KIOXIA LIGHT RING EQUIPMENT GROUP CO.,LTD.

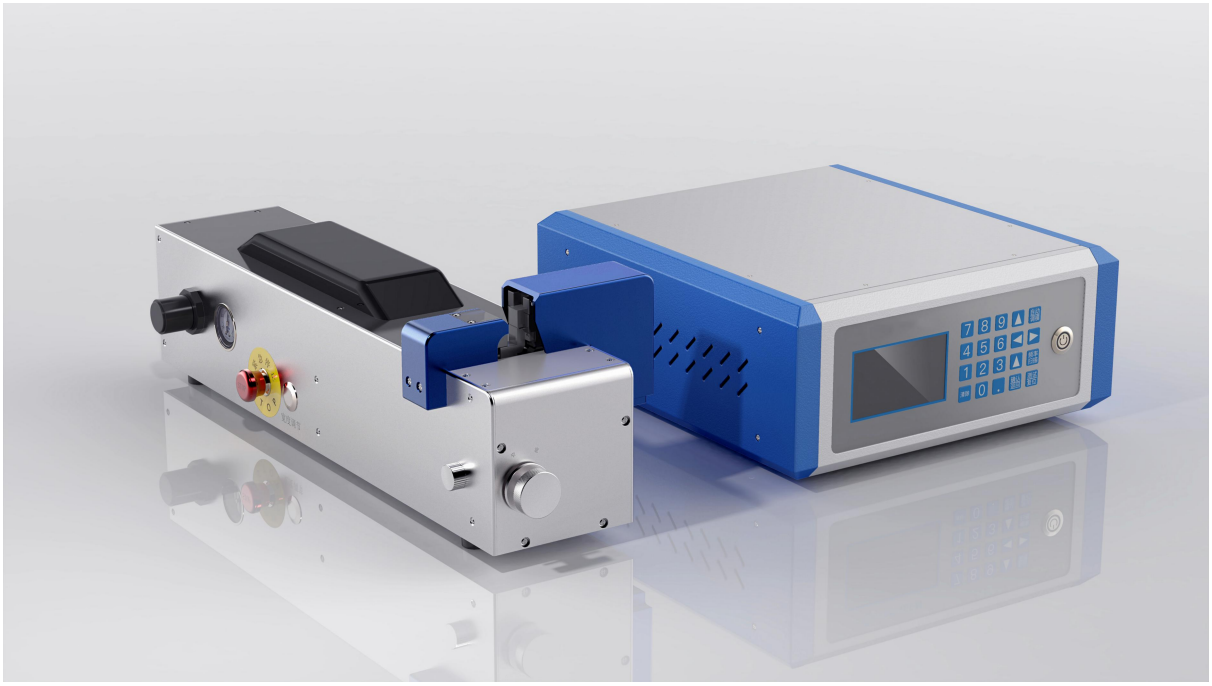
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KX-700 Ultrasonic Wire Welding Machine

User Manual



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1. Safety Guidance

1.1 Precautions

Please read the following precautions carefully before starting and using our ultrasonic welding machine!

The manual will give you a detailed description of the proper use of the ultrasonic welding machine, please be sure to strictly observe the implementation

The machine must be installed and used by trained professionals

Do not touch the welding tool head during work and operation. Ultrasonic vibration may cause serious skin burns.

The ultrasonic welding machine is not allowed until the operators have been properly trained

- Before maintenance and overhaul, the machine shall be powered off first, and repair and maintenance work shall be completed by specially trained technicians
- Do not open the chassis or adjust the machine without the permission of the equipment manufacturer, or all warranties of the manufacturer will automatically expire.

The operators shall strictly observe the safety and usage of the operation manual

1.2 Safety precautions for use

Before starting and using, make sure that the cables are properly connected and that the ultrasonic waves are maintained

Welding machine normal grounding years

* For safe use and to avoid damage, do not use metal steel pins or similar Material placed between welding tools

* Please maintain the welder and welding tools regularly and ensure the machine works.

Under normal conditions

Some abnormal conditions, sounds during welding, in order to avoid machine damage,

Please stop using immediately, maintain by relevant professional or contact after-sales

personnel

2. Machine Overview

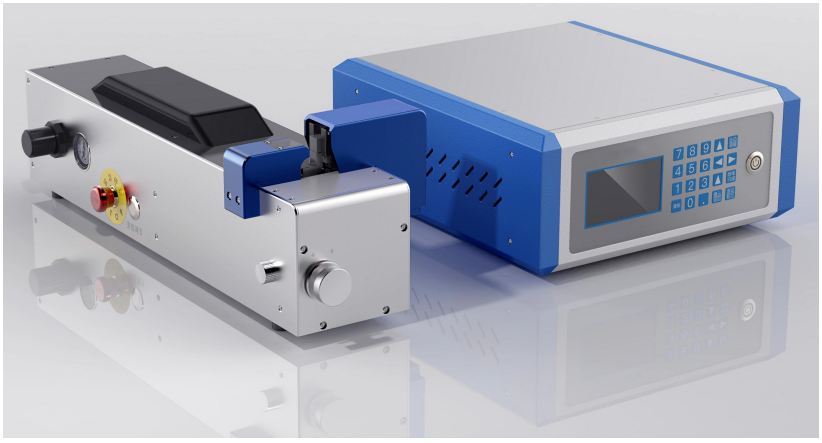


Photo (1) Ultrasonic welding machine

2.1 Basic machine parameters

Standard chassis size	385 * 350 * 165(Mm)
Standard rack size	573 * 220 * 175(Mm)
Operating frequency	20kHz
Working air pressure	0.5~06 Mpa
Suitable wire harness dimensions	1-12 Mm

2.2 Composition description of various parts of the machine:

The ultrasonic wire harness welder HMS - X00 consists of the following parts

- Ultrasonic generator(Chassis)

- Welding machine body(Rack)

Ultrasonic vibration system

2.2.1 Ultrasonic body(Rack)

The body of the welding machine is mainly composed of pneumatic device and control device, and the fixing device is mainly fixed ultrasonic wave.

Vibration system; A pneumatic device is to provide the pressure required for welding; And the adjusting device is composed of the left module and the right module.

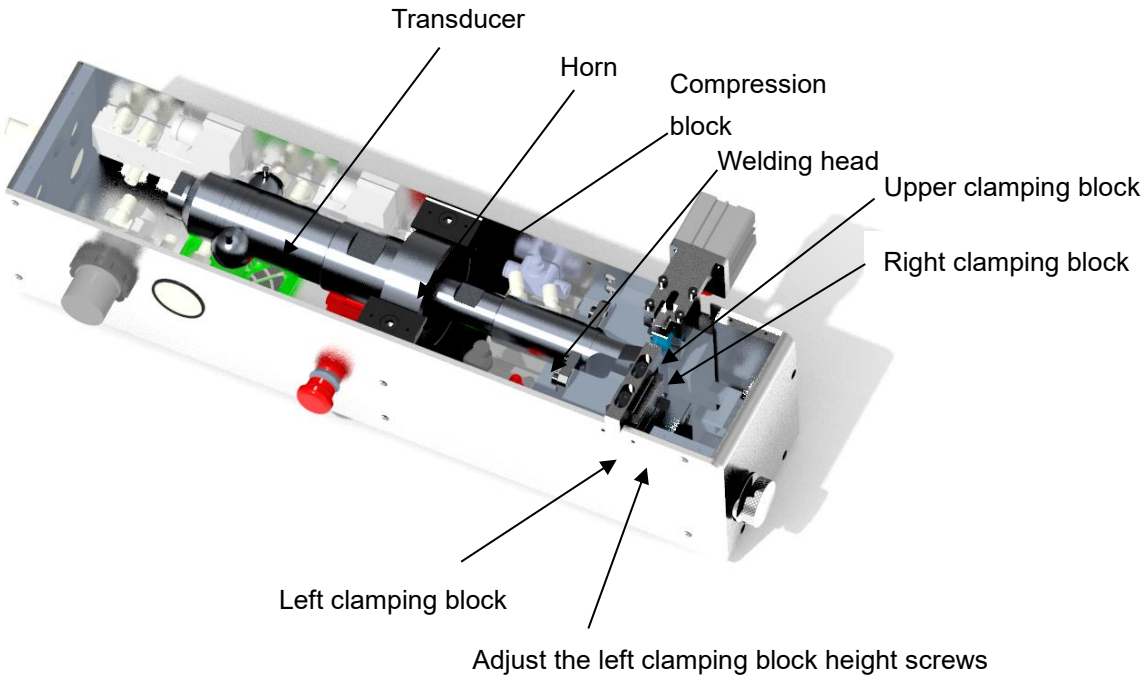


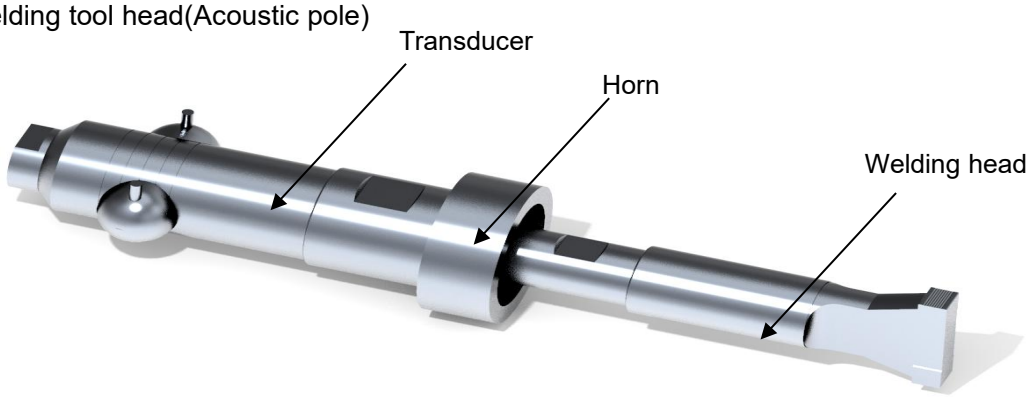
Diagram of simple mechanism inside harness welding machine(Three)

Simple internal structure of harness machine frame
Component Description:

Part name	Functional description
Transducer,horn, welding head.	Complete vibration system
Compression block	For fixing the vibration system to the rack
Left clamping block	For welding and width control; Two set screws on the left clamping block for setting the width to zero
Upper clamping block	Press movement during welding
Right clamping block	Use of limit position to prevent right line running phenomenon during welding
Adjusting Left Module High and Low Screws	Adjust the upper and lower clearance between the left clamping block and the welding head to prevent the left running line phenomenon during welding

2.2.2 Ultrasonic vibration system

The ultrasonic vibration system is a frequency modulated acoustic unit consisting of:
Transducer
Horn
- Welding tool head(Acoustic pole)



These three parts are connected by special bolts, the contact surfaces of which are highly machined and ground, have high flatness, lack of flatness or uncleaned contact surfaces may cause great energy loss, and the parts are tightened with special hook wrench to avoid loosening due to ultrasonic vibration.

Transducer
The transducer is a device for converting high-frequency electrical energy into high-frequency mechanical energy.

Amplitude changer
The amplitude changer functions to change the amplitude in the vibration system, to obtain the desired welding amplitude value and to stabilize the vibration process, and to increase or decrease the amplitude by changing the shape and size of the changer

Welding tool head(Acoustic pole)
The welding head (acoustic pole) is to transmit energy to the workpiece and drive the workpiece to vibrate in the axial direction of the welding head (acoustic pole) to realize welding. In order to make the welding head and the workpiece skid (relative movement) as far as possible in the vibration process with high frequency acceleration, transmit energy to the welding surface as far as possible, ultrasonic metal welding will usually be designed on the welding position surface of the welding head, the base surface, and the design of the mesh has square, rhombus, stripe mesh, mesh size and depth according to the specific welding material requirements.
Fixed age

2. 2.3 Three ultrasonic welding generator(Electric box)



Figure(Five)

3. Ultrasound Use

3.1 Operating instructions for ultrasonic generator

1. Click the startup button to enter the operation interface(Note: Enter the main interface during welding)



2. Click OK/Return to enter the parameter setting interface;



Action 1: Triggering time of left shift cylinder;
Action 2: Triggering time of lower pressure cylinder;
Delay time: Welding head delay wave time;
Fusion time: Ultrasonic fusion time;
Cooling time: Pressure holding time required after welding;
Vibration time: After triggering, trigger the ultrasonic time again to prevent adhesion;
Welding amplitude: The power of ultrasonic welding;
Control mode: Controlling ultrasonic welding effect by time;

3.



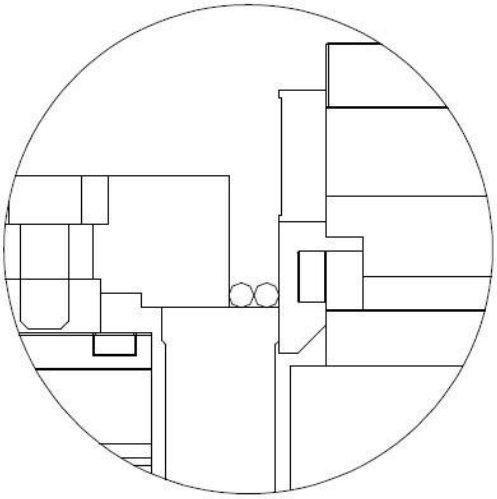
Press the up and down keys to adjust the Selection

Enter the value size to confirm the change

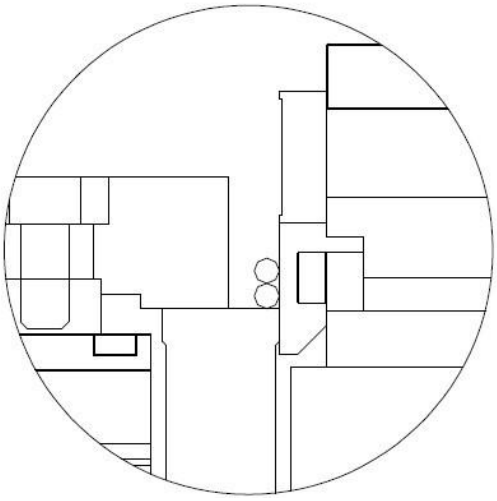
Frequency scanning: Test the frequency of the transducer before startup to ensure normal operation.
In case of abnormal alarm of electric box, press frequency scanning;
Test reset: Check whether the welding head contact wave is normal;

4. Weld placement instructions for four harness

Wiring harness welding, placement of the position is required; It is better to place it on the welding head and try not to lift the harness.
Can see below



Wrong



Correct

When multiple strands of wire harness are welded, they are stacked in layers and placed at the lower right; Don't put them all flat

5. Installation Details

- Appropriate protective measures shall be taken in the workplace to avoid damp of the ultrasonic generator and to prevent dust and corrosion.
  Age of sex gas entering ultrasonic generator

To ensure the normal use of ultrasonic wire harness welding equipment, please connect the grounding wire to avoid interference with ultrasonic metal welding.
Normal working years

6. Procedure

6.1 Unpacking

The ultrasonic welding machine has been tested and adjusted to the best state before delivery

In order to avoid damage to welding equipment, please read this manual carefully and conduct test welding before putting it into use after unpacking.

6. 2 Compressed air intake source

Compressed air input (before pressure reducing valve and filter provided by ultrasonic controller):

Minimum: 0.5 MPa

Max: 0.6MPa

Warning!The specific air pressure setting is determined by the number of wires to be welded, when the input air pressure is lower than the air pressure required for welding

When the value, the welding machine use function will not be guaranteed, please pay attention!

6.3 Connection between welder and generator

Behind the rack, behind the chassis.





Rack to chassis

The ultrasonic generator and the welding machine are connected by a cable bus. Refer to the figure.
Connect the cable to the appropriate aviation socket and tighten the nut.

6.4 Start the ultrasonic generator

- Check that the emergency stop switch on the rack is not in the depressed position

Press the start button on the generator

Press the test button directly on the ultrasound generator (the ultrasound should not be triggered for more than 5 seconds).
Check the vibration of no-load ultrasonic output

- Ratio of welding time to welding force to welding amplitude to welding width

Place the wires on the solder box, when finished, trigger the foot switch

- Check the firmness of the welded workpiece, check the deformation of the wire, if it does not meet the requirements,
Adjustment of welding parameters and re-test of welding years

Confirm ideal welding parameters and ideal welding results
- Confirm the welding effect meets the requirements of welding specifications, is in ideal working state and is put into production for use

Warning!Do not put your fingers in the welded box while the machine is running!

7. Adjustment

Each time the welding machine changes the welding head or the wear device, it is difficult to ensure that the welding head is not displaced relative to the device and the module due to the problem of the size of the device or the installation method, and two problems easily occur:

1、 The gap between the clamp and the welding head is too small, or even the energy is very large when the ultrasonic trigger is collided, or the gap is too small, or even collided, or the grain between the clamp and the welding head can be directly damaged, or the welding effect can be affected, or even the welding head can be damaged when the number of times is too large, please pay attention to

2、 The gap between the clamp and the welding head is too large, and it is easy to run the line during welding, or the welding effect is affected by the excessive age of the cutting edge.

The following describes how to adjust the replacement solder head and wear devices:



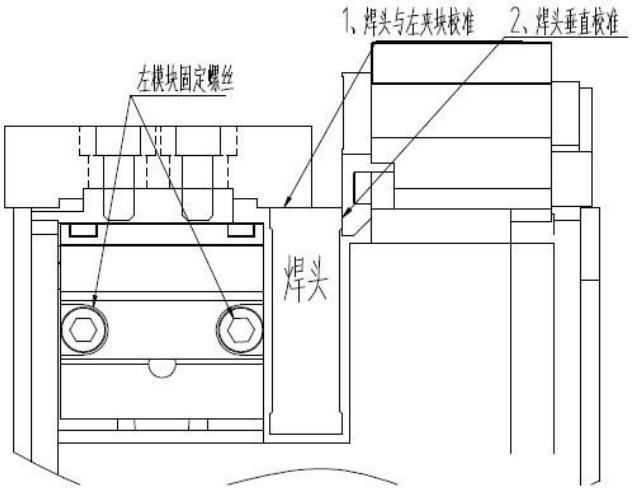
Warning!In the process of adjusting the welding machine, it is strictly forbidden to trigger ultrasonic wave to prevent damage to the welding head and fixture. After the adjustment is completed, it is forbidden to trigger ultrasonic wave for a long time. Generally, the trigger ultrasonic wave should not exceed 5 seconds. Each time the machine is adjusted, it is necessary to check the pressing height of the upper clamping block and prevent the welding head from colliding.

7.1 Replace welding head adjustment

Adjustment steps:

1、Remove the upper panel and front panel of the harness machine as shown in Fig. (3)
2、Loosen the fixing screws of the left module and lift the left module a little for easy removal of the vibration system
3、Loosen the pressure block and take out the vibration system
4、Replace the welding head and install it back to the original age
5、Calibration head years
6、Install back pressure block and fix tightly vibration system

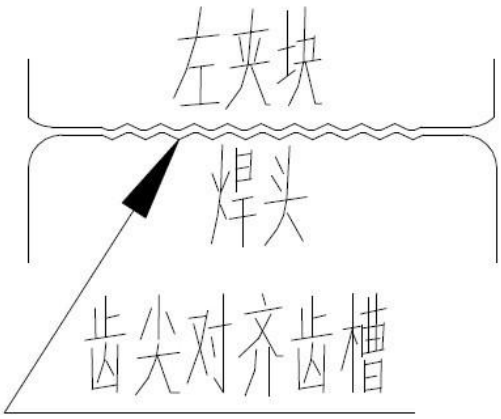
Welding head calibration method:



It can be seen from the left image (8) that the calibration of the welding head is divided into two aspects:

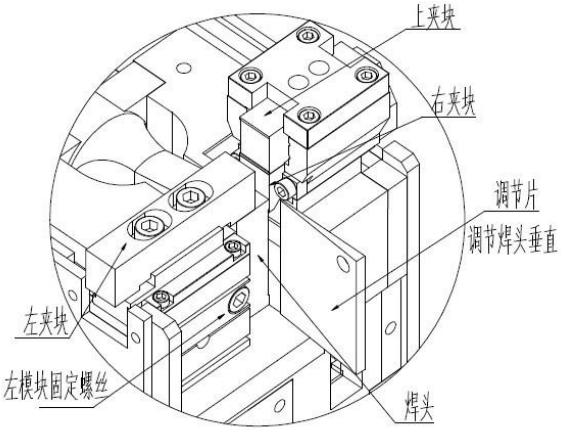
1、 Alignment between welding head and left clamping block
2、 Welding head vertical calibration

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Alignment between welding head and left clamping block

1、Remove the right module
2、Fasten the left module to prevent displacement
3、Visual inspection of tip alignment groove
4、Alignment between welding head and left clamping block
5、The ripple wave peak of the welding head is aligned with the wave valley of the left clamping block.



Welding head vertical calibration

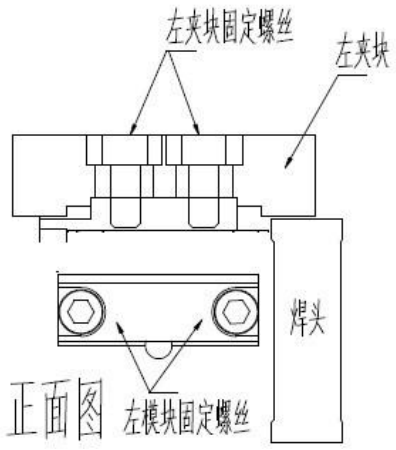
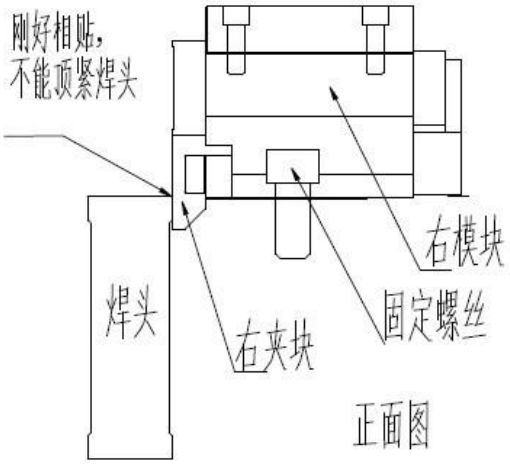
1、Remove the right module
2、Use the adjustment tab supplied with the machine to plug the welding head into the gap between the right module and the underside and the right module
3、Calibrate the angle of welding head and observe the light leakage of welding head.
4、 If no light leaks, calibration is complete

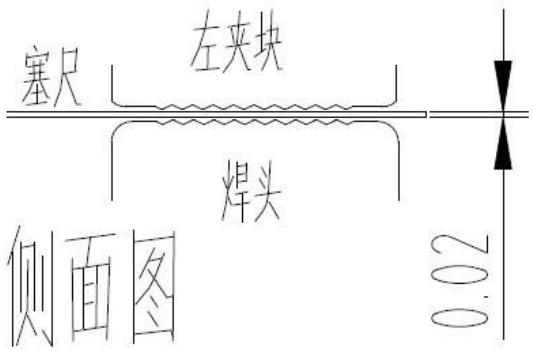
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Attention!When the welding head is calibrated, the two calibration aspects shall be carried out at the same time. After the calibration is completed, it shall be verified that the vibration system shall be fixed properly. After the calibration is completed, the vibration system shall be prevented from loosening when the vibration system starts to vibrate.

7.2 Adjustment of clearance between left and right modules

The clearance adjustment methods of the left and right modules must be readjusted each time the welding head is replaced or the wear device is replaced, as shown in the following table:

Gap adjustment between left clamping block and welding head	Gap adjustment between right clamping block and welding head
	

	
Adjustment instructions: Tighten the left clamping block fixing screw during calibration Loosen the left module fixing screws and the left clamping block.Move Please use 0.02 mm feeler gauge for clearance adjustment After calibration, tighten the left module fixing screws Press the "left and right" icon to check whether the left module is tightened and moves smoothly	Adjustment instructions: Loosen the fixing screws in the above figure * The right clamping block is just attached to the welding head. Try not to play a strong role in preventing damage to the welding head or fixture. Tighten the fixing screw year Press the "Up and Down" icon to check whether the right module is tightened and moves smoothly
Precautions: The fixing screws of left clamping block shall be tightened before adjustment	Precautions: Can be adjusted using 0.01 mm's feeler gauge for safety

7.3 Width of three wire harnesses



Rotate knob anti-clockwise/clockwise



Width test button

7.3.1 Wire width adjustment

1. Turn anti-clockwise to increase the width, turn clockwise to decrease the width
2. Press width test button to check if the width if suitable

7.4 Replacement of four welding surfaces

In order to use the welding head to the maximum extent, please replace the welding surface for every 50,000 times.

Heavy, please replace the welding tool head in time, replace the welding surface at the same time, please check the left and right clamping blocks and upper clamping blocks for wear.

When the welding effect is not ideal due to serious wear, or the welding front is too large after welding, or even running the line, please replace the welding tool in time.

8. Disassembly, assembly and replacement of eight-year-old vibration system

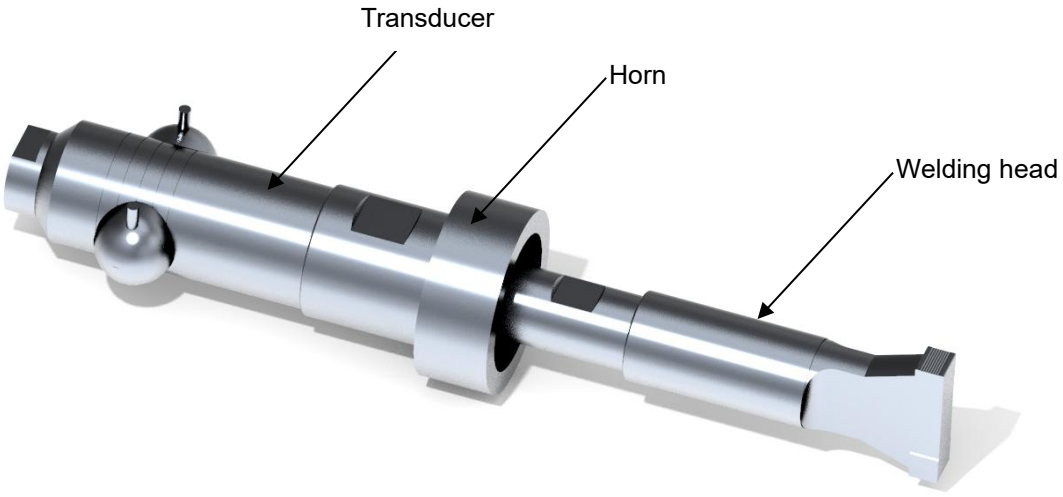
When the machine is turned on or the machine works for a specified number of times, there are the following reasons for abnormality:

1. The connection surface is not clean when replacing the welding head, and the connection with the horn is not tight enough;
2. The welding head collides with the clamp too many times, resulting in damage or fracture; Please replace the welding head;
3. When the welding head is used for a long time and reaches the limit life, the system will give an alarm automatically. Please replace the welding head;
In order to achieve the best working conditions and maintain the performance of the machine, to ensure the normal operation of the vibration system, the vibration system must be manually checked.
4. All parts of the gantry must be tightened properly. Do not contact the welding head with the workpiece or clamp.
5. Turn on the power and the power LED is on.
6. Press the overload test key to check whether the resonance frequency of the vibration system is within the working range and whether overload occurs.
7. Generally, the ultrasonic sound is a relatively smooth and gentle sound. If strange sound occurs, please replace the welding head or check for loose sound.
Movement;
8. No abnormal sound, normal operation can be performed.

For the whole ultrasonic metal welding machine, the welding head is a wear-prone part, the service life is limited, and the service life of the welding tool head is affected by various factors. The main factors are the hardness difference between the tool head (hardened tool steel) and the workpiece (for example, non-ferrous metal), and the wear and even fracture of the surface groove caused by welding for a long time, and the welding head must be replaced when there is a problem with the welding head.

- Welding tool head(Acoustic pole)

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Problems to be noted during replacement:

1、Carefully observe whether the connection bolt thread is complete, so as not to damage the screw buds of the vibration system due to vibration. If necessary, replace the screw buds.

2、Make sure the connecting surface is clean, free of dirt and objects, butter during installation, and allow ultrasonic waves to pass better.

Remember!

3. After the bolt is tightened, loosen half a ring to prevent the bolt from being fixed on the welding head, and then install the second stage on the dipole.

The rod and transducer must be screwed to the secondary rod first, and then the transducer can not be installed in the reverse order, please pay attention!

3、After the replacement, do not install it on the machine immediately, connect the cables, and place the vibration system directly on the table to test whether the ultrasonic wave is abnormal.

a) When there is a strange sound, please reinstall the vibration system

b) Intermittent two-year-old three-minute ultrasound, each time the trigger ultrasound should not be too long, check for fever abnormal fever please re-install Loading(Connection surfaces may not be neat)

If you have any questions, please contact our after-sales service department

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9. Maintenance

1. After the daily welding work is completed, the copper wire on the welding tool head and fixture surface must be cleaned with a brush.
Please wipe the welding head and welding fixture with tarpaulin.

2. When carrying out the above work, check the wear on the working surface of the welding tool head at the same time.
In case of obvious depression, the working surface or welding tool shall be replaced in time.

3. Pay attention to the air source filter behind the rack. If the filter water and filter oil accumulate more, please clean it in time to avoid affecting the precision pressure regulating valve.

4. When starting the machine every day, pay attention to whether the ultrasonic system is in normal working state during the self-test of the machine. If there is any abnormality, please press
Conduct troubleshooting according to the following steps, and contact the after-sales service personnel in time.

1) The ultrasonic system is divided into three core parts, which are the transducer and the generator.
First, judge whether there is a problem with the welding head, replace the welding head with a new one, and then observe the state of the ultrasonic system.
No return to normal, if yes, it indicates a welding head problem, if no, please see the next step;

2) If it's not a problem with the welding head, you can put another good ultrasonic generator (if there are two devices connected to the problem ultrasonic)
On the vibration rod of wave metal welding machine, observe if the machine is normal. If it is normal, it indicates that the ultrasonic generator has problems.
If it is abnormal, it indicates that the transducer is faulty. If the ultrasonic generator or transducer is faulty, please contact the manufacturer in time.
Business maintenance year

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10. Weld Data Reference

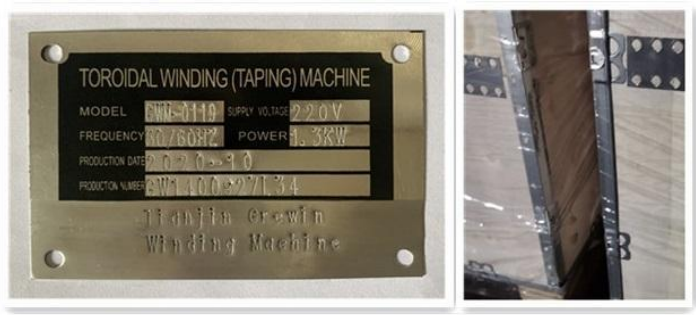
EW-6030 Weld Data Refrence

Conductor cross-section (mm²)	Width (mm)	Meter Data	Amplitude	Weld Time (S)	Pressure (MPa)	TIM ACT1 (s)	TIM ACT2 (s)	TIM DELY (s)	TIM COLD (s)	TIM SHOK (s)
1	1.27	2.8	100	0.1	0.5	0	0.3	0.3	0.2	0.02
1.5	1.44	3.7	100	0.15	0.5	0	0.3	0.3	0.2	0.02
2	1.7	4.8	100	0.2	0.5	0	0.3	0.3	0.2	0.02
2.5	2	6.1	100	0.2	0.5	0	0.3	0.3	0.2	0.02
3	2.3	7.8	100	0.2	0.5	0	0.3	0.3	0.2	0.02
3.5	2.4	8.3	100	0.25	0.5	0	0.3	0.3	0.2	0.02
4	2.6	9.1	100	0.25	0.5	0	0.3	0.3	0.2	0.02
4.5	2.8	10.1	100	0.25	0.5	0	0.3	0.3	0.2	0.02
5	3	11.15	100	0.25	0.5	0	0.3	0.3	0.2	0.02
5.5	3.1	11.4	100	0.3	0.5	0	0.3	0.3	0.2	0.02
6	3.2	11.85	100	0.3	0.5	0	0.3	0.3	0.2	0.02
6.5	3.4	12.7	100	0.3	0.5	0	0.3	0.3	0.2	0.02
7	3.5	13.3	100	0.35	0.5	0	0.3	0.3	0.2	0.02
7.5	3.6	13.8	100	0.35	0.5	0	0.3	0.3	0.2	0.02
8	3.7	14.1	100	0.4	0.5	0	0.3	0.3	0.2	0.02
8.5	3.8	14.7	100	0.4	0.5	0	0.3	0.3	0.2	0.02
9	4	15.5	100	0.5	0.5	0	0.3	0.3	0.2	0.02
9.5	4.2	16.5	100	0.55	0.6	0	0.3	0.3	0.2	0.02
10	4.4	17.5	100	0.6	0.6	0	0.3	0.3	0.2	0.02

11. Packaging

Packaging Material: Carton/Wooden case with foam inside.

1. General package(Paper carton or plastic bag): For small equipped parts for Digital CNC Wire Coil Winding Machine, Package it with form and pack paper to guarantee unbroken during the transport.
2.Wooden case package: For larger scale Digital CNC Wire Coil Winding Machine ,we have special skilled carpenter, who would make the proper wooden case with exact thickness, density,length. The up arrow ↑marked on the outer wooden case. Buffer material would be put in the wooden case to prevent crack and shock.







12. FACTORY:

Founded in 1993, KIOXIA LIGHT RING EQUIPMENT GROUP CO.,LTD. has established itself as a well-known manufacturer specializing in high-performance winding machines, along with associated production equipment, technologies, and comprehensive documentation. A key offering in its product and support portfolio is the KX-700 Ultrasonic Wire Welding Machine—a precision tool for ultrasonic wire bonding, complemented by a detailed User Manual that ensures optimal operation and maintenance. This equipment enhances the company's capabilities in providing end-to-end solutions for wire processing in component manufacturing.

Beyond delivering specialized equipment like the KX-700 Ultrasonic Wire Welding Machine (supported by its comprehensive User Manual), KIOXIA LIGHT RING provides highly cost-effective manufacturing

solutions. These solutions cater to the production needs of various wound components, including transformers, chokes, and other devices requiring reliable wire connections, ensuring efficient, high-quality processing across diverse electronic component manufacturing applications.



