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Zhejiang Huaqi Zhengbang Automation Technology Co., Ltd.

Tel. : +86577-86701181 Website: www.itechsmt.com
Add:NO. 1, Shanha Road, Nanming Mountain Street,
Liandu District, Lishui City, Zhejiang, China

Zhejiang Huaqi Zhengbang Automation Technology Co., Ltd.

Desktop Reflow Oven
RF-A200/RF-A250/RF-A350/RF-A500
User Manual

**Thank you very much for
your choice of our products and
please read this manual carefully before using!**

Foreword

Thank you using the equipment of our company. We sincerely promise to you that: We assist your undertaking with excellent product quality and complete after-sales service.

Founded in early 2000, Zhejiang Huaqi Zhengbang Automation Technology Co., Ltd. is specialized in design and production of electronic welding equipment and production lines, such as soldering pot, foot cutter, tool sharpener, semi-automatic welding workpiece machine, wave-soldering, reflow soldering, silkscreen machine, inspection conveyor, plugin lines, production lines, etc. Since establishment, our company has always adhered to the management tenet and the quality policy of “Customer-Driven, Total Involvement, Continuous Improvement and Sustainable Operation” and the guiding thought of “Building a Famous Brand and Creating Trend-Setting Products”. Developing and producing quality products based on the market demand at home and abroad are the core resource of our company. We have always kept manufacturing products with high quality and high performance.

We have professional designers with rich experience, quality controllers for each production procedure as well as an excellence after-sales service team. “Customer Satisfaction” is our purpose. We equally emphasize quality and service and strive to achieve “Making Perfection More Perfect”.

Note: please read this User Manual carefully before using the equipment of our Company. The writer apologizes for the deficiencies in this user manual due to limited ability.

Yours sincerely,

Directory

XIII.Maintenance

1. Check if there is any greasy dirt on the inner wall of the drawer and clean it.
2. Check whether the observation window glass is blurred and wipe it with a cloth and alcohol.
3. Check whether the fan blades on the left and right sides of the device are dusty and clean up.
4. Check if the fan blades on the rear side of the device are dusty and clean up.
5. Check the appearance of the device for dust accumulation, wipe it with a clean cloth.

XIV.Attached List

1. Φ100 Tin Foil Tube * 1.5 Meters
2. Power Line * 1 PC
3. The Fuse * 1 PC
4. Manual * 1 PC
5. Certificate * 1 PC

XV. After-sales Service

The warranty period of this machine is 12 months from the date of purchase. If the warranty period is not human, we will be free maintenance. If the warranty period is over or after the warranty period, we will charge the appropriate maintenance fee and maintain it for life.

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I. Overview

ITECH series reflow furnace is mainly for the production and maintenance of SMT products such as desktop solder reflow equipment. The product uses high efficiency far infrared heating elements and distributed thermocouple temperature measurement device. Through the microcomputer's precise control, the temperature of the reflow oven curve control can be more accurate, and the temperature of the reflow plane can be more uniform. ITECH series reflow furnace is fully able to adapt to a variety of different alloys and lead-free solder reflow requirements. Its temperature curve precision can be adjusted; in addition, this kind of equipment also has automatic fault detection alarm and other functions.

This product has a variety of applications such as reflow soldering, repair, drying and so on. It's suitable for small quantities of SMT electronic products production, test research, electronic product development, school training courses and other units. This operating software is Chinese and English bilingual operating system developed independently by Zhengbang. The structure of the circuit adopts high efficiency, convenient and integrated design, adopts aluminum silicate high temperature environmental protection heat preservation cotton, has good heat preservation effect, and improves and upgrades in aspects of performance, structure and operation.

The outer shell of the machine is made of high quality cold-rolled sheet by electrostatic spraying, and the inner tank is made of 201 stainless steel. Durable, the inside of the case is filled with high-quality thermal insulation cotton to effectively save heat loss and reduce the case temperature, dual language mode. The single-chip microcomputer control system is independently developed by our company.

II. Technical Parameters

Model	RF-A200	RF-A250	RF-A350	RF-A500
Max. Power	700W	1600W	2400W	3600W
Heating Method	Infrared Radiation Heating	Infrared Radiation Heating & Hot Air Circulation		
Effective Welding Area	200*150mm	250*200mm	350mm*300mm	500mm*400mm
Drawer Size	250*180*20mm	350*250*20mm	400*330*20mm	550*430*20mm
	Remark:Regard these sizes as valid welding area, please pay attention and distinguish.			
Operating System	AC220V±10% 50Hz (AV110V Custom-Made)			
Power Supply	Chinese and English Bilingual Operating System			
Outline Size	375*350*312mm	425*400*312mm	525*500*312mm	675*600*312mm
Weight	13.5kg	19kg	24.9kg	37.1kg

III. Technical Parameters

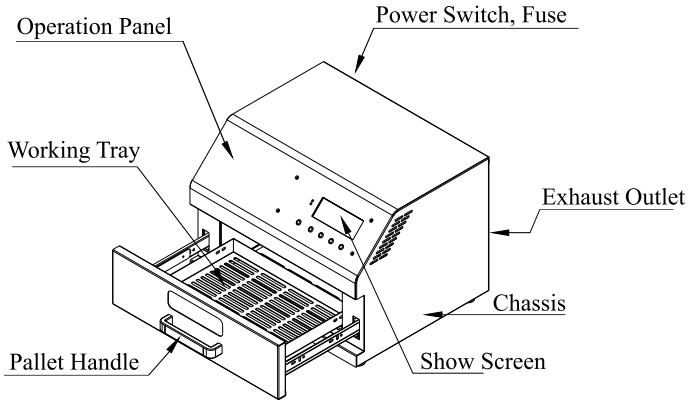

Fig. 1

IV. Function Button Description

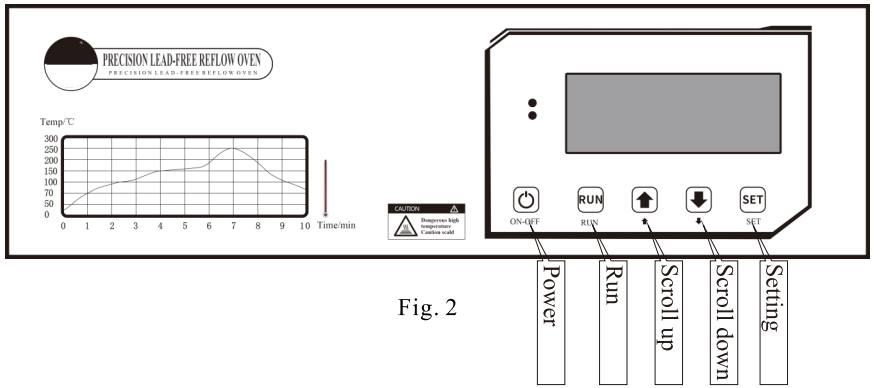

Fig. 2

There are 5 buttons on the operation panel of the device: “Power button”, “Up button”, “Down button”, “Set button” and “Run button” in which the key “RUN” and “SET” are multi-function keys, different "SETTING" operation interface, the bottom of the screen will have the corresponding keyboard function display.

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VII. Fault Alarm

Failure Phenomenon	Cause Analysis	Approach
No Power	1. Poor contact with the plug	Check the board or wall socket and plug it in again
	2. Fuse is broken	Update the fuse
	3. Control board is damaged	Replace control board
Not Heated	1. Heating tube is damaged	Replace the heating tube
	2. Thyristor is damaged	Replace thyristor
	3. Control board is damaged	Replace control board
	4. Poor contact of heating tube connection wire	Re-check the connection
Runaway temperature keeps rising	1. Thyristor breakdown	Replace thyristor
	2. Control board is damaged	Replace control board
Over Temperature	1. The exhaust fan is damaged.	Replace the exhaust fan.
	2. Smoke exhaust pipe is blocked	Check and clear the smoke exhaust pipe
	3. Control board is damaged	Replace control board
Warm up slowly	1. Part of the heating tube is damaged	Replace the heating tube.
	2. Some silicon can be damaged	Replace thyristor
	3. Control board is damaged	Replace control board
Slow cooling	1. The exhaust fan is damaged.	Replace the exhaust fan.
	2. Smoke exhaust pipe is blocked	Check and clear the smoke exhaust pipe
	3. Exhaust pipe is too long or bent too much	Shorten exhaust pipe or reduce bending
	4. Illegal installation of exhaust fan at the end of the exhaust pipe	
Button failure	1. Button is damaged	Replace the button
	2. The PVC panel is under excessive pressure	Tear off the PVC panel and repaste
LCD screen freezes and all buttons fail	1. The LCD screen cable is not in good contact.	Replace the exhaust fan.
	2. Control board is damaged	Update control board
Welding or uneven welding	1. Insufficient temperature at each stage	Increase the temperature, especially the temperature of the welding section
	2. The holding time is not enough.	Increase the holding time. Do not add too much in the welding section.
	3. The PCB board is placed in an unreasonable position.	Place the PCB board in the middle of the drawer, leaving 30mm on each side.
Scorched on a board	1. The temperature is too high in each stage.	Reduce the temperature, especially the temperature of the welding section.
	2. The holding time is too long.	Reduce the holding time. Do not add too much in the welding section.
	3. Exhaust fan is illegally installed at the end of the exhaust pipe	Shorten exhaust pipe or reduce bending
	4. Smoke exhaust fan is damaged.	Replace smoke exhaust fan.
	5. The exhaust pipe is blocked.	Check and clear the exhaust pipe.
	6. Exhaust pipe is too long or bent too much	

XII. Fault Alarm

1. Sensor Failure

In the operation of the equipment, if the temperature measurement element is damaged, it will automatically alarm and the display will show "sensor fault", as shown in Fig. 26.

2. Heating Failure

In the operation of the equipment, if the temperature of the oven cannot be detected, the device will report heating failure alarm, and the display will show "heating fault", as shown in Fig. 27.

3. Heating Timeout

During the operation of the device, if any heating time exceeds the maximum timeout protection time set by the system parameters, the device will report a heating timeout alarm, and the display will show "heating timeout", as shown in Figure 28.

4. Heating Over Temperature

During the operation of the device, if any of the current temperature exceeds the set temperature and deviates from the system parameter over-temperature value, the device will report a heating over-temperature alarm, and the display will show "heating over-temperature" as shown in Figure 29.

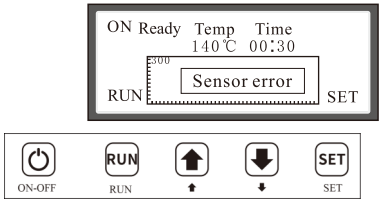

Fig. 26

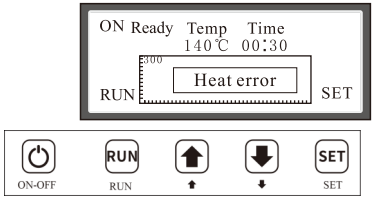

Fig. 27

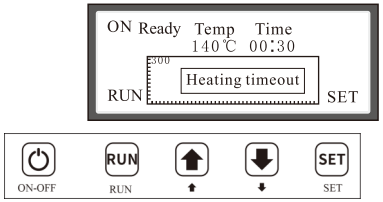

Fig. 28

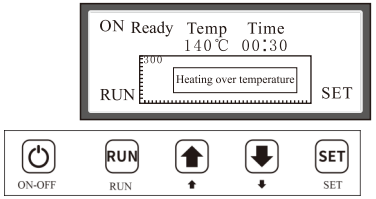

Fig. 29

V. Equipment Installation Precautions

1. Equipment should be installed in a place convenient for short distance exhaust. The power supply should be equipped with a 15A high current tripod socket, and the ground terminal must be grounded reliably.
2. The exhaust pipe should use φ100mm aluminum exhaust pipe, the outlet height of exhaust pipe should be higher than the machine installation height of 1m or more. This is conducive to the use of hot air chimney exhaust effect.
3. The total length of the exhaust pipe must not exceed 1.5 meters, and the exhaust pipe must not bend more than 90 degrees. The bending radius should be as large as possible. No exhaust fan can be installed at the end of the exhaust pipe.
4. Reserve the space when placing the equipment, as shown in Figure 3 below.
5. The equipment drawer is equipped with a mica sheet pad can not be removed.
6. Do not place other items on the top of the device, especially flammable liquids. Such as "washboard water,Alcohol, methanol, gasoline ", etc.
7. At the beginning of use the machine may discharge some miscellaneous gas, this is a normal phenomenon, after a period of time this kind of smell will disappear.
8. When the machine is not used, you should switch off the power switch behind the machine. In the state of the software shutdown, the main control board of the machine is still at work. When not in use for a long time, you should remove the machine, pack it and put it back to the original container to.

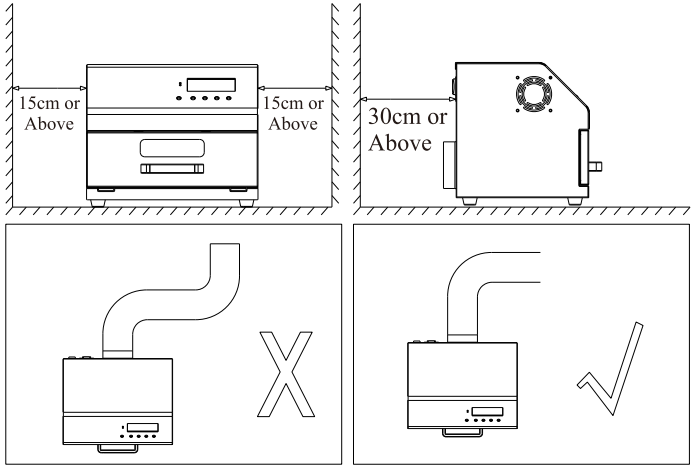

Fig. 3

VI. Function and function of temperature curve

Typical reflow soldering usually has five temperature zones. The drawer reflow furnace is set with five temperature zones to simulate the five temperature zones of the tunnel reflow furnace. In order to ensure the soldering requirements of different PCB boards, the maximum temperature points and corresponding holding times of each temperature section are designed. The purpose and role of each temperature section are described below:

1. Purpose and Role of the Preheating Section

It can fully vaporize the moisture of the PCB board and eliminate the internal application of the PCB board. The purpose of the PCB board is to heat the PCB board at room temperature. The force and some residual gas are a smooth transition in the next temperature section.

2. Purpose and Role of Heating Section

The PCB board processed through the preheating section is to activate the flux in the solder paste during the heating section, and remove the oxide in the solder paste and the component surface under the action of the flux. Prepare for the welding process.

3. Purpose and Role of Welding Section

The main purpose of the soldering section is to complete the SMT welding process. Since this stage is the highest temperature section in the entire reflow process, it is very easy to damage the components that do not meet the temperature requirements. The temperature setting at this stage is generally based on the fact that the melting point temperature provided by the solder paste data is about 30-50 ℃ higher, and the time is generally set at about 2-5 s. In order to ensure the quality of reflow, the holding time at this stage is shortened as much as possible, which is beneficial Protect components.

4. Purpose and Role of Insulation Section

The role of the thermal insulation section is to allow the high-temperature liquid solder to solidify into solid solder joints. The quality of the solidification directly affects the crystal structure and mechanical properties of the solder. Too fast solidification time will cause the solder to form rough crystals and the solder joints will not be smooth. We use to stop heating and maintain the temperature for a period of time, so that the solder solidifies and crystallizes well during the slow temperature drop.

5. Purpose and role of cooling section

The role of the cooling section is relatively simple, usually it is sufficient to cool to a temperature that will not be hot, but in order to speed up the operation process, you can also directly pull out the drawer to cool down to end the process when the temperature drops below 120 ℃.

Zhejiang Huaqi Zhengbang Automation Technology Co., Ltd.

X. Temperature Setting Reference

Solder Paste Type	Low Temperature Solder Paste	Medium Temperature Solder Paste	High Temperature Solder Paste
Melting Point	138℃	183℃	217℃
Preheating Section	90-110℃	110−130℃	120−150℃
Hold Time	90-120s	90−120s	90−120s
Heating Section	130-150℃	140−160℃	150−180℃
Hold Time	30-60s	30−90s	30−60s
Welding Section	165-185℃	200−220℃	220−240℃
Hold Time	2-5s	2-5s	2-5s
Insulation Section	150℃	170℃	190℃
Hold Time	5s	5s	2-5s
Cooling Section	100℃	100℃	100℃
Hold Time	0s	0s	0s

Fig. 25

1. Temperature Setting Reference Value:

The above fig. 25 is the temperature setting reference for three commonly used solder pastes. The user can select the corresponding reference data according to the type of solder paste used. In addition, the size of the PCB board and the component distribution density must be within the reference data range. Fine-tuning, the larger the board, the denser the board, the higher the temperature required, and the longer the holding time, and the lower the density of the small board, the lower the temperature and the holding time.

2. Note on Temperature Setting:

(1) The principle of setting the temperature and holding time is to slowly increase from low to high.

(2) In the case of good soldering, the temperature and holding time should be as low as possible to prevent the PCB from discoloring under high temperature and damage to some components with low temperature resistance.

(3) Set the temperature of the soldering section according to the melting point of the solder. Generally, the temperature of the soldering section is the melting point temperature plus about 30 degrees.

(4) The temperature setting and holding time of the welding section should be as short as possible, because improper setting at this stage for the high temperature stage will lead to the risk of scorching the PCB board.

(5) If the PCB is not tinned or partially tinned, the temperature and holding time of the heating section should be considered first. If the problem cannot be solved, the temperature and holding time of the soldering section should be considered.

IX. Connect the Computer for Operating

ITECH drawer type reflow oven equipped with DB9 needle port to connect the customer's computer, which is convenient for the customers to operate the reflow oven with computer and test the temperature curve in time.

1. Equipment Connection

Connect the right and back of the reflow oven with one side then connect the computer with DB9 with the other side through equipped series report extension cord. Secondly, press"power supply" then the button screen light after getting through the power supply. Check the port part and record the communication port name by double-clicking to open the reflow oven monitoring software. "Port"choosing record communication port name and clicking to open then click again to connect, then the reflow oven screen will show: upper computer communicating... the software info part will show: has connected this equipment. The window display will show as Fig. 24.

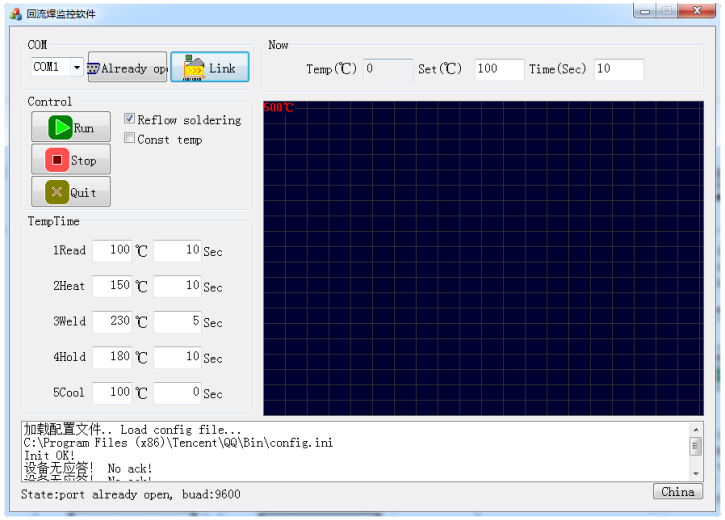

Fig. 24

2. Specifications Setting

Check and choose reflow oven mode "temperature and time" column to set each section temperature and time of the reflow oven, click Run after complete setting then can show the real time temperature on the "front" column, show temperature curve at the lower down corner. Check and choose constant temperature mode and set the constant temperature need to import on the "front"column.

VII. Operating Parameter Setting

Generally speaking, you need to set the operating parameter at the time of using the machine or when the tin liquid formula is changed. Moreover, you may set up the language of the machine according to your preference. There are two operating modes, i.e. "REFLOW SOLDERING" and "CONSTANT TEMPERATURE". "REFLOW SOLDERING" Mode is designed for soldering SMT circuit board components and has five temperature setting modes in the entire process, i.e. Preheat, Heating, Soldering, Heat Preservation and Cooling. "CONSTANT TEMPERATURE" mode is designed for dismantling circuit board components or drying goods and only has one temperature setting mode. Before heating, please confirm whether set temperature value and set time value are reasonable.

1. Starting Up

Turn on the main power switch at the back of the machine, and the red indicator light on the upper left of the screen will be on. Press "POWER SUPPLY" on the panel and then "PRESET", "PRODUCTION" and "CONSTANT TEMPERATURE" will be displayed on the LCD screen as shown in Fig. 4.

Fig. 4

2. Language Setting

Before pressing "POWER SUPPLY", long press "SET" button as shown in Fig. 5. Press "PAGE DOWN" button and select language setting to conduct Chinese-English switch.

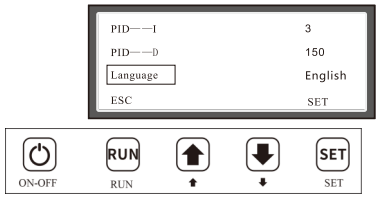

Fig. 5

3. Production Mode Setting (Temperature and Time Settings Are Only for Reference)

(1) After pressing “POWER SUPPLY”, “PRODUCTION” is in highlighted state, which means being selected. Press “RUN” as shown in Fig. 6 and press “SET” button to select “PREHEAT”, “TEMPERATURE” and “TIME” modes. When the heating mode is “PREHEAT”, press “SET” button to switch “TEMPERATURE” column to the highlighted state, as shown in Fig. 7. Press “PAGE UP” button and “PAGE DOWN” button to conduct preheating temperature preheating setting. The minimum preheating temperature shall be set as 70℃. Press “SET” button to switch “TIME” to the highlighted state and conduct time setting.

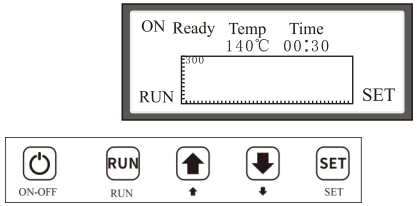

Fig. 6

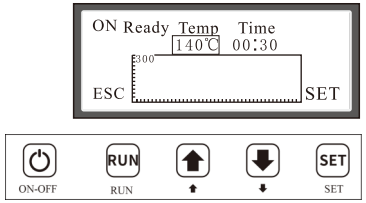

Fig. 7

(2) Press “SET” button to switch “PREHEAT” to the highlighted state, press “PAGE DOWN” button to switch to “Heating” as shown in Fig. 8. Press “SET” button again to switch “TEMPERATURE” to the highlighted state and conduct temperature setting by pressing “PAGE UP” button and “PAGE DOWN” button. The temperature setting range shall be higher than the set preheating temperature. Press “SET” button to switch “TIME” to the highlighted state as shown in Fig. 9 and then conduct time setting.

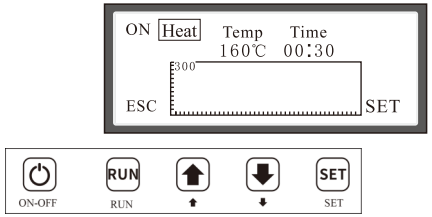

Fig. 8

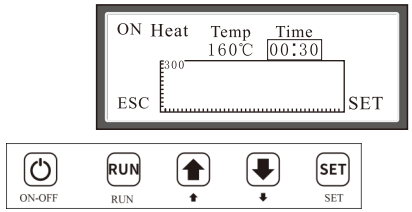

Fig. 9

Welding maximum time: refers to the heating from the heating section to the set temperature value of the welding section plus the sum of the holding time. If this setting value is exceeded, an alarm will be generated to reduce the temperature and stop the machine to avoid long-term heating and damage to the PCB.

Maximum holding time: refers to the temperature from the welding section to the set temperature value of the holding section plus the sum of the holding time. If the set value is exceeded, an alarm will be generated to reduce the temperature and stop the machine to avoid long-term high temperature damage. When the temperature in the temperature zone exceeds the set value, the offset reaches this set value, and an alarm shutdown will be generated to avoid damage to the PCB due to excessive temperature.

VIII. Reflow Soldering Operation

When the setting is completed and the machine meets safety operating conditions, put the circuit board placed with the components into the middle of the tray and then feed into the case. Press “RUN” button to enter working state after entering production state, as shown in Fig. 22. Highlighted state in the upper left is shown in the display screen; the temperature display is current case temperature, and the time display is the set time value. After the temperature reaches the set value, the time starts counting down. After counting down, it will enter the next temperature zone. When each temperature zone reaches the constant temperature zone, the lower operating panel indicator light will flicker. When the actual temperature are about 5℃ more than the set temperature, the fan will be opened to cool the temperature and the power indicator light on the upper operating panel will flicker at this time. If you want to exit during the operation, you can press “SET” button to exit. When the machine reaches the cooling zone during operation, the fan will make all-out efforts to exhaust air. At this time, the power indicate light will be off, the buzzer alarm will be alerted when the temperature is dropped to the set temperature. The displayer screen will show “COMPLETE”, as shown in Fig. 23. For the sake of safety, the cooling fan will continue working until the temperature is decreased to 80℃ and the fan will stop exhausting air.

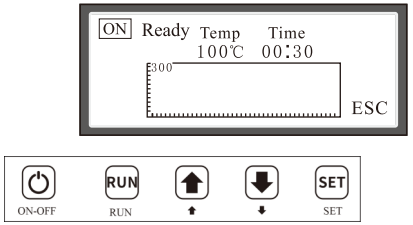

Fig. 22

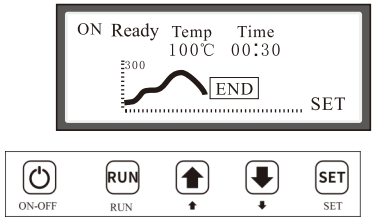

Fig. 23

5. System Parameter Setting

After powering on the device, not before pressing "Power". Press and hold the SET button to enter the system parameter setting. The system parameter setting content is shown in Figure 21 below. Pressing the "Down" button can switch to view all contents. The system parameters are set at the factory and need not be adjusted except for special circumstances. If adjustment is required, adjustments must be made under the guidance of the manufacturer, otherwise the risk of system heating and malfunction will be caused.

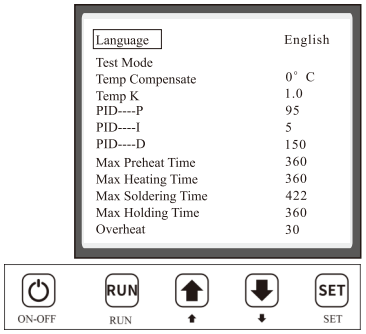

Fig. 21

System Parameter Introduction:

Language: The device supports Chinese and English dual language modes, which can be switched by the setting key.

Tuning Mode: After entering tuning mode, you can test each function module separately to determine Whether the device is normal.

Room Temperature Compensation: If the room temperature is not accurate, you can correct the temperature by setting the compensation value.

Temperature Coefficient: If the temperature is not accurate under high temperature, it can be corrected by modifying the temperature coefficient.

PID --- P: Refers to the proportional term in the PID algorithm.

PID --- I: Refers to the integral term in the PID algorithm.

PID --- D: Refers to the differential term in the PID algorithm.

Preheating Max. Time: Refers to the total temperature from the normal temperature to the set temperature in the preheating section plus the total holding time.

If it exceeds this set value, an alarm will be generated to reduce the temperature and shut down to avoid long-term heating damage to the PCB board. The maximum heating time: refers to the set temperature value from the preheating section to the heating section plus the total holding time. The setting value will generate an alarm to reduce the temperature and stop the machine to avoid long-term heating and damage to the PCB board.

(3) Press “SET” button to switch “Heating” to highlighted state, and press “PAGE DOWN” button to switch to “SOLDERING”. Press “SET” Button again to switch “TEMPERATURE” to highlighted state. Press “PAGE UP” button and “PAGE DOWN” button to conduct the setting of “TEMPERATURE” as shown in Fig.10. Press “SET” Button again to switch to “TIME” setting to highlighted state as shown in Fig.11, and then Setting the hold time.

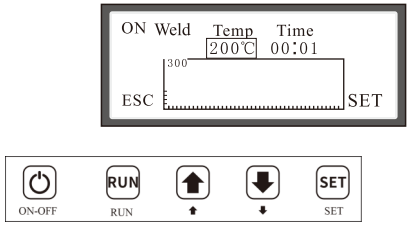

Fig. 10

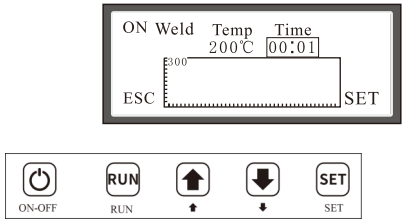

Fig. 11

(4) Press “SET” button to switch “SOLDERING” to highlighted state, and press “PAGE DOWN” button to switch to “HEAT PRESERVATION”. Press “SET” Button again to switch “TEMPERATURE” to highlighted state. Press “PAGE UP” button and “PAGE DOWN” button to conduct the setting of “TEMPERATURE” as shown in Fig.12. The heat preservation setting range shall be lower than the soldering temperature. Press “SET” Button again to switch to “TIME” setting to highlighted state as shown in Fig.13, and then Setting the hold time.

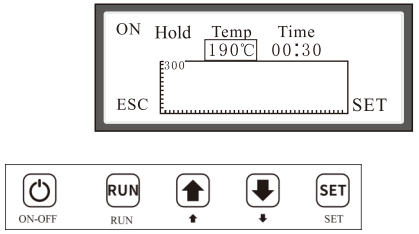

Fig. 12

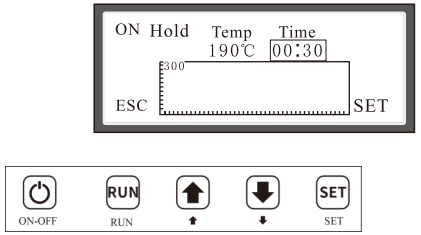

Fig. 13

(5) Press “SET” Button to switch “Heat Preservation” to highlighted state, and press “PAGE DOWN” button to switch to “cooling”. Press “SET” Button again to switch “TEMPERATURE” to highlighted state. Press “PAGE UP” button and “PAGE DOWN” button to conduct the setting of “TEMPERATURE” as shown in Fig. 15. The heat preservation setting range shall be lower than the soldering temperature. “TIME” setting is not available under cooling mode and its default value is 00:00.

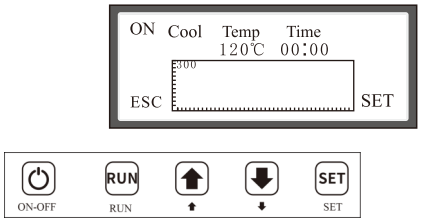

Fig. 14

4. Constant Temperature Mode Setting (Temperature and Time Settings Are Only for Reference)

After pressing “POWER SUPPLY”, “PRODUCTION” is highlighted. Press “PAGE DOWN” button button to switch “CONSTANT TEMPERATURE” to highlighted state, which means being selected as shown in Fig. 15. Press “RUN” button to confirm entry as shown in Fig. 16. Press “PAGE UP”button and “PAGE DOWN”button to conduct temperature setting. Press “RUN” button to run and Press “SET” Button to exit.

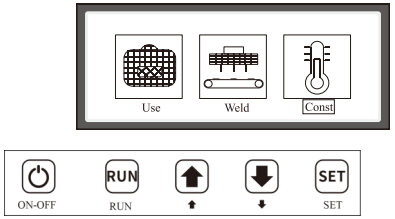

Fig. 15

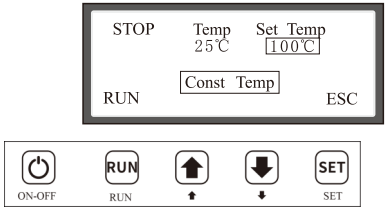

Fig. 16

5. Preset Mode Setting (Temperature and Time Settings Are Only for Reference)

(1) After pressing “POWER SUPPLY”, “PRODUCTION” turns into highlighted state. Press “PAGE UP” button to turn “PRESET” into highlighted state, which means being selected as shown in Fig. 17. Press “RUN” button to confirm entry as shown in Fig. 18. Press “PAGE UP” button and “PAGE DOWN” button to conduct the setting of “Lead Soldering 1”, “Lead Soldering 1”, “Lead Soldering 1” and “Lead-Free Soldering”.

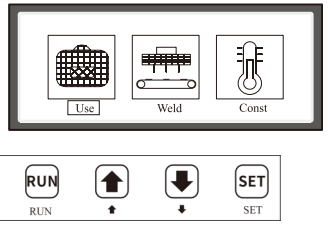

Fig. 17

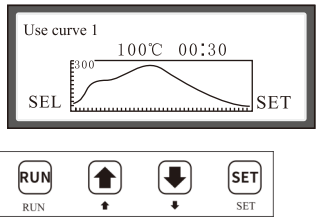

Fig. 18

(2) After selecting “Lead Soldering 1”, press “SET” button to conduct setting as shown in Fig. 19. Press “SET” button to switch “Heating Zone”, “TEMPERATURE” and “TIME”. Press “PAGE UP” button and “PAGE DOWN” button to conduct the setting of “TEMPERATURE” and “TIME”. Press “RUN” button to exit as shown in Fig. 18. Press “RUN” button again to select as shown in Fig. 20. After saving the preset is successful, it will automatically switch to main interface of “PRESET”, “PRODUCTION” and “CONSTANT TEMPERATURE”, as shown in Fig. 17. After entering “PRODUCTION” interface, the time and temperature values are preset values.

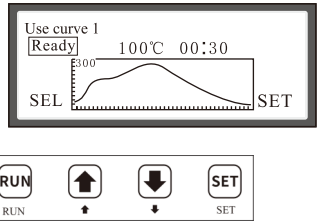

Fig. 19

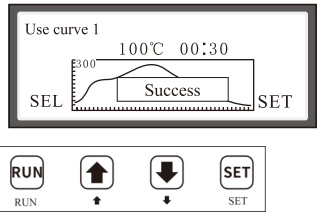

Fig. 20