Operation Manual

Model: MSK-115A-MS

CONTENTS

1. Product Overview

MSK-115A-MS multifunctional vacuum sealing machine for flexible packaging (medium and small specifications) lithium battery top side sealing, liquid injection after the vacuum degassing, hot pressure sealing, the machine through precise control of the main vacuum box and pneumatic heat sealing components, automatic completion of the battery aluminum-plastic shell of the sealing, vacuum static, vacuum sealing and other actions.

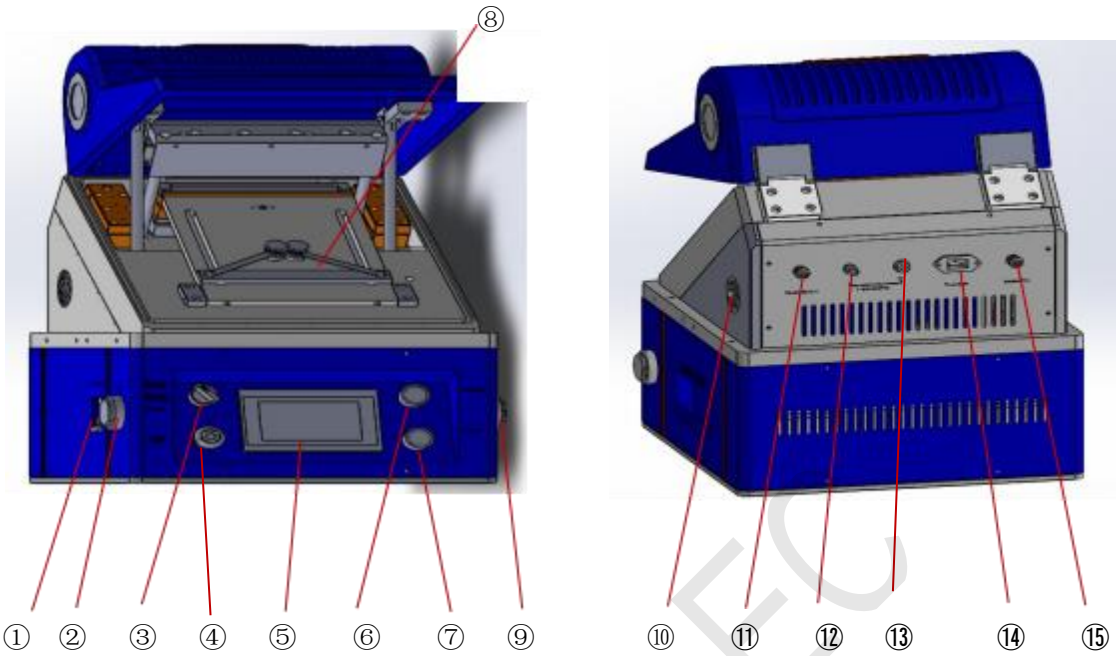
2. product features

- Equipment installation and commissioning is convenient, safe and stable operation of the machine, reliable control, easy to operate.
- Small size, easy to place in an ordinary glove box operation.
- Electronic control and structure standard modular design, convenient maintenance.
- Accurate precision of working part, good sealing effect.
- Firm sealing edge, beautiful package appearance, good tensile consistency.
- Simple operation, safe and reliable.

3. Technical Parameters

- **Operating voltage:** AC110V/60HZ or AC220V/50Hz (±10%)
- **Max power:** 800W
- **Head temperature:** 200℃ recommended for the upper head and 180℃ recommended for the lower head (temperature adjustable up to 250℃)
- **Temperature control accuracy:** ±2℃
- **Heat seal pressure:** 0~1000N (adjustable)
- **Parallel clearance when the upper and lower heads are engaged:** ≤ 0.03mm
- **Air consumption:** about 5L compressed gas/once per seal
- **Edge width:** 4mm (can be customized)
- **Edge length:** ≤190mm
- **Heat sealing time:** 0~90S (adjustable) 5~6S recommended
- **Vacuum degree:** -95Kpa~0 (adjustable)
- **Air pressure working speed:** ≥180 times/hour
- **Battery size:** ≤ L160*W180*H12mm
- **Dimensions:** L455*W390*H600mm (maximum height of open cover)
- **Equipment weight:** about 55Kg

4. Equipment component



① Circuit breaker

② ⑨ Dual start switch

③ Three-speed switch

④ Scram switch

⑤ Integrated touch screen

⑥Heating switch

⑦ Power switch

⑧ Battery locating plate

⑩ Heat dissipation hole

⑪ Vacuum drain connection

⑫ Pneumatic components use air source intakes

⑬ Air vents for pneumatic components

⑭ Power plug

⑮ Vacuum interface

5. Touch Screen Operation Instructions

5.1 Boot screen

To display the program version and device model, click 'Chinese' to enter the Chinese interface, and click 'English 'to enter the English interface.

5.2 Master screen

- **Current vacuum value:** Display the current vacuum value;
- **Upper/lower head temperature:** Displays the current value of the upper/lower head temperature.
- **Function switch status:** Displays the current status of the function switch. The switch arrow points to the current function status.
- **Pre-seal/final seal status:** The working step status is displayed. The right side is the remaining time of the corresponding working step (for example, when the pressure holding operation is displayed, the right side is the remaining time of the pressure holding).
- **Vacuum standing state:** Display the working step status, the right side is the remaining time of the corresponding working step (for example, when the pressure holding operation is displayed, the right side is the remaining time of the pressure holding), the upper right corner is the number of remaining cycles;
- **Reset:** used for cavity vacuum reset, cylinder reset;
- **Alarm clearing:** clear the current alarm information;
- **Soft bag sealing/solid state sealing:** switch between soft bag sealing process and solid state sealing process. When switching to the pre-seal/final seal state, the switch button for soft bag/solid state sealing will be displayed.

5.3 Manual control

- **Cover closing cylinder:** manually control the cover opening switch (the cover needs to be long pressed for more than 1S, and the cover opening is single point);
- **Sealing cylinder:** manually control the sealing switch;
- **Vacuum:** manually control the vacuum switch;
- **Inflation:** manually control the inflation switch;

5.4 Parameter setting

- **Sealing time:** top/side sealing time set value (0~90S), it is recommended to set 5~6s;

- **Upper sealing temperature:** upper sealing temperature setting (0~250 degrees);
- **Lower sealing temperature:** lower head sealing temperature setting (0~250 degrees);
- **Static vacuum:** static vacuum pressure setting value (-95~0Kpa) in vacuum static mode;
- **Standing time:** setting value of standing time (0~900S);
- **Cycle number:** set value of static cycle number (1~90 times);
- **Closing time:** cap closing time set value (0~90S);
- **Temperature shielding:** shielding the head temperature, can automatically run debugging action when the temperature does not reach;
- **Vacuum shield:** shield vacuum, can automatically run debugging action in the absence of vacuum;
- **System setting:** Enter the system setting interface, you need to enter the password 1111 to enter the interface;
- **Next:** Enter the sealing process parameters interface;

Solid state sealing parameter

- **First stage pressure:** vacuum pressure setting value (-95~0Kpa) in the first stage of solid state sealing process under pre-/ final sealing mode;

- **Pressure of the second stage:** the inflation pressure of the second stage of the solid-state sealing process in the pre-/ final sealing mode is set (0~0.8Kpa), and this stage is used in the glove box under positive pressure;
- **Number of cycles:** Set the number of cycles between the first stage and the second stage pressure (0~90 times);
- **Sealing vacuum:** setting value of sealing vacuum pressure in solid state sealing mode (-95~0Kpa);
- **Pressure holding time:** solid state sealing vacuum pressure holding time set value (0~900S);
- **Sealing time:** solid state sealing time setting value (0~90S), it is recommended to set 5~6s;

Soft packet sealing parameters

- **Sealing vacuum:** pre-seal/final seal mode sealing vacuum pressure setting value (-95~0Kpa);
- **Pressure holding time:** soft bag sealing vacuum pressure holding time set value (0~900S);
- **Sealing time:** soft bag sealing time set value (0~90S), it is recommended to set 5~6s;
- **Previous page:** Return to the previous page parameter Settings;

5.5 System setting

- **Upper head temperature correction:** When the temperature of the upper head deviates from the temperature measured by the temperature controller, the deviation temperature can be corrected. For example, after heating to the set temperature, the temperature displayed on the screen is less than 5℃ of the temperature controller. After the temperature correction input is -5℃, the displayed temperature will be less than 5℃, and the temperature will start to heat to the set temperature (-30℃ ~30℃).
- **Lower head temperature correction:** When there is a deviation between the lower head temperature and the temperature measured by the temperature controller, the deviation temperature can be corrected. For example, after heating to the set temperature, the temperature displayed on the screen is less than 5℃ of the temperature controller temperature, and after the temperature correction input is -5 ℃, the displayed temperature will be less than 5 ℃, and the temperature will start to heat to the set temperature (-30℃ ~30℃).
- **Restore factory Settings:** restore factory parameter Settings button;
- **Language selection:** Click 'Chinese' to enter the Chinese interface, click 'English' to enter the English interface;

5.6 Alarm message

When the equipment is abnormal, the alarm information will be displayed in the alarm information screen, according to the alarm information for alarm processing;

Alarm 1. vacuum abnormal.

Cause: When the vacuum is opened during automatic operation, the set vacuum value is not reached within a certain period of time.

Solution: Check whether the vacuum pump is abnormal, whether the vacuum pipeline is leaking, and whether the vacuum fluid valve is damaged.

Alarm 2. Abnormal inflation.

Cause: When the inflation is opened during automatic operation, the normal pressure state alarm is not reached within a certain period of time.

Solution: Check whether the charging fluid valve is damaged, check whether the vacuum gauge can be lower than -7Kpa close to normal pressure.

Alarm 2. Reset timeout.

Cause: Each cylinder/vacuum/inflation solenoid valve is not reset within a certain period of time to complete the alarm.

Solution: Check whether the vacuum/charging fluid valve is damaged, check whether the air pressure is abnormal, check whether the vacuum gauge can be lower than -7Kpa close to normal pressure.

Alarm 3, the temperature has not arrived.

Cause: An alarm will be generated when the temperature is not reached when the automatic operation is started in sealed mode.

Solution: Check whether the heating is on and whether the heating system is abnormal.

Alarm 4. The upper/lower head temperature controller module is abnormal.

Cause: When the PLC and the temperature controller can not communicate, it will alarm.

Solution: Check whether the communication line between the temperature controller and PLC is abnormal, and whether the communication parameters of the temperature controller are modified.

Alarm 5, upper/lower head overtemperature alarm.

Cause: It will alarm when the displayed temperature is higher than 255 ° C.

Solution: Check whether the heating system is abnormal, check whether the heating solid state relay is abnormal.

6. The device has not been reset.

Cause: When the device is not restored to the initial state, the automatic operation will alarm.

Solution: Click Reset button to start automatic operation after the reset is complete.

Alarm 7. Emergency stop is pressed.

Cause: Emergency stop press.

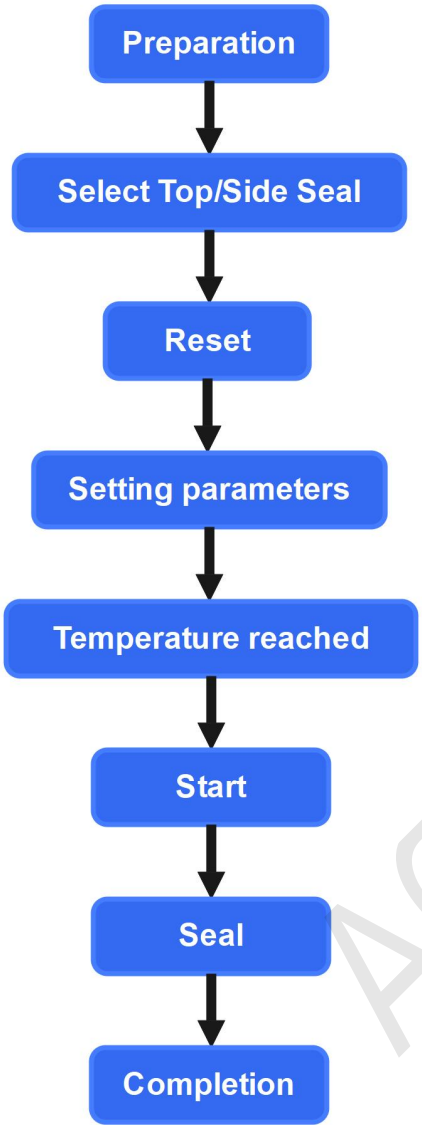
Solution: Restore the emergency stop button and then clear the alarm.

5.7 I/O Monitoring

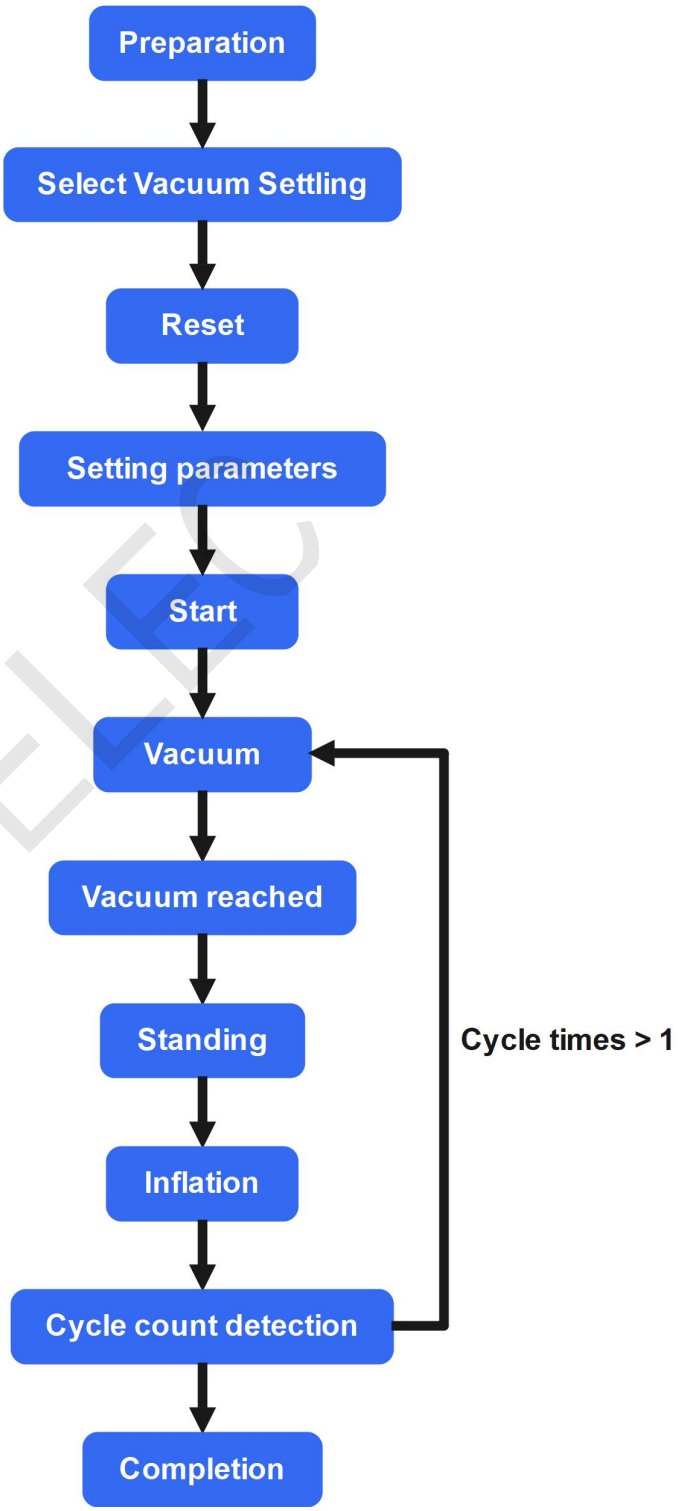
Display PLC input/output point definition, easy to find faults;

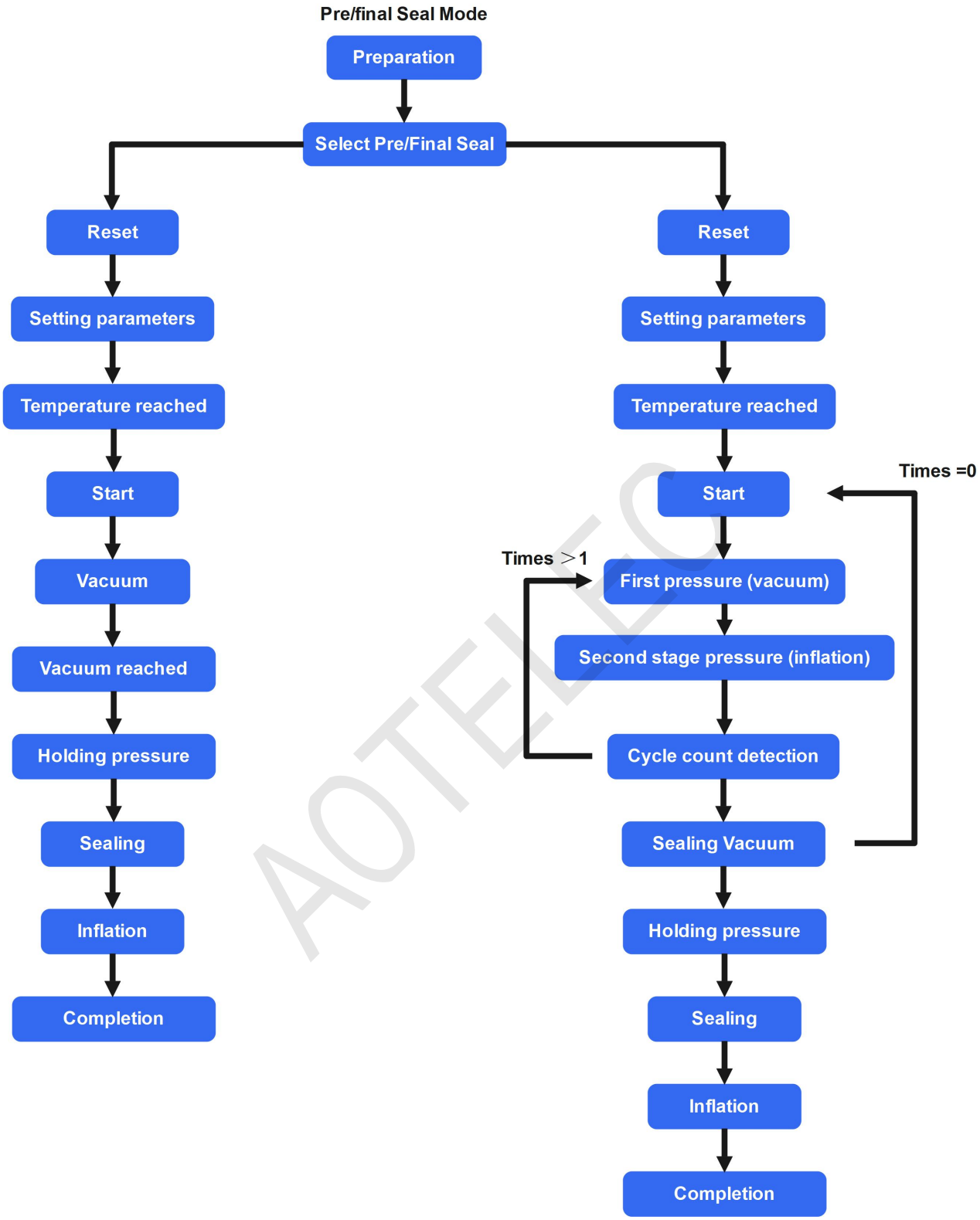
6. Operation process

Top side sealing mode



Vacuum Standing Mode



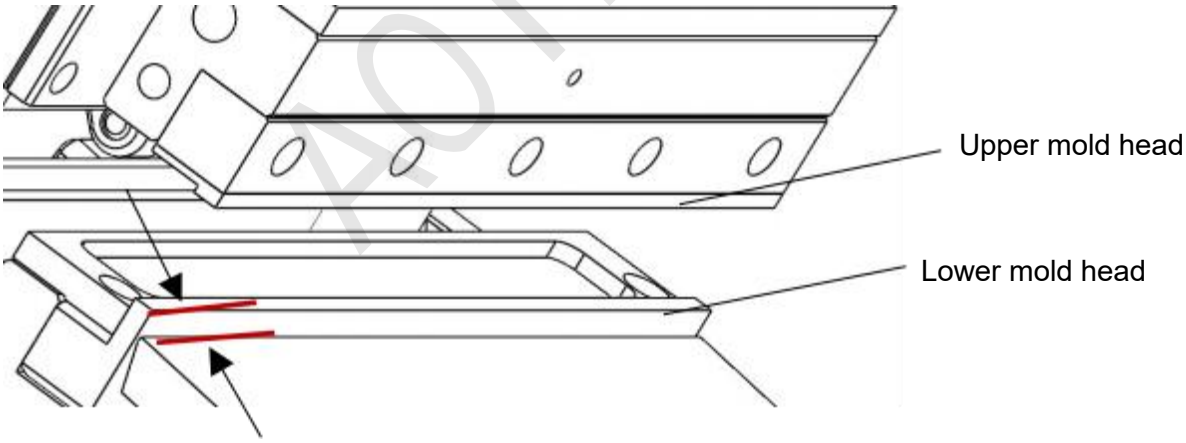

Pre/final Seal Mode
Preparation
Select Pre/Final Seal
Reset
Setting parameters
Temperature reached
Start
Vacuum
Vacuum reached
Holding pressure
Sealing
Inflation
Completion
Reset
Setting parameters
Temperature reached
Start
Times =0
Times ＞1
First pressure (vacuum)
Second stage pressure (inflation)
Cycle count detection
Sealing Vacuum
Holding pressure
Sealing
Inflation
Completion

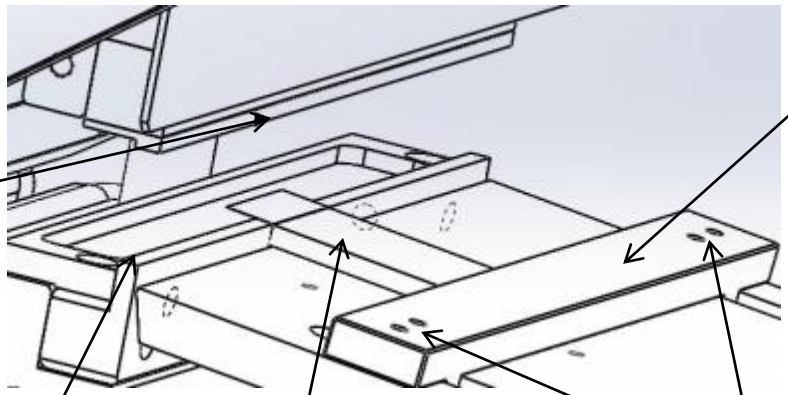
7. Precautions for equipment installation and commissioning

- When the machine is installed, the level of the machine should be adjusted.
- Adjust the cylinder speed so that the product will not be damaged.
- Adjust the cylinder pressure to the desired heat seal pressure.
- Set the heat sealing time; Set the heat seal temperature.
- Adjust and secure the battery positioning bar before placing it in the battery for heat sealing.
- It is recommended to wear gloves for heat sealing and machine maintenance.
- The machine must be well grounded.

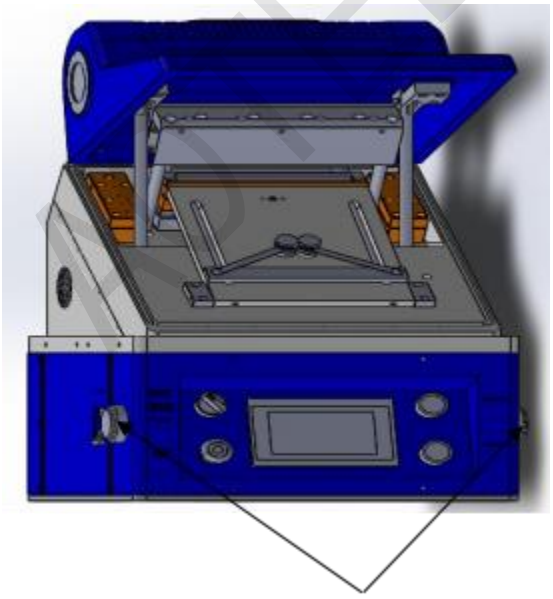
8. Location diagram for battery sealing

Cutaway view of the location of the package port:





Start packaging (upper die, lower die temperature does not reach the set temperature of the equipment is not working, before the factory, the upper die temperature is set at 200℃, the lower die is 180℃.



4. Press the run buttons on both sides at the same time for 1 second

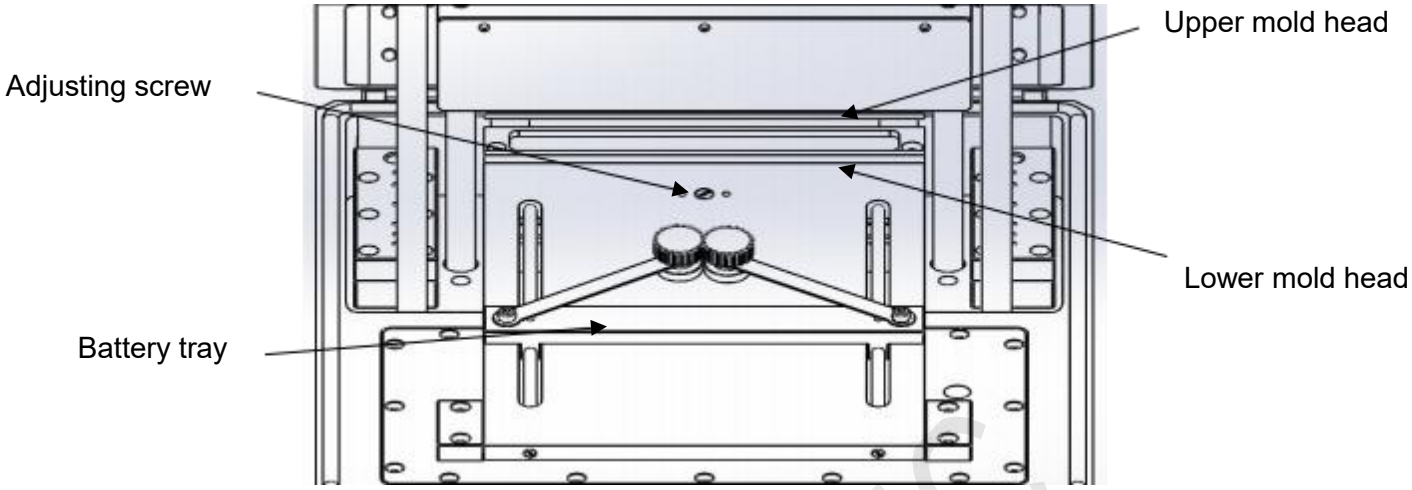
9. Procedure and precautions

- Connect the gas pipe and the vacuum part, turn on the power supply, and debug the equipment. (Adjust the air pressure, set the packaging temperature, packaging time, vacuum degree, and adjust the appropriate height of the battery.)
- After the debugging is completed, put the battery into the vacuum chamber of the packaging part correctly, and press the start button on both sides of the working part with both hands at the same time. The machine will automatically complete a series of processes of battery packaging.
- After the completion of the process, it automatically returns to the standby state, and the next battery can be packaged.

Note:

- No one can operate the machine at the same time. Users must pay attention to safety.
- Do not place hands or other objects between the upper chamber and the bottom plate during operation to prevent injury.
- Prevent excessive heating.
- Do not press the display with sharp objects.
- Any time you press the emergency stop button, the machine will revert from any state to the start state.
- During the maintenance process, non-relevant technical personnel are strictly prohibited from opening the electrical box of the machine, and the air pressure must be adjusted to as small as possible but still able to move, so as not to cause accidents.

10. Method for adjusting the height of the battery tray



To adjust the height of the battery tray based on the thickness of the battery, move the battery tray down with one hand, and use a screwdriver with the other hand to adjust the adjustment screw to the appropriate position.

11. Maintenance of equipment

- The inside and shell of the device should be clean and free of dust.
- Check whether the screws are loose at least once every half month.
- The heat seal should be checked once a week for wear.
- Add a little lubricating oil to the guide post and guide bush every week.
- Prevent other foreign bodies from entering between the upper and lower hot heads for hot pressing.
- The machine should be placed in a clean and dry environment without dust and debris.
- Correctly check the pressure gauge, power supply voltage, air pressure, pressure control solenoid valve, etc., regularly check the equipment power supply, gas source, vacuum pump and time relay parameters, and carry out necessary maintenance.

- Clean the electrolyte contaminated during packaging in the work department in time to avoid corrosion of the head.
- Power and air supply should be turned off when the equipment is not in use.