

深圳市鼎华科技发展有限公司

SHENZHEN DINGHUA TECHNOLOGY DEVELOPMENT CO.,LTD



DH-A09 BGA Rework station specification

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Rework Station

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A. Company introduction

Shenzhen DingHua Technology & Development Co, Ltd is a professional manufacturer of BGA rework station, rework tools and related products It is a collection of R&D, production, sales and service Our company views R&D as the foundation, the quality as the core, service as the guarantee We commit us to offer the professional equipment, professional quality and professional service for the customer As one of pioneer in this industry, we continue to improve and innovate along with the market demands by absorbing the advanced development experience from home and abroad to adhering to our vision of 'Professionalism, Integrity, Innovation and Responsibility'

Science and technology is the first productive force Through teamwork, we achieved the core thermal-control technology and other related patents At the same time, our products cover three categories: top grade, mid-range and low-end, and we accomplished R&D and production of products from manual operation, semi-auto to fully automation Our market had expanded into fields like: individual repair, industrial and mining enterprises, education, military and aerospace etc Besides, we had established the commercial network and terminal service at home and abroad

We always follow the business principles of 'Strenuousness makes good achievement; Honesty makes good business' Your satisfaction is our responsible; adhering to customer-focus, market oriented, our company provides first class products and high efficient services for customers through continuous innovation We believe that your success is our success; your glory is our glory It's our honor to work with you to create a brighter future!

B. Installation of BGA rework station

(A) Installation places

In order to guarantee the longevity of BGA rework station, you should follow the conditions as follows when install the machine:

- 1、Far away from the inflammables, explosion-prone objects
- 2、The places will not be splashed water or other liquid
- 3、Well-ventilated, dry places
- 4、Stable , flat areas less susceptible to vibration
- 5 The places with little dust
- 6、Prohibit placing heavy objects on the top of the control case
- 7、The places without the affect of air-condition, heaters and fans
- 8、There should be more than 30cm space behind rework station for moving and rotating the head.

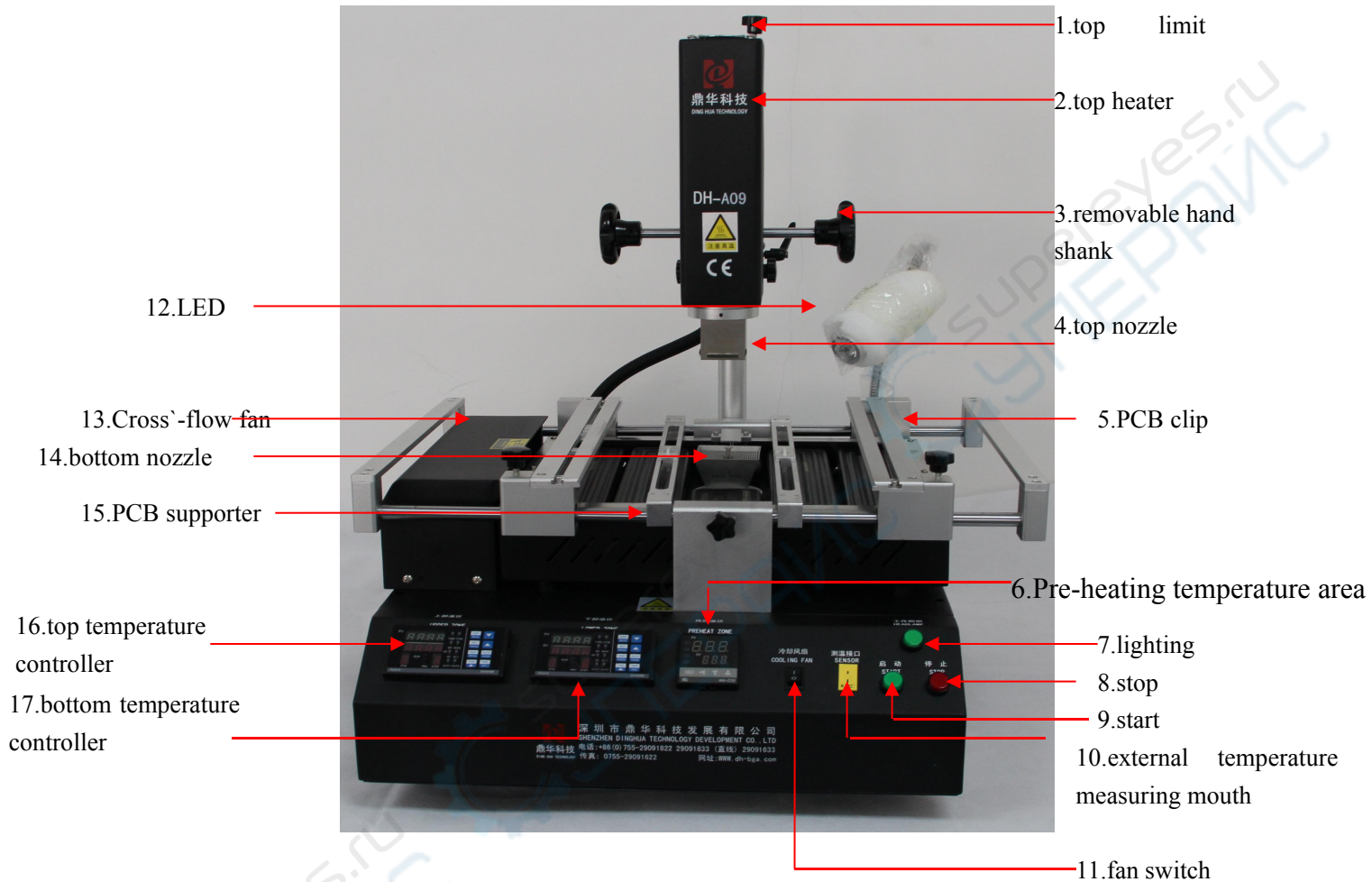
(B) Power supply: AC220V±10% 50/60Hz

C. Safety notices of BGA Rework Station

- a、 Do not use fans or other devices to blow directly the repair station when it works, otherwise the heating plate surface will suffer minus tolerance, which can burn the work piece.
- b、 After starting up, high-temperature heating zone can not contact with the object directly, it may cause fire or explosion ,and the PCB work piece should be placed on the PCB support shelves.
- c、 Do not shake rework station, and move gently
- d、 Do not touch the high fever area , otherwise it will scald you
- e、 After starting up, do not use the flammable spray , liquid or flammable gas near the repair station.
- f、 Do not try to modify rework station; Otherwise it will cause fire or electric shock.
- g、 Electrical box has the high-voltage components, do not attempt to disassemble
- h、 If the metal objects or liquids fall into the repair station when it works , immediately disconnect the power , unplug the power cord until the machine cool down , then completely remove litter , dirt ; if dirt left ,there is odor when reboot.
- i、 When abnormal heating or smoke appears, immediately disconnect the power, and inform the technical service to repair. Disconnect the wire between the electrical cases and machine when carry, hold the pin when pull out the wire, or it will cause bad contact and it won't work normally.
- j、 Note that the repair station not to press or run over other electrical equipment or power lines or communication cable, and it may cause device malfunction or cause fire or electric shock.
- k、 You have to read this instruction book before you handle the BGA machine.

D. Structure and parameters:

(1).structure



(2) .Function

No.	name	usage	How to use
1	Top limit knob	Restrict the bit head down position	Rotate to appropriate place
2	Top heating zone	The upper part of the hot air generated institutions	
3	Removable handle	Adjust up and down the	Rotate the handle

		location of the bit head	
4	Top nozzle	Hot air more focused uniform	Resorted to the appropriate location of the outlet from the BGA
5	PCB clip	Clamping the PCB, to the appropriate location	Adjustment knob, move to the appropriate location
6	Pre-heating temperature area	Control preheat zone temperature	start button , automatic heating
7	Lighting button	Light switch	Press the button
8	Stop	Stop the machine self-heating	Press the button
9	Start	Start the machine self-heating	Press the button
10	External temperature measuring interface	Connect an external galvanic measuring the actual temperature	Directly connected temperature line
11	Fan switch	Automatic and manual conversion of the cross-flow fan	Switch to a different location
12	LED	Lighting when Equipment works	Press the lighting button
13	Cross-flow fan	Cooling PCB board after soldering	
14	Bottom heating nozzle	Hot air more focused uniform	Resorted to the appropriate location of the outlet from the BGA
15	PCB supporter	Supporting the PCB without distorted	Adjust the supporting columns
16	Top temperature controller	Control of the upper hot air temperature	start button , automatic heating
17	Bottom temperature controller	Control of the lower part of the hot air temperature	start button , automatic heating

(3)、Main Parameters

Total Power	4800W
Top heater	800W
Bottom heater	2 nd :1200W; 3 rd : 2800W(large heating zone for all kinds of PCB boards)
power	AC220V±10% 50/60Hz
Dimensions	L380×W490×H650 mm
Positioning	V-groove, PCB support can be adjusted in X ,Y direction with external universal fixture
Temperature control	K Sensor Closed loop
Temp accuracy	±2 degrees
PCB size	Max 360mm × 350mm Min20mm × 20mm
BGA chip	5*5~55*55
Minimum spacing	chip 0.15mm
External Temperature Sensor	1
Net weight	About 28KG

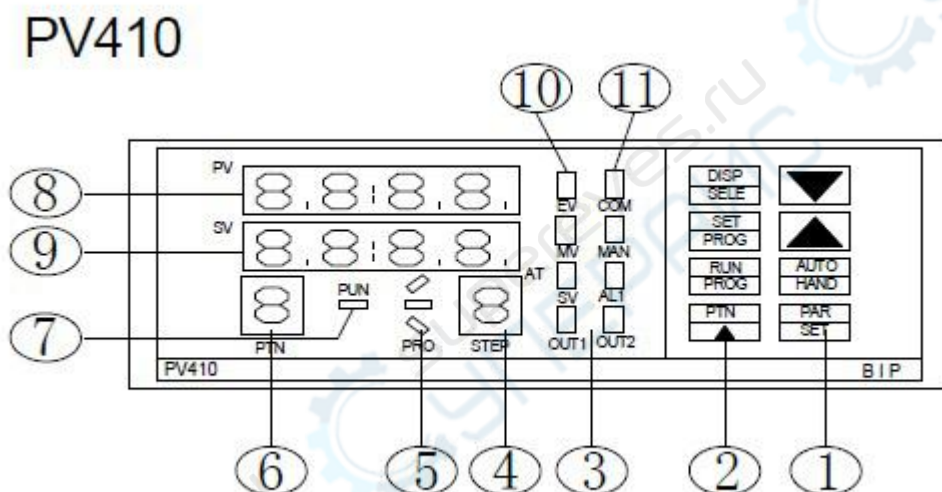
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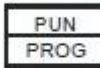
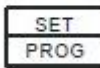
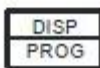
- Three temperature areas can independently heat and they are multiple temperature control, which can ensure best integration of different temperature areas. Heating temperature, time, slope, cooling and vacuum can all be set in the high precision instrument.
- It uses high precise K-type thermocouple closed-loop control and automatic temperature compensation system, with PLC and temperature module to enable precise temperature deviation to add and subtract 2 degrees. Meanwhile, External temperature measurement connector enables temperature diction and accurate analysis of real time temperature curve.
- V-groove PCB works for rapid, convenient and accurate positioning, which can meet all kinds of PCB board of positioning.
- Flexible and convenient universal clip on the PCB board can protect the PCB fringe devices from damaging and deformation. It can also adapt to various BGA reworking.
- Various sizes of BGA alloy nozzles, which can be adjusted 360 degree for easily installation and replacement.
- 8 temperature rise and down +8 constant temperature

- Collocating with sound control "early warning" function. It can warn workers to make some relative preparation 5-10 seconds before the completion of uninstalling or welding. Meanwhile, it adopts high flow fan for cooling the PCB board automatically or manually. Besides, it can prevent the PCB board from deformation and ensure the welding effect.
- CE certification, equipped with emergency stop switch and automatic power-off protection device when emergency happens.

E、Setting and operation

1、Introduction about the functions of the temperature controller

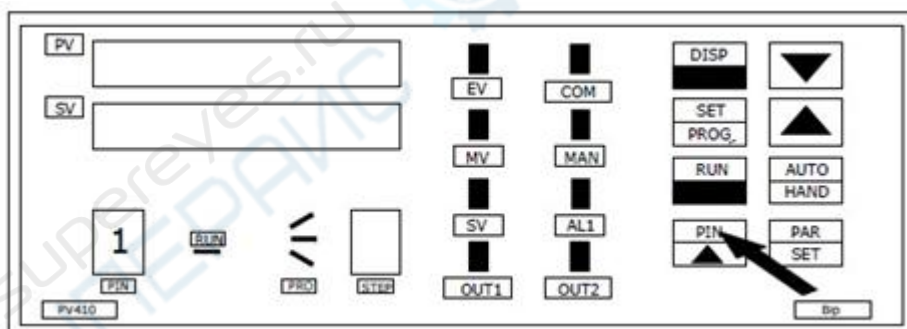


No	Item	Explanation
1		Parameter hypothesis key
		Automatic / manual switch key
		numerical increase key
		numerical reduce key
2		Curve program group increased bond
		Start / pause curve program running key
		Curve program parameters set key
		Display item switch key
3	OUT1	Output 1 indicator light
	OUT2	Output 2 indicator light
4	STEP	Display of Curve program segment, display curve program is running, the segment number display curve
5	PROFILE	Curve program monitoring indicator light, when operating in the ramp up time, display" /" when running on the platform section, show "-"
6	PIN	Program number display curve, curve shows the program number
7	OP3	The third output indicator
	AT	PID self tuning indicator
	RUN	Curves running indicating lamp
8	PV	Display measured values
		Show that the set value, the output value or the long

9	SV/MV/EV	running time, when you press the DISPSELECT key items to display toggle
10	MV	Set value indicating lamp, a downlink window display the set value, the indicator will be lit
		Output value indicating lamp, downlink window display value, the indicator will be lit
		External indicator lamp, a downlink window display the set value, the indicator will be lit
11	AL1	The first alarm lamp
	MAN	Manual control indicator light, when the manual control, the indicator light
	COM	Communication indicator lights, and other registration form to transmit data, the indicator light

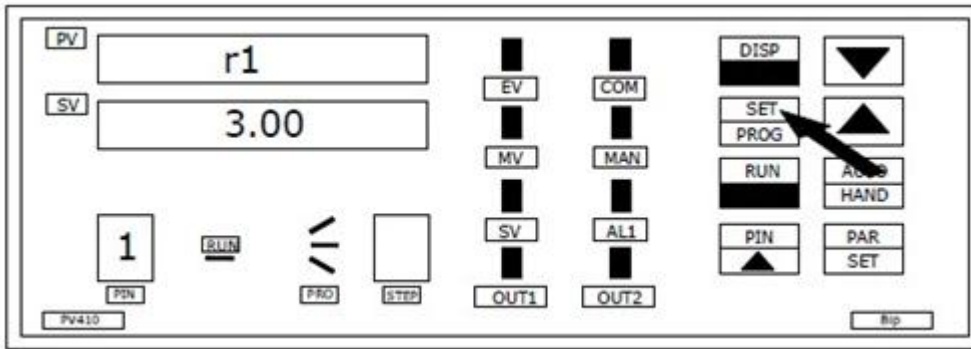
2. Setting steps

(1) First start the power and then choose the temperature store position:(set the group number) Press PIN button (it can store 10 group data) when you press the button , the group will change(1,2,3,4,5.....10), choose one group data to be the temperature curve(choose one group of these ten groups data, now we will choose the first group data to set).



(2) speed rate setting(Rising temperature per second, use R to represent)

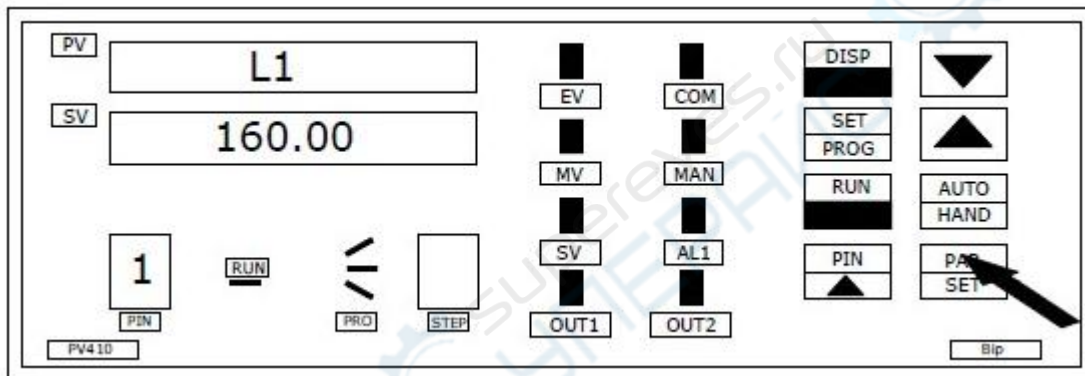
Press SET button to set the temperature ,r1 represents the speed rate of first temperature section(the rest can be done in the same manner,r2 represents the speed rate of the second temperature section.....);3.00 represents 3 degrees\second. Press the increase\reduce button to adjust, press PAP to save the setting and run the next step.(as the following picture)



(3) Temperature(L) setting (As following picture)

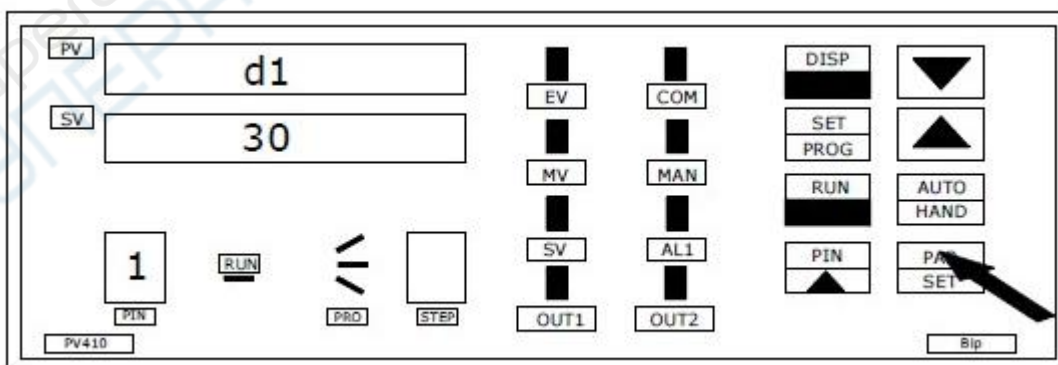
L1 represents the first temperature section(L2 represents the second temperature section.....);

160 represents temperature number (pre-heating temperature is 160 degree), press the increase\reduce buttons to adjust. Press PAR button to save the setting and run the next step.



(4)Time(d) setting(like the following picture)

d1 shows the first time of constant temperature;30 shows the time value, to adjust by pressing up and down key, and press the PAR key for sure finish and go on the following step.



(5)The remaining seven of the temperature settings are identical with the above setting

(6)Not need to use the eight sets of temperature, to set up a few paragraphs you want, for

example, just need 6 sets, after the setting for 6th temperature, press

PAR
SET

 to enter the rate of 7th, pressing the down key until the

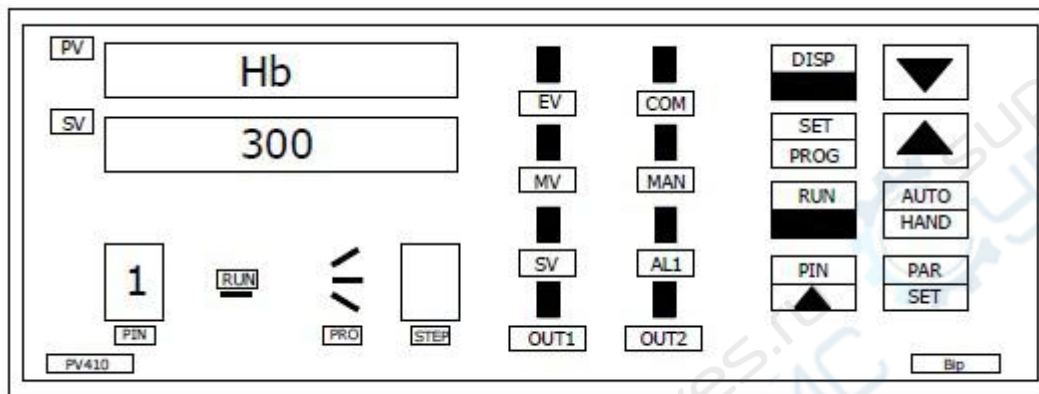
SV

 shows "END", then press

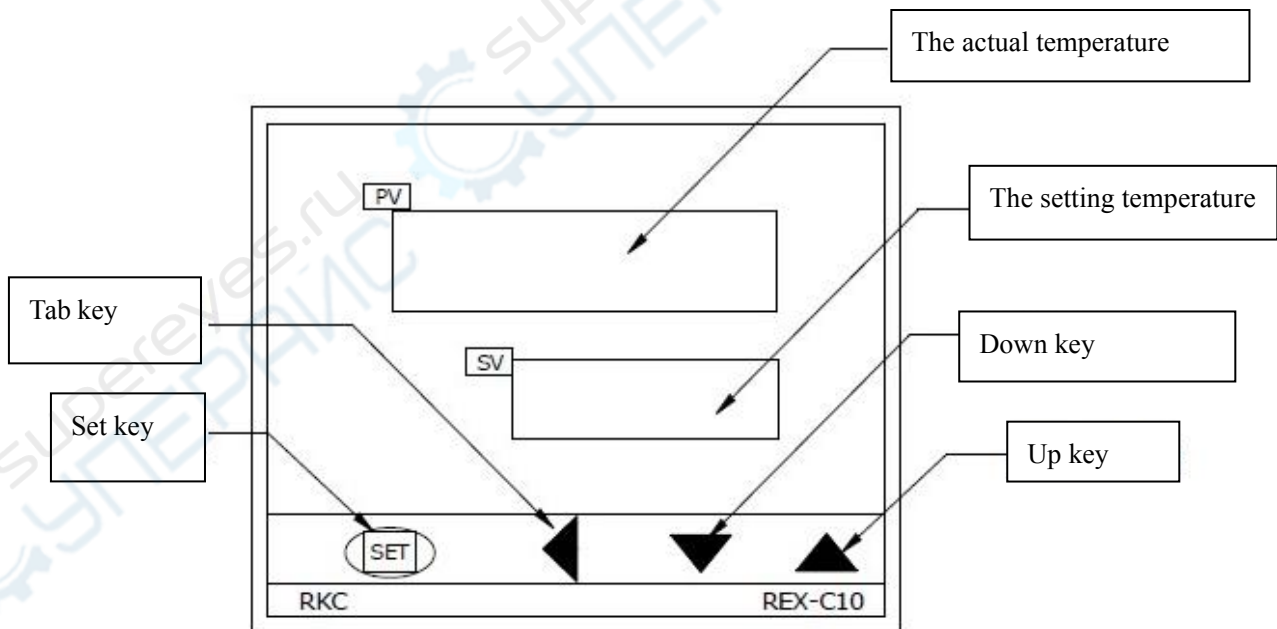
PAR
SET

 will appear the following picture(show it finishes),press it again for sure.

(7)When it finished, it will show the following picture (the highest temperature can't be changed).



3.The lower part of the temperature setting



Setting method: Press the Set key for 5~6 seconds, and at this time the bits of setting temperature is flashing, then press the up or down key to get the right value, and then to press the tab key, the flash will changed from bits to ten, the following operation is same with the bits. At last, get the right value to press the set key for sure.

F. Operation steps:

A. Preheat:

Preheat before the PCB and BGA reworking , the temperature of constant temperature oven is set at 80°C-100°C,for 4-8 hours to remove internal moisture of the PCB and BGA ,to prevent the burst phenomenon when heating.

B. Remove:

Place the PCB on the support of the repair station. Select the appropriate hot air reflow nozzle and set the appropriate welding temperature curves ,and then press the start button .Move away the warm wind heater manually until the procedure is finished , then suck up the BGA chip with the vacuum suction pen.

C. Clean-up welding:

You can clean-up the BGA pad with de-soldering line or iron to drag flat; the best way to remove the tin in a short time after the BGA removed, then BGA has not completely cooled, and the temperature difference make less damage to the pad; It can improve the activity of soldering tin with the flux and is better to clean the soldering tin. Pay attention that do not to damage the PCB pad, and in order to ensure the reliability of BGA solder, try to use some volatile solvents when cleaning the pad, such as plate washer water, industrial alcohol.

D.BGA reballing:

Wipe the paste flux equably with the brush pen on the BGA pad, choose the right steel mesh, and then plant tin beads by the re-balling kit on the right pad.

E.BGA tin beads welding

First, you should heat the bottom heating zone of BGA re-balling station. Second, you can weld the tin beads on the pad.

F.Wipe the paste flux

Wipe the paste flux with the brush pen on the PCB pad. If you wipe so much, it will cause connected welding, on the contrary, it will cause null welding. In order to wipe off dust and impurity of tin balls, and enhance welding effect, the welding paste must be wiped equally.

G.Surface mount

Post the BGA chip on the PCB board. The Silk screen box line can assist you to counterpoint when you counterpoint it by hand. You can touch the tin surface of welding pad to check whether it is well mounted.

H.Welding:

First, put the PCB board which is pasted with BGA on the positioning stand, and then move the hot wind head to the working place. Second, choose the appropriate backflow nozzle and set right welding temperature curve, start heating, open the switch, and then run the welding process. Besides, after the welding process is finished, you have to cool the BGA by the cooling fan. Hoist the upper hot wind head and make the bottom of hot wind nozzle apart from the surface of BGA 3-5mm, and stay 30-40 seconds, or, you can move the hot wind head after the starting switch is put out, withdraw the hot wind head. Finally, take away the PCB board from the heating zones.

(A) Missing weld:

Because of counterpoint by hand will cause deviation between chip and welding plate, surface tension of tin ball will have a process of automatic correction between BGA chip and welding pad. Once heating, BGA falls not evenly, which will cause that the chip drops not evenly. It will cause the phenomenon of missing weld and false weld if stop reflowing at this time, the chip will not fall normally. So it is necessary for you to extend heating time of third 、 forth temperature zones or add the bottom pre-heating temperature to make the tin balls meltdown and drop evenly.

(B.)short-circuiting:

When the ball reached the melting point, it is in a liquid state, if too long or too high temperature and pressure, it will destroy surface tension of solder balls and the supporting role, resulting in short-circuit phenomenon when reflows, the chips fall entirely on the PCB pads the, so we need to appropriately reduce the heating section of the third and fourth soldering temperature and time , or reduce the bottom of the preheat temperature.

Attention please: It will cause trace odor in the normal working process. In order to assure safe and healthy operation environment, please keep ventilation in and out of the room.

Attention:

When it alarm because of breakdown, all functions are in locked state! You should deal with the breakdown and it will recover after power-offer!

Usual temperature parameters as follows:(take Intel chip as example)

1) Intel lead temperature

41*41 BGA welding temperature setting:

	pre-heating section	Constant section	Warming section	Welding section 1	Welding section 2	Cooling section
Top heat	160	185	210	220	225	0
Constant time	30	30	35	40	20	0
Bottom heat	165	190	215	225	230	0
Constant time	30	30	35	40	70	0
Speed rate	3	3	3	3	3	0
Infrared heat	180					

38*38 BGA welding temperature setting:

	pre-heating section	Constant section	Warming section	Welding section1	Welding section2	Cooling section
Top heat	160	185	210	215	220	0
Constant time	30	30	35	40	20	0
Bottom heat	160	185	215	220	225	0
Constant time	30	30	35	40	40	0
Speed rate	3	3	3	3	3	0
Infrared pre-heating	180					

31*31 BGA welding temperature setting:

	pre-heating section	Constant section	Warming section	Welding section1	Welding section 2	Cooling section
Top heat	160	180	200	210	215	0
Constant time	30	30	35	45	20	0
Bottom heat	160	180	200	215	225	0
Constant time	30	30	35	45	60	0
Speed rate	3	3	3	3	3	0
Infrared pre-heating	180					0

Above are welding temperature reference of lead BGA

2) Intel lead-free temperature setting

41*41 BGA welding temperature setting:

	pre-heating section	Constant section	Warming section	Welding section 1	Welding section2	Cooling section
Top heat	165	190	225	245	255	240
Constant time	30	30	35	55	25	15
Bottom heat	165	190	225	245	255	240
Constant time	30	30	35	55	25	15
Speed rate	3	3	3	3	3	0
Infrared pre-heating	180					

38*38 BGA welding temperature setting:

	pre-heating section	Constant section	Warming section	Welding section1	Welding section2	Cooling section
Top heat	165	190	225	245	250	235
Constant time	30	30	35	45	25	15
Bottom heat	165	190	225	245	250	235
Constant time	30	30	35	45	25	15
Speed rate	3	3	3	3	3	0
Infrared pre-heating	180					

31*31 BGA welding temperature setting:

	pre-heating section	Constant section	Warming section	Welding section1	Welding section2	Cooling section
Top heat	165	190	220	240	245	235
Constant time	30	30	35	40	20	15
Bottom heat	165	190	220	240	245	235
Constant time	30	30	35	40	20	15
Speed rate	3	3	3	3	3	0
Infrared pre-heating	180					

Above are Intel lead-free BGA reference temperature

The cooling temperature can be settled 0 when you remove the BGA chip.

G. Announcements of operation of BGA rework Station

1、After opening the power, firstly you should check whether the upper and

bottom hot air nozzles have cold wind. If not, starting the power is strictly prohibited, or the heaters will be burnt. The bottom infrared heating areas are all controlled by switch, and you can choose the bottom heating areas depend on the PCB board size.

- 2、 You should set different temperature curves when repair different BGA, each temperature should not higher than 300℃.Lead-free rework setting can refer to welding temperature curve of BGA tin bead.
- 3、 When demount BGA, the cooling fan and vacuum should be set to automatic transmission,
The buzzer will warn automatically when temperature curve runs to the end. Meanwhile, remove the BGA from PCB board with vacuum pen, and then remove the PCB board from the positioning frame.
- 4、 When welding the BGA chip, set the cooling fan to manual grade、 close vacuum. After the temperature curve runs to the end, the buzzer will alarm automatically, the cooling fan begins to cooling the BGA chip and bottom heating zone, meanwhile, the warm heating head will blow a cold wind. Then elevate the upper heater, make the gap has 3-5mm space between the bottom of nozzle and the upper surface of BGA chip and keep cooling for 30-40 seconds, or move away the main heater after the starting light is off, finally take away the PCB board from the support.
- 5、 Before installation of BGA, it is necessary to check that if the PCB pad and BGA tin bead are all in good condition. It is necessary to check the outlet after welding and to stop installation if you find something unusual. Go on welding after anything is normal, or the BGA and PCB board will be damaged.
- 6、 The machine surface needs to be clean at regular time, especially the infrared heating board. Avoid the dirt stay on the board, because the dirt can lead to heat radiation unnormally, bad welding quality and shorten the using time of infrared heating element.

If the heating element was burn out because of this, our company is not responsible for free change!

Conclusion:

In the electric products line, especially the PC and electric production field, component trend to microminiaturization、 multi Function and greening of management, various capsulation technology spring up, and BGA/CSP is the main trend.

In order to satisfy the growing need of BGA device circuit assembly, manufacturers should choose more safe 、 more convenient、 more speedily assembly and repair equipment craft.

Attachment: Packing List

No.	name	type	unit	QTY
1	BGA rework station	DH-A09	set	1
3	Vacuum pen		piece	1
4	Vacuum sucker		set	3
5	Specification	DH-A09	piece	1
6	nozzle	Top nozzle 38*38、34*34、 41*41、bottom nozzle 31x31 55*55	piece	5
7	Shaped folder		piece	6
8	Plum knob		piece	6
9	Support screws		piece	4