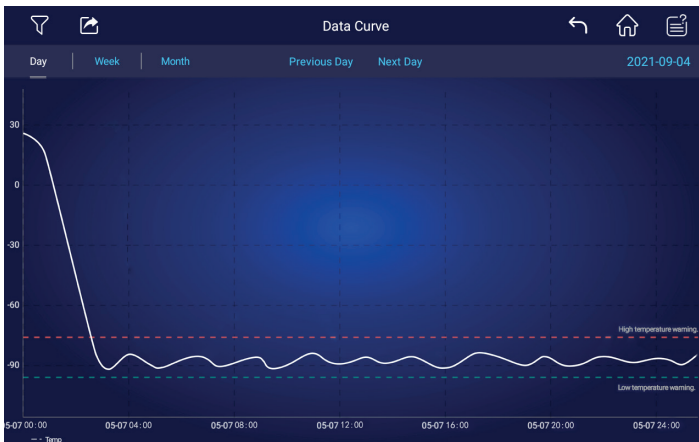
Range Choose		2019-8					Clear
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
				1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28	29	30	31	
Start Date				End Date			
CONFIRM							

- Click the  export icon to select the date range of the export. Select the start and end dates for the data you want to export. Click the OK button to export a data file in Excel format (\*.xls) to the USB flash drive.



- Click the  printer icon to pop up the print settings dialog box where you can choose to print by time or print by day. You will need to set the date or time range as well as the printing interval of the data you want to print. A printer needs to be connected via bluetooth to use this function.

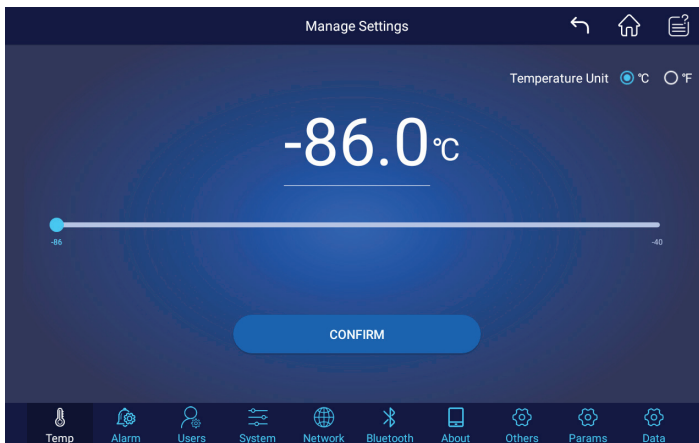
## 5.5 DATA CURVE



## Ultra Low Temperature Lab Freezer

- Click on the day/week/month tab to view each corresponding curve graph.
- Click the previous day/next day tab to view the corresponding curve graph.
- Click the filter icon in the upper-left corner to set the date range for the curve.
- Click the export icon in the upper-left corner to export the curve data to the USB flash drive.
- Pinch to zoom in/out of the curve graph, and slide with a single finger to view detailed temperature values.

### 5.6 SETTINGS

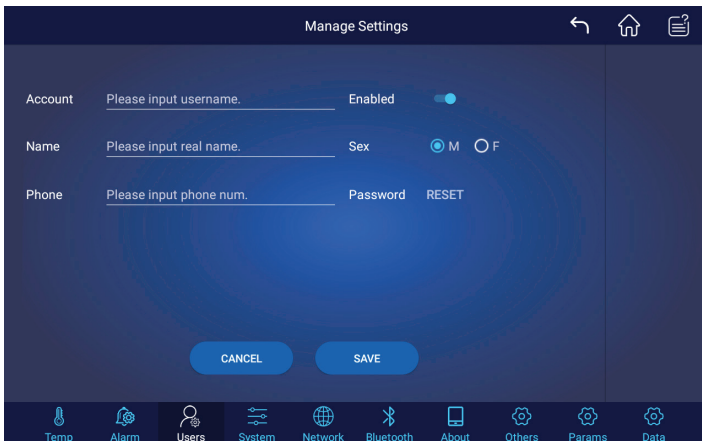


- **Temperature settings.** Slide the button on the slider or click the temperature value to modify the set temperature, and click the °C (Celsius temperature scale) or °F (Fahrenheit temperature scale) to switch the temperature unit.



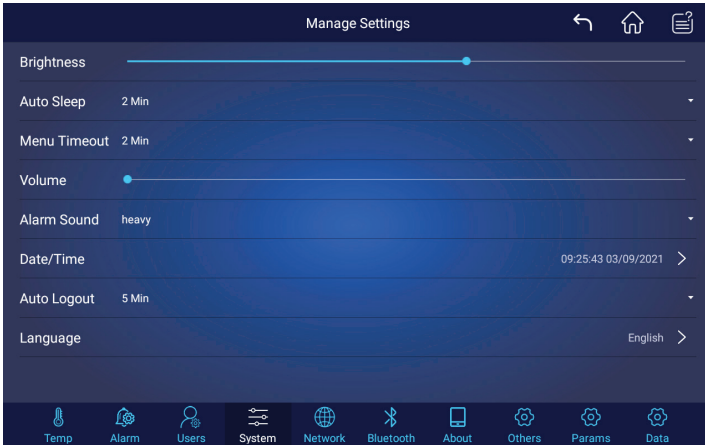


- Alarm settings.** Slide the button on the sliders or click the value to set the high-temperature alarm value, the low-temperature alarm value, and the high ambient temperature alarm value.

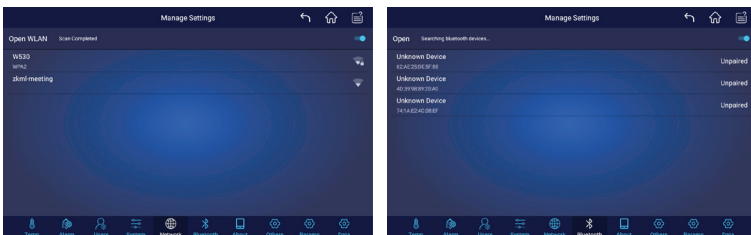


- User management.** The administrator can add or modify users. Users created by the administrator are ordinary users (ordinary users do not have the authority to add/modify contents). Click "RESET" password to reset the user's login password. The initial password is set to "123456".

## Ultra Low Temperature Lab Freezer

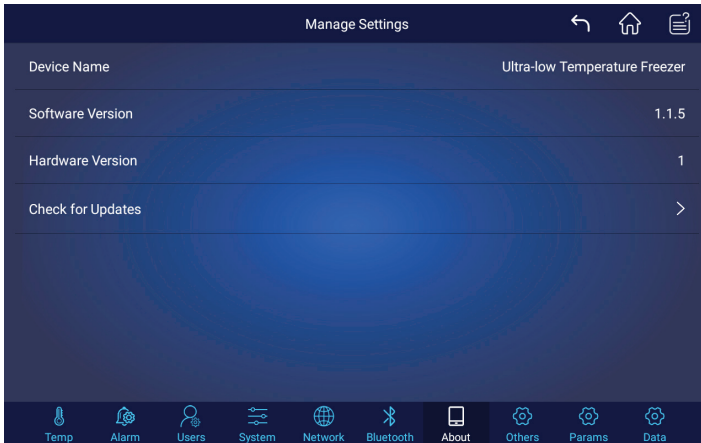


- **System settings.** Adjust the control panel screen brightness, the time for the display screen to automatically turn off after a period of inactivity, the time for the display screen to automatically return to the main interface after a period of inactivity, the volume, the alarm sound (the new alarm sound will take effect after the display screen returns to the main interface), the date and time, the automatic user logout time, and the language.

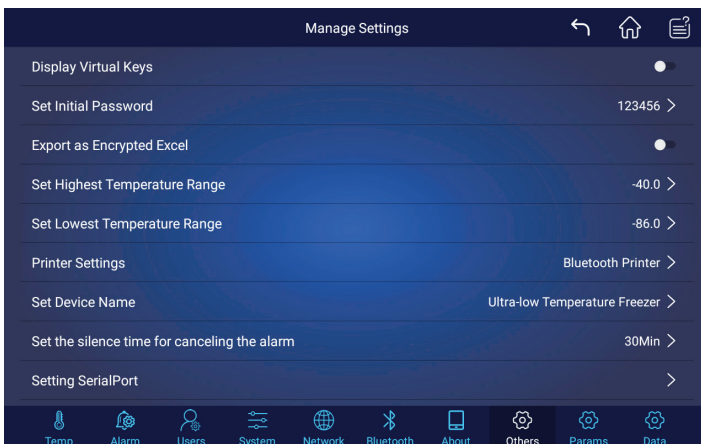


- **Bluetooth and Network settings.** Set up the bluetooth connection or Wi-Fi connection to a wireless network.

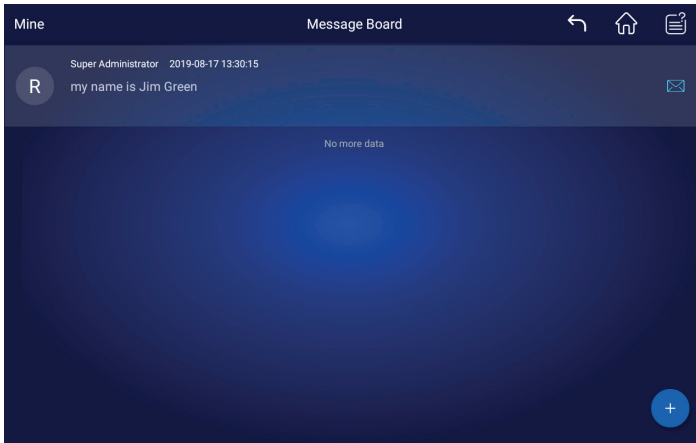
- Machine information.** This page displays the current machine model, the software version, and the hardware version. If the machine has been connected to the Internet, you can click the “Check for Updates” button on this page to check for software updates. If a newer version exists, you can choose to download and install the newer version.




- Other settings.** Only the administrator has the authority to view this page. On this page, the administrator can hide/show virtual buttons, set the initial password for new user logins, set whether the exported Excel file is encrypted as well as the encryption password, set the temperature intervals, set the printer selection, and access the equipment name settings.



## 5.7 MESSAGE BOARD



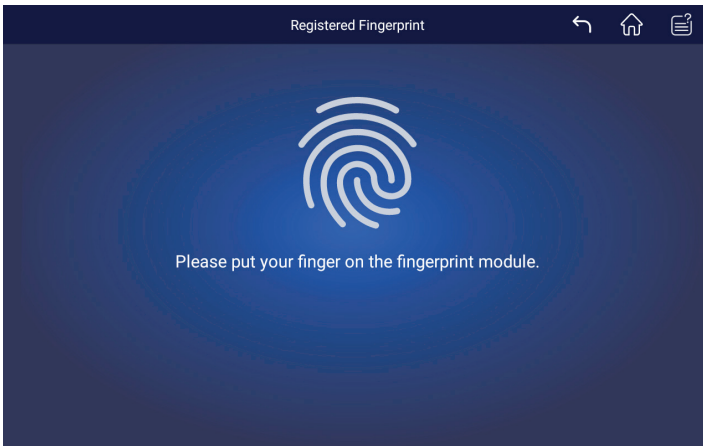
- Click the "+" button in the lower-right corner to post a message. You can choose to be make the message readable to everyone or only to specified users.
- Click the  icon to identify that the message entry has been viewed.
- Click My/All in the upper-left corner to switch between your messages and all messages.
- Press and hold a message entry and slide to the left to delete the message.

## 5.8 LOGIN

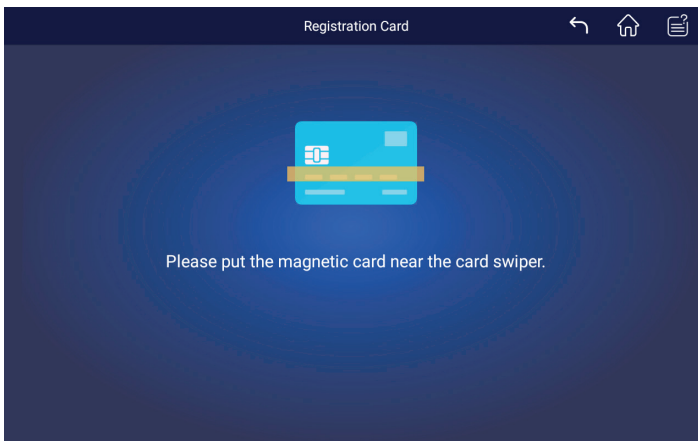
- **Login with account username and password**

- Enter the correct account username and password to log in. The default password for new users is "123456". You will be asked to change the password when logging in for the first time. The administrator can change the default password for new users under Settings > Other settings > Set the initial password.

- **Login with fingerprint (not available in North America)**



- After the user logs in, enter the fingerprint registration interface from the menu on the right side of the homepage. Once a fingerprint is successfully registered, you can log in with the fingerprint.
- **Login with card (not available in North America)**



- After the user logs in, enter the card registration interface from the menu on the right side of the homepage. Once an IC or ID card is successfully registered, you can log in with the IC or ID card.
- **Login with facial recognition (not available in North America)**
- After the user logs in, enter the face registration interface from the menu on the right side of the homepage. After a face is recognized, click the icon on the interface to register the face. After successful registration, click the icon on the login page to enter the face recognition interface for face login.
- (Note: When a face is registered for the first time, it needs to be activated online, and then it can be used offline. If the face cannot be registered after the machine is powered off, it can be activated again online).

## 6.0 Defrost/Unused/Maintenance



### **WARNING:**

- Turn off/cut off the power supply before making any repair services to prevent electric shock or injury.
- Prepare a safety check sheet when you request any repair or maintenance for the safety of service personnel. Make sure you do not inhale any noxious gas while servicing the freezer.

### **6.1 DEFROST**

- Frost may form and build up inside the freezer after a period of time. If the layer of frost inside the freezer is more than 1.5 mm, the freezer's performance will be affected and power consumption can increase. Regular defrosting is required.
- Defrost the inside wall of the freezer as follows:
  - Remove the frost using the enclosed scraper. Take care not to damage the inside walls.

- Thorough defrosting:
  1. Take out and transfer all the contents to another freezer or to a container which contains liquid nitrogen.
  2. Switch off the power supply.
  3. Open the door and remove the inner door. To remove the inner door, open and lift.
  4. Leave the freezer as is.
  5. Water remaining in the freezer compartment should be wiped up.
  6. After cleaning is completed, restart the freezer according to the procedure. Place the items back once the freezer has sufficiently cooled.

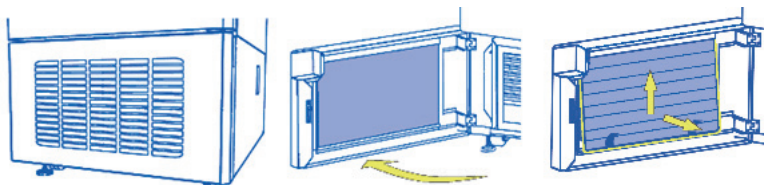
**!** **Caution:** Do not use an electric heater, metal tools, or a sharp weapon to defrost the freezer.

## 6.2 UNUSED

- If the unit is to be stored or unused for an extended period of time, it should be powered off and cleaned as indicated in 6.3, then it must be packed without any items inside.
- Before reuse, use a dry cloth to wipe the water around the lining of the freezer (especially around the door seals which directly touch the inner doors). This will prevent the door seal from being frozen by the low temperature.

## 6.3 MAINTENANCE

- Cleaning the condenser filter. Clean the condenser filter once a month. A clogged filter may cause a shorter compressor life as well as poor cooling. Clean the condenser filter following the procedure below:



1. Open the grille by pulling it towards you as shown in the figure above.
2. Take out the condenser filter.
3. Wash the condenser filter with water.
4. Replace the condenser filter and the grille.





**WARNING:**

- Do not touch the condenser directly when the filter is removed for cleaning. This may cause injury due to the hot surface.
- Never pour water onto or into the unit. Doing so can damage the insulation and cause equipment failure.
- The compressor and other mechanical parts are completely sealed. This unit requires absolutely no lubrication.
- Do not let children play around the freezer.

**6.4 DISPOSAL OF THE UNIT**



**WARNING:**

- If the unit is to be stored unused in an unsupervised area for an extended period, ensure that children do not have access and that doors can not be closed completely.
- The disposal of the unit should be performed by appropriate personnel. Always remove doors to prevent accidents such as suffocation.

## 7.0 Troubleshooting


Malfunction	Causes and solutions
The freezer is not turning on/not cooling down	<ul style="list-style-type: none"> <li>• The circuit breaker of power source was triggered.</li> <li>• The voltage is too low (in this case, call an electrician).</li> <li>• The power is not supplied.</li> <li>• The breaker is free.</li> <li>• Too many items were added to the freezer at one time.</li> </ul>
Compressor is not running	<ul style="list-style-type: none"> <li>• The power switch at the bottom right-side of the freezer is not turned on.</li> <li>• The set temperature is out of the freezer's temperature range capacity.</li> </ul>

Malfunction	Check/Remedy
Cooling is poor	<ul style="list-style-type: none"> <li>• The ambient temperature is too high.</li> <li>• The latch of the inner door is not closed completely. The outer door is not closed firmly. Frost or ice between the cabinet and door gasket may be preventing the door from properly sealing.</li> <li>• The air intake vent is blocked.</li> <li>• The condenser filter is clogged. Always clean the filter when the filter check lamp is lit.</li> <li>• The door is not shut tightly.</li> <li>• The inner door is not installed correctly.</li> <li>• The set temperature in the controller is not set properly.</li> <li>• The grille is blocked.</li> <li>• The filter is clogged.</li> <li>• The freezer is in direct sunlight.</li> <li>• There is a heating source near the freezer.</li> <li>• The insulation is not set correctly.</li> <li>• Too many items were placed into the freezer at the same time.</li> </ul>
Loud noise	<ul style="list-style-type: none"> <li>• The freezer is not on a flat surface.</li> <li>• The freezer is too close to the wall.</li> <li>• The fin of the fan is touching the other components.</li> </ul>
E4 error code: system failure	<ul style="list-style-type: none"> <li>• Reason: Ambient temp is &gt; 32 °C or the freezer is too close to the wall, causing bad ventilation.</li> <li>• Solution: Keep 30cm clearance on all sides of the freezer, keep no obstacle at the air outlet, wash the filter regularly, open the air-conditioner during hot summers to maintain a suitable ambient temperature.</li> </ul>
EE error code: sensor failure	<ul style="list-style-type: none"> <li>• Check the connection of the sensor and the controller.</li> </ul>

**NOTE:**

If the malfunction is not resolved after following the instructions in the troubleshooting table, or if the malfunction is not shown in the above troubleshooting table, contact an **abm** sales representative or agent.

**THE FOLLOWING ARE NOT FAILURES/MALFUNCTIONS:**

- There will be a slight crashing sound when the compressor is starting up and stopping. The cooling time will take longer than normal for the first power on of the freezer.
- In wet rainy seasons, there may be a little frost forming on the surface of the freezer. Use a dry cloth to wipe it off and the unit will operate as normal.
- Please wait at least 5 minutes to re-open the freezer door after the first opening. This prevents the warmer outside air from entering the freezer, causing a sharp decline in pressure which will make the door difficult to open.
- A sound of liquid flowing inside the freezer is the normal sound of refrigerant circulating.
- The inner lining that is opposite of the gasket is a pressure release area of the freezer. There may be some slight cracking due to switching between cold and hot temperatures. This is a normal and does not affect regular use.
-  Optional with printer: the screen may flicker slightly when the printer is printing or the screen is refreshing the data.
- The touch screen control panel may show that the freezer is malfunctioning when the freezer is powered on. This is normal and the control panel will display normal operations after it has read the freezer data. If after a long period of time after power up, the control panel does not display normal operations, user should restart the freezer.

**WARNING:**

Before requesting any repairs or maintenance, prepare a safety check list and ensure that the freezer is cleaned and sterilized for the safety of service personnel.

This product uses flammable refrigerants and is biodegradable (especially the components of the compressor and refrigeration pipes, etc.). If there is a failure, it must be overhauled by an authorized **abm** representative.

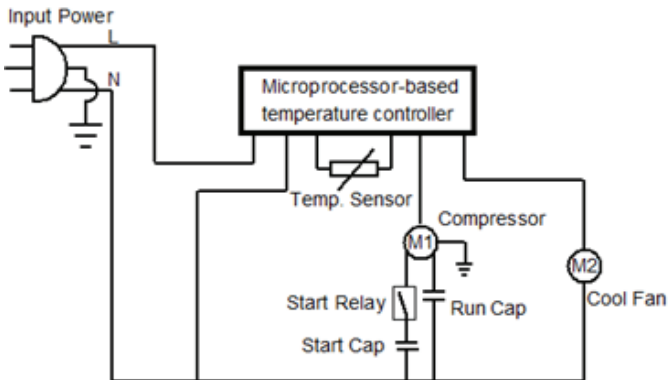
## 8.0 Specifications

<b>Model</b>	510 L	Facility Safety	Level 1
<b>Climate type</b>	N	Input Power (W)	1300
<b>Valid capacity (L)</b>	510 L	External Size (D × W×H) (mm)	1041x930x1947
<b>Rating voltage (V~)</b>	208-230V	Rating frequency (HZ)	60

### PACKING LIST

<b>Item</b>	Operation Manual	Key	Defrost Shovel
<b>Quantity</b>	1	2	1

### CIRCUIT



**NOTE:**

- Design or specifications may be changed without notice.
- The battery for the power failure alarm should be replaced every 2 years. Contact an **abm** sales representative or agent at the time of battery replacement for recycling.
- Replace fan motors every 6 years. Contact an **abm** sales representative or agent at the time of replacement.

**EXCLUSIONS OF THE WARRANTY:**

As a condition of this warranty, the customer is responsible for proper use, maintenance, and care for the freezer. Periodic removal of ice build-up and adjustment of door handles and/or latches are considered routine maintenance on the equipment and is excluded from this warranty.

This warranty does not cover:

- Calibration
- Accident
- Misuse
- Fire
- Flood
- Other Acts of God
- Incorrect line voltages
- Damage caused by improper installation
- Improper or unauthorized repair
- Broken or marred freezer cabinets
- Torn gaskets or seals, accessories
- Filters

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

Safety check sheet:

1. Freezer contents : Yes No
2. Risk of infection: Yes No
3. Risk of toxicity: Yes No
4. Risk from radioactive sources: Yes No

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

Contamination of the unit:

Unit interior: Yes No

No contamination: Yes No

Decontaminated: Yes No

Contaminated: Yes No Others:

Instructions for safe repair/maintenance of the unit

- a) The unit is safe to work on Yes No
- b) There is some danger (see below) Yes No

Procedure to be followed to reduce safety risk indicated in b) below.

**Date:**

**Signature:**

**Address, Division:**

**Telephone:**

**Product name:**

**Model:**

**Serial number:**

**Date of installation:**

Please decontaminate the unit yourself before calling **abm**.

## EQUIPMENT TERMS AND CONDITIONS

These terms and conditions apply to Equipment purchased from Applied Biological Materials Inc. ("we" "us" or "our").

If you have any questions about our quotation, our ordering process, or what terms and conditions apply to your order, please call Customer Services at 1-604-247-2416.

### 1. Contract Terms.

1.1 General Terms. These are the contract terms and conditions under which we sell, and/or provide, our Equipment to you ("Service Terms"). By ordering or requesting Equipment from us, you agree to accept and be bound by these Service Terms. This Agreement is the complete and exclusive contract between us with respect to your purchase of Equipment.

1.2 When Agreement takes Effect. The Agreement between us is created when you send us your Equipment order and we provide you with an order confirmation.

### 2. Price.

2.1 Determining Price. For the Equipment you purchase, the price is shown in our quotation to you. If we do not provide you with a quotation, the price will be the list price that applies to your country on the date we receive your order.

2.2 Taxes and Fees. Our prices do not include any taxes (including VAT), duties, levies or other government fees that may apply to your order. If they apply, it will be your responsibility to pay them. If we pay them, we will add them to your invoice.

### 3. Payment Terms.

3.1 Late Payment. If you are late in making payment, without affecting our other rights, we may suspend the warranty support, cancel your contract, reject your future orders, and charge you a late-payment charge, from the due date until paid, at the rate of 1% per month (12% per year) or, if less, the maximum amount allowed by law. You agree to pay this late charge upon request.

3.2 Collection Costs. If we appoint a collection agency or an attorney to recover any unpaid amounts, you must pay all reasonable costs of collection, including all associated reasonable attorneys' fees.

### 4. Warranty.

4.1 Limited Warranty. We warrant that the Equipment we provide to you will be in accordance with the generally accepted standards. You must make any claim for this warranty prior to any unauthorized repair, change, or modification has been made to any part of the Equipment. If the serial number of the product is altered, removed, or defaced so as to be illegible, the warranty shall be null and void in its entirety.

We hereby undertake to repair, replace or refund at our option, or to arrange repair or replacement by our representative, on the Equipment if a defect in materials or workmanship arises under conditions of normal and proper use and maintenance provided that:

- The Equipment was purchased and used for a purpose for which it was suitable, was operated and maintained in accordance with the operating instructions, and was not used in a way which was unsuitable or not in accordance to the operating manual's procedures;
- The claim is first notified promptly to us in writing;
- The defect occurs within twelve months from the date of delivery of the Equipment;
- The Equipment has not been repaired or modified by anyone other than us or our authorized representative;
- You have paid the invoice for the Equipment in full.

4.2 Remedies. During the applicable warranty period only, we agree, at our option to: (i) repair the defective Equipment, (ii) replace the defective Equipment with the same model or equal value, or (iii) refund to you the fee you paid to us for the defective Equipment, if applicable. This section states our entire liability for a valid warranty claim under this Agreement.

4.3 Obligations of the Original Purchaser. The original dated purchase receipt must be retained as proof of purchase and submitted upon request by us for replacement or repair processing. For the repair option, transportation to and from us is the responsibility of the purchaser.

4.4 Exclusions. Our warranties do not apply to (i) normal wear and tear; (ii) damages by fire, flood, and/or acts of God; (iii) your neglect, carelessness, or unsuitable or improper use, such as but not limited to, connecting the Equipment to electrical services or other utilities not in accordance with the installation requirements for the Equipment, using incompatible solvents or samples with the Equipment, operating the Equipment not in conformance with our instructions or specifications, or your improper or inadequate maintenance of the Equipment; (iv) defective installation, bad civil works, or start up by you or third parties; (v) modification, repair, service transfer to another location of the Equipment that you or your employees, agents or an unauthorized contractor made; (vi) ignorance of relevant user manuals; or (vii) any defects or damage that you did not cause. ADDITIONALLY, ANY INSTALLATION, MAINTENANCE, REPAIR, SERVICE, RELOCATION OR ALTERATION TO OR OF, OR OTHER TAMPERING WITH, THE EQUIPMENT PERFORMED BY ANY PERSON OR ENTITY OTHER THAN US WITHOUT OUR PRIOR WRITTEN APPROVAL, OR ANY USE OF REPLACEMENT PARTS WE HAVE NOT SUPPLIED, WILL IMMEDIATELY VOID AND CANCEL ALL WARRANTIES WITH RESPECT TO THESE EQUIPMENT AND THE AFFECTED PRODUCTS.

4.5 Limitations. OUR WARRANTIES EXTEND ONLY TO YOU, THE ORIGINAL PURCHASER, AND YOU CANNOT TRANSFER THEM. WITH RESPECT TO EQUIPMENT, EXCEPT AS EXPRESSLY STATED, WE DISCLAIM ALL OTHER WARRANTIES OF ANY KIND, WHETHER OR EXPRESS OR IMPLIED, ORAL OR WRITTEN, INCLUDING BUT NOT LIMITED TO WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.

4.6 Except as expressly warranted above, equipment is provided without

other representations, warranties or conditions of any kind, including implied representations, warranties and conditions of merchantability, fitness for a particular purpose, title or non-infringement of third party rights. Except for the limited remedies provided above, you assume the entire risk as to the results and performance of Equipment. Nothing stated in these terms will imply that the operation of any Equipment will be uninterrupted or error free or that errors will be corrected. Other written or oral statements by us, our representatives, or others do not constitute warranties of Applied Biological Materials Inc.

### 5. Compliance with Law.

We make no representation that the Equipment we provide to you will meet or satisfy standards of any governmental body, including the U.S. Food and Drug Administration. You agree that it is your responsibility to ensure that such Equipment are adequate to meet your regulation or certification requirements and that all requirements of any governmental body or other organization, including, but not limited to, any requirement of the U.S. Food and Drug Administration are your responsibility.

### 6. Limitation of Liability.

**TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, WE WILL NOT BE LIABLE UNDER ANY LEGAL THEORY (INCLUDING BUT NOT LIMITED TO CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR WARRANTY OF ANY KIND) FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, MULTIPLE, EXEMPLARY OR CONSEQUENTIAL DAMAGES (INCLUDING BUT NOT LIMITED TO COSTS OF COVER, LOST PROFITS, LOST DATA, LOSS OF BUSINESS, LOSS OF GOODWILL, OR LOSS OF REVENUE) THAT YOU MIGHT INCUR UNDER THE AGREEMENT OR THAT MAY ARISE FROM OR IN CONNECTION WITH OUR EQUIPMENT OR SERVICES, EVEN IF WE HAD NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. WE WILL NOT BE LIABLE FOR ANY LOSS OR INJURY THAT IS THE RESULT OF INSTRUMENT, EQUIPMENT, OR PRODUCT ERROR OR THE FAILURE OF AN INSTRUMENT, EQUIPMENT, OR OTHER PRODUCT TO PERFORM IN ACCORDANCE WITH ITS SPECIFICATIONS. OUR TOTAL CUMULATIVE LIABILITY IN CONNECTION, INCLUDING WITHOUT LIMITATION ANY SERVICES RENDERED THEREUNDER, OR BREACH THEREOF OR FAILURE TO PERFORM IN CONTRACT, TORT, WARRANTY, OR OTHERWISE, WILL NOT EXCEED THE AMOUNT OF FEES YOU PAID US FOR THE EQUIPMENT THAT GIVE RISE TO YOUR CLAIM.**

### 7. INDEMNIFICATION.

You shall indemnify, hold harmless, and if so requested by Applied Biological Materials Inc., defend Applied Biological Materials Inc. against all claims (Claims) directly or indirectly arising out of or in connection with the Equipment, its use or this Agreement. Claims refer to all losses, liabilities, damages, penalties, expenses (including legal fees and costs), claims, actions, and suits, whether in contract or in tort, whether caused by Applied Biological Materials Inc.' negligence or otherwise, and whether based on a theory of strict liability of Applied Biological Materials Inc. or otherwise, and includes, but is not limited to, matters regarding:

- The selection, manufacture, purchase, acceptance, rejection, ownership, delivery, lease, possession, maintenance, use, condition, return or operation of the Equipment;
- All latent defects or other defects in any Equipment or software, whether or not discoverable by Applied Biological Materials Inc. or by you;
- Any patent, trademark or copyright infringement; and
- The condition of any Equipment arising or existing during your use.

### 8. Miscellaneous.

8.1 Assignment. You may not transfer or assign your warranty or any contract with us on the Equipment. Any attempted transfer or assignment will be void.

8.2 Governing Law. The Agreement and performance under it will be governed by the laws of the British Columbia, Canada, without regard to provision on the conflict of laws. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to the Agreement.

8.2 Uncontrollable Circumstances. We will not be responsible or liable for failing to perform our obligations under the Agreement to the extent caused by circumstances beyond our reasonable control.

8.3 No Waiver; Invalidity. Our failure to exercise any rights under the Agreement is not a waiver of our rights to damages for your breach of contract and is not a waiver of any subsequent breach. If any provision or part of the Agreement is found by any court of competent jurisdiction to be invalid or unenforceable, such invalidity or unenforceability will not affect the other provisions of the Agreement. No person other than you or us will have any rights under the Agreement. Headings are for convenience only and shall not be used in the interpretation of these Terms.

8.4 Confidentiality. You agree to keep confidential any non-public technical information, commercial information (including prices, without limitation), manuals or instructions received from us as a result of discussions, negotiations and other communications between us in relation to our products or services.

8.5 Notices. Any notice or communication required or permitted under these Terms must be in writing and will be deemed received when personally delivered, or 3 business days after being sent by certified mail, postage prepaid, to a party's specified address.

8.6 Commercial Purposes: You represent and warrant that Equipment is being purchased hereunder, as applicable, for business or commercial purposes and not for personal, family or household purposes.

8.5 You acknowledge that you have read and understand the terms and provisions of these Sale Conditions and have had an opportunity to have the same reviewed by an attorney of choice.