JunZhi

# 全自动焊接机
# Automatic Welding Machine
# MODEL:DK25

**Original Version**

**To avoid the wrong operation, please keep the manual available and read the manual completely before operating the machine.**

**DONGGUAN JUNZHI AUTOMATION MACHINERY CO.,LTD.**
**Address：No.01,Lane04,SongbaiLang,Dalang Village,Dongguan,Guangdong,China**

网址：www.junzhijixie.com　　邮箱：junzhijixie@qq.com

# Chapter 1 Preface

First of all,thank you for choosing our products,we believe that your wise choice will let you work with great facility.In order to help you know the operation and maintenance of the equipment with more details and maximize the performance of it,we write this manual for your reference.

To ensure the full performance and prolong the machine life-service,please read this manual carefully before installation,debugging and operation.

Junzhi automatic brazing machine is suitable for brazing carbide tips into the saw blanks.In normal use,our company will be responsible for the treatment or replacement of non-consumable parts within the warranty period when failure or damage happens.Warranty will not be provided in the case of the following circumstances:improper operation and maintenance,or modifying the machine arbitrarily.

This product belongs to our own intellectual property,and protected by law.Our company will preserve the right to pursue legal liability if any entity or individual copies our product without permission.

You are welcome to use our products and thanks for your trust.

# Chapter 2 Safety Warning

Please be sure to receive related training and read the manual before using the machine to avoid any machine malfunction,personal injury and property loss or any other dangers caused by improper operation.

## Special notes:：

1. Installation and commissioning of the machine must be performed by professional staffs to prevent accidents or damage to the machine;
2. Maintenance of the electrical equipment or machinery parts must be performed by qualified personnel;Cut off the power and hang warning sign;
3. Wear working clothes and safety helmet;
4. Keep the machine out of reach of the children and the non-operating personnel should stay outside the working area.
5. Do not open any cover during the operation,otherwise it will easily lead to electric shock.
6. Connect the machine to effective ground wires.(Simple workable ground wire can be made:Insert any conductive objects 2 meters below the ground or into the brine tank,but avoid touching of anyone,especially children and pregnant women).

## Marking Notes：

高压危险( High Voltage) : This mark shows potential danger to human health and life under the exposure of power.Do not ignore it,it may cause significant damage,even endanger the life.

注意安全(Be Safe) :This marks shows potential danger to human health and life or machine parts. Do not ignore it,it may cause significant damage,even endanger the life,or may cause damage to the machine parts.

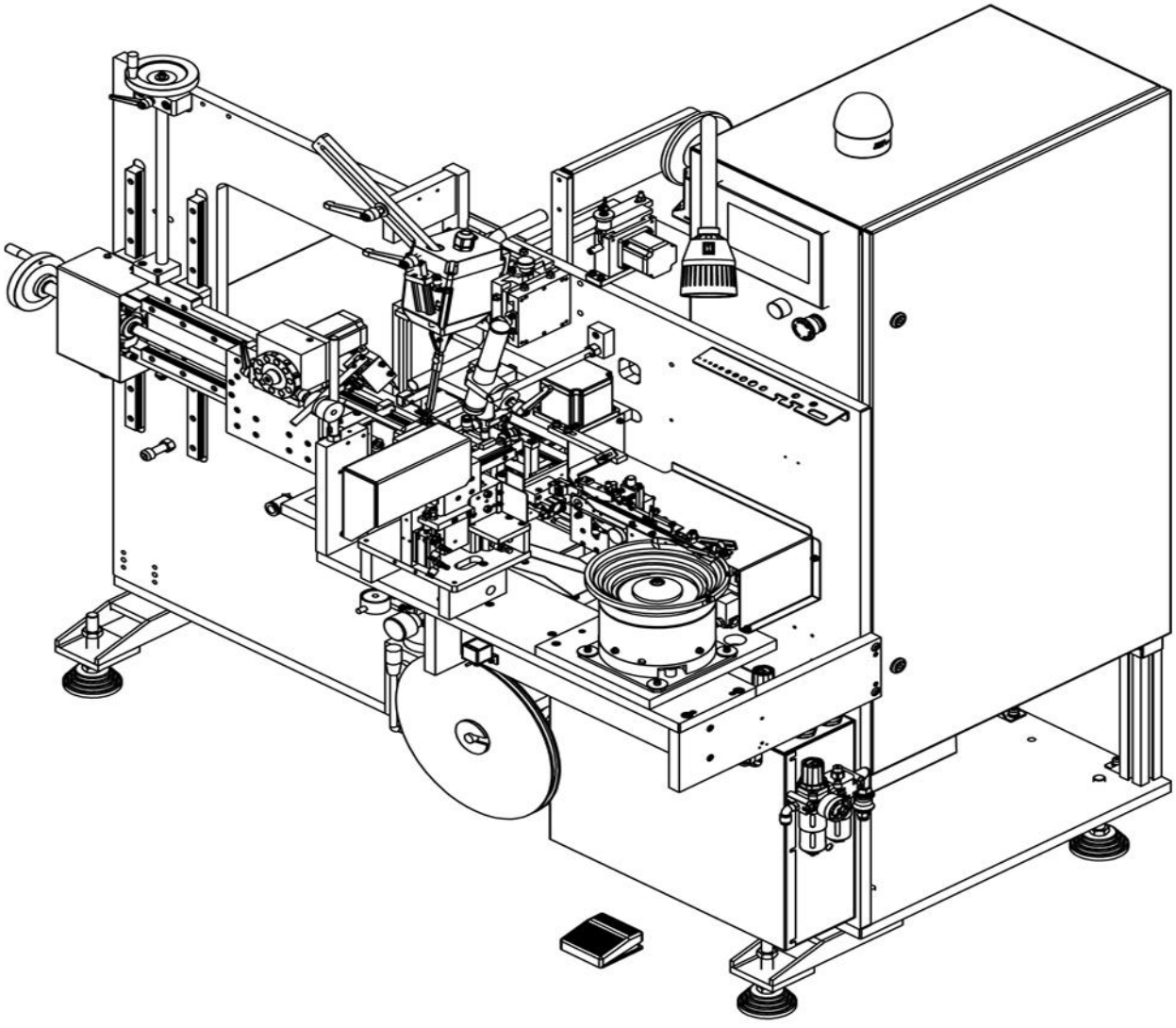
Laser Caution. Be careful of laser when you operate the machine.

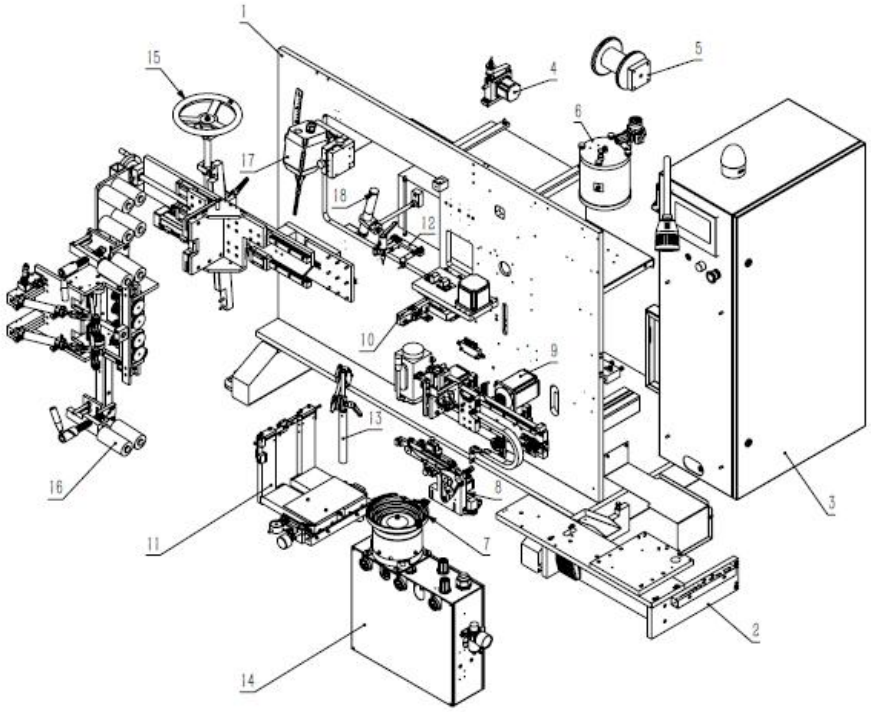
Cardiac pacemaker 。 Keep away from the machine if anybody wear cardiac pacemaker、 cardiac defibrillator or other life support electric device。

# Catalogue

# Chapter 1　Structure and main technical parameters

## 1.1、Machine Structure






1、body frame 2、working table part 3、electric box 4、wire feeding part

5、Welding wire hanging parts 6、glue storage part 7、material selecting part

8、clamping part 9、first-time feeding part 10、senond-time feeding part

11、clamping part 12、flux pot part 13、wire-hanging part

14、air-control part 15、Angle adjusting part of frame saw

16、wire-feeding part 17、high-frequency machine part

18、temperature measuring part

## 1.2、Technical parameters

Saw blade width： 25～180 mm　　Hook angle： -5～+10°

Saw tip width： 1.5～4.0 mm　　Saw tip length： 4.0～12 mm

Saw tip thickness： 1.5～3.0 mm　　Working pressure： 6 kgf/cm2

Total power： 6.5 Kw/h　　Ventilation capacity： ＞5 $m^3$/min

Chiller flow(optional)： 22 L/min　　(power：1.5 kW)

Power supply：220 V（one phase），50 Hz　(wire connection no less than 6$mm^2$)

**Nameplate**

| | |
|---|---|
| Automatic Welding Machine | |
| 型号 MODEL： DK25 | 电源 MACHINE： 220VAC 50/60Hz |
| 重量 WEIGHT： 480KG | 功率 POWER： 7.5 kW |
| 尺寸 SIZE(mm)：1650*1000*1800 | 满载电流 FULL LOAD CURRENT： 35A |
| 制造日期 DATE： | 气压 AIR PRESSURE： 0.55 MPa |
| 出厂编号 SERIAL NO: | CE |
| DONGGUAN JUNZHI AUTOMATION MACHINERY CO.,LTD. | |
| Address：No.01,Lane04,SongbaiLang,Dalang Village,Dongguan,Guangdong,China | |

# Chapter 2 Packing and Transportation

This machine is medium-sized type and packed with special wooden box when leaving the factory.The packing box should be fixed with the transport vehicles during shipping to prevent the rain and rollover.Small-sized truck can be used when loading and unloading or transporting to installation site;Make sure that the carrying truck is strong enough to bear the weight of the machine and handled by experienced operator to avoid accidents.

We suggest to do the following steps after you receive the machine:

1. Check if the appearance of the wooden box is damaged,record it and inform the freighter if this happens;

2. Check out all the items according to the packing list after opening the package,if any missing or damage,please inform us.

# Chapter 3 Installation

The machine must be installed by our appointed professional mechanic or yours to avoid any damage to its performance.

Installation notes：

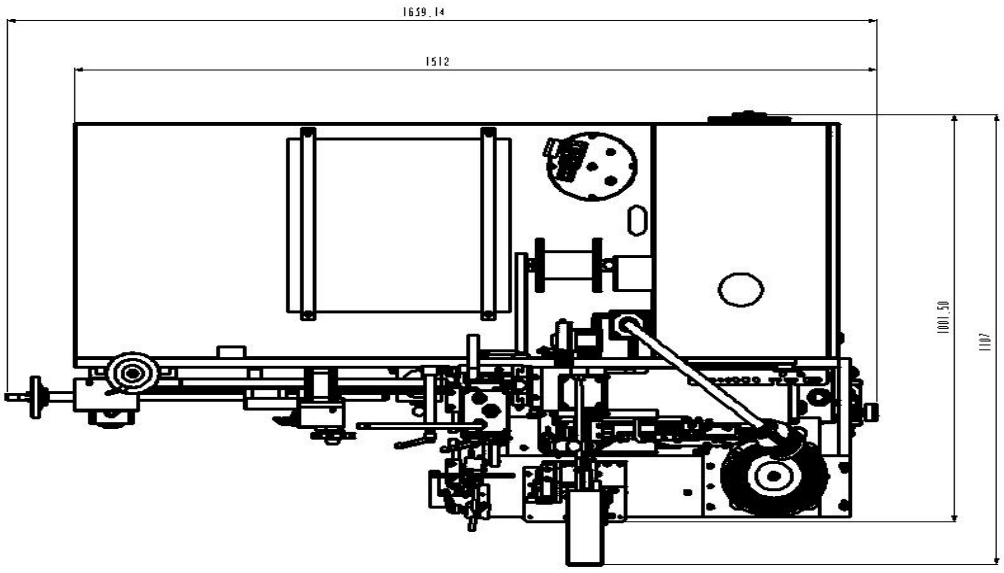
1.The machine should be installed in clean and dry room；

2.The machine must be installed on flat and solid ground.Adjust the supporting bracket to a proper height and keep it horizontal so that the machine can be stable.

3.The space around the machine should be enough;And the door of the electric box is accessible for the machine from all directions;

4.Keep the heat and air vents on the side of the electric box clear.To ensure the effective cooling ,we suggest that it should be at least 50cm away from the wall;

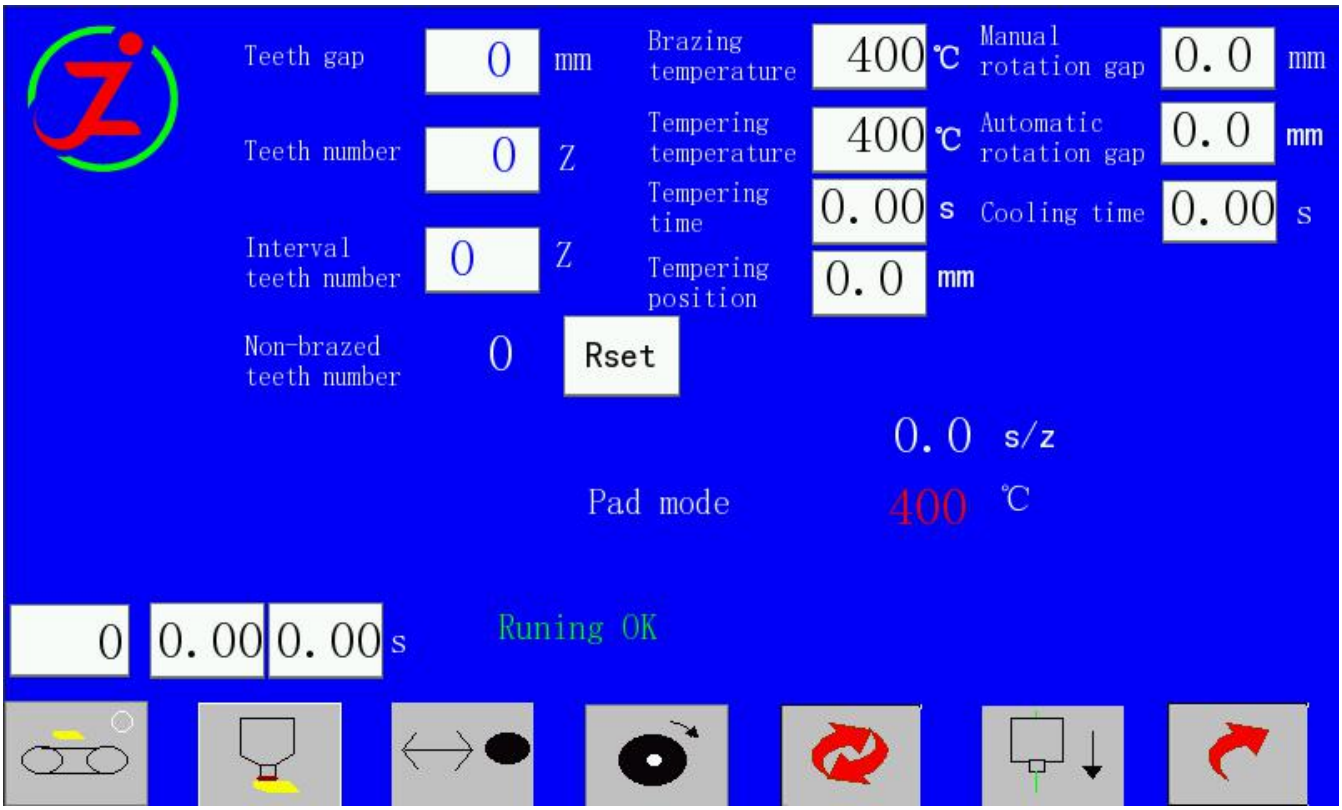
5.Correct connection to the power supply,air source and cooling water flow。



# Chapter 4 Basic Operation and Notices

## 4.1、Control Panel

### A、Main Interface




**Teeth gap**

Input corresponding teeth gap number before brazing every band saw bladewith different specification,other it will affect the band saw rotation positioning during working.

**Teeth number**

Please input the actual teeth number accordingly when brazing different size of saw blades.Otherwise,it may cause damage to the machine(when there are empty teeth,they are also should be counted)。

**Brazing temperature :** To set the brazing temperature

**Tempering temperature:** Set the tempering temperature after the brazing is completed;It's related to the tempering time;Only the tempering time is long enough,this temperature can be reached.The data frame are shown as follows:tempering temperature,tempering time,tempering displacement.Tempering displacement：the position of the saw blade whening controlling tempering,which meansthe saw will rotate according the number value before tempering.（You can also set the tempering temperature higher,then use time to control heating to see the tempering color of saw teeth）.

**Interval teeth brazing:** The number frame shows the teeth number during interval welding,that's the teeth number that need to be spaced during brazing.(1 for no intervals,2 for one tooth interval…and so on,note:this parameter can't be 0)

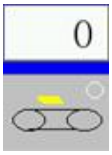
Rset **Reset tips:**Reset the"teeth number to be brazed"display,"Reset"operation first before changing each saw blade to ensure the counting is accurate;

**Manual rotation gap:**For setting the gap between the first tooth of the saw rotation positioning when the saw in the feeding position and manual rotation position， which is the gyration gap when the photoelectric switch detects a saw tooth（the larger the data,the bigger the gap）；

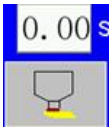
**Automatic rotation gap:** For setting the gap of the saw automatic rotation positioning when brazing starts,which is gap of the saw automatic rotation positioning when one tooth is brazed.(the larger the data,the bigger the gap)。

**Cooling time**(it's the time between the holding and tempering time)。

The brazing clamp will return after a little cooling time when each tooth is brazed;The bigger the carbide tips,the longer the cooling time,this is to ensure the carbide and wire are well cooled.




**Conveying belt start/stop button**:The above data shows the vibratory voltage of the vibrating disk.

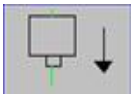



**Applying flux button**:for setting the flux amount;The larger the number,the more the flux.

**Saw advance/retreat button**:To load or return the saw manually.

**Automatic/Manual state:**To show the working state of the current working—automatic or manual(press this button to enter automatic brazing state when the screen shows"running ok";The icon is green at this moment,and the machine is under automatic brazing state until the finish of the brazing work or stop because of failure.It's under manual state when the icon is in red color).

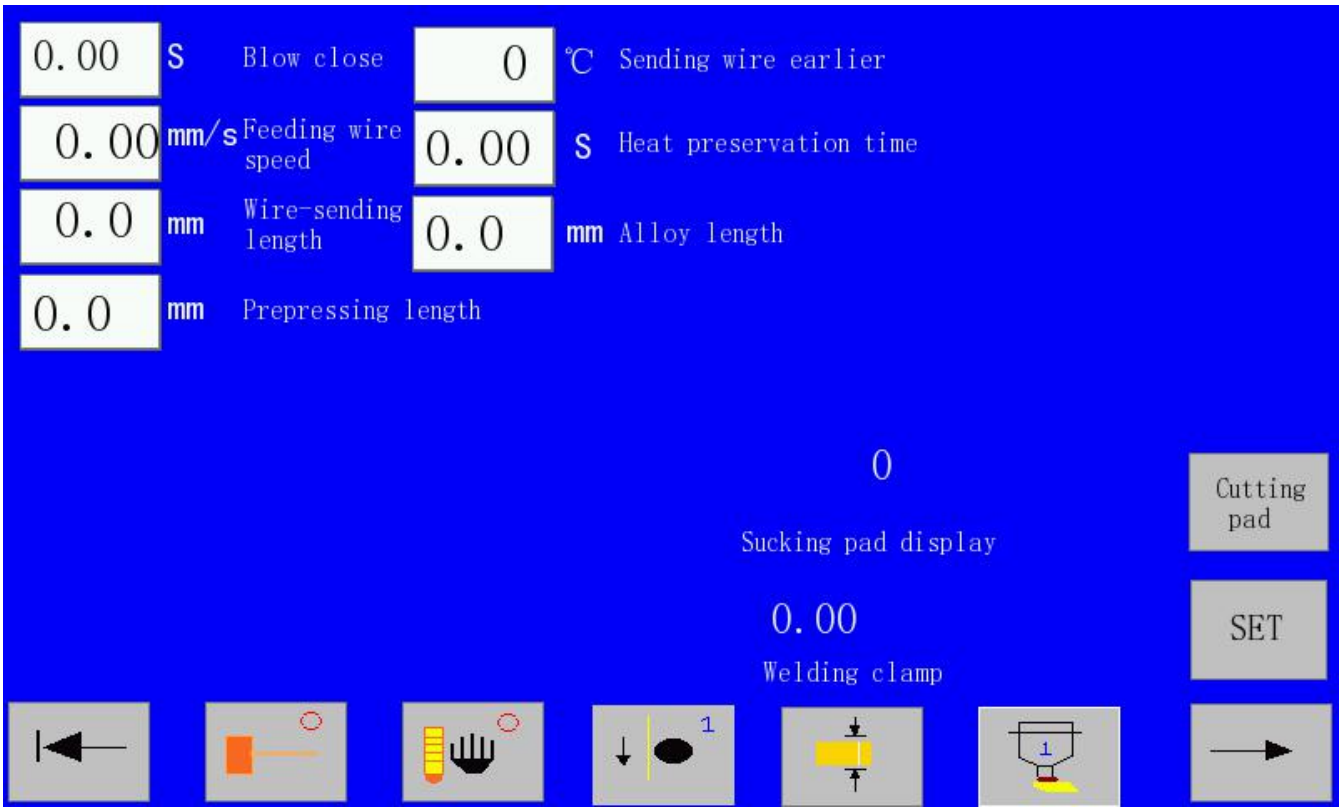
**Saw rotation button:**Press this button when debugging,the saw will be delivered to corresponding position;Continuous rotation will happen if press it for longer time;The position can be changed by setting of gap 1.



**Wire-sending cylinder button**: Can lower the cylinder by pressing this button when debugging.

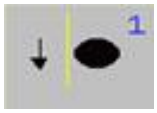
**To next page.**

## B、Sub-interface



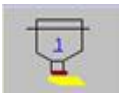

**Return:**Press this to return to main page.

**Repairing button:**It's default state when the icon displays 0;When it displays 1,repairing bad tooth work can be done(in manual mode,select feeding wire or not and then press the step button to complete tooth reapairing;If the whole saw is in bad condition,you can also press the auto button to repair teeth automatically).

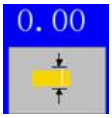


**Wire sending switch**:1—the wire will be sent during brazing;0—the wire will not be sent during brazing;This button is only used for wire brazing.

**Manual heating button:**Press it in manual mode， manual heating can be done by pressing step button.（can test the high frequency machine or braze by high frequency head cooper tube）。



**Gluing switch**:1-gluing state;0-no gluing state（it can be setted as 0 when debugging）。




**Carbide width memory button**：Press it for 3 seconds when the first replaced carbide tip of different size is picked by the brazing clamp,then the width of the tip will be memorized;This is the standard data,the subsequent tips can pass as long as its width is within this error range.

Turn to next page。

**Feeding wire speed**：for setting wire-sending speed.Set it according to the wire melting condition.There is no good outflow effect and the wire will deviate if the wire is melted too fast;But if too low,it will effect heating time,then leads to not good brazing.

**Wire-sending length**:the wire length for each tooth during brazing.

**Prepressing length**：The saw will rotate before brazing to make the teeth and tips fully close;The length of saw rotation at this monent is the prepressing length.

**Blow close**：The closing time of air blowing vent on the conveying belt(to let the tips with correct direction pass after detection,on the contrary,they can't enter the conveyor belt,the closing time needs to be used with debugging steps of selecting tips).

**Alloy(Carbide) length**： input data according to actual needs to ensure the sending clamp can pick the carbide.

**Heat preservation time**：The time for maintaining the brazing temperature；

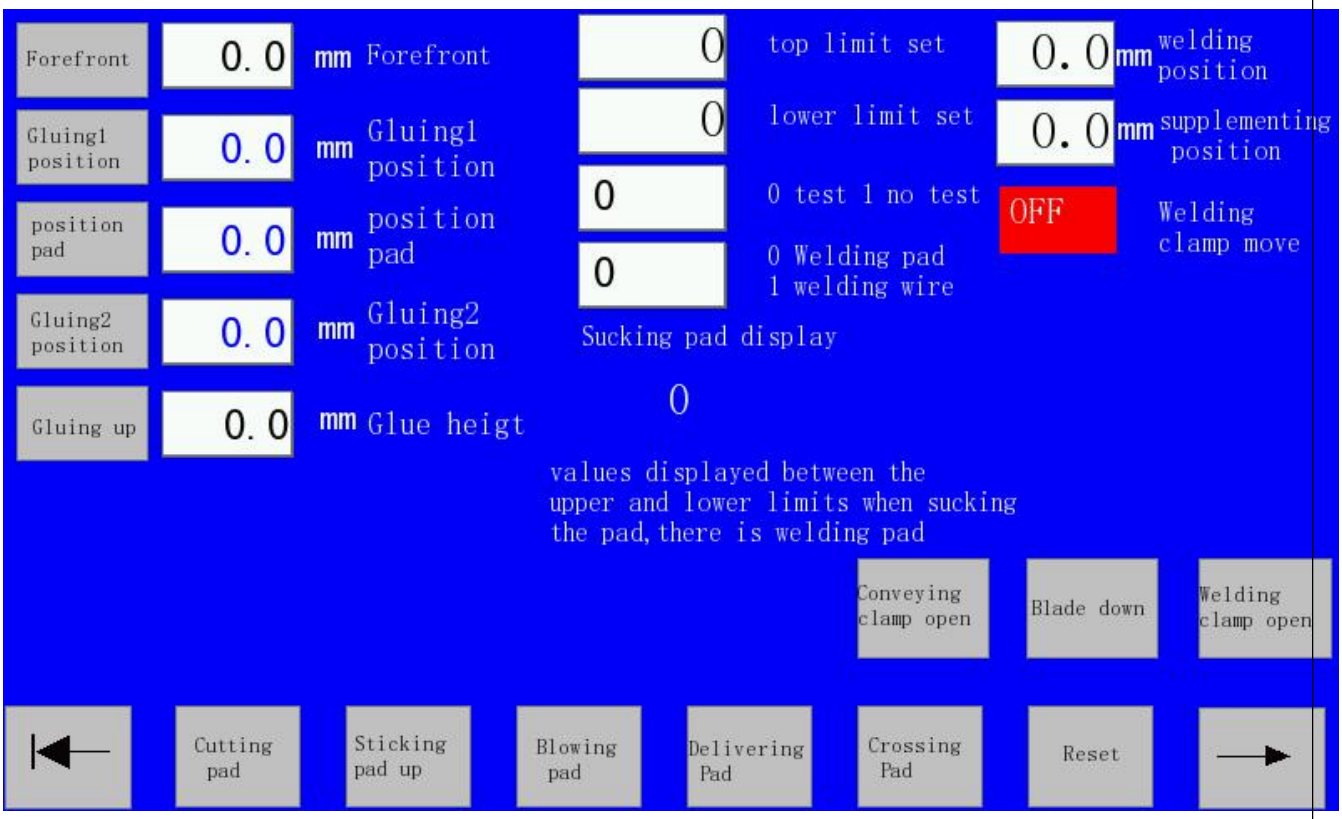
**Sending wire earlier：**（**Advance wire feeding**）：

Under wire-brazing condition, ， the difference of the wire-sending temperature and brazing temperature.(wire-sending temperature=brazing temperature-advance wire feeding)； Under pad-brazing condition, the supplementary temperature will be sent in advance.

SET To enter into pad cutting and motor positioning page

→ To next page

## C、Setting Page




The related conveying clamp positions are on the left side of the page;Press the left buttons(the buttons are used for adjusting machine) after the motor is reset,then the conveying clamp will come to corresponding position of the right data frame.And the brazing clamp moving positions are on the right page.Press the"OFF"button next to the "welding clamp move" after the motor is reset,the brazing clamp will

come to corresponding positions.The middle and below parts of the page are for related parameters of “cutting pad”.

**Pad testing**：0 state—When the pad is sucked by the suction nozzle,the system will have a test of pad existence process;The pad exists when the displayed data is between the up limit and down limit;If it is out of the scope,which means no pad.1 state—the pad can pass under any condition.

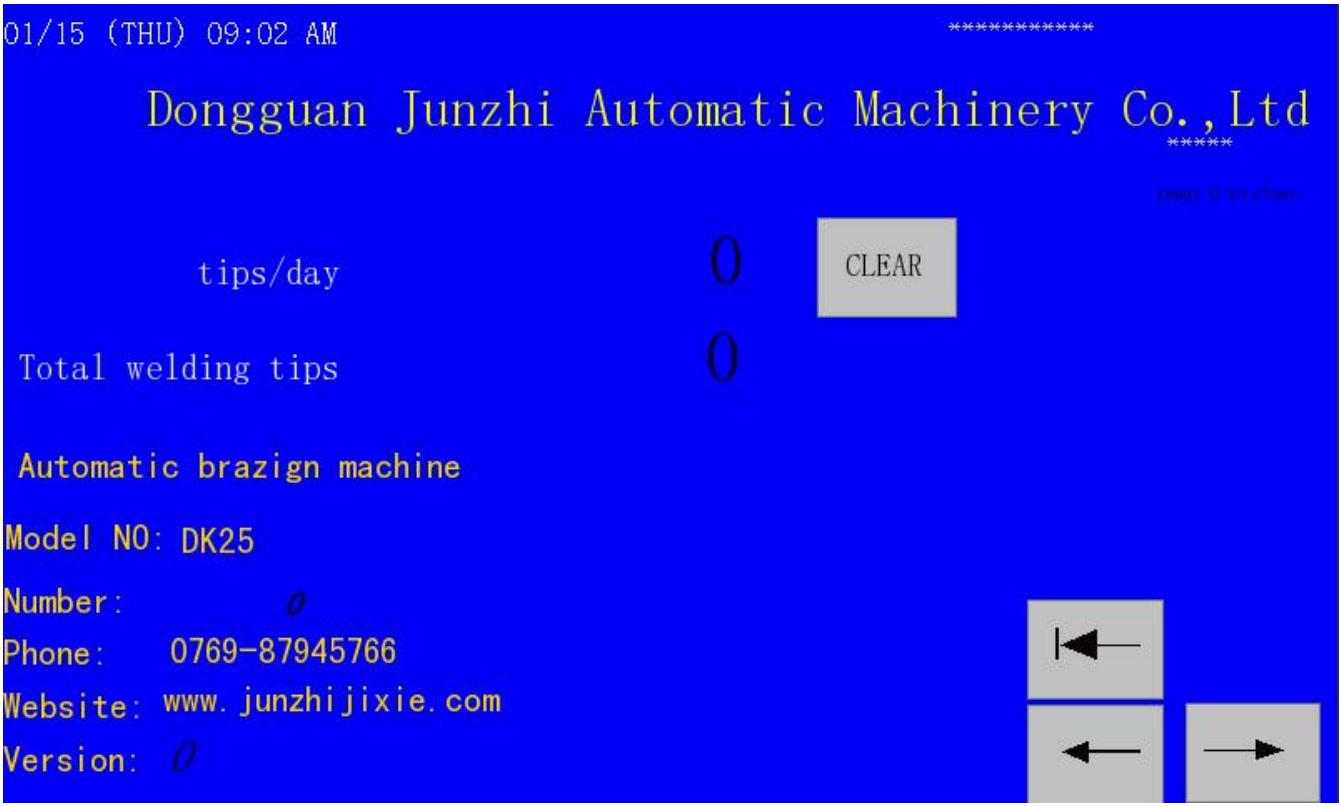
**Sucking pad number display**：Normally,the number displayed should be larger than the upper limit of pad testing;The number will become smaller when sucking the pad and it’s between the upper and lower limit value.


Pad/wire brazing selections: 0 pad brazing mode；1wire brazing mode；

The below buttons are for each cylinder movement of pad-cutting devices .

 .Turn to main page.

## D、密码输入页面

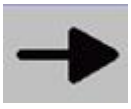



Tips/day：To record the brazed teeth number each day，reset it before starting the machine every day.

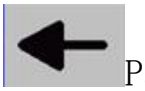
**Total welding tips**：To record the total brazed teeth number,can't be reset.

CLEAR：Reset daily brazed teeth number.

**Password input**：first line for inputting password;next line for clearing password.Input 0 to clear password.

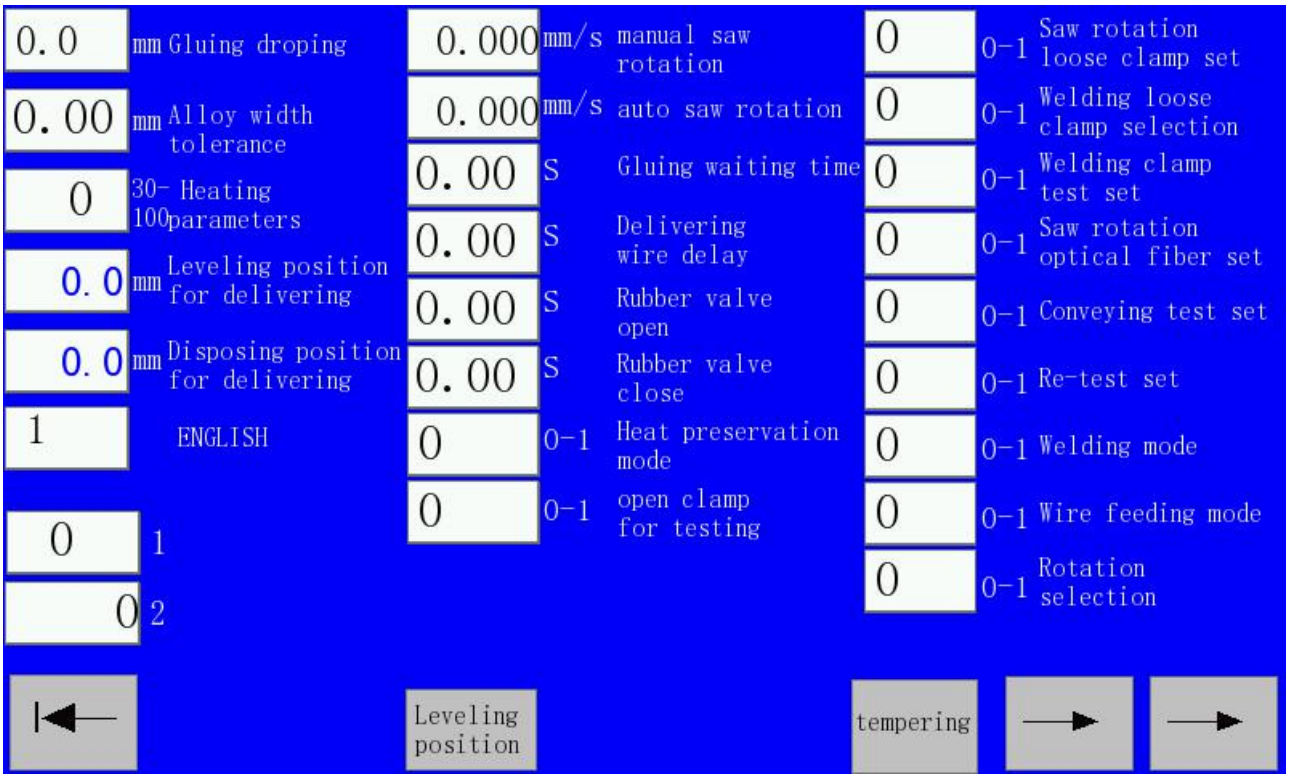


Enter into next page:Press it after correct password is inputted to enter into next page;Password"333333".



Page up。

## E、Mode Setting Page




**Special notes:**In normal condition,don't change the data in this page.

Return，press it to return main page。 Page down，turn to parameter setting page.

**Saw rotation loose clamp set :(Revolve to clamp the saw)**：When the saw is rotating, the data show 0 the saw clamp will relief pressure.1—the saw clamp with tighten。

**Welding loose clamp selection:** 0—brazing clamp loose and heating starts;1—brazing clamp not loose to heat when brazing.

**Welding clamp test set**：There will be a carbide-width testing process after the carbide is passed from sending clamp to brazing clamp. 0-test,1-no test;Use this function with"**carbide width memory button**"and "**carbide width error**".

**Saw rotation optical fiber set**：saw rotary positioning option. 0 state,the saw will rotate and fix the position by the spin fiber after it comes to the front position,then the saw will be clamped after positioning;1 state,when the saw blade reaches in right place,the saw clamp will fix the saw automatically

without rotation.Now,poke the saw manually and adjust the gap to let the carbide tips come into the space of teeth.Meanwhile,the maual rotation is not available. 2 state,the saw rotary positioning is also finished by spin fiber positioning when the brazing starts.

**Conveying test set:**The sending clamp to detect if there are carbides at zero position when picking the carbides.0 for starting the detecting,the sending clamp tightens at this time;If the light is on when the test come near to the switch,whether there are carbide tips clamped or not,PLC will default to no carbides;Then the sending clamp will open automatically and clamp again after 2 seconds;It will repeat 3 times in this way;If the light is on for each test,then the machine will pause,the screen will show no carbide;1 for close of the detection,in this condition,whether there are tips clamped or not,the sending clamp will move for the next operation.(Please refer to “sending carbide process”)

**Re-test set：** Options for on or off of second-time test. 0-on；1—off .

**Welding mode：** 0 mode—heating first,then compensation; 1 mode—compensation first,then heating;

**Wire feeding mode：** wire-feeding cylinder actions options. 0:the wire-feeding cylinder starts moving when the temperature reaches the wire-feeding temperature ;1： the wire-feeding cylinder starts moving without feeding wire after saw prepressing,It starts feeding wire when the temperature reaches the wire-feeding temperature.

**Open clamp for testing**:The sending clamp picks the carbide and move to the calibration position,then the clamp loose and clamp to calibrate actions start.Input 0 for this action,and1—without this action.

**Rotation selection： the saw rotates to position**—0 state,the saw brazing positioning is by automatic motor rotating. (is this state，the saw tooth gap must be accurate)；1 state, the saw brazing positioning is by optical fiber

**Heat preservation mode:** 0 mode—the brazing clamp close to preserve heat; 1 mode—brazing clamp open to preserve heat; **Gluing dropping：** This is only used in pad brazing mode.

**Alloy width tolerance：** Use it with”**carbide memory button**”

**Heating parameters：** The smaller the number ,the faster the heating speed;

**Leveling position for delivering**： which is the"second-time test"position, the left side data frame for its corresponding position, only used in debugging the machine,once confirmed,don't change it.

**Disposing position for delivering**：position for throwing carbides,the conveying clamp will throw the tips away when they are detected as wrong ones during re-test.

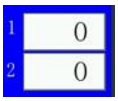
**Manual saw rotation**:The saw rotating speed in brazing position when press manual rotation button.

**Auto saw rotation:**In "rotation selection" 0 mode,the motor speed for rotation positioning during brazing.

**Gluing waiting time**：the conveying clamp staying time at gluing position after gluing finishes.

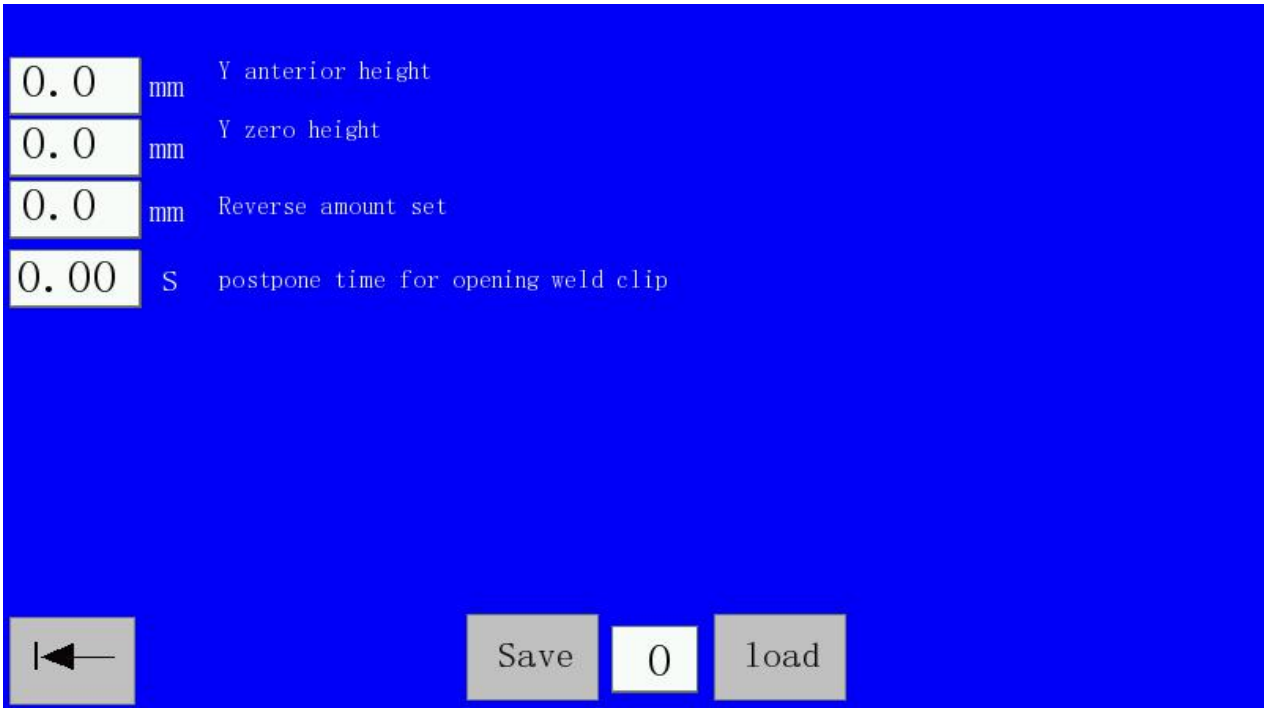
**Delivering wire delay:**The time between the wire-sending cylinder starts and wire-sending motor starts rotate.

**Rubber valve open:** time for gluing； **Rubber valve close:** time for rubber valve to close.



Don't change the numbers in normal condition.Otherwise it'll cause improper working.

## F、Parameters setting 2 page




**Y anterior height:**the conveying clamp height when the tips are delivered between conveying clamp and brazing clamp.

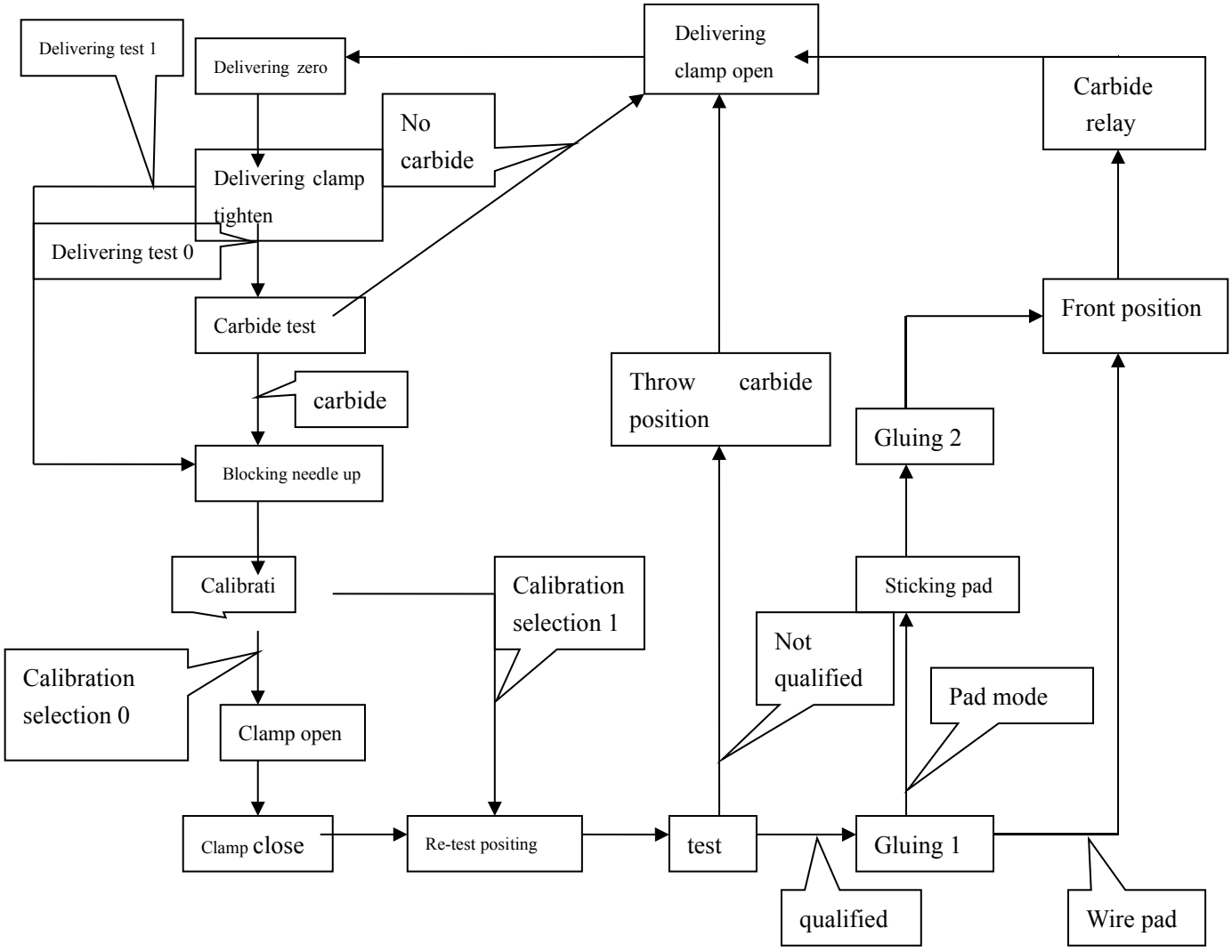
**Y Zero height**：the height between the up and down limit positions of conveying clamp.

**Reverse amount set**:The saw will move a liitle downwards before the brazing clamp returns to zero position when the cooling time is enough.In this way,to reduce the friction between supporting bar and tips.

**Postpone time for opening weld clip**：Only useful during"loose clamp for brazing";The brazing clamp will open according to set time when heating begins.

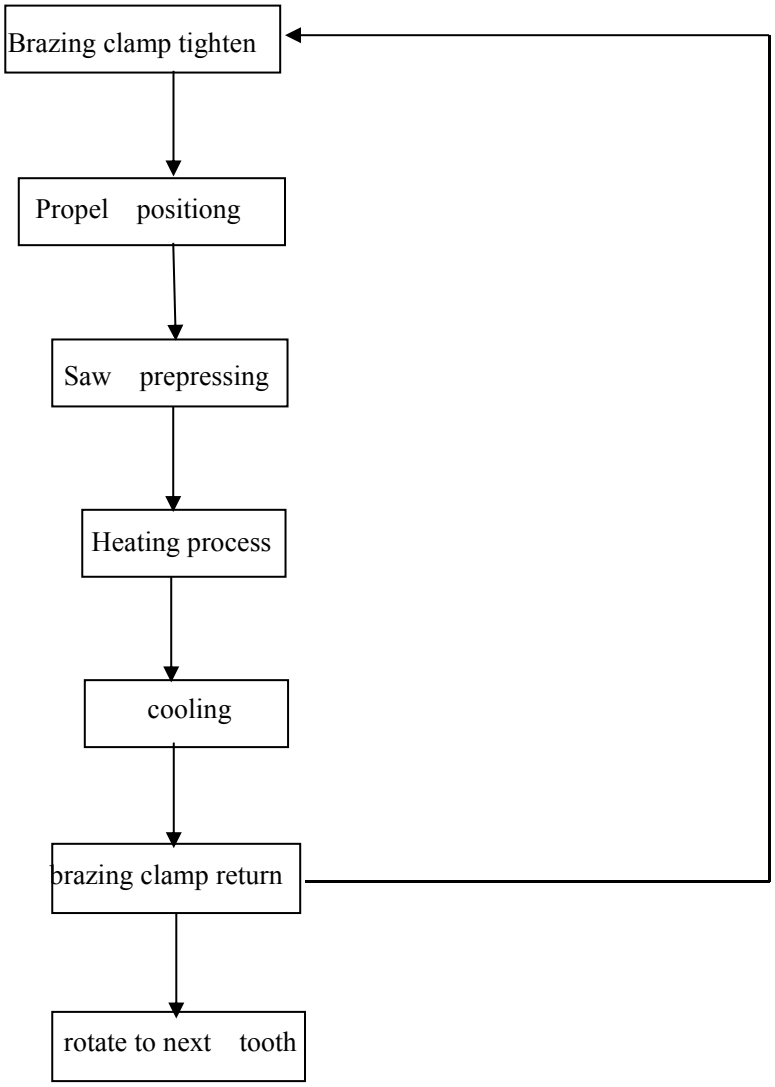
## 4.2、Machine Working Process

### 4.2.1 Carbide delivering process：



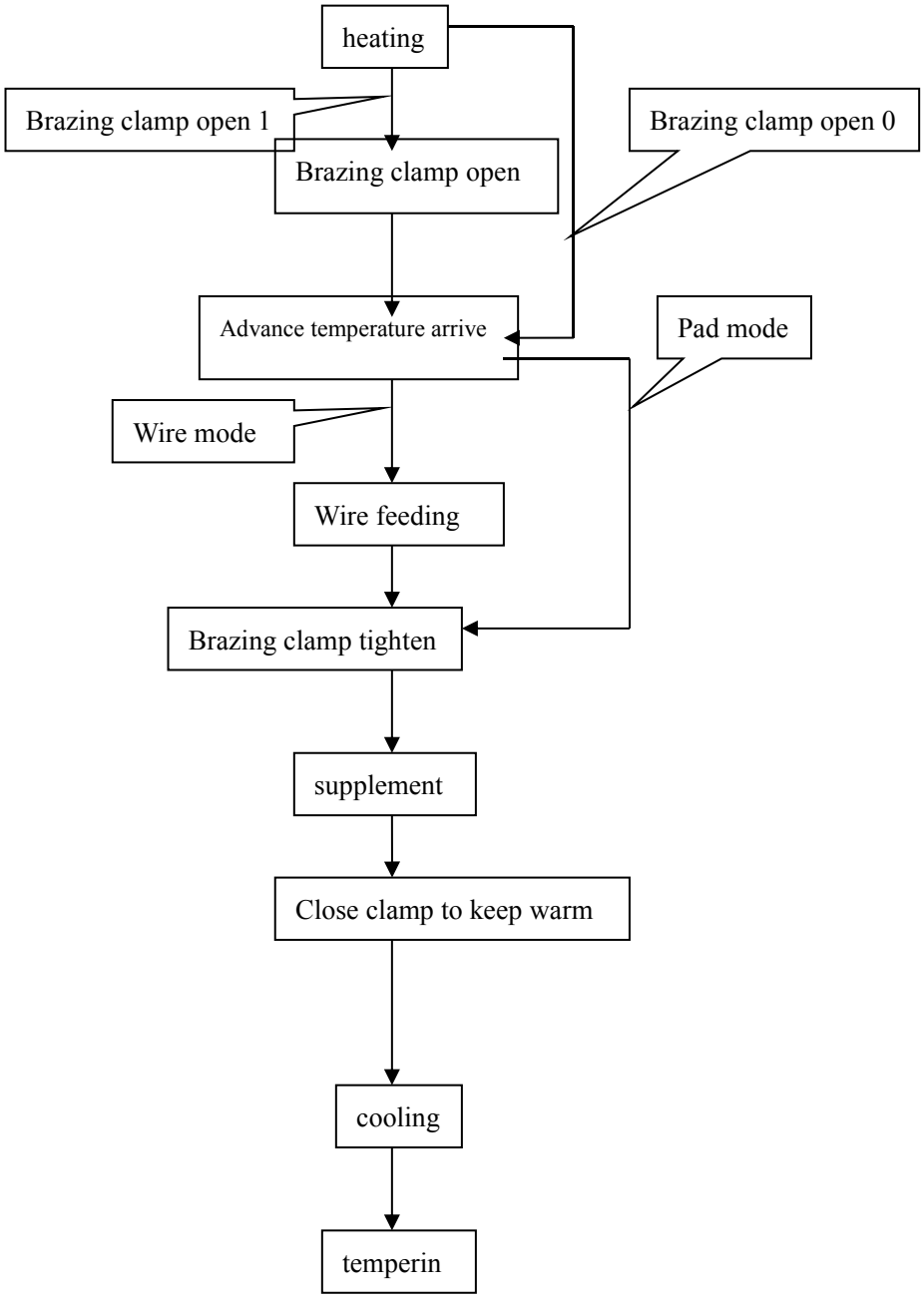

**Sending clamp process**

### 4.2.2 Brazing clamp delivering process

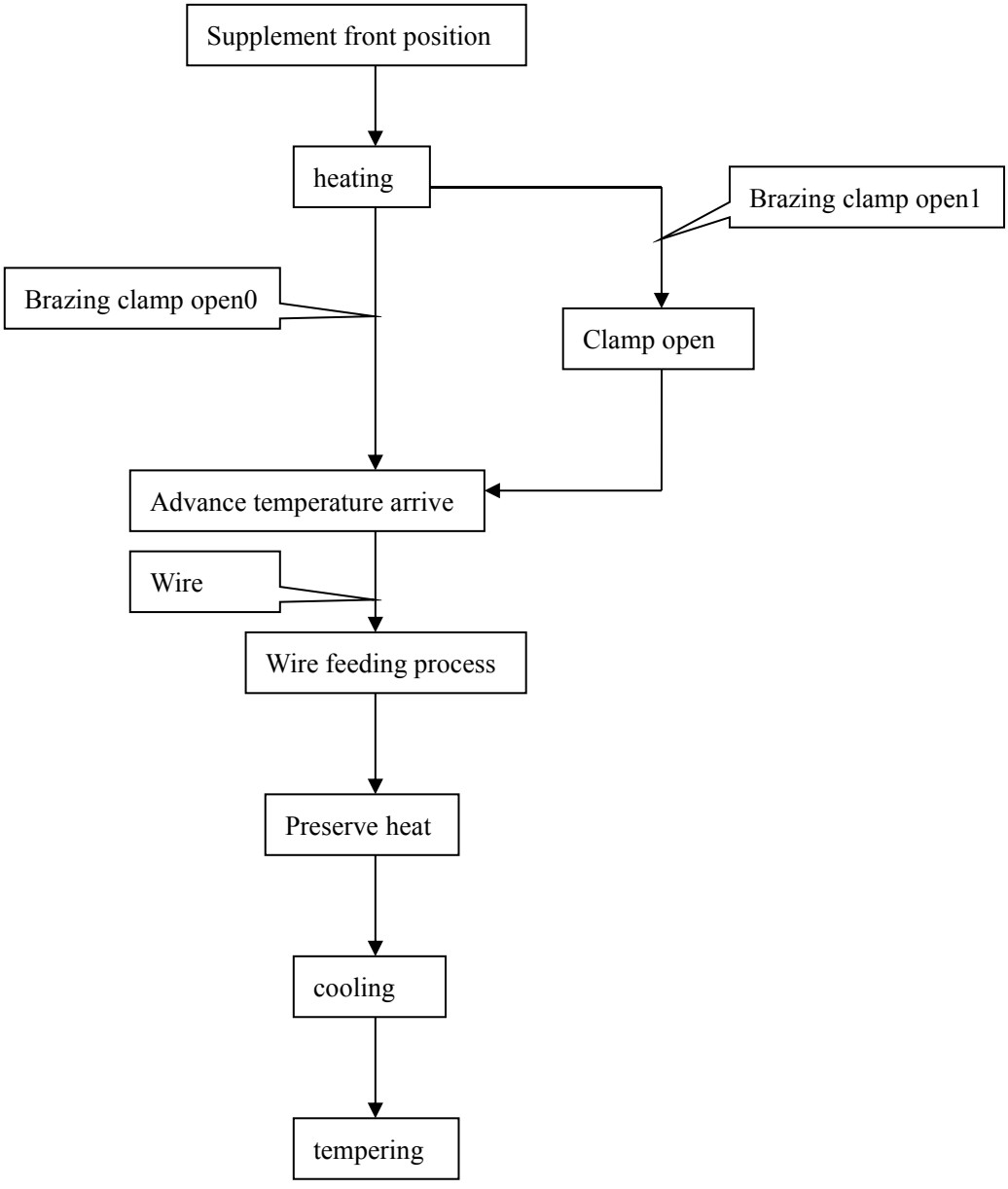


### 4.2.3 Heating process

Propelling mode(0)process

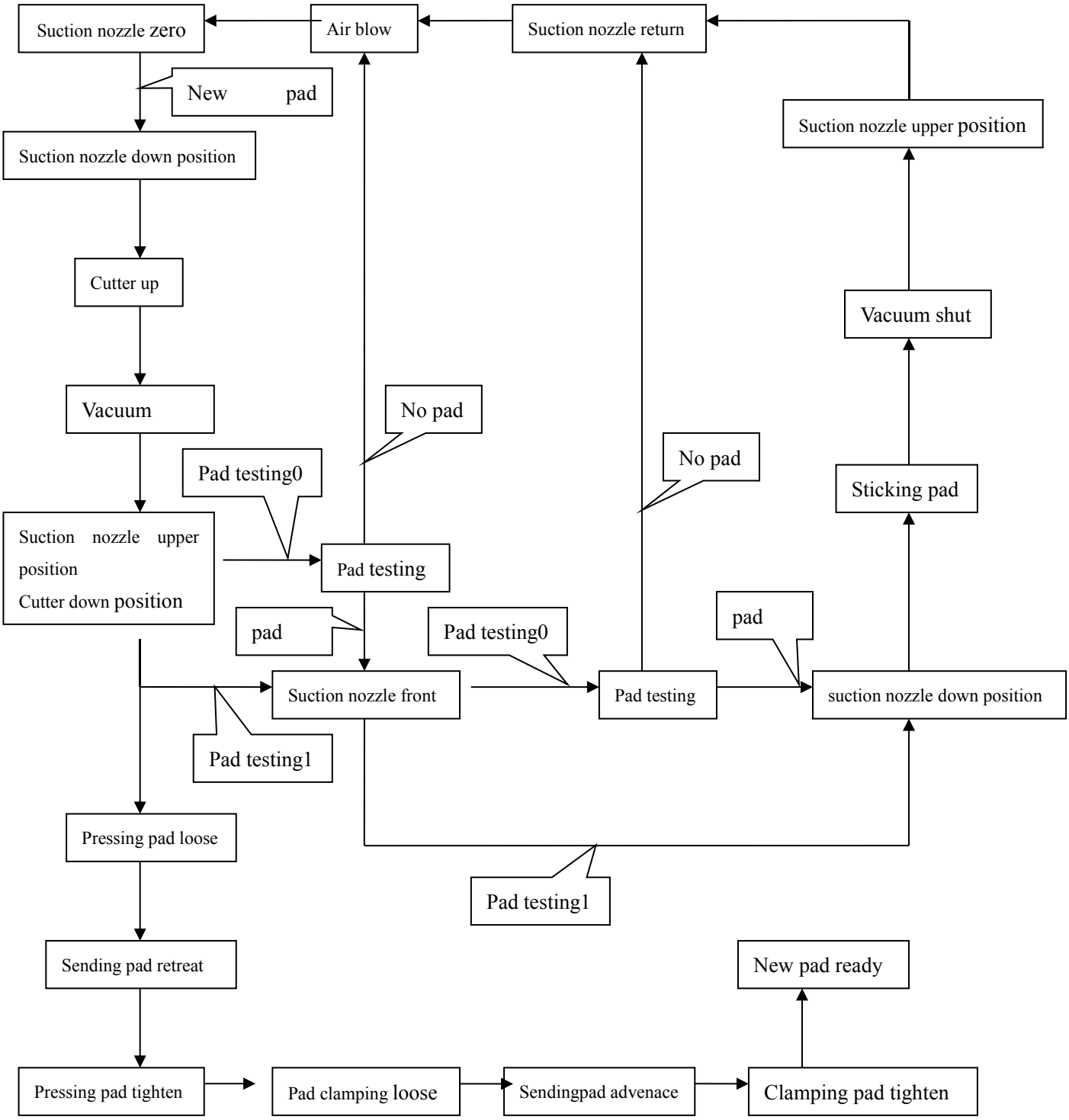


Propelling mode(1)process




Considering brazing technology,don’t use this propelling mode when the pad is used for brazing.

## 4.2.4 Cutting pad process



## 4.3、Operating Instructions

### 4.3.1 Notes before operation

1) Machine power supply 220VAC；

2) Air pressure requirement: 0.55MPa——0.65Mpa，the machine will not be in stable working state if the pressure is lower.

3)Please use clean water；

4)The water inlet pressure and outlet pressure difference is greater than 0.4MPa，the water temperature is below 30℃；

5)Don't swap the machine water inlet and outlet.

### 4.3.2 Operating Steps

1) Turn on the power.Start the cooling device by pressing start button under the panel when the operation panel screen displays normal(the start button is also used as the reset button.Start the high frequency machine and the chiller before starting machine every time,then press it again after 3 seconds to reset all the motors.)Check if water circulation is normal,there is wire or not,and the pressure is above 0.6MPa。

2)Check all the related parameters on the control panel:teeth number,diameter,interval teeth number,brazing temperature.

3) Install the saw to the sucking disk(disk size is upon the saw diameter,about 1/3 of outer diameter).And adjust the upper/lower and horizontal screw rods to the appropriate positions.(Note:Push the saw-advance/retreat cylinder to the max travel position if degugging the machine in no-air condition;Otherwise,the cylinder will impact carbide clamp during working).Adjust the high-frequency brazing head to a higher position.

4)Put the saw blade to be brazed to front position by pressing the loading/unloading button,press it again,the loading/unloading clamp will tighten and rotate to corresponding position;If the saw teeth can't be detected by the optical fiber,adjust slightly the saw advance/retreat screw rod until it's automatically set.

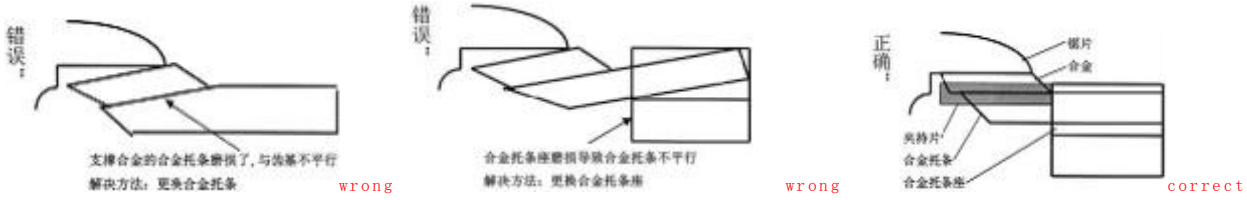
5 ） Adjust the width of carbide stopper on conveyor belt to let the carbides pass the guide slot smoothly.The setting of fiber sensing amount in front of the carbide tips:(refer to **4.3.4 .1 Material feeding/waiting part adjusting**);Starting coneying belt and vibrating disk to check if the automatic carbide feeding is correct and make sure it's smooth after adjusting.

6) Press "no flux gluing"button and step the pedal switch when there are carbide tips on conveying belt,then the sending clamp will pick the carbide,step the pedal switch in turn until the carbide tips are delivered to the saw tooth position(at this moment,stop stepping,adjust the machine first)

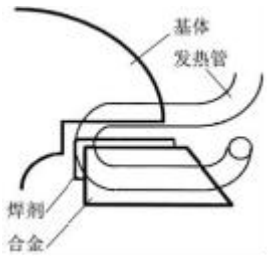
7) **Saw blank and carbide brazing position adjusting.**The blank must be adjusted according to the hook angle of saw tooth(the gap between tooth root and the back of carbide 0.3mm);Otherwise the blank will be heated first,which results in overheating blank and not well-heated front of carbide;There will be only a little heat conducted from the blank to carbide,if the basic contact surface of carbide and blank is too small,then the temperature on the gauge will be lower than the actual one;If the blank and carbide are parallel,the heat can be conducted well from the blank to carbide,the temperature difference will be very small.

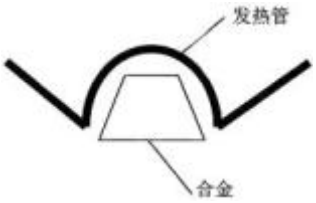

错误：wrong　　只在此处传导热量：heat only conducted here
正确：correct　　热传导区域: heat conduction area

**Note:**If the carbide support or carbide support seat is worn,there will be an included angle between the carbide and blank:The carbide may also go into the clamping piece too deep,resulting in decreased heat conducted from heating tube,at this moment,the heat to carbide is mainly from the overheating saw blank.



8)**Heating Pipe Position Adjusting**:Adjust up/down,left/right,front/back to right position by the X,Y,Z direction handles of high frequency brazing components.(基体:saw blank 发热管 heating pipe 焊剂 solder 合金 carbide)

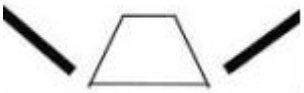



**Heating pipe shape**:The heating is generated at the tooth base of saw blank because of the dense coil here;but the temperature measuring point is at the blank edge;If the heating is too fast,the temperature at the tooth base will be overheating when the temperature measuring point reaches the set temperature(figure 1).You can avoid this by changing the shape of heating pipe:Enlarge the coil in the vertical direction(longitudinal) to decrease heat density and make the temperature on the blank and carbide more average(figure 2);If enlarging the upper part of heating pipe,the heat of coil will be more concentrated(figure 3).

①

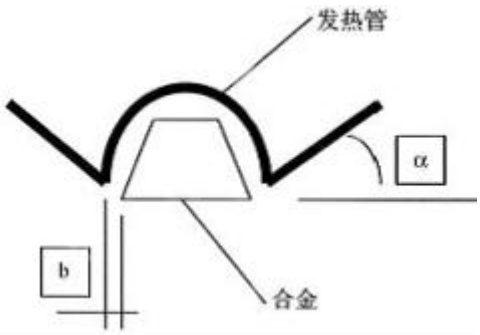
②



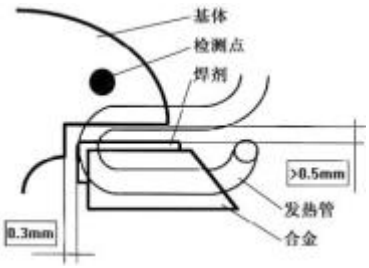
③

**Thin saw brazing adjusting:**It'd be very dangerous if it's overheated during the process of thin saw blade brazing,as the hardness of blank near the cutter will become higher.The heating pipe spacing should be increased to avoid overheating of thin blades.Inclination angle α =0～45° ;The spacing between the coil and cutter should be as small as possible,Distance b=0.1 ～ 0.5mm； Minimize brazing temperature to700℃ and decrease brazing time to 0.5～1 second， continuous

brazing;If the saw blank is still too hard,the annealing operation will be needed for the saw separately.




9) **Optical fiber position adjusting:**The firber beam is emitted by the back sensor and received by the front one,the emitter and receiver switch alternately;Make the beam close to the tooth base when passing through heating pipe;The gap between rotating saw and cutter should be more than 0.5mm;Adjust the saw position horizontally to make the gap between tooth base and carbide in 0.2-0.5mm;Press rotation button to check if the saw is in the correct place after rotation(the position can be adjusted by gap 1).




**基体 blank　检测点 measuring point 发热管 heating pipe 合金 carbide**

10)**Infrared thermometer adjusting:**The temperature measuring point is near the carbide on the blank(edge).If the bending part behind heating pipe is too close to carbide,the solder on it will stick to heating pipe;Too much solder will affect the measuring results of high temperature sensor,which will make the temperature of high frequency generator exceeds the set one,then the blank will be overheated.


**错误 wrong　高温传感器 high temperature sensor**

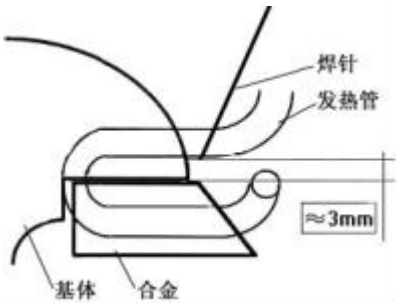
**光束未打到合金或基体上　the beam fails to fall on the carbide or blank**

**在发热管后部有焊剂堆积 solder accumulates behind heating pipe**

**正确 correct　约 45 当长度足够长 about 45 degree,when the length is enough**

**基体与合金处的测温点 temperature measuring point at the blank and carbide**

11) **Wire-feeding position adjusting.** Adjust the wire-feeding cylinder to proper position,and make the wire sent to the middle position of saw tooth cusp and carbide intersection during wire –feeding process;Please refer to the following:(**焊针 brazing needle 发热管 heating pipe 基体 blank 合金 carbide)**




12) **Pushing-tooth cylinder adjusting:**Adjust the position and angle of pressure cylinder by the manual handle,which can make it aim and push the tooth back in clockwise direction at max path state.

13)**Applying solder adjusting.**In the use of brazing pad condition,step the pedal switch to pick a carbide and deliver it to applying solder position;Adjust the dripping needle before dripping solder,then step to sticking pad position and check if there is any gap between the front and

back position of the pad;And fine-tune at the same time;Again,step forwardly to stick the pad and deliver it to the applying solder position.Please adjust them if some positions are changed.At this time,the tooth can be brazed by step moving(there are no sticking pad and second-time applying solder actions if it's wire brazing).

14) All the above adjustments are done in the condition that the saw reach reaches the max path and it's clamped tightly:standby materials conveying belt,feeding material clamp parts,gluing needle,brazing clamp part,high frequency brazing parts heating tube,pushing tooth parts-pushing cylinder axis,saw blank,all of their centers are in the same plane.

15） After all the adjustments,the brazing working can be started when it's in automatic state;Press Press single-tooth brazing button to braze one tooth,and then rotate the saw manually to check the brazing condition;Check the centering,the automatic brazing can be started after the adjustments;

16)Please press emergency stop button if any abnormal phenomena happens during brazing process,and press start button to reset;Then re-adjust again;

17) If the brazing effect is ok,then continuous automatic brazing can be started;

18) Press automatic button to switch to the automatic working status if the machine is well adjusted in step-moving condition;

19) If the machine is already well adjusted,then the automatic working state can also start,just press the automatic operation button;

20） In full-automatic mode,if press the manual/pause buttons,the automatic mode will stop,then the step-moving mode will starts(i.e.step the pedal switch to the next movement;Press auto-button again,the automatic working will begin).

21)Turn of the power switch after working.

**4.3.3 Notes during operation:**

1)Confirm normal voltage,pressure and cooling water supply before operation;

2)Confirm the brazing position before loading any new saw blade so as not to damage the machine;And press “run”and ‘RESET”buttons to reset.;

3)In the air pressure existence condition,the saw tooth position can’t be too low when it’s the first time for positioning the saw; If it’s too low,adjust the gap 2 first;In a word,the saw tooth seat should be 1mm higher than the height of carbide,otherwise it will hit the clamp.(adjust it according to the saw tooth:the gap can be a little larger if the teeth are sparse;For dense teeth,the gap must be controlled well);

4)The carbide can’t be clamped if the delivering clamp and brazing clamp are not in a line or the ceramic chip is damaged;At this time,adjust the two clamps to a line.(Turn off the power and air source,push the delivering clamp to the front limit,then put one carbide on the brazing clamp;Press “brazing clamp tighten”and “delivering clamp tighten”to check if there is any dislocation condition,if so,then loose the air finger screw to adjust its position;If no,check if any damages on the brazing clamp and ceramic chip;

5)The wire length depends on the brazing effect;The heating temperature and tempering temperature time can all be adjusted according to requirements.

6)If the brazing tongue is brazed with the carbide accidentally,do not press”emergency stop’button and then open it;Please wait until the machine stops naturally and then start “manual heating”button to pull out the saw tooth and clean the clamp before any brazing work(don’t press”running”button to reset),remove brazing clamp holder.

7)Don’t block optical fiber X-ray and infrared X-ray during adjusting the machine so as not to affect the saw tooth positioning the temperature dedection;

8) If any bad-brazed teeth,clean them before brazing again;

9)The saw will reset automatically after every return;If there are some bad-brazed teeth during brazing process,you can use manual reset,but please note that the total brazing teeth numbers are changed,it is the supplement brazing;Return the saw manually after brazing,please reset first when replacing the saw for further brazing;

10)If the carbide is in wrong position nor there's no carbide,please press "emergency stop"button or "initial"button to cancel the current operation and clean the brazing clamp;

11)If the induction coil is folded too flat,the heating will be slow,or the water flowing is not smooth,then the brazing quality will be affected.Check the air or water way before connecting induction coil again;

12）Clean the brazing clamp and heating head regularly.

## 4.3.4 Machine Debugging

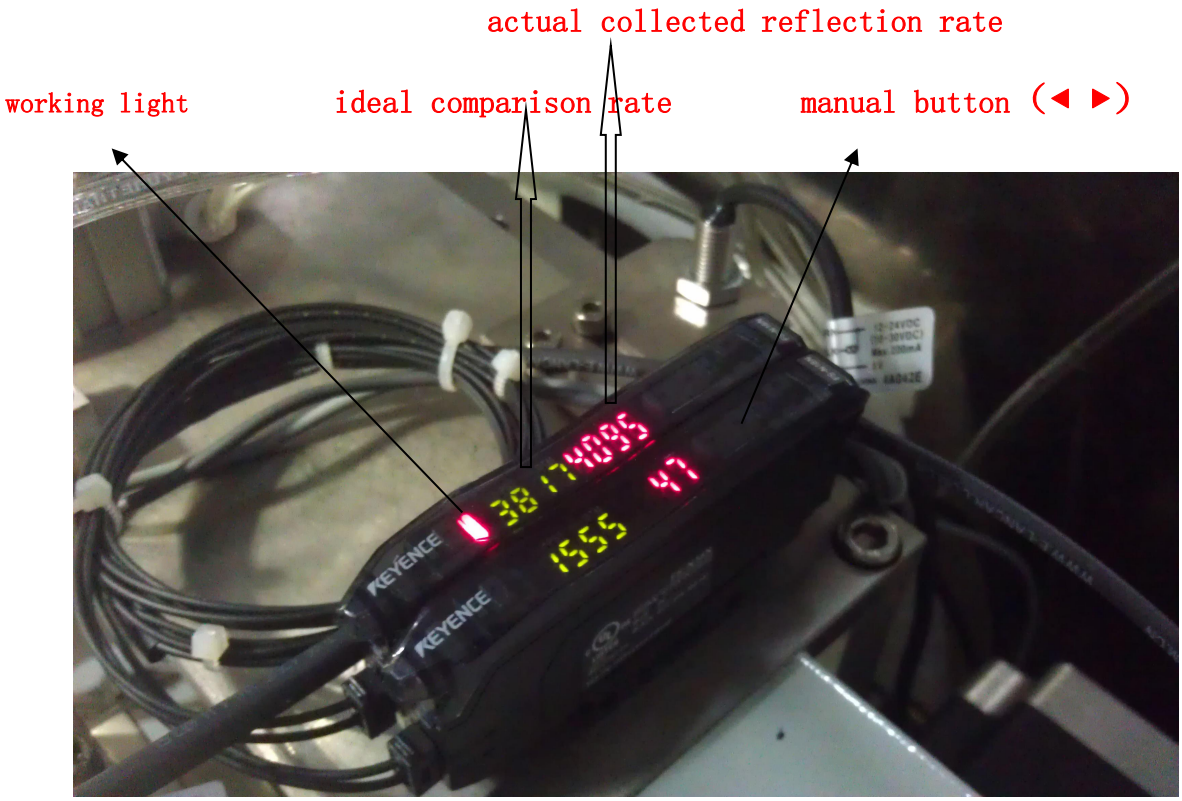
#### 4.3.4.1 Material feeding/waiting part debugging

##### 4.3.4.1.1 Preliminary Work

Get rid of previous carbide tips and clean the vibrating disk before putting new tips;

**Carbide tips processing:**Ensure all the carbide tips are with same sizes(width,length),otherwise it will affect the machine selecting the tips. Then,all the tips should be clean.As the carbide selecting is based on the reflection rate of carbide surfaces.If the carbides are not clean,it'll affect the Digital Fiber Sensor accuracy.Then put the carbide tips of about 0.5kg-0.8kg into the disk.(The carbide weight in the disk will affect the vibration speed;The less the carbide tips,the faster the speed.The weight 0.5-0.8kg will affect the speed to the minimum scope).

For "Digital Fiber Sensor" working theory,please refer to attached file "Digital Fiber Sensor FS-N18N" manual. Please check "Digital Fiber Sensor Icon"as below:




When the Digital Fiber Sensor is electrified,its main screen(red)and sub-screen(green) will show corresponding numericals;The numerical in red is named"actual collected reflection rate"， green is named"ideal comparison rate"; The working theory of the Digital Fiber Sensor used on our brazing machine is"the fiber sensor compares the"actual collected reflection rate"to the set "ideal comparison rate".When "actual collected reflection rate"(in red)is greater than the "ideal comparison rate"(in green),the working state indicator light will glow and give the machine PLC signals;The PLC will let the"blowing stop"action happen according to the signals.

#### 4.3.4.1.2 Debugging Steps

1. Adjust width of the"barrier chips（合金挡片）",which is on the left and right of material-waiting seat,by the "regulating handle （调节手柄）".It should be about 0.2mm wider than carbides.Then adjust the height of the "upper pressure plate（上压板）".Loosen the"Screw"(螺丝),and adjust"adjustment screw".（调整螺丝）Make the distance between the "upper pressure plate （上压板）" and belt about 0.1-0.15mm farther the the carbide thickness;Then tighten"Screw（螺丝）"
2. Now check the distance between "material-blocking needle(挡料针)" and material-conveying

belt,it should be from 0.3mm-0.5mm.(Never let the “material-blocking needle(挡料针)”press the conveyor belt).

3. Regulate the “passing plate”on the material-feeding disk to let the reserved width between vibration disc and conveyor belt “passing plate” 0.5mm-1mm wider than the carbide’s.
4. Select a carbide with correct direction,put in the place as shown in the figure:The front of the carbide should be about 1.5mm away from the air-blowing vent.

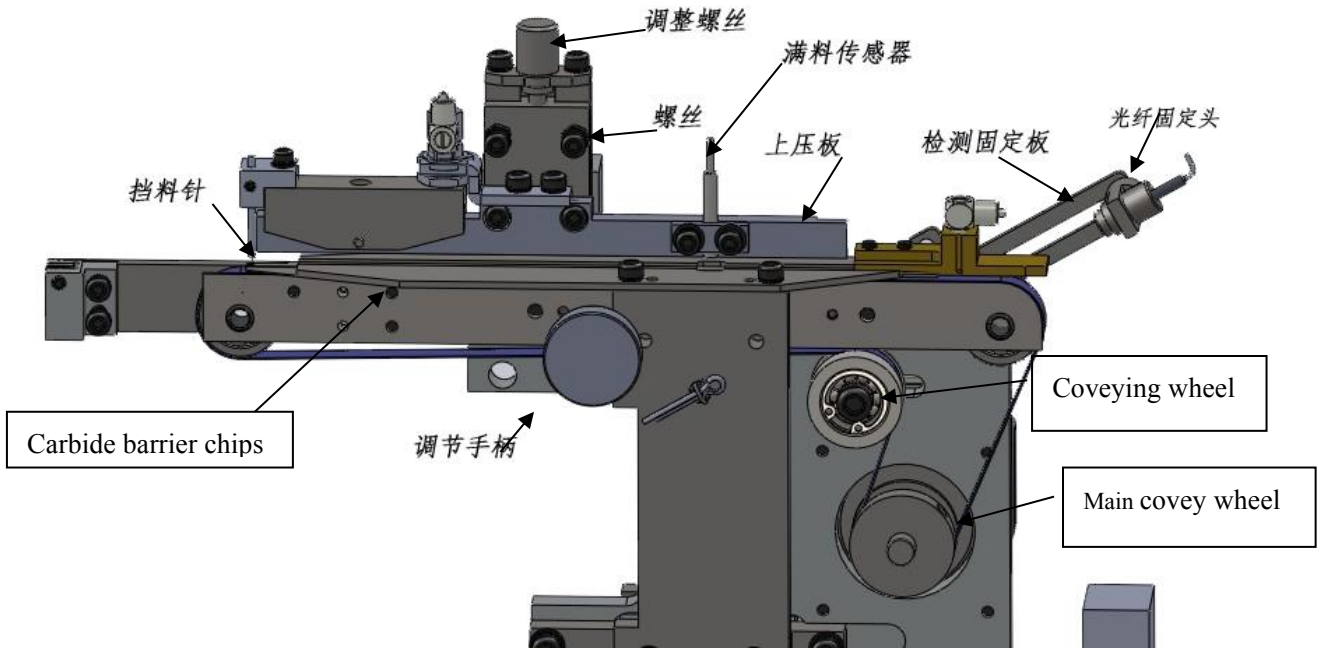



Figure 1

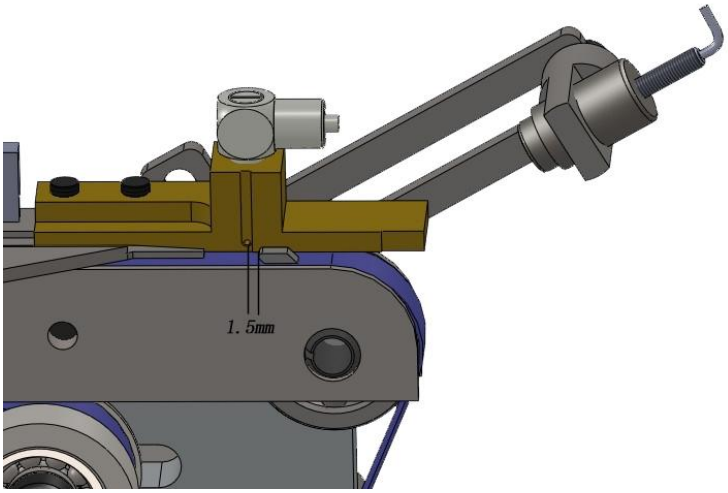



Figure 2

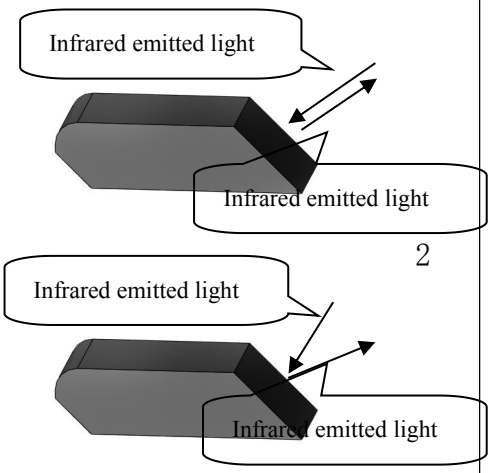



Figure 3

5. Adjust “test fixed plate(检测固定板)” and “fixed fiber terminal” to make the fiber infrared light vertical to the bevel side of the carbide end.If possible,make the diameter of infrared light circle on the caibide as about 1.5mm.See Figure 3: According to the infrared radiation angles and reflection condition,the above“actual collected reflection rate” is greater than the below one.

   When the infrared emission light is vertical to the carbide surface,the reflected light will also be reflected back vertically,the”actual collected reflection rate”at the moment will be the maximum.So when we are adjusting the fiber sensing,make the emitted infrared vertical to the carbide bevel side.,then set”ideal comparison rate” according to “actual collected reflection rate”.Usually,the set “ideal comparison rate”is 150 smaller than the largest”actual collected reflection rate”;At this time,the working lamp lights up.(adjust “ideal comparison rate” by manual button【◄ ►】)

6. Start conveyor belt and adjust “frequency and amplitude modulation controller” to make the carbides pass to conveyor belt.Adjust”air blowing stop”time to make the carbides with correct direction after testing pass smoothly.

## 4.3.4.1.3 Common Problems and Solutions:

**1）Carbides with wrong side pass though frequently.**This may caused by the following several reasons :

A、 Two carbides pass through together.The main reason is the “air blowing time”is set too long,set it again properly.

B、 The lamp of Digital Fiber Sensor lights up when the fiber infrared detects the wrong side of carbide ,then the machine gets the information and let the carbide pass through.In this condition,you need to adjust the fiber infrared irradiation angle;This will make the “actual collected reflection rate” on the right side of carbide greater than it is on the reverse side;Set “ideal comparison rate”between the two”actual collected reflection rate”.

C、 If the right carbides are blowed reversely when they arrives “air blowing vent”，then the “reverse carbides”will be sent to conveyor belt when the “blowing vent”close.If this happens,you need to increase the “1.5mm distance”,which is mentioned in ”waiting part adjusting”.

D、 If the right carbides are blown reversely when they haven’t passed through the “blowing vent”completely.， you need to extend the “blowing stop” time on the screen.“

**2）Digital Fiber Sensor display is not normal.**

Please refer to the attached”Digital Fiber Sensor FS-N18N”;If you can’t fiind the corresponding solution,please do “initial setting”operation.If the problem is still there after initialization,please replace the Digital Fiber Sensor.

**3）The conveyor belt does not rotate:**

Normally,the conveyor belt doesn’t rotate after it’s started,check if the main wheel is rotating at this moment.

A. If the main wheel of conveyor belt doesn’t rotate,please open the electric box to check the corresponding step driver inside.If light of step driver doesn’t light up,please.check power supply 24V;If the warning light turns to red,please change the driver.

B. If the main wheel of conveyor belt rotates,please check if the belt is stuck or it’s with much friction due to dirtiness;Please clean the conveyor belt or change it.Check if the sealing

ring inside the main wheel.

**4) Vibrating disc doesn't vibrate and feed material.**

The vibrating (feeding)disc doesn't vibrate or feeding materials after the conveyor belt starts.Firstly,check if the "full-material"detection switch is working,if its working light is on,it is normal when there's no vibration;If the working light is off,check if the power of frequency and amplitude modulation is on;If the power is ok,please refer to" "Frequency and Amplitude Controller " manual to adjust the frequency and voltage.If there is a power supply problem,please refer to electrical drawings.

## 4.3.4.2 Carbide Delivering Basic Operation:

**4.3.4.2.1、Enter the manual page for basic debugging.**

The "reset" operation can be done after the power and air supply of the machine are on;The sending clamp and brazing clamp positions can be controlled by the buttons in the manual page after reset operation when the machine is in automatic running,and also the corresponding cylinder motion of electromagnetic valve can be controlled.You can also adjust the positions of sending clamp and brazing clamp by changing the values near the buttons.(e.g:If we click "throw-carbide position"button,the sending clamp will be transferred to this position, change the values next to the button now;Then press this button again,the sending clamp will be sent according to the valued that just changed.)

**4.3.4.2.2、Single-step operation by Single-step Button:**

When "running ok"appears on the machine screen,you can press"single-step"button and foot switch for once,then the machine will act at single operation.Check the machine stability of each action.

**4.3.4.2.3、Notes during operations:**

**A. Sending clamp picks the carbide at zero position**

①、Check the sending clamp stop position and the first carbide position on the conveying belt after the machine is reset.You need to adjust this position when another type of carbide is changed.When the new carbide is longer,set the value in"carbide-clamping position' smaller;When it's shorter,set the value bigger;Then press the"reset"button again to reset the machine one more

time;Then check the “carbide-clamping position” of sending clamp,The sending clamp can’t pick 2 carbides at this position;Can’t pick 1 carbide either as the clamping area is too small.

②、If there are no carbides on conveyor belt when the sending detection is in open state,the sending clamp will clamp repeatedly.After 3 repeats,if there are still no carbides,the machine will stop running and display”no carbides sending”.

**B．The position when the carbide is delivered from sending clamp to brazing clamp**

When the carbide is clamped and delivered by sending clamp to brazing clamp during the machine operation,the carbide place will affect the stability of machine automatical running.The correct position of the carbide when it’s delivered to the brazing tongue,see Figure A.If the carbide is placed beyond the brazing tongue(see figure B),it is easy to be tilted,this will lead to bad brazing angle,even the carbide will drop during brazing;If the carbide is placed too far back (see figure C),then the carbide can’t be pushed into right place during brazing,and it’s easy to be stuck with brazing tongue when adding the flux(solder).

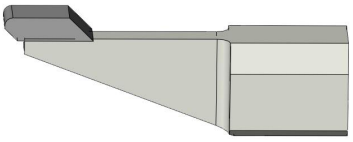
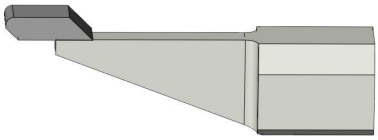


Figure A



FigureB

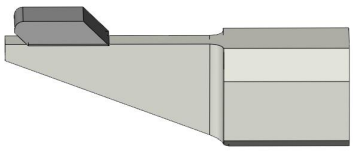


Figure C

**C.Brazing Position and Supplementary Postion**

Please press the step button after the carbide is delivered,the sending clamp will return to “carbide-clamping”position and pick the carbide again;And brazing clamp will push forwardly to the brazing position,then a supplementary process will follow.For these 2 distances,the supplementary distance must be longer than the brazing distance,but not too much,about 1mm.

**4.3.4.2.4.Common Problems and Solutions**

1 ）The sending clamp picks the carbide but can’t deliver it to the conveyor belt.

Check if center lines of sending clamp and feeding material seat are on the same level.If the center line diviation is too much,please adjust the fixed screws of “carbide barrier chips”on the right and left to make the center lines level.Then adjust ”Blocking needle lower to delay” parameters a little larger.

2）When the sending clamp picks and deliver the carbide to conveyer belt,the next carbide falls out of the conveyor belt.

Check whether the sending clamp is picking the second carbide,if this happens,reduce the “carbide-clamping position” parameter in manual page.If the “blocking needle” of waiting-material part lowers too slow when the carbide is delivered by sending clamp,you can adjust “blocking needle lower to delay”.

3）Carbide delivering between Sending clamp and Brazing clamp it not stable

A．Check if the ceramic clamping block of brazing clamp is worn;

B． Check if the brazing tongue is sticking with some dirty things,which makes the brazing tongue uneven.

C． Check if the carbide is blocked by the brazing tongue when it’s delivered from sending clamp to brazing clamp.There are several reasons for this ：

1、The changed brazing tongue is with the different size;

2、The brazing tongue surface is not clean;

3、When the sending clamp is on the levelling platform for aligning,there is too much space for the lower plane of the picked carbide.

D． The carbide clamped area by the brazing clamp is too small. Please adjust the height of sending clamp when it’s on the leveling platform.

E．Check the distance between the lower part of sending clamp and the upper part of ceramic brazing clamp.It’s generally between 0.1-0.2mm。

F． Check if center lines of sending clamp and brazing clamp are on the same level.You can adjust it by the fixed screws of sending clamp.

G.The sending clamp looses when the brazing clamp hasn’t picked the carbide.

At this time,please check if there is anything stuck at the brazing clamp part or the guide rail of brazing clamp is not clean or lubricated.These will make the brazing clamp slow when picking the carbides;Please remove the slide block to clean and

lubricate the guide rail.

**4.3.4.3 Centering and Angles Adjustment**

4.3.4.3.1. Saw advance/retreat and angles adjustment We need to adjust the advance/retreat screw rod to change the saw diameter.Please pay more attention when changing small saw blades to big ones,otherwise,the induction coil will be damaged.

Press “propel”button in the setting screen to push brazing clamp to”brazing position” when the machine is reset; Adjust the induction coil position by the X、Y、Z 3 directions adjusting knobs on the high frequency seat;This will make the induction coil in the middle of brazing clamp and both sides of the bottom on the same level with ceramic clamping block;It’s front end should be equal to the clamping block(Figure 1).(Note:the induction coil adjustment will afftect the heating efficieny and the brazing quality).(the brazing clamp still need to be in the brazing position with a carbide picked at this moment)Hang the saw on the sucking disc and push the “saw-hanging plate”forwardly to the max journey of saw advance/retreat cylinder;Rotate the “angle adjusting screw rod” and ‘saw advance/retreat screw rod”by adjusting handle;Adjust any one saw tooth to brazing tongue to make the saw blank tooth seat and the carbide on brazing tongue coincide(you can first adjust the induction coil higher,then return to original position after this operation is finished);Pay special attention to note 7(Chapter 3.2) during operation,then press ‘start”button to reset.

Press’saw advance/retreat”button to push the saw to ‘brazing position”， then check if the red spot is between the tooth root and tooth tip;If the saw keeps rotating,then adjust the front and rear positions of the saw until it can position by teeth-selecting switch and stop rotating.Now press”saw rotate”again,check if the tooth plane is higher than the bottom copper tube of induction coil after the saw stops rotating.If not,please adjust”manual gap distance”,rotate the saw again after adjusting to see if the positioning meets the requirements.(too high or too low will lead to colliding of brazing tongue and saw teeth)

Loosen the adjusting handle 1 after the saw is clamped to make the saw and saw clamp in the same line,then tighten.Tighten adjusting handle2 and adjusting handle 3 after the brazing position is confirmed,Fix the screw rods of the saw up/down and saw advance/retreat.

Saw angle screw rod

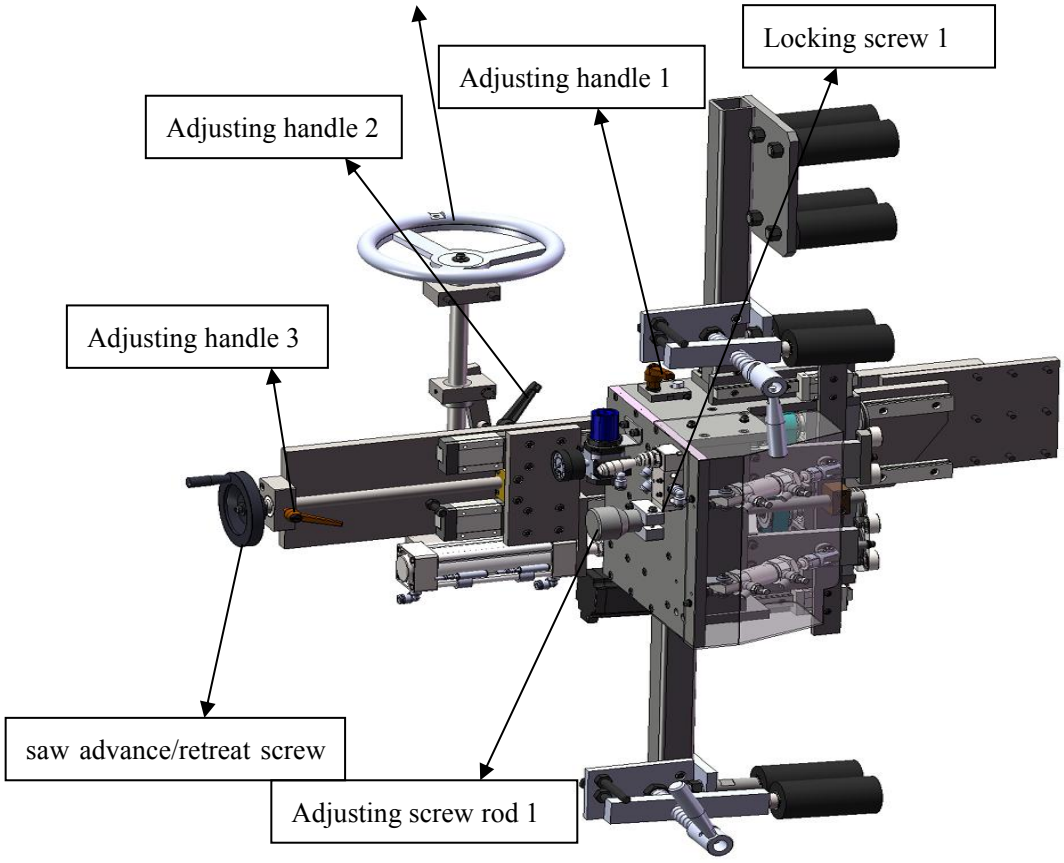



**Figure 1**

If the width varies with big difference when replacing another band saw,you can loose “locking screw1” and adjust “adjusting screw rod 1” to let the blade clamped with more parts of it.

#### 4.3.4.3.2 Centering Adjustment

See figure 3,the saw centering is adjusted by the adjusting screw rods.Firstly,loosen adjusting handle 1 and locking screw 2 when adjusting centering,then tighten the adjusting screw rod(clockwise,the saw will move inside;counter-clockwise,it will move out);Tighten adjusting handle 1 and locking screw 2 after adjustment. Observe the dial indicator readings when tightening “locking screw 2”,you’ll see that the readings will change according to the tightening of “locking screw”,thus this error should be included when adjusting centering.

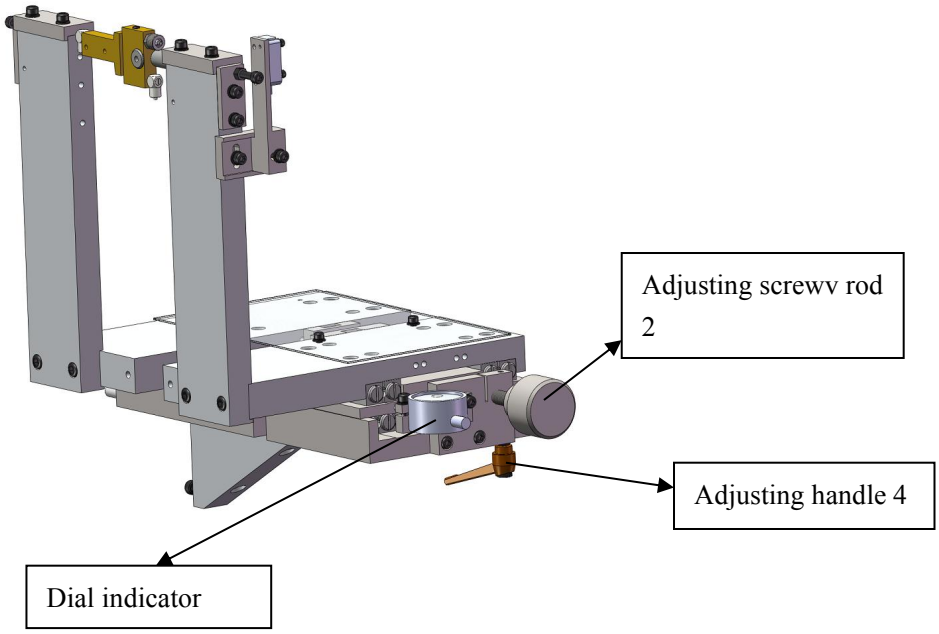
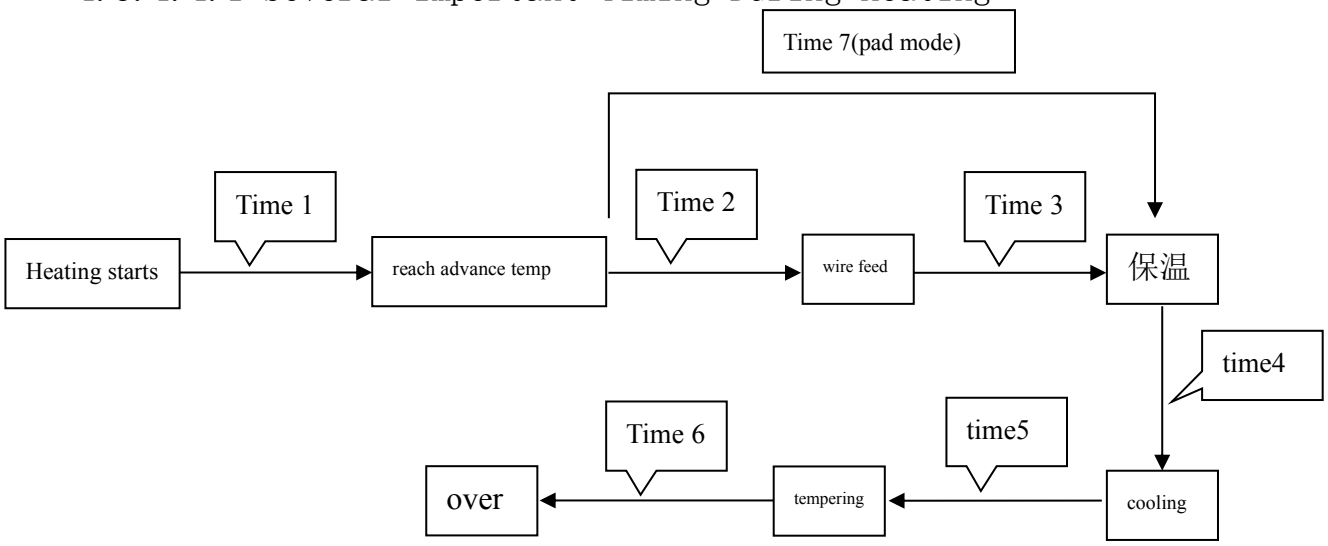



**Figure 2**

### 4.3.4.4 Heating Adjustment

#### 4.3.4.4.1 Several Important Timing During Heating




**Time 1**：Time for heating reaches advance temperature（advance temperature=heating temperature setting-advance temperature setting）;This can't be set directly,there are many factors that influence the time.Such as the shape of the induction coil,the power of high frequency,the size of the carbide,heating parameters,heating temperature setting and advance temperature setting.

**Time 2**：Wire-feeding delay.Which is the time for the wire-feeding cylinder comes down,it can be set.

**Time 3**： The time for sending wire.This is decided by sent-wire length,wire-feeding speed and wire-feeding stay time.Wire-feeding speed is set according to wire-melting speed,ensure that wire-melting speed can keep up with wire-feeding speed.If it is too fast,the wire is easy to be delivered deviated or can't be fully melted,so the brazing is not qualified.If too slow,it will affect the brazing time.

**Time 4**：Heat preservation time.It can be set.That is the heating holding time from heating starts to wire-feeding is finished(after propelling).

**Time 5**：Cooling time,it can be set.That's the time from the heating is finished to tempering starts.

**Time 6**：Tempering time,it can be set.

**Time 7**：Brazing clamp supplementary time.

#### 4.3.4.4.2 Brazing Temperature and Setting

Brazing temperature is set during brazing process.(It depends on the silver content of solder)

How to set the brazing temperature correctly? Set it according to the silver content of solder(wire).For example:30% silver content pad with melting point 750-780,we should increase10 degrees within the range of melting point during brazing(to increase the brazing strength).

#### 4.3.4.4.3 Saw Cooling and Tempering

**Saw cooling** means the time for natural cooling when heating reaches the set temperature.

**Saw tempering:**the second heating process to reduce the steel body hardness after brazing;

How to set the cooling time:when the brazing temperature reaches the set temperature,the natural cooling time will be needed;The cooling time depends on the material of steel body and size of carbide tips.(cooling time has direct effect on the next process"tempering")

Cooling and tempering should match well,the bigger the tips,the longer the cooling time;The specific cooling time setting:check the screen,when the temperature on the right of the screen is reduced to below the tempering temperature,then should stay 0.5S(by own calculation);**Tempering setting:**It is set according to the size of carbide tips;The bigger the tips,the longer the temperature time;During the brazing process,the steel body and tips are in dark red for about 0.5 second,if the tips are bigger,increase the time.

**Note:Tempering should be set according to the distance between the induction coil and tips;The farther the distance,the higher the temperature,or increase the tempering time.**

#### 4.3.4.4.4 Saw Blade Heat Preservation

It refers to the time for heat preservation after brazing is completed.(wire-feeding or propelling is over)to advance the wettability of pad or wire.

Heat preservation time should not be too long or too short.

The disadvantages of too long heat preservation time：

A）Solder paste(flux) volatilizes;The moist elements of pad or wire lose;Oxide layer and debris increase.

B）Too much brazing flux spot,which leads to deformation of the saw blade.

C）The carbide tips are easy to be broken.

Disadvantages of too short heat preservation time:.The wettability of pad or wire is not enough,which will effect the brazing strength.

#### 4.3.4.4.5 Key Points for Brazing Process

1.Ensure the carbide and saw blank are clean without any dust or oil stain.(to ensure the strength)

2.Make sure that delivering parts of the machine are clean,especially the feeding-carbide disc.，

3.Set the brazing temperature,heat preservation,cooling,tempering(to ensure the saw body hardness and sharpness)according to requirements.

4.Don’t let the high-grade saw blades become cool so fast or contact with water after brazing is finished. The best way is to let it cool naturally. You’d better put them in holding furnace for 5-6 hours with the set temperature 250-280 degrees.Then take them out after 5 hours of natural cooling.This method is helpful to eliminate the internal stress during brazing and remove the internal elements of the carbides,then the carbide service life and sharpness will be improved.

5.Besides the above mentioned notes,other things should be paid attention to when starting brazing a new type of saw blade:centering,brazing strength,brazing angles and so on.

#### 4.3.4.4.6 Induction Coil Requirements and Notes

1. We need 3 size of induction coil:big,medium and small.And ensure the distance between induction coil and carbide is 1mm.

2.The forepart of the induction coil should be arc transition, not angle transition, otherwise,it will affect the heating results.

3.Scrape the oxide layer of internal surface of the induction head to let the flux flow smoothly.

4. Keep the 2 conduction copper blocks of the heating head in the sam plane.The copper blocks may get oxidized after a long time. the copper block for a long time,use sandpaper to remove the oxide layer. Be sure to tighten the symmetric locking screws when installing the induction head and high frequency head;Otherwise,most of the current will flow to the screws and results in damage because of high current.

#### 4.3.4.4.7 Two Common Abnormal Conditions During Heating

**1. Propelling(pushing)is not in right position,main reasons:**

a) The pushing distance is too short;

b) Heating temperature is not enough;

c) Wire is not melted well;

d) Brazing clamp air pressure is too low;;

e) Adding-pressure is too high;

f) Carbide relay position is not good.（See figure 4.3.2.4.3 C）

**2. Low degree of wire liquidity,its main reasons:**

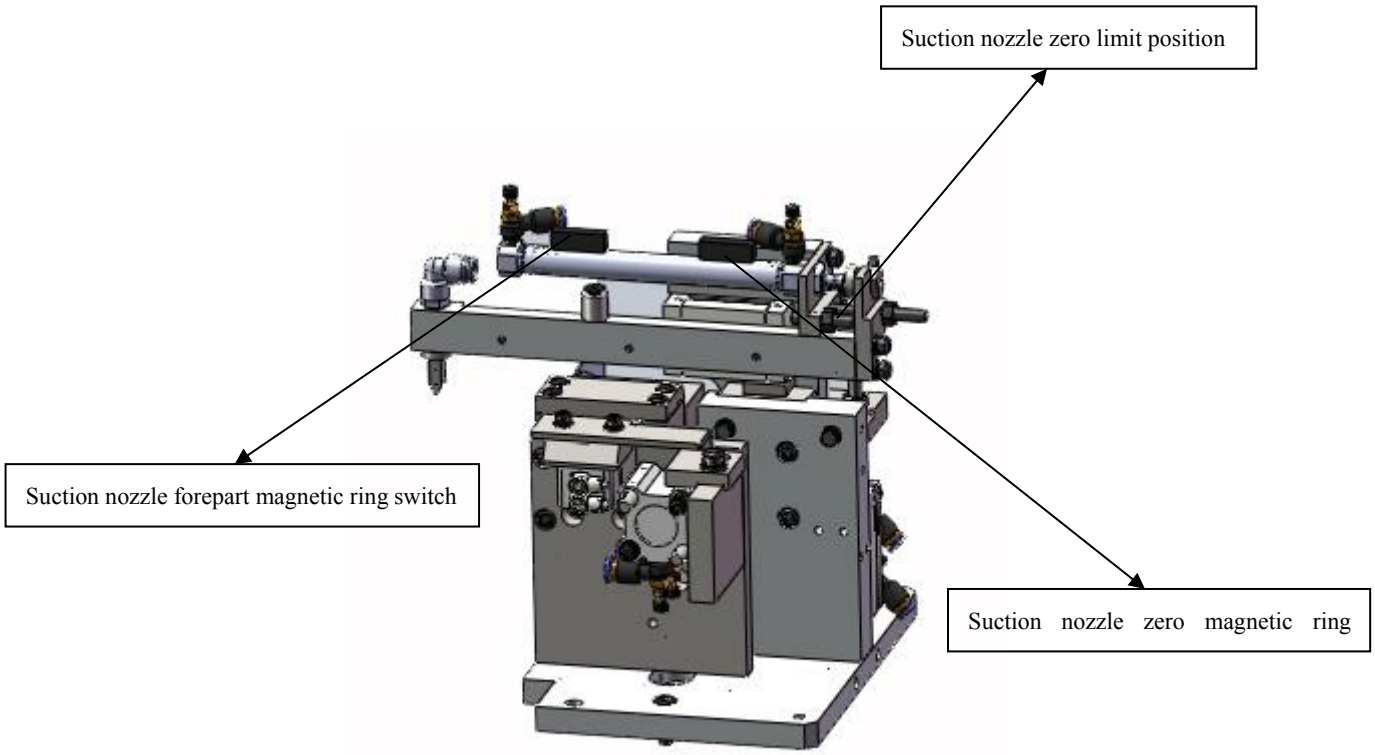
a）、The flux is few or the flux quality;

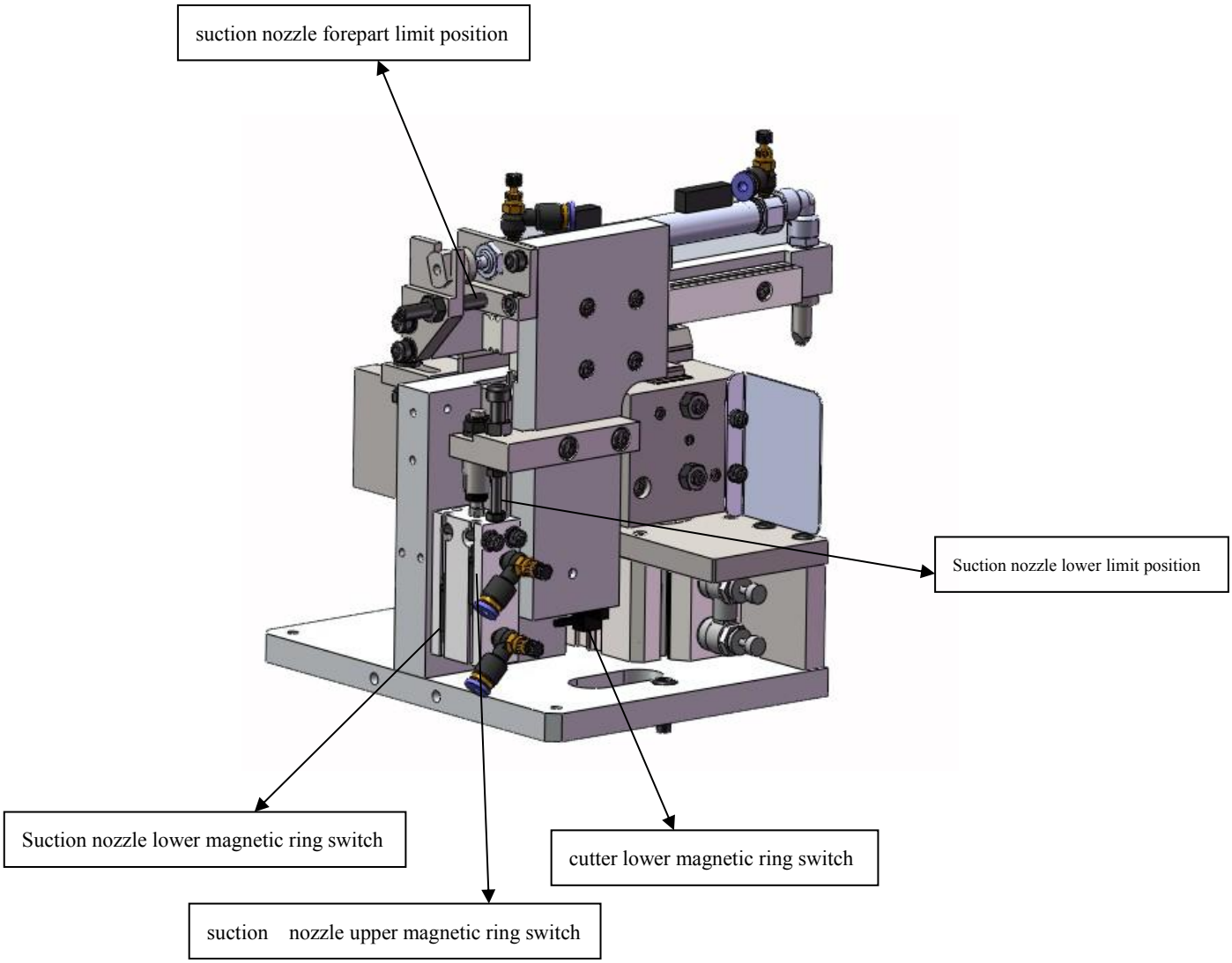
b）、Low temperature;

c)、The heating area of induction coil is near the back;

d）、The burr on the saw blade tooth seat need to be removed.

### 4.3.4.5 Cutting Pad Adjusting






**1、Abnormal Sucking-Pad**

A、The suction nozzle is not in the middle of the pad position when sucking the pad,then the suction force is not enough.Please adjust “suction nozzle zero limit position top screw”to move the nozzle to the middle of the pad.

B、The suction nozzle is blocked, then the suction force is not enough. Remove the suction nozzle and clean the suction hole.

C、Wrong “pad testing up/down limit”setting in the screen.The value should between” pad testing up/down limit” when the pad is being sucked,otherwise the system will show:no pad is sucked.Adjust the up/down limt on the screen,to make the sucking-pad value between the up/down limit;And make it bigger if there are no pads being sucked.

D、The vacuum generator is broken. The suction force is generated by the vacuum generator. Replace the vacuum generator.

**2、Abnormal Sticking Pad**

A、 The pad is sticked tiltedly.The pad should be sticked in the middle part of carbide.Adjust"sucktion nozzle forepart limit position"screw clockwise,then the suction nozzle return;If anticlockwise,the suction nozzle will move forward.

B、 The suction nozzle hits the carbide or there's no pad sticked to the carbide.Adjust"suction nozzle lower limit position"screw;Adjust the screw clockwise if the nozzle hits the carbide;Anticlockwise if the pad can't be sticked to the carbide;

C、 The suction nozzle lowers down to the right place,but doesn't stick the pad and the sending clamp doesn't move.This is because the suction nozzle lower limit magnetic ring switch is not open,which makes the machine can't move for next action.check if the place of magnetic ring switch is right or the magnetic ring switch is broken.

3、The pad is sticked,then the suction nozzle is back but no pad-cutting action

A、"Sucking pad"value setting is wrong;It should beyond the "pad testing up/dow limited value".

B、Magnetic ring switch at suction nozzle zero position is not open,then the system will think that the nozzle hasn't come back.Check if the place of magnetic ring switch is right or the magnetic ring switch is broken.

C、The magnetic ring switch of cutter lower position is not open,the system will think the "sending-new-pad"process has not been finished，so there's no pad-cutting action after the nozzle comes back;Adjust the magnetic ring switch position or replace it.

# Chapter 5 Alarm and Solutions

| No | Alarm signs | Solutions |
|---|---|---|
| 1 | Emergency stop | The “emergency stop”button is pressed,open is again. |
| 2 | Short of air pressure | Check if the air pressure supply is above 5.5MPa. |
| 3 | Chiller is not open | Press reset button to start the chiller. |
| 4 | No carbide is picked by the finger clamp | No carbide is picked by the sending clamp;The carbide is stuck on the conveyor belt or there are no carbides in the vibrating disk. |
| 5 | saw is not clamped | Press”saw advance/retreat”button to reload the saw blade. |
| 6 | abnormal brazing position | When the brazing clamp is in the brazing position,the induction switch is not working.Please adjust again. |
| 7 | conveyor belt is not started | conveyor belt must be started when machine is in automatic working state.Press’start conveyor belt”in the screen. |
| 8 | delivering is not in zero position | Press reset button to reset the machine.If no reset action happens,please check corresponding driver. |
| 9 | interval teeth is wrong | Wrong interval teeth number setting,please reset.The set interval teeth number can be divided by the total teeth number |
| 10 | Brazing timeout | The heating time of high frequency machine is not finished and longer than the set heating time. If there is heating,then change heating alarm time parameters;If no heating,please check the high frequency machine. |
| 11 | Brazing clamp zero | Brazing clamp is not back at zero position.Press reset button |

| | | |
|---|---|---|
| | position not normal | to reset the brazing clamp. |
| 12 | saw start position not normal | Saw move out abnormally， or when it return to start position,the magnetic ring switch at start place is not working.Please adjust it again. |
| 13 | Saw feeding position not normal | Or the induction switch is not working when the saw reaches the front position，please adjust it again. |
| 14 | wrong carbide width | When the carbide width is not within the aimed carbide width scope,add the carbide width error value and memorize the carbide width again. |
| 15 | Programme 1 | Please contact us. |
| 16 | Programme 2 | Please contact us. |
| 17 | Programme 3 | Please contact us. |
| 18 | Abnormal cutter lower postion | The magnetic ring switch light of cutter lower position is off,check if magnetic ring switch is damaged or the place is right or wrong. |
| 19 | Abnormal suction nozzle front position | The magnetic ring switch light of nozzle front position is off,check if magnetic ring switch is damaged or the place is right or wrong. |
| 20 | Abnormal suction nozzle start position | The magnetic ring switch light of nozzle start position is off,check if magnetic ring switch is damaged or the place is right or wrong. |

| | | |
|---|---|---|
| 21 | Abnormal suction nozzle upper position | The magnetic ring switch light of nozzle upper position is off,check if magnetic ring switch is damaged or the place is right or wrong. |
| 22 | Abnormal suction nozzle lower position | 。The magnetic ring switch light of nozzle lower position is off,check if magnetic ring switch is damaged or the place is right or wrong. |

# Chapter 6 Maintenance

To ensure the full performance and prolong the service life of the machine,there are some requiremens during everyday use:

1. Clean the working countertops after working and keep the table and control-box clean and tidy;
2. Lubricate all the rotating and sliding parts from time to time;
3. Check the motor,bearings or other rotating parts and sliding parts regularly;
4. Setting,maintenance and inspection work shall be executed by permitted staffs on schedule.
5. During complete maintenance,inspection and repairing process,the power and air supply should be cut off to avoid the accident starting of the main switch.

DONGGUAN JUNZHI AUTOMATION MACHINERY CO.,LTD
No.01,Lane04,SongbaiLang,Dalang Village,Dongguan,Guangdong,China

# EC/EU Declaration of Conformity

CE

The undersigned, representing the following:

| Manufacturer and | the authorised representative established within the European Economic Area: |
|---|---|
| Company name:<br>DONGGUAN JUNZHI AUTOMATION MACHINERY CO.,LTD<br><br>Address: No.01,Lane04,SongbaiLang,Dalang Village,Dongguan,Guangdong,China | |
| Business name: | |
| Name and address of person/Company authorised to compile the technical file established in the EU Community: | |

herewith declare that the following machinery:

| **Description of machinery** |
|---|
| Generic denomination: Automatic Welding Machine |
| Function: The machinery is designed to welding carbide tips to saw blades. |
| Model/s: HZ079E; HZ079R; HZ026R; HZ035R; HZ036R; DK25 |
| Serial no/s.: |

Fulfill the relevant provisions of European Directive 2006/42/EC (MD), 2014/30/EU (EMCD) and safety objectives of 2014/35/EU (LVD). The harmonized standards used in order to obtain compliance to 2006/42/EC (MD), 2014/30/EU (EMCD) and 2014/35/EU (LVD) are the following:

EN 60204-1:2018 Safety of machinery - Electrical equipment of machines - Part 1: General requirements;

EN ISO 12100:2010 Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology;

EN 61000-6-2:2019 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

EN 61000-6-4:2019 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments