BGA Rework Station (LY-G580)
User's Manual V1.O

Introduction

Respected customers, thank you very much for using our Touch Screen BGA Rework Station。

The main features of LY-G580 Touch Screen BGA Rework Station ：

1）Linear slider is adopted, so all the three axles (X, Y, and Z) can do fine tuning and quick location with perfect positioning accuracy and speedily maneuverability**；**

2）Adopted touch screen , PLC controlling ，can store 1-50 groups of temperature curve data.;

3）Three temperature zones to heat up independently, hot air heat up between up and down zones, IR heat in the bottom, temperature precise control is in±3℃，**the three heating zones can work at the same time ,7 temperature curve controlling can be set at most in the up and down zone;**

4）The hot air nozzle can be arbitrary rotation in 360 degree, the IR heater in the bottom can make PCB board heated evenly;

5) High accuracy K-type thermocouple closed-loop controlling. It can test temperature accurately through external temperature measurement interface；

6）PCB board location with V-shape slot，**movable and adjustable jigs can protect the PCB board;**

7）High power cross-flow fan is used for cooling PCB board quickly to improve work efficiency. What is more, the built-in vacuum pump and external vacuum nozzle is convenient to take BGA chips；

8）Having alarm prompt function after welding is done, specially added early warning function for convenient operation；

9）Under this situation that temperature is out of control, circuit can automatically cut off the power with double over temperature protection function；

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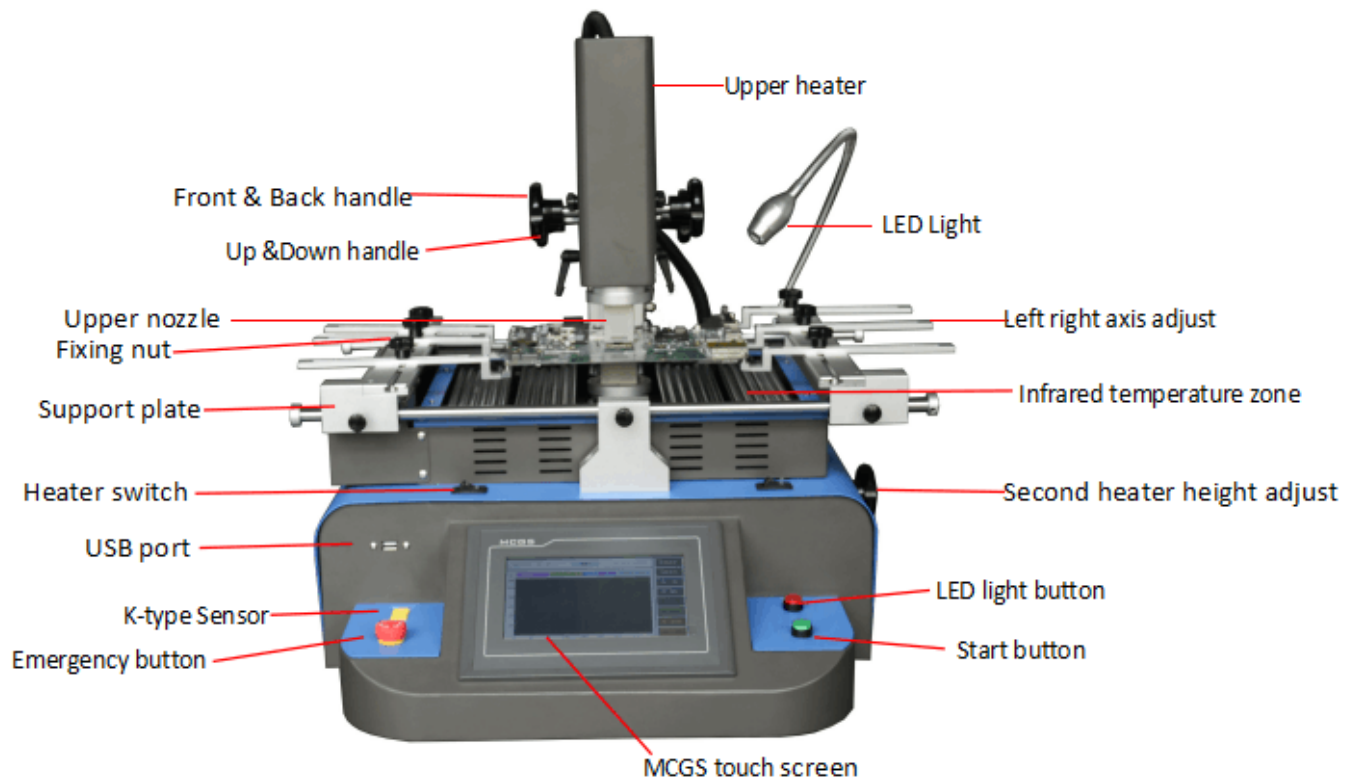
一、 Installation requirements

1、 Far from inflammable, explosive, corrosive gas or liquid environment。

2、 To avoid wet places, air humidity is less than 90%。

3、 Environmental temperature-10 ℃ ~ 40 ℃, avoid direct sunlight,。

4、 No dust, floating fibrous and metal particles work environment。

5、 Installation plane require that flat , firm and no vibration。

6、 No heavily object on the machine。

7、 Avoid any air conditioner, heater or fan directly airflow influence。

8、it is required to reserve >300mm space at the back of the rework station to heat elimination。

9、 Workbench of placing bga rework station Suggest surface area (900 x 900 mm) relative level, level 750 ~ 850 mm。

10、 Equipment of wiring must be made by qualified professional and technical personnel for operation, the main line 2.5 square, the equipment must be grounding is good。

11、 Turn off the power when discontinued the switch, long-term out of service must be pulled out power plug。

二、 Technical parameter

Total Power	4800W
Upper Heating Power	800W
Lower Heating Power	Second zone:1200W, Third zone: IR 2700W
Power Supply	AC 220V±10% 50/60HZ
Overall Dimension	L635*W600*H560mm
Locating Mode	V-shape card slot, PCB holder can be adjustable by X and Y axes with universal jigs.
Temperature Controlling	K-type thermocouple closed loop control, independent temperature control, precision up to ±3 degree
PCB Size	Max 410*370mm, Min 20*20mm
Electrical Material	High sensitive temperature control module, Delta PLC, Touch Screen made-in Taiwan
Weight of machine	40KG

三、 Introduction of main structrue
（一）Structure Introduction

Upper heater

Front & Back handle

LED Light

Up &Down handle

Upper nozzle

Left right axis adjust

Fixing nut

Support plate

Infrared temperature zone

Heater switch

Second heater height adjust

USB port

LED light button

K-type Sensor

Start button

Emergency button

MCGS touch screen
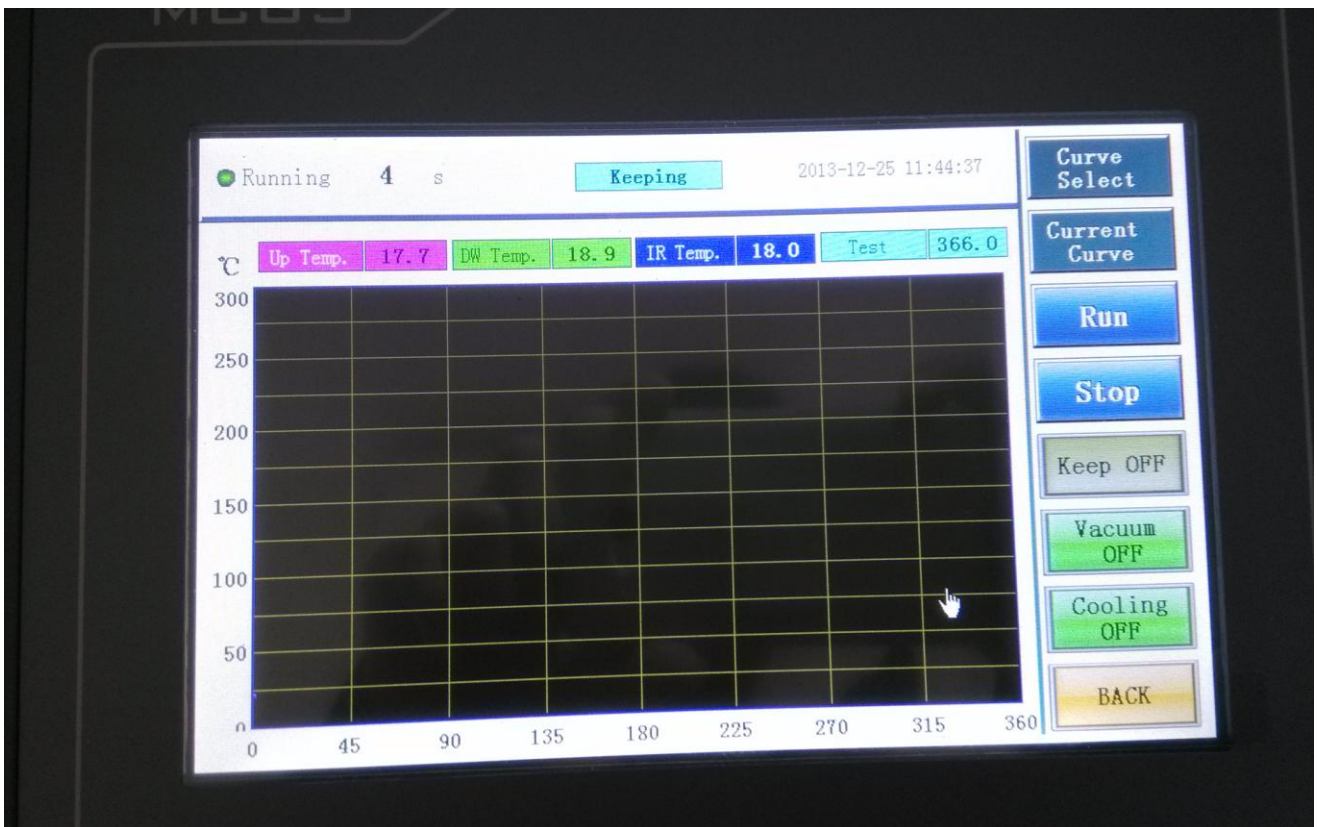
四、 Program setting and operation

Screen Name: System Home Page

The first picture after the touch screen lighted

Chinese : button and then go to the operation screen in Chinese
ENGLISH: button and then go to the operation screen in English

Screen Name: Main Window (English)

Current Curve: Press and pop up current using parameters.

Run: The system will start heating operation according to the current parameter after pressing

Stop: The system will stop heating operation according to the current parameter after pressing

Keep OFF: After pressing, the system will stop heating operation.

Keep ON: After pressing, the system will keep the current temperature unchanged.
Vacuum ON : After pressing the system initiates the vacuum.
Vacuum OFF: After pressing the system stop the vacuum

Cooling ON：After pressing the system initiates cooling.

Cooling OFF: After pressing the system stop cooling

Current Curve: Press and appear followed picture

Current Curve	1st	2cd	3rt	4th	5th	6th	7th	8th	Curve Name
Up Temp	200	230	260	285	240	200	0	0	111
Up Rate	10	10	10	10	10	5	0	0	
Time Constant	30	30	30	50	30	20	0	0	
Down Temp	160	200	200	230	290	200	0	0	
Down Rate	10	10	10	10	10	0	0	0	Temp curve
Time Constant	30	30	190	30	35	20	0	0	
IR Temp	180	0	0	0	0	0	0	0	
IR Rate	3	0	0	0	0	0	0	0	
Time Constant	400	0	0	0	0	0	0	0	BACK

Up Temp : upper temperature

Up Rate：the upper rise temperature speed

Time Constant: when the rise temperature speed up to the temperature ,the time will keep

30s then go on to the next temperature parameter

Down Temp: Down temperature

Down Rate: the down rise temperature speed

Time Constant: when the rise temperature speed up to the temperature ,time will keep 30s

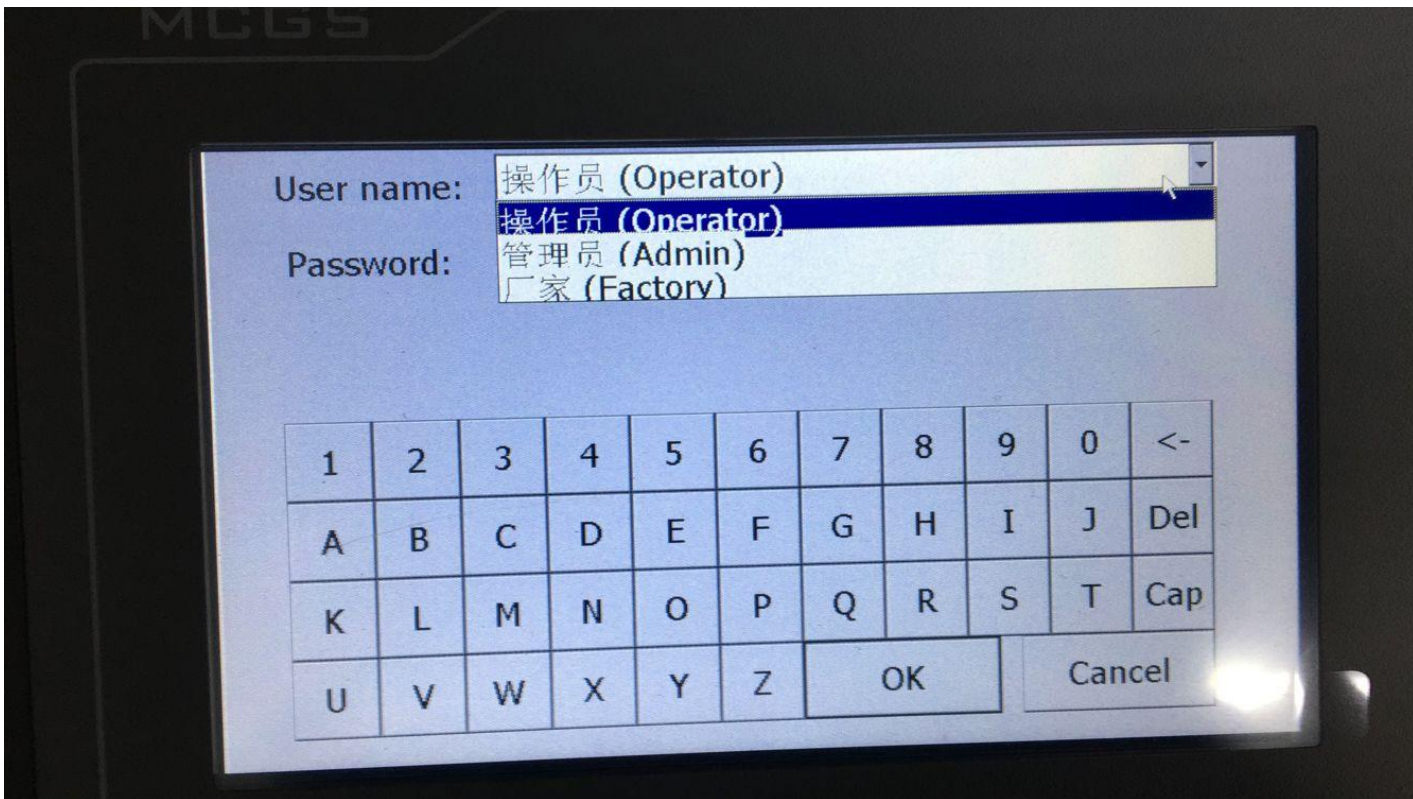then go on to the next temperature parameter

IR Temp: IR temperature

IR Rate: the IR rise temperature speed

Time Constant: the keep time

Temp curve: the curve temperature parameter

Curve name: name of the curve temperature

Current Select: Press and setting the heating temperature parameters (as followed picture)

管理员：Administrator (choose this and click)

Password : 8888 (after press this password press OK then will appear the followed picture)

Parameter Setting

	1st	2cd	3rt	4th	5th	6th	7th	8th
Up Temp.	0	0	0	0	0	0	0	0
Up Rate	0	0	0	0	0	0	0	0
Time Constant	0	0	0	0	0	0	0	0
Down Temp.	0	0	0	0	0	0	0	0
Down Rate	0	0	0	0	0	0	0	0
Time Constant	0	0	0	0	0	0	0	0
IR Temp.	0	IR Rate	0	Time Constant	0	Fan Speed	0	
Cooling Time	180S	Vacuum Time	5s	Alarm Time	2S	Curve Name	0	

| System Parameter	Change Password	Delete Curve	Save Curve	Download Curve	Choose Curve	Back

Password: this bottom can change the password u want to set

Delect: delete the current temperature parameter curve

Save: to save the input parameters.

Apply : after you change the temperature parameter then download the current temperature curve and press save ,Download the setting parameters to the current parameters

Choose: choose the temperature parameter to the current parameter to heating
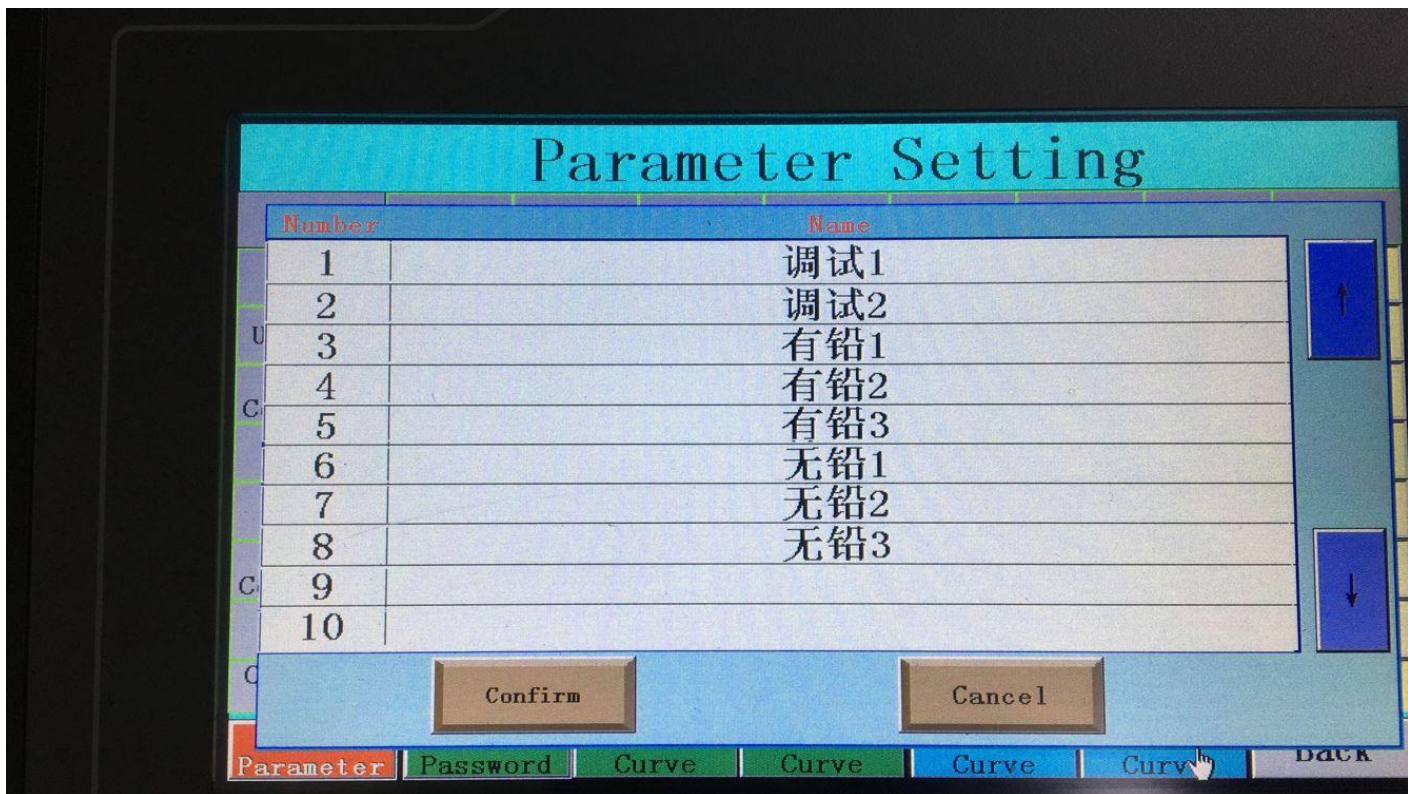
Screen Name: System Parameter (parameter setting)

五、Instructions of external temperature testing thermocouple

（一）Function of external thermocouple

1、Testing the actual temperature of the heating parts when soldering 。

2、Can be movable，convenient to test temperature of different parts of cell that need to soldering 。

3、Calibration function, through the appropriate adjustments, as far as possible make welding parts temperatures close to the setting temperature。

（二）Thermocouple installation

1、Check the thermocouple lines having the following phenomenon or, such as scratching and broken line。

2、Put the thermocouple line plug into the external thermocouple socket according to the positive and passive identification。

3、After right installation，the current testing temperature of thermocouple will be displayed on the touch screen :"actual measurement"

（三） Using thermocouple to measure actual temperature

1、Place PCB board onto the BGA Rework Station，fix the thermocouple line on the PCB through the tin foil sticker（Picture 29）。

2、 Adjust the probe height，locate the probe above the part that will be tested 1-2mm（Picture30）。

Picture 29

Picture 30

3、Adjust head related adjustment button，make the part that will be heated above the wind cover（Shown as picture 30）。

4、Adjust the head heater' up-down adjustment button，the distance between wind cover edge and PCB about 3-5mm。

5、When soldering and desoldering，that is to say upper and lower heater begin to heat 。

6、At this time, the red, yellow and green curves will be displayed on the external testing temperature curve screen of the touch screen.

7、External thermocouple actual temperature curve（Green）。

8、Upper heater internal thermocouple actual temperature curve（Red）。

9、Lower heater internal thermocouple actual temperature curve（Yellow）。

（四） Correct temperature curve through the external thermocouple

Notice：This group of operation may cause temperature deviation even out of controlling because of incorrect operation，please operate carefully ！

1、Setting upper parameter such as temperature, time and slope and so on （The upper heater correction）。

2、Advice to correct on the waste PCB board to avoid damage board and electronic component.

3、Implement above（三）process.

4、Close the lower heating（set the lower heater data to 0），back to

"**temperature curve setting screen**"click"**Run**"button，machine will heat according to the setting，The upper actual temperature (Red) and external testing temperature will be displayed on the external testing screen of the touch screen.

5、The red curve said Upper heater internal thermocouple actual temperature curve，The green curve said External thermocouple actual temperature curve，difference between the red curve and the green curve is smaller, that is to say the temperature of actual heating parts and the setting temperature are closely，the upper heating process is more standard；on the contrary，difference between the red curve and the green curve is bigger，that is to say the temperature of actual heating parts and the setting temperature are far，the upper heating process is not standard 。

6、If the difference between the two curves is too big ，should adjust and correct.

7、The detail adjustment ways are the following，**Error can not be avoided because of the system process and the environment，if temperature deviation does not affected soldering and desoldering, non-professionals try to avoid the following operation !**

a、If the external thermocouple actual temperature curve（Green）is less than upper heater internal thermocouple actual temperature curve（Red），Adjust upward the internal thermocouple probe in the upper wind cover；

b、If the external thermocouple actual temperature curve（Green）is more than upper heater internal thermocouple actual temperature curve（Red），Adjust downward the internal thermocouple probe in the upper wind cover；

c、Adjustment range can not be too big，with 1mm every time；

d、Adjust for many times；

e、When heating after adjustment，no thing close to the upper internal thermocouple probe，to avoid affection on accuracy of the testing temperature；

f、After temperature adjustment，fix probe well，to avoid the affection on testing temperature because of the shake；

g、The adjustment method of this case is only apply for two parallel curve smoothly uniform deviation，not apply for the rule less rise and fall of the temperature ！

h、Location of upper internal thermocouple：Take cover in the upper edge of the hair as about the distance of 2 ~ 3 cm place；

i、 To avoid empyrosis, so please operate regularly！

8、As the same ，fix the external thermocouple line under the PCB through the tin foil sticker，is above the lower nozzle ，Run the lower heater（close the upper heater），to test and correct the accuracy of lower heating 。

9、Making out：close setting temperature of the lower heater，（Notice：run time according to the upper heater，the upper temperature is set as 0 degree when run the lower heater alone，the first constant temperature time of the upper heater should be equal or bigger than the total heating time of the lower

heater。

10、 Attention, please refer to the above seven related content。

11、 The detail adjustment methods are the following：

a、If the external thermocouple actual temperature curve（Green）is less than lower heater internal thermocouple actual temperature curve（Yellow），Adjust downward the internal thermocouple probe in the lower wind cover。

B If the external thermocouple actual temperature curve（Green）is more than lower heater internal thermocouple actual temperature curve（Yellow），Adjust upward the internal thermocouple probe in the lower wind cover。

六、 Reballing Process

1. Put the BGA that need to reball onto the bottom of the adjustable BGA Reball Kit, adjust two sliders without spring to fix BGA.

2. Chose suitable stencil according to the BGA size .fix the stencil on the header and lock 4 M3 screw, then cover the top. adjust the 4 screw on the bottom to suit the height of the BGA.

3. Observe the alignment situation between the stencil hole and the BGA soldering point, if misplace, please adjust again.

4. Lock two fixed slider without spring, take away the BGA and painted thin a layer of BGA solder paste, then put it to the kit and cover the top.

5. Put into suitable BGA Solder Ball ,then shake the reball kit lightly, to ensure every soldering point has the ball, then put out the needless part .

6. Place the reball kit on the flat table ,take away top cover, take away the BGA carefully.

7. To fix the solder ball can be through our bga rework station or soldering iron，to heat the BGA Solder Ball on the BGA ,soldering the ball to the BGA, last reballing is over !

七、 Maintenance

In order to guarantee the machine function and prolong service life of the machine, during usage, we have to do some maintenance on the system regularly as follows

Parts Name	protection	Maintenance Period
Upper heater	Open the cover, clean the fan with high-pressure air	1 month
Drive mechanism of upper heater	Apply some butter on the lead rail, rack and gear and shaft.	1 month
Distribution box	Open the back cover of the machine, use vacuum cleaner to suck the dust and dirt, and check whether the components fixed well	3 month
Rotation Part of upper heater	Apply some butter on the drive parts	1 month
Bottom IR heating tube (protecting fence)	Clean the heating plate with dry cloth(do not use wet one)	1day
PCB clamps	Apply some lubricant to the PCB supports and shaft of support guiding axle	1 month

八、 Safety caution

⚠ （一） **Power of the machine is AC220V，working temperature is up to 400℃，may damage the machine because of the incorrect operation，even endanger the safety of the operator。So must strictly comply with the following items：**

1、No fan or other equipment to blow up the machine when it is working ，or cause the damage of the components；

2、No operation under that environment such as Inflammable and explosive liquids or gases；after power on ，no combustible to touch the high temperature area and metal components，or cause fire and blast easily ；

3、To avoid high temperature burns，no touching on the high temperature area when working，there is hot after working，it is necessary to take some measures when operating；

Commonly used BGA soldering and desoldering process parameter table：（For reference）

Leaded temperature curve soldering

41*41 BGA soldering temperature setting：

	Preheating	Constant temperature	Warming period	Soldering 1	Soldering 2	Cooling
Upper heating	160	185	210	235	240	225
Constant temperature time	30s	30s	35s	40s	20s	15s
Lower heating	160	185	210	235	240	225
Constant temperature time	30s	30s	35s	40s	20s	15s
Slope	3.0	3.0	3.0	3.0	3.0	3.0
IR preheating	180					

38*38 BGA soldering temperature setting:

	Preheating	Constant temperature	Warming period	Soldering 1	Soldering 2	Cooling
Upper heating	160	185	210	225	235	215
Constant temperature time	30s	30s	35s	40s	20s	15s
Lower heating	160	185	210	225	235	215
Constant temperature time	30s	30s	35s	40s	20s	15s
Slope	3.0	3.0	3.0	3.0	3.0	3.0
IR preheating	185					

31*31　BGA soldering temperature setting：

	Preheating	Constant temperature	Warming period	Soldering 1	Soldering 2	Cooling
Upper heating	160	180	200	215	225	215
Constant temperature time	30s	30s	35s	40s	20s	15s
Lower heating	160	180	200	215	225	215
Constant temperature time	30s	30s	35s	40s	20s	15s
Slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR preheating	180					

The above is apply to the leaded BGA

Lead-free temperature curve soldering

41*41　BGA soldering temperature setting：

	Preheating	Constant temperature	Warming period	Soldering 1	Soldering 2	Cooling
Upper heating	165	190	225	245	255	240
Constant temperature time	30s	30s	35s	55s	25s	15s
Lower heating	165	190	225	245	255	240
Constant temperature time	30s	30s	35s	55s	25s	15s
Slope	3.0	3. 0	3. 0	3. 0	3. 0	3. 0
IR preheating	210					

38*38　BGA soldering temperature setting：

	Preheating	Constant temperature	Warming period	Soldering 1	Soldering 2	Cooling
Upper heating	165	190	225	245	250	235
Constant temperature time	30s	30s	35s	45s	25s	15s
Lower heating	165	190	225	245	250	235
Constant temperature time	30s	30s	35s	45s	25s	15s
Slope	3.0	3.0	3.0	3.0	3.0	3.0
IR preheating	210					

31*31　BGA soldering temperature setting：

	Preheating	Constant temperature	Warming period	Soldering 1	Soldering 2	Cooling
Upper heating	165	190	220	240	245	235
Constant temperature time	30s	30s	35s	40s	20s	15s
Lower heating	165	190	220	240	245	235
Constant temperature time	30s	30s	35s	40s	20s	15s
Slope	3.0	3.0	3.0	3.0	3.0	3.0
IR preheating	210					

The above is apply to the Lead-free BGA
Put the cooling temperature to 0 degree when desoldering 。