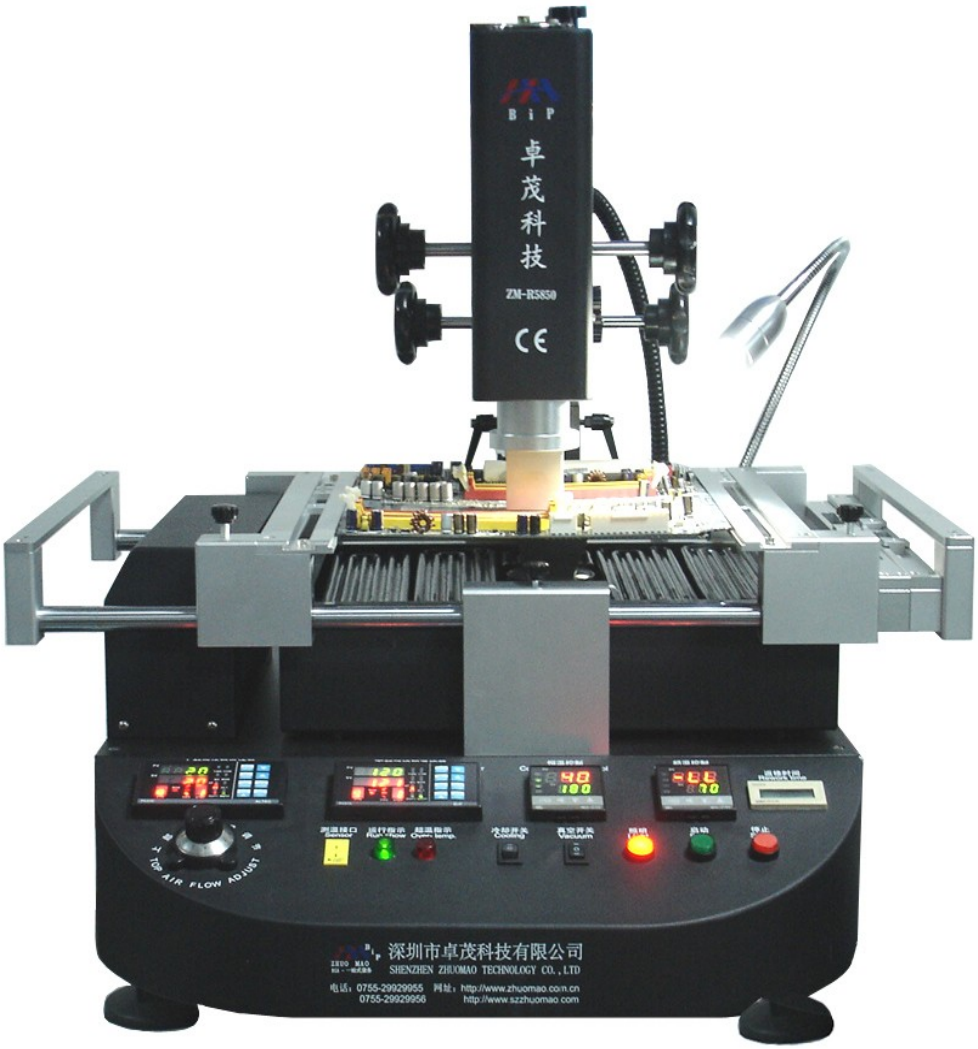
SHENZHEN ZHUOMAO TECHNOLOGY CO., LTD.

Seamark ZM

Manual Zm-R5850



NO.：ZM-SMS-05-03

Address: Building A3, 4th Floor, Donghua Industrial Park, Sanwei

Section, Bao'an Road, Bao'an, Shenzhen, China
Telephone： 0755-29929955 29929956 Fax：0755-29929953
Http://www.szzhuomao.com E-mail:bga29929955@126.com

Preface

Shenzhen ZhuoMao Technology Co., Ltd. is a high-tech enterprise involved in research, development, production and marketing. Since its establishment, with strong technical force, faithful business philosophy, a sound sales network, comprehensive and thoughtful after-sales service, through the absorption and the introduction of foreign advanced technology, we improved ourselves and won customers trust & supports in the field of BGA rework systems and peripheral auxiliary equipment.
Company's product are sold in most cities in China and exported to Japan, South Korea, North Africa, Vietnam, Southeast Asia, the Middle East, Europe and the United States etc. We got a strong vitality and higher visibility in the same industry. Our company will continue adhering to the idea of "profession, innovation and integrity", to provide our customers with more efficient high-quality and convenient services! Your smile is always Zhuomao’s constant pursuit.

- Thank you so much for choosing BGA rework station ZM-R380C of Shenzhen ZhuoMao Technology Co., Ltd.
- Before you operate the machine, please read the manual book carefully to make sure of the safety and Superior performance of the machine.
- As technology continues to update, Zhuo Mao Technology Co., Ltd. has the right to modify specifications of the product before notice.
- Please take care of the accessories of the machine.
- If you have any doubt and special requirements of this equipment, you may contact with our company at any time.
- The Company reserves the final right to interpret the Manual.

Contents

1st 、 Features of ZM－R5850

1、 Adopt linear slide so that X, Y, Z axis can make fine tuning or make rapid positioning movements.

2、 This machine can be connected to a computer to be controlled more conveniently with a built-in PC serial port and proprietary software attached to it. It will easy to set, show, save and print the curve.

3、Choose imported high-precision K-Sensor and closed-loop to detect the up/down temperature precisely. Unique design of three heating areas operates independently to control temperature more accurately.

4 、First / second temperature areas heat independently, which can set up 8 rising temperature segments and 8 constant temperature segments to control. It can save 10 groups of temperature curves at the same time. The temperature can be controlled in ±3℃.

5、Use a V-groove equipped with a flexible fixture for PCB positioning to protect the PCB from deformation when heated or cooled.

6、 Use a powerful cross-flow fan to cool the PCB rapidly to prevent it from deformation and ensure the welding effect.

7、After finishing desoldering & soldering, there is an alarming. When the temperature goes beyond control, the electric circuit can cut off automatically, with over-heating protection.

.

2nd 、 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 ℃ ~ 40 ℃, 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.

3rd 、Specifications

1、Power supply: 220V±10％ VAC 50/60 Hz

2、Power consumption：4800W Max

3、heaters：Top heater 800 Wbottom heater 1200 W
IR 2700 W

4、Electric material：PLC，support computer communication.

5、Temperature control: K-type closed-loop thermocouple, top and bottom heating independently, temperature error ±3℃

6、Positioning: V-groove fixture for PCB positioning

7、PCB size : 410×370 mm Max22×22 mm Min

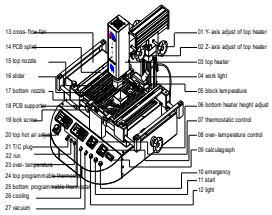
8、Machine dimension：710×680×660mm

9、Weight：40kg

10、Machine color：Black

4th 、main structure description

(1)、 Structure description



Features

NO.	Name	Function	Use method
1	Y-axis adjust of top heater	Adjust the top heater	Right-back，left-forward
2	Z-axis adjust of top heater	Adjust the top heater	Right-up，left-down
3	Top heater	Heating BGA when welding	Adjust through Z-axis
4	light	Work lighting	
5	Block temperature		
6	Height adjust of bottom heater	Adjust the lower height	Adjust to a suitable place

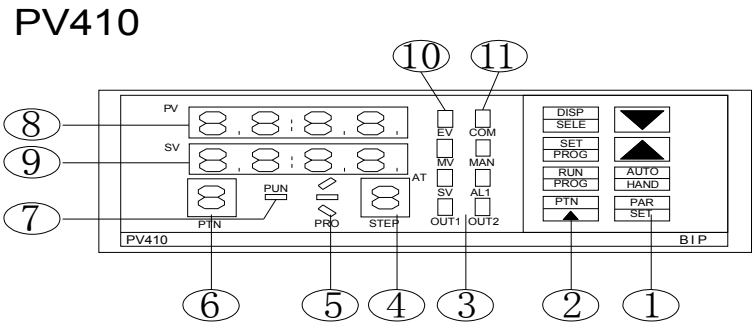
7	thermostatically control	To set the procedures	Over-temperature control
8	Over-temperature control		According to setting
9	calculagraph		
10	stop		
11	Start switch		
12	Lighting switch		
13	Crow-flow fan	Cool the PCB after heating	
14	PCB splint	To hold up PCB board	
15	Top nozzle	Make hot air focus on BGA	Make a suitable place to BGA
16	Slider	Lock screw to support PCB	
17	Bottom nozzle	Lower heating when welding	
18	PCB board supporter		
19	Locking screw	To fix the splint	
20	Top hot-air adjust	Adjust the top hot air	Turn left and right
21	T/C plug	To measure the true temp.	
22	run	To show it is heating	
23	Over-temperature		
24	Top programmable thermostat		
25	Bottom programmable thermostat		
26	Cooling switch		

27	Vacuum switch		

5th 、Program setting and operating instructions

(1) Top temperature Program setting:

1、Thermostat button interface and Features introduction



NO.	item	explain
1	PAR SET	parameter setup key
	AUTO HAND	Auto / Hand switching button
	▲	Number increase
	▼	Number decrease
2	PIN ▲	Curve group number increase
	PUN PROG	Run/stop button for curve running
	SET PROG	curves program parameter setting button
	DISP PROG	Display select
3	OUT1	Output 1 indicator

	OUT2	Output 2 indicator
4	STEP	Curve program segment NO. Display, showing the running NO. of the curve procedure
5	PROFILE	curves Procedures monitoring light, when running up of the slope section, it will display "/", when running in the platform section, it will display "-", when running down of the slope segment, it will display "\".
6	PIN	Curve program number display, display curve program number
7	OP3	3rd Output indicator
	AT	PID self-tuning indicator
	RUN	Curve Running indicator
8	PV window	Show measured values
9	SV/MV/EV window	Display settings, the output value or run the remainder of section, press DISPSELECT key, it will show display items switch
10	SV	Setting indicator, lower display shows the set value, the indicator will be lit
	MV	Output indicator, lower display shows the value, the indicator will be lit
	EV	Outside test light, lower display shows the set value, this indicator will light up
11	AL1	1st alarm indicator
	MAN	Manual control indicator ----when you use the manual control, the indicator light
	COM	when sending data the indicator light

2、Setting process

（1）、First turn on the power supply, choose the number for saving the temperature profile: (set groups) press PTN button (can save 10 groups temperature profiles), Press PTN groups will be changed (1, 2, 3, 4, 5, and 0) choose one of them for temperature profiles (We take 1st group for example)

（2）、Slope setting (r) (Per second increase in temperature)

Press SET button enter into temperature curve,r1 stands for slope（the temperature will rise at the speed of 3℃ in one second）3.00 stands for 3℃/second, press number increase button to adjust. Press PAR button enter next step.

（3）、Temperature setting (L)(as following picture)

Press number increase button to adjust,L1 means that this is the temperature for segment1(L2 means that the temperature for segment 2, and so on),160 stands for preheating temperature 160℃. Press PAR button for confirming and enter to next step.

（4）、Time setting (d)（as pictured）

D1 stands for the time how long the temperature stays at this stage. (30 means that when the temperature reach 160℃, it will last 30 seconds.) Press number increase button to adjust. Press PAR button for confirmation and enter to next step.

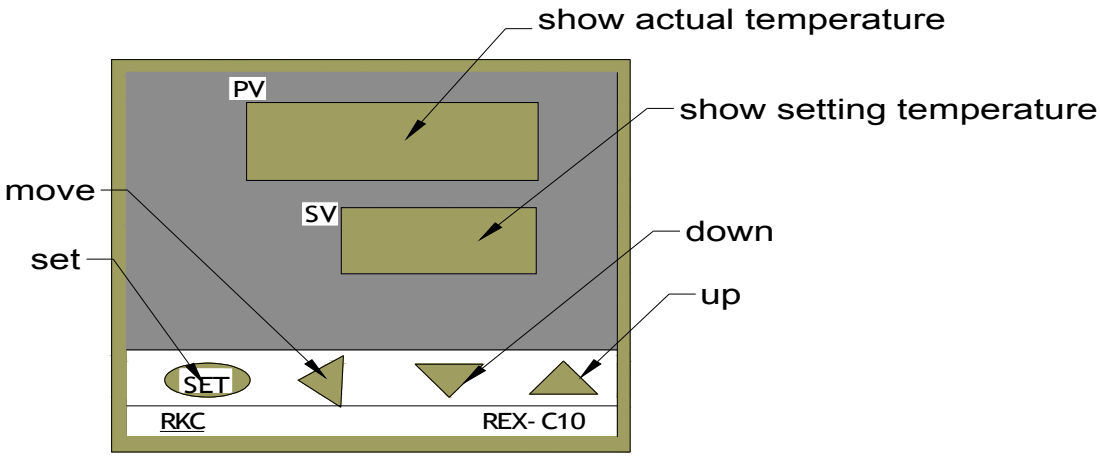
（5）、The remaining seven-segment temperature settings are same as above exactly.

（6）、、If you do not want to set 8 segments, then you can change as you wish. For example, if you just need 6 segments, then after you set the sixth segment, and then press PAR SET to enter the seventh segment. When you set slope of the segment 7, then you press button until show END. Press SV button, it will show the picture as following, press button, it means confirmation.

（7）、After setting finished, it will show the picture as following.(This feature is as follows: the maximum limit temperature, prohibit changes) 。

3、bottom temperature settings:

Such as REX--C10



Setting Method:

Hold down the adjustment button for 5-6 seconds, then the setting of the temperature a bit flash, press numerical increase (decrease) key to change. And then move button to move the modified adjusted value of 10, and finally to 100, after finished, press the SET to confirm.

（2）、 the use of an external computer

The device can connect with an external computer, you can observe two temperature curves of the head of internal heating wire and external measurement of galvanic through the computer interface, and you also can set the temperature, time and other parameters

through the computer, but also can achieve data transfer between computer and instrument, store many curves and facilitate to print out. (Note: This feature is limited to the upper heating control)

Statement: the related temperature parameters of the equipment can be set-up and stored completely through the instrument age, but in order to set the temperature more user-friendly, more intuitive, and easy to store, and print the temperature curve, our company specially developed this software！

1、 Software Install

（1）、Lowest requirement of computer configuration for software installment

a CPU：P Ⅲ 800

b Memory：128M

c display card: 4M

d driver: CD ROM

e Serial Communication Interface

（2）、 Software Installation，

a Put the video into the video driver, open CD driver， run“V2.08setup” appear language select. Choose” English” and Click “Next” to enter Picture

Figure1

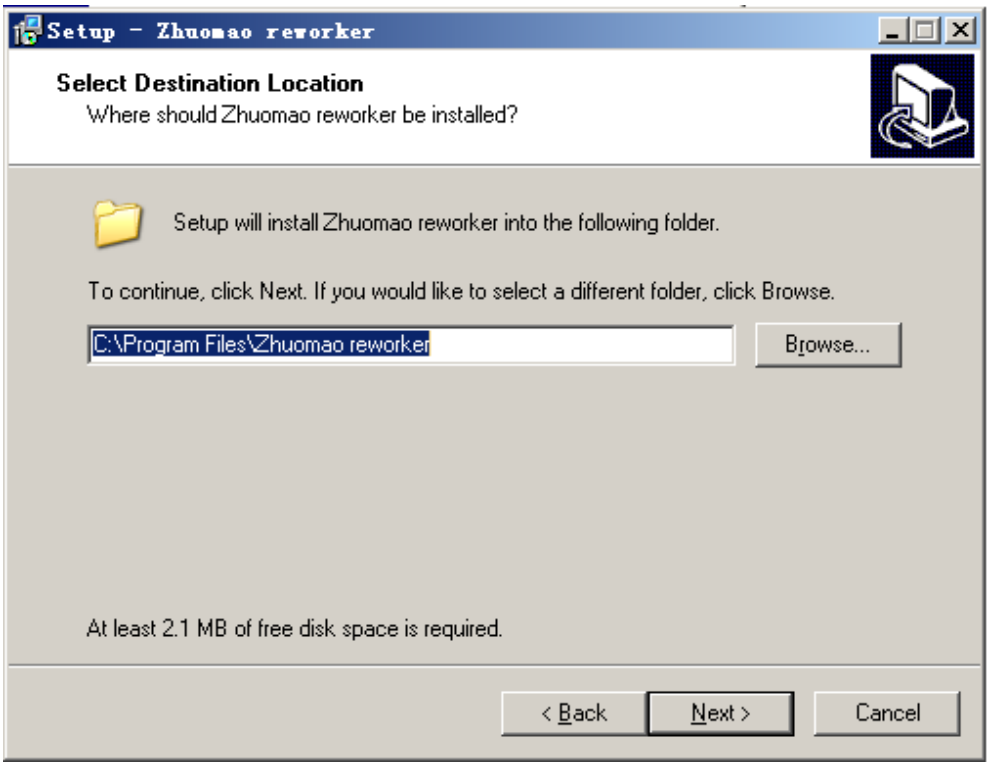


Figure2

b Click“Next”to enter Picture 2

c After enter “Picture 2”，click“Next” button，enter Picture 3

d Click“Next”，enter Picture 4

e Click“Next”，enter Picture 5

f Click“Install”，enter Picture 6，start installing.

g Click“Finish”，finish installing process.

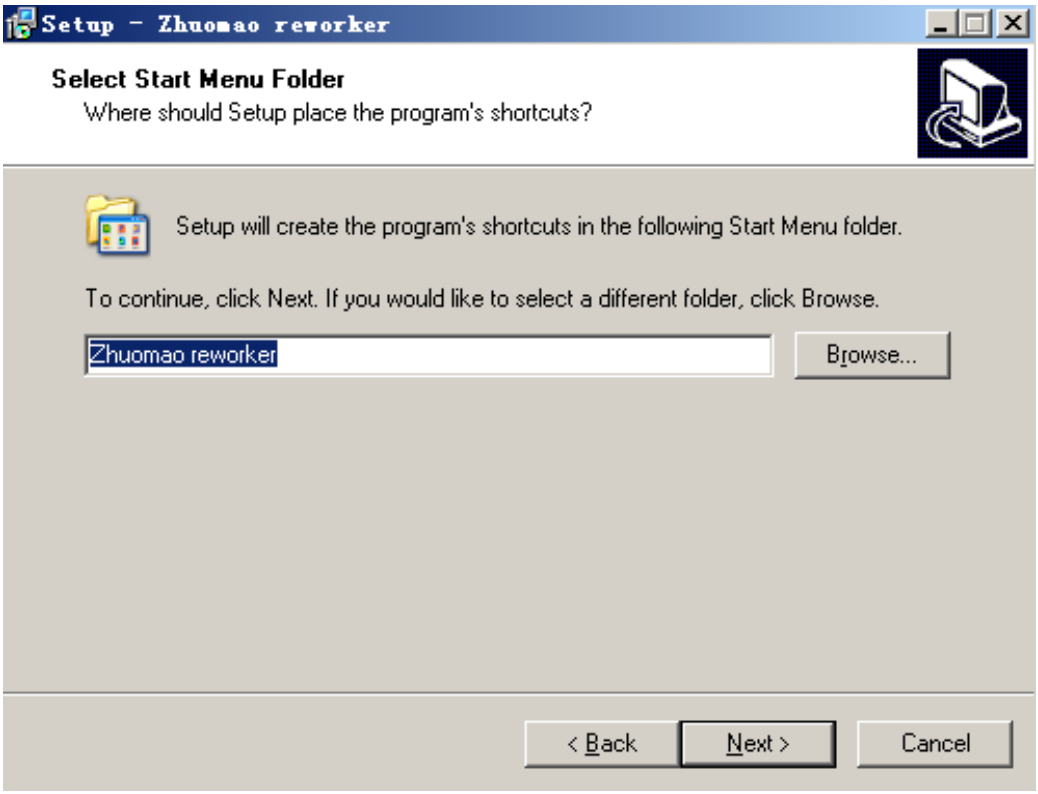


Figure3

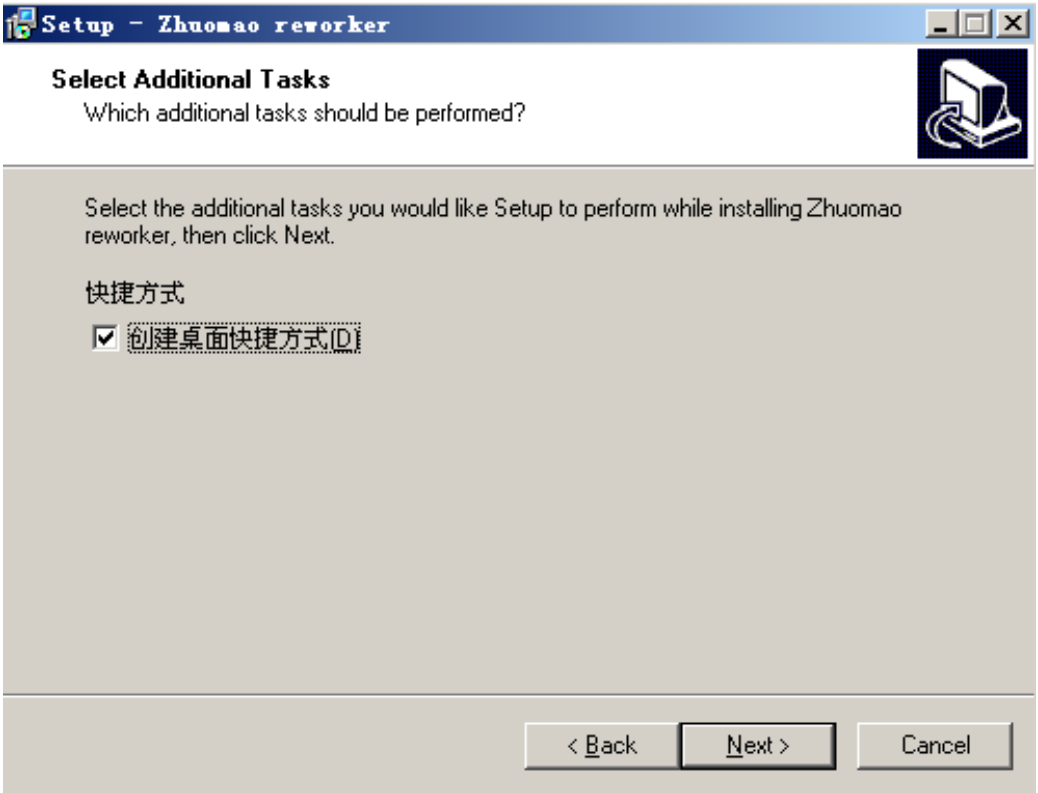


Figure4

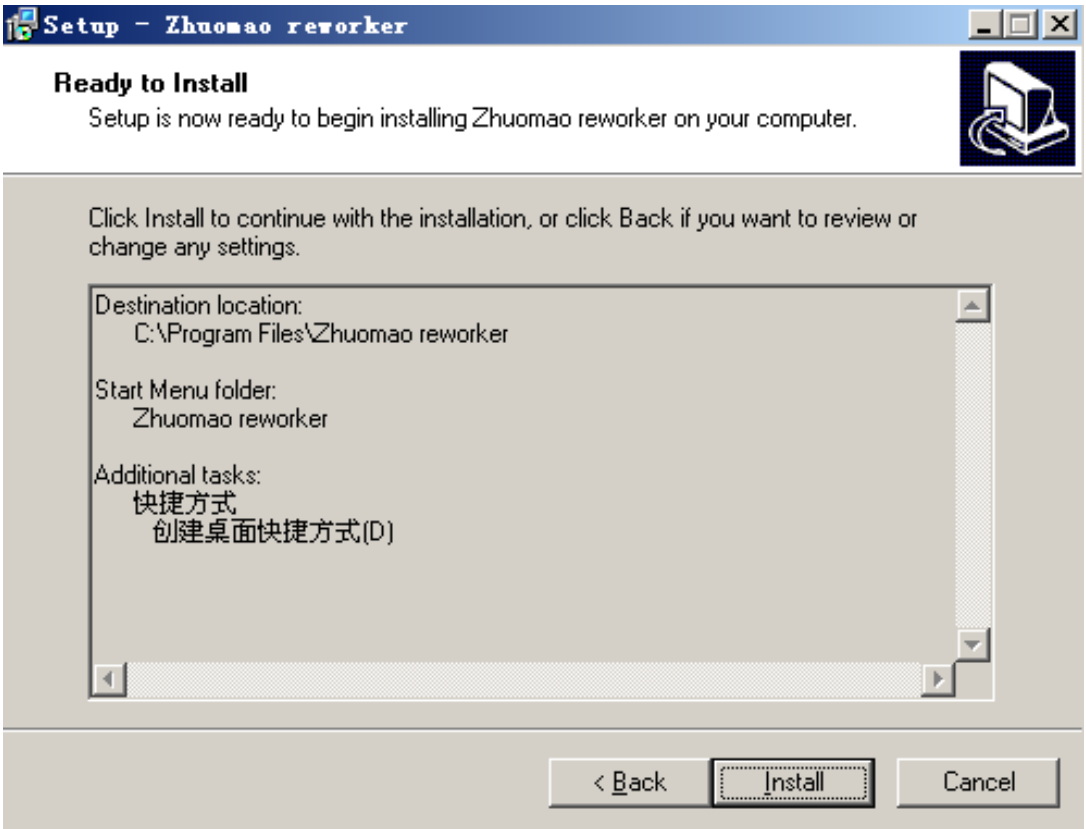


Figure5

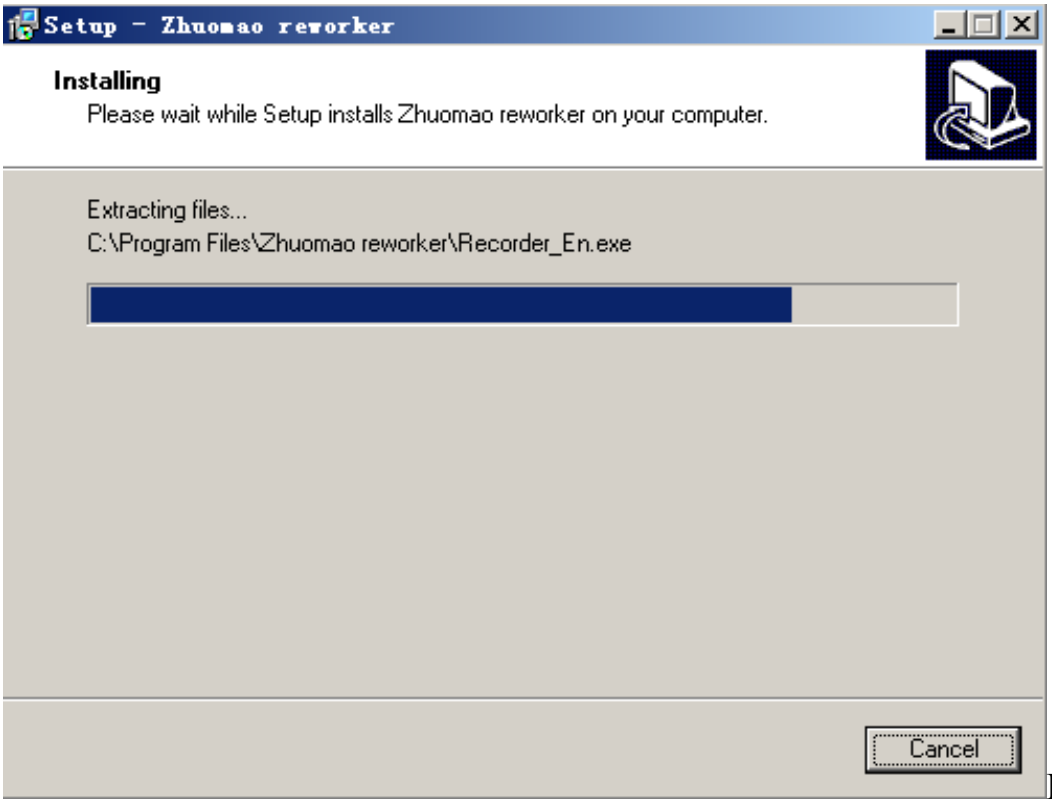


Figure6

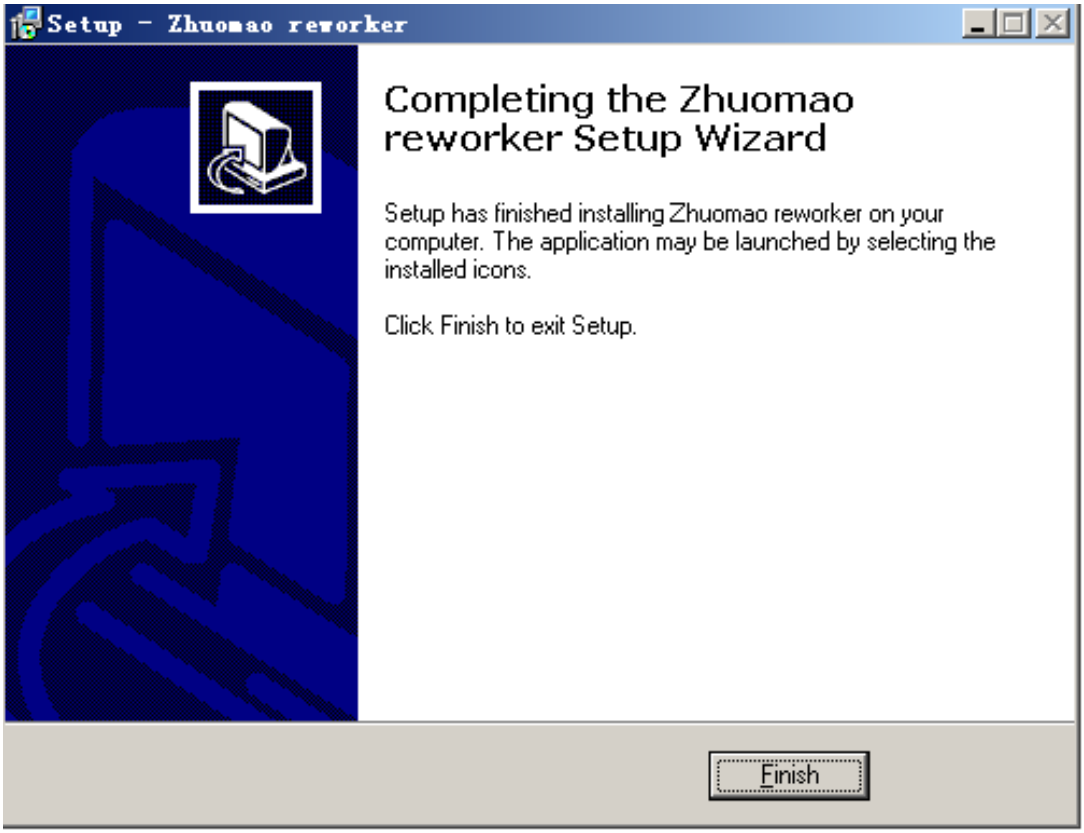


Figure7

2、Using of software

1）Connect the computer series port and machine communication port with the enclosed date cable.

2）Turn on the power of the equipment.

3）、Click  Zhuomao reworker.lnk on the desktop，enter into temperature curve recorder system interface（picture 10）

4）Set the temperature, time, slope parameter for every segment.

a Click“Profiles setting”， the interface will enter into (Picture 9)，according to “welding BGA” and solder ball to set the parameter for each segment. And for specific date and operating parameters, please refer for the construction book.

b Note 1： This software is for showing the temperature curve and recorder, the software does not have the motion control functions, for the movement of the machine need manual adjustment.

c Note 2： The related temperature profiles, you can set through the meter on the machine. However, in order to facilitate the users for temperature setting, in particular for the temperature curve showing, save and print, so we develop and expand this software.

（5）、Click “download Controller”， so the temperature for just setting can be down load to the programmable controller.

（6）、Fix the nozzle according to the BGA chip, pay attention to the top heater work normal or not; if not, stop heating, and check what the problem is. Otherwise it will damage the heating wire easily as the high temperature.

（7）、Fix the PCB board on the PCB pallet, and make the heating part just below the nozzle.

（8）、Adjust Z-axis and Y-axis to make the nozzle on the top of the

heating part, the height between them is 2～5mm.(Figure 8)

（9）、Click“Run/Stop”，the machine will carry out heating motion.

（10）、At this time you can see the temperature curve.(Figure 9)

（11）、Curve 1（Green）shows：The actual measurement of heater temperature

（12）、Curve 2（Red）shows：The actual measurement of external galvanic

（13）、After heating, it will automatically run cooling system; It will reduce the deformation of the PCB board, shorten the work cycle and improve the work efficiency through cooling.

（14）、During the process of heating，Click“Run/Stop”，or click “Stop”on the control panel，heating process will be stop.

（15）、Click "Exit System" button, the computer will quit the application programmer.

3、Development Features Instruction (figure 10、figure 11)

（1）、“Upload from Controller”：Click this button can upload the internal instrument parameter from controller to the computer; it can set a group of data each click.（Note: the programmable controller can save 10 groups itself）

（2）、“download Controller”： Click this button can download the parameter from computer to the controller;

（3）、“Save”：After using the software for heating，“Profile View” curve display page will show the two temperature curve, use this button can save the curves to any position on the computer hard disk.

（4）、“Open”：Through using this button can pick up the temperature curve stored in computer.

（5）、“Print”：Through an external printer can easily print the current

curve.

（6）、"X-axis maximum number (minutes) "number setting window: The maximum setting of the horizontal of the curve screen

（7）、"Y-axis maximum number (Degrees Celsius) "number setting window: The maximum setting of the Ordinate of the curve screen

Figure8

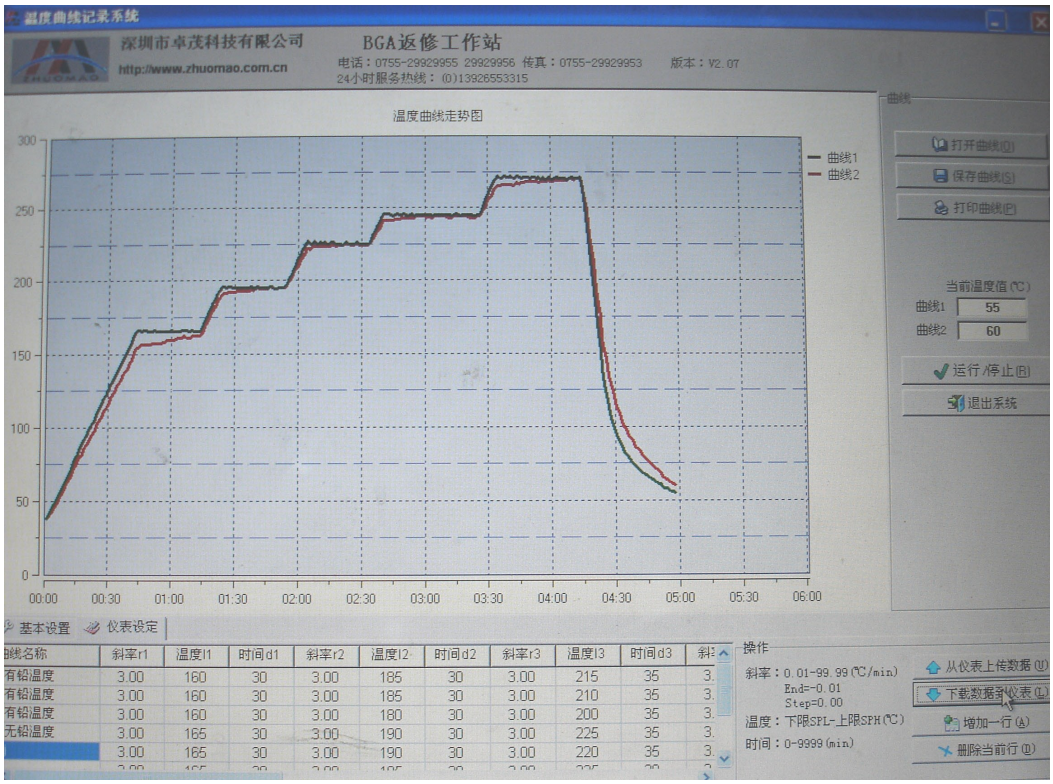


Figure9

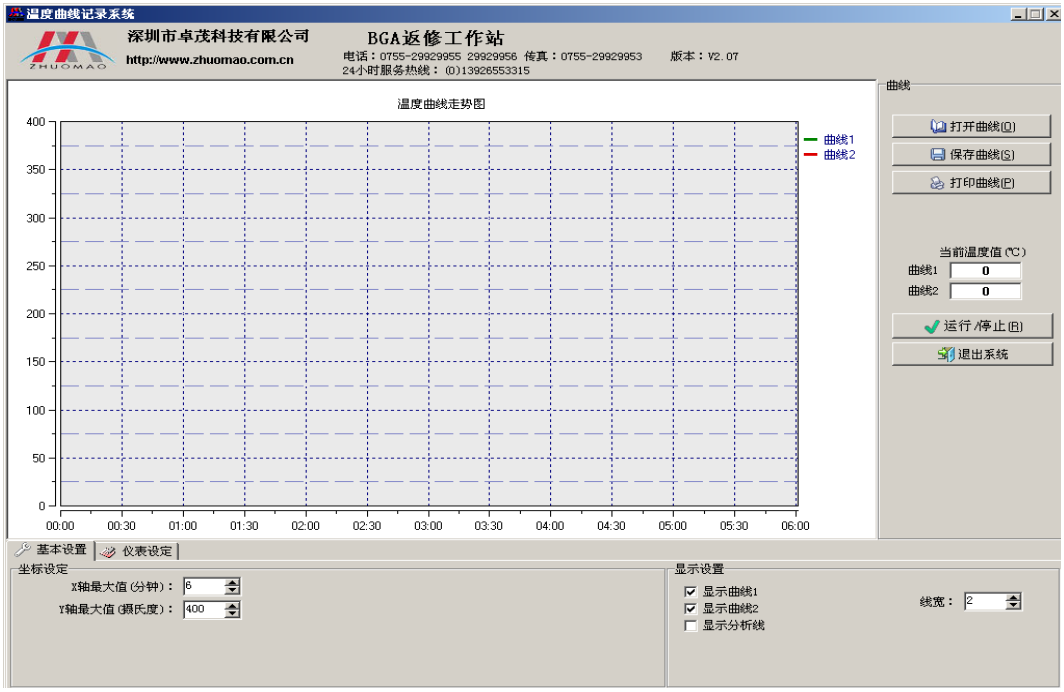


Figure10

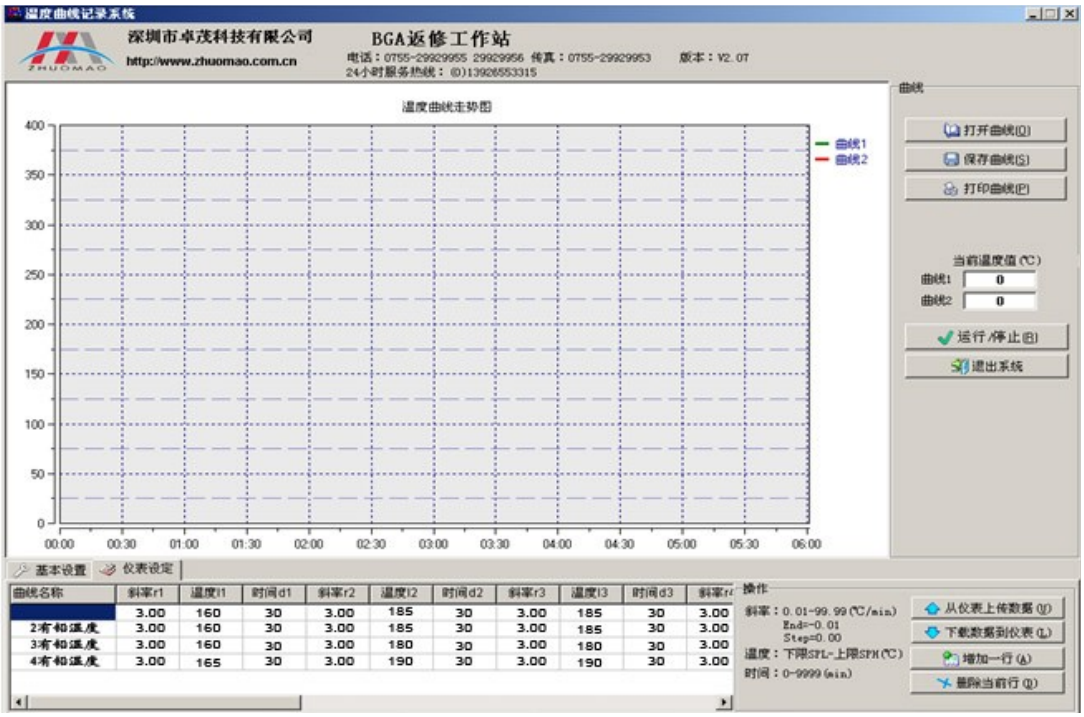


Figure11

6th 、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）、Calibration role, through appropriate adjustment, it will make the temperature of the welding parts get close to the set temperature as much as possible.

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, click "DiSP SELE" button on the upper instrument panel, (the button which is used to switch the

displaying item), switch to "EV", the corresponding galvanic current temperature will be displayed in the second line of instrumentation on the "SV" display window.

(4) Stated: "DiSP SELE" is the button to switch the displaying items, when press it, the downstream sequence of display windows display setting no., output no., the remainder of the number of segments of running, corresponding to Panel "SV", "MV", "TIME "indicator light.

3、Measurement

(1)、 PCB board will be installed on the rework station, with the galvanic fixed on the PCB board using foil stickers.

(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 12)

Figure12

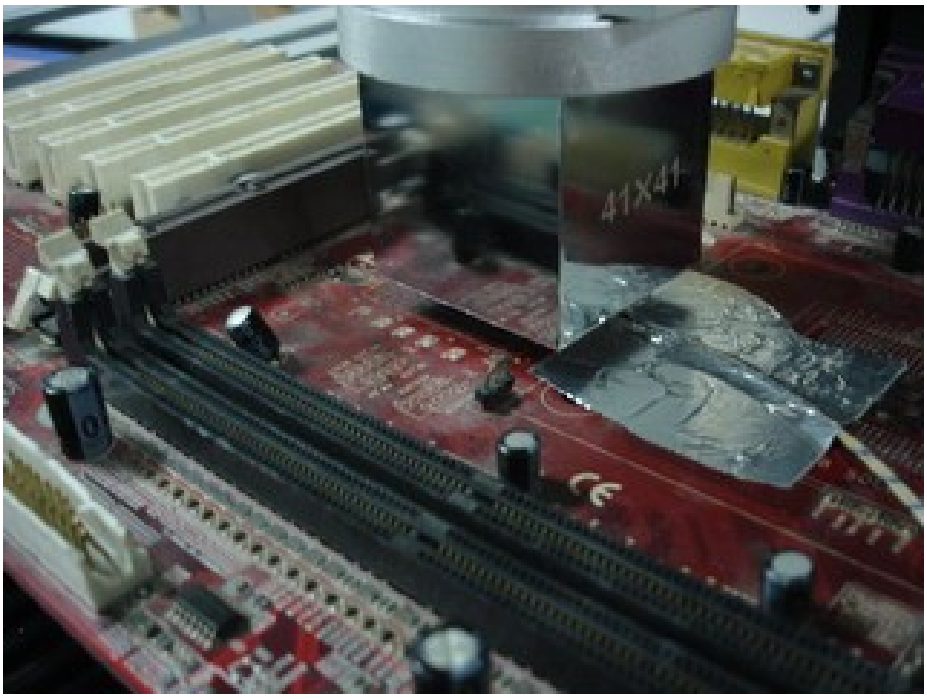


Figure 13

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 two curves of the green and red on the computer monitor screen

7、 Curve 1, the actual measurement temperature of the internal galvanic of the top heater (green)

8、 Curve 2, the actual measurement temperature of the external galvanic curve (red)

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 operating 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、Set the parameters of the lower heating temperature, while closing the upper part of the heating process, click on "Start" button to start heating

11、 Now you can see "SV" which displayed on the panel of the upper programmable thermostat (also click on the "DiSP SELE" button of the upper instrument panel, and switch to the position of the "EV" indicator light) is the temperature of the external galvanic, with the abbreviation as the outer temperature; And "PV" is the temperature of the internal galvanic, with the abbreviation as the bottom temperature.

12、The caution is same as the top heater.

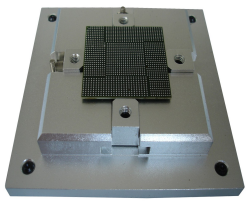
13、The methods of adjustment:

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

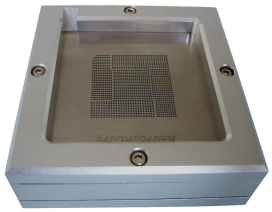
B If the outer temperature is higher than the bottom; you should adjust the lower internal galvanic probe upward.

7th 、Reballing Process

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

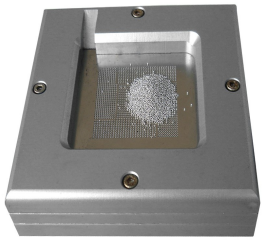


2、 Select the appropriate steel mesh according to chip type. Fix the steel mesh to the ceiling cover and tighten it with 4 M3 screws, covered with lid. Adjust 4 Jimmy on the base to meet the suitable height required.



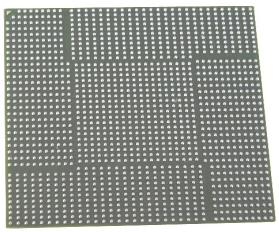
3、Observe the hole on steel mesh which should be completely coincide with the solder holes on BGA. If not coincide, we must remove the cap to reposition to ensure steel mesh holes aligned with the chip, and then lock the four screws.

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 reballing station to ensure the solder ball completely filled in the holes and pour out extra solder balls.

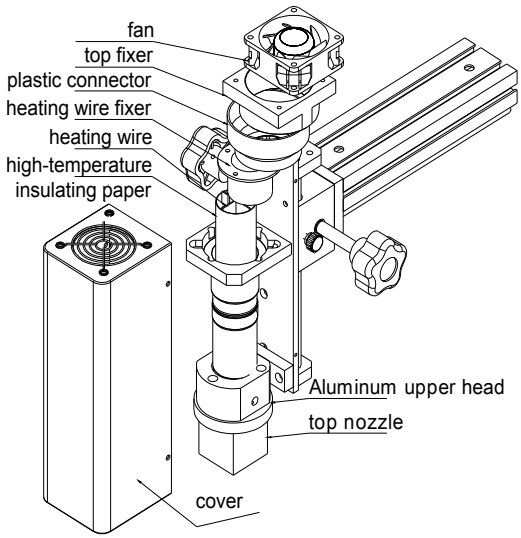
6、 Place the reballing station on the flat location; Remove the lid, carefully scored BGA chips. Observe the chip, if individual solder balls are not in the hole rightly, please correct it with forceps.



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

8th、Repair and Maintenance

（1）Upper heater：(Pictured)



1. The replacement of fan:

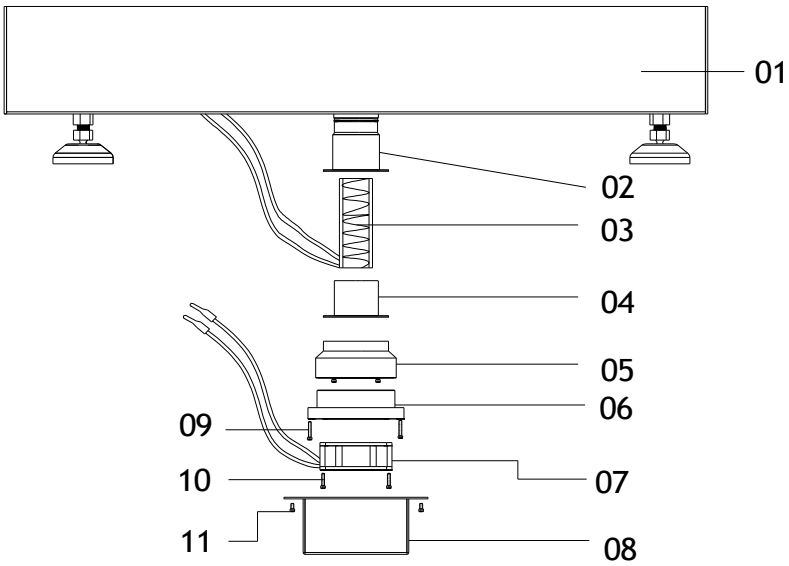
   Remove the heater cover, and remove the insulation fiber block, then you can replace the fan.

2. The replacement of heating wire

   Remove the heater cover 、 the insulation fiber block and fan, remove the upper fixed block, then take out the hot wire. Then it can be replaced.

   Note: When you change the heating wire; it must be wrapped by High-temperature insulating paper.

(2)、 Replacement of the lower hot air heating wire: (Pictured)



01 body 02 Heating Duct

03 Heating wire0 04 heating wire fixture

05 plastic connector 06 fan holder

07 fan 08 Heater cover

09 fan holder bolt 10 fan bolt

11 heater cover bolt

Replacement of the lower hot-air heating wire:

1）、Remove the heater bolts, and then remove the heater cover.

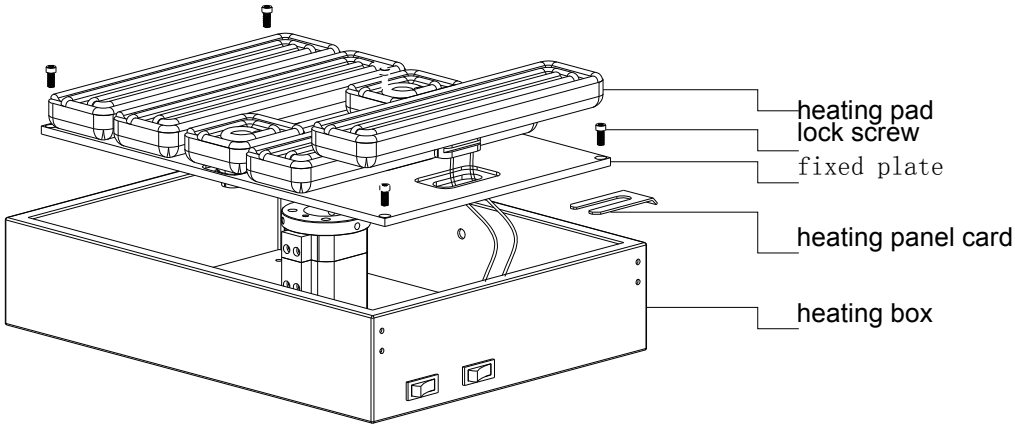
2）、Demolition of fans, fan holder, plastic connector and fan wire fixture, take out the hot wire. Then you can replace the heating wire.

（3）、The bottom heating panel (pictured)

1、 Replacement of heating plate:

1). 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.



9th 、safety precautions

（1）、BGA Rework Station ZM-R5850 use AC220V power, working temperature may up to 400 ℃, Improper operation may cause damage to the equipment and even endanger the safety of the operator. Therefore must strictly abide the following:

1）、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;

2）、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;

3）、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;

4)、PCB board should be placed on V type support shelves and used slider

pairs to support PCB board in the centre;

e. Metal or angular and sharp objects are avoided on touch screen surface;

5)、upper and lower heater inlet must not be blocked, otherwise heating wire will be damaged;

6)、 After work, please guarantee natural cooling for 5 minutes, then Switch off;

7)、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.

8）、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.

（2）if it belongs to one of the following situations, and other damage caused by them; It will not be in the Company guarantee scope!

1、Failing uses the method in manual to operate in wrong conditions or environmental operation;；

2、The Company product outside reasons；

3、Not the transformation and maintenance of the company；

4、not accordance to the method stipulated when using the products ；

5、unpredictable situation that the company scientific technical level not reached；

6、Natural disasters or man-made destruction of non-responsibility of the company premises.

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.