PSH-2021 BGA Rework station Mannual

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Attach: Packing List

A. Company introduction

DieHard Technology & Development Co., Ltd is a professional manufacturer of BGA rework station, rework equipments

Our main products:

.BGA rework station .BGA reballing kit/steel mesh .BGA weld kit of tin ball

.BGA test fixture .Lead/ lead-free in ball、paste flux

Meanwhile, we also carry on with BGA rework and BGA samples of PCB board, batch reballing of BGA chip and nonstandard device's design and manufacture!

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. Our products find a good sale in southeast Asia，the middle east ,Africa，Europe, America and Oceania. Besides, we had established the marketing network and terminal service at home and abroad.

We always follow the business principles of ‘Strength 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 source requirements: Use the power source which is small voltage fluctuation.

voltage fluctuation:220V±10 frequency fluctuation:50Hz±3

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.

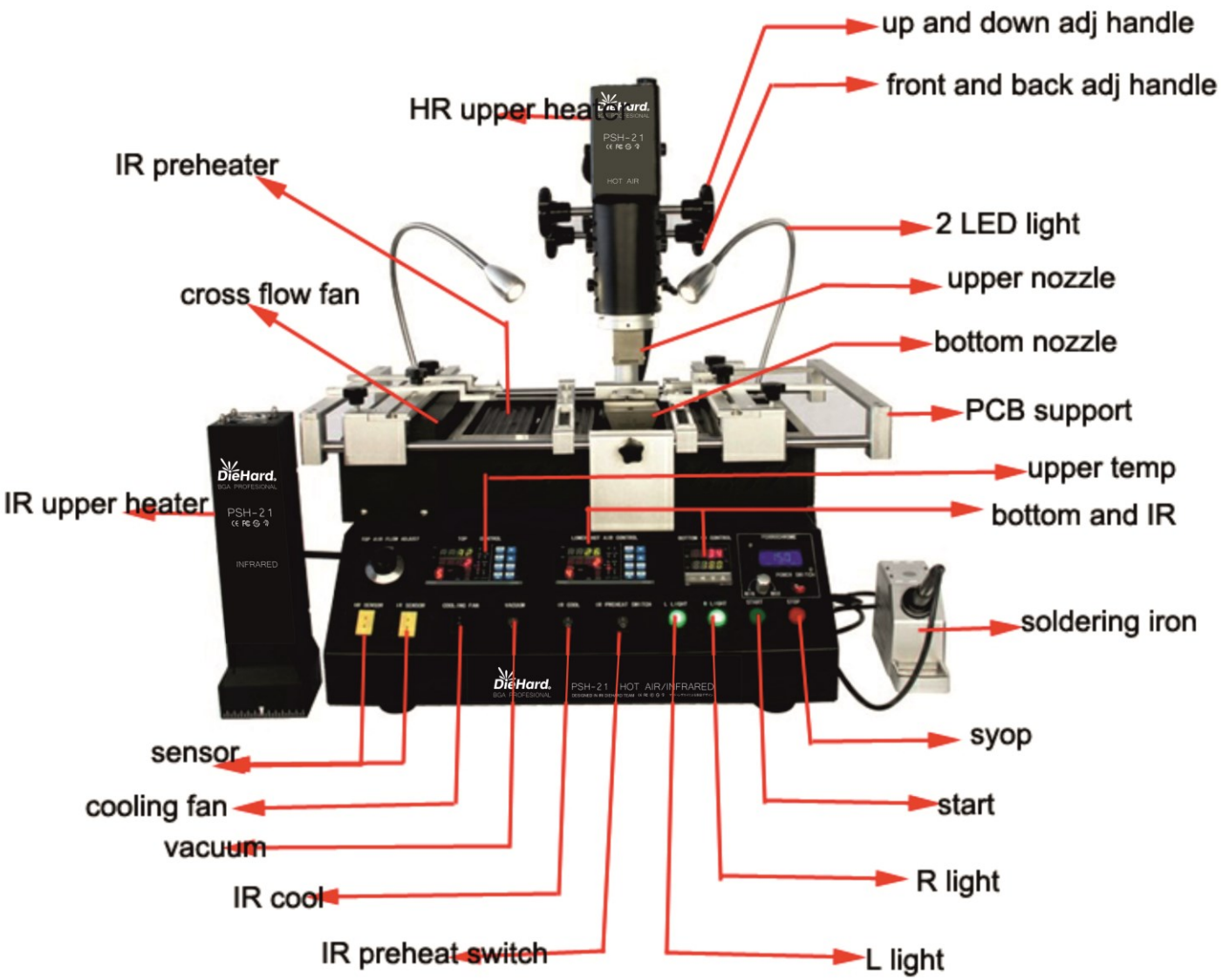
i、When abnormal heating or smoke appears, immediately disconnect the power, and inform the technical service to repair. Disconnect the wire between the electrical cases and machine when carry, hold the pin when pull out the wire, or it will cause bad contact and it won't work normally.

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.Stru



（2）.Function

name	usage	How to use
limit knob	Restrict the bit head down position	Rotate to appropriate place
Top heater	The upper part of the hot air generated institutions	
Up and down handle	Adjust up and down the	Rotate the handle

	location of the up head	
LED	Lighting when Equipment works	Press the lighting button
PCB clip	Clamping the PCB, to the appropriate location	Adjustment knob, move to the appropriate location
Pre-heating heater controller	Control preheat zone temperature	start button , automatic heating
Lighting button	Light switch	Press the button
Stop	Stop heating	Press the button
Start	Start heating	Press the button
Temperature sensor	Connect an external galvanic measuring the actual temperature	Directly connected temperature line
Top heater nozzle	Hot air more focused uniform	Resorted to the appropriate location of the outlet from the BGA
Bottom heating nozzle	Hot air more focused uniform	Resorted to the appropriate location of the outlet from the BGA
Cross-flow fan	Cooling PCB board after soldering	
PCB supporter	Supporting the PCB without distorted	Adjust the supporting columns
Top heater controller	Control of the upper hot air temperature	start button , automatic heating
Bottom heater controller	Control of the lower part of the hot air temperature	start button , automatic heating
Fan switch	Automatic and manual conversion of the cross-flow fan	Switch to a different location

（3）、Main Parameters

Power	4350W/4800W
Top heater	450W/800W

Bottom heater	Second heater 1200W, IR preheating 2700w
Power supply	AC220V±10％ 50/60Hz
Dimensions	560*530*590mm
Positioning	V-groove, PCB support can be adjusted in any direction with external universal fixture
Temperature control	K Sensor close loop control
Temp accuracy	±2 degrees
PCB size	Min:20mm*20mm, Max:320mm*375mm
BGA chip	2*2~80*80
Minimum chip spacing	0.15mm
External Temperature Sensor	1
Net weight	32 kG

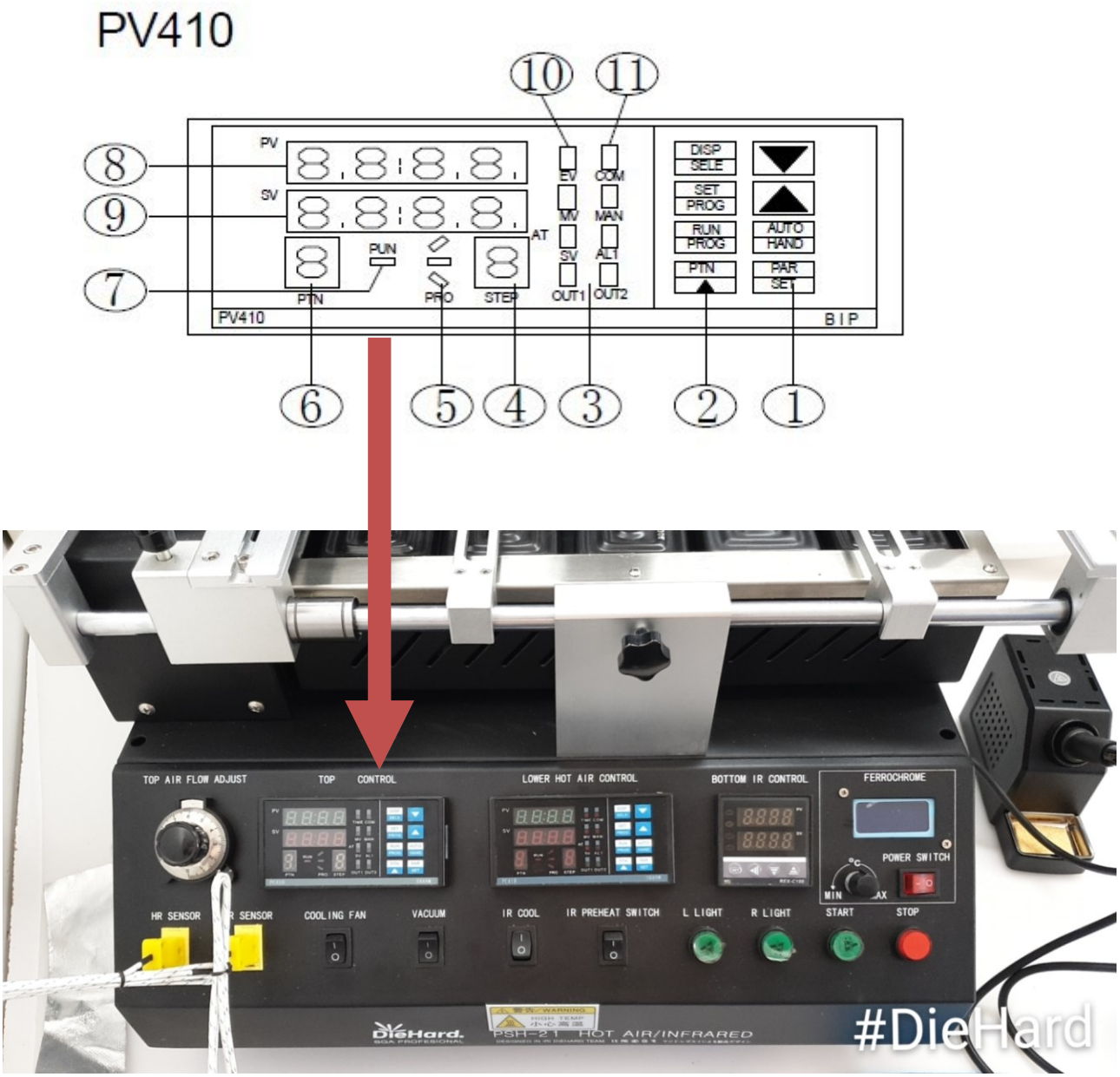
Description：

1) Two top heating: hot air heating and infrared heating
2) Bottom heaters are hot-air heating, the third heating is infrared heating, temperature accuracy within ±2°C, the top and bottom heaters can set 8 segments rising temperature and 8 segments activity temperature.

1.Embedded Industrial PC, high definition touch screen interface, PLC control, and instant profile analysis function. Real-time settings and actual temperature profile display can be used to analyzed and correct parameters if necessary.
2.It uses precise K-type close circuit control and automatic temperature adjustment system, with PLC and temperature module to enable precision temperature control of ±2 degC. External temperature sensor enables temperature monitoring and accurate analysis of real time temperature profile.
3.V-groove PCB support for rapid, convenience and accurate positioning that fits for all kinds of PCB board.
4.Flexible and convenient removable fixture on the PCB board which protectsand prevent damage to PCB. It can also adapt to rework various BGA packages.
5.Various sizes of BGA nozzles, which can be adjusted 360 degree for easy installation and replacement;
6.There are 6-8 levels of variable and constant temperature controls. Massive storage of temperature curves which are Instant accessible according to different BGA. Curve analysis, setting and adjustment are all accessible via touch screen. Three heating areas adopts independent PID calculation to control heating process to enable more accurate and precise temperature control.
7.It uses high powered blower to enable fast cooling of PCB board and prevent it from deformation. There are also internal vacuum pump and external vacuum pen to assist with fetching the BGA chip.
8.Equipped with constant temperature digital display soldering iron
9.Including Voice "early warning" function. 5-10 seconds before the completion of uninstalling or welding, voice reminder / warning to get the workers prepared. Cooling system will start after vertical wind stopped heating. When the temperature drops to room temperature, the cooling process will stop, so that the machine will not age after heated up.
10.CE certification, with emergency switch and automatic power-off protection device when emergency happens.

E、Setting and operation

1、Introduction about the functions of the temperature controller

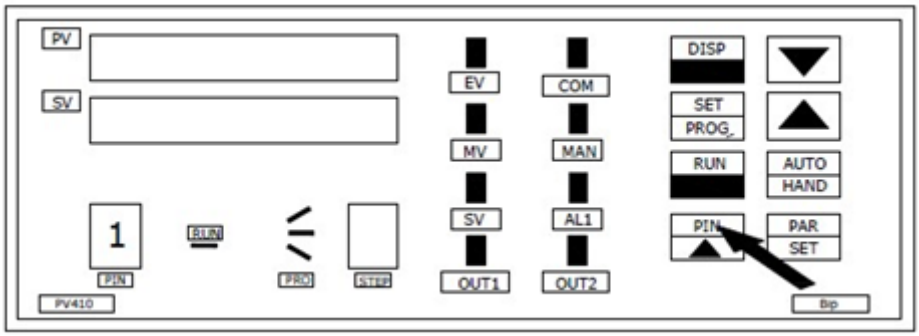


No	Item	Explanation
1		Parameter hypothesis key
		Automatic / manual switch key
		numerical increase key
		numerical reduce key
2		Curve program group increased bond
		Start / pause curve program running key
		Curve program parameters set key
		Display item switch key
3	OUT1	Output 1 indicator light
	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
9	SV/MV/EV	Show that the set value, the output value or the long running time, when you press the DISPSELECT key items to display toggle
		Set value indicating lamp, a downlink window display the set value,

10	MV	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

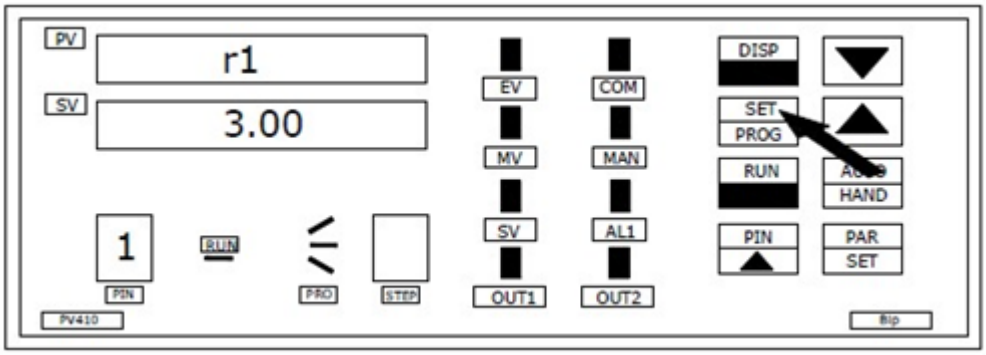
2. Setting steps

(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)

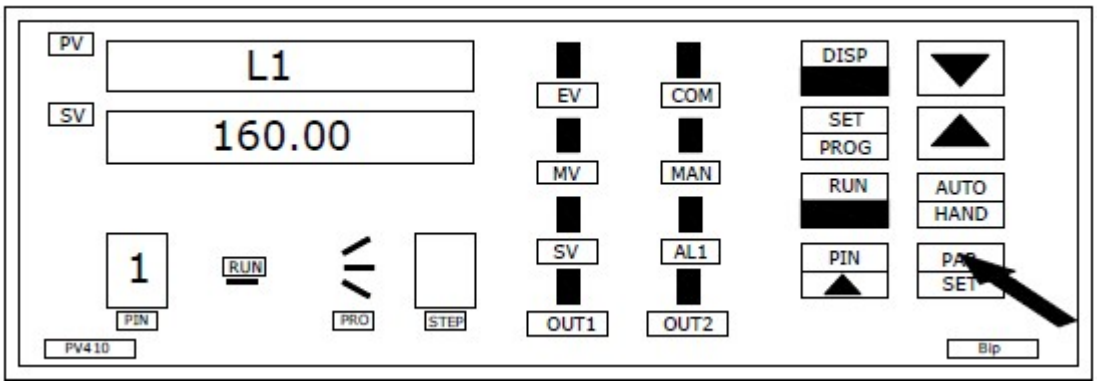
Press SET button to set the temperature ,r1 represents the speed rate of first temperature section(the rest can be done in the same manner,r2 represents the speed rate of the second temperature section.....);3.00 represents 3 degrees\second. Press the increase\reduce button to adjust, press PAP to save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



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

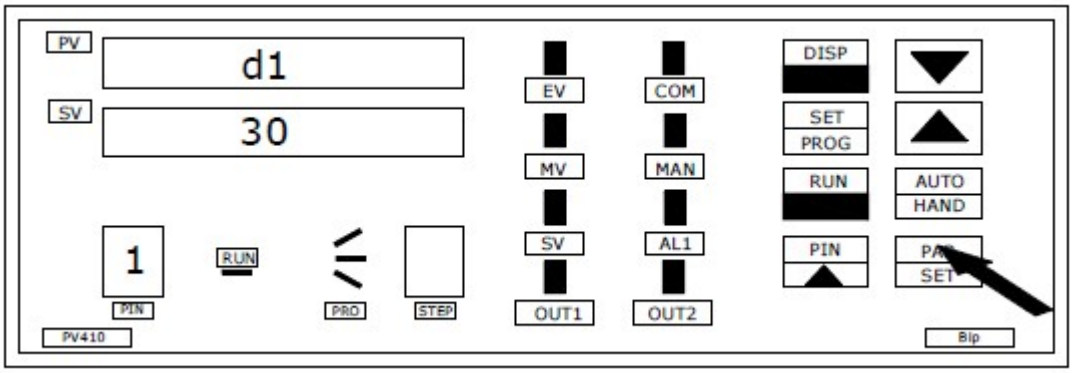
L1 represents the first temperature section(L2 represents the second temperature section.....);

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.

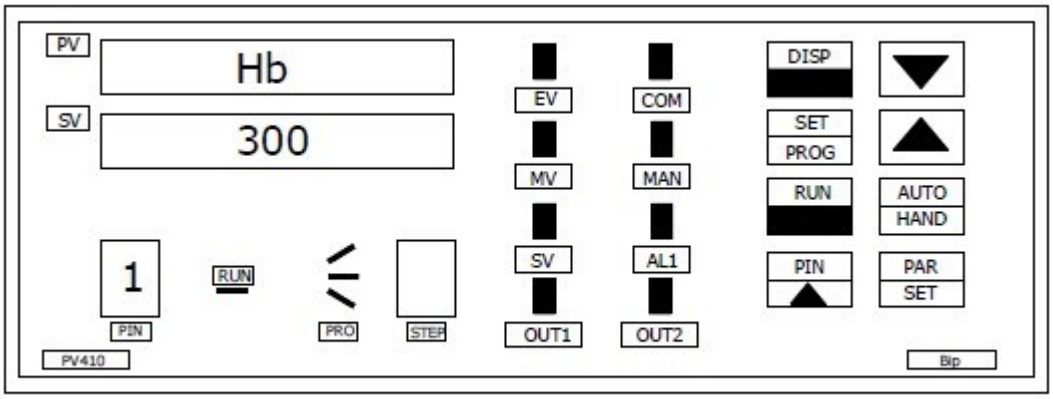


(5)The remaining seven of the temperature settings are identical with the above setting

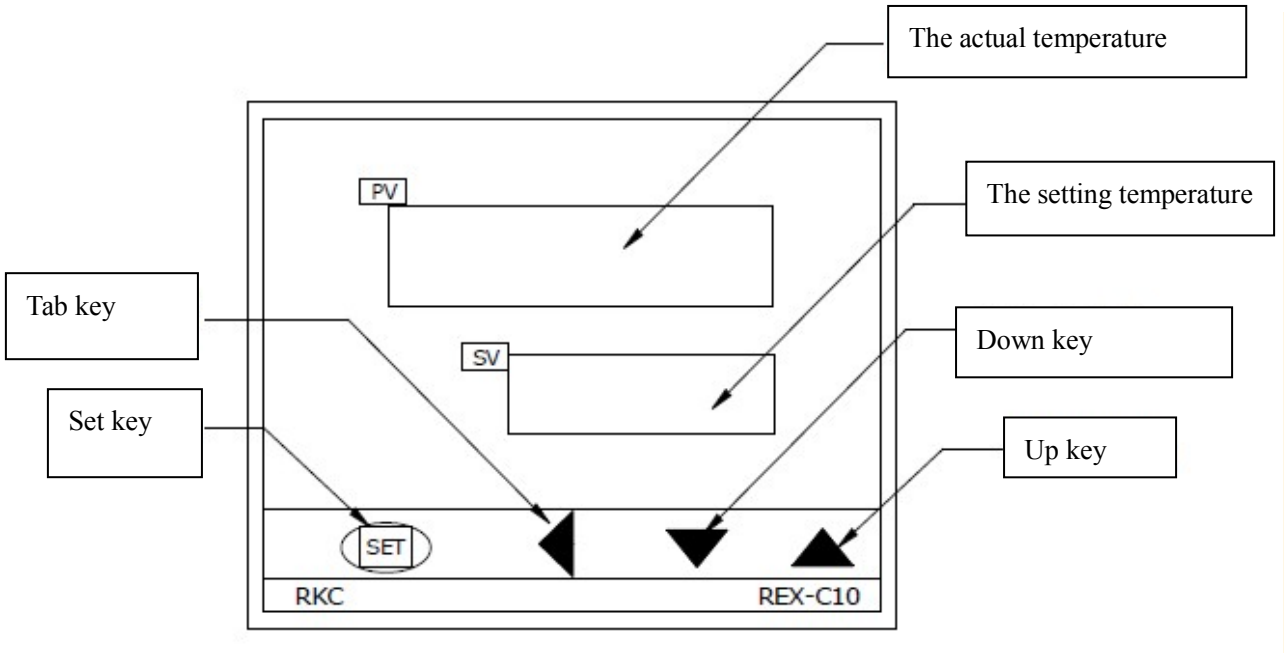
(6)Not need to use the eight sets of temperature, to set up a few paragraphs you want, for example, just need 6 sets, after the setting for 6th temperature, press PAR SET to enter the

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.

3. Digital Soldering iron

The temperature can be controlled independently and Adjust the temperature from 150 degree to 450 degree.

4. Two upper heaters. HR and IR

Change the upper heater

F. Operation steps：

A. Preheat：

Preheat before the PCB and BGA reworking , the temperature of constant temperature oven is set at 80℃-100℃,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)

3) 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 section 1	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

4) 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.
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G.Announcements of operation of BGA rework Station

1、After switch on the power, check whether the upper and bottom hot air nozzles have cold air or not. If not, switch off the power, or the heaters will be burnt. The bottom IR heating areas can be controlled by switch according to 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 abnormally, 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!

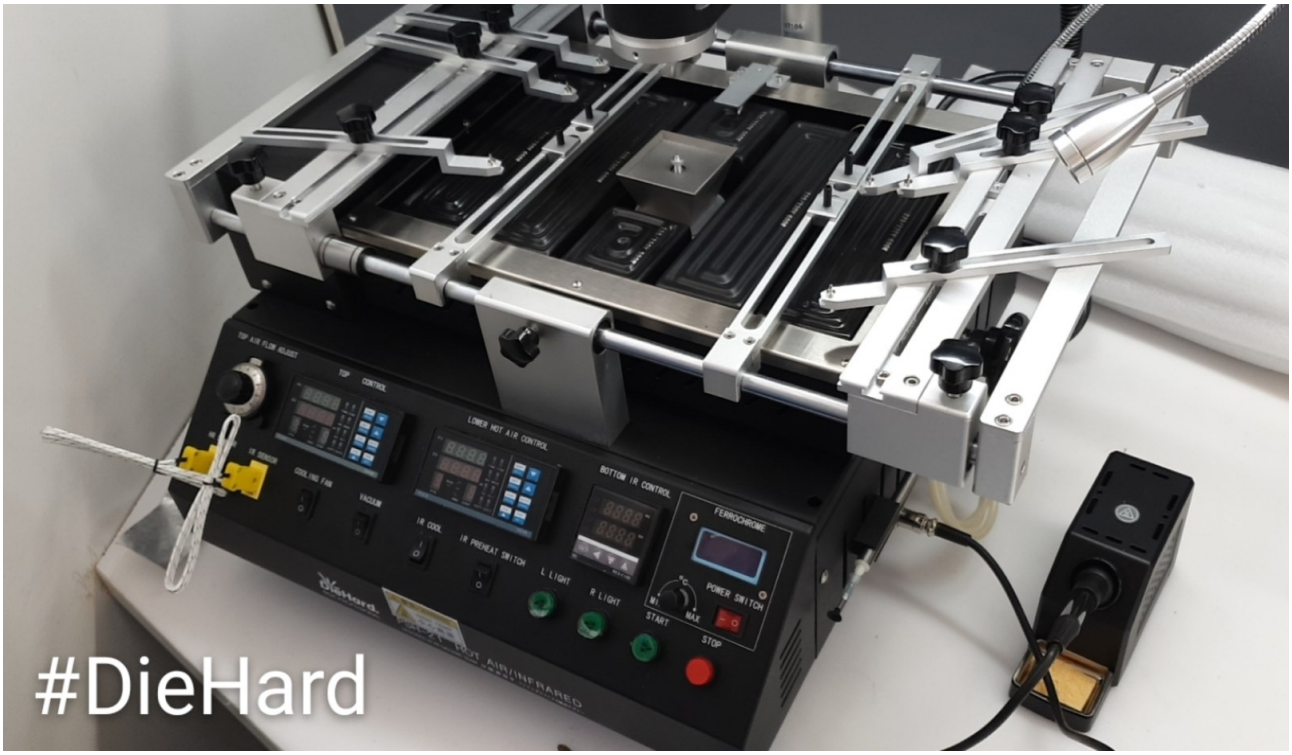
Conclusion:

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	Unit price	note
1	BGA rework main engine	PSH-2021	set	1		Precision instrument control
3	Vacuum pen		piece	1	/	
4	Vacuum sucker		set	3	/	
5	Specification	PSH-2021	piece	1	/	
6	nozzle	Upper nozzle 31*31、38*38 41*41 Bottom nozzle 55*55 34*34	piece	5	/	
7	Universal fixture		piece	6	/	
8	Plum knob		piece	6	/	
9	Support screws		piece	6	/	
10	Data line		Piece	1		
11	brush		Piece	1		
12	Sensor wire		Piece	1		



POWERED BT TAJAN-CO


#DieHard
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BGA PROFESIONAL
PSH-21
HOT AIR
TOP CONTROL
LOWER HOT AIR CONTROL
BOTTOM IR CONTROL
COOLING FAN
VACUUM
IR COOL
IR PREHEAT SWITCH
L LIGHT
R LIGHT
START
IR SENSOR
DieHard.
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PSH-21 HOT AIR/INFRARED