preface

Thank you for choosing our company's equipment. Our company has been dedicated to the research, development, production, and sales of battery production and testing equipment for over a decade.

A specialized and standardized production service system has been formed, mainly consisting of spot welding machine series, battery internal resistance tester series, battery protection board tester series, battery tester series, and ultrasonic welding equipment series products.

We strive to provide you with simple, easy-to-use, user-friendly, high-quality, and cost-effective battery production and testing equipment, helping your battery production and operation to go faster and fly higher. Let's work together for the future and create brilliance!

Before using this product and in case of any malfunctions, please read this manual carefully!

Safety regulations

Please read this rule carefully before using this machine

1. Do not let this machine get damp or engage in strong mechanical movements.
2. Please confirm that the local power supply voltage is 220V+/-10V.
3. Please pay attention to the warning messages on the machine.
4. The power cord is the main power supply connection. Do not leave any objects on the power cord, and do not place the power cord in places where the user is likely to accidentally move it, or in environments with high heat sources.
5. The power cord plug is a single-phase three wire plug, with the third end grounded.

If your plug cannot be inserted into the socket, please contact an electrician to replace the original power socket without rendering the safety function of the single-phase three wire plug ineffective.

6. Do not overload the power socket or extend the power cord, otherwise it may cause fire or electric shock.
7. As an additional protective measure, please turn off the power when not in use;

When there is a power outage or the machine is not in use for a long time, the power plug should be unplugged from the socket to prevent surge impact on the machine through the power cord.

8. The grooves and openings on the casing are designed for ventilation and also to ensure the reliability of machine operation and prevent overheating.

Do not block the heat dissipation holes with other objects.

9. Before using this machine, it is necessary to train the operators and designate a dedicated person to be responsible.
10. When the machine encounters the following situations, please unplug the power plug from the socket first and ask professional maintenance personnel for comprehensive repair:

a) The power cord or plug is damaged or worn out.

b) Liquid spilled into the machine.

c) The machine was soaked in rainwater.

d) When the machine cannot be used normally.

11. When replacing parts, ensure that maintenance personnel use substitute components with the same performance as the original parts as specified by the manufacturer.

Unaccepted substitute components may cause fire, electric shock, or other hazards.

12. Please strictly follow the user manual for operation. It is prohibited to modify or disassemble the machine without authorization. We do not assume any responsibility for any consequences caused by this.

1、 Overview

This model is an upgraded intelligent high-frequency inverter power battery spot welding machine, designed based on the principles of the most advanced spot welding machines abroad, with performance reaching the top level of resistance welding.

It mainly has the following characteristics:

1. Beautiful appearance and lightweight.

2. The welding points are beautiful, with small sparks, no blackening, stable welding current, and uniform welding point size.

3. Completely overcoming the low voltage and water leakage phenomenon after spot welding of lithium batteries, it is the ideal equipment for your production and assembly of batteries.

4. Due to the use of a microcomputer microcontroller control, the machine can achieve single pulse and double pulse welding.

5. All parameters are microcomputer based, using LCD liquid crystal display and key surface adjustment, accurate, intuitive, and convenient.

6. It has a counting function, making it convenient to calculate daily production.

7. Both pedal type and pneumatic type have accurate alignment and are suitable for welding small cap battery cells,

Characteristics of high yield rate.

8. The pressure of the two welding needles can be adjusted independently and conveniently, ensuring stable and reliable welding pressure.

9. Welding switch is the only photoelectric switch used in China, eliminating the need to replace switches for similar machines.

At the same time, in order to facilitate and speed up debugging, the machine has added an intelligent adjustment mode. Multiple welding parameter templates are preset according to the thickness of the nickel sheet. During welding, the corresponding welding parameter templates can be called up by pressing the "switch" button based on the thickness of the nickel sheet being welded, and welding can be done directly or by making simple adjustments.

(For example, to weld a nickel sheet with a thickness of 0.15mm, simply press the "Switch" button to select "Template: 0.15", and then weld it directly or finely).

Based on the thickness of mainstream solder pads on the market, the corresponding "default" template is preset as follows:

Template/solder thickness (mm)	Prewelding current (BI)	Welding time (WT)	Welding current (WI)
0. 05	20	01	16
0. 1	20	01	26
0. 15	20	01	36
0. 2	20	01	43
0. 3	20	01	60

In addition, four custom templates are reserved for users, who can set them according to their actual situation.

After the setting is completed, the machine will automatically remember the corresponding template parameters, and the same product can be welded directly by simply calling up the template for the next welding.

★ Attention:

1. The above default templates are approximate welding parameters, and in production, it may be necessary to slightly increase or decrease the welding current (WI) according to the actual situation

2. For the convenience of adjustment, the program is pre-set to only adjust the welding current (WI) parameter to achieve the effect of welding nickel sheets of different thicknesses.

Please follow the default parameters for pre welding current (BI) and welding time (WT) in production, and do not adjust them. We only need to adjust the welding current (WI) according to the welding situation.

If the welding firmness is not sufficient, simply increase the welding current (WI). If the welding is too strong, simply reduce the welding current (WI).

3. The template has the property of being able to change and automatically remember the changed parameters. When we reduce or increase the welding current (WI), the machine will automatically save the changed parameters. The next time we call the template, the machine will automatically weld according to the changed parameters.

4. Template reset: When the template is scrambled, the factory preset template can be restored through the following methods:

First press the "Reset" button for 1 second to reset the counter, then press the "Switch" button for 1 second and release it. All templates will be restored to factory settings.

★ Special attention:

Templates 0.05, 0.1, and 0.15 are conventional thickness solder pads, and the welding pressure (two silver adjustment knobs on the machine head) is adjusted between approximately 1.5-2.0.

Template 0.2 and 0.3 are for thick plate welding. At this time, the welding pressure needs to be adjusted between 2.0-2.5, and the welding pressure cannot be further increased, otherwise the welding may not be firm.

2.Main technical parameters

Pneumatic type:

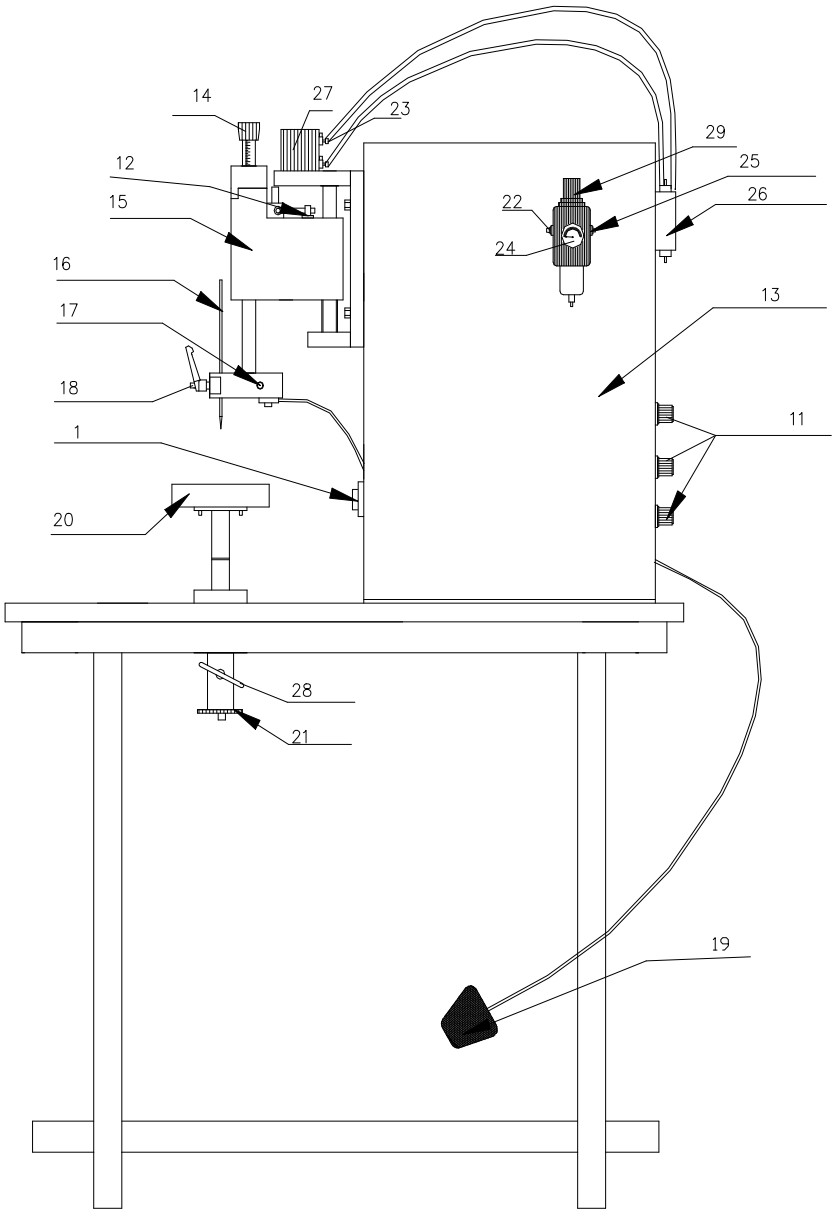
1. Power supply: AC 220V ± 10% 50Hz ± 5% Hz
2. Maximum output power: 15KVA
3. Input air pressure: 0.1-0.8MPa
4. Welding current: 00-99
5. Whole machine weight: 40KG
6. Dimensions: 585L × 380W × 420H (unit: mm)
7. Scope of application: Suitable for various welding plates ranging from 0.03mm to 0.3mm.

3. Pneumatic usage instructions and operating steps

1) Pneumatic usage instructions:

1. Power switch: Use a reset button to turn on the power when entering, and press it again to turn off the power again.
2. Output waveform: reflects the pulse state of the machine during operation.
3. Counter: displays the number of spot welds for easy calculation of production output.
4. Pre welding current (BI): refers to the height of the first pulse, with a set size of 0-99, usually around 20 for testing.
5. Welding time (WT): refers to the width of the second pulse, with a total duration of 1-3mS. The welding time is selected based on the specific welding effect, usually 01.
6. Welding current (WI): refers to the height of the second pulse, with a setting range of 0-99, and its size adjustment should be based on the actual welding effect.
7. Status: Visually display the "on" and "off" states of the photoelectric switch and touch switch during operation.
8. Template: Reference welding parameters for welding metal sheets of different thicknesses.
9. Switch: Switch between welding templates, switch one template with each press.
10. Reset: Press and release for 1 second to reset the counter.
11. Fuse holder: The 15A fuse is located in the lower right corner of the electrical box.
12. Welding switch: Inside the machine head, the two switches are connected in series. When the welding needle presses against the workpiece and both switches are closed, the spot welding machine will discharge and weld. This switch is a vulnerable part.
13. Electrical box.
14. Welding pressure adjustment knob: Adjust the pressure by rotating it clockwise to increase the pressure, and vice versa to decrease it.
15. Head sliding body.
16. Welding needle.
17. Welding needle width adjustment screw.
18. Welding needle height adjustment screw.
19. Touch switch: Start welding.
20. Welding material placement table.
21. Place the table height adjustment screw.

22. Air pressure input port: Input air pressure.
23. Throttle control valve: Adjust the air pressure by rotating clockwise to increase the air pressure, and vice versa to control the airflow.
24. Barometer: displays the pressure reading.
25. Air pressure output port: Output air pressure.
26. Electromagnetic valve: converts air pressure input and output.
27. Cylinder: Push the machine head up and down.
28. Height positioning screw for storage platform.
29. Air pressure regulating valve: after pulling upward, adjust and control the input air flow, rotate clockwise to increase the air pressure, otherwise decrease, and the reading of the barometer changes.



2) Pneumatic operation steps:

1. Adjustment of welding needle height:

First loosen the height adjusting screw 18 of the welding needle, then adjust (or replace) the length of the welding needle exposed below the electrode (generally about 20mm, if the welding needle is too long, it is easy to deform), and then lock the screw to ensure that the two needle tips are always on the same horizontal plane.

2. Adjustment of electrode (welding needle) width:

First, use a wrench to loosen the width adjustment screw 17 of the welding needle. Then, according to the required welding width, adjust the two electrodes to the appropriate distance between the two welding needles. Finally, tighten the screw and ensure that the two needles do not touch each other.

3. Adjustment of storage platform height:

Firstly, use a wrench to loosen the locking screw 22 of the storage platform, then adjust the distance between the battery to be welded and the welding pin to a suitable position (generally 3-4mm is recommended), and then tighten this screw.

(Note: The gantry spot welding machine cannot adjust the storage platform, but the height of the machine head can be adjusted.)

4. Adjustment of welding pressure:

Turn the welding pressure adjustment knob (the two silver knobs on the machine head) by hand. Rotate it clockwise to increase the pressure, and vice versa. Adjust the appropriate pressure according to the welding requirements.

Generally speaking, too little pressure can cause large sparks, while too much pressure can lead to weak welding. In general, the welding pressure for welding 0.05-0.18 should be maintained between 1.5-2.0, and the welding pressure for welding 0.2-0.3 should be maintained at around 2.5. The welding pressure cannot be further increased, otherwise there will be a phenomenon of weak welding.

5. Adjustment of input air pressure:

Twist the air pressure regulating valve 29 upwards by hand, rotate it clockwise to increase the air pressure, and vice versa to decrease it. At the same time, the air pressure gauge displays its reading, and then press this regulating valve to fix its value (usually at 0.2MP);

6. Adjustment of cylinder input speed:

Twist the cylinder input speed adjustment valve 23 by hand, rotate counterclockwise to increase air pressure, and the machine head descends quickly;

On the contrary, when the air pressure decreases, the nose descends slowly;

7. Adjustment of cylinder output speed:

Twist the cylinder output speed adjustment valve 23 by hand, rotate counterclockwise to increase air pressure, and the machine head rises quickly;

On the contrary, when the air pressure decreases, the nose rises slowly;

8. Connect the power supply:

First, plug the plug into a 220V power outlet, then turn on the power switch. The screen displays "Power Welding Machine" as normal. If it does not display, turn off the power and restart it again.

9. Trial welding:

Press the switch with your foot, and the machine head will descend. When the welding needle presses onto the workpiece, both welding switches will be in a closed state, and discharge welding will begin.

Change the welding current, welding needle pressure, and air pressure according to the welding situation until the welding is optimal.

10. Repair of welding needles:

In order to ensure good welding quality, it is necessary to diligently repair the welding needle. The cleanliness and flatness of the spot welding needle tip is a prerequisite for ensuring welding quality.

If carbon deposits are generated after the needle tip is ignited, the contact between the needle tip and the nickel sheet will be poor, and continuing spot welding will lead to more serious explosion phenomena. If the carbon deposits are too severe, it will hinder the conduction of current, resulting in no discharge during spot welding, that is, no welding.

The trimming of the welding needle is an important step in spot welding, so we need to be good at trimming the welding needle.

(1) When there is carbon accumulation or continuous explosion at the tip of the welding needle, we need to use a small file to clean the lower end of the needle tip

4. General troubleshooting:

序号	Fault phenomenon	cause	Troubleshooting
1	No display on the startup LCD	15A fuse burned out. 2. Input power failure. 3. The sensitivity of contrast adjustment is too high.	1. Replace the same specification fuse. 2. Check and repair the power supply circuit. 3. Adjust the adjustable resistor R2 (103) on the circuit board.
2	The startup LCD displays, but there is no response during soldering	1. 10A fuse burnt out	1. Replace the fuse with the same specification.

3	There is a power indicator, but no welding sparks	1. The air pressure is too low, 2. The welding current parameter is set too low 3. The distance between the lower end face of the welding pin and the battery is too large 4. The welding switch connection is disconnected 5. The photoelectric switch is damaged The working status of the photoelectric switch on the light screen does not jump, mainly due to power interference.	1. Increase the air pressure 2. Increase the welding current value 3. Adjust the distance between the battery and the solder pin end face to about 3-4mm 4. Connect this wire according to the diagram (2, 4) 5. Replace the photoelectric switch Turn off the power switch and turn it back on.
4	Easy to ignite or even burn the battery casing during welding	1. The welding needle pressure is too low, 2. There are foreign objects stuck on the lower end face of the welding needle, 3. The welding material is incorrect 4. Welding current is too high The heights of the two soldering pins are not on the same horizontal plane	1. Increase welding pressure 2. Use a small file to smooth out the end face of the soldering pin 3. Choose appropriate welding materials 4. Reduce welding current. Adjust the height of the welding needle to the same horizontal plane

Explanation on sparks during spot welding:
Basically, all spot welding will generate sparks, especially when the welding current required for spot welding thick plates is high. We can try the following methods to reduce sparks:
1. Replace nickel plated sheets with pure nickel sheets;
2. Increase the contact area between the soldering needle tip and the battery by selecting soldering needles with slightly thicker tips;
3. Slightly increase the welding pressure, but the pressure should not be too high, not exceeding 2.5, otherwise it will cause weak welding.

Regarding adhesive needles:
This type of spot welding machine may have some degree of needle sticking

during spot welding. We can try the following methods to avoid or reduce the occurrence of needle sticking:
1. Step on and release quickly. When spot welding, quickly step on the foot pedal and release it quickly after discharging. The slower the release, the easier it is for the needle to stick;
2. On the premise of ensuring welding firmness, slightly reduce the welding current (WI);
3. Use high-grade spot welding needles;
4. When continuous explosion occurs during spot welding, black carbon deposits will appear on the needle tip. At this time, we need to use a small file to clean and level the lower end of the needle tip (be careful not to flatten the tip).

Regarding the explosion:
Sometimes there may be continuous explosion during spot welding with a spot welding machine. We can try the following methods to solve it:
1. When the welding needle is continuously fired, black carbon deposits will appear on the tip of the welding needle. At this time, we need to use a small file to clean and level the lower end of the needle tip, remove the carbon deposits, otherwise continuing to spot weld will cause even more intense fire. Be careful not to file the tip flat;
2. Adjust the height of the two soldering needle tips to the same horizontal plane;
3. On the premise of ensuring welding firmness, slightly reduce the welding current (WI).