

W473N
TWXBCB176
High Thermal
Soldering Machine

Instruction Manual

Thank you very much for purchasing our product.

This operation manual describes the features and operation of the machine.

Before using, read the manual thoroughly for proper use of the unit. Store the manual in a safe easily accessible place for future reference.

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1 General Notes

1.1 Safety Labels



Caution Electric Shock! Protect yourself against electric shock.
Do not plug or unplug cables when the machine is powered.



Keep hand away from moving parts to avoid injury!



Crush hazard keep hands clear. Lockout / tag out before maintenance.



Mind your head!



High temperature!



Shut off power and air supply at the source before performing maintenance. Failure to observe this can lead to electric shock and other accidents.



Caution, Rolling! Keep hands away!

NOTE:

1. Use original spare parts from us to replace defective ones.
2. If the problem occurs on any designated purchasing components, clients can also source the same models from their own purchasing channels.
3. Please feel free to contact us if there's any problem during the maintenance.
4. Do not plug or unplug cables when the machine is powered.

1.2 General Safety Information

1. Machine must be used or stored in an applicable environment:
Operating ambient temperature is 0~40°C, relative humidity is 20%~90%(No condensation).
2. Follow the steps and drawings to maintenance.
3. Wear safety work cloth and laser glasses.

1.3 Safety Introductions-Electrical Components

1. Maintenance may only be performed by a certified electrician, or by persons who have been instructed in electrical engineering under the direction and supervision of a certified electrician in accordance with standard electrical engineering practice.
2. On machines with fixed connection, turn off power switch.
Note: The power disconnecting device (power switch) itself is then still under voltage (live)! Wait for 120s to maintenance!
3. Disconnect the machine from the power supply before performing maintenance on any electrical or opening the switch cabinet.
4. Disconnect main power plug. Machine is safely isolated from the power supply.
5. Check safe isolation from the power supply with suitable measuring instruments (2-pole voltage tester). Only perform maintenance work on the system or machine that is safely isolated from power supply!
6. Maintenance work must be performed in accordance with related drawings.

1.3.1 Check Safety Devices

Safety devices may only be disabled by technical persons if absolutely necessary as part of the maintenance work. Safety components such as limit sensors, safety door and emergency stop button must be enabled immediately after maintenance. Check if all safety devices are fully functioned before starting again.

1.3.2 Securing Power Switch OFF

Secure the power disconnecting power switch with a lock to prevent it being switched on again. If the power switch needs to be switched on for certain repair jobs, particular care must be taken to ensure that persons cannot be harmed.

NOTE: The power switch must be secured to prevent it being switched on during interruptions in repair work.

1.3.3 Measurements at Live Components

Seek the assistance of a second person if it is necessary to perform measurements on live components. In the case of emergency, the second person can have the ability to lock the switch in the OFF position and disconnect the power plug.

1.3.4 Switch Cabinet

- No fire can occur in the switch cabinet under normal operating conditions.
- Fan is used to extract generated heat and enhance air circulation.
- Immediately replace fan if damaged. Pay attention to the air throughput of the fans. The air throughput must be great in order to dissipate the heat.
- Filter pad must be clean.
- In the case of fire, do not use extinguish with water. Use a carbon dioxide dry powder fire extinguisher in the case of fire!

1.3.5 Electrical Current

- Defective electrical components may be live (under voltage), danger of death on contact with them.
- Molten particles can spray out in the event of short-circuits, risk of burn injuries.
- Defects which found on the electrical components and machine must be changed immediately.
- Check that all electrical connections are made and secure before starting up this machine.

1.3.6 Emergency Stop Button

Activating the E-Stop button immediately stops the movement of all mechanical parts (include electrical and pneumatic supply) of the machine. After resolving the error, the E-Stop button must be counter clockwise pulled out as acknowledgement. Thereafter the error can be acknowledged on the touch screen.

1.4 Pneumatic

- Maintenance on pneumatic parts may only be performed by persons with special knowledge, and experience with pneumatic machine!
- Disconnect the air source before performing any maintenance. Compressed air tube must be depressurized before disconnecting!
- Set the appropriate using pressure, recommended below 0.7Mpa.

1.5 Residual Safety Check

1.5.1 Cleaning

- Hydrocarbons dissociate causing an explosion if contacting Zinc element. In this machine, Zinc plate is used.

-
- Only use solvents or cleaning agent without hydrocarbons! Before you use a solvent or cleaning agent, check its ingredients!

1.5.2 Safety at the Workplace

- Ensure adequate ventilation of the workplace to protect operator from dangerous fumes and vapors.
- Do not eat and drink at the workplace, keep soldering process away from food-stuff, beverages and feedstuff. The possibility of smoke in the soldering process may be contaminated food and drink.
- Keep workplace clean and tidy is the prerequisite for ensuring soldering.
- Keep safety datasheets for soldering maintenances clearly visible and accessible at the workplace.

1.5.3 Personal Protection

Avoid skin contact or any other body contact to soldering components. This requirement applies both during processing and as well as storage.

2 Technical Data

2.1 Parameter

| Module | Technical indicators | Parameter |
|-------------------|---|---|
| Soldering machine | Input voltage | 220V AC,50/60HZ |
| | Power Consumption | 2200W |
| | Dimension (mm) | 8300(W)×900(D)×1620(H) |
| | Soldering Module Stroke (mm) | X:400 ; Y:320; Z:30 |
| | Soldering Module Speed Range (mm/sec) | X/Y Axis: 0.1~400 |
| | | Z Axis: 0.1~100 |
| | Soldering Module Repeatability (mm) | X/Y/ Z axis: ±0.02 |
| | Programming approach | Offline programming: Supports CAD import + USB flash drive data import. |
| | PCB board length (mm) | 320(Max) |
| | PCB board width (mm) | 250(Max) |
| | The height of the components under the PCB board (mm) | 30(Max) |
| Weight(Kg) | 240 | |
| Flux Module | Spray control method | Micro dot spraying (dot spraying/line spraying) |
| | Spray width (mm) | 2-8 |
| | Flux barrel capacity(L) | 1 |
| | Nozzle diameter (mm) | 3-8 |
| | Spray pressure (bar) | 0.5-1 |
| | Liquid level monitoring | Low liquid level automatic alarm |
| | Spray valve protection | Protective cover plate + cylinder |

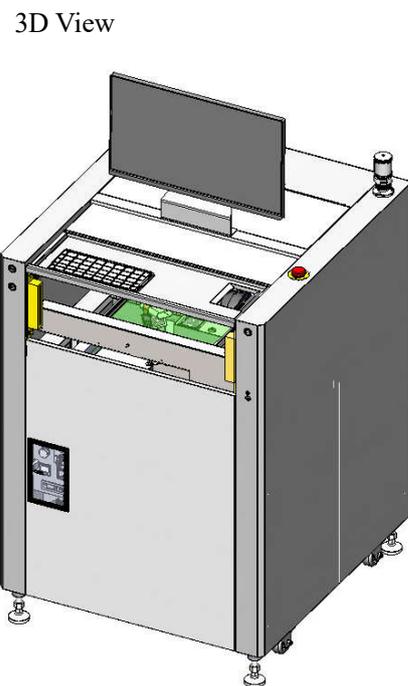
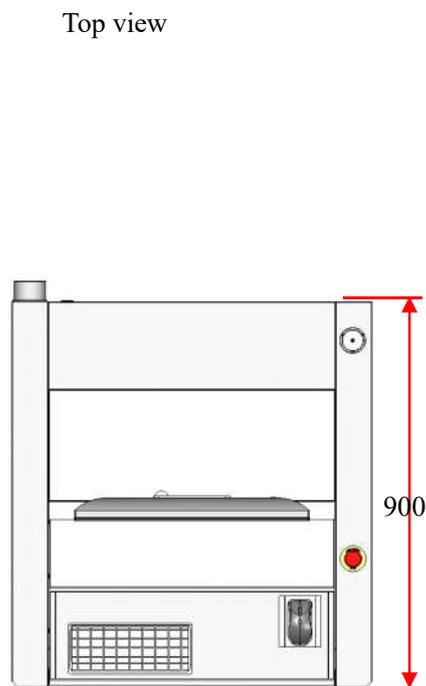
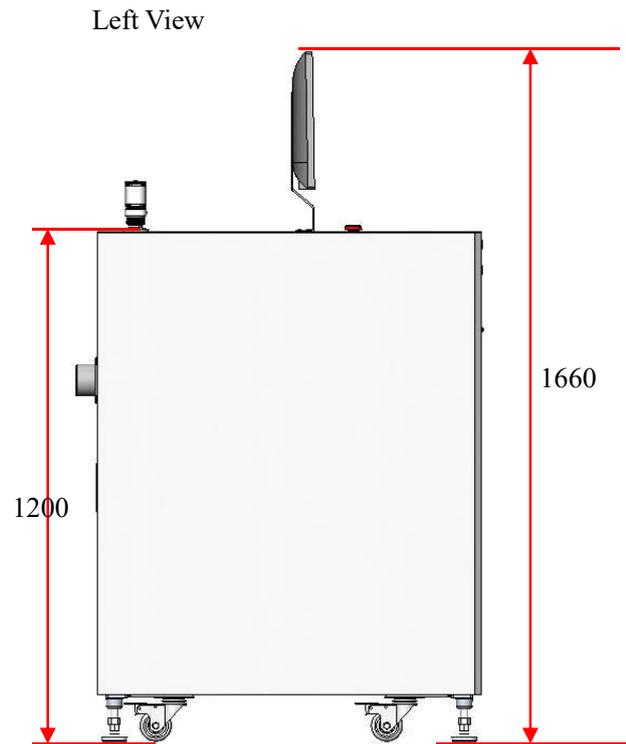
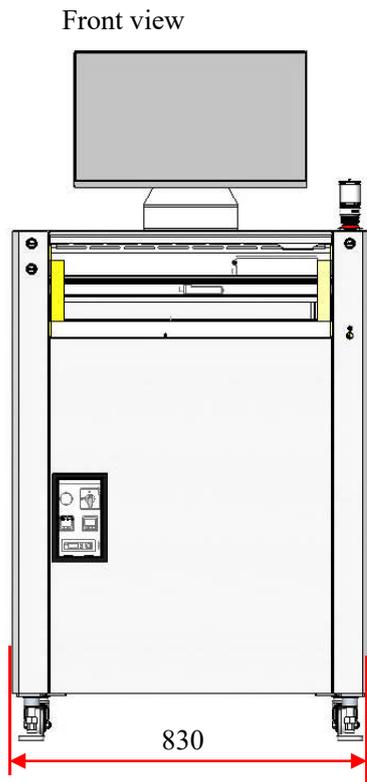
| Module | Technical indicators | Parameter |
|--------|----------------------|-----------|
| | Flux type | RO,RE,OR |

Remark: Ensure that your power supply data agrees with the information on the nameplate of the machine.

➤ Soldering Module Specification Sheet

| Module | W473N |
|---|-------------------------------------|
| Peak height (mm) | 0-5 |
| Tin wave drive type | Electromagnetic pump drive |
| Heating power of the tin cylinder (W) | 1400 |
| Power of tin cylinder frequency converter (W) | 600 |
| Tin cylinder capacity (Kg) | 13 |
| Temperature control accuracy of the tin cylinder (°C) | ± 1 °C/PID control |
| Tin cylinder temperature (°C) | ≅ 350 |
| Peak calibration method | Automatic |
| Temperature calibration form | Manual |
| Liquid level monitoring | Liquid level monitoring |
| Nozzle size range (MM) | Inner diameter φ3-φ8 (customizable) |
| Requirements for nitrogen purity | 99.999% |
| Nitrogen usage (m ³ /h) | 2-3 |

2.2 Dimension



Unit: mm

3 Transport, Installation, Storage, Disposal

3.1 Transport

When lifting, transporting the machine, personnel should observe the following precautions:

- Transport work only be performed by properly trained and qualified personnel!
- Use proper lifting and transporting equipment which is suitable for the load!
- Do not stand or walk below suspended loads!
- Lift the machine always in the center of gravity.
- Transport must be in an upright position.

3.1.1 Unloading with a Forklift

The forklift must meet the minimum crate weight requirements.

To unload with a forklift:

- 1) Determine the center of gravity and suitable points of the crate for transport by way of trial.
- 2) Use the right lifting points to raise the machine.
- 3) Place machine on a flat.
- 4) Remove the forklift.

3.1.2 Unloading with a Crane

The crane must meet the minimum crate weight requirements.

To unload with a crane:

- 1) Load always to be lifted at the marked symbol of chain points, if there is no symbol, user determine the center of machine gravity.
- 2) Place machine on a flat.
- 3) Remove the ropes, chains and lifting device.

3.2 Installation

Machines can be packed in the crates before delivery. Check it carefully, if you have any problem, just tell us, we'll see if we can oblige.

3.2.1 Uncrating the Machine

To uncrate the machine:

- 1) Remove the steel bands.
- 2) Remove all 5 sides woods with suitable tools, and the woods have been screwed to the pallet before delivery.
- 3) Remove the films covered the machine.

-
- 4) Remove the four machine - to -crate shipping brackets attached to the pallet.

3.2.2 Placing the Machine

When placing the machine, personnel should observe the following precautions.

- Operation only be performed by proper trained and qualified personnel!
- Lift the machine from the front only, other sides may cause serious damage.
- Do not close to flammable or explosive items.
- Keep the machines away from thermal sources.

To place the machine:

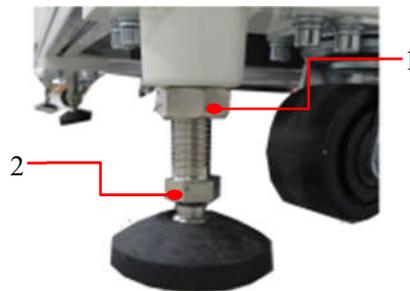
- 1) Use a forklift to gently lift the machine off the pallet.
 - Dispose the pallet according to local regulations.
- 2) Move the machine to the location where it will be installed.
- 3) Slowly lower the forklift until the machine rail is at the approximate height of the matched upstream machine.
- 4) Clean up space around the machine, and keep enough space (with open doors, a 1 meter passageway is required) for operation and maintenance.

3.2.3 Adjusting the Feet

Raise or lower each foot as follows until machine is level

To adjust the feet:

- 1) Loose the lock nut.
- 2) Adjust the bottom nut to raise or lower foot as required.
 - Turning the bottom nut clockwise raises the foot height.
 - Turning the bottom nut counterclockwise lowers the foot height.
- 3) Tighten the lock nut.



Machine feet parts name list:

| Item | Part Name | Item | Part Name |
|------|-----------|------|------------|
| 1 | Lock nut | 2 | Bottom nut |

3.2.4 Unpacking the Box

All packaging materials are put into the box, user can check them according to packaging list.

To unpack the box:

- 1) Open the front maintenance door or rear cabinet door.
- 2) Take out the box.
- 3) Remove the packaging tap from box.
- 4) Check the parts from packing list.

3.2.5 Connecting the Power and Air Supply

Caution about connecting the power & air supply:

- Operation only performed by proper trained and qualified personnel!
- Consult the electrical drawings carefully.
- Make sure the voltage and pressure supply information agrees with the nameplate.

To connect power supply:

- 1) Open the cabinet switch door.
- 2) Check and make sure the leakage protector is in the OFF.
- 3) Connect the male power cable to power supply device.

To connect air supply:

Air inlet port of soldering station is located in the front panel of the machine, and the air inlet port manual station is located in the rear panel of the machine.

- 1) Check and make sure the handle valve is in the OFF.
- 2) Connect the air supply of factory into inlet port of oil water separator.

3.3 Storage

1. Protect the machine from the weather (moisture, humidity, sea air, fog). If necessary, provide the machine with dehumidifier and air-tight packaging.
2. Storage conditions
 - Allowed storage temperature: 0~40°C
 - Allowed relative humidity in storage: 20%~90% (No condensation)

3.4 Disposal

1. Disposal packaging materials in a safe and environmentally friendly manner.
2. Soldering material is a kind of hazardous waste. It is strictly prohibited to discharge it together with

domestic waste.

3. Processing materials and replaced parts shall be disposed in a safe and environmentally friendly manner.
4. Waste shall be classified and disposed according to relevant environmental laws and regulations.

4 Commissioning

4.1 Initial Debugging

4.1.2 Pneumatic Connection

Observe the following points for pneumatic connection.

- 1) Before connecting the compressed air, switch off the supply to the system.
- 2) After connection, slowly and carefully turn on the compressed air supply while listening for noise of escaping air.
- 3) Required compressed air pressure is 0.4-0.6 MPa.

4.1.3 Fume Extractor Connection

The fume extractor is installed in our site, and it is located behind switch cabinet of machine. Plug the following power inlet module to sockets.

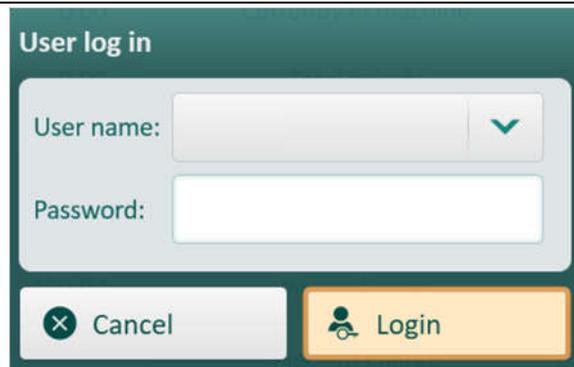
4.1.4 Checking after Connection

- 1) Make sure that the machine is connected to the required power supply and compressed air supply.
- 2) Transform the electrical current corresponding to system and machine requirements.
- 3) Operate the system only with a suitable transformer. Incorrect voltage and power rating can cause damage.
- 4) Check that all safety devices (safety door, e-stop button, light house) have been installed correctly and are fully functional.
- 5) Use your hands to feel if there is cool air coming from cooling fan.

4.2 User setting

4.3.1 Login

- 1) Double-click  to open the software and enter the main interface of the software.
- 2) Click on the drop-down list of "Login", select "Login", and a login dialog box will pop up. Enter the super administrator [username] and [password] to log in to the system

A screenshot of a "User log in" dialog box. The dialog has a dark teal header with the text "User log in" in white. Below the header, there are two input fields: "User name:" followed by a white text box with a small teal dropdown arrow on the right, and "Password:" followed by a white text box. At the bottom of the dialog, there are two buttons: a grey "Cancel" button with a teal 'X' icon on the left, and an orange "Login" button with a teal person icon on the left.

- 3) Click on the "General Settings" in the main menu on the right to enter the user management interface, where you can create, delete users and edit user information. After checking "Enable User Management", you can manage users and permissions.
- 4) Click the "Add" button to create a new user.
 - ⊙ Enter the username and click [Change Password] to set the password (the username and password must not be empty).
 - ⊙ Check the option to configure user permissions on the interface. The permissions corresponding to each option can be found in the permission list.
 - ⊙ Set whether to allow barcode login. When barcode login is allowed, the barcode value needs to be entered.
 - ⊙ You can set how long it takes for the currently editing user to log out after a long period of inactivity or after switching to another application.
 - ⊙ After checking the box, when logging out automatically, you can switch to another user for login.

4.3.2 Password reset

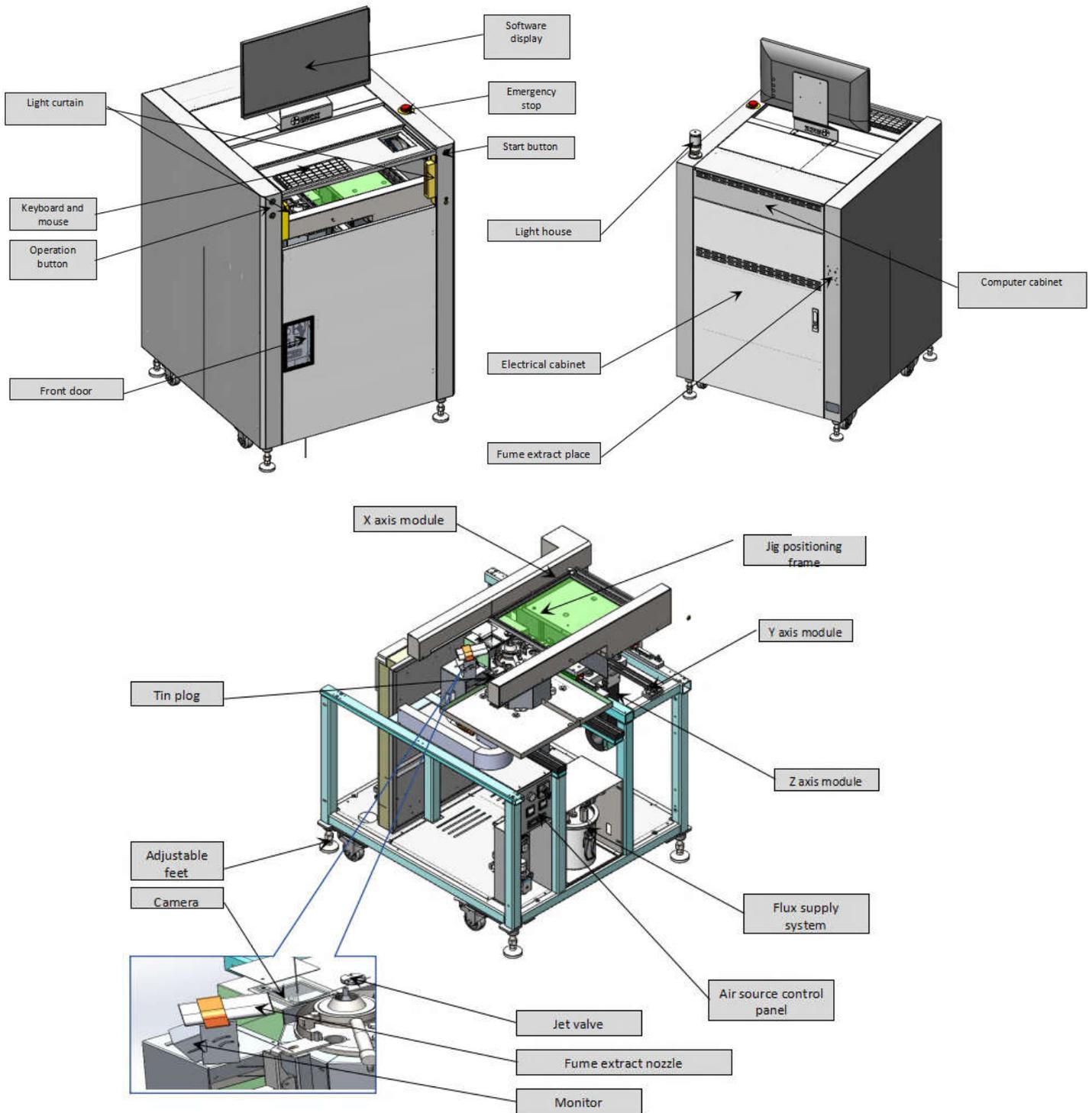
Passwords can be a combination of numbers and upper and lower case English letters or used separately, and the maximum number of characters a password can support is 11.

Password setting steps

- 1) Click the drop-down list of "Login", and select "Change Password".
- 2) Enter the old password correctly;
- 3) Enter a new password in the new password area; Click "Edit". Log in again after the modification is completed.

5 Function Introductions

5.1 Components Introduction



5.1.1 Operation Button

Soldering machine operation button

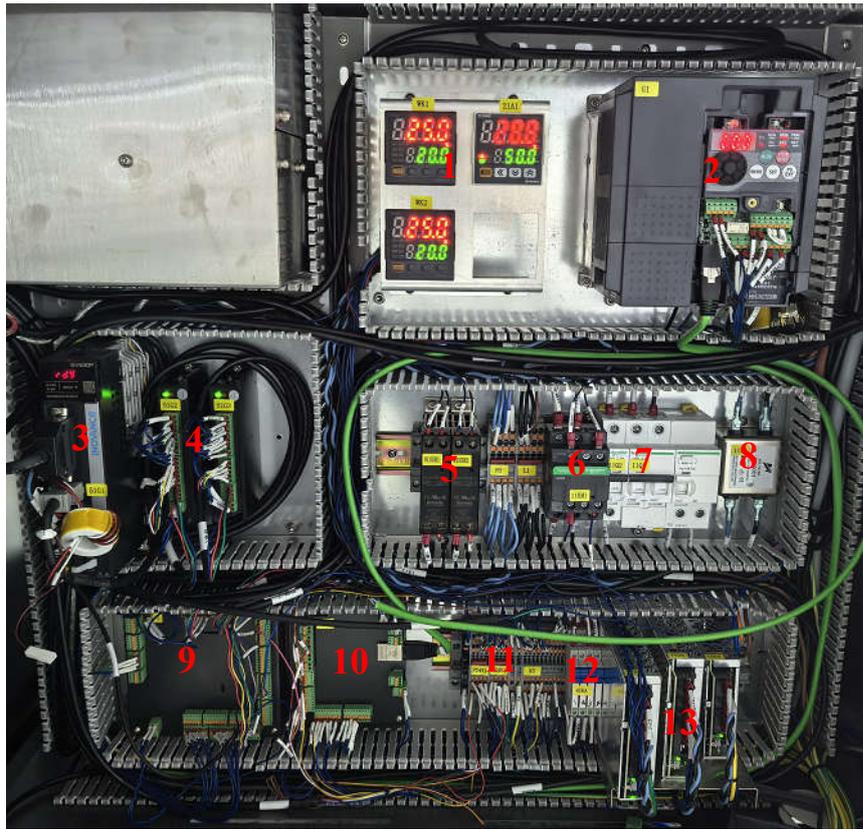
| Button | Function |
|---|--|
|  | In an emergency, activating the button immediately stops the movement of all mechanical parts of the machine but the pneumatic system still activate. After resolving the error, the emergency stop button must be pulled clockwise out as acknowledgement. |
|  | It can only be activated in manual mode. Press and hold it 3s to move all movements to the default home position. “Orange Light flashing” indicates the machine is resetting, and the “light” indicates the machine has reset. |
|  | Press this button when the device reset is complete and in automatic mode, and the device will start to automatically reset Run, then press again to pause the operation. When the device is in a paused state, the duration is long Press 1 second to release the pause and resume operation. |



NOTE: Follow the procedure to restart the processing after pausing process.

- 1) Check and confirm alarm.
- 2) Press RESET key to move the machine to home position.
- 3) Press START key to re-activate the process.

5.1.2 Cabinet Switch



Cabinet switch parts name list:

| Item | Part Name | Item | Part Name |
|------|---------------------|------|---------------------------|
| 1 | Leakage protector | 8 | Power filter |
| 2 | Frequency converter | 9 | 9075L board |
| 3 | Servo motor driver | 10 | Main motion control board |
| 4 | Stepper driver | 11 | Terminal block |
| 5 | Solid power relay | 12 | Power relay |
| 6 | AC Contractor | 13 | 48V&24V&12V Power supply |
| 7 | Leakage protector | | |

5.2 I/O Functions

5.2.1 Main Board Definition

| Board Port | Port | Function |
|----------------------|------|---------------------|
| Expansion Input Port | EIN1 | Upper light curtain |

| Board Port | Port | Function |
|------------|-----------------------|---------------------------------------|
| | EIN2 | Front light curtain |
| | EIN3 | Reserved |
| | EIN4 | Reserved |
| | EIN5 | Peak detection sensor |
| | EIN6 | Reserved |
| | EIN7 | Reserved |
| | EIN8 | Reserved |
| | EIN9 | Inverter alarm |
| | EIN10 | Inverter in operation |
| | EIN11 | Heating contactor on/off signal |
| | EIN12 | Reserved |
| | EIN13 | Tin pot liquid level detection sensor |
| | EIN14 | Nitrogen Flow Rate |
| | EIN15 | Flux barrel nitrogen pressure |
| | EIN16 | Flux level detection |
| | Expansion Output Port | EOUT1 |
| EOUT2 | | Reserved |
| EOUT3 | | Light |
| EOUT4 | | Injection valve cylinder |
| EOUT5 | | Lighting cylinder |
| EOUT6 | | Reserved |
| EOUT7 | | Reserved |
| EOUT8 | | Reserved |
| EOUT9 | | Inverter startup |

| Board Port | Port | Function |
|----------------------------|-------------|--|
| | EOUT10 | Inverter alarm cleared |
| | EOUT11 | Power on the temperature control contactor |
| | EOUT12 | Tin pot nitrogen solenoid valve |
| | EOUT13 | Reserved |
| | EOUT14 | Reserved |
| | EOUT15 | Start button indicator light |
| | EOUT16 | Reset button indicator light |
| Main Input Port | MIN1 | Reset signal |
| | MIN2 | Emergency stop signal |
| | MIN3 | Safety door |
| | MIN4 | Start signal |
| Main Output Port | MOUT1 | Reserved |
| | MOUT2 | Reserved |
| | MOUT 3 | Reserved |
| | MOUT 4 | Reserved |
| | MOUT 5 | Reserved |
| Drive output | X | Reserved |
| | Y | Reserved |
| | Z | Reserved |
| | RD | Reserved |
| | RP | Reserved |
| Photoelectric switch input | X- | X-axis negative limit sensor |
| | X+ | X-axis positive limit sensor |
| | Y- | Y-axis negative limit sensor |

| Board Port | Port | Function |
|--------------------|-------------|------------------------------|
| | Y+ | Y-axis positive limit sensor |
| | Z- | Z-axis negative limit sensor |
| | Z+ | Z-axis positive limit sensor |
| | R- | Reserved |
| | R+ | Reserved |
| Sensor | K1 | Reserved |
| | K2 | Reserved |
| | K3 | Reserved |
| | K4 | Reserved |
| Communication mode | 485 | RS485 |
| | 232 | RS232 |
| | 422 | RS422 |

6 Troubleshooting

6.1 Overview

If you have difficulty operating machine, use this section to identify a possible solution to the problem. If you have difficulties not listed in this section, or the suggested solution does not correct the problem, contact us for supporting.

6.2 Record Keeping

The type of procedure performed should be recorded in a maintenance record. Dates, picture of replaced parts, changing times and other pertinent information should be recorded.

6.3 Basic Troubleshooting

6.3.1 Machine Power

| Malfunction Type | Possible Cause | Correction |
|---------------------------|--|---|
| Machine does not power on | The power switch button is not in “I”. | Press the power switch to “I” on the front panel, the white light will illuminate. |
| | The circuit breaker is “OFF”. | Turn on |
| | Power supply cable is disconnected | Connect the power supply cable to an AC source. |
| | E-stop button has been activated. | ① Pull the E-stop button counter clockwise until it pops out. ② Click on POWER key on the front panel. |
| Machine fails to start | The operating mode is manual. | Switch to automatic mode. |
| | START key error | Replace a new one |

6.3.2 Pneumatic System

| Malfunction Type | Possible Cause | Correction |
|------------------|------------------------------|----------------------|
| No air pressure | Compressed air source is not | Check and connection |

| | | |
|--|--------------------------------|----------------------------|
| | Hand valve is OFF. | Switch to Supply position. |
| | Main air solenoid close | Check and open it. |
| | Air pressure setting incorrect | Set a proper air pressure. |

6.3.3 Machine Startup

| Malfunction Type | Possible Cause | Correction |
|---------------------------------------|-----------------------|---|
| “Communication Error” message appears | Communication failure | ① Verify COM port settings ② Check if the communication cables are attached or not. ③ See if the Main Board is functioning. ④ Check the PLC communication cable. ⑤ Check the Laser Height Sensor communication cable. ⑥ Restart the computer |
| Axis not motion | No power | Follow the Turn-On Procedure to power. |
| | Limiting sensor cable | Connect cable |
| | Safety door is open | Close it |
| | No click on START key | Press and hold START button for 2s to activate process file. |

6.3.4 Camera System

| Malfunction Type | Possible Cause | Correction |
|----------------------------------|-----------------------|--|
| No image in the monitor display. | Camera not connected. | Connect it. |
| | Camera cable faults. | Replace a required one. |
| | Lens is blocked. | Remove and inspect the lens, if necessary, replace it. |

| | | |
|---------------------|--|--|
| | Light source intensity is too low. | Increase light level. |
| Light source is OFF | Camera not connected. | Connect |
| | Camera cable faults. | Replace a required one. |
| | Light source is closed. | Open it. |
| Un-focused Image | Substrate is not within height focus limits. | Adjust |
| | Lens is loose. | Tighten |
| | Lens is damaged or blocked | ① Replace a new one, ② Remove the blocks. |

6.3.5 Limiting Sensor

| Malfunction Type | Possible Cause | Correction |
|-----------------------------------|------------------------------------|---|
| Limiting sensor does not power on | The power cable is not plugged in. | Check and plug in. |
| Limiting Sensor does not trigger | Sensor is damaged | Replace, refer to 7.3.5 Limiting Sensor Replacement . |
| Intermittent function | Loose or frayed cables | ① Tighten cable ② Replace a new |

6.3.6 Machine Conveyor

| Malfunction Type | Possible Cause | Correction |
|------------------|---------------------------------|--|
| Rails not move | No power | ① Connect 220V AC power inlet module into machine. ② Click on POWER button. |
| | E-stop button has been pressed. | Pull it counter clockwise until it back to position. |
| | X or Y motor cables are | Retighten |
| | The conveyor chain speed | Set a higher speed in the Touch Screen. |

| | | |
|----------------------|---------------------------------------|---|
| Sensor no function | Sensor cable damaged | Replace a new one, refer to 7.3.5 Limiting Sensor Replacement . |
| | Sensor is in OFF. | In the Touch Screen, set ON. |
| Cylinder no function | The compressed air supply is too low. | Set a higher pressure. |
| | Cylinder no activation | ① Verify IO Monitor can toggle sensor bits. ② Check tube if leakage or not. |

6.3.7 Heating Controller

| Malfunction Type | Possible Cause | Correction |
|---|---|---|
| Heating controller does not power. | ① Power cord is disconnected. ② The heating controller is shut down in the HMI. | ① Connect. ② Turn ON it, refer to 5.5.2 Manual Menu . |
| Heating controller is power but no temperature. | The heating controller is in sleeping mode. (When the set temperature is more than 200°C, the standby temperature will be 200°C when in sleep mode; when the set temperature is below than 200°C, the standby temperature will be 50°C.) | ① Click on any button in heating controller panel to wake up. ② Click on sleeping button in the HMI, refer to Parameter Menu . ③ Trigger the process program. |

6.3.8 Movement Parts

| Malfunction Type | Possible Cause | Correction |
|---|--|--|
| One axis is offset intermittently during processing, but the other axes are normal. | 1) Synchronous belts or retaining screws are loose. 2) Z & R axes connection cables are disconnected or loose. 3) Maybe the captured Mark picture is error, if the machine has a vision system. 4) Maybe the motor, main board or driver has problem. | 1) Tension them, see Tensioning Synchronous Belts . 2) Remove the axis cover and tighten them, see Removing Axis Covers . 3) Recreate a new obvious point as the Mark, see Creating a Mark File . 4) Inspect and replace if necessary, see Replacing Servo Driver, Replacing Main Board . |



NOTE: If you have any problem out of list, please contact us for supporting!

7 Maintenance

7.1 Daily Inspection

Safety Introductions:



Risk of electric shock!

Be sure to open the cabinet door after the power off.

Cut off the power supply for 5 minutes and replace the servo unit (including the rectifier) and control the power unit. During this time, please do not touch the terminal!



Risk of electric shock and injury!

After the repair, please do not forget the tool in the switch cabinet, make sure the door of the electric switch cabinet is closed.

The power switch should be labeled "no power supply" during maintenance, so as to prevent non-related personnel from closing the switch.

Daily check:

- 1) Check if there are flammable or explosive items close to the machine.
- 2) Check if the working voltage is correct.
- 3) Check if pneumatic system is normal, if the air tube is smooth.
- 4) Check if home position of each axis is correct.
- 5) Test the movement and communication performance of the machine.
- 6) Check if the emergency button can be pushed and unscrewed normally.
- 7) Check if the external screws of the machine are screwed well.
- 8) Clean the working environment of machine.
- 9) Write down machine condition in each shift.
- 10) Run a testing program after each shift.
- 11) Check the degree of oxidation of the nozzle
- 12) Clean the tin slag in the tin jar
- 13) Clean and inspect the residual flux

7.1.1 Inspection before ON

| Parts | Item | Service | Remarks |
|------------------------------|----------------------------|---------------|---------|
| Ground cable & other cables. | Looseness | Re-tightening | |
| | Breaking or damage of wire | Replacement | |
| Working voltage. | Checking | | |

| | | | |
|-----------------|--------------------------------|-----------------------------|---|
| Motion platform | Attachment of spatter or dust. | Removal of spatter or dust. | Do not blow them off with compressed air, dust and spatter may enter the clearance or inside the cover, resulting in damage to the machine. |
| | Looseness | Re-tightening | |
| Safety door | Damage | Replacement | Read the technical information on their manual. |
| Working area | Tidiness | | |

7.1.2 Inspection after ON

Note: check that no personnel are present within the working area before turning on the power.

| Parts | Item | Service | Remarks |
|-----------------------|---|-------------|--|
| Emergency stop button | Turn off the servo power immediately. | Replacement | Do not use the machine unless the button is repaired. |
| Motion platform | Each axis makes steady and smooth motions (no abnormal vibration, noise or looseness) in manual and operation mode. | | Do not use the machine unless the motion platform is repaired. |
| Limiting sensor | When the home return is completed, the origin limit sensor is sheltered. | Replacement | |
| Cooling Fan | Cooling air inlet fan of the switch cabinet. Attachment of dust on the fan. | Clean | Turn off the power before cleaning the fan. |
| Testing | Run a testing program. | | |
| Light house | Damage | Replacement | |

7.2 Parts Maintenance Schedule

7.2.1 Guide & Screw Lubrication

1. Thoroughly wipe off the anti-rust oil before using the product.
2. Lubrication is needed to let the module demonstrate their functions fully. Using the product without sufficient lubrication may increase wear of the rolling elements or shorten the service life.

3. Do not mix different lubricants. Mixing greases using the same type of thickening agent may still cause adverse interaction. Use grease according to the attached lubrication chart.
4. When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, use the grease appropriate for the specification/environment.
5. Because the intervals between greasing vary depending on the conditions of product use, it is recommended that the greasing interval be determined through an initial inspection. Although the lubrication interval may vary according to use condition and the service environment, lubrication should be performed approximately every 100km in travel distance (3 to 6months).It is recommended to add grease to the ball screw and guide rail. Replace the grease if there is any color change.
6. Machine lubrication part bases the attached lubrication chart.

7.2.2Pneumatics System

Maintenance Schedule

| Task | Operating hours | Daily | Weekly | Monthly | Every 3 months | Every 6 months | Annually |
|--|-----------------|-------|--------|---------|----------------|----------------|----------|
| Check air pressure | 8 | √ | | | | | |
| Clean | 40 | | | | | √ | |
| Check for leaks | | | √ | | | | |
| Check Water Trap, replace soiled Water Trap. | | | | | | | √ |

7.2.3Heating Controller

| Parts | Item | Service | Remarks |
|-----------------|---|-------------|---------|
| Power Switch | Press it to power on heating controller | Replacement | |
| Connection Line | Check if loosen | Retighten | |

7.2.4Cabinet Switch

Maintenance Schedule

| Task | Operating hours | Daily | Weekly | Monthly | Every 3 months | Every 6 months | Annually |
|-----------------------------|-----------------|-------|--------|---------|----------------|----------------|----------|
| Clean cabinet switch | 8 | √ | | | | | |
| Check lines | 40 | | √ | | | | |
| Check terminal blocks | 160 | | | √ | | | |
| Change filter pad | | | √ | | | | |
| Check emergency stop button | 8 | √ | | | | | |
| Check power switch | | √ | | | | | |
| Check switch cabinet seals | | | √ | | | | |
| Check indicator lights | | | √ | | | | |

Procedure:

Frist: System switched off and mains power plug disconnected.

Second: use a vacuum cleaner to remove dust from the switch cabinet every day, thoroughly remove all dust and dust deposits from the switch cabinet.

Third: Checking for loose cables in the switch cabinet. Regularly check all cables, replace if necessary.

Check whether the door is closed.

7.3 Routine Parts Replacement

7.3.1 Changing Filter Pad

The filter pads takes up dust from the ambient air draw in, therefore it can clean the cabinet ambient air.

The dust which remains in the filter pad can clog the filter, if the filter pad is clogged the flow of air at the outlet opening of the fan will be distinctly weaker or can no longer be felt. Clogged filter pad must be replaced.

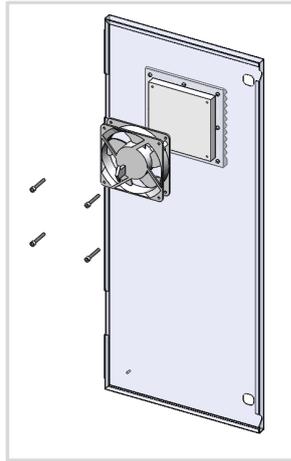
Tools:

Screwdriver (cross screwdriver & allen wrench)

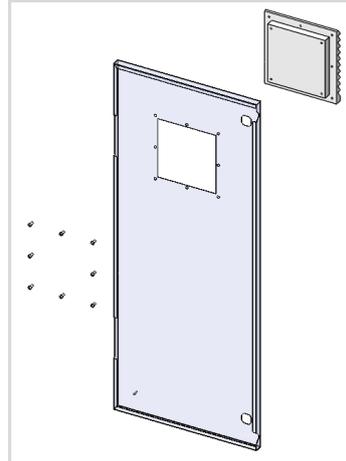
Process:

- 1) Follow the Turn off sequence to shut down the power supply.
- 2) Open the door to the switch cabinet.
- 3) Undo the screw (allen wrench) and remove the fan component, see picture.

-
- 4) Undo the screw (cross screwdriver) and remove the filter pad device from back, see follow picture.



Step 7



Step 8

- 5) Fit a new filter pad.

7.3.2 Replacing Servo Driver

To replace a servo driver:

- 1) Follow the Turn off sequence to shut down power supply.
- 2) Unplug all lines.
- 3) Undo two screws and remove damaged servo driver.
- 4) Fit a new servo driver and connect all cables according to drawings.
- 5) Renew the driver configuration.

7.3.3 Replacing Main Board

The main board is a circuit connects motion signal to machine. If the main board is damaged, replace it correctly.

To replace a new main board:

- 1) Follow the Turn off sequence to shut down power supply.
- 2) Open the rear door of the machine.
- 3) Unplug all cables installed in the main board.
- 4) Undo four screws located the main board into the cabinet switch.
- 5) Fit a new main board and connect all cables according to drawings.
- 6) Renew the main board configuration.

7.3.4 Replacing Limiting Sensor

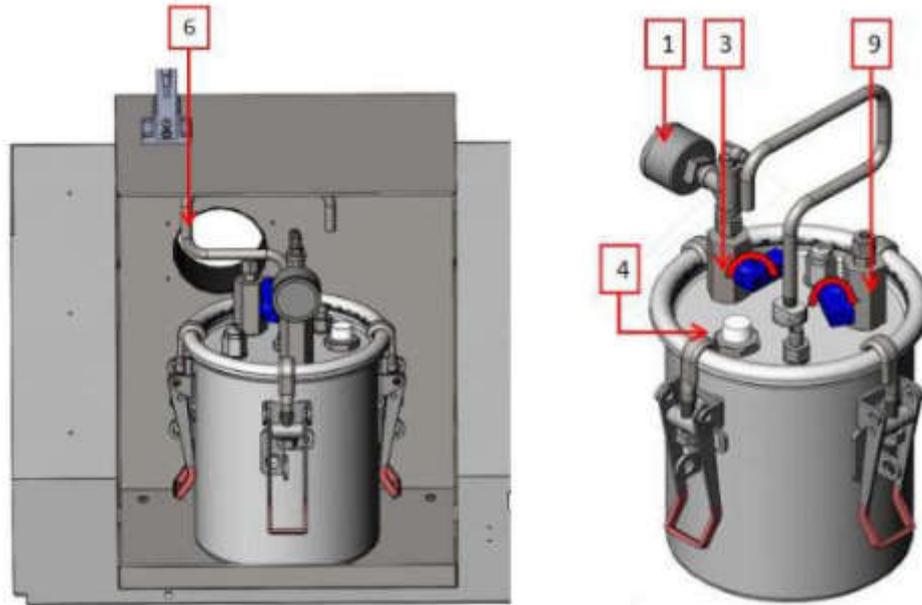
To replace limit sensor:

- 1) Follow the Turn off sequence to shut down power supply.
- 2) Disconnect the sensor cable connected with the machine.
- 3) Undo the screws located in the machine

-
- 4) Remove the damaged sensor.
 - 5) Fit a new sensor and connect cables according to drawings.

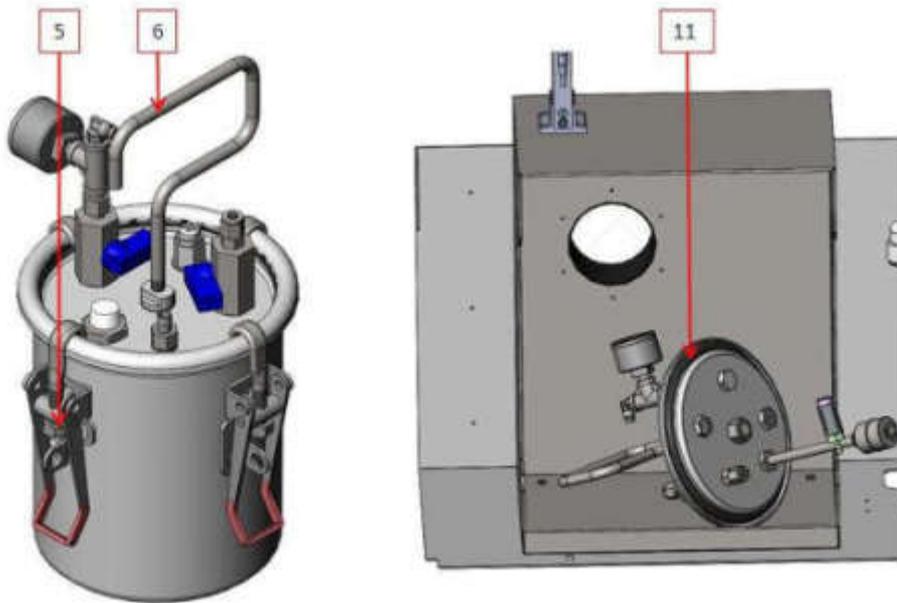
7.3.5 Adding Flux

7.3.5.1 Removal of Flux Barrel Voltage Reduction



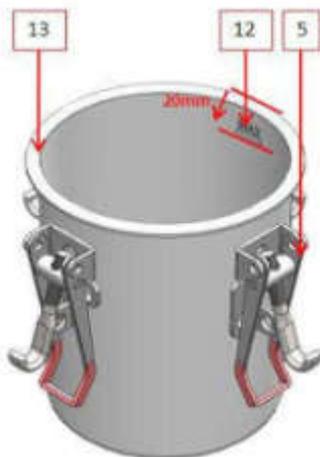
- 1) Open the maintenance safety door
- 2) Turn ball valve 1 (3) to the position shown in the figure and turn off the nitrogen input
- 3) Turn ball valve 2 (9) to the position shown in the figure and turn off the flux output
- 4) Slowly open the manual exhaust valve (4) and fully release the pressure in the bucket until no more wind noise is heard. At this point, the pressure release in the bucket is complete
- 5) Close the manual exhaust valve (4)
- 6) Remove the flux bucket and place it in a flat, clean area

7.3.5.2 Open the bucket lid



- 1) Press and hold the handle (6), and open the 4 stainless steel locks (5) upwards respectively
- 2) Use the handle (6) to lift the lid of the bucket
- 3) Place the lid of the soldering bucket in the dust cover of the soldering bucket at the soldering station
- 4) Check and remove dirt on the sealing ring (11), and it is recommended to use the cleaning agent recommended by the flux manufacturer. Replace the hardened sealing ring in a timely manner

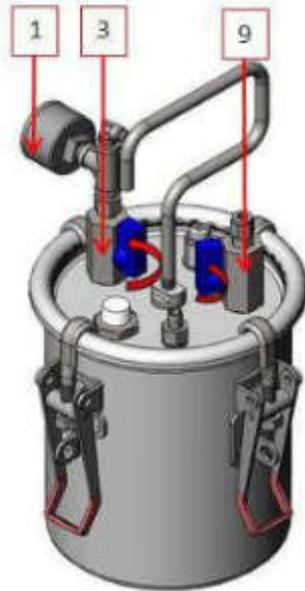
7.3.5.3 Adding Flux



- 1) Add soldering flux (maximum capacity 2 liters) to the horizontal line below the MAX liquid level mark (12)
- 2) Clean the edge (13) of the flux bucket with dust-free paper to remove any residual liquid and other contaminants

3) Carefully lift the flux bucket cover and place it above the flux bucket, securing the bucket cover with 4 stainless steel buckles (5)

7.3.5.4 Check the set pressure



- 1) Check the components on the lid of the flux barrel and remove all impurities
- 2) Carefully open ball valve 1 (3) to open the nitrogen input, and ball valve 2 (9) to open the flux output. Check the mechanical pressure gauge (1), which shows the pressure set by the proportional valve.
- 3) Lift the flux bucket and carefully move it to its original position

Note: To prevent flux leakage, in the event of flux leakage or audible wind noise:

- >Check if the pressure gauge is within the correct range
- >Check if the manual exhaust valve (4) is tightened

NOTE: The process of adding flux should be carried out by trained professionals. If you have any questions, please feel free to contact us for technical support

7.3.6 Replacing the nozzle

Tools: Sharp nose pliers, insulated gloves Steps:



(1) Remove the nitrogen protective cover



(2) Pinch the nozzle with pointed pliers and move it above the vertical tin wave to melt the excess tin block at the bottom of the nozzle



(3) Melt excess tin blocks above the nozzle



(4) Install nozzle



(5) Adjust the nozzle position



(6) Install nitrogen protective cover

7.3.7 Cleaning Tin Slag

Tools: thermal insulation suit, high-temperature gloves, brush, tray, tin slag spoon



Steps for cleaning tin slag:

- 1) Open the safety door at the welding module, place a protective plate on the track, and place the tray in a reasonable position
- 2) Release the nitrogen 1&2 pipe fittings
- 3) Remove the nitrogen protection device and clean it with a soft brush. Use a scraper to remove stubborn residual solder. After visual inspection, place it on a tray
- 4) Clean the control lever assembly
- 5) Release the cylinder head buckles that secure the electromagnetic pump components on both sides
- 6) Remove the electromagnetic pump component vertically with both hands facing upwards
- 7) Clean the residual tin on the electromagnetic pump
- 8) Clean the residual tin in the tin cylinder with a tin spoon
- 9) After cleaning, install the electromagnetic pump, operating rod assembly, and nitrogen protection device in sequence

Note: Residual tin in the electromagnetic pump can be cleaned once a week, while the nitrogen protective cover and control rod components need to be cleaned every shift!

7.3.8 Flux module

➤ Cleaning Tools

Tools: dust-free cloth, anhydrous industrial alcohol, rubber gloves



➤ Cleaning the injection valve

Pre cleaning inspection: Check if there is any residual flux at the spray valve port. Failure to clean for a long time can lead to accumulation and affect the movement of the shaft system. In severe cases, it can easily block the nozzle and affect the spraying of flux

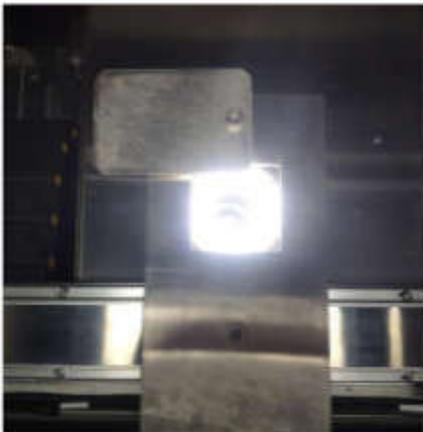


Cleaning steps:

- 1) Wear rubber gloves and gently wipe the residue of the flux injection valve port with a dust-free cloth dipped in alcohol
- 2) Regularly replace the spray sponge, with a recommended cycle of one month

➤ **Cleaning the camera cover**

Pre cleaning inspection: Check for any solder residue on the camera glass panel. Failure to clean for a long time can lead to accumulation and affect camera scanning and visual positioning



Camera glass protective plate

Cleaning steps:

- 1) Wear rubber gloves and use a dust-free cloth dipped in alcohol to wipe off any solder residue and dirt on the camera glass protective plate
- 2) Wait for 2 minutes and wipe off any residue such as alcohol with a dry, dust-free cloth
- 3) Check if the glass protective panel has been cleaned

NOTE: The glass has been damaged and broken. Please correct the glass's visual inspection error.

➤ **Cleaning flux tray**

Pre cleaning inspection: If the flux tray is not cleaned for a long time, residual flux will accumulate, posing a safety hazard

Cleaning steps:

- 1) Wear rubber gloves and use gauze dipped in alcohol to clean the flux residue and dirt on the flux tray
- 2) Check if the tray has been cleaned

NOTE: If you have any questions during the operation, please contact us promptly for technical support