

Introduction

Thank you for purchasing the Revella Cell Thawing System. This manual describes the functions and procedures of the unit. To ensure correct and safe use of the unit, please read the manual carefully before operating the unit. Please retain this manual for future reference.

Unpacking Inspection

Upon opening the instrument box for the first time, the user should check the instrument and accessories against the packing list. In the event that there is any discrepancy, the user should contact the seller or manufacturer.

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Important Note

1. Important Safety Information

It is imperative that the user has a comprehensive grasp of the instrument's operation to ensure safe and effective usage. Prior to operation, users are advised to meticulously review this manual.



It is strictly forbidden to operate the instrument before reading the manual. Failure to follow the instructions may result in severe burns from the heated module or electric shock. Please read the following safety tips and instructions carefully and take all precautions therein.

2. Safety

It is imperative that the following basic safety precautions are observed at all times when operating, maintaining or repairing this instrument. Failure to comply with these measures or the warnings noted elsewhere in this manual may compromise the instrument's protection and its intended range of use.



This instrument is a Class I, Type B general-purpose device conforming to GB9706.1, intended for indoor use only.



Please read this operation manual carefully before operating the instrument, to avoid personal injury. Only qualified personnel trained in the installation and use of electrical equipment should operate this instrument.



Operators must not attempt to open or repair the instrument, as this may result in loss of warranty eligibility and potential electric shock. For repairs, our company is responsible for maintenance. To prevent electric shock accidents, the input power cable of the instrument must be reliably grounded. This instrument is equipped with a three-prong grounded plug. The third prong serves as the grounding terminal.



Before connecting the power supply, ensure that the voltage matches the required voltage of the instrument. Additionally, verify that the rated load of the power socket meets or exceeds the instrument's requirements.

In the event of a broken power cord, it is essential to replace it with a power cord of the same type and size. Do not place heavy objects on the power cord or pinch the power cord while the instrument is in use. The power cord must not be placed

in areas where it may be walked on.

Please ensure that the plug is held firmly when the power cord is connected to the socket. Ensure that the plug is fully inserted into the socket when connecting to power, and do not pull the power cord forcefully when disconnecting.



The metal module reaches high temperatures during operation and may cause burns. Do not touch the module during operation. Therefore, it is strictly prohibited to contact any part of the body with the module during the whole operation to avoid burns.



This instrument should be stored in a low-humidity environment with minimal dust, away from water sources and direct sunlight or strong light sources. Ensure proper indoor ventilation, free from corrosive gases or strong magnetic interference, and keep it away from heating systems, stoves, and other heat sources. Avoid placing the instrument in damp or dusty areas. The ventilation openings on the instrument must not be blocked or covered to prevent overheating. When using multiple instruments simultaneously, maintain a minimum distance of 30 cm between each device.



When stopping operation, the power supply should be turned off. If the instrument is not used for an extended period, the power plug should be unplugged and the instrument covered with a soft cloth or plastic sheet to prevent dust ingress.



In the following circumstances, the power plug of the instrument should be immediately unplugged from the power socket, and contact the supplier or have it handled by trained maintenance personnel:

- Liquid has been spilled inside the instrument;
- Instrument has been exposed to rain or water;
- Instrument is not working properly, particularly if unusual sounds or odours are present;
- Instrument has been dropped or case damaged;
- There is a noticeable change in the functioning of the instrument.

3. Instrument Maintenance

1. The power supply must be disconnected during instrument cleaning.
2. Clean the instrument surface regularly and avoid using corrosive cleaning agents such as strong alkali solutions, concentrated alcohol, or organic solvents.
3. Maintain a relatively dry environment within the module and holes, free from water stains or other contaminants.

Chapter I. Introduction

1. Product Introduction and Features

The Revella Cell Thawing System is a specialized instrument designed to thaw cryopreserved cell samples in cryovials based on film heating technology and non-contact temperature measurement technology. Its unique cryopreservation tube clamping technology and non-contact temperature measurement method enable rapid and efficient thawing of cell cryopreservation tubes.

This product has the following characteristics:

- The patented automatic clamping mechanism enables dry thawing, prevents contamination, and ensures sample safety.
- Suitable for thawing and recovery of biological products such as mesenchymal stem cells, CAR-T cells, and cell lines.
- The instrument is equipped with a 7-inch color resistive touchscreen with a display resolution of 800×480 pixels.
- Equipped with a high-reliability embedded operating system, it offers responsive performance and smooth operation.
- Thawing data can be exported via USB for viewing and tracing of original thawing data on a computer.
- Supports wireless network connection and allows export of thawing data via email.
- It can be connected to a thermal printer to print thawing results.
- Automatic fault detection and alarm function.
- Supports three-level permission management.

2. Operating Conditions

Ambient temperature: $0\text{ }^{\circ}\text{C} - 35\text{ }^{\circ}\text{C}$

Relative humidity: $\leq 70\%$

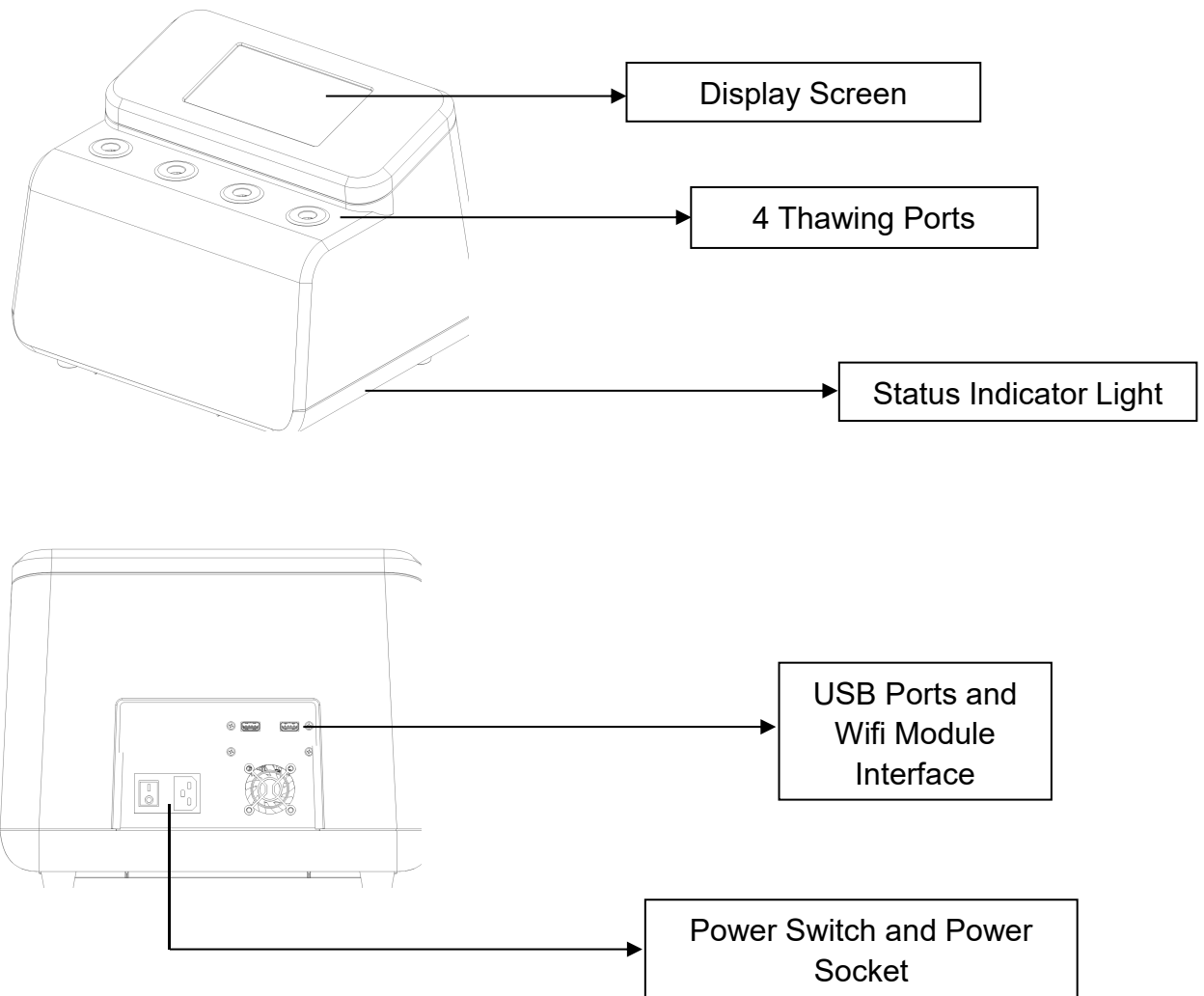
Power supply: AC100~220 V /50-60 HZ

3. Basic Parameters

Project	Parameter
Vial Compatibility	5 mL cryovial
Working Volume per Vial	3-4.5 mL
Temperature Control Accuracy of Sample Holder	$\pm 1\text{ }^{\circ}\text{C}$ @ $50\text{ }^{\circ}\text{C}$
Thawing Time	≤ 3 minutes (typical)
Liquid Crystal Display	7-inch color touchscreen
Display Screen Resolution	800x480
Communication Interfaces	USB (2 ports), Wi-Fi
Data Export Format	PDF format
Maximum Power	300 W
Voltage Specification	AC100 V-240 V, 50-60 Hz
Fuse	250 V/3A $\Phi 5 \times 20$
Size	335*293*266 mm
Weight	7 kg

Chapter II. Structural Overview

1. Structural Introduction

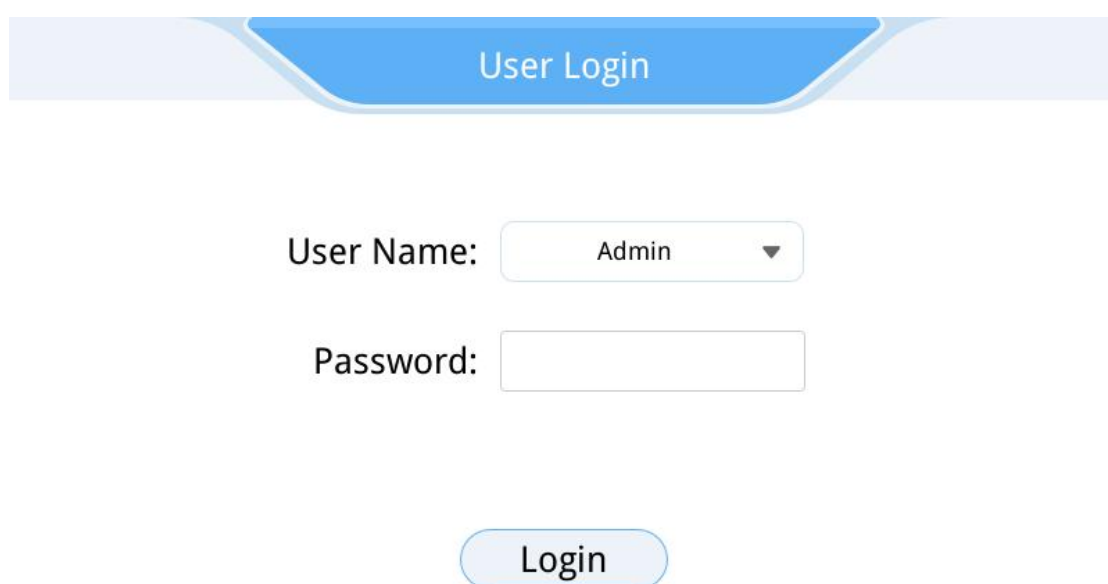


Chapter III. Basic Operation Guide

1. Power on and Log in

Connect the device to power and turn on the power switch. Once powered on, each channel will automatically warm up to the preset temperature, with the status indicator light (orange) flashing.

After completing the system self-check, you will enter the user login interface (as shown below). Select a username and enter your password (default username: Admin, default password: abc123). You will need to change the administrator password on your first login.



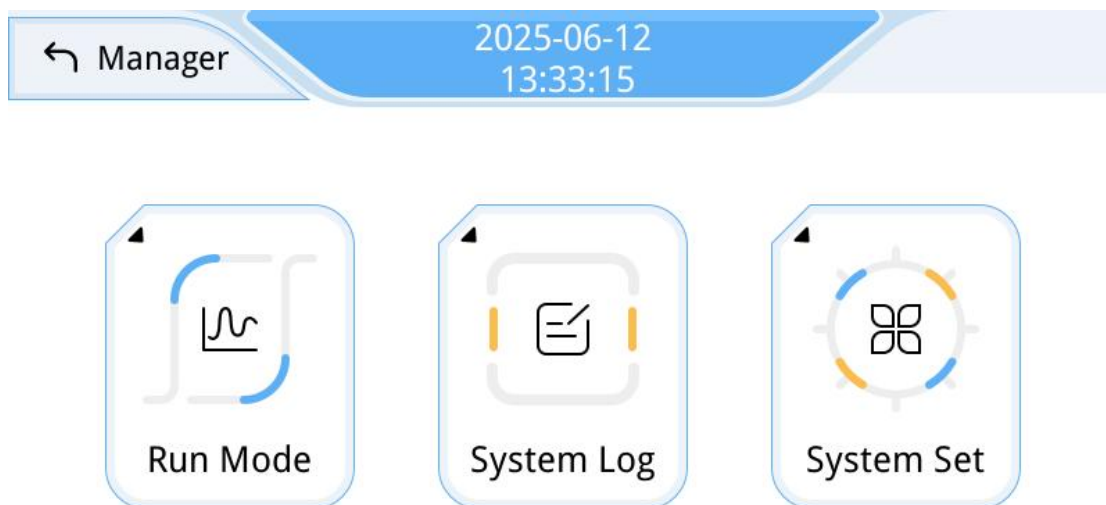
The screenshot shows a 'User Login' interface. At the top, there is a blue header with the text 'User Login'. Below the header, there are two input fields. The first is labeled 'User Name:' and contains a dropdown menu with 'Admin' selected. The second is labeled 'Password:' and is an empty text box. Below these fields is a blue button with the text 'Login'.

Button/Label Name	Function Definition
User name	Select created users
Password	Enter user password
Login	Go to the main menu interface

This device comes with three default users preconfigured at the factory:

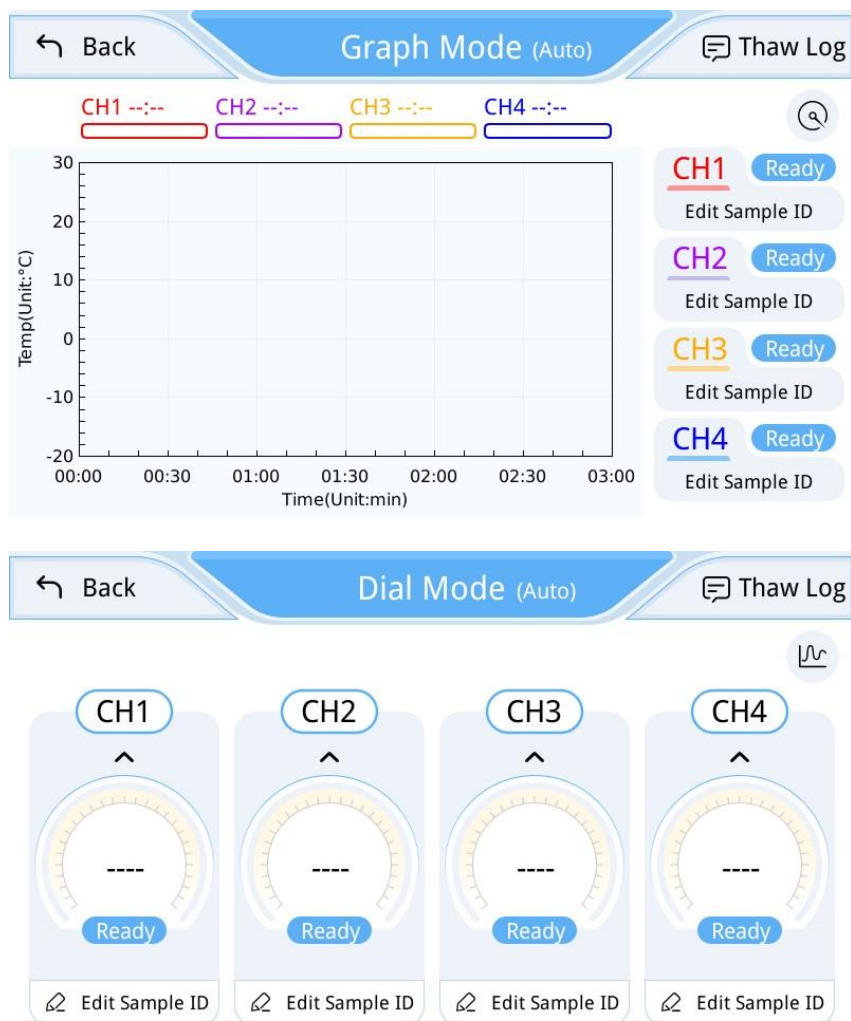
User name	Initial Password	Authority
Admin	abc123	Device parameters, logs, users, and permission allocation management
Manager	abc123	Thawing procedure, device parameters, log management
Operator	abc123	Thawing operation and log management

2. Main Menu Interface



Button/Label Name	Function Definition
Run Mode	Thawing interface
System Log	Go to the log view interface
System Set	System parameter settings interface

3. Thawing Interface



Note: After startup, the thawing interface will be displayed. Thawing procedures must be initiated only after the status indicator light turns blue. Forcibly removing the cryopreservation tube during thawing may cause instrument malfunction.

Thawing process:

Insert the cryovial vertically into the thawing port and apply gentle pressure until fully seated. The automatic clamping mechanism will engage. The device will emit a confirmation sound indicating correct insertion, allowing the user to release their grip. The thawing program will then commence. Upon initiation of thawing, the status indicator light will turn orange, and the device will begin timing (mm:ss).

After thawing, the cryovial will automatically eject, and the device will emit an audible prompt with the status indicator light rapidly flashing green.

Button/Label Name	Function Definition
Back	Return to the parent menu
 	Switch between graphical and dial modes
Thaw Log	Go to the recovery log interface
Edit Sample ID	Edit sample ID

4. System Logs

System logs should be exported and backed up regularly to prevent automatic deletion. No user can manually delete logs. Below are the scenarios requiring log export and backup:

1. Recovery log

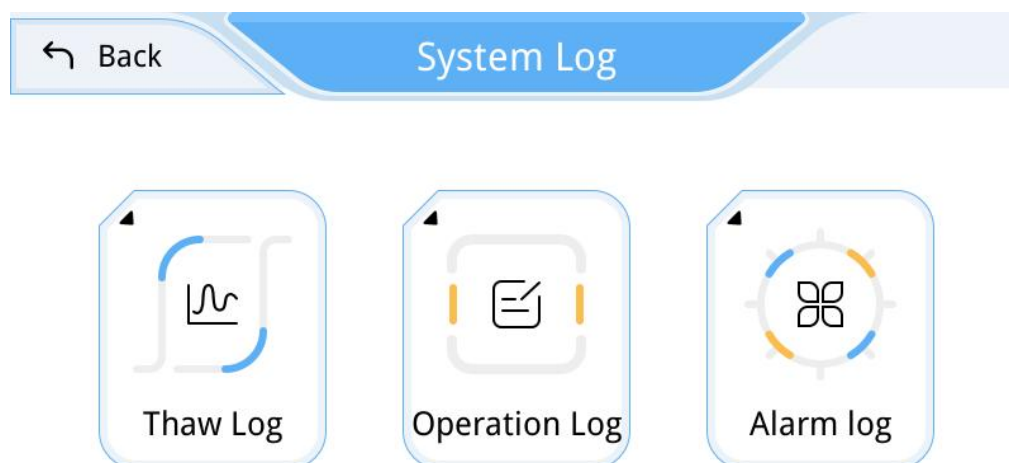
Based on the remaining available storage space as the judgment criterion, when the available storage space ratio is less than or equal to 20%, the system will prompt the user to export thawing logs upon startup, and the earliest 20 days of thawing logs will be automatically deleted during the next experiment.

2. Operation log

Using the number of operation log entries as a threshold, the system prompts users to export operation logs when the log count exceeds 14,000 entries upon startup. When the count surpasses 15,000 entries, the system automatically deletes the first 3,000 operation log entries.

3. Alarm log

Alarm log cannot be deleted or overwritten, and will always remain in the device.



Button/Label Name	Function Definition
Back	Return to the parent menu
Thaw Log	Go to the recovery log interface
Operation Log	Go to the operation log interface
Alarm Log	Open the alarm log interface

5. Thawing Logs

Back

Thaw Log

Export

CH3-unnamed_20251215_161555

CH2-unnamed_20251215_161557

CH4-unnamed_20251215_161552

CH1-unnamed_20251215_161559

Filter

View

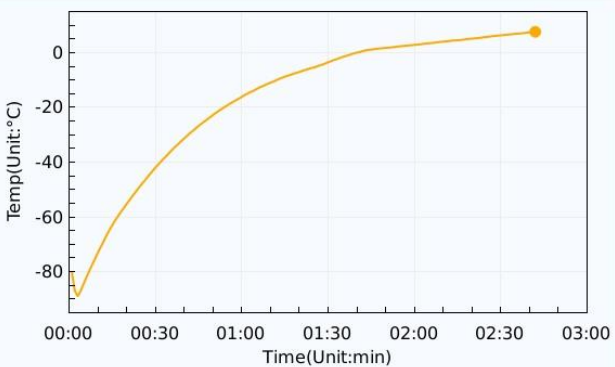
1/1

Back

Log View

Export

CH Name: CH3 Sample ID:
Serial No: 20251215002



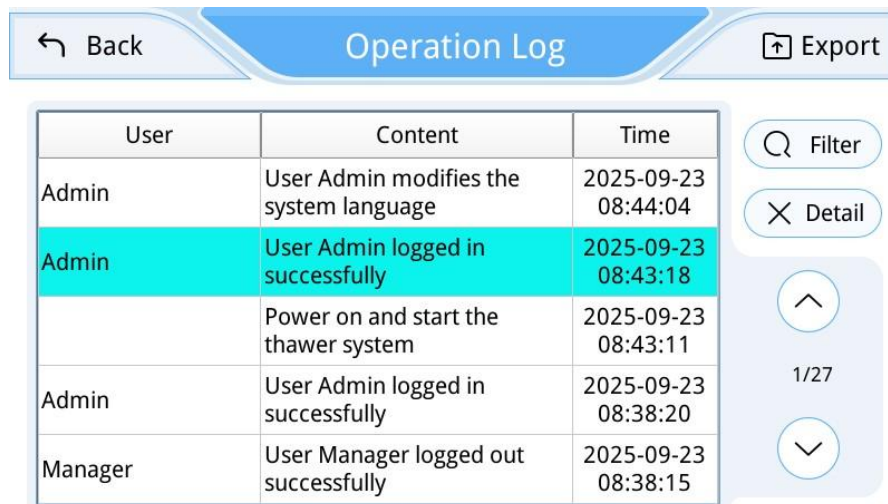
Operator: Manager
Test Date: 2025-12-15
Start Time: 16:15:55
End Time: 16:18:37
Total Time: 02:42
Start Temp: -80.4°C
End Temp: 7.6°C

Button/Label Name	Function Definition
Back	Return to the parent menu
Log View	Go to the log view interface
Export	Export the selected recovery log

6. Operation Logs

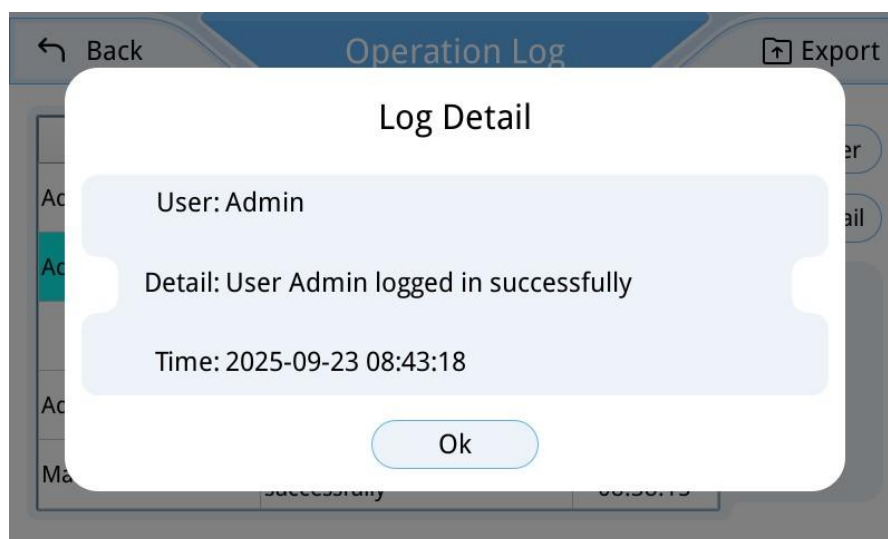
Operation logs can record the following categories of information:

1. User login, sign out, and management operations.
2. Thawing procedures and management of thawing logs.
3. Modify system parameters.



User	Content	Time
Admin	User Admin modifies the system language	2025-09-23 08:44:04
Admin	User Admin logged in successfully	2025-09-23 08:43:18
	Power on and start the thawer system	2025-09-23 08:43:11
Admin	User Admin logged in successfully	2025-09-23 08:38:20
Manager	User Manager logged out successfully	2025-09-23 08:38:15

Buttons: Back, Export, Filter, Detail, Up/Down arrows, 1/27



Log Detail	
User:	Admin
Detail:	User Admin logged in successfully
Time:	2025-09-23 08:43:18
Ok	

Button/Label Name	Function Definition
Back	Return to the parent menu
Filter	Go to the Filter
Detail	Log Details Interface
Export	Export operation log
	Flip pages up/down

7. Alarm Logs

Alarm logs can record the following categories of information:

Class	Alert Content
Storage Space	Insufficient remaining storage space
Thawing Procedures	Abnormal termination of thawing procedure: Freezing tube overheating
	Abnormal termination of thawing procedure: Cryopreservation tube was removed abnormally
Thawing Error	No thawing permission: illegal insertion of test tube
	Illegal insertion of test tubes in non-testing interfaces
	Excessive temperature in the test tube
Temperature Abnormalities	Abnormal temperature in the left module
	Abnormal module temperature on the right side
	Abnormal infrared sensor

[Back](#)

Alarm Log

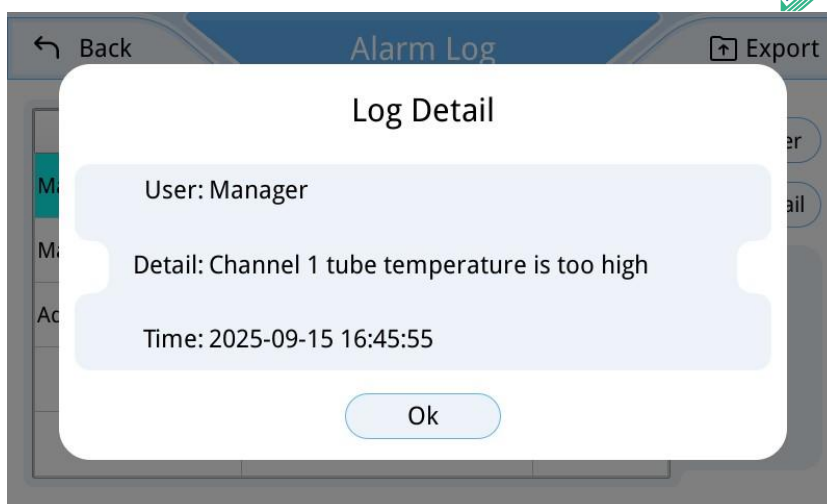
[Export](#)

User	Content	Time
Manager	Channel 1 thaw error	2025-09-15 16:45:55
Manager	Channel 1 thaw error	2025-09-15 16:45:42
Admin	Channel 1 thaw error	2025-09-15 16:42:53

Filter

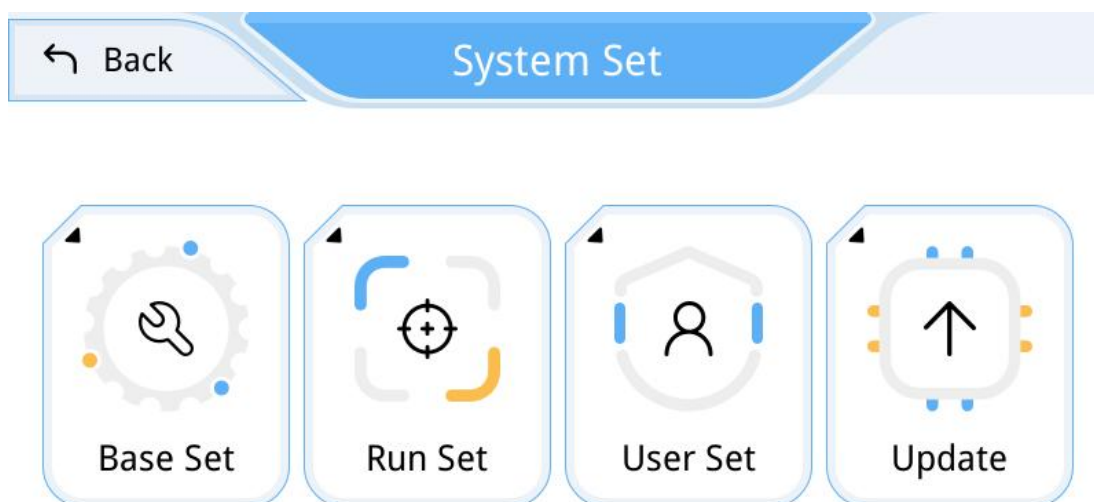
☒ Detail

1/1



Button/Label Name	Function Definition
Back	Return to the parent menu
Filter	Go to the Filter
Detail	Go to the log details page
Export	Export alarm logs
⬆ ⬇ ⬇ ⬆	Flip pages up/down

8. System Settings



Button/Label Name	Function Definition
Back	Return to the parent menu
Base Set	Go to the basic settings interface
Run Set	Go to the Run Settings interface

User Set	Go to user settings
Update	Upgrade the software system

9. Basic Settings

← Back
Base Set
Save

Date/ Time

2026

 Y

4

 M

22

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9

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25

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Language

☒ Chinese
☐ English

Auto Logout

☒ Enable

30

 Min

Beep

☒ On
☐ Off

Prompt volume

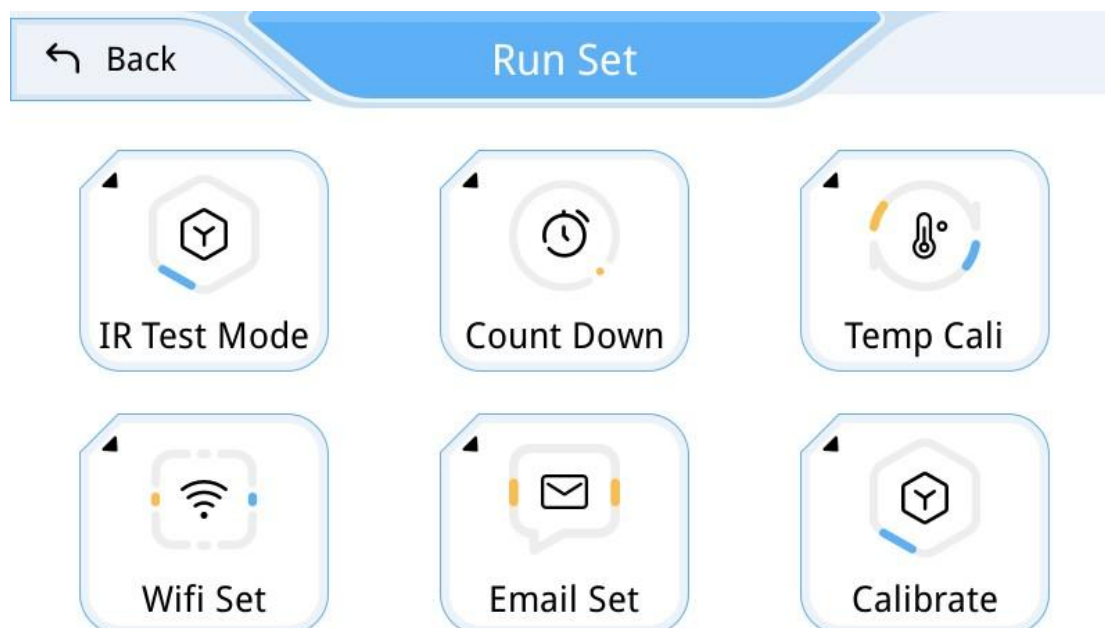
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Button/Label Name	Function Definition
Back	Return to the parent menu
Date/Time	You can modify the current system time
Language	You can modify the current system display language
Auto Logout	Enable or disable automatic sign-out for the current user
Beep	Enable or disable button sounds
Prompt Volume	You can adjust the alert sound volume
Save	Save modification settings

10. Run Settings



Button/Label Name	Function Definition
Back	Return to the parent menu
IR Test Mode	For third-party verification of infrared probe accuracy
Count Down	Recovery Countdown Settings Interface
Temp Cali	Temperature calibration interface of internal heating blocks in the entire machine
Wifi Set	Wifi settings interface
Email Set	Mail settings interface
Calibrate	Touchscreen calibration

11. Countdown Settings

← Back
Count Down
 Save

• CH1 • Value: 80

☐ Countdown
sec

• CH2 • Value: 80

☐ Countdown
sec

• CH3 • Value: 80

☐ Countdown
sec

• CH4 • Value: 80

☐ Countdown
sec

 Reset

Button/Label Name	Function Definition
Back	Return to the parent menu
Count Down	Set the countdown time for the corresponding channel
Reset	Reset the countdown time for all channels
Save	Save modification settings

12. Wifi Settings

 Back

Wifi Set

 Save

Wifi Name:

Password:

Encryption Method:

☒ Wap
 ☐ Wep
 ☐ None

Connect

Button/Label Name	Function Definition
Back	Return to the parent menu
Wifi Name	Set the Wifi name for connection
Password	Set Wifi connection password
Encryption Method	Configure Wifi encryption method
Connect	Connect to Wifi automatically
Save	Save modification settings

13. Email Settings

← Back
Email Set
 Save

Server:
Port:

Encryption Method:
☒ SSL
☐ TLS
☐ None

From:
Password:

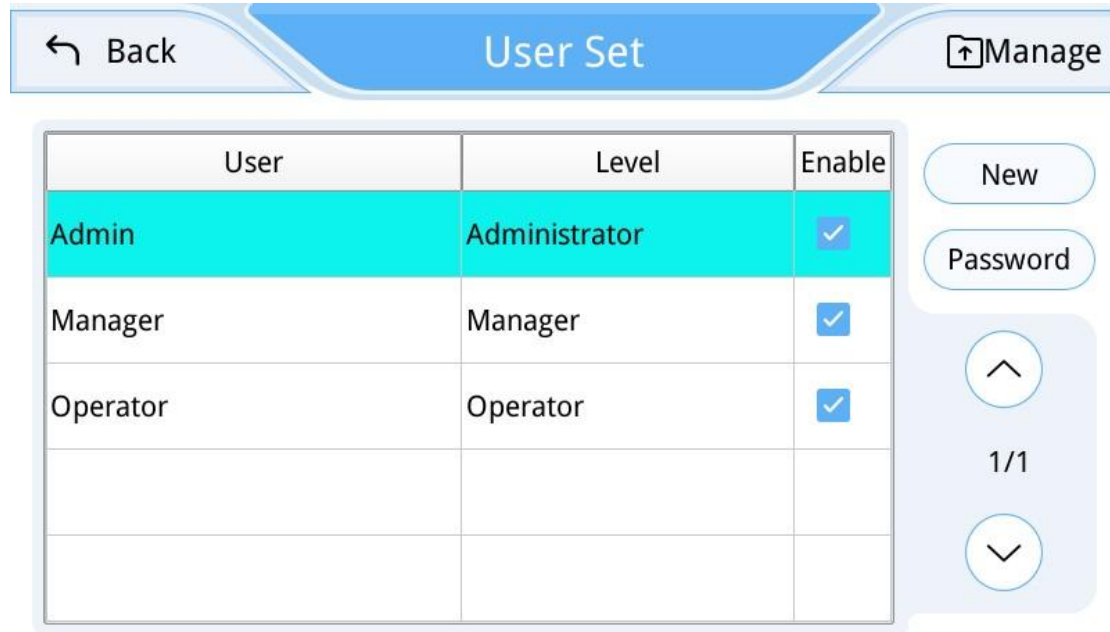
Recipient:
Copy:

Test

Button/Label Name	Function Definition
Back	Return to the parent menu
Server	Set mail server address
Port	Set the mail server port number
Encryption Method	Set email encryption method
From	Set sender email
Password	Sender email password
Recipient	Set recipient email
Copy	Set CC email addresses
Test	Check if the email settings are correct
Save	Save modification settings

14. User Settings

The instrument comes with three default user roles: Admin, Manager, and Operator, all using the initial password abc123.



User	Level	Enable
Admin	Administrator	☒
Manager	Manager	☒
Operator	Operator	☒

Buttons: Back, User Set, Manage, New, Password, Up/Down arrows, 1/1

Button/Label Name	Function Definition
Back	Return to the parent menu
New	Create new user interface
Password	Change the current user's password
Enable	Click the checkbox below to enable or disable users
Manage	Go to user management interface
^ v	Flip pages up/down

15. New User

Only administrators can create users.

← Back
New User
 Save

User Name:

Password:

Permission:
☐ Manager
☒ Operator

Button/Label Name	Function Definition
Back	Return to the parent menu
User Name	Enter username
Password	Enter user password
Permission	Select user permission level
Save	Save modification settings

16. User Permissions

Only administrators have the permission to modify other users' permissions. Administrator permissions cannot be modified or revoked and are automatically granted all permissions except manufacturer permissions. Screen calibration, temperature calibration, and software upgrades fall under manufacturer permissions.

← Back
Permission
Save

Select User: Manager ▼

Manager Permission

☒ Time Setting	☒ Sound Setting	☒ Language Setting
☒ Parameter Setting	☒ Log viewing	☒ User Manage
☒ Thaw Operation	☒ Log Manage	☒ Network Setting

← Back
Permission
Save

Select User: Operator ▼

Operator Permission

☒ Thaw Operation	☒ Log viewing	☐ Log Manage
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Button/Label Name	Function Definition
Back	Return to the parent menu
Select User	Select users whose permissions need to be modified
Manager Permission	Manage user permission modifications
Operator Permission	Operator user permission modification
Save	Save modification settings

The permission management matrix is shown in the table below. Selecting indicates that users can be granted or revoked these permissions; otherwise, the permissions will be disabled.

Permissions	Authorizations		
	Administrator	Manager	Operator
User Management	√	Can manage Operator-level users only	×
Permission Allocation	√	×	×
Time Setting	√	√	×
Sound Setting	√	√	×
Language Setting	√	√	×
Infrared Metering Mode Setting	√	√	×
Countdown Setting	√	√	×
Temperature Calibration	√	×	×
Wifi Setting	√	√	×
Email Setting	√	√	×
Screen Calibration	√	×	×
Software Upgrade	√	×	×
Log Management	√	√	√
Log Viewing	√	√	√
Thawing Operation	×	√	√

17. Manage Passwords

Only administrators can manage other users' passwords.

← Back
Manage Password
Save

Select User:

Manager
▼

Reset password

New Password:

Confirm Password:

Validity period

Select days:

90 days
▼

Button/Label Name	Function Definition
Back	Return to the parent menu
Select User	Select users who need to reset their passwords
New Password	Enter the user's new password
Confirm Password	Enter the user's new password again
Select Days	Select the password validity period
Save	Save modification settings

18. Password Modification

← Back
Password
 Save

Original Password:

New Password:

Confirm New Password:

Button/Label Name	Function Definition
Back	Return to the parent menu
Original Password	Enter the current user password
New password	Enter the user's new password
Confirm New Password	Enter the user's new password again
Save	Save modification settings

Chapter IV. Fault Analysis and Handling

Fault Phenomenon	Fault Analysis/Handling
No Response after Startup	Power not connected (a)
No Response after Startup	Fuse blown (b)
The Device Heats Up Slowly or Fails to Warm Up after Startup.	Heating system malfunction (b)
Fault Code E1/E2	Left/right temperature sensor failure in the corresponding module (c)
Fault Code E3	Infrared sensor failure (c)
Button is Inactive	Touchscreen failure (c)

a) Check the power cord connection and ensure the external power supply meets the requirements.

b) Restart the instrument after replacing the fuse. If the issue persists, contact the supplier or manufacturer for resolution.

c) Restart the instrument. If the issue persists, contact the supplier or manufacturer.



The instrument contains high-voltage components. Unauthorized disassembly is strictly prohibited.

Notes