Dry Block Temperature Calibrator

ET2501-150B

Hangzhou Zhongchuang Electron Co., Ltd

East Tester®

Catalog

East Tester®

1 Safety precautions

1.1 safety information

Please use the instrument in accordance with this manual. Otherwise the protective function of the instrument may be affected. See the security information in the warning and attention sections below.

The following definitions apply to the terms "warning" and "attention."

"Warning" indicates conditions and actions that may endanger users.

"Caution" indicates conditions and actions that may damage the instrument used.

1.1.1 warning

To avoid personal injury, follow these guidelines.

Summary

Please do not Use this instrument for other applications other than calibration. The instrument is designed for temperature calibration. Any other use can cause unpredictable harm to users.

Please do not Place the instrument under a cabinet or other object. Space needs to be left at the top so that probes can be inserted and taken out safely and easily.

Special care should be taken when using this instrument for a long time at high temperature. No monitoring is recommended during operation at high temperature. There may be safety problems.

Do not use any other direction equipment except vertical. Tilting instruments or pulling them back may cause a fire.

Watch out for burns

Please do not Touch the thermostat with your hand while working.

Please do not Use instruments near combustible materials.

Attention should be paid when using this instrument for a long time at high temperature

In constant temperature higher than 100 ℃, the screen will display the high temperature warning icon and text. Do not remove plug-ins to avoid personal injury or fire, whether the instrument is working or not.

Do not shut down the instrument when temperature higher than 100 ℃. This can lead to dangerous situations. Choose the set point is below 100 ℃, and close the output, and let it cool before shut down the instrument.

2 brief introduction

This product is easy to carry, easy to use, easy to quickly and reliable temperature calibration, widely used in machinery, chemical, food, medicine and other industries.

At present, the existing dry type inspection furnace in China generally has the disadvantages of slow cooling and slow constant temperature, so it takes a long time for users to calibrate. The latest generation of dry shaft furnace of our company adopts the most advanced international cooling principle design, which has the features of rapid cooling and rapid constant temperature, greatly improving the existing calibration efficiency.

The temperature control circuit measured by high-precision sensor is gentle and reliable, which ensures that the precision is higher than that of other domestic manufacturers and the technology is up to international standards. The world's first touch operation, use simple and quick.

2.1 main features

Small size, light weight, easy to carry;
Various types of insert tubes can meet different sizes and quantities of sensor testing and calibration. And can be customized according to the special needs of users;
The horizontal and vertical temperature fields are good.
The depth of being checked is the industry leader;
5.0-inch TFTLCD touch screen, 16-bit color RGB display, full touch operation, intuitive and eye-catching;
Rapid cooling, convenient setting, good temperature control stability;
Quick replacement of the heat flow;
With load short circuit, load break, sensor protection and other functions.
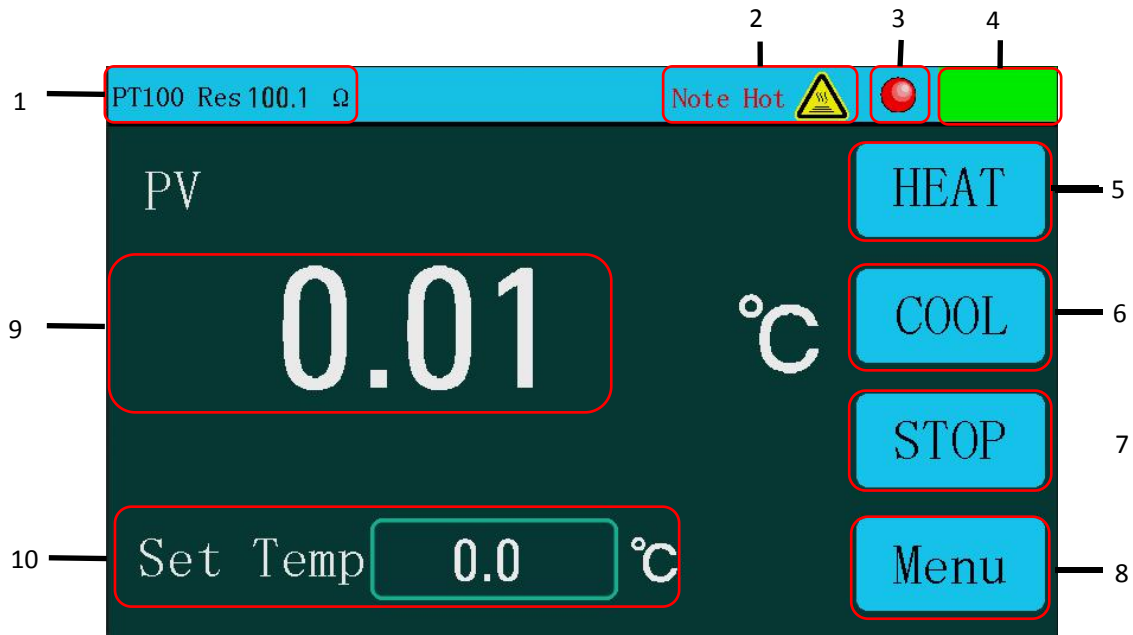
3 quick reference

3.1 display interface

FIG. 3.1.1 display interface

① Resistance value of PT100: shows the resistance value corresponding to the temperature;

② Warning: high temperature when temperature block temperature over 100 ℃, will show the attention to high temperature of text and ICONS, and text;

③ Main output indicator: indicates whether the heating module is working, gray is not working, red is working;

④ The current working state of the instrument: three states are not started, have been started, and the temperature exceeds the warning value;

⑤ Heating buttons;

⑥ Refrigeration keys;

⑦ Stop button;

⑧ Menu button: enter menu screen;

⑨ Heat source temperature: shows the temperature of the thermostatic block measured recently;

⑩ Set target temperature;

3.2 Starting dry-body furnace

1. Connect AC power

Connect the dry-body furnace to 220V ac power supply using the attached power cord.

2. Start the fan

Turn on the power switch on the front of the case.

3. If the instrument does not start normally, please follow the following steps for inspection:

1) Check whether the power cord is in good contact.

2) If the instrument is not started after inspection, please check whether the power fuse has been blown. If necessary,Please replace the fuse.

3) If the instrument is not started after the above inspection, please contact the related department.

3.3 Begin to use

Follow the steps below to use it quickly:

1. Set the target temperature

As shown in FIG. 4.1.1, click the setting temperature input box on the main interface, and the setting temperature window pops up. Enter the target temperature.

2. Heating/cooling operation

Click the "heating"/" refrigeration "button on the main interface (select" heating "/" refrigeration "according to the starting temperature). The work status icon on the main interface turns green, the instrument starts working, and the main output indicator will flash at a specific time interval.

3. Stop working

Press the "stop" button on the main interface and the output of the instrument will stop working.

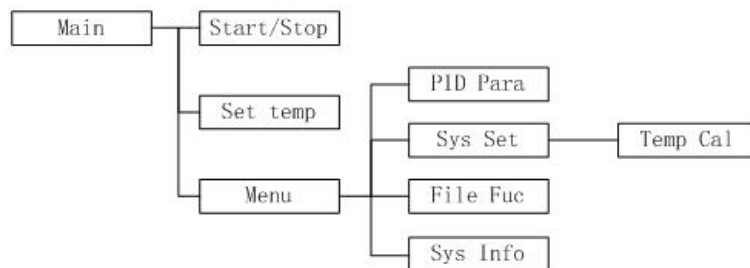# 4 Instructions for

4.1   The menu structure

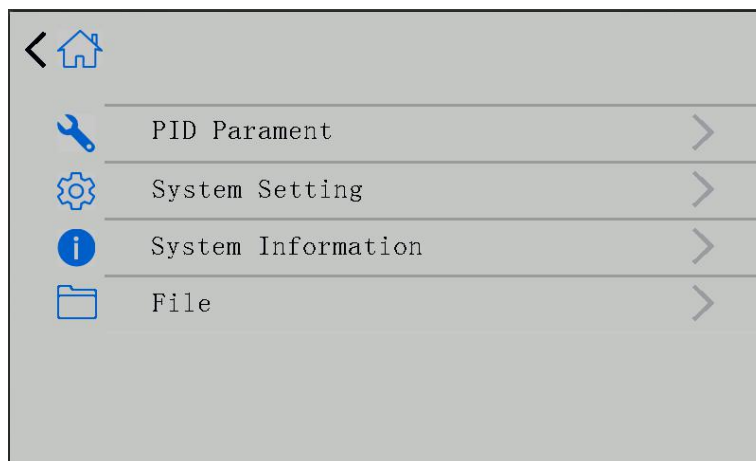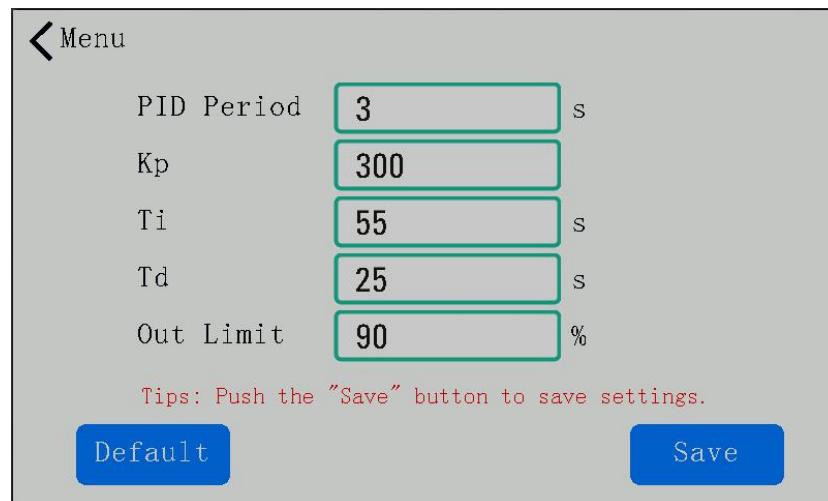**Figure 4.1 system menu structure**

Figure 4.2 menu interface

4.2 Output Settings

The temperature of the constant temperature block is controlled by PID method. Users can customize the Settings to meet the on-site use.

PID related parameters are set in the output setting interface, and the output setting interface is shown in figure 5.2. Click the restore default button to restore all Settings to the default value.

Note: after setting, press the "save" button to save the setting value, otherwise it is deemed to have been abandoned

Figure 4.3 output setting interface

PID cycle setting

The adjustment operation cycle of the meter is in seconds. Setting range: 0~100, system default is 3. This parameter has a great influence on the quality of adjustment, and the appropriate numerical value can perfectly solve the overshoot and oscillation phenomena, and at the same time obtain the best response speed. Modifications are recommended based on the preset values.

PID ratio setting

The scale factor determines the size of the scale band. The smaller the proportional band, the stronger the regulation (equivalent to increasing the amplification coefficient); In contrast, the larger the proportional band, the weaker the regulation. Modifications are recommended based on the preset values.

PID integral time setting

The integral time determines the intensity of the integral action. If the integral time is short, the integral action is strong, and the static difference is eliminated. On the contrary, if the integral time is long, the integral action is weak, but the time to eliminate the static difference is longer. Modifications are recommended based on the preset values.

PID differential time setting

Differential time determines the strength of the differential action. If the differential time is long, the differential effect is strong and sensitive to the temperature change, which can reduce the temperature overshoot. However, too strong differential action may increase the temperature shock amplitude and increase the stable time.

Power limit

Limit the main output power. The percentage indicates that 0~100, and the larger the value means that the larger the output power when heating, the faster the heating, but it may be unfavorable for the service life of the heating module. The system is preset to 90%.

4.3 System Settings (the following functions can only be used by manufacturer's authorization)

System Settings include language setting, temperature scale setting, alarm setting, screen brightness setting, temperature correction, etc. The temperature correction key is the key to enter the temperature correction interface. The system setting interface is shown in figure 5.3
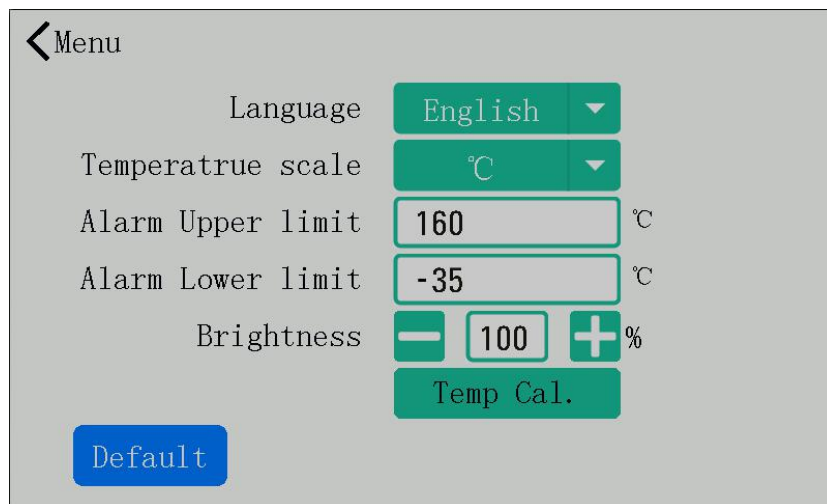

Figure 4.4 system setting interface

4.3.1 System language Settings

Support two system languages: simplified Chinese and English. Click the drop-down menu.

4.3.2 System temperature scale setting

℃ support degrees Celsius and Fahrenheit ℉ two system scale, click the drop-down menu Settings.

4.3.3 Alarm ceiling setting

Used to set a maximum alarm point. When the output is opened, if the temperature of the thermostat exceeds the alarm limit, the system will pop up the temperature alarm window,

the buzzer will sound, and the output will be closed. Set the range of 0 ℃ ~ 650 ℃, and cannot be smaller than under the alarm limit.

Set to maximum if not required.

4.3.4 Alarm lower limit setting

Used to set a minimum alarm point. When the output is turned on, the system will give a prompt message if the temperature of the thermostat is below the alarm lower limit. Set the range of 0 ℃ ~ 650 ℃, and cannot be larger than the upper limit alarm.

If not, set it to -1.

4.3.5 Screen brightness Settings

Set the percentage value from the darkest to the brightest, 0~100, and press +/- button to adjust the value.

4.3.6 Temperature correction

If the temperature is not displayed correctly on the main interface, users can correct it through the temperature correction interface. Click "temperature correction" button under the system setting interface and enter the temperature correction interface as shown in figure 5.4
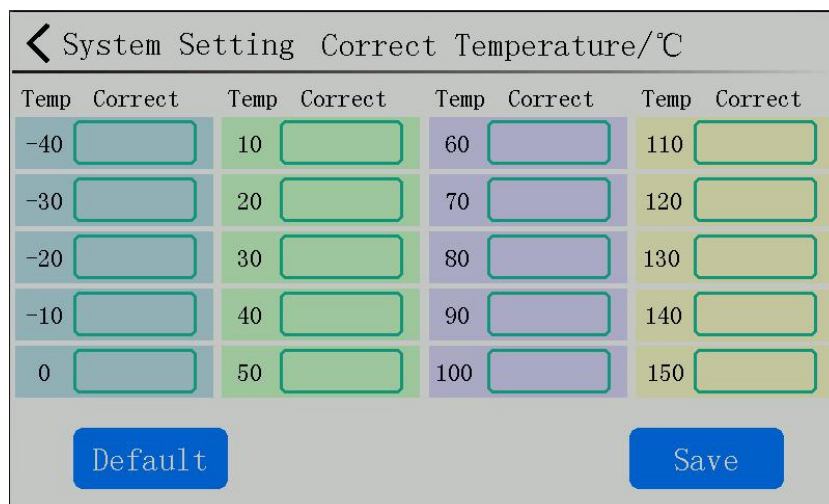

Figure 4.5 temperature correction interface

The system provides 20 temperature points, when the instrument displays an error with the real temperature, input the correction to correct the current display. Click the restore default button to restore all Settings to factory value.

Note: press the "save" button after setting, the setting value will be saved; otherwise, the modification will be deemed abandoned.

4.4   File functionality (ET2501 series only)

4.4.1   File function introduction

The file function gives the user the ability to record test data.

Such as user tests, in a temperature sensor to produce a set of data, including sensor model, the temperature of the test point, measured value (can make mV, Ω, ℃ or ℉ data etc.), etc., use of file function can record the above content, go to the lavatory search after test and analysis.

Click the "file" button under the menu interface to enter the file list button, as shown in figure 5.6.

Files are displayed as ICONS, and empty files do not display text on ICONS. Users can edit and save 10 files, and each file can record data of 6 sensors. Click the file icon to enter the corresponding file editing interface.
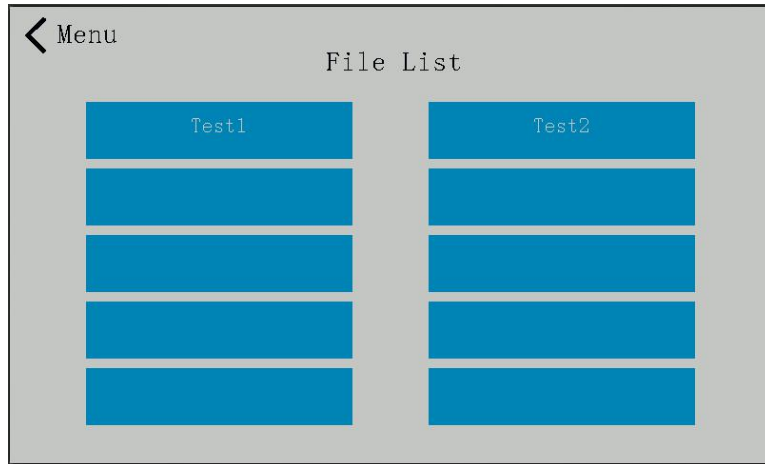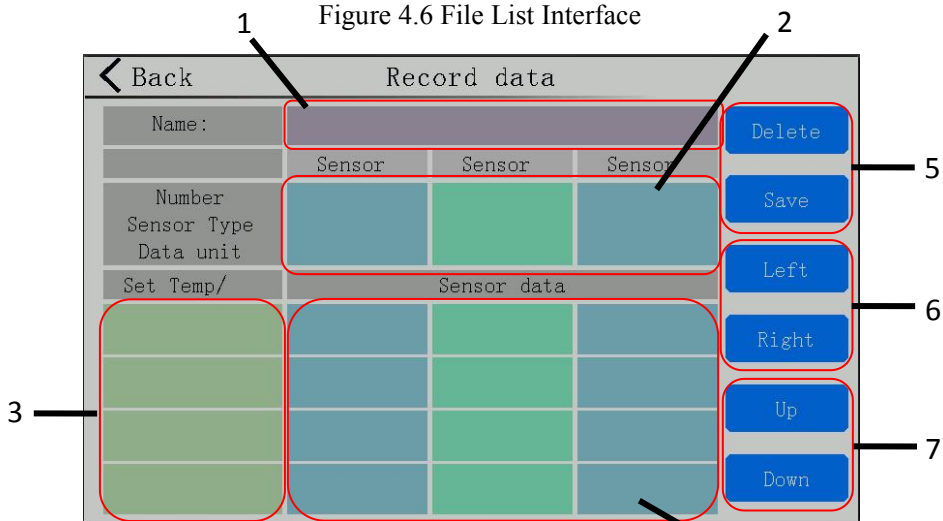

Figure 4.6 File List Interface
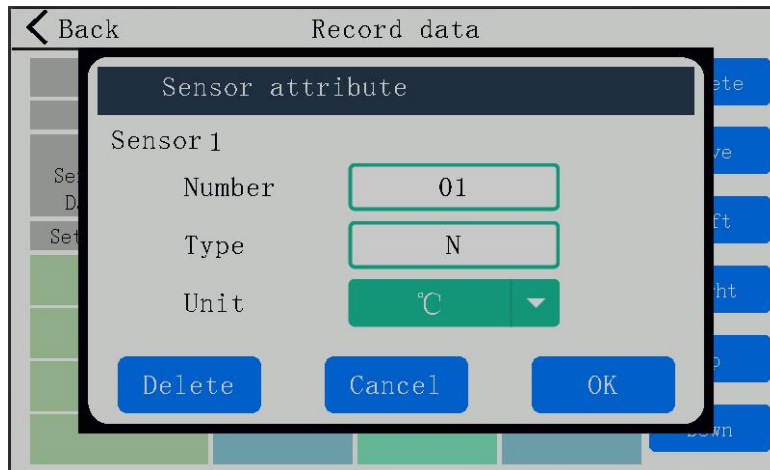

Figure4.7 File Interface

Figure4.8 Sensor editing interface

①. File name: must be entered before saving. Up to 16 English characters will appear on the file list. User manual input is required;

②. Sensor information display area: the property information of the sensor is saved, including number, dividing number and data unit; Click the corresponding property position to pop up the sensor property editing interface, and the user can edit information.

③. Test temperature area: record temperature value at test time. User manual input is required;

④. Test data; Click the corresponding position to input;

⑤. File operation button; Click delete button to clear the file, and click save button to save file 1;

⑥. Sensor page-turning button: a single file can record the data of 6 sensors, and left-right page-turning can switch to display different sensor data

⑦. Button for page turning of temperature data: a single file can record data of 10 temperature points, and the page turning up and down can switch to display data corresponding to different temperature points;

Note:

1：Click return and the system will save the data.

4.4.2 Use file function

The steps of recording test data with file function are as follows:

1. Click an empty file in the file list to enter the file interface.

2. Enter the file name. Click on the blank position of the file name, and the input box will pop up.

3. Edit sensor properties. Click the corresponding position of sensor 1 in the display area of sensor information, and a sensor attribute editing window pops up, and input relevant information according to the actual demand. If it is not needed, it can be left blank.

4. Enter the test temperature. The temperature value corresponding to the test data is recorded according to the temperature point area (i.e. the column of "set temperature" in the figure). Please input the temperature unit indicated.

5. Enter test data. In the data input area, find the position where the current sensor intersects with the current temperature point, and input the data obtained from the test.
6. If there is data of other sensors and temperature points, continue to input in accordance with the above method;
7. When finished, click the save button.
8. Click the back button to end the operation.

At this point, the data of 1 file is saved successfully, and the power loss of this data can be recovered.

4.5 USB communication (optional)

4.5.1 USB communication command

1. **Calibration command**

   Calibration -Controller：Calibration control parameter

SOUR:PERIOD	PID cycle
SOUR:PBAN	(P)
SOUR:INT	(I)
SOUR:DER	(D)
SOUR:HAL	Upper limit alarm
SOUR:LAL	The lower limit alarm
SOUR:POWER	Power limit
SOUR:TEMP	Set the temperature

2. **Main interface command**

   （1）READ:STD? Return measurement

   （2）READ:RTD?// Returns the PT100 resistance value

3. **System commands**

   （1）*IDN？：Instrument query command

4. **Internal use command**

   SYSTEM:XHVERSION （SYST:XHVE）//Hardware version

   SYSTEM:XMODEL （SYST:XMODEL）//model

   SYSTEM:XSERIAL （SYST:XSERIAL）//The serial number

   SYSTEM:RATIO (SYST:RADI)//Modified resolution

5. **Instrument status order**

   MACHINE:STATE //The instrument is ON /OFF

4.5.2 Data area format

The format of the command is as follows (CMD stands for command word) :

（1）The query command: CMD?+ 0x0A

（2）Set the command: CMD value+0x0A（there is a space between CMD and value,0x0A is the end of the frame)

Take setting and querying setting temperature for example:

（1）Query setting temperature：SOUR:TEMP?+0x0A

（2）Set setting temperature：SOUR:TEMP 500+0x0A　(set the temperature to 500 ℃)

4.6　System information

Figure 3.9 system information interface

Click "system information" button under the menu interface and jump to the system information interface to view the system information. including

- The serial number
- The version number
- File function enabled status
- Communication function enabled status

5　Technical indicators

Note: this technical indicators need to 23 + / - 5 ℃ environment, valid for stable under 10 minutes after the products reach the set temperature:

- Temperature: - 30 ℃ ~ 150 ℃

- Temperature units: ℃ or ℉

- Model specification:

    Model ET2501-150B: maximum temperature of 150 ℃

- Temperature gauge accuracy: 0.1℃

- Display resolution: 0.01 ℃ maximum display 5 digits

- Speed: 25 ℃ to 50 ℃ 6 minutes; 50 ℃ to 100 ℃ for 15 minutes;

  100 ℃ to 150 ℃ for 20 minutes;

- Cooling speed: 25 ℃ to 0 ℃ for 15 minutes. 0 ℃ to - 20 ℃ for 15 minutes;

  - 20 ℃ to -30 ℃ - 22 minutes;

- Temperature stability: ≤ +- 0.02 ℃ / 15 minutes or less

- Depth of insertion: 160mm

- The number and aperture of sensors that can be inserted: the standard configuration is 4 holes, which are less than 6, less than 8 , less than 10 and less than 12mm respectively

6 General technical specifications

- Size: 300mm x 190mm x 330mm (length x width x height)
- Weight: 13kg;
- Working voltage: 220v.ac + / - 10%, optional: 220v.ac + / - 10%, 45-65hz;
- Power: 300W.

7 Maintenance and maintenance

1.General maintenance and repair

1） After 1 year, the instrument should be recalibrated to ensure that the indicators of the instrument meet the requirements.

2.Replace the fuse

The fuse is installed under the power outlet switch.

Fuse specification:

10 A fuse in the 250 v L fuse Φ 5 x20mm

Operation steps:

1） Turn off the power and unplug the power cord.

2） Find the location of the fuse and remove the fuse as indicated on the device.

3） Replace the new fuse and put it back in.

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