



Automatic Melting Point Meter LB-21MPM

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1. Safety Measures

- The tested samples shall be sampled as required and melted in the cleaning container. The filling height of the samples must be $9\text{ mm} \pm 1\text{ mm}$. The same batch, the same sampling method, and highly consistent samples are used for one measurement to ensure consistent measurement results.
- Suppose the melting point of the sample is high during the detection process. In that case, the instrument will automatically cool down to the starting temperature without detection. Kindly expand the coordinate axis time and increase the termination temperature setting parameter before testing.
- The starting temperature of some samples has an impact on the melting point determination results, and it is required to be operated according to the specifications.
- The linear heating rate is different, and the measurement results are not consistent, requiring the formulation of appropriate specifications. The higher the general rate, the higher the read value. The melting point read values of each rate can be unified by experimental corrections. Samples with unknown melting point values can be measured at a high rate or manually, stop the temperature set blank, and then automatically detect after the range.
- When using the instrument, pay attention to the light, away from the acid and alkali solution, and avoid use under strong light.
- When the glass sleeve is broken or damaged in the sample tank, it should be removed after cooling and powering off.
- When the data needs to be exported, kindly insert the U disk for a while for the system to identify the external U disk before operation.

2. Introduction

Automatic Melting Point Meter LB-21MPM is a semi-automatic table top instrument for determining the melting point of samples. It features high definition camera technology and highly integrated measurement function for precise detection of the melting point. The front panel consists of a colour TFT touch screen for visual and operating accessibility of the melting process of the sample.

3. Features

- Temperature range is RT - 400 °C
- High definition camera technology for capturing the melting process digitally
- Detection capacity of 4 samples per process
- Efficient and convenient for access
- Highly integrated measurement function
- Automatic melting process recording for result storage
- Real time detection function
- TFT color display screen for visual and operating accessibility
- Stable and reliable test results

4. Specifications

Model No	LB-21MPM
Temperature range	RT - 400 °C
Detection method	Semi-automatic
Camera and Video	Camera and Video
SD card capacity	8 GB
Result storage	400 groups
Temperature gradients	0.1 °C ~ 20.0 °C / min
Temperature accuracy	± 0.3 °C (< 250 °C)
	± 0.5 °C (> 250 °C)
Repeatability	± 0.1 °C (At 0.1 °C / min)
Video playback	Yes
Magnification	7
Operator account	8
Display	TFT touch screen
Interface	USB, RS232, SD card
Standard capillary size	Inner diameter- 1.0 mm
	Outer diameter- 1.4 mm
Power	110 V-220 V
	50 Hz / 60 Hz
	120 W
Dimensions	400 × 280 × 300 mm
Gross weight	5 kgs

5. Applications

Used in the field of chemicals, pharmaceuticals, food and drug administration, colleges and universities and other related departments, scientific research units, medical purpose, spices, dyes, other organic crystalline substances, metallurgic components, biological and molecular samples, etc.

6. Instrument Introduction



Figure-1 Front View of the Instrument

- 1) Upper cover and test hole (see Figure 2 for details)
- 2) Capacitor touch screen
- 3) Ventilation intake hole



Figure-2 Top Cover and test hole

The user can load the tested sample into the capillary (100mm length, inner diameter 1.0~1.3mm, 0.10~0.15mm wall thickness) in the standard loading method, and then put the capillary into the hole of the measuring tube.

7.1 Software Operations

7.1 Function Introduction

7.1.1 Boot Animation

When booting, the interface as shown in **Figure 3**, automatically starts up and displays the boot animation.

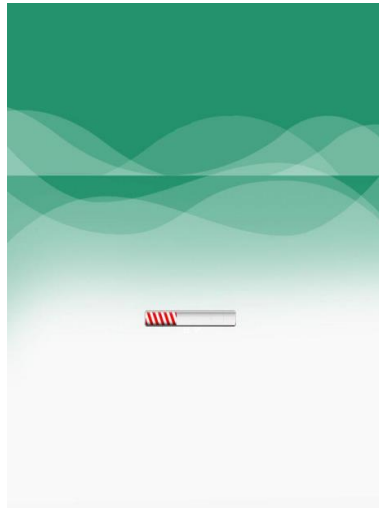


Figure-3

7.1.2 Login Interface

After the boot animation is completed, the interface is shown in **Figure 4**. Kindly select and fill in the correct username and password in the corresponding input box, and then click "login" (factory default maximum permission username admin, default password 888888).

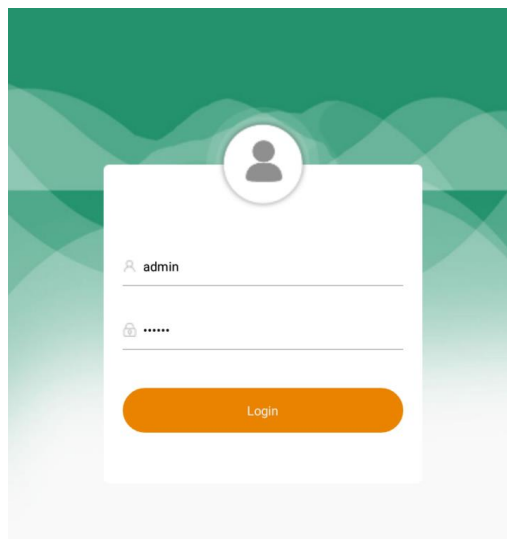


Figure-4

7.1.3 Test the Interface

The interface of test parameters is the sample number, sample name, use method, starting temperature, termination temperature, heating rate, coordinate axis length, and automatic or manual switch (as shown in **Figure 5**).

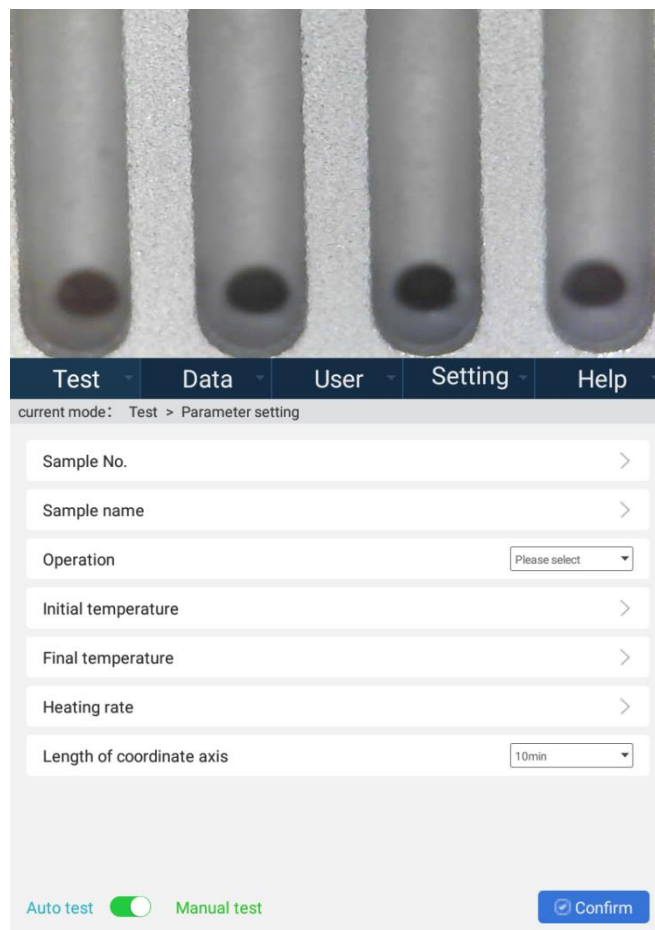


Figure-5

[Sample number]: User can enter English, Chinese, numbers, or symbols.

[Sample name]: User can enter English, Chinese, numbers, or symbols.

[Usage method]: The established method can be called directly.

[Starting temperature]: The input value ranges from 20.00 to 400.00.

[Termination temperature]: The input value range is 20.00~400.00 and must, greater than the starting temperature and less than the maximum temperature of the axis length. After the termination temperature is reached, the instrument will automatically cool to the starting temperature and wait for the user's subsequent operation. When the temperature blank is terminated, the maximum available value is automatically calculated.

[Heating rate]: The input value can range from 0.10 to 20.00 (including 0.10 and 20.00).

[Axis length]: Specify the maximum horizontal coordinate of the atlas; only 10 minutes, 15 minutes, and 20 minutes are optional (only for automatic test parameters).

[Automatic test / manual test]: sample automatic test and manual test switch.

7.1.4 Automatic Test Interface

In the test interface, after the starting temperature and heating rate are set, enter the automatic detection interface, the interface is shown in **Figure 6**.

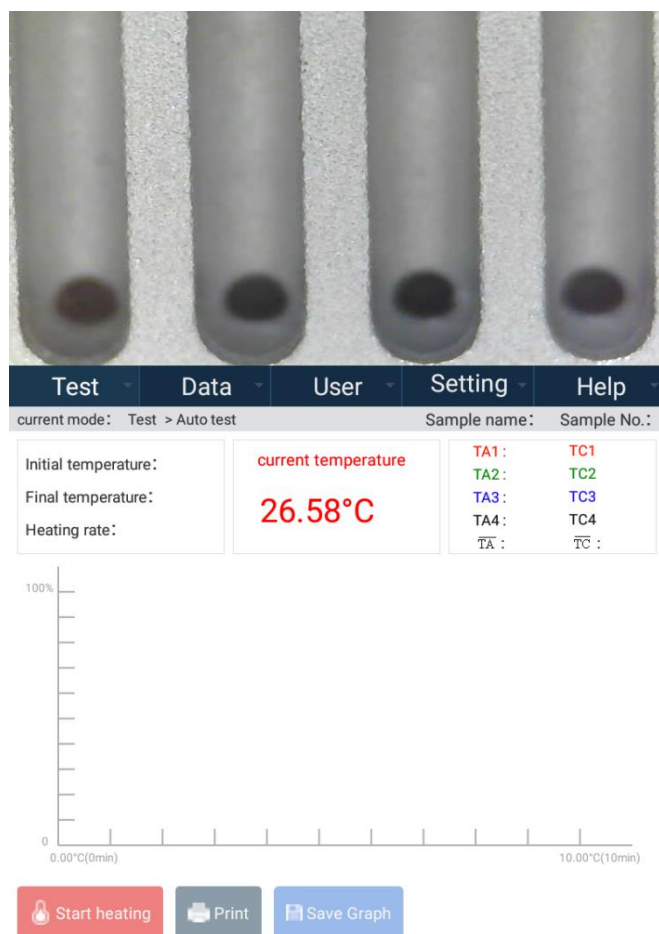


Figure-6

TA1 to TA4 indicate the initial melting point value of the sample from left to right in the sample groove.

TA: The average initial melting point value from TA1 to TA4.

T C 1 to T C 4 shall represent the melting point value of the sample corresponding from left to right in the sample groove, respectively.

TC: The mean final melting point value from T C 1 to T C 4

[Start heating]: When the current temperature is stable within $\pm 0.1^{\circ}\text{C}$ of the set starting temperature, this button is allowed to heat up according to the specified heating rate, that is, the test starts.

[Stop heating]: Click this button to pop up the 4-1 option. (This icon will appear after pressing the heating key).

"Cancel" cancel the stop heating order, "give up" give up the experiment, "save" save the experiment results.

[Map save]: Click this button and the instrument will save the map result.

[Print]: Click this button and the instrument will print this data.

Attention

- The longest time of automatic sample detection is 20 minutes, exceeding the parameter set horizontal coordinate length or the maximum value of 20 minutes, the map will not be displayed. If the sample does not complete the whole melting process within 20 minutes during measurement, it is recommended that users adjust the parameters according to the situation.
- Before each test, the capillary is not inserted into the sample slot, first to the parameter setting page to ensure that the parameters are set correctly and click the "sure button" to jump to the corresponding test page, after the actual temperature reached the preset starting temperature $\pm 0.1^{\circ}\text{C}$ (there is a buzzer prompt), then put the capillary (such as the sample capillary first enter the automatic detection interface, will cause abnormal detection), press the [start] key to test the sample melting point. At this time, the melting process of the tested sample can be observed through the video above the interface. Meanwhile, the instrument will automatically display the melting curve of the sample and automatically record the melting value of the sample.
- If the atlas is saved or the video is saved as "Yes", the atlas or video of the experiment will be automatically recorded after the test ends.

7.1.5 Manual Test Interface

After setting the parameters such as starting temperature and heating rate, if entering the manual detection interface, the interface is shown in **Figure 7**.

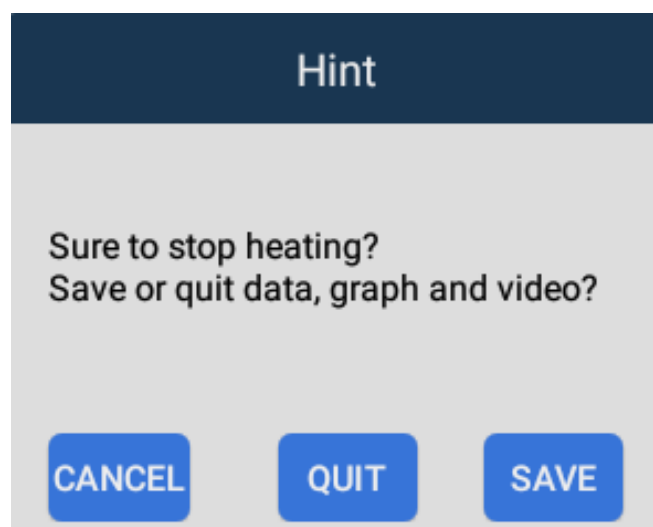


Figure-7

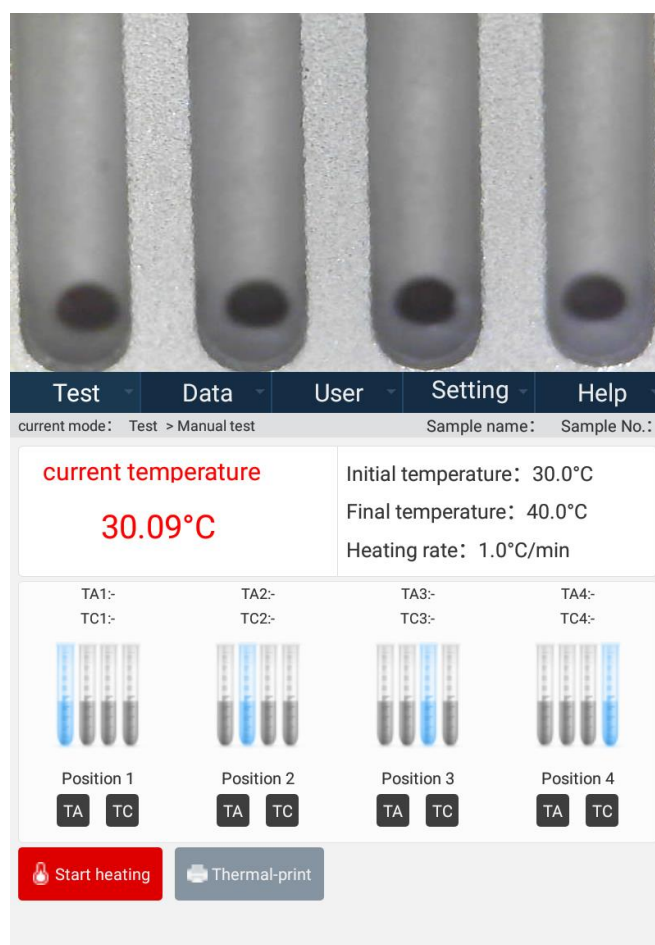


Figure-8

[Start heating]: When the current temperature is stable within $\pm 0.1^{\circ}\text{C}$ of the set starting temperature, this button is allowed to heat up according to the specified heating rate, that is, the test starts.

[Stop heating]: Click this button to pop up the 4-1 option. (This icon will appear after pressing the heating key).

"Cancel" cancel the stop heating order, "give up" give up the experiment, "save" save the experiment results.

[Thermal printing]: Click this button and the instrument will print the data, either thermal sensitivity or needle type.

TA: Manually click to record the initial melting value

TC: Manually click to record the final melting value of the sample.

Attention

- When the termination temperature of the manual test sample is not set, the highest temperature can be automatically selected according to different models, without time constraint, and an atlas display.

- Before each test, the capillary is not inserted into the sample slot, first to the parameter setting page to ensure that the parameters are set correctly and click the "sure button" to jump to the corresponding test page, after the actual temperature reached the preset starting temperature $\pm 0.1^{\circ}\text{C}$ (there is a buzzer prompt), then put the capillary (such as the sample capillary first enter the automatic detection interface, will cause abnormal detection), press the [start] key to test the sample melting point. At this time, the melting process of the tested sample can be observed through the video above the interface. It is necessary to manually click the TA button to record the melting value of the sample in each channel.
- If the video is saved as "Yes" in the system setting, the video of the experiment will be automatically recorded after the test ends.

7.1.6 The Database Interface

Click the [Data] key on the left to enter the database interface, as shown in **Figure 9**. This interface is used to display and query the data saved by the user and can associate the corresponding video file of each test data with the map file. The more new the data, the more the front, that is, the larger the serial number, the more new the data displayed. Click the data, User can check the details of the data.

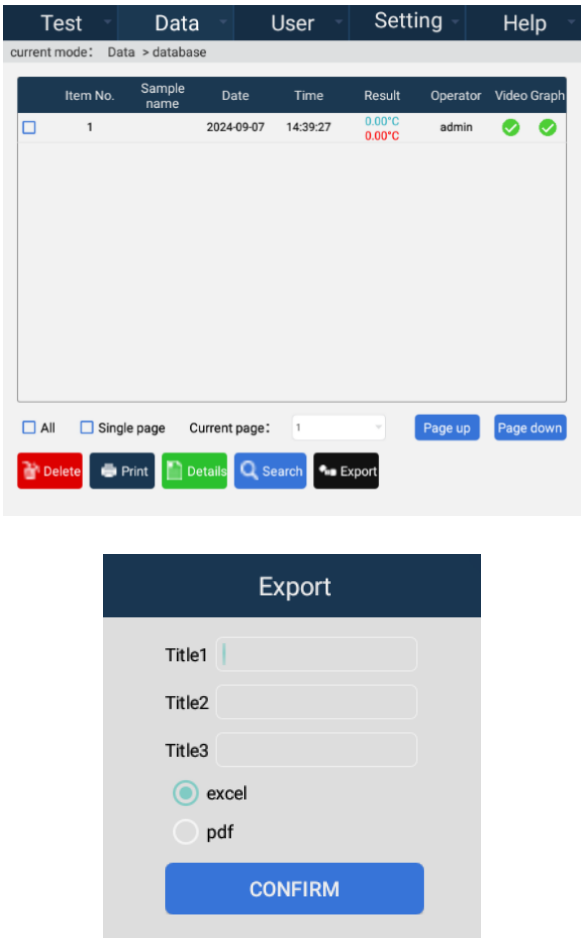


Figure-9

[**Delete**]: With the data deletion permission, User can delete the data.

[**Printing**]: Select the corresponding data, press the print button, jump to the title input interface, enter the title, and press "**OK**" to print (laser printing).

[**Details**]: Check the single data to view the detailed parameters.

[**Retrieval**]: Pop up for users to find out the qualified test data (all data are displayed by default, and if User want to display all data again after retrieval, Kindly expand the retrieval conditions).

[**Export**]: When connecting the U disk, generate the selected test data to generate PDF or CSV report and export to the U disk.

[**Last page**]: Turn a page up.

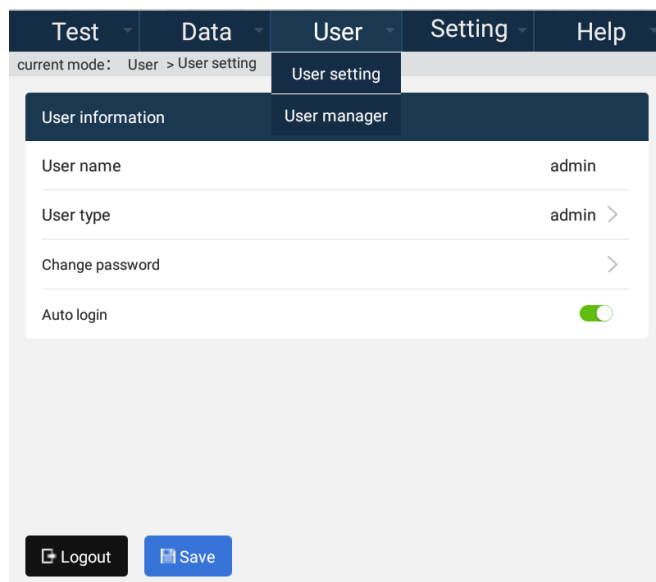
[**Next page**]: Turn a page down.

At the end of the "Video" and "Atlas" columns of each row of data in the test list, display "" indicates that the data has a bound video or map, display "" indicates a video or map that is not bound and helps filter out the associated video or map record for further operation.

"Video management" and "graph management" can be the corresponding data query.

7.1.7 User Management Interface

Click [**User**] and [**User Setting**] on the left successively to enter the user setting interface, as shown in **Figure 10**. User can change the password of this account and the non-secret login.



The screenshot displays the 'User setting' interface. At the top, there is a navigation bar with tabs: 'Test', 'Data', 'User', 'Setting', and 'Help'. Below this, a breadcrumb trail shows 'current mode: User > User setting'. The main content area is divided into two sections: 'User information' and 'User manager'. Under 'User information', there are four rows: 'User name' with the value 'admin', 'User type' with the value 'admin' and a right-pointing arrow, 'Change password' with a right-pointing arrow, and 'Auto login' with a green toggle switch. At the bottom of the interface, there are two buttons: 'Logout' and 'Save'.

Figure-10

[**User management**]

An account with new user permission can be added on the current page. An account without permission can only be viewed. After entering the username and password, click [**OK**] to request permission for the new account. Click [**Save**].

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The screenshot shows the 'User setting' interface. At the top, there is a navigation bar with tabs: 'Test', 'Data', 'User', 'Setting', and 'Help'. Below the navigation bar, the 'current mode' is 'User > User setting'. The 'User setting' tab is active, and it contains two sub-tabs: 'User information' and 'User manager'. The 'User information' sub-tab is selected, showing the following fields: 'User name' (admin), 'User type' (admin), 'Change password' (with a right arrow), and 'Auto login' (with a green toggle switch). At the bottom, there are two buttons: 'Logout' and 'Save'.

Figure-11

The screenshot shows the 'User permission allocation and remark' interface. It has a title bar 'User permission allocation and remark'. Below the title bar, there is a section 'Permission allocation' with a list of permissions, each with a checkbox: 'Delete data', 'Print', 'Export', 'Backup', 'Created by', 'User manager', 'Basic setting', 'Method base', 'Network setting', 'Melting point', 'Test light adjustment', 'Factory setting', 'Cloud service', 'Update', 'MD5', and 'Audit trail'. Below the list, there is a 'Hint' label in red. At the bottom, there is a blue 'SAVE' button.

Figure-12

7.1.8 Set the Interface

1) Basic Settings

In the settings interface, select the [Basic Settings] option and enter the interface as shown in **Figure 13**.

Automatic Melting Point Meter LB-21MPM

Test Data User Setting Help

current mode: Setting > Basic setting

Basic setting

Function setting

Method management

Melting point correction

Test light adjustment

Network setting

Audit trail

MD5

Factory setting

Date: 2024-09-07 Time

Language: English

The initial melting point: 0

Save

Figure-13

User can set the date, time, and language.

2) **Function Settings**

In the Settings interface, select the [Function Settings] option and enter the interface as shown in **Figure 14**.

Test Data User Setting Help

current mode: Setting > Function setting

Function setting

Auto video recording ON

Auto spectrum recording ON

Auto Thermal Printing ON

Buzzer alarm ON

Save

Figure-14

The place can set automatic video recording, automatic map saving, automatic thermal printing (also needle printing), buzzer alarm, and the buzzer switch in the figure is open state.

3) Method Management

In the setting interface, select the [Method Management] option and enter the interface as shown in **Figure 15**.

Test Data User Setting Help

current mode: Setting > Method base

Creation method

Method name Coordinate axis length 10min

Initial temperature Final temperature

Heating rate ☒ Confirm

Item No.	Method name	Initial temperature	Final temperature	Heating rate	Coordinate axis length	Date	Created by
----------	-------------	---------------------	-------------------	--------------	------------------------	------	------------

☒ Delete Current page: 1

Figure-15

This interface can create methods and management methods.

4) Melting-Point Calibration

In the setting interface, select the [melting point calibration] option and enter the interface as shown in **Figure 16**.

Test Data User Setting Help

current mode: Setting > Melting point correction

29.09

Item No.	Test temperature	Reference temperature
----------	------------------	-----------------------

Test temperature Reference temperature

Auto replacement ☒ Manual filling ☒ Start calibration

Figure-16

[Start correction]: Click this button to jump to the parameter setting interface of the test page, which is the same as the ordinary sample measurement method. After the test, click the confirmation correction or abandon the correction. If User click the confirmation correction system to fill in the average value of the measured melting point in the test temperature box in **Figure 17**.

[Add/replace]: After filling in the legal test temperature and standard temperature, click this key; if automatic replacement, the system will compare the value with the value in the existing correction list, select the optimal replacement scheme and ask for confirmation before replacement; if manual replacement, User need to specify a line in the existing correction list for replacement, and ask for confirmation before replacement.

[Automatic replacement / manual replacement]: Automatic replacement The system selects the optimal replacement scheme; manual replacement requires specifying the line to replace.

5) Network Settings

In the settings interface, select the [Network Settings] option to enter the interface as shown in **Figure 18**.

Figure-19

The search for the wireless name is displayed on the left. Click the name of the wireless network User want to connect to and enter the password correctly; a black dot is displayed at the front of the connected wireless network name. When selecting the wireless network connected to the Internet, the cloud service function can be operated. When connecting to the "DIRECT-95-HP LaserJet M104W" wireless AP, User can use the specified model laser printer to print the A4 experiment report.

Right DHCP enabled indicates automatic assignment of IP address; otherwise, enter the IP address manually.

The left wireless network is invalid when wired through the back RJ 45 network port.

6) Audit Trail

In the setting interface, select the [Audit tracking] option and enter the interface as shown in **Figure 20**.

This table records the key operations of all users, like the system log. User can export the audit tracking log using the external U disk, and the export file type is an Excel encrypted with MD5.

Audit tracking record time includes: date, time modification, test database content delete, system upgrade, boot time (accurate to minutes), equipment start self-fault and error, light strength adjustment, sensor calibration, permission configuration, video file delete, cloud backup upload, download, delete, user new, delete, modify user password, user rights change, login name, new test method, delete test method, modify the automatic login name.

Test

Data

User

Setting

Help

current mode: Setting > Audit trail

	Item No.	Operator	Date	Time	Operation interface	Sub interface	Events
☐	19	admin	2024-09-07	14:51:23	Login		Login
☐	18	admin	2024-09-07	14:46:48	Setting	Standard Setting	Language
☐	17	admin	2024-09-07	14:45:00	Login		Login
☐	16	admin	2024-09-07	14:43:10	Setting	Standard Setting	Language
☐	15	admin	2024-09-07	14:43:09	Setting	Basic setting	Update delay
☐	14	admin	2024-09-07	14:41:56	Login		Login
☐	13	admin	2024-09-07	14:33:23	Setting	Standard Setting	Language
☐	12	admin	2024-09-07	14:33:22	Setting	Basic setting	Update delay
☐	11	admin	2024-09-07	14:32:56	Login		Login

☐ Single page
 ☐ All

1/2 Page

PAGE DOWN

Search

Export

Figure-20

7) MD5

Data, audit tracking export Excel type will produce an MD5 code to verify the authenticity of the exported data.

7.1.9 Help Interface

1) Fault Interface

In the help interface, select [troubleshooting] to enter the troubleshooting interface, as shown in **Figure 21**. The content is the troubleshooting list. In the list, different fault names are explained accordingly, and appropriate handling methods are recommended.

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Test	Data	User	Setting	Help
current mode: Help > Troubleshooting				
Report error				
Error code	Reason	Idle		
UART4 communication fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
UART5 communication fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
COM_+5V power supply fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
RTD_+3.3V power supply fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
Cooling fan driving circuit fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
Support_Camera adjustable power supply fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
Support_Detection adjustable power supply fails	Hardware fails or wires get loose	Ask for after-sales maintenance		
The camera is not detected	Hardware fails or wires get loose	Ask for after-sales maintenance		
Error of the actual furnace temperature is reported	The apparatus is not working at allowed ambient temperature, the apparatus heating furnace does not allow heating or cooling by external equipment, or the hardware fails	Please confirm that the apparatus is working at allowed ambient temperature (0-40°C)		
Error of the measured room	The apparatus is not working at allowed ambient temperature, the apparatus heating	Please confirm that the apparatus is working		

Figure-21

2) Usage Method

In the help interface, select [Use method] to enter the use method interface, which is shown in **Figure 22**.

Test	Data	User	Setting	Help
current mode: Help > Operation				
Operation Summary				
Usage Description				
1. Preparation of capillary sample				
Grind the test sample in an agate mortar and dry it. Take a dry and clean glass tube approximately 800mm long and place it upright on a flat glass plate. Place the specified specification melting point capillary tube containing the test sample freely into a glass tube, repeatedly dropping it several times until the sample powder in the melting point capillary tube is tightly packed at the bottom of the tube, with a height of about 3-5mm. Wipe the outer wall of the capillary tube clean. For samples that are prone to decomposition and dehydration, the other end of the melting point capillary tube should be melted and sealed.				
2. Sample testing inside capillary tube				
2.1 Automatic testing				
-Step 1: Enter the [Testing] - [Parameter Settings] interface, enter the sample number, sample name, starting temperature (about 5 °C lower than the estimated final melting point), heating rate (choose according to needs, generally 1 °C/min), and stop temperature can be empty. Select the switch to [Auto Detection], ensure that the sample tank is empty, and then press [OK]. -Step 2: When the actual temperature stabilizes to the set starting temperature (± 0.1 °C, there will be a buzzer prompt), place the tested sample and wait for the buzzer to prompt the temperature to				

Figure-22

3) Update

In the help interface, select [Update] to enter the update interface, as shown in **Figure 23**. Copy the software upgrade package into the U disk, insert the USB interface on the back of the instrument, and then click the update button to complete the upgrade.

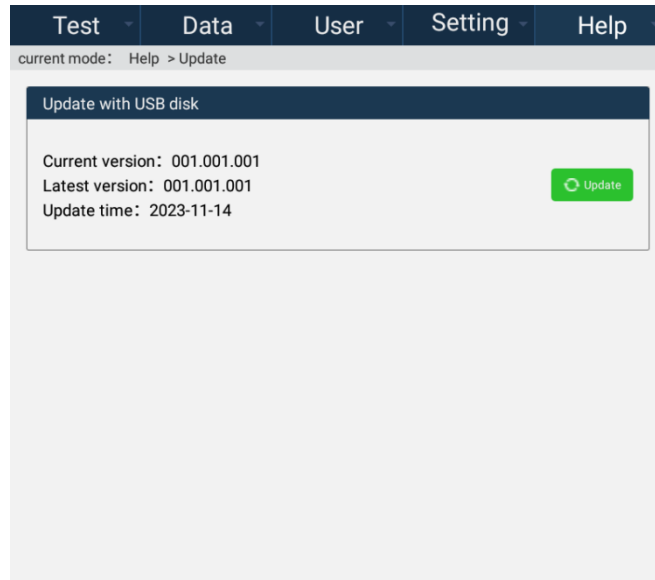


Figure-23

8 Operations

8.1 Preparation of capillary test samples

Place the samples to be tested in a mortar and dry. Take a long, dry, clean glass tube of about 100mm and stand it upright on the magnetic plate or glass plate. The capillary containing the tested sample is placed from the upper mouth, so that it can fall freely and repeatedly drop 8 times, so that the sample powder is tightly assembled at the bottom of the tube, with a height of about 3 mm- 5 mm.

8.2 Melting Point Instrument Test

8.2.1 Automatic test sample: Sample final melting point 153°C

Step 1: Turn on the power switch and preheat the instrument for 20 minutes.

Step 2: Enter the main interface, select the test, enter the sample name: di acid, starting temperature 148°C, heating rate 1°C / min, stop temperature 155°C, select the default scheme, and then enter [automatic detection] to the corresponding interface (note: before automatic detection, ensure that there is no capillary in the furnace).

Step 3: When the actual temperature is stable at 148°C (the buzzer indicates above 4 sounds), put the capillary of the sample, until the temperature is stable at 148°C.

Note: After putting the temperature into the sample, the furnace temperature is slightly lower than 4 °C. After the temperature stabilizes, press the [heating] key. When the tested sample reaches the initial melting degree, the instrument will automatically display the initial melting value; when the measured sample reaches the final melting degree, the instrument will automatically display the final melting value.

Step 4: When all the results come out, User can press [save] to save data or press [print] to print data. If User test the sample again, User only need to repeat the second step. If User want to change the sample being tested, press [Return] and retreat to the test interface for the corresponding parameter setting.

8.2.2 Manual test sample: Sample final melting point 153°C

Step 1: Turn on the power switch and preheat the instrument for 20 minutes.

Step 2: Enter the main interface, select the test, enter the sample name: di acid, start temperature 148°C, heating rate 1°C / min, stop temperature 155°C, and then press [manual detection] to enter the corresponding interface.

Step 3: When the actual temperature stability to 148°C (there will be buzzer prompt 4 above), into the test sample, press the [heating] key from the instrument at the top of the video to observe the measured sample melting process, when the measured sample reached the initial melting degree, click the corresponding position in figure 10, when the measured sample to the final melting degree, click the corresponding position in figure 10 [final melting] key.

Step 4: When all the results come out, User can press [save] to save data or press [print] to print data. If User test the sample again, User only need to repeat the third step. If User want to change the sample being tested, press [Return] and retreat to the test interface for the corresponding parameter setting.

8.3 Melting Point Instrument Correction

8.3.1 Correction Paradigm

The final melting point of the sample was corrected for diacid to 153°C

Step 1: Enter the calibration interface in the setting, set the test parameters of the standard sample adipic acid, input the sample melting point 153°C, starting temperature 146°C, temperature rate 1°C / min, stop temperature 156°C, and then press [automatic detection] or [manual detection] to enter the corresponding interface. If the correction method is automatic detection (the correction sample is three standard samples, and the default parameters can be selected).

Step 2: The same test sample step 3 (Kindly see page 13 of this manual for specific operation).

Step 3: If there is no abnormality after the test result comes out, press the [correction] key to save the corrected test result, and otherwise, press the third step to test again. Press the [Return] key to exit the correction interface.

Attention

If it is found that the final melting temperature of the measured sample and the starting temperature is less than 5°C, it is recommended to readjust and set the starting temperature at more than 5°C below the final melting temperature. (Example: Under the above set of spare parts, the final melting temperature of the standard sample 153°C, is 151.5°C. During correction, the starting temperature needs to be reset below 144.5°C and recorrected. The correction can be corrected by 1 point or three points (up to three points), including 0°C -100°C, 100°C -200°C, and 200°C -400°C. If the user corrects multiple times in the same range, the last correction value is valid.

8.3.2 Standard equipped with the recommended setting value of standard samples

Set the test parameters of the standard sample naphthalene, input the sample melting point of 80.6°C (the specific value can be based on the value indicated in the attached certificate), starting temperature 76°C, heating rate 1°C / min, stop temperature 85°C, Set the test parameters of the standard sample already di acid, input the sample melting point 153°C (the specific value can be based on the value indicated in the attached certificate), starting temperature 146°C, heating rate 1°C / min, stop temperature 156°C.

Set the test parameters of anthraquinone for the standard sample, input the sample melting point 217.1°C (the specific value can be based on the value indicated in the attached certificate), starting temperature 212.1°C, heating rate 1°C / min, stop temperature 222°C.

Attention

The instrument has been calibrated before leaving the factory and is not corrected for a short time.

If the user has an abnormality in the correction process, it can restore the factory settings to restore the original data of the instrument.

The instrument can be corrected with one to three standard samples.

9. Maintenance

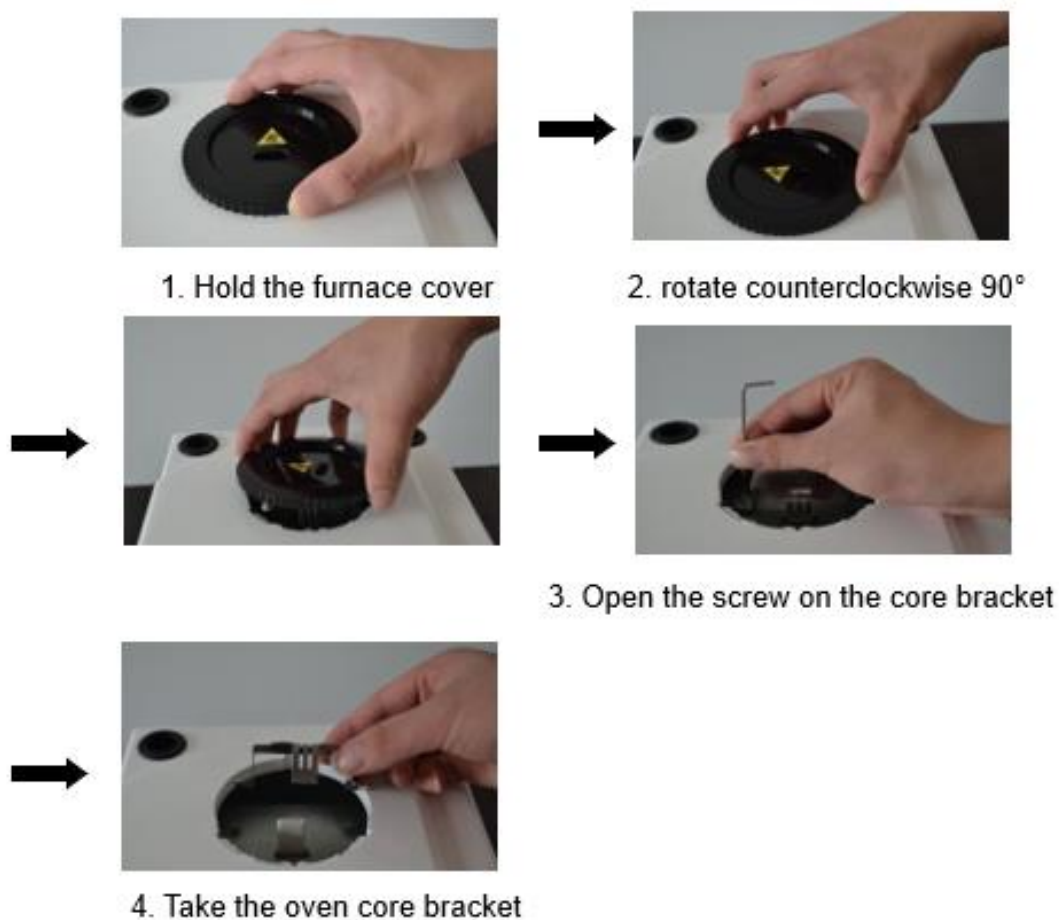
Daily Maintenance

- The instrument should be used in a dry and ventilated room and water to prevent moisture. The instrument uses a three-core power plug; the ground end should be connected to the earth and cannot be replaced by the middle line.
- The glass casing and capillary tube used by the instrument are only allowed to be provided by the factory. Avoid third-party glass casing or capillary tube substitution, in case of fracture caused by incorrect size or deviation of test results. The fine capillary should be selected.
- If the instrument is not used for a long time, it is suggested to turn off the power switch at the rear of the fuselage and unplug the power cord.

10. Troubleshooting

Glass Casing Fracture Treatment Method

During the test, if the capillary breaks in the furnace, follow the diagram



Common Faults and Handling Methods

Fault Phenomenon	Analysis of Causes	The Solving Method
No reflection on the screen after boot	1) Power supply is not in place. 2) The internal screen wiring harness of the instrument is loose. 3) The fuse is fused	1) Plug in the power plug or close the main switch.
Start-up self-check reported a fault	The corresponding hardware may fail	Try to restart and observe again.
Map, video saving failed	1) The automatic profile saving option is 'No' 2) Insufficient internal storage space	1) Automatic map saving is set to Yes. 2) Delete useless associated files to make space.

Automatic Melting Point Meter LB-21MPM

[Start heating] The key is invalid	1) Initial temperature control has not been performed. 2) The current temperature is not stable within $\pm 0.1^{\circ}\text{C}$ of the set starting temperature.	1) Enter the parameter setting page to set the appropriate starting temperature and heating rate and click OK. 2) Wait for the current temperature to stabilize.
The automatic test result is abnormal	1) There is foreign matter in the heating furnace sample tank or water pollution in the glass casing. 2) On the parameter setting page, click [Confirm] when the furnace has the capillary or the glass sleeve. 3) The light source brightness is wrong or changes for a long time.	1) Clean the sample tank and the water. 2) Remove the capillary, place it into a glass cannula, and re-test.
The melting point results are not accurate	1) Platinum resistance aging. 2) There is foreign matter in the furnace sample tank, temperature departure.	Clean the sample tank Melting point calibration was performed.
Only help pages are available after account login	At least one failure occurred in the boot self-test.	Try to restart and observe again but still report the error.
Poor reproducibility	1) Inconsistent loading method or batch. 2) Inconsistent capillary dimensions. 3) Glass of is glass, not size. 4) The height of water injection in the glass casing is not compliant.	1) Strictly follow the specifications. 2) Strictly pick up compliant capillaries. 3) Use the original glass casing. 4) Make sure the water surface of the glass sleeve without capillary insertion is $22\text{mm}\pm 1.5\text{mm}$ before testing.