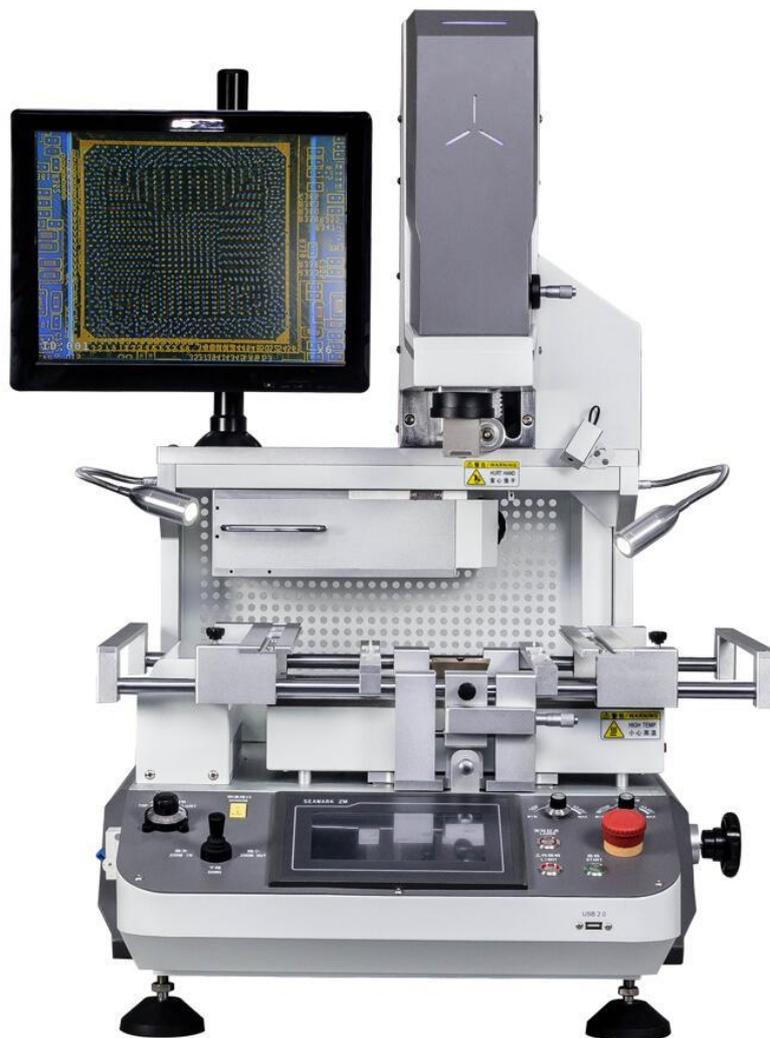


# ZM-R7220A Rework Station

NO.: ZM-SMS-06-08A

## Instruction Manual



---

# Contents

<b>1st 、 Introduction Features</b>	3
<b>2nd 、 installation</b>	4
<b>3rd 、 Product specifications and technical parameters</b>	5
<b>4th 、 Introduce of the main structure</b>	5
(1) Structure description	6
(2) Features	7
<b>5th 、 procedures Installation and operation</b>	7
(1) Use of “setting screen”	11
(2) use of “operation screen”	13
(3) other functions of touch screen	14
<b>6th 、 Operation Basic Introduction</b>	15
<b>7th 、 use of external galvanic</b>	17
(1) Installation	17
(2) function	19
(3) measurement	19
<b>8th 、 Reballing process</b>	20
<b>9th 、 Equipment repair and maintenance</b>	22
(1) Replacement of the upper heating wire	23
(2) Replacement of the lower heating plate	24
(3) Maintenance	25
<b>10th 、 precautions</b>	26
<b>Normal BGA welding and disordering parameters</b>	27

## 1st、 Instruction features

- 1、 Adopt liner slide which make X、 Y、 Z axis all can do micro adjust or rapid positioning with high precisely.
- 2、 Heating system controlled by touch screen, and optical alignment are easy operation to ensure positioning precision.
- 3、 have connect computer device, achievable computer control, convenience for setting, display, save, and printing curve.
- 4、 The excellent temperature control system ensures the effectiveness of welding.
- 5、 There are three independent heating areas from top to bottom. the first and second temperature areas can control many groups & sections of temperature parameters at the same time. The third area preheats the PCB thoroughly to achieve the best welding effect. Temperature, time, slope, cooling and alarming all display on the touch screen.  
The machine used touch-screen interface and PLC control to show the three temperature graphs at any time, so that the temperature error can be controlled within 1°.
- 6、 Use a V-groove equipped with a flexible fixture for PCB positioning to protect the PCB.
- 7、 Use a powerful cross-flow fan to cool PCB rapidly to prevent it from deformation and ensure the welding effect.
- 8、 When the temperature goes out of control, the electric circuit can cut off Automatically, with over-heating protection

## **2<sup>nd</sup> 、 Installation**

- 1、 Be away from flammable, explosive, corrosive gas or liquid.
- 2、 Avoid damp places, the air humidity is less than 90%.
- 3、 Temperature -10 °C ~ 40 °C, avoid direct sunlight, prolonged sun exposure.
- 4、 No dust, fibers and metal particles floating in the operational environment.
- 5、 The place of installation needs to be flat, solid, no vibration.
- 6、 Place heavy objects on the body are strictly prohibited.
- 7、 Avoid the affection of direct airflow, such as air-conditioners, heaters or fans.
- 8、 The back of rework station should be reserved 30CM for heat dissipation.
- 9、 The placing table (900 × 900 mm) be flat, the relative level of a height 750 ~ 850 mm.
- 10、 Distribute wiring must be handled by a qualified professional technician, the main line is 1.5 square feet. Equipment must be well grounded.
- 11、 Switch off the power after use, Power must be disabled if a long-term no need.

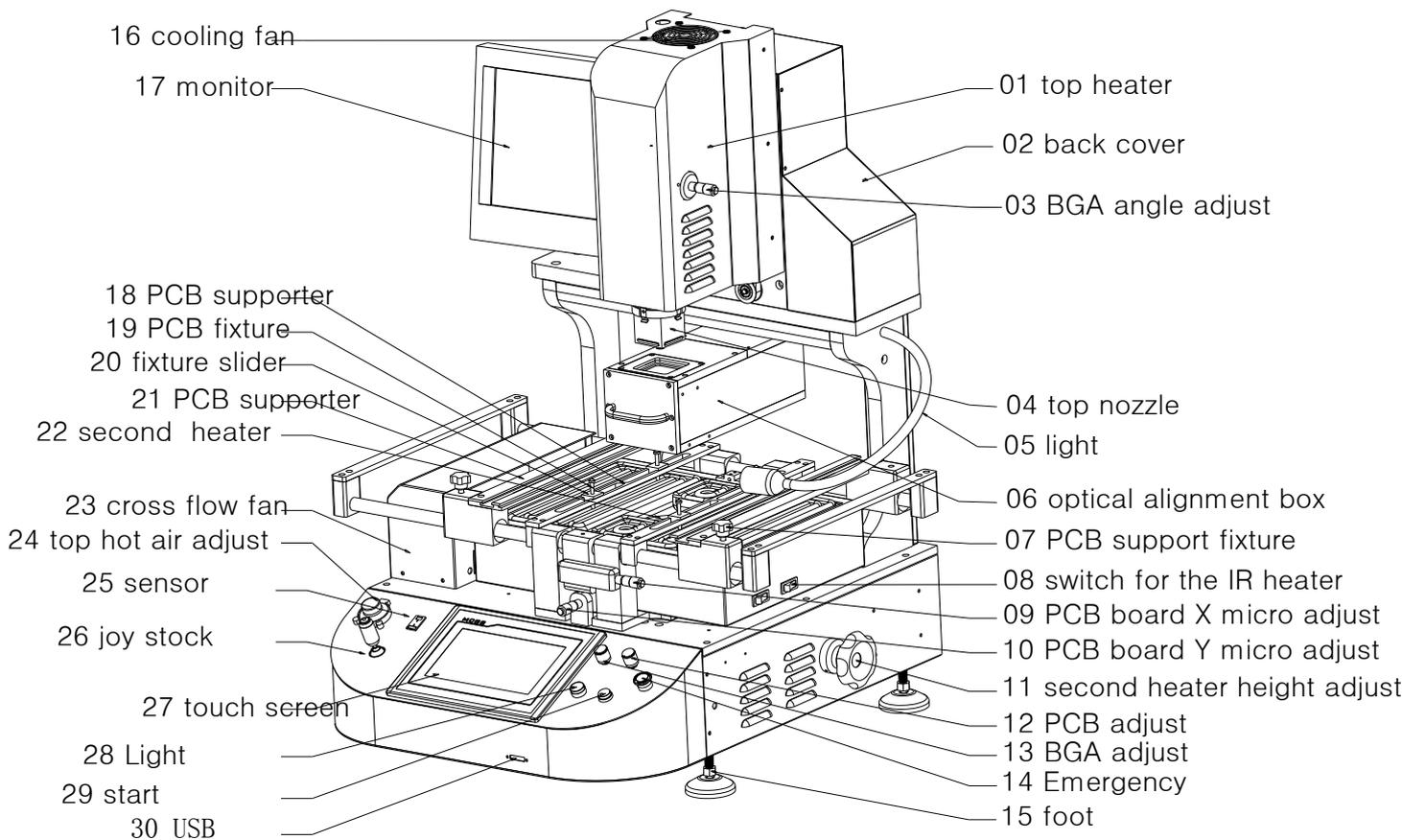
## **3<sup>rd</sup> Product specifications and technical parameters**

- 1、 Power voltage : 220V±10% VAC      50/60 Hz
- 2、 Total power: 5300W    Max
- 3、 Heaters: Top    hot-air heater 1200 W Bottom    hot-air heater 1200 W  
Bottom IR heater 2700 W
- 4、 Electrical materials: Intelligent programmable temperature control system, have connect computer device.

- 5、 Temperature control: K-type thermocouple (Closed Loop): independent control top and bottom temperature, temperature accuracy within  $\pm 3^{\circ}\text{C}$
- 6、 Positioning: V type groove, with universal fixture
- 7、 PCB size: 415x370 mm Max            6x6 mm Min
- 8、 Max 60x60mm    Min 2x2 mm
- 9、 Machine size: 680x640x960 mm
- 10、 Weight : 79kg
- 11、 Color: white

## 4<sup>th</sup> 、 Introduce of the main structure

### (1)、 structure instruction



(II) Function instruction

No.	Name	Function	Method
1	Top heater	Soldering or desoldering BGA	Up and down to the desired position.
2	Back cover	Protect electric elements	Fixed
3	BGA angle adjust	BGA and PCB board position	Adjust forth and back
4	Top heater nozzle	Ensure hot air concentrate on BGA surface	Blow to desired position from BGA
5	Headlamp	lighting	Adjust light position
6	Optical alignment box	BGA and PCB board position	90 degree rotate, pull out when positioning, push back after finished position
7	PCB pallet fixing knob	Fixed PCB position from left to right position	clockwise、anti clockwise rotation
8	Switch of left and right of preheating heaters	On or Off left/right heater.	On or Off
9	PCB board micro adjust X-axis	BGA and PCB board when the X-axis direction of the bit of fine adjustment	PCB to the left rotating clockwise, counterclockwise
10	PCB board micro adjust Y-axis	BGA and PCB board when the Y-axis direction of the bit of fine adjustment	PCB backward spin clockwise, counterclockwise
11	second heater height adjustment	Adjustable height of the lower part of hot air	According to adjust the height of the PCB thickness Light up
12	PCB adjust	Control the brightness of radiation BGA	Brightness of lights rotating clockwise, counterclockwise rotation dimming
13	BGA adjust	Control the brightness of PCB exposure	Brightness of lights rotating clockwise, counterclockwise rotation dimming

14	Emergency	Abnormal or special equipment when emergency stop	Press to stop, clockwise rotation on
No.	Name	Function	Method
15	Foot	Support and adjustable height	Elevated body clockwise, counterclockwise
16	Cooling fan	To cool the air inside the head	Work automatically
17	Monitor	BGA and PCB alignment display images	Good video connector plug, power cord
18	PCB board support	Place the support of the slider	Move around to the right place
19	PCB board supporting bar	Support a larger area of the middle of the PCB, so heat does not distort	Adjust the height of rod
20	Support of the slider	PCB board supporting bar fixed	Determined before and
21	PCB Pallet	Hold up the PCB board	The PCB into the V-groove, moving pallets for clamping
22	Third zone heater	Lower heat when soldering BGA	Put the appropriate nozzle
23	Cross-flow cooling fan	After cooling the PCB heating	Choose manual or automatic
24	Top hot air adjust	Control of the upper part of a heating nozzle size of the wind	Clockwise to increase air flow, counter-clockwise
25	sensor	Measure the actual temperature	Connect an external galvanic
26	Operating handle joystick	Rise and fall on the heater up and down the left and right to zoom	Shaking the handle up and down
27	Touch Screen	Equipment operation control	Hand touch-screen
28	Light	Lighting control	press

29	start	Start heating the external	press
30	USB	Touch screen data transfer	External connection computer

## 5<sup>th</sup> 、 Program settings and operation

**(I)** power to prepare power on:

1. Careful check examination after installed, then switch power on.

(Figure 1)

2. Check the emergency stop button is pressed or not (Note: if emergency stop button is pressed, the device will cut off the control power.)

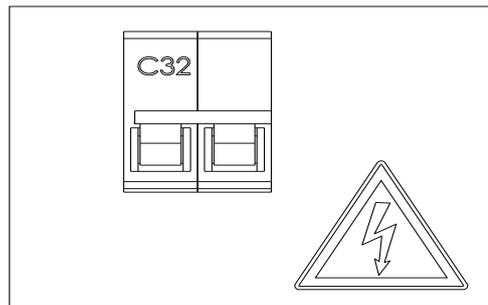


Figure 1

**(II) “Setup ”operate**

1. After power on, the touch screen will be display ( as Figure 2)interface, click “Set up” button, appears number dialog box (figure 3) then input initial password 8888。

Figure 2

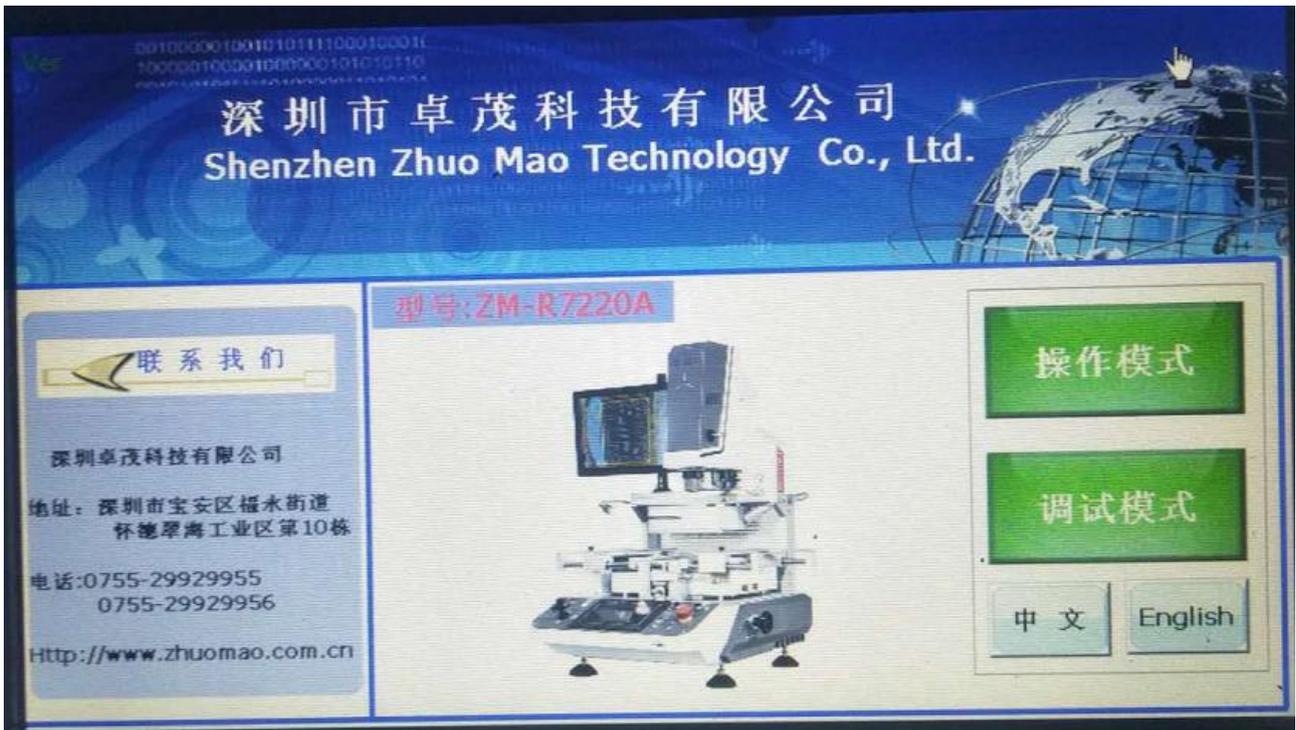


Figure 3

2、input password, click ok, enter “Curve adjust” (Figure 4)。

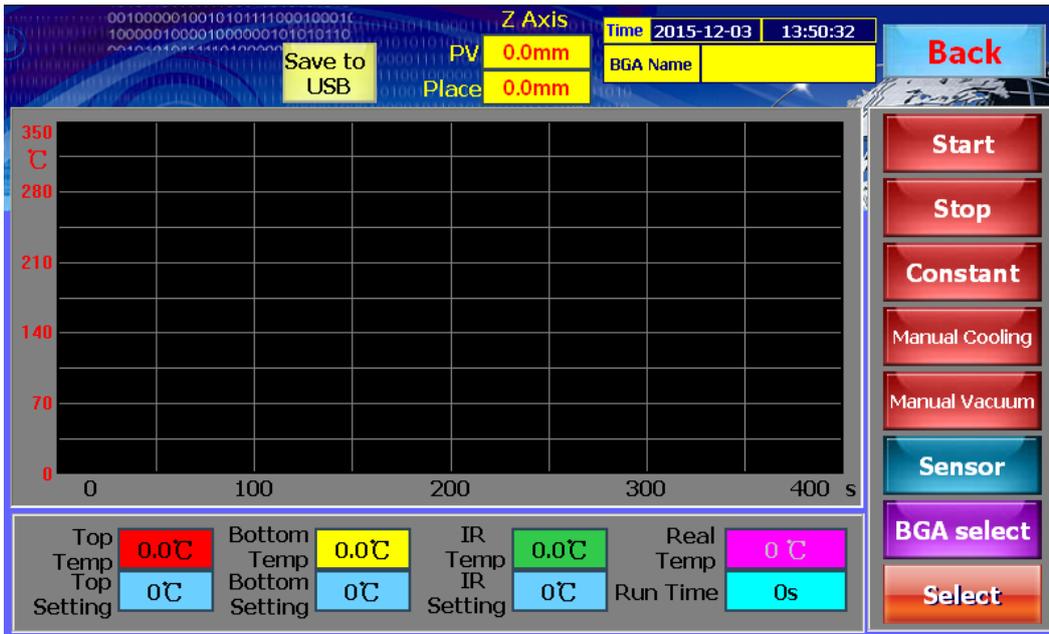


Figure 4 curve adjust interface

**Adjust curve screen introduction:**

**Top heating temperature:** top heating temp. corresponding to the red curve.

**Bottom heating temperature:** Bottom heating temp. corresponding to the yellow curve.

**Top heater setting:** top heater temperature setting 。

**Bottom heater setting:** bottom heater temperature setting。

**IR temperature:** 3<sup>rd</sup> IR bottom heater temperature setting. Corresponding green curve 。

**IR setting :** IR bottom heaters setting。

**Sensor temperature:** shown current sensor temperature。

**Operating time:** recording the time from start to end 。

**Date:** shown current date and timer.

**BGA name:** shown current running group name 。

**Start:** Click start, starting heating。

**Stop:** when machine is heating, click “Stop” to stop heating.

**Cooling :** Cooling System, switch control of the cooling system between manual and Automatic.

(Note: During the heating process, don't allow to open the cooling system.)

**Vacuum:** Vacuum button to control the vacuum。

**Curve analysis:** Screen change button, control switch “curve analysis” 。

**Temperature setting:** Screen change button, control switch “Temperature setting” screen。

**Select model:** model switching button, repeat to click the button, program will “Select” on the menu “Desoldering model” “7220A model” “Mounting model” “Desoldering model” between switching

**Save to U Disk:** there is USD connector, can insert USB and saving current screen (BMP format)。

**Exit:** screen Back button to return to the boot screen。

(Note: the heating curve will show from start to end, and save the curve until the next time start, and re-display the current time temperature curve next time)

3、Click (Figure 4) “Temperature setting”button, then enter“Temperature parameters setting”as (figure 5) shown



Figure 5 temperature set screen

#### 4、Temperature parameters setting introduction

**Top hot-air temperature:** top heater temperature setting window, can be set up to 8 segment, if don't use , setting as “0”

**Top hot-air time:** top heater temperature time setting, if don't use , setting as "0".

**Top hot-air slope:** per segment rising temperature speed, suggest setting at 3,.

**Bottom temperature:** bottom heater temperature setting window, can be set up to 8 segment, if don't use , setting as "0" 。

**Bottom temperature time:** bottom heater temperature time setting 。

**Bottom temperature slope:** per segment rising temperature speed, suggest setting at 3, 。

**IR temperature:** IR heaters temperature setting window, we suggest that don't use multi-segment control 。

**IR time:** IR heating time, we suggest that setting time lager than top heater total time settings 。

**IR slope:** IR temperature rising speed.

Operation: Click on the corresponding need to modify the input box, digital input window will pop up (Figure 6), input parameters and press "OK" button to complete the setup.

**Mounting height :** On "Mounting model", the top heater will down , top heater nozzle vacuum nozzle closely fit together BGA surface, relative to the top (original) distance.

**Advance buzzing:** a heating cycle is completed will buzz in advance

**Buzzing time:** The time of buzzing responses

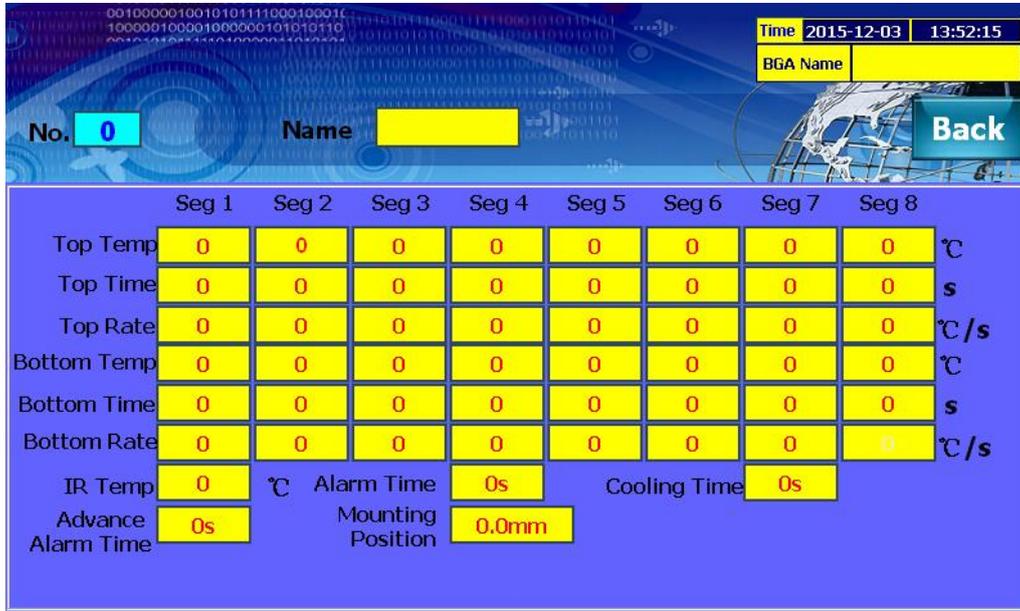
**Cooling time:** after completed the action, is the cross flow fan reaction time

**Name :** group name setting window.

Operation: Click on the yellow box, the screen will pop up sub-window (Figure 6), this

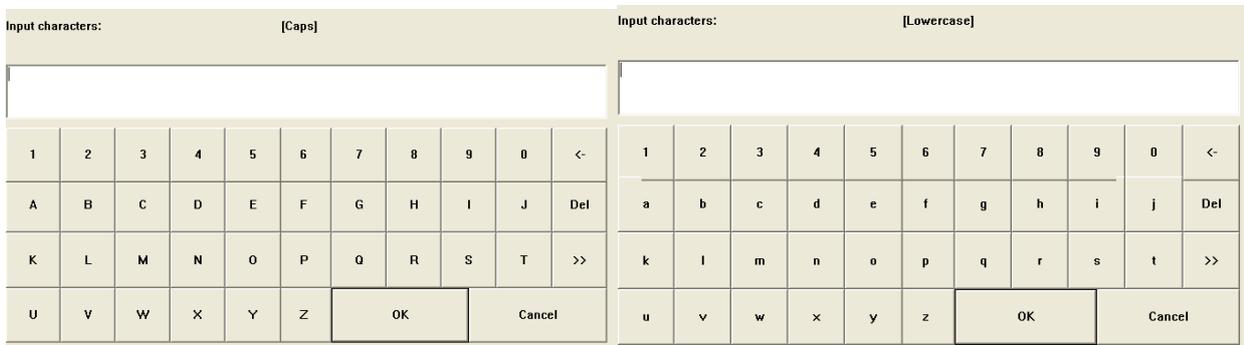
program supports a variety of input methods, click on  (Figure 7) button on the screen, can switch uppercase, lowercase , phonetic, symbols, such as (Figure 8, Figure 9, Figure 10) shows.

### View database:



The screenshot shows a data entry interface with a blue background. At the top right, it displays 'Time 2015-12-03 13:52:15' and 'BGA Name' with an empty input field. Below this, 'No.' is set to '0' and 'Name' is an empty field. A 'Back' button is visible on the right. The main part of the screen is a table with 8 columns labeled 'Seg 1' through 'Seg 8' and several rows of parameters. Each cell in the table contains the number '0'. The parameters and their units are: Top Temp (°C), Top Time (s), Top Rate (°C/s), Bottom Temp (°C), Bottom Time (s), Bottom Rate (°C/s), IR Temp (°C), Alarm Time (0s), Cooling Time (0s), Advance Alarm Time (0s), and Mounting Position (0.0mm).

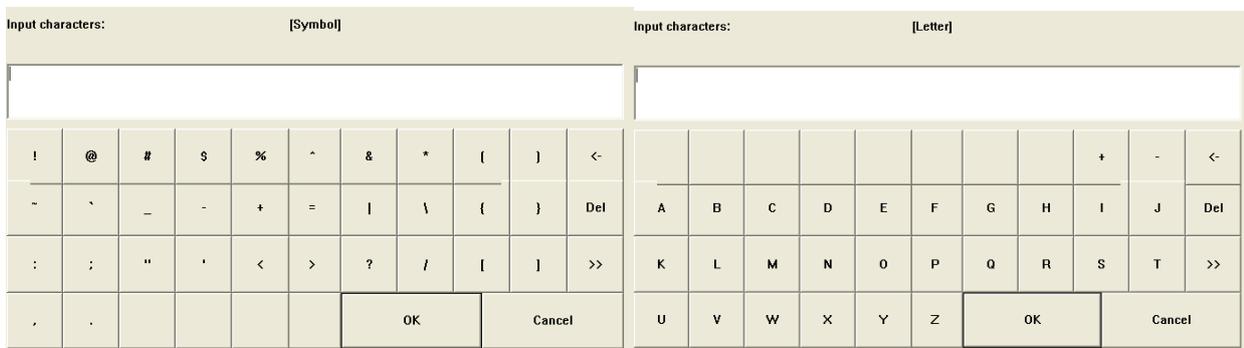
Figure 6



Two screenshots of input character keyboards. The left one is labeled '[Caps]' and shows a standard QWERTY keyboard layout with uppercase letters. The right one is labeled '[Lowercase]' and shows a similar layout with lowercase letters. Both keyboards have an 'OK' button and a 'Cancel' button at the bottom.

Figure7

figure8



Two screenshots of input character keyboards. The left one is labeled '[Symbol]' and shows a keyboard layout with various symbols and punctuation marks. The right one is labeled '[Letter]' and shows a keyboard layout with uppercase and lowercase letters. Both keyboards have an 'OK' button and a 'Cancel' button at the bottom.

Figure 9

Figure 10

**View database:** Click the button will pop up all stored data within the database

information, the screen will pop up a sub-window (Figure 11), within the click data in the screen name, data name was red, indicating that the set of data is selected, then click the sub-window below the "select" button, the group data has been used to the current page.



Figure 11

**Store data to database:** click the button after finished parameters setting, current group will be save to database.

**Note:** when store data to the database, if you modify the name and then to save, the software will default to save other new set of data, if you want to overwrite the data, only modified temperature parameters do not need to change the name click on the "store data to database "button.

“ + ” : reverse the store data.

“ - ” : forward the store data.

**Apply the group data:** click this button will be pop up data (as figure15),shown the temperature are machine will be used .

**Delete the current data:** delete the current seen data.

**Back:** screen Back button, click it to return to " curve adjust screen."

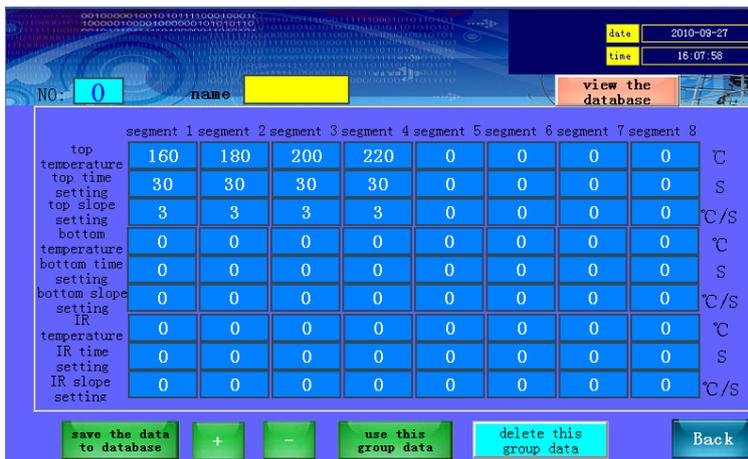


Figure 12

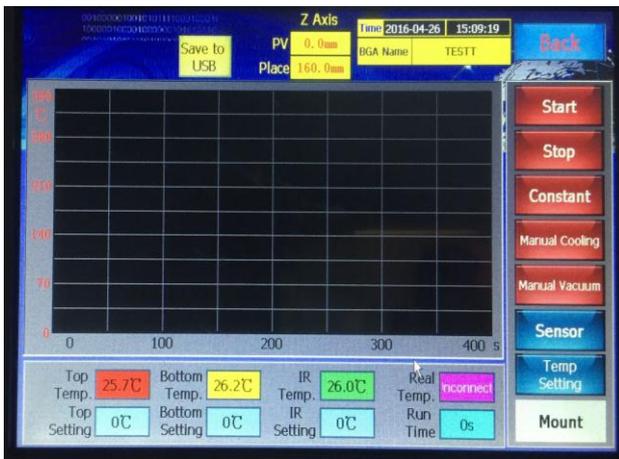


Figure 13: Mount model

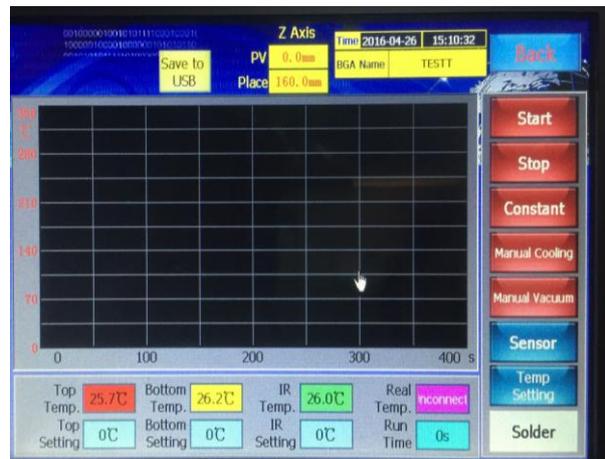


Figure 14: Solder model

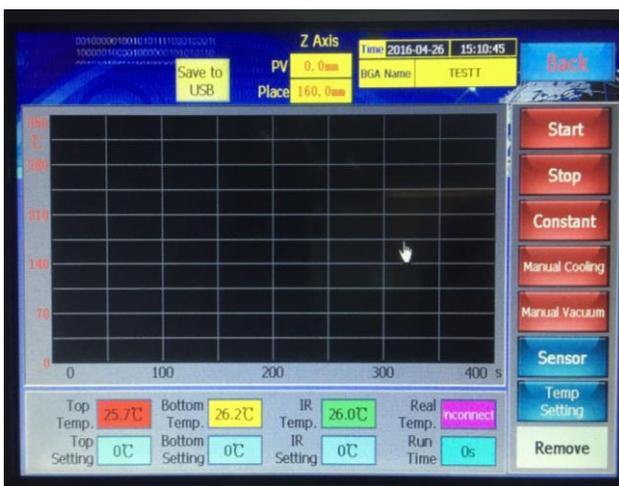


Figure 15: Remove model

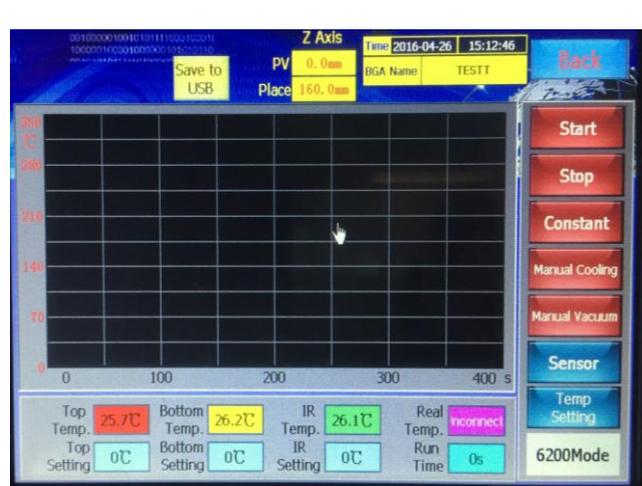


Figure 16: 7220A mode

6. Movement Model introduce:

In order to the user operate in convenient, machine have 4 models of movement: Mounting model, Soldering model, Desoldering model, 7220A Model

**6.1 Solder model:** If need finish soldering model, then the operation steps as following:

1. Make the PCB board BGA pad alignment the bottom heater, and then fixed it well.
2. X-axis locking screw locking, locking the PCB clip, smears some flux paste on the bga pad.
3. Put the BGA chip that have been reball to the BGA pad, manual positioning.
4. Touch screen enter the temperature parameter setting interface (Figure 4), Adopt the suitable temperature parameter that previously has used
5. Upon the adjusting curve interface (Figure 3) switching the working model to "Soldering model" Such as Figure (13), click "Start" button;
6. Top heater will down fast, distance PCB board 5~6cm into the slow motion;
7. when the top heater down to setting "Mounting position" (distance PCB board 2~3mm) stop motion;
8. Automatically turn on the heating process;
9. After finished the heating, top heater will up automatically, return to origin position and stop. setting the touch screen program to ensure the optical lens at the origin position (return status ) to enable automatic movement, work automatically when start or in the work automatically process, if can not perform the specified action, check the optical lens is in the origin position! If it is not the origin, press Stop (Figure 3) let the machine do the origin action.

**6.2 Remove model:** If need desoldering BGA, then the operation steps as following:

1. Make the PCB board BGA pad alignment the bottom heater, and then fixed.
2. X-axis locking screw locking, locking the PCB clip.
3. Touch screen entering temperature parameter setting interface (Figure 4), Adopt the suitable temperature parameter that previously has used
4. On the adjusting curve interface (Figure 3) switching working model to

“Desoldering model” Such as Figure (14), click “Start” button;

5、 Top heater will down fast, while top suction pen will down to the limit position;

6、 When distance PCB board 3cm,the head heater into the slow motion;

7、 when the top heater down to setting “Mounting position” (distance PCB board 2~3mm)stop motion;

8. Suction pen upward movement to the limit position;

9、 Automatically turn on the heating;

10、 After finished the heating, suction pen down and begin breathing movement;

11、 When suction nozzle down to “lower limit position” (suction nozzle closed to BGA), stop do downward movement;

12、 Delay 1S and the suction nozzle absorb BGA, turn upward movement to suction nozzle limit stop ;

13、 Top heater upward movement, until stop the origin position ;

14、 Delay 5s, stop breathing motion, BGA is released, in that time pls attention to catch BGA.

**6.3 Mount model:** accurate positioning and soldering BGA process, operation steps as below:

1、 Make the PCB board BGA pad alignment the bottom heater, and then fixed, smear some solder paste on the BGA pad;

2、 X-axis locking screw locking, locking the PCB clip.

3、 Put the BGA chip that have been reball to the BGA pad;

4、 Touch screen entering the interface of temperature parameter setting (Figure 4), Adopt the suitable temperature parameter that previously has used

5、 On the adjusting curve interface (Figure 3) switching the working model to “Mounting model” Such as Figure (12), click “Start” button;

6、 Top heater down movement, while head suction pen down to suction pen limit position;

7、 Motion to setting “Mouting position” stop, turn on breathing motion, suck BGA up;

8、 Top heater upward movement and come back to limit position(original);

9、 Next, top heater downward movement to “Optical position”;

10、 Pull out the optical alignment system by manual as the Figure (16), in that time will show BGA bottom pad and PCB board with two interlaced images on the CCD monitor.

11、 As Figure (16) you can adjust the focus of optical lence in the arrow position ;

12、 Adjust PCB board X、 Y axis micro-adjust knob(Figure 18) and BGA micro-adjust knob (Figure 17), make two images together completely, and the positioning is finished very well ;

13、 after finished the positioning, turn the optical system back to the origin position, and click Figure (12) positioning completed knob;

14.Heater downward movement, reach” Mounting position”, breath motion is stop, BGA is putted on the corresponding pads in accurate, suction agency upward to limit position, top heater down micro-movement, perform the heating operation;

15、 heating completed, head heater upward and turn to origin position ; BGA 被 soldering on the PCB pad;

16、 At this time, all of process for Mounting is finished;

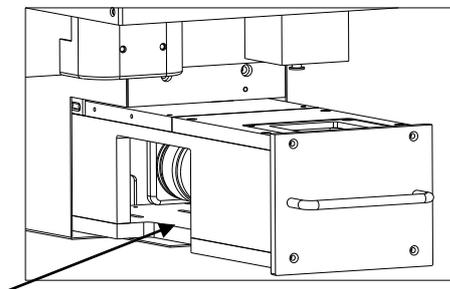


Figure 16 Optical lence

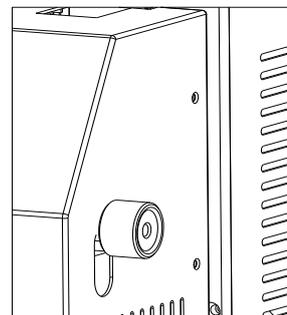


Figure 17 head BGA rotation micro-adjust button

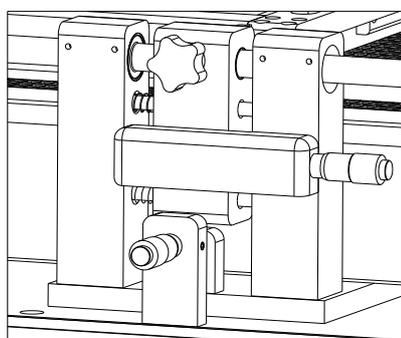


Figure18: PCB clip micro-adjust knob

## 6.4 7220A Model: the manual model

5、description the parameter settings (take picture 12 as an example)

1) **Preheating section:** when you start the program, the top heater will enter the process of heating, the slope of it is 3 degrees per second, when it reaches to 165°C (the temperature setting of preheating section ), keep this temperature for 30 seconds (the time setting of preheating section, till now, the preheating section is finished, then the top heater will enter the next work process—insulation section.

The bottom heater start to heat from room temperature, the heating slope is 3 degrees per second, when it reaches to 165°C (the temperature setting of preheating section ), keep this temperature for 30 seconds (the time setting of preheating section, till now, the preheating section is finished, then the top heater will enter the next work process—insulation section.

**IR preheating:** Set 180°C, it means that the IR heating plate will be heated to 180°C, and then keep it.

2) Insulation section: The slope of the top heater is 3 degrees per second, start from 165°C to 195°C, then keep it for 30 seconds.

The slope of the bottom heater is 3 degrees per second, start from 165°C to 190°C, then keep it for 30 seconds.

3) Heating section: The slope of the top heater is 3 degrees per second, start from 195°C to 225°C, then keep it for 30 seconds.

The slope of the bottom heater is 3 degrees per second, start from 190°C to 225°C, then keep it for 30 seconds.

**4,5) Welding 1、welding 2 and cooling section** are same as above.

The process of actual temperature control of this system can be less than the maximum control sections (6 sections). During the heating process, if you do not need to use the control section, then you can set 0 to close it.

### (III) “OPERATION”

1. Back to the boot screen, (Figure18); click “OPERATION”, (Figure18), then it will show operation curve screen. (Figure19)



Figure 2



Figure 13 operation screen

**BGA options:** Select the data stored in the database, click the button to pop up a list of stored data and information sub-window (BGA choice, as Figure 14), then click the data group name (the text will become red color after selected), and then click “select” button at the window, the selected data will automatically switch to the interface in Figure 15, this set of data is the operating parameters; in the Figure 15 screen click on the "Back" button, the screen switches back to Figure 13

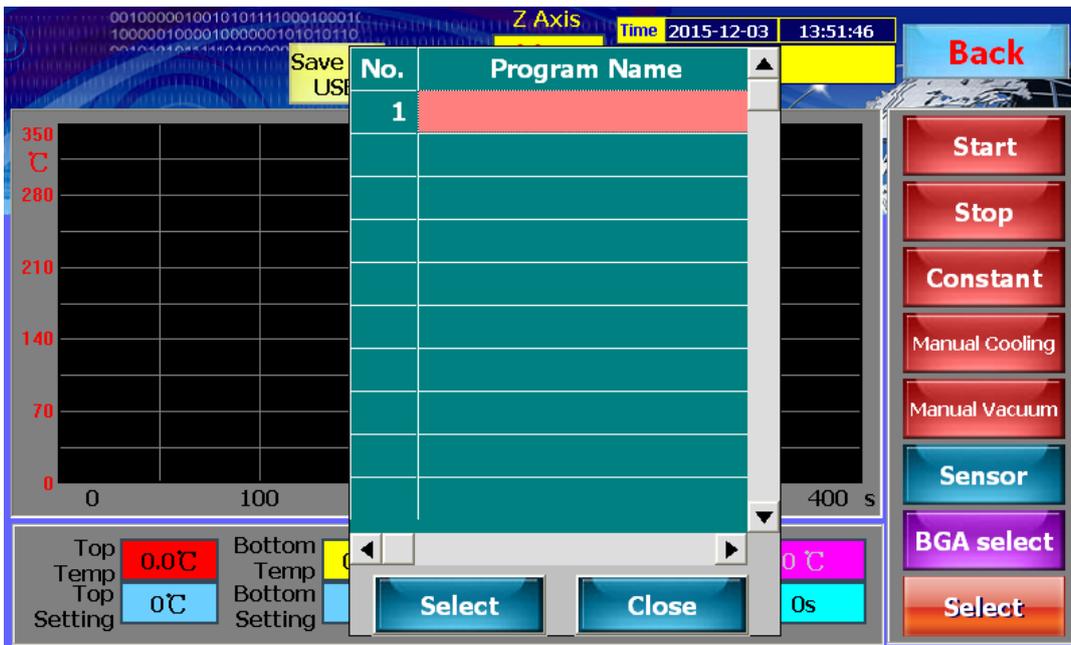


Figure 14

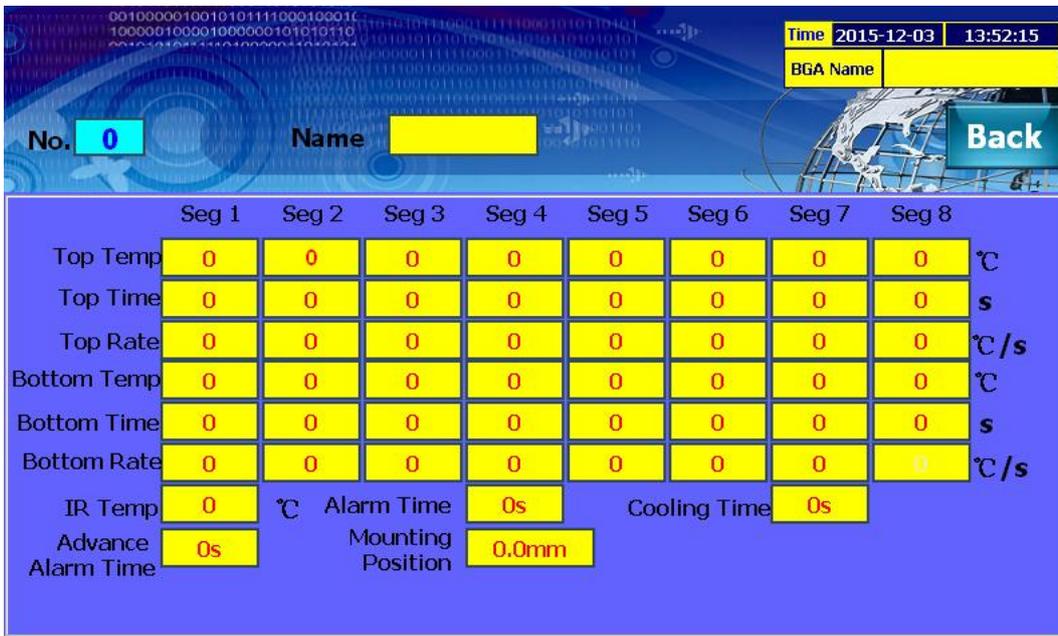


Figure 15

**Stated:** "Operating mode" and "set up mode" of operation are basically same, the difference is below:

“**Set up mode**” the user have rights ( need input password ) to set or modified each parameter.

“**Operation mode**” the user haven’t right ( need input password ) to set or modified each parameter. Except operate according set parameters.

o

## 6<sup>th</sup> 、 Operation Basic Introduction

(I) Removing process:

### 1) Work flow:

Power on → Place PCB on PCB supporter → front forward Joystick → adjust position  
→ Fixed the splint → Start

### 2) Detailed description:

- 1、 put the BGA pad align bottom heater, Fixing the PCB on the PCB supporter;
- 2、 Fixed PCB board by locked screw of X aisle;
- 3、 Choose the proper nozzle according BGA chip, adjust the joystick to make the top heater fall down to the distance 3~5mm from PCB board.。
- 4、 press “start” to run, machine will be automatic heating.。
- 5、 after finished heated, press“vacuum ”, make the sucker point sucked up BGA, rising the sucker point to proper position, take out BGA after cooling.

## **(II)Soldering process:**

### 1) work flow:

Power on → Place PCB on PCB supporter → Front forward Joystick → adjust position  
→ Fixed the splint → Start

### 2) Detailed description:

- 1、 Place the PCB on the PCB splint, coating proper flux paste on the BGA PAD, choose the proper nozzle according BGA size;
- 2、 Front forward Joystick, stop when nozzle approaching BGA, then adjust alignment, make the center of BGA pad aligns nozzle, adjust X axle fixing screw of PCB splint, to fixed PCB board;
- 3、 Put the balled BGA chips on the PCB pad;
- 4、 Choose the proper nozzle according BGA chip, adjust the joystick to make the top heater fall down to the distance 3~5mm from PCB board.
- 5、 press “start” to run, machine will be automatic heating
- 6、 after finished heated, top heater will automatic rising up to original position and stop there.

7、cooling fan start cooling.

8、welding are finished.

### **(III) mounting process:**

1) work flow:

Power on → Place PCB on PCB supporter → Place BGA → adjust position → Fixed the splint → Front forward Joystick → sucking BGA → Go Back Joystick → optical alignment  
adjust image

2) Detailed description:

1、make the BGA soldering pad aligns nozzle, then fixed it on the PCB splint, coating proper flux paste on the BGA welding pad;

2、fixed X axle screw, locked PCB splint;

3、Put the balled BGA chips on the PCB pad;

4、operate joystick to front forward, make the sucking point touched BGA, press "Vacuum" to sucking BGA;

5、go back the joystick, let the sucker point with BGA to rising up proper position;

6、Drag out optical alignment to proper position (BGA center);

7、adjust image, operating joystick from left to right as zoom in and zoom out, micro control X,Y axle and R angle to got more clear image。

8、push back optical alignment to original position, and there is magnetic positioning。

9、Front joystick, top heater fall down to put BGA on correspond welding pad, then start heating;

10、after finished heated, top heater will automatic rising up to original position; BGA has welded on PCB;

11、So far, the mounting process are finished。

## **7th 、 The use of external measuring galvanic**

### **1、 Function**

(1)、More accurate to measure the actual temperature of the part to be heated during the welding process.

- (2)、 It is easy to move, so that it can be convenient to measure the temperature of the different parts of the welded components during the heating process.
- (3)、 After installing galvanic correctly, it will display the galvanic current measurement temperature in the touch-screen outside the measured temperature curve screen "measured" column.

## 2、 Installation

- (1)、 Check the galvanic lines, whether there are disconnected phenomena or not.
- (2)、 Insert the galvanic Plug into the "outer galvanic Socket" on the control panel according to the positive and negative mark.
- (3)、 After GALVANIC installed correctly, the real temperature of the outer temperature curve screen of the touch screen will show the temperature of the GALVANIC.

## 3、 Measurement

- (1)、 PCB board will be installed on the rework station, with the galvanic fixed on the PCB board using foil stickers. (As shown in Figure 12)
- (2)、 Adjust the height of the probe with the probe galvanic head located in the top 1-2mm of the test site (as shown in Figure 13)



Figure12

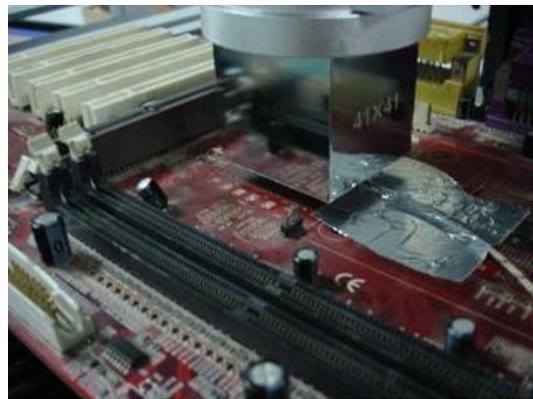


Figure13

- 3、 Adjust the related mechanical adjustment knob, so that the heating part just below the hot-air tube. (As shown in Figure 13)
- 4、 Adjust the up and down adjustment knob of the hot-air head to make the distance between the edge of PCB board side and the hot-air head is 3-5mm.
- 5、 Implementation of the welding / disordering process, that is to start the process of upper and lower heater.
- 6、 Then it will show three curves of the green and red and yellow on the computer

monitor screen (picture 14)

- (1)、 Curve 1, the actual measurement temperature of the internal galvanic of the top heater (green)
- (2)、 Curve 2, the actual measurement temperature of the external galvanic curve (red)
- (3)、 Curve 3, the actual measurement temperature of the internal galvanic of the bottom heater (yellow)

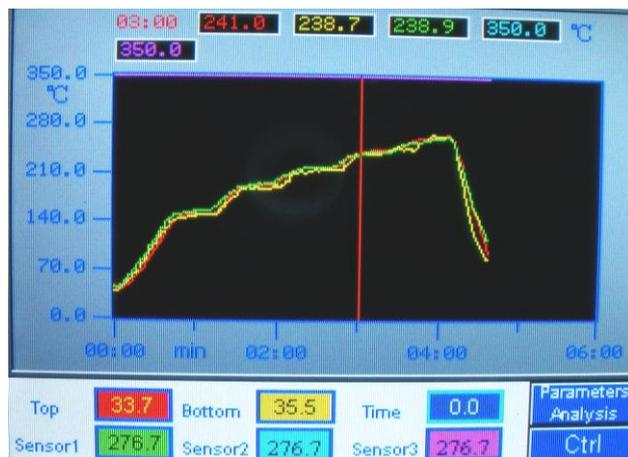


Figure14

#### 4、 Using the outer galvanic to adjust the temperature curve

Statement: In this operation, it may be due to improper operation to cause the temperature deviation of the device or even lose control, please caution!

Take the upper hot-air tube as an example to make detailed description of adjustment method

- (1)、 Set the temperature, the time, the slope and so on parameters of the upper heater
- (2)、 Adjustment process proposed to do on a waste circuit board in order to prevent damage to the circuit board and on-board electronic components.
- (3)、 Implementation of the above process (3), installed the outer measured galvanic, in which the top of the PCB board just below the hot-air tube.
- (4)、 Close the lower part of the heating process, click on "Start" button to start the heating process, which will on the computer monitor screen will be displayed on the upper curve of the measured temperature (green) and external galvanic measuring temperature (red) the two curves
- (5)、 Green curves represent the actual measurement of the galvanic temperature curve of the upper heating wire inside, the red curve represents the actual measurement of the

galvanic temperature outside. the smaller the gap between the green curve and red curve, the closer between the actual temperature and set temperature of the heating parts, more standard of the upper heating process; On the contrary, the greater the gap between the two curves, the greater the actual temperature deviate from the set temperature, the more non-standard of the upper part during the heating process.

6、 If the deviation between the two curves is too much, you should make the appropriate adjustments

7、 The specific adjustment method is as follows, because of the impact of the system processes and the environmental, deviations in the objective is inevitable. If the temperature deviation does not affect the normal welding and desordering, non-professionals should avoid the following corrective actions!

A If the outer galvanic curve (red) lower than the upper one (green), adjust the internal hairdryer galvanic probe upward;

B If the outer galvanic curve (red) higher than the upper one(green), adjust the internal hairdryer galvanic probe downward;

C Adjustment must be small, try to control the amplitude of accommodation in 1mm or less;

D Repeated several adjustments;

E During adjustment process, the heated of galvanic probe is strictly prohibited from contacting with any objects, so as not to affect the accuracy of measuring temperature;

F After temperature adjustment, you should fix the probe, to avoid the probe vibration measurement of the temperature of the equipment

G The method of the adjustment applies only to the two parallel curves in a smooth uniform deviation, and it is invalid to the temperature which is from top to bottom jitter free-laws regulating!

H The upper part of the internal galvanic Duct location: Remove the upper heater nozzle, at a distance of 2-3cm at the edge wind-cone .

I operate the standard procedure to avoid the high-temperature burns!

8、 There is no booster thermocouple temperature curve on the bottom of the computer

screen, so you have to adjust the process of the lower part of the heaters by visual.

9、 fixed the galvanic line with foil stickers on the bottom of PCB board (as opposed to the upper heater set back on the PCB board), so that the probe of the booster thermocouple is located just 2mm above the mouth of the bottom hot-air nozzle, and adjust the mechanical parts, make the upper hot-air nozzle deviate from the heated parts to avoid cold air affect the temperature of the heated parts.

10、 The caution is same as the top heater.

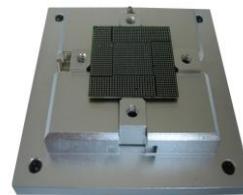
11、 The methods of adjustment:

A If the outer temperature is lower than the bottom, you should adjust the lower internal galvanic probe downward.

B If the outer temperature is higher than the bottom; you should adjust the lower internal galvanic probe upward.

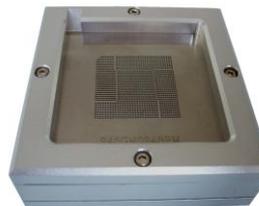
## 8th 、 Reballing Process

1、 Fix the BGA chip on the base of our universal station; Adjust the four slipper blocks to fix the it on the center of the reballing kit.



reballing chip to make

2、 Select the appropriate steel mesh according to chip type. Fix the steel mesh to the ceiling cover and tighten it with 4 M3 screws, covered with lid. Adjust 4 Jimmy on the base to meet the suitable height



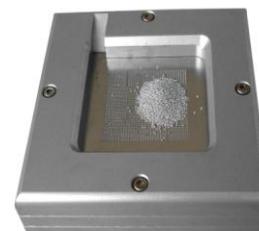
Fix the type. Adjust required.

3、 Observe the hole on steel mesh which should be coincide with the solder holes on BGA. If not we must remove the cap to reposition to ensure holes aligned with the chip, and then lock the four screws.

completely coincide, steel mesh

4、 Locking two no spring fixed slide, remove the BGA chip and coated with a thin layer of solder flux, card the chip into the base again, covered with lid(make sure the right direction).

5、 Put into solder ball, clench hands and gently swaying station to ensure the solder ball completely filled in

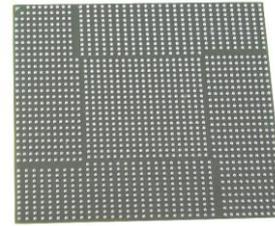


reballing the holes

and pour out extra solder balls.

6、 Place the rebalancing station on the flat location; Remove the lid, carefully scored BGA chips. Observe the chip, if individual solder balls are not in the hole rightly, please correct it with forceps.

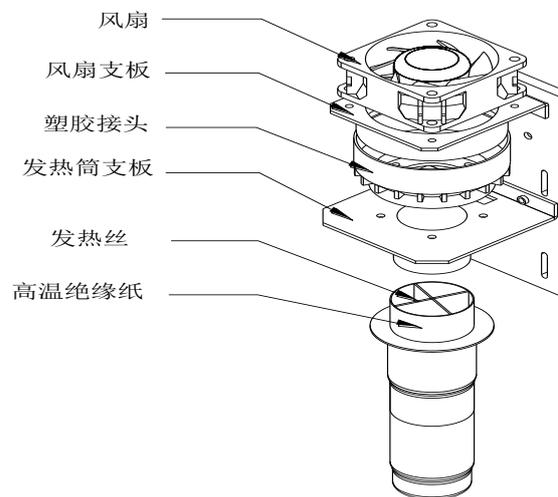
7、 It is convenient to use our different types of repair welding machine to fix solder ball. Heat solders the BGA to soldering it on BGA, thus rebalancing



stations or balls on finished.

## 9th 、 Repair and Maintenance

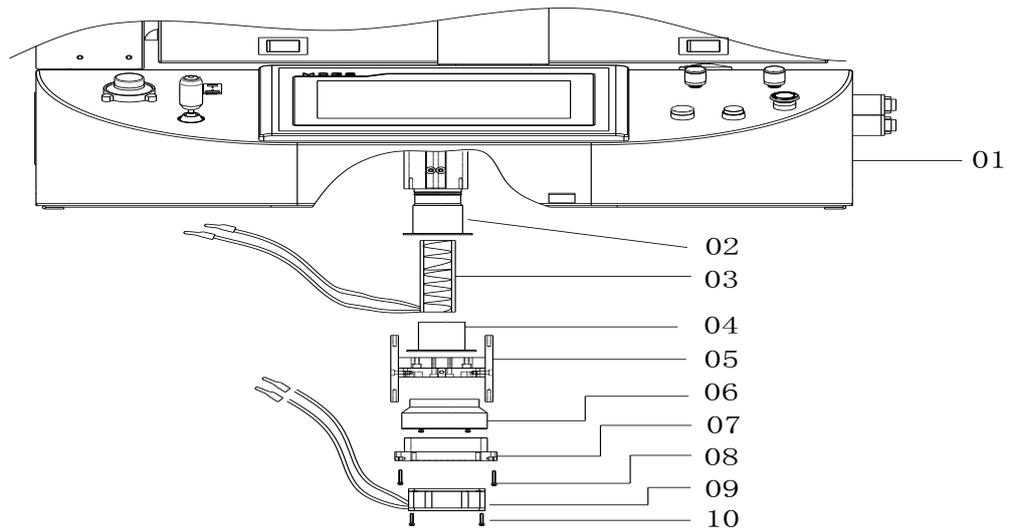
### (I) Upper heater: (Pictured)



1. Turn off the power supply, wait until the machine is cool down;
2. Replace the fan: take off the cover of top heater, then change the fan.
3. Then replace the cover, fan, fan splint, plastic connector, heating tube, take off the heater and replace heater. ( as figure ) .

**Noted:** It must be use high-temperature insulation paper to wrapped heating wire when replace it.

### (II) Replacement of the lower hot-air heating wire:



01	Body	02	Heating tube	03	heating tube
04	Heater fixture	05	assembly shelf	06	plastic connector
07	Fan fixture	08	Bolt of Fan fixture	09	Fan
10	Fan bolt				

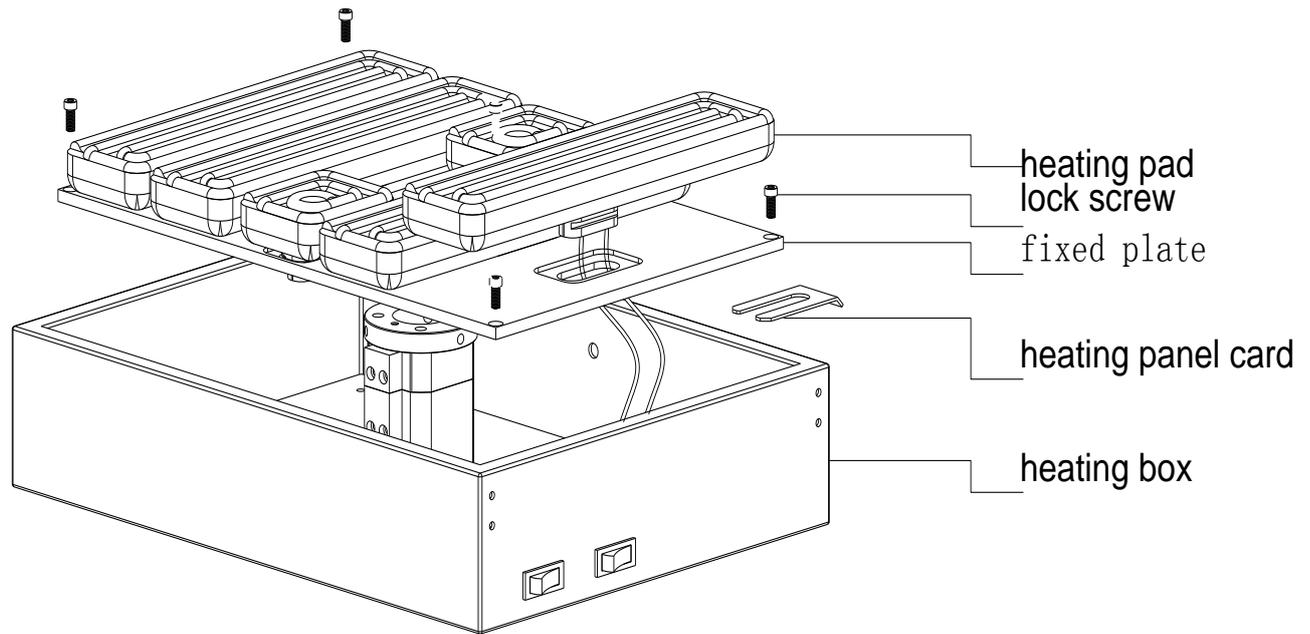
### **Replacement of Bottom heating wire:**

1、 Dismantle the locking bolts (10), careful overturn body of machine, then the components are shown.

2、 Remove fan and fan fixture, plastic connector, heating wire fixture, then take off the heating wire to replace.

**Noted: It must be use high-temperature insulation paper to wrapped heating wire when replace it.**

**(III)Bottom (3td heating area) heater replacement (as figure):**



#### 1、 Replacement of heating plate:

- 1). Remove the heating box cover, demolition of locking screws (4), remove the heating plate and the assembly of the fixed plate, placed on the table which is covered with a sponge (with heating plate surface facing down).
- 2). Removed the fixed heating plate card, you can break down the fixed plate and heating plate assembly, remove the heating plate then it can be replaced.

### **(IV) Machine maintain**

- 1、 Always keep slider clean;
- 2、 Optical system do not remove at random, use the fabric with alcohol to clean.
- 3、 frequently cleaning heating plate, PCB split. Use cloth with alcohol wrap surface of machine after heaters fully cool.

### **(V) transmission maintain**

- 1、 drive screw rod must be regular clean( at least once one month) and add lubricant oil, use dry cloth to wrap;
- 2、 top slider rail and optical slider rail: always keep surface clean,,without sundries. Regular (at least once one month) add lubricant oil;

3、 regular check each transmission part; if there are loose, injure and etc.

## **(VI) electronic maintain**

1、 always keep display and touch screen clean, use the detergent to clean;

2、 regular check circuit, replace old one in time ;

3、 always keep the optical system and top heater and Photoelectric switch

Always avoid dusty pile up to dysfunction 。

4、 regular check the leakage switch sensitivity, ensure safety.

## **10th 、 safety precautions**

(1)、 BGA Rework Station ZM-R5860 use AC220V power, working temperature may up to 400 °C, Improper operation may cause damage to the equipment and even endanger the safety of the operator. Therefore must strictly abide the following:

1)、 The power supplier for this machine is  $\sim 220V$ , the total power is 4700W; So before you use it, you have to check your power supplier is suitable for this machine.

2)、 No directly fan or other blowing air to the station when working, otherwise it may cause damage to the equipment or components as the distortion of heater thermometric;

3)、 prohibited flammable gases or liquid around the machine; After booting, forbidden combustibles touch high temperature district and peripheral metal parts, otherwise it will easily cause fire or explosion;

4)、 To avoid high temperature scald, forbidden touching high temperature fever zone during working. PCB board still warm when completed, operation process should take necessary protective measures;

5)、 PCB board should be placed on V type support shelves and used slider pairs to support PCB board in the centre;

- 6)、 Metal or angular and sharp objects are avoided on touch screen surface;
- 7)、 upper and lower heater inlet must not be blocked, otherwise heating wire will be damaged;
- 8)、 After work, please guarantee natural cooling for 5 minutes, then Switch off;
- 9)、 if metal objects or liquid fall into rework station during working, you should power off immediately, unplug power plug, until it cooled, then eradicate litter and dirt; it will be influenced if grease on the heating panels and accompanied by odor when rebooting. Please keep the machine clean and timely maintenance.
- 10)、 when appears abnormal warming or smoke on the machine, immediately disconnect power and notify technical service personnel to repair it; Remove the connections data line between computer and devices, hold the plug to unplug the data line, to avoid damaging internal connection.

## **Normal BGA welding and disordering parameters (for reference)**

### **1、 The temperature curve of lead welding**

41\*41 the temperature setting of the BGA welding:

	preheating	insulation	heating	welding1	welding2	cooling
upper	160	185	210	235	240	225
time	30	30	35	40	20	15
bottom	160	185	210	235	240	225
time	30	30	35	40	20	15
slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR	180					

38\*38 the temperature setting of the BGA welding :

	preheating	insulation	heating	welding1	welding2	cooling
upper	160	185	210	225	235	215
time	30	30	35	40	20	15
bottom	160	185	210	225	235	215
time	30	30	35	40	20	15
slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR	185					

31\*31 the temperature setting of the BGA welding :

	preheating	insulation	heating	welding1	welding2	cooling
upper	160	180	200	215	225	215
time	30	30	35	40	20	15
bottom	160	180	200	215	225	215
time	30	30	35	40	20	15
slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR	180					

The upper is the reference temperature of the lead BGA

## 2、 The temperature curve of Lead-free welding

41\*41 the temperature setting of the BGA welding :

	preheating	insulation	heating	welding1	welding2	cooling
upper	165	190	225	245	255	240
time	30	30	35	55	25	15
bottom	165	190	225	245	255	240
time	30	30	35	55	25	15
slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR	210					

38\*38 the temperature setting of the BGA welding:

	preheating	insulation	heating	welding1	welding2	cooling
upper	165	190	225	245	250	235
time	30	30	35	45	25	15
bottom	165	190	225	245	250	235
time	30	30	35	45	25	15
slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR	210					

31\*31 the temperature setting of the BGA welding:

	preheating	insulation	heating	welding1	welding2	cooling
upper	165	190	220	240	245	235
time	30	30	35	40	20	15
bottom	165	190	220	240	245	235
time	30	30	35	40	20	15
slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR	210					

The upper is the reference temperature of the lead-free BGA

Such as set 0 when the demolition of the cooling section of BGA.