Portable Black body Radiation Source
ET385-050

User Manual

Hangzhou Zhongchuang Electron Co., Ltd

Catalog

1、Summary

ET385-050 portable black body radiation source is mainly used for the calibration of infrared ear temperature gun, infrared forehead temperature gun, Infrared body surface screening instrument, infrared imaging thermometer, to eliminate temperature measurement's error created by scene. This instrument can improve measurement accuracy of measurement and reliability of infrared temperature measurement system effectively, and reduce error detection rate on the scene.

2、Function Features

1、Easy to carry out with light weight, just 5kg.

2、5 inches touch-screen operation, easy to operate.

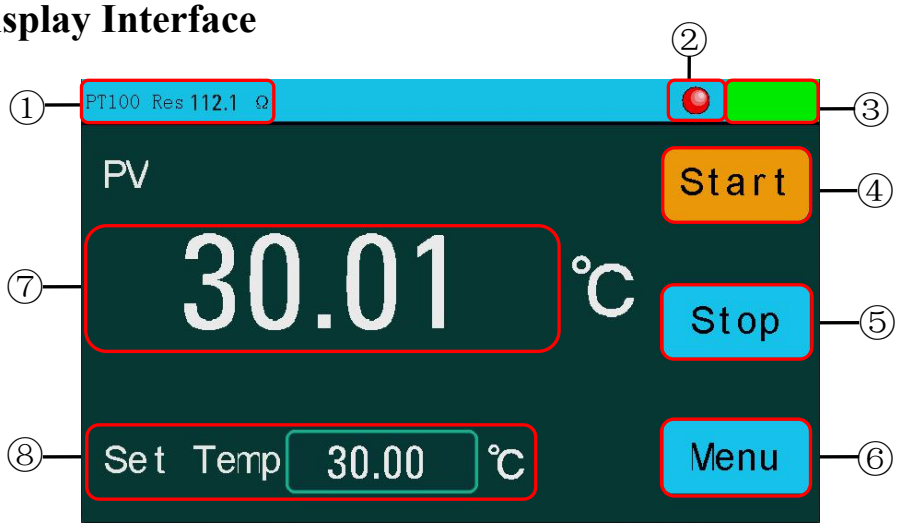
3、Adapting advanced PID contRol system to improve temperature stability.

4、Fast heating speeding and short stabilization time

5、Multi - point temperature correction function

3、Quick Reference

3.1、 Display Interface



① PT100 resistance value: display resistance value corresponding to temperature.

② Main output indicator: indicates whether the heating module is working, gray is not working, and red is working;

③ Current working condition of instrument: 1. start ; 2. not start; 3.temperature exceed

the warning value

④ Start button

⑤ Stop button

⑥ Menu button: to enter into menu

⑦ Heating source temperature: displayReal-time measurement of blackbody temperature

⑧ Temperature setting

3.2、Start Instrument

一、Use the power cord provided in the attachment to connect the blackbody radiation to the 220V ac power supply.

二、Before starting instrument, check carefully if there is any damage in the blackbody surface. If there is a problem , please contact manufacturer in time.

三、Turn on the power switch at back of instrument

四、If the equipment is not starting successfully, please check according to the following steps:

1．check whether the power line is in well connection

2．if the instrument does not start still after checking, please check whether the power fuse has been fused, if necessary,Please replace the fuse.

3．if the instrument does not work after the above inspection, please contact the relevant department.

3.3、Ready to Use

Follow these steps to quickly use:

1. Set Target Temperature

As shown in figure 3.1, click the setting temperature input box under the main interface, pop up the temperature window, enter the target temperature, click "confirm" button, return to the main interface, and the temperature setting is successful.

2. Start working

Click “START” button in the main interface.If the working icon at the right corner is changing to green color, it starts to work. The main output indicator flashes at a specific time interval

3. Stop working.

Click “STOP” button, instrument will working.

4、Operation Description

4.1、Menu Structure

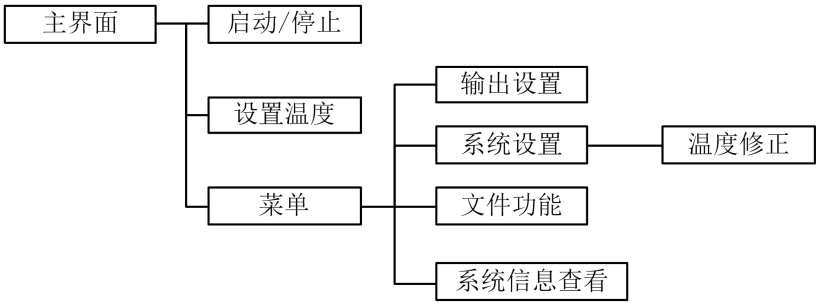


Fig 4.1 **System Menu Structure**

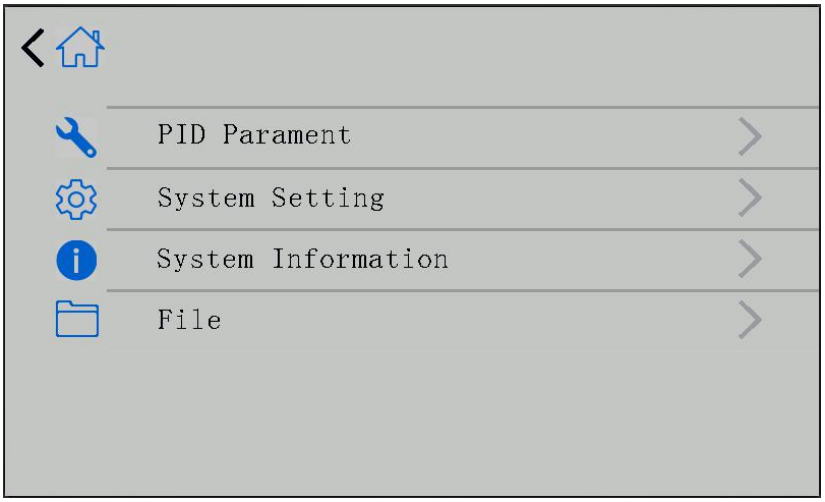


Fig 4.2 Menu Interface

4.2、Output setting

The system adopts PID control to control the temperature of the thermostat, and a set of setting parameters is preset when the system is delivered. Users can customize the Settings to meet site usage.

Set the PID correlation parameter 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*

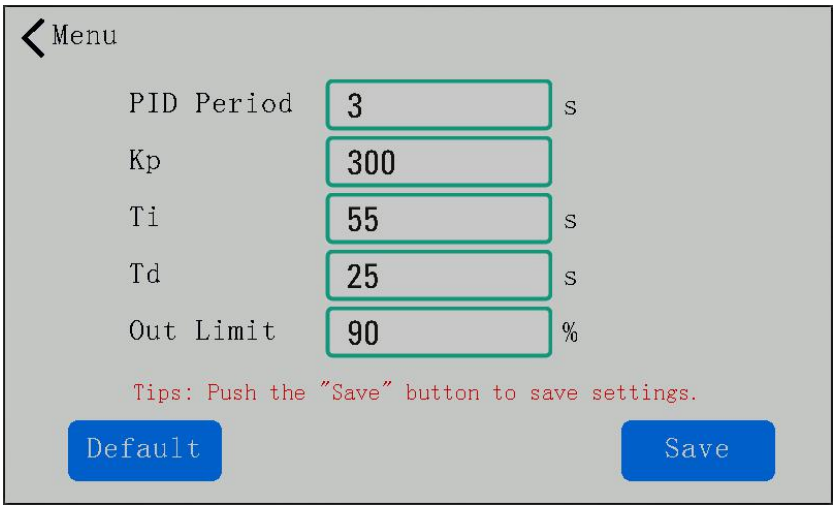


Fig4.3 Output setting interface

PID Cycle Setting

The adjustment operation period of the instrument is in seconds; Setting range: 0~100, system preset to 3. This parameter has great influence on the adjustment quality, and the appropriate numerical value can be used to solve the overshoot and oscillation, and obtain the best response speed. It is recommended to modify the default values.

PID **Proportional Coefficient Setting**

The proportional coefficient determines the size of the proportional band. The smaller the proportional band, the stronger the regulation effect (equivalent to enlarging the amplification factor); Conversely, the larger the ratio, the weaker the regulation. It is recommended to modify the default values.

PID **Integral Time Setting**

The integral time determines the integral action intensity. The integral time is short, the integral action is strong, the time of eliminating static difference is short, but the overstrong integral action may cause the temperature to be stable with a large oscillation. On the contrary, the integral time is long and the integral function is weak, but the time to eliminate static difference is longer. It is recommended to modify the default values.

PID **Differential Time Setting**

Differential time determines the intensity of differential action. The differential time is long and the differential action is strong. It is sensitive to temperature change and can reduce the temperature overshoot. But strong differential action may increase the temperature oscillation amplitude and lengthen stable time.

Power Limit

Limit the main output power. The percentage indicates that the larger the value of 0~100, the larger the output power is when heating, and the faster the heating. The system defaults to 100%.

4.3、System setting (part of the following functions need to be authorized by the manufacturer)

System setting including language setting, temperature scale setting, warning setting, screen brightness setting, temperature correction and others. Users can enter into the temperature correction interface by clicking temperature correction button. The system setup interface is shown in figure 4.4

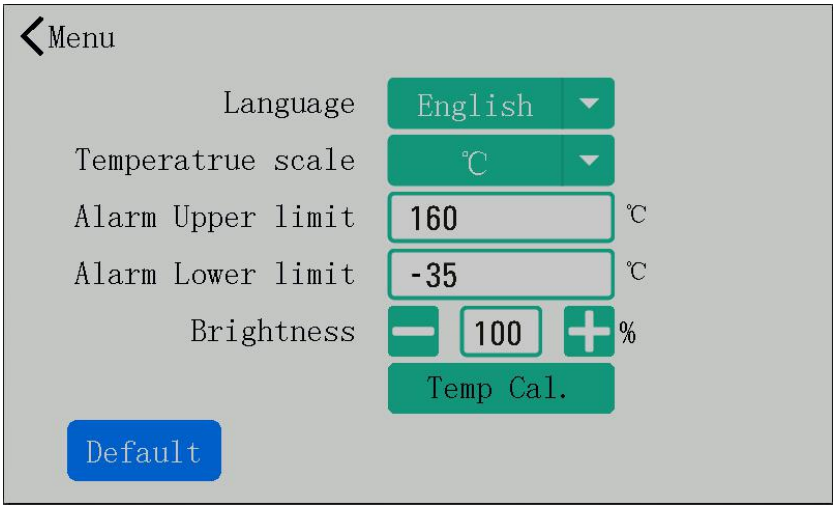


Fig4.4 System setting interface

4.3.1System Language Setting

Support Chinese and English system languages, click the drop-down menu Settings.

4.3.2System Temperature Scale Setting

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

4.3.3 Alarm Upper Limit Setting

Used to set upper alarm points. When the output is opened, if the thermostat temperature is above the alarm limit, the system will pop up the temperature alarm window, the buzzer will ring, and the output will be closed. Set the range of 20℃ ~ 60 ℃, and cannot be smaller than under the alarm limit.If don't need, set it to Max.

4.3.4 Alarm Lower Limit setting

Used to set lower alarm points. When the output is opened, the system will give the prompt message if the temperature is lower than the alarm limit. Set the range of 20 ℃ ~ 60 ℃, and cannot be larger than the upper limit alarm.

If don't need,set it to -1.

4.3.5Brightness Settings

Percentage value setting, from the darkest to the brightest, 0~100, press +/- button to adjust the numerical value.

4.3.6Temperature Correction

If the main interface shows that the temperature is not accurate, the user can modify the temperature through the temperature correction interface. Click "temperature correction" button in the system setting interface, the temperature correction interface as shown in figure 4.5.

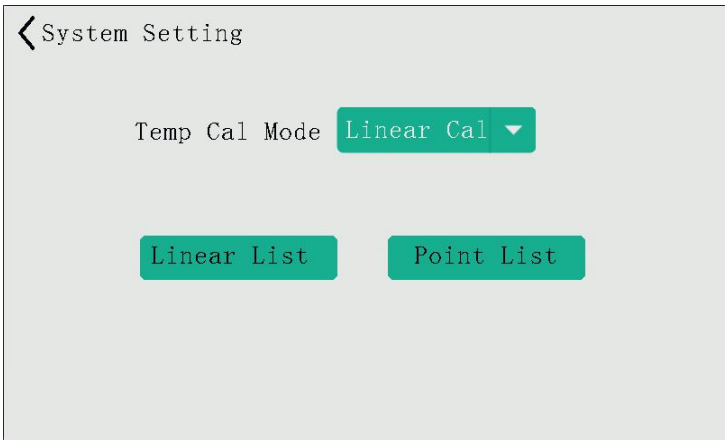


Fig 4.5 Temperature Correction Interface

There are 2 kinds of correction modes for selection: 1 Liner correction ;2 Point correction. Linear correction ensures accurate and reliable data throughout the range by using calibration data to establish multiple binary linear equations.Point correction is to correct only the error of fixed set temperature point, which can be changed in the "fixed point correction table".

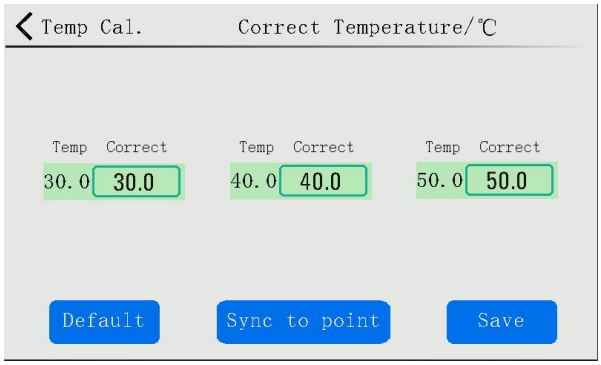


Fig4.6 Liner Correction excel

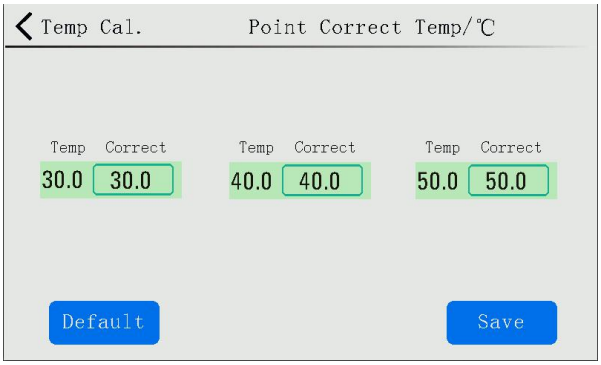


Fig 4.7 Point Correction Excel

System provides with 3 temperature calibration points. When there is a difference between display temperature and actual temperature, input correction value to modify the correct value. Click the restore default button to restore all Settings to factory values.

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

4.4、System Information

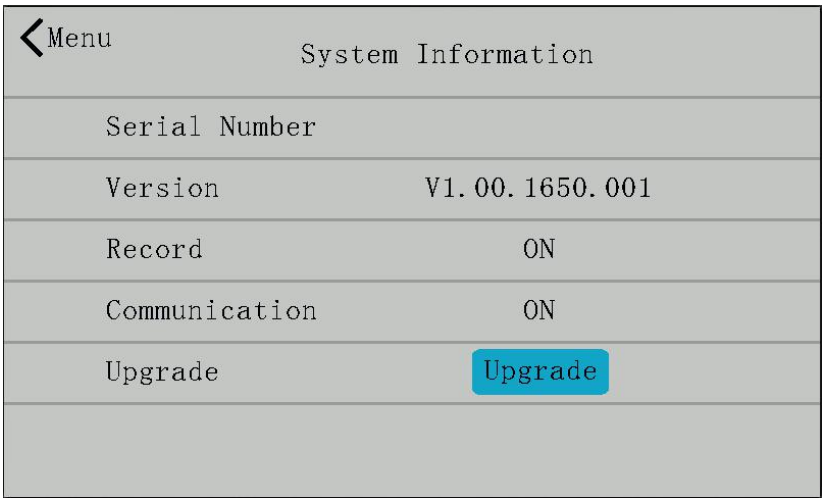


Fig4.8 system information interface

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

- ·Serial number.
- ·Hardware version number.
- ·File function is enabled or not.(Blackbody Radiation Source does not support)
- ·Communication function is enabled or not.(Blackbody Radiation Source does not support)

5、 Technical Index

Model	ET385-050
Effective emissivity	≥0.99
Temperature ranges	30℃~50℃
Display Resolution	0.01℃
Temperature	±0.1℃/10min

stability	
Temperature Uniformity	≤0.15℃
Control Method	PID
Cavity Diameter	Φ60mm
Dimension size	300mm*350mm*145mm（L*W*H）
Weight	5kg

These index will be valid when temperature is stable for 15 mins after starting instrument.

6、Maintenance

6.1、General maintenance

1. After being used for about 1 year, the instrument should be rectified to ensure that its indicators meet the requirements.

6.2、Replace Fuse Tube

The fuse tube is installed at the right side of power switch.

Specification of fuse tube

10A L 250V Quick fuse Φ5x20mm

Operation steps:

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

2) find the location of the fuse and remove the blown fuse according to the device.

3) replace the new fuse tube and reload it.

7、Repair

1) if the instrument breaks down under the conditions stipulated in the warranty period, the factory will be responsible for free warranty for one year.\

2) during the warranty period, if the equipment is damaged due to improper use and maintenance by the user, the factory shall be responsible for the repair, but the user shall be responsible for the cost.

3) if the fault occurs after more than one year, the factory will be responsible for the maintenance and charge fees according to the regulations.