

**ET7583KYA-P1-
TWXBCB144**

**Desktop Screwing
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

Serious warning	
	Electric Shock!
<ul style="list-style-type: none"> ➤ Do not touch the parts that may be live, and non-professionals should not modify it to prevent electric shock. ➤ Shut down the machine or push the stop button when there is an emergency situation appears. ➤ Do not power on the machine if the power cable is damaged. ➤ Power off the machine and plug the power cable if it has no long time to use or idle. ➤ Power off the machine and make sure there is no live, then perform the maintenance or inspection. ➤ Plug the power cable with protection earth, and do not modify the power supply socket. ➤ Do not plug or pull cables during the machine is powered. ➤ Do not repower immediately when the machine is OFF. Wait for 120s to repower the machine otherwise damage the controller and motor drivers. 	
	Injured!
<ul style="list-style-type: none"> ➤ Do not put hands into the machine when it is operating or powered. ➤ Do not wet the machine. ➤ Do not modify the machine. ➤ Do not pull the power cable freely. 	
	Warning!
<ul style="list-style-type: none"> ➤ Only professionals perform maintenance procedures. ➤ Cut down the power and sir supplies during maintenance. ➤ Do not use the machine in a flammable or explosive surrounding. ➤ Remove the stoppers which is located in the controller prevent moving during transportation. 	
Warning	
	Caution Hands!

<ul style="list-style-type: none"> ➤ Do not remove the movement parts by hands, otherwise injure hands or damage machine. ➤ Do not touch the movement parts during running. ➤ Make sure there is no dangerous if the machine is down, then perform the inspection and maintenance.
<p>0~40 °C Operation</p>
<ul style="list-style-type: none"> ➤ Storage and operation environment: ➤ Temperature: 0~40 °C ➤ Humidity: 20%~90%(No condensation)
<p> No</p>
<ul style="list-style-type: none"> ➤ Do not multilayer, prevent damage the controller and machine.
<p> Maintenance</p>
<ul style="list-style-type: none"> ➤ Regular inspection and maintenance will prolong the machine lifetime. ➤ Inspect there is no obstacle in the machine before powering, observe the power on steps. ➤ Do not power on the machine continual prevent the damage of the machine. ➤ The batch head should be placed in the suspended state if the screwdriver is powered or the process of saving parameters.
<p> Air</p>
<ul style="list-style-type: none"> ➤ Make sure the compressed air is clean and tidy. ➤ Recommended compressed air pressure is from 0.4 to 0.7MPa.
<p>Attention</p>
<p> Caution Wet!</p>
<ul style="list-style-type: none"> ➤ The package is made of non-moisture-proof material. Keep away from rain or moisture during transportation or storage. ➤ Packaging materials should be in accordance with local environmental laws and regulations, for processing.

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 with power on.

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.

1.3 Screwdriver Controller Information

In order to ensure the safe operation and optimal performance of the screwdriver controller, please follow all warnings and safety introductions in this manual during process of controller operation.

1.3.1 Protection Requirement

When installing or disassembling, please remember to turn off the system and pull out the power plug to avoid damage to the machine or cause accidents.

1.3.2 Operation Introduction

You should read the following procedures before operating the screwdriver controller.

1. Corresponding operators must be trained and examined and know the normal safety information for operating the screwdriver controller.
2. Regular inspection and maintenance will prolong its lifetime.
3. Never touch the batch nozzle when the controller is working.
4. Please do not operate when it's damaged.
5. Turn off the system when resting or after completion
6. Use rated voltage and frequency. (Please refer to the nameplate on the back of it.)
7. Do not modify screwdriver controller without authorization.

1.4 Electrical Components Safety

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 and make a maintenance fence.

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.

1.4.1 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.

1.4.2 Securing Power 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.

1.4.3 Measuring 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.

1.4.4 Electrical Parts 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!

1.4.5 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 the machine.

1.4.6 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.

1.4.7 Power ON Procedure

Ensure that the machine is supplied with power and compressed air. Please follow this sequence to turn on the machine:

- 1) Connect power cord which is located in the rear panel of machine.
- 2) Turn on power switch.
- 3) Release the emergency stop button.
- 4) Click on **POWER** key to power movement parts.
- 5) Click on **RESET** key to move all movement parts to home position.



NOTE: After switching off the system always wait for at least 120s before switching it on again.

1.4.8 Power OFF Procedure

Please follow this sequence to turn off the machine:

- 1) Click on **RESET** key to move all movement parts to home position.
- 2) Turn off power switch
- 3) Slowly plug the power supply cable.

1.5 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.

1.6 Residual Safety Check

1.6.1 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!

1.6.2 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 screwing process away from food-stuff, beverages and feedstuff. The possibility of smoke in the screwing process may be contaminated food and drink.
- Keep workplace clean and tidy is the prerequisite for ensuring screwing.
- Keep safety datasheets for screwing maintenances clearly visible and accessible at the workplace.

1.6.3 Personal Protection

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

2 Technical Data

Machine Model		ET7583KYA-P1-TWXBCB144
★ Input voltage		220V AC 50/60HZ
Power consumption		400W
Axes number		3
Movement Range	X (mm)	0.1~500
	Y (mm)	0.1~400
	Z (mm)	0.1~100
	R (degree)	--
Movement Speed	X (mm/sec)	0.1~1000
	Y (mm/sec)	0.1~1000
	Z (mm/sec)	0.1~300
	R (degree/sec)	--
Repeatability	X/Y/Z (mm)	±0.01
	R (degree)	--
Resolution	X/Y/Z (mm)	0.01
	R (degree)	--
Motion Control		Motion Control PCBA + Q Screwing software
Noise		<70dB (Measure in the distance of 1m)
Operating Ambient	Temperature	0~40℃
	Humidity	20%~90% (No condensation)
Weight(Kg)		95

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

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 Unpacking the Box

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

To unpack the box:

- 1) Take out the box.
- 2) Remove the packaging tap from box.
- 3) Check the parts from packing list.

3.2.4 Connecting the Power & 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) Connect the male power cable to power supply device.

To connect air supply:

Air inlet port of screwing machine is located in the left column of the machine.

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

3.2.5 Connecting the Rear Peel

- 1) 4-pin socket: connect to right key box, pin functions refer to [4-pin Socket Instruction](#).
- 2) 7-pin socket 1: connect to right jig sensor, pins functions refer to [7-pin Socket Instruction](#).
- 3) Power inlet socket: Connects AC line cord to power inlet socket.
- 4) ESD socket: Reliable grounding is essential for machine.
- 5) 5-pin socket: connect to screw feeder, pin functions refer to [5-pin Socket Instruction](#).
- 6) 6-pin socket: reserved, pin functions refer to [6-pin Socket Instruction](#).
- 7) 8-pin socket: reserved, pin functions refer to [8-pin Socket Instruction](#).
- 8) 6-pin socket: reserved, pin functions refer to [6-pin Socket Instruction](#).
- 9) 5-pin socket: connect to screw feeder, pin functions refer to [5-pin Socket Instruction](#).
- 10) 5-pin socket: connect to screw feeder, pin functions refer to [5-pin Socket Instruction](#).
- 11) Ethernet socket: connect to computer.
- 12) DB9 socket1: follows RS485 standard communication protocol, pin functions refer to [DB9 Socket Instruction](#).
- 13) DB9 socket2: follows RS485 standard communication protocol, pin functions refer to [DB9 Socket Instruction](#).
- 14) 7-pin socket 1: connect to left jig sensor, pins functions refer to [7-pin Socket Instruction](#).
- 15) 4-pin socket: connect to key box, pin functions refer to [4-pin Socket Instruction](#).

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

4 Commissioning

4.1 Initial Debugging

4.1.1 Check before Starting

- Make sure that the machine is connected to the required power supply and compressed air supply.
- Operate the system only with a suitable transformer. Incorrect voltage and power rating can cause damage.
- Check that all safety devices (protective covers, e-stop button, light curtain, light house) have been installed correctly and are fully functional.
- Use your hands to feel if there is cool air coming from out of the vents.

4.1.2 Switching ON

- After switching off the system always wait for at least 120s before switching it on again.
- If a mistake is made, switch off the machine and wait for at least 120s before switching it on again.
- Switch on the machine process as follows:
 - 1) Connect the power cord to the appropriate power supply.
 - 2) Install the new bit.
 - 3) Switch on the power switch.
 - 4) Release the emergency stop button.

4.2 Starting/Exiting Software

The **Q Screwing** start-up procedure assumes that it is already installed on your computer and that the computer is turned ON and running the operation system.



NOTE If the computer on your system is not running operation system, consult your Information System Group.




Q Screwing is designed for use on a dedicated PC. Using any other application while **Q Screwing** is running may interfere with **Q Screwing** normal operation.

4.2.1 Starting Software Procedure

To start **Q Screwing**:

Open **Q Screwing** using one of the following methods:

- Double-click the icon  on the desktop.
- In the lower left hand corner of computer screen, click on **Start>Program>Screwing**.


When **Q Screwing** starts, it will check to see that all the Input and Output devices for your Screwing system are communicating properly with software.



Do not press any keys or the mouse while **Q Screwing** is starting unless you are prompted to do so.

4.2.2 Exiting Software Procedure

To exit **Q Screwing**:

1. Save any open files.
2. Click on  icon on the right top corner.



NOTE: Be sure to exit operation system before powering down the computer.

5 Function Introductions

5.1 Safety Device Function



5.1.1 Power Switch

The power switch connects the system to the electrical circuit or disconnects it from circuit. It is a power safety device. The power switch has 2 switch positions: ON position “I” and OFF position “O”.

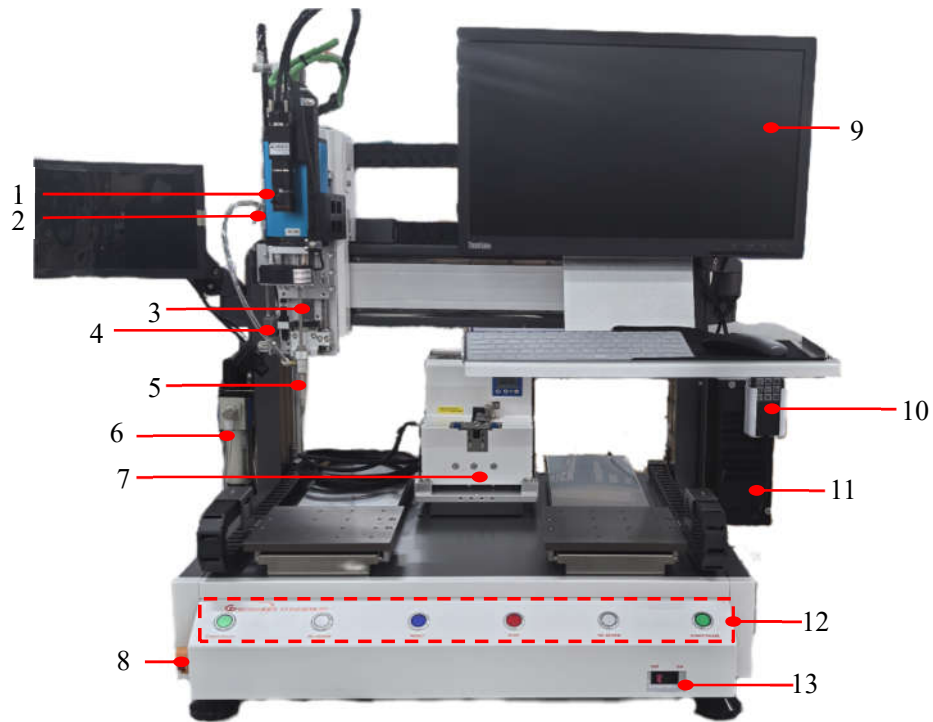
ON: switch ON power to the machine.

OFF: shut down the machine.

5.1.2 Emergency Stop Button

The emergency stop button is a safety feature device located on the front panel, activating it all pressure in the pneumatic system, de-energizes the motor power, and cuts power to all system components.

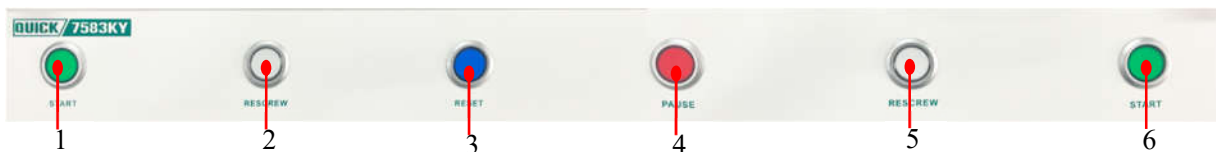
5.2 Components Introduction









Screwing machine part names list:

Item	Part Name	Item	Part Name
1	Screwdriver module	8	Emergency stop button
2	Vacuum filter	9	Q Screwing software
3	Batch	10	Handle programmer
4	Camera	11	Computer
5	Nozzle	12	Operation buttons
6	Water trap	13	Power switch
7	Screw feeder		

5.2.1 Operation Buttons



Operation button functions list:

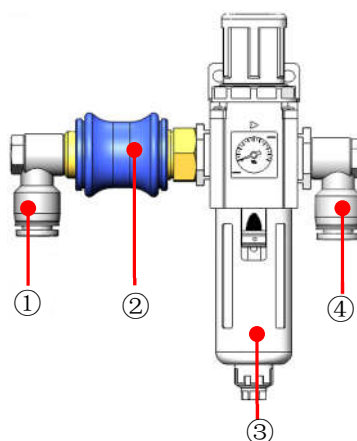
Item	Command Button	Function
1		Left start command button Press and hold this button to activate left processing file. Note: Make sure there are no obstacles in the machine before operation.
2		Re-screw command button If the left locking result is finished, remove the failed screw then press this button to re-screw this position.
3		Reset command button Press it to move all movements to the default home position. “Light flashing” indicates the machine is resetting, and the “light” indicates the machine has reset.
4		Stop command button Press it to stop processing. If the program will run again, press and hold start button to activate processing file. Press and hold start button to activate processing file.
5		Re-screw command button If the right locking result is finished, remove the failed screw then press this button to re-screw this position.
6		Right start command button Press and hold this button to activate right processing file. Note: Make sure there are no obstacles in the machine before operation.



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

- a) Check and confirm alarm.
- b) Press RESET key to move the machine to home position.
- c) Press START key to re-activate the process.

5.2.2 Pneumatic System



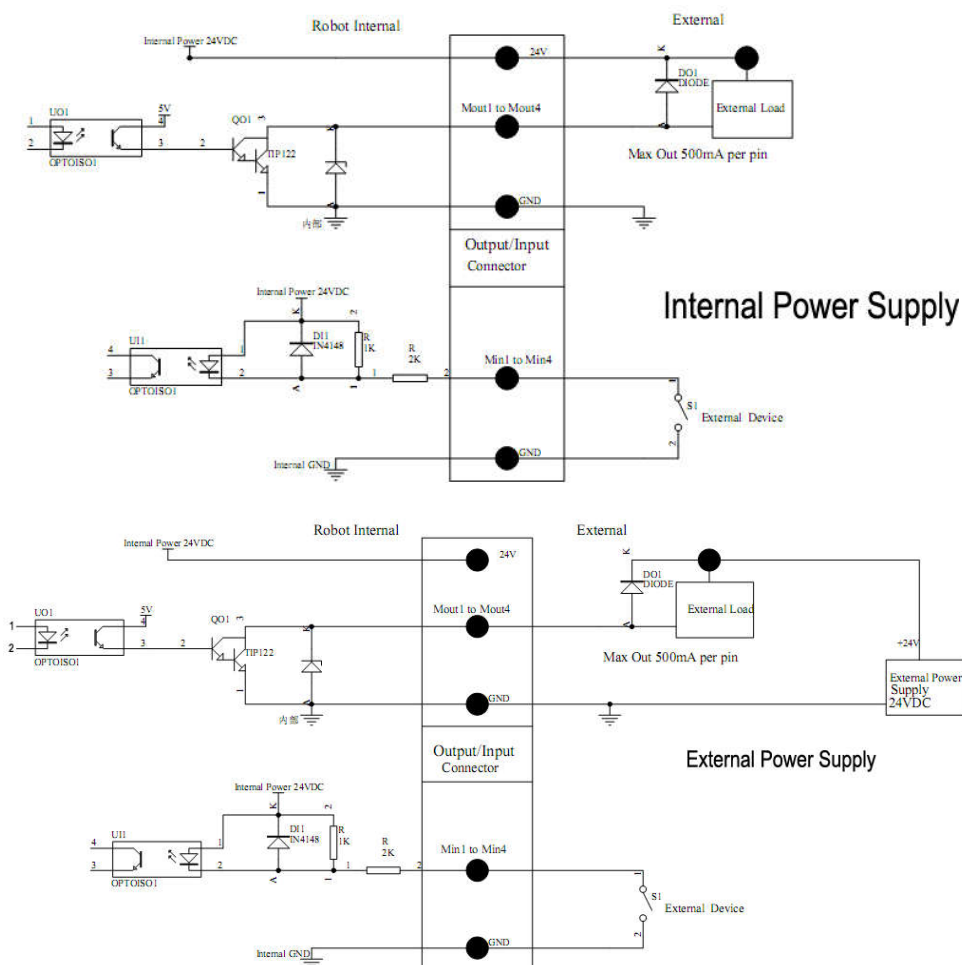
Part Name Description List:

Item	Part Name	Description
①	Compressed Air In Port	The Dia.: φ10 PU tube, connect with compressed air supply device.
②	Hand valve	Compressed air supply and exhaust knob.
③	Water Trap	The facility air supply may contain moisture that can damage the machine. The water trap condenses this moisture before it enters the pneumatic system.
④	Air Out Port	The Dia.: φ10PU tube.

Pneumatic system is a device for controlling the amount of air pressures supplied.

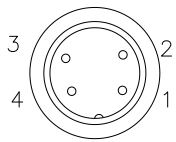
5.3 I/O Socket Instruction

5.3.1 Circuit Instruction of I/O Socket

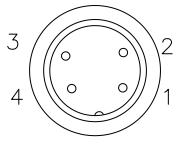


5.3.2 4-pin Socket Instruction

4-pin socket is connected to left key box, pin functions refer to table below.


4-pin socket	Pin	Pin Name	Description
	4P-1	Min4	Connect to “START/PAUSE” button of left key box.
	4P-2	GND	GND
	4P-3	Min1	Connect to “ORG” button.
	4P-4	Min2	Connect to emergency stop button.

4-pin socket is connected to right key box, pin functions refer to table below.

4-pin socket	Pin	Pin Name	Description
	4P-1	Ein16	Connect to “START/PAUSE” button of left key box.
	4P-2	GND	GND
	4P-3	Min1	Connect to “ORG” button.
	4P-4	Min2	Connect to emergency stop button.


5.3.3 5-pin Socket Instruction

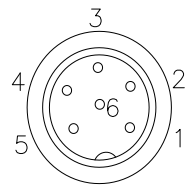
5-pin socket is connected to screw feeder, pin’s functions refer to table below.

5-pin socket	Pin	Pin Name	Description
	5P-1	24V DC	24V DC
	5P-2	GND	GND
	5P-3	Ein3	Screw feeder ready signal
	5P-4	Ein4	Screw feeder alarm signal
	5P-5	Eout3	Screw feeder picking signal

5.3.4 6-pin Socket Instruction

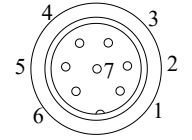
6-pin socket is used to connect with screwdriver controller, pin’s functions refer to table below.

6-pin socket	Pin	Pin Name	Description
	6P-1	24V DC	24V DC
	6P-2	GND	GND
	6P-3	Eout1	Screwdriver starts to move signal

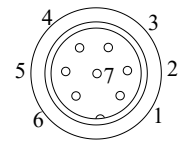
	6P-4	Eout2	Screwdriver move quickly signal
	6P-5	Eout4	Screwdriver reversal movement signal
	6P-6	Ein1	Screwdriver ready signal

5.3.5 7-pin Socket Instruction

7-pin socket is connected to left jig sensor, pin's functions refer to table below.

7-pin socket	Pin No.	Pin Name	Function
	7P-1	24V DC	24V DC
	7P-2	0V	0V
	7P-3	Ein5	Left cylinder-home sensor
	7P-4	Ein6	Left cylinder-work sensor
	7P-5	NC	No connection
	7P-6	NC	No connection
	7P-7	NC	No connection

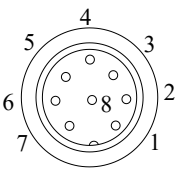
7-pin socket is connected to right jig sensor, pin's functions refer to table below.

7-pin socket	Pin No.	Pin Name	Function
	7P-1	24V DC	24V DC
	7P-2	0V	0V
	7P-3	Ein7	Right cylinder-home sensor
	7P-4	Ein8	Right cylinder-work sensor
	7P-5	NC	No connection
	7P-6	NC	No connection
	7P-7	NC	No connection

5.3.6 8-pin Socket Instruction

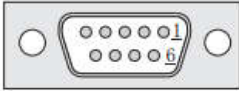
8-pin socket is spare socket, pin's functions refer to following table.

8-pin socket	Pin No.	Pin Name	Function
	8P-1	24V DC	24V DC
	8P-2	GND	GND
	8P-3	Eout14	Reserve
	8P-4	Eout15	Reserve

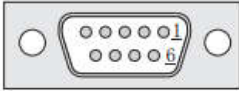
8-pin socket	Pin No.	Pin Name	Function
	8P-5	Eout16	Reserve
	8P-6	Ein14	Reserve
	8P-7	Ein15	Reserve
	8P-8	Ein16	Reserve

5.3.7 DB9 Socket Instruction

DB9 socket 1 follows Standard RS485 Communication Protocol.

					
No.	Pins	Function	No.	Pins	Function
1	9P-1	No connection	6	9P-6	No connection
2	9P-2	No connection	7	9P-7	2-485A
3	9P-3	No connection	8	9P-8	2-485B
4	9P-4	No connection	9	9P-9	No connection
5	9P-5	No connection			

DB9 socket 2 follows Standard RS485 Communication Protocol.

					
No.	Pins	Function	No.	Pins	Function
1	9P-1	No connection	6	9P-6	No connection
2	9P-2	No connection	7	9P-7	2-485A
3	9P-3	No connection	8	9P-8	2-485B
4	9P-4	No connection	9	9P-9	No connection
5	9P-5	No connection			

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”.
	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 Reset key.
Machine fails to start.	The operating mode is manual.	Switch to loop 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 connected.	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.
Axis not motion	No power	Follow the Turn-On Procedure to power.
	Limiting sensor cable disconnected	Connect cable
	No click on START key	Press and hold START button to activate process file.

6.3.4 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 Limiting Sensor Replacement .
Intermittent function	Loose or frayed cables	① Tighten cable ② Replace a new

6.3.5 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.

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	
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 driver 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.		

7.2 Parts Maintenance Schedule

7.2.1 Lubrication Chart

Machine part	Standard Grease	Remark
X Axis component	THK AFB-LF Grease	Grease nipple type: A-M6F
Y Axis component	THK AFB-LF Grease	Grease nipple type: A-M6F
Screwing head component	THK AFB-LF Grease	Grease nipple type: PB107

7.2.2 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.

7.2.3 Pneumatics 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			√				

Task	Operating hours	Daily	Weekly	Monthly	Every 3 months	Every 6 months	Annually
Check Water Trap, replace soiled Water Trap.							√

7.3 Routine Parts Replacement

7.3.1 Changing Vacuum Filter

The vacuum filter should not use any tool to replace.

- 1) Rotate the connector clockwise, see picture below.
- 2) Pull out the filter from vacuum cavity.
- 3) Replace a new filter and tighten the connector.



7.3.2 Replacing Driver

To replace a servo driver:

- 1) Follow the Turn off sequence to shut down power supply.
- 2) Unplug all cables.
- 3) Undo two screws and remove damaged 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.

7.4 Routine Parts Maintenance

7.4.1 Prolong Screwdriver Lifetime


In order to prolong the screwdriver lifetime, the attention before maintenance should be performed.

- 1) Maintenance should be performed approximately every two months or one million times in usage.
- 2) Torque calibration procedure should be performed every one month or it has offset, calibration steps see

Torque Manual.

- 3) It is recommended to perform preventive maintenance every month, or after tightening 500,000 times.
- 4) If the screwdriver is used under high torque, high cycle rate or long tightening time, it needs to be maintained according to the following table.

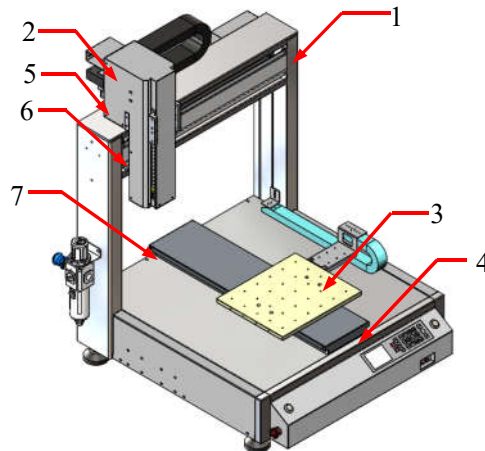
Maintenance Schedule	Cleaning header & Main Parts	Inspecting Cables	Torque Calibration
Tightening 5 million times or one month	√	×	×
Tightening 10 million times or one month	√	√	√
Tightening 15 million times or one month	√	×	×
Tightening 20 million times or one month	√	√	√

 **NOTE:** If the tool torque use frequency is more than 80%, you need to increase the frequency of maintenance.

7.4.2 Removing Axis Covers

In order to lubricate the linear guides and tension the cables, it will be necessary to remove the axis covers.

The shut down procedure should be performed before removing the covers of axes.



Item	Description	Item	Description
1	X-Axis cover	5	Screwing head screw
2	Screwing head cover	6	X-Axis screw
3	Jig baseplate	7	Y-Axis screw
4	Y-Axis cover		


Fig. Movement covers position

To remove the X-Axis cover:

- 1) Move the screwing head to the middle of X-axis by hand.
- 2) Use a hex key to loosen the four X-Axis screws (6).
- 3) Slide out the X axis cover (1) from right side and set aside.

To remove the Y-axis cover:

- 1) Use a hex key to loosen the four Y-Axis screws (7).
- 2) Slide out the Y axis cover (4) from front side and set aside.

 **NOTE:** Make sure the jig baseplate (3) should not be removed.

To remove the screwing head cover:

- 1) Disconnect the feed and iron cables from the rear side of the screwing head.
- 2) Remove the wire feed device from screwing head and set aside.
- 3) Use a hex key to loosen the eight screwing head screws (5).
- 4) Remove the screwing head cover (2).

7.4.3 Lubricating Guide & Screw

To ensure smooth movement, the X & Y guides and Z axis screw must be lubricated approximately every three months or 100km in travel distance. Before perform the following procedure, you need consult [7.2.1](#)

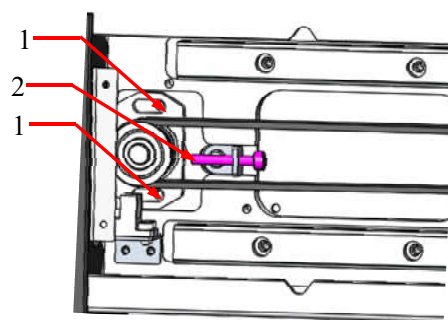
[Lubrication Chart.](#)

To lubricate guide and screw:

- 1) Follow the Turn off sequence to shut down power supply.
- 2) Move the screwing head to the front of working area.
- 3) Remove the X,Y&Z axes covers, see [7.3.8 Removing Axis Covers.](#)
- 4) Using a clean and soft cloth to clean and wipe the X,Y&Z rails.
 - Manually move the X, Y & Z axes to reach all parts of the rails.
- 5) Locate the grease fitting on each of the rails.
- 6) Attach grease gun to each fitting and pull the grease gun lever one time to squirt grease, .
- 7) Use a soft cloth to clean up excess grease.
- 8) Replace the X,Y&Z Axes covers.
- 9) Power on the machine when all lubrication steps are finished.
- 10) In the *manual* window of software (refer to [Q Screwing Manual](#)). Click on Manual Key(X, Y, Z) to move the screwing head back and forth in X,Y&Z axes.
- 11) Use a clean and soft cloth to clean up the working area.

7.4.4 Tensioning Synchronous Belts

To ensure smooth moving jig substrate, the belts must be inspected approximately every six months. If the belts are replaced or loosen, tensioning it.



Item	Description
1	Tensioner screw
2	Adjustable screw

Fig. Belt component

To tension belts:

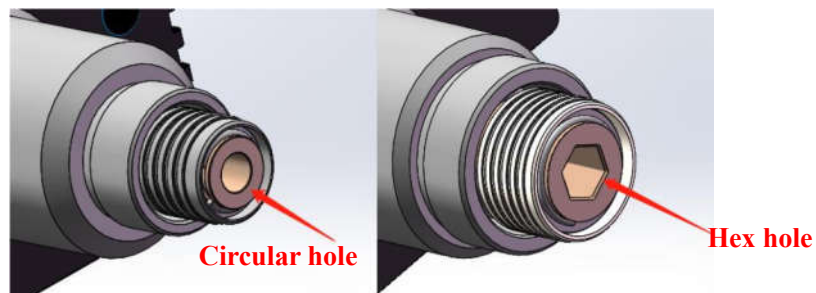
- 1) Follow the Turn off sequence to shut down power supply.
- 2) Remove the axes covers, see [Removing Axis Covers.](#)


- 3) Loosen the two tensioner screws (1).
- 4) Rotate the adjustable screw (2) clockwise until the desired tension is obtained, and if the tension is force, rotate it count clockwise to decrease.
- 5) Tighten the tensioner screws.

7.4.5 Lubricating Screwdriver

Lubricating Screwdriver

- 1) Push the batch upward and pull it out gently
- 2) Clean the installation hole of the head with an air gun or cotton swab
- 3) Screwdriver is coated with lubricating oil before rust prevention oil
- 4) Wait for 48h.
- 5) Install the batch.



 **NOTE**: If the batch is not used for more than 1 week, pull out the batch!

7.4.6 Draining Water Trap

To drain water trap:

- 1) Turn off the machine, refer to [Power OFF Procedure](#).
- 2) The Water Trap is located at the front of machine.
- 3) Disconnect the compressed air supply from the Pneumatic System.
- 4) Put a container under the Water Trap to catch the waste water.
- 5) Press the Water Drain knob.
- 6) Loosen the Water Drain knob, when it has been drained.
- 7) Connect the compressed air supply tube into Air Port.

Appendix Parts List

This section includes general information for ordering recommended spares & consumable parts for machine.

A.1 Spare Parts List

Table Spare Parts List

No.	Product Name	Qty.	Remark
1	Suction Nozzle	2	Order on demand

A.2 Consumable Part

Table Consumable Parts List

No.	Product Name	Qty.	Remark
1	Vacuum filter	1pcs	ZFC74-B
2	Batch	5pcs	Order on demand

