



STAR PRO 510

PRODUCT USER MANUAL



ORDER NOW



More information
www.goldstarcnc.us



More information
(786) 400-0910

StarPro | 510

The StarPro 510 is our best-selling model. It is designed for woodworking and can cut MDF, acrylic, PVC, aluminum, and copper with precision and ease.

It is an auto-tool-changing machine with a linear tool magazine. It can accomplish complicated jobs requiring different tool patterns at once, with tools changing automatically.





PREFACE

Thank you for purchasing our products!

Please read the following precautions carefully after receiving your machine:

1

Read the following pre-installation precautions and check whether the installation environment of the machine is suitable to avoid unnecessary trouble during your installation and use.

2

Check the appearance and packaging of the machine to see if there is any damage.

* If you encounter problems while using this product, please call our after-sales service.

INDEX

Preface	3
Delivery of the machine	7
Machine overview	9
Machine identification	10
Important safety instructions	11
Installation Notes	12
Vacuum pump installation	12
Dust collector installation	13
Power and air supply installation	14
Installation of other accessories	15
Preparation and operating instructions before machine operation	15
Check air source	15
Check auto lubrication	16
Power on	16
Material fixation	17
User interface introduction	18
1. Description of handle buttons and commonly used key combinations	18
2. Manual Control User Interface	19
3. Manual Function User Interface	21
4. System Setup	22
5. Operate File	22
6. Input output control user interface	24
Tool path user interface	26
Machine Operation	27
1. Power on and return to origin	27
2. Change tool	28
(1) How to use the lock knife holder	28
(2) Manual tool change	29
(3) Changing tools using the controller	30
3. Tool setting	31
4. Load processing file	32
5. Switch between machine coordinates and workpiece coordinates	33

6. Manual Operation	33
(1) Manual speed switching and adjustment	34
(2) Manual movement modes	34
7. Auto processing operation	36
(1) Set work origin	36
(2) Load processing file	37
(3) Set Auto processing parameters	37
8. Operations during processing	38
(1) Speed ratio & spindle state adjusting	38
(2) Pause & position adjustment	38
(3) Breakpoint processing & power failure recovery	39
Appendix: Controller Operating System Troubleshooting	41
1. Solution to the fault message prompted on the controller screen	41
2. Frequently asked questions during operation	42
3. Situation analysis and solutions	43
4. Electrical components and wiring problems	44
Equipment electrical schematic diagram	46
Machine preview	49
Equipment maintenance and upkeep	51
1. Maintenance	51
2. Lubrication and maintenance	51
3. Other maintenance	51

Star PRO | 510



1. Delivery of the machine

To ensure that your machine can be used normally, please read the following before delivering the machine:

1. For your convenience in loading and unloading, please prepare a forklift before unloading the machine (recommended to be 3 tons and above).



Please pay attention to our fixtures before running the machine! Before shipment, we will set two high-strength bolts on both sides of Y1 and Y2 to fix the machine's beams and columns to the bed, as shown below (only for machines without disassembling the gantry).



2. Place the machine tool in the designated position and level the four legs of the machine tool.

* Note: The four legs must be leveled and cannot be deflected or suspended in the air.

3. The installation environment requires no water droplets, steam, or oily dust.

4. The floor is smooth, clean, solid, and vibration-free.

5. There is no electromagnetic interference nearby

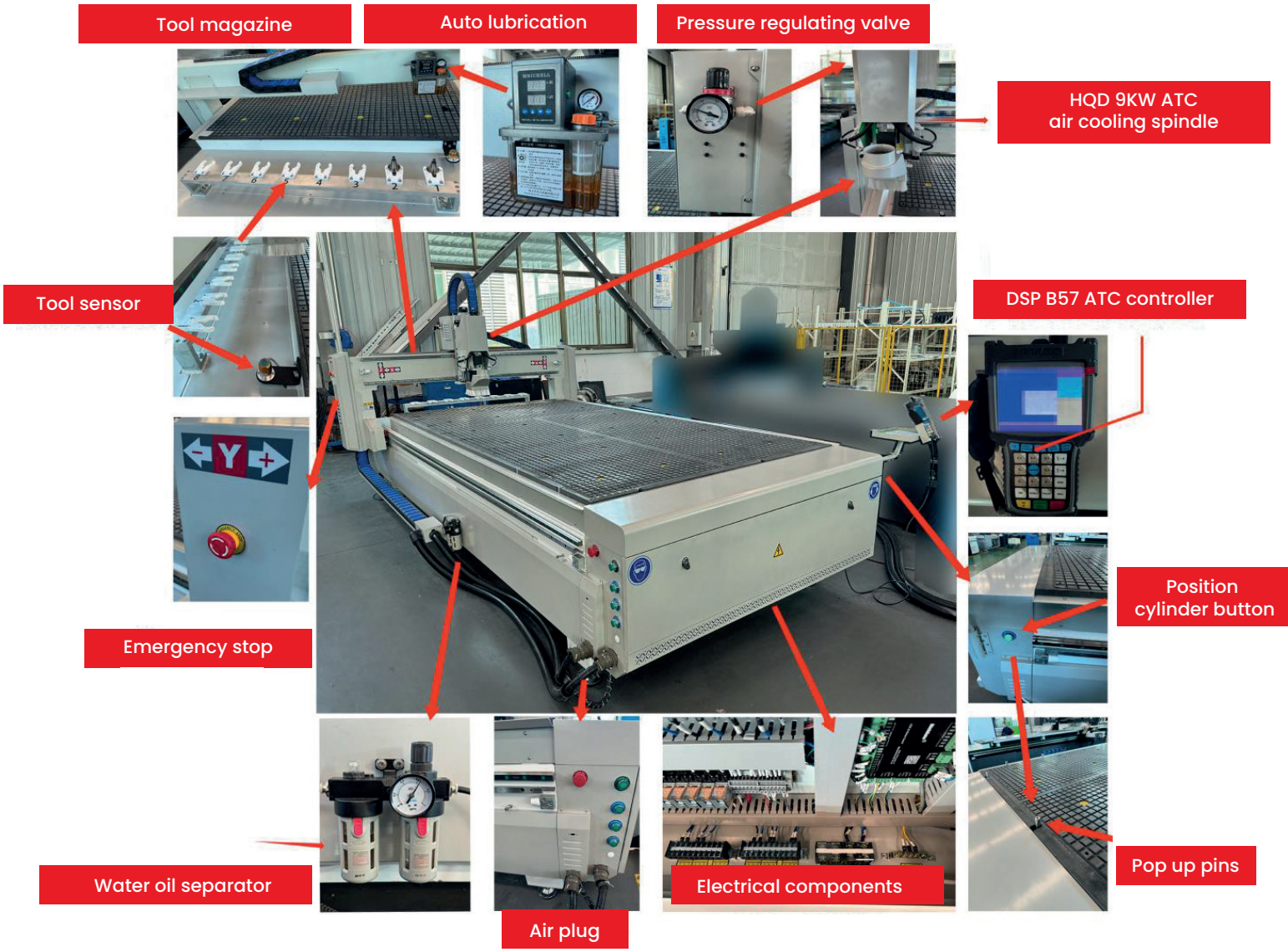
6. The operating ambient temperature is $-5^{\circ}\text{C} \sim 35^{\circ}\text{C}$. When the ambient temperature exceeds 35°C , please install ventilation facilities. Relative humidity environment: $30\% \sim 75\%$.

7. The input voltage is AC380V/50/60Hz or AC220V/50/60Hz. Please connect the voltage indicated on the nameplate according to the instructions on the machine nameplate.

8. Most machines will be packed in wooden boxes with plastic packaging inside. Please check the general condition of the machine before unpacking it.
9. There may be wood dust or lubricating oil inside the machine because it is produced during factory testing.
10. The weight of the machine may reach 1.2 tons or more. Please ensure that there is enough space to place the machine; and reserve a safe area for dust collectors, vacuum pumps, control cabinets, and other tools that may be carried.
11. Please refer to the machine parameters, consider the weight of the site environment and electrical load, and whether the on-site wiring meets the requirements.
12. Regarding the assembly of the machine, the weight of the machine is very heavy and requires 2 or more people to complete it. During the assembly process, you need to pay attention to personal safety and use appropriate tools to assemble the mechanical and electrical components of the machine.



2. Machine overview




* For reference only, please refer to the actual machine.

3. Machine Identification

There are many technical signs and safety signs on our machines. Please read the following overview. The information they contain is to ensure the safety of the machine operator and the stable and normal operation of the machine itself. (The color of the axial mark may be different, please refer to the actual machine).

X Y Z
axis mark



The diagram shows three axes: X, Y, and Z. Each axis is represented by a green bar with a white arrow pointing left and a white arrow pointing right. The X-axis is horizontal, the Y-axis is horizontal, and the Z-axis is vertical. The word 'AXIS' is written below each bar.

Emergency
stop switch




The icon is a red circular button with a white 'E' and a white 'S' inside. The words 'EMERGENCY STOP' are written around the top edge of the button.

Please wear
goggles when
working




The icon is a blue circle containing a white silhouette of a person's head wearing safety goggles.

Please wear
earplugs/earmuffs
when working



The icon is a blue circle containing a white silhouette of a person's head wearing earplugs or earmuffs.

Machine operation
danger zone




The sign is rectangular with a yellow background. It features a black triangle with a white exclamation mark, the word 'DANGER' in black, and a black silhouette of a hand being struck by a machine part. Below the silhouette, there is a warning in German: 'IMPACT HAZARD: STAY CLEAR OF THE READING OPTIC! MOVING PARTS CAN CRUSH AND CUT. MACHINE MAY START AUTOMATICALLY.'

Be aware of
electrical hazards



The sign is a yellow triangle with a black border and a black lightning bolt symbol in the center.

Be safe



The sign is a yellow triangle with a black border and a black exclamation mark in the center.

Pay attention to
high temperature



The sign is a yellow triangle with a black border and a black symbol of three wavy lines above three horizontal lines, representing heat.

4. Important safety instructions

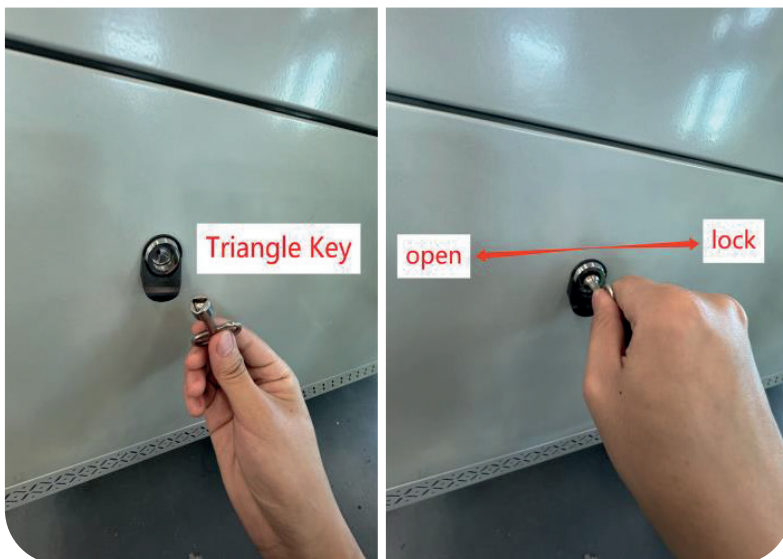
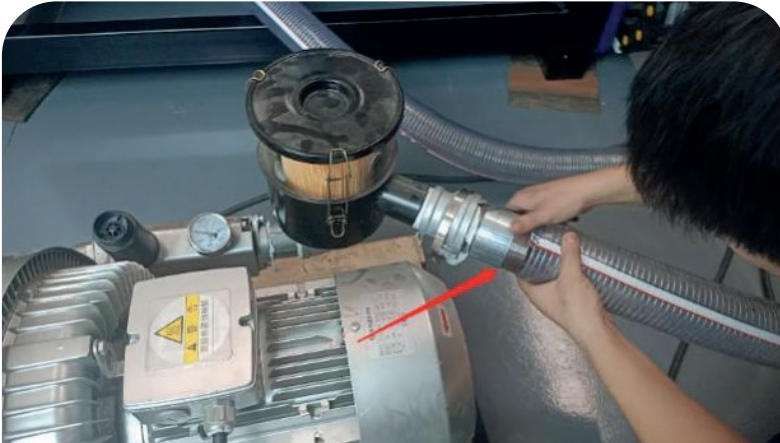
Before disassembling this machine, please read this safety operation instruction carefully. Failure to pay attention to the following instructions may lead to electric shock, fire, and other serious safety accidents. Do not change the factory settings of this machine at will. This machine is for specialized industries. settings, do not use it for purposes outside other industries, as this may cause machine failure; if you have any other questions, please contact us.

1. The machine itself has certain noise and safety hazards. Necessary safety protection measures cannot be ignored. Machine operators must undergo strict training and need to concentrate during operation. Pay attention to personal safety and machine safety during operation.
2. The power supply voltage requirement of the machine itself is 220V/380V. Only professional personnel are allowed to perform electrical installation and maintenance work. Check the grounding condition of the machine, and the power supply needs to be cut off before installation and maintenance.
3. The tools must be installed and clamped to keep the cutter sharp. A dull tool will reduce the quality of the engraving and overload the motor.
4. The size of the processed materials should not exceed the machining range. Please cut off the power when not in use for a long time. There must be professional guidance when moving the machine.
5. Be sure to pass the water before using the water-cooled spindle.
6. Do not put your fingers into the working range of the tool, and do not remove the engraving head for other purposes. Materials containing asbestos must not be processed.
7. Please pay attention to the various warning signs on the machine and make correct judgments.
8. Do not wear clothes that may be entangled in the machine (high-speed rotation of the spindle may cause danger), do not be in the danger zone of the machine, and use the correct tools to complete the corresponding operations of the machine.
9. Avoid damage to the power cord caused by moisture or external foreign objects.

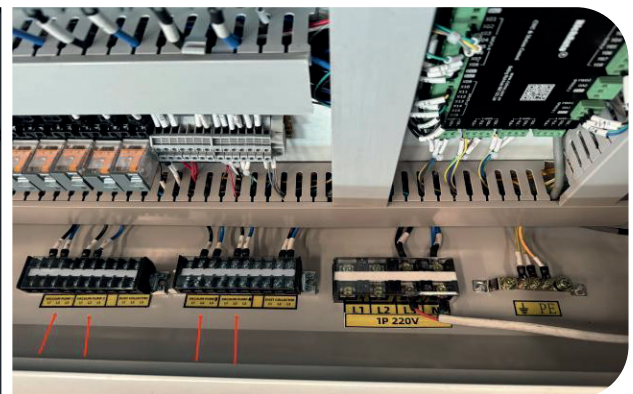
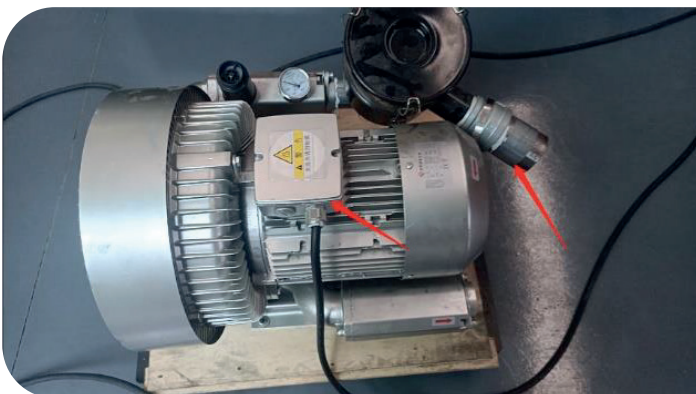
5. Installation Notes

5.1. Vacuum pump installation

1. After receiving the machine, take the vacuum pump out of the package and fix the steel wire pipe at the air inlet of the filter with a tightening tool.



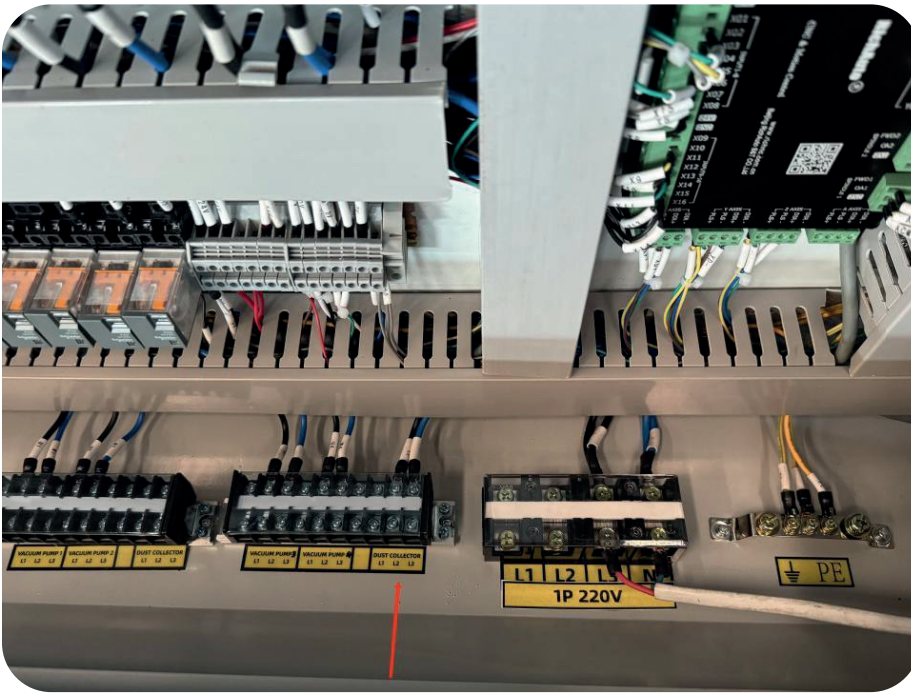
2. Open the cover of the motor connect it to the power supply, and connect the other end to the wiring of the vacuum pump controlled by the engraving machine.



3. Pay attention to the cleaning of the filter during daily use.

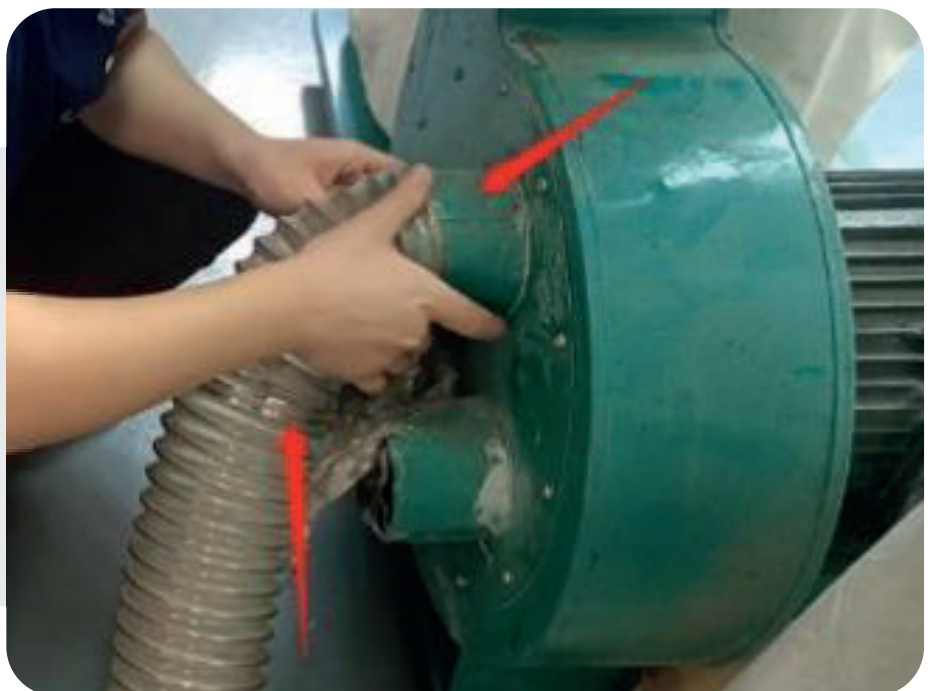
5.2. Dust collector installation

1. Take the dust collector package, install it according to the collector collector instructions, and place it stably.



2. Connect the power supply to the dust collector, and connect one end of the power supply to the electrical box -the connection point of the dust collector.

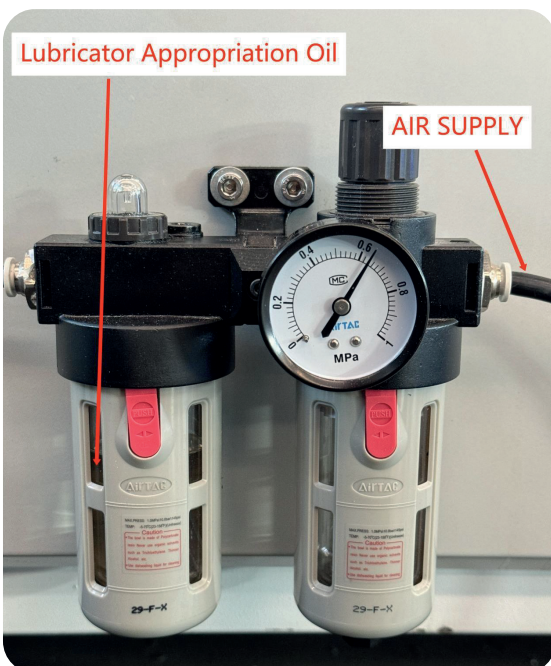
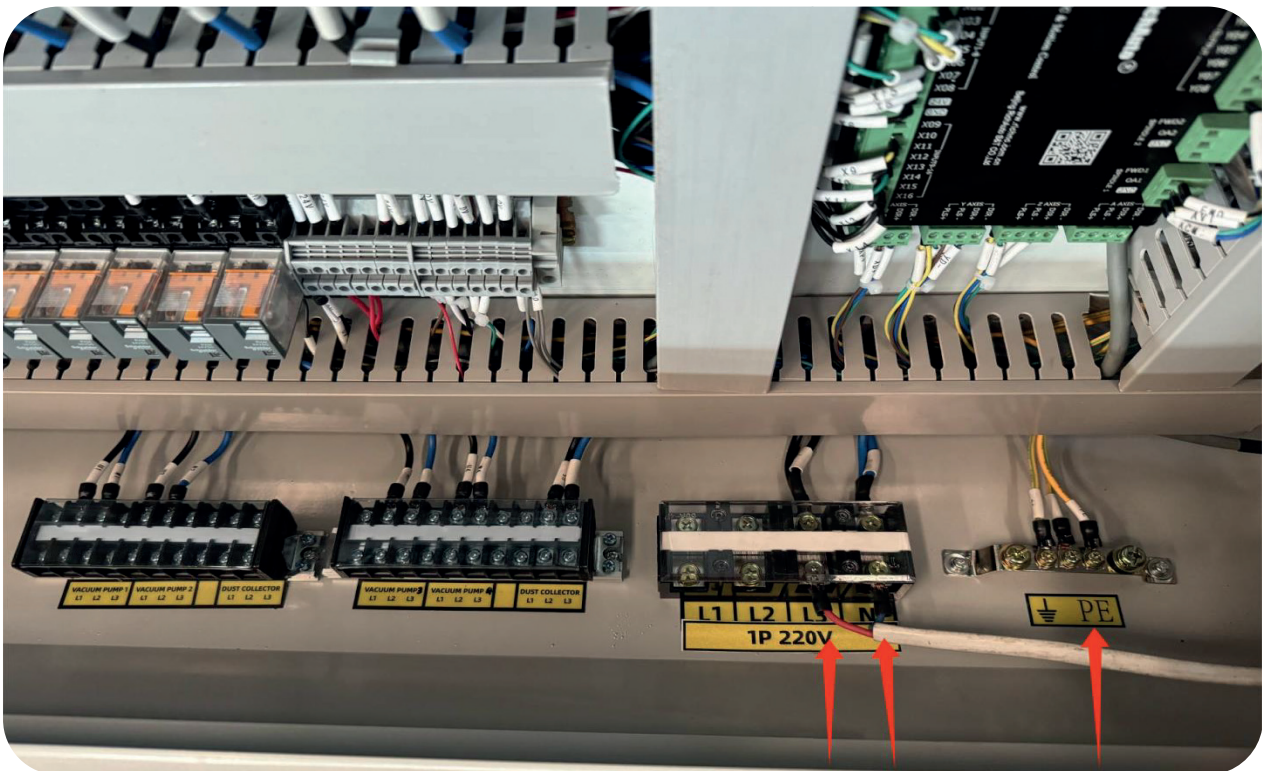
3. Connect one end of the vacuum hose to the machine's dust cover and the other end to the dust collector.



5.3. Power and air supply installation

5.3.1. Power supply

- As shown in the picture (the voltage is subject to the actual order), connect the power supply. Be careful when connecting the power cord. The power cord with wire number L3 is the live wire, the neutral wire is N, and the ground wire is PE. Be sure to check the wire number. Corresponding connection, otherwise a short circuit will occur and burn the machine; the ground wire must be connected.



5.3.2. Air source

The air source should be connected to a clean air source, and the air pressure should be maintained at 0.6-0.8Mpa.

5.4. Installation of other accessories

After all accessories are installed, you need to check whether the accessories are installed correctly and whether the clearance is appropriate.

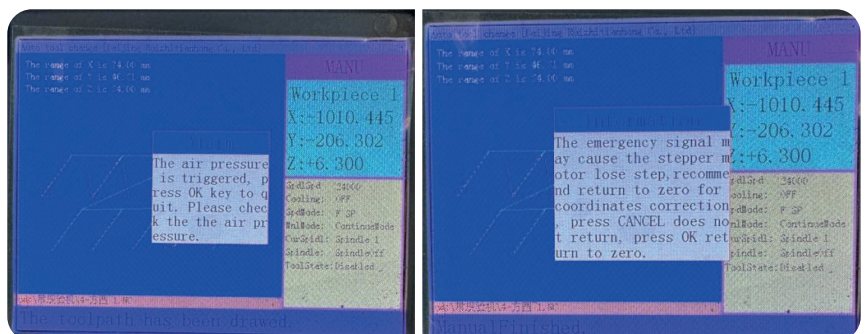


6. Preparation and operating instructions before machine operation



5.5. Check air source

After the air source is connected, the air pressure rises to 0.6-0.8 Mpa (the controller will issue a warning if the pressure is too small or too large).



5.6. Check automatic lubrication

Automatic lubrication will replenish oil every time the machine is turned on and every 240 minutes after startup. Each oil replenishment lasts for 30 seconds. (Please do not turn on and off the power frequently. Automatic lubrication will replenish oil every time the machine is turned on.) The parameters of automatic lubrication are set at the factory when the machine leaves the factory. The time has been set by our technical staff. Please do not change the settings at will. Also, pay attention to regular inspection and cleaning. If you have any questions, please contact us in time.



5.7. Power on

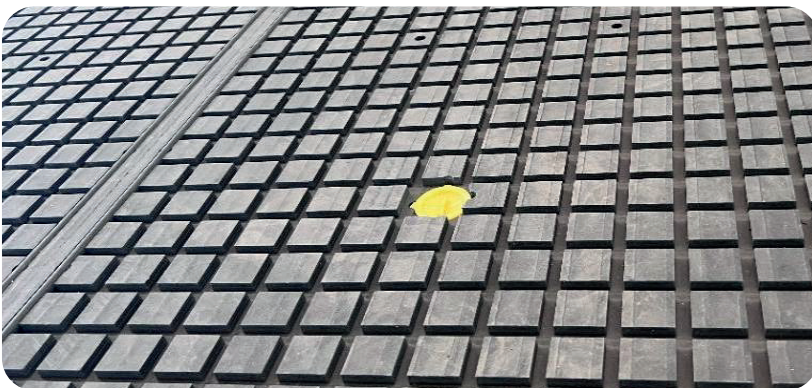
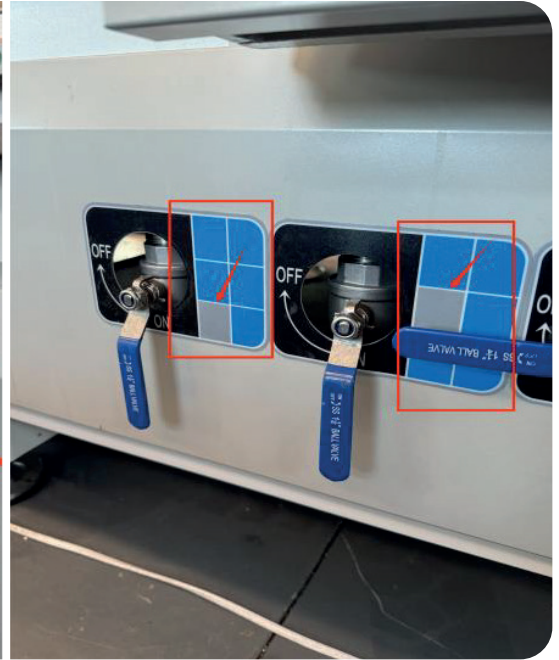
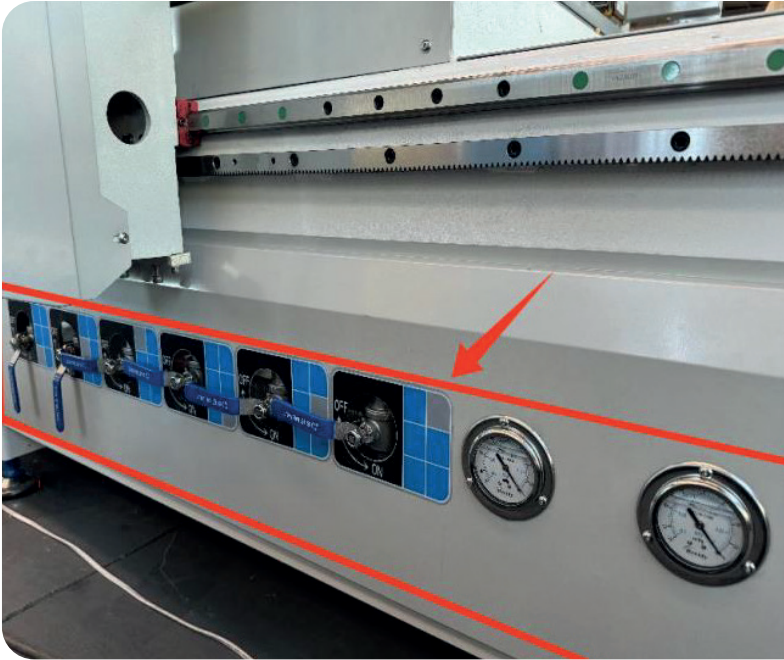
Press the corresponding start button to choose to turn on the required function

*The vacuum pump must be turned on when setting the workpiece/working origin, otherwise there will be an error in the Z-axis height.

Please don't forget to turn it on when returning to work from a break to avoid safety accidents.

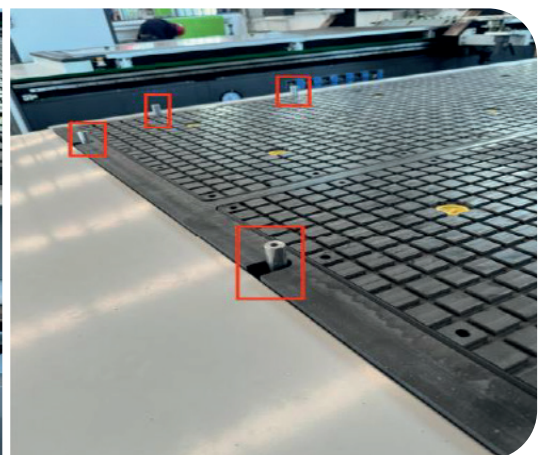
5.8. Material fixation

1. The vacuum table is divided into 6 areas. Each valve corresponds to the corresponding area. The corresponding area can be opened according to the material.



2. Use the negative pressure of the vacuum suction table to adsorb the material to the surface of the vacuum suction table.

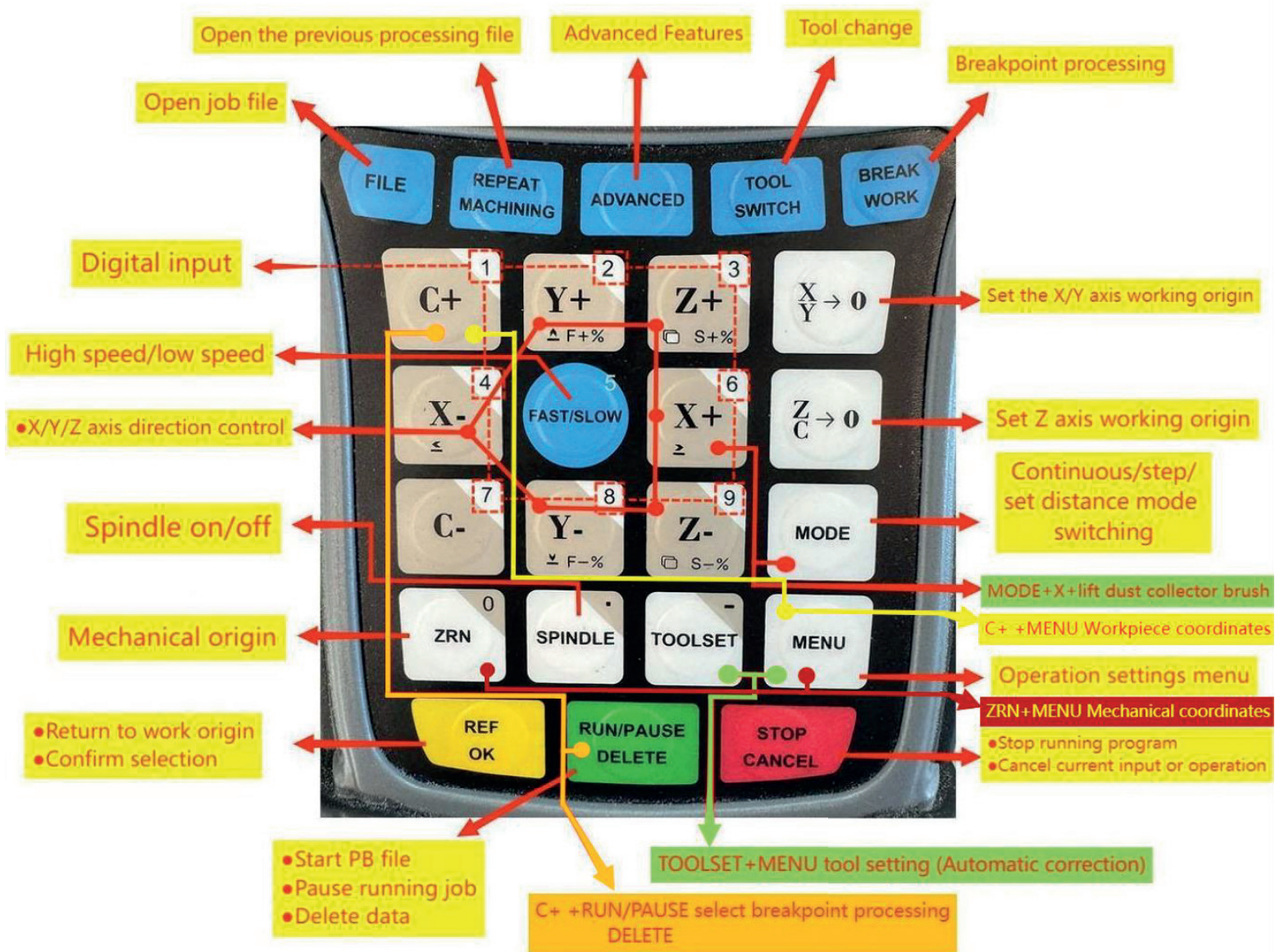
3. Press the fixed cylinder button on the side of the fuselage (next to the controller handle bracket) to raise the fixed cylinder.



6. User interface introduction

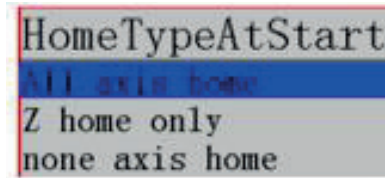
* Because it involves modified parameter settings, here we only introduce some common functions and basic operations of the machine to prevent mis operation caused by introducing too many functions and modifying the set factory parameters. However, this will be used in actual use. Please forgive me for the functions not introduced in this manual. If you need to use the functions not introduced in this manual, please use it with caution according to the actual situation. If you have any questions or suggestions, please contact us in time.

1. Description of handle buttons and commonly used key combinations.



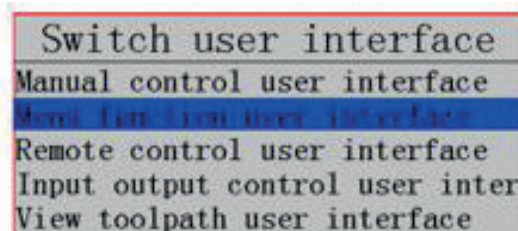
2. Manual Control User Interface

After the system is powered on system prompts “home At Start” at the boot screen to remind you to execute return mechanical origin position operation:



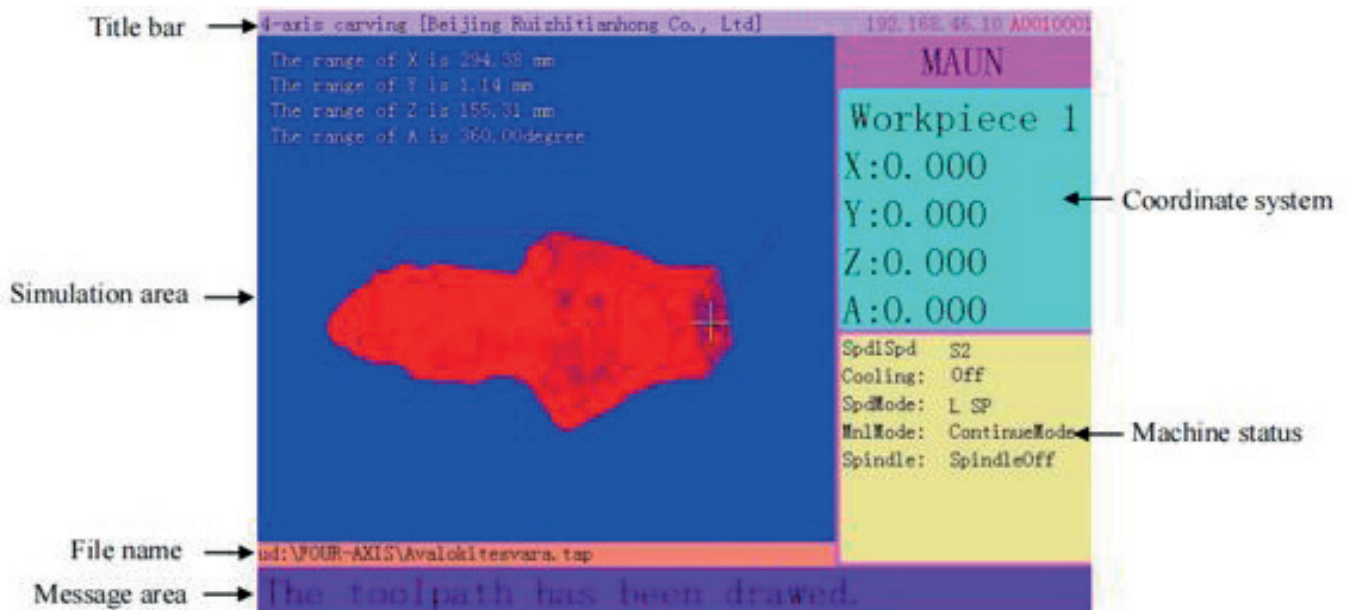
Press “ $Y+^2 / Y-^8$ ” keys to move the cursor and choose one Home type, and then press “REF, ok” key to confirm.

Press “MENU”, the screen prompt “Switch user interface” dialog box:



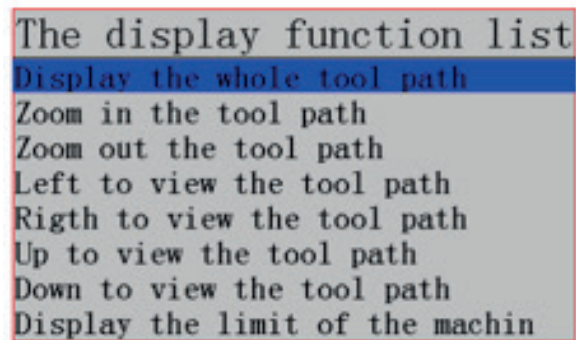
Press “ $Y+^2$ ” or “ $Y-^8$ ” to choose one user interface as you need, and then press “REF, ok” to confirm and access.

MANUAL CONTROL USER INTERFACE



1. **Title bar:** Display system software type (4-axis carving) and company information.
2. **Simulation area:** Display processing file simulation graph, tool path and file size etc.
3. **File name:** Display file name (including file name extension), record location.
4. **Message area:** Display file loading and complete information.
5. **Coordinate system area:** Display the current coordinate system, including machine coordinate system and work coordinate system; there are 1-9 work coordinates system, total 9 work coordinates.
6. **Machine status area:** Display spindle state, speed mode, spindle state, cooling unit state etc.

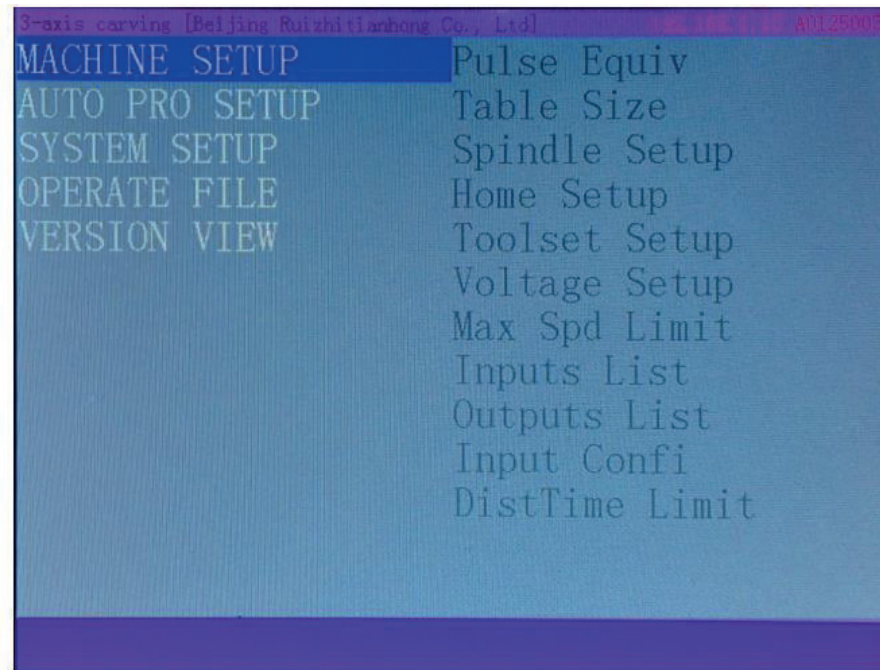
Under the manual control interface, press "STOP, CANCEL" key, screen shows "The display function list", it is convenient for customers to use different ways to view the simulation image of processing file. Function list as shown below:



```
The display function list
Display the whole tool path
Zoom in the tool path
Zoom out the tool path
Left to view the tool path
Righth to view the tool path
Up to view the tool path
Down to view the tool path
Display the limit of the machin
```

3. Manual Function User Interface

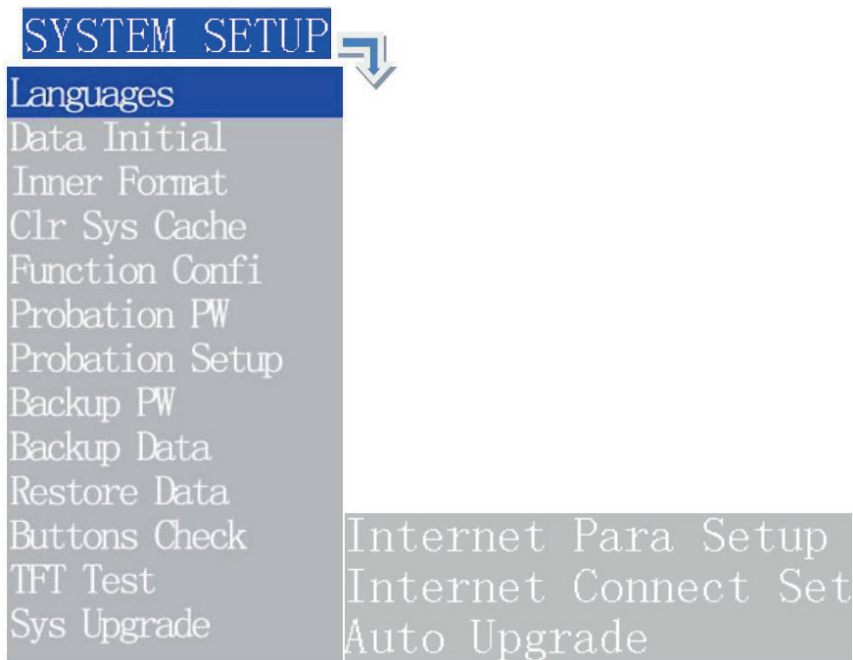
* The parameter configuration menu is used to set hardware-related parameters. The settings have been completed by our technical engineers according to the equipment model. If there is no change in the machine tool hardware, electrical parameters, etc., there is no need to modify them. If you need to modify the parameters, please contact us and modify them under the guidance of the technical engineers.



Menu details: The system menu is divided into 5 primary menus according to its function type: **Machine Setup, Auto Por Setup, System Setup, Operate File, Version View.**

4. System Setup

System Setup menu structure chart

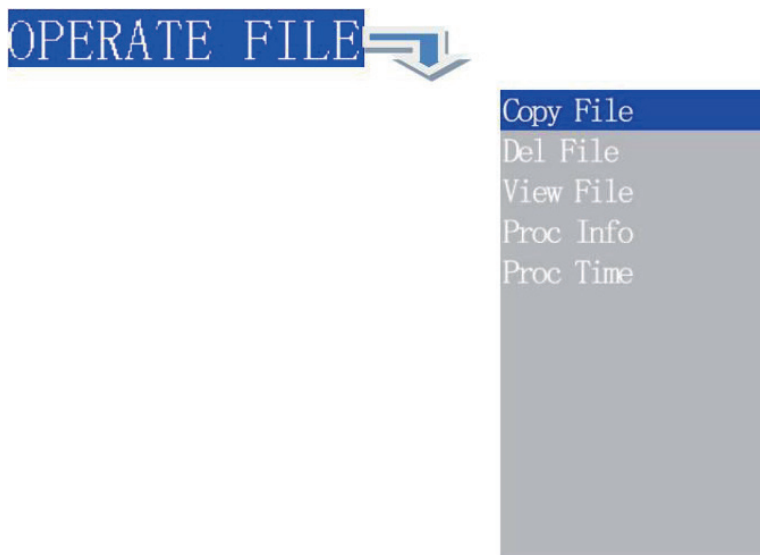


Languages:

Change system language display, users can choose Chinese or English.

5. Operate File

Operate File Menu Structure Chart



(1) Copy File:

Copy files from U disk to inner space.

(2) Del File (Delete File):

Delete system internal files.

(3) View File:

View the files and G codes of the U disk or inner.

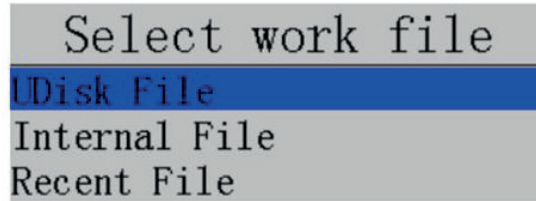
(4) Proc Info (Processing Information):

When the system powers on, it will show statistically the times of successful processing by file name, if the system powers off, the data will disappear.

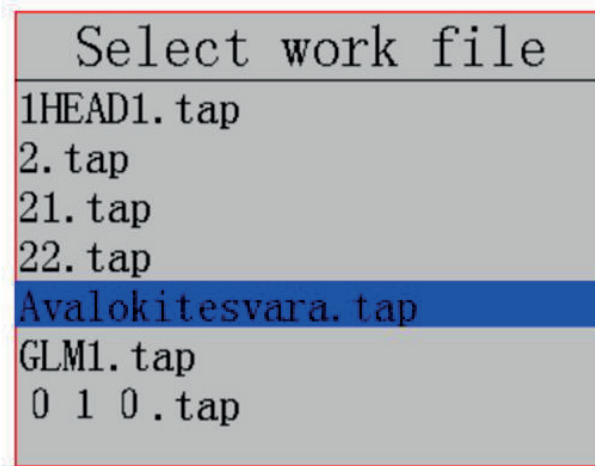
(5) Proc Time (Check Processing Time):

Calculate processing time according to work speed, after reading G codes, the screen will display the processing time, and different work speeds corresponding to different processing times.

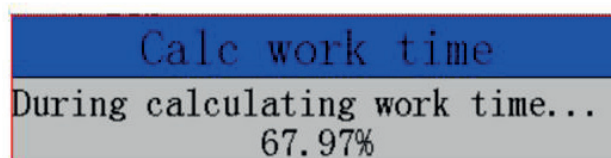
Operating mode: Press "Ref, ok" to enter "Proc Time", the screen shows:



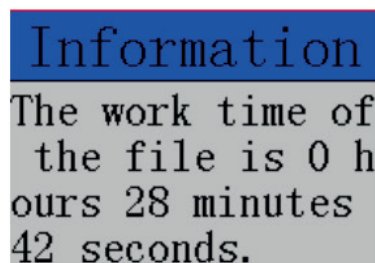
Press "Y+2" or "Y-8" key and select from the options, after that, the screen shows:
 $\Delta F + \%$ $\underline{Y} F - \%$



Press "Ref, ok" key to enter and select the processing file required to be calculated, and then press "Ref, ok" key, the screen shows:

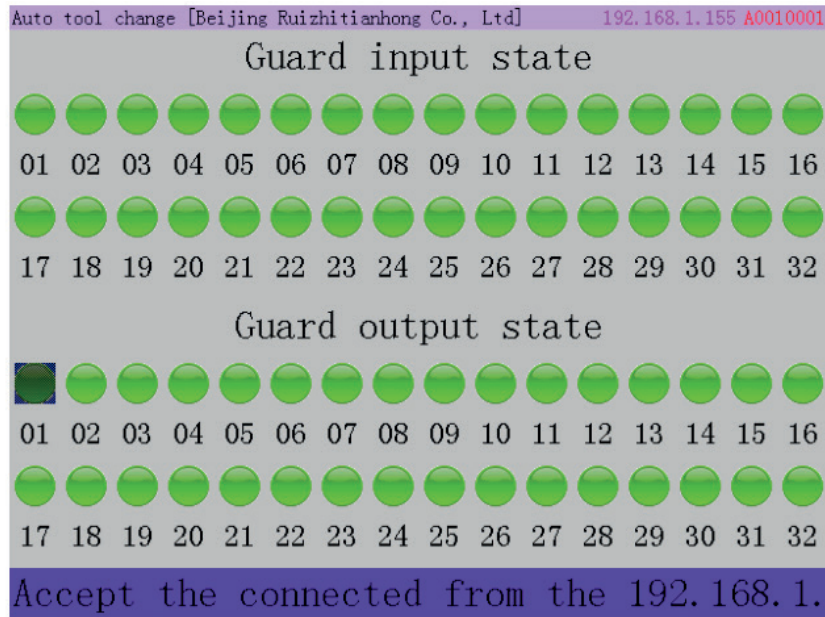


Screen will show processing time:



* **Note:** Please pull out the U disk correctly after copying files from the computer, to avoid the risk for the controller can't recognize the U disk.

6. Input output control user interface



1) Guard input state:

- 2) The stepper wiring board has 16 status indicators which are corresponding to the X01~X16 port of the wiring board INPUT SIGNAL terminal.
- 3) Indicator 01 is X01-X axis HOME signal (Mechanical origin);
- 4) Indicator 02 is X02-Y axis HOME signal;
- 5) Indicator 03 stands for X03-Z axis HOME signal;
- 6) Indicator 04 stands for X04-Auto tool sensor signal; Or A axis HOME sensor on 4 axis system (B58)
- 7) Indicator 05 is X05 input signal to be defined, or tool sensor signal on 4 axis system (B58)

Input terminal debugging: Normally the lights display in green which means the signal has not been triggered; The lights turn to red when the input signals are triggered. However, if corresponding indicator light stays in green while the input signal is triggered. User should check the problem of corresponding signal sensor, circuit and the wiring board.

2) Guard output state:

There are 8 output ports on the stepper wiring board, while 16 output ports on the servo wiring board. Each output port is corresponding to the indicator light No. 01(Y01) to 16(Y16).

Indicator 01 stands for Y01-Spindle ON/OFF;

Indicator 02 stands for Y02-multi-step spindle speed 1;

Indicator 03 stands for Y03-multi-step spindle speed 2;

Indicator 04 stands for Y04-multi-step spindle speed 3;


The remains indicator lights are to be defined.

Press "RUN/PAUSE, DELETE" key can change the indicator status (color). Thus, user can manually control the corresponding output port signal status. Press " $X_{\pm} + 6$ ", " $X_{\pm} - 4$ " keys to move to left or right; then press "RUN/PAUSE, DELETE" key to modify corresponding light status. E.g.: The cursor stays at 01 indicator, press "RUN/PAUSE, DELETE" it turns red from green; spindle starts.

Tool path user interface

Auto tool change [Beijing Ruizhitianhong Co., Ltd] 192.168.1.155 A0010001

The range of X is 66.52 mm
The range of Y is 45.11 mm
The range of Z is 2.00 mm



```
1:N0 G0 X8.070 Y43.482
2:N1 G1 X8.070 Y43.482
3:N2 G1 X8.045 Y43.378
4:N3 G1 X8.390 Y43.378
5:N4 G1 X8.685 Y43.283
6:N5 G1 X8.705 Y43.274
7:N6 G1 X8.020 Y43.274
8:N7 G1 X7.996 Y43.170
9:N8 G1 X8.953 Y43.170
10:N9 G1 X9.166 Y43.066
11:N10 G1 X7.971 Y43.06
12:N11 G1 X7.950 Y42.98
13:N12 G1 X7.944 Y42.96
14:N13 G1 X9.379 Y42.96
15:N14 G1 X9.544 Y42.88
16:N15 G1 X9.581 Y42.85
17:N16 G1 X7.908 Y42.85
18:N17 G1 X7.872 Y42.75
19:N18 G1 X9.745 Y42.75
20:N19 G1 X9.909 Y42.65
21:N20 G1 X7.836 Y42.65
22:N21 G1 X7.801 Y42.54
23:N22 G1 X10.072 Y42.5
24:N23 G1 X10.127 Y42.5
25:N24 G1 X10.212 Y42.4
26:N25 G1 X7.765 Y42.44
```

Accept the connected from the 192.168.1.

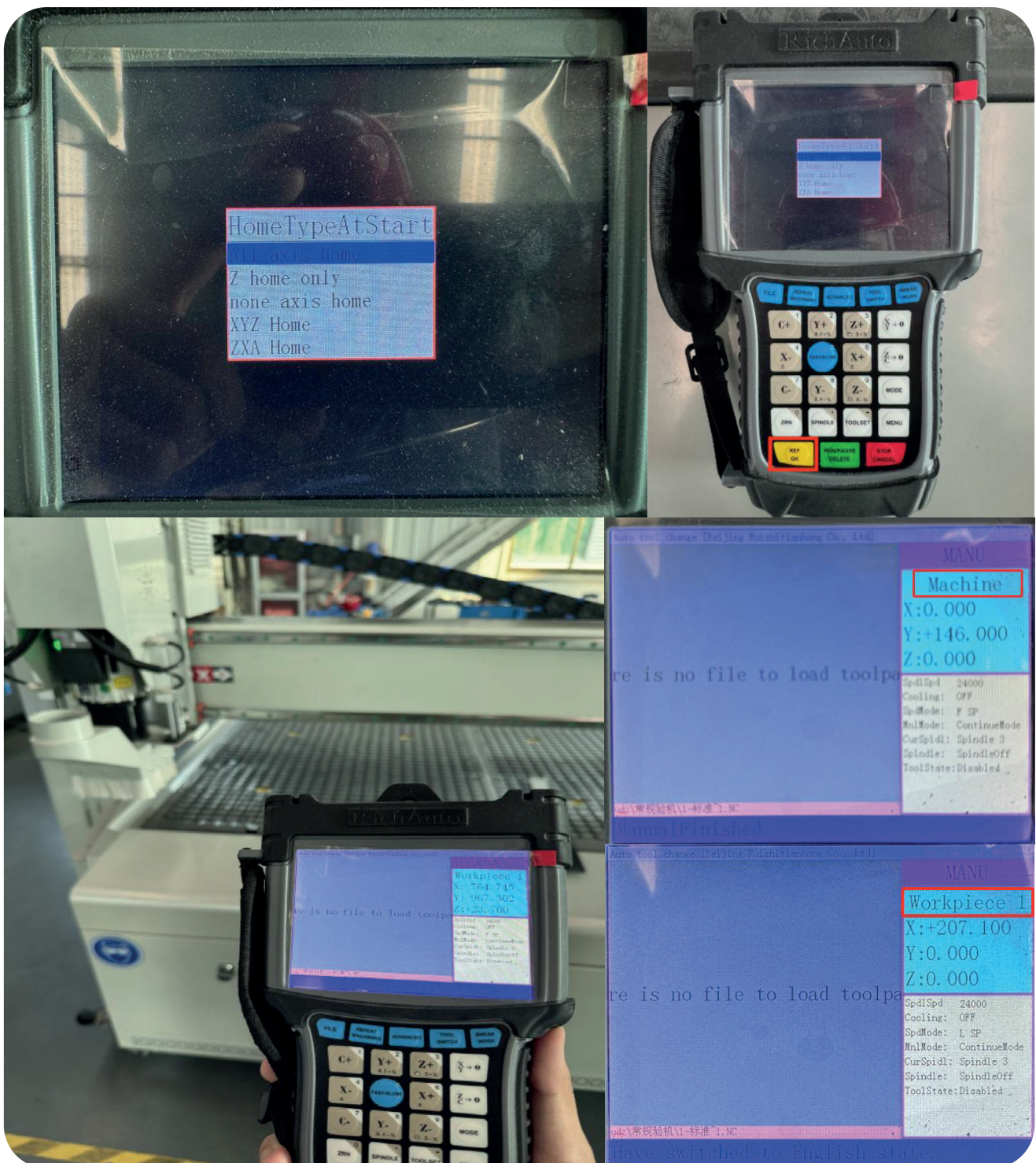
1. In this interface, user can preview simulation drawing, X/Y/Z/A axis machining range and the G code of the processing file.
2. In the g code viewing, press number buttons“2”or“8” to move up or down line by line.
3. Press number buttons“3”or“9”to move page by page.
4. Press number buttons“4”or“6” to switch from G code head to the end.
5. Press combination buttons “MODE”+ number buttons“2”or“8”to view top and bottom of the work path.
6. Press combination buttons, “MODE”+ number buttons“4”or“6” to view left and right side of the work path.
7. Press combination buttons, “MODE”+ number buttons“3”or“9”zoom in or out.

7. Machine Operation

1. Power on and return to origin

Every time you turn on the machine, you must press the confirmation button to return to the origin, and wait for each axis of the machine to return to the mechanical origin, otherwise the limiter will fail. (If you do not return to the origin, the machine will continue to move beyond the maximum stroke, which may easily cause safety accidents!)

*Machine is the mechanical coordinate and Workpiece is the workpiece coordinate.

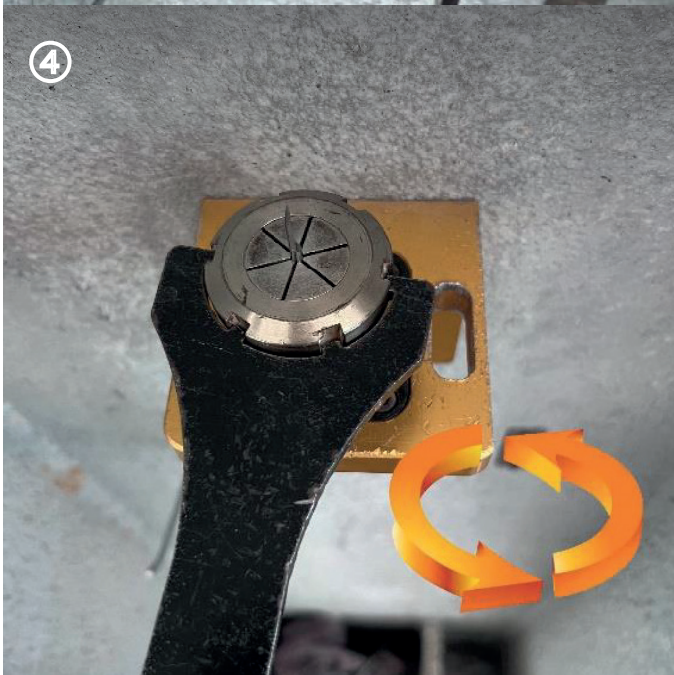


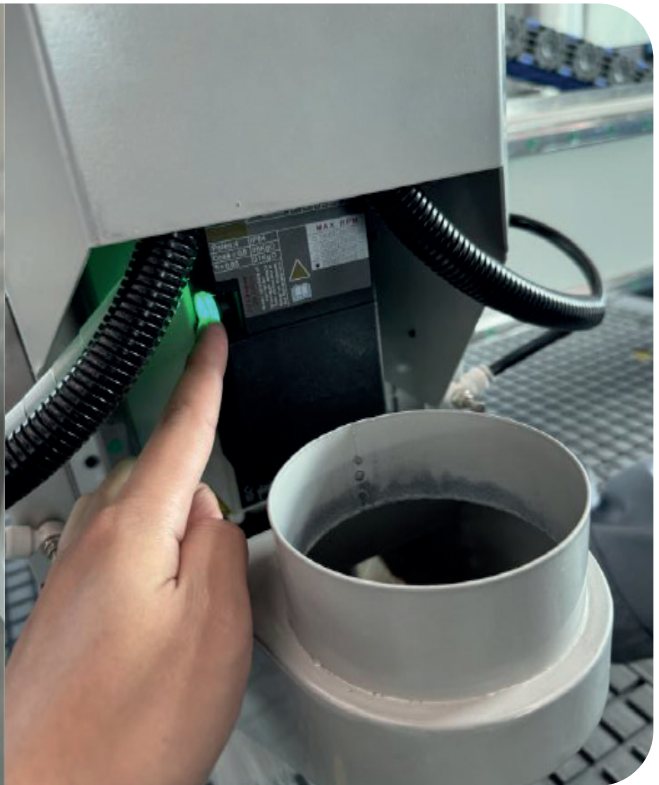
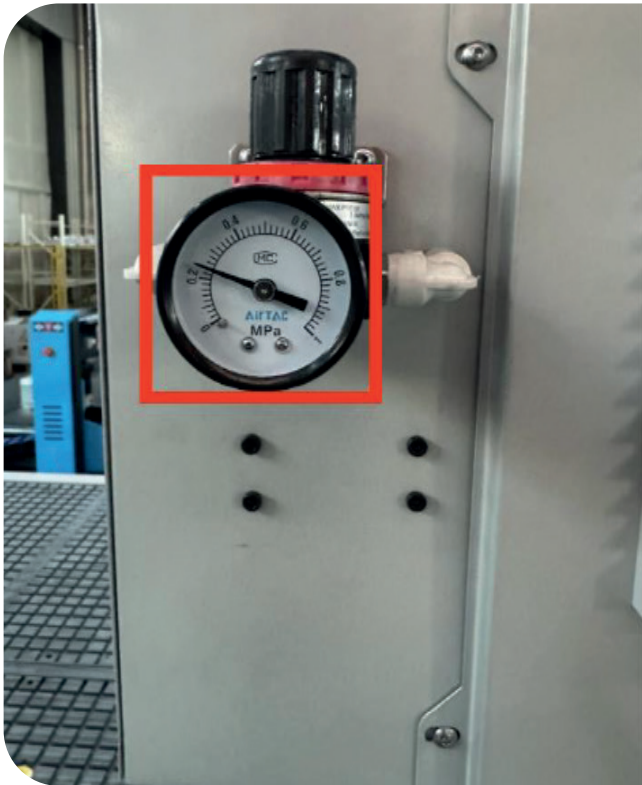


2. Change tool

(1) How to use the lock knife holder

The locking tool holder is used to fix the tool changer handle to facilitate the removal of the tool on the tool handle. Place the tool changer tool handle upside down in the tool changer lock seat and use a spindle wrench to rotate counterclockwise to remove the nut on the tool changer tool handle.





(2) Manual tool change

The air pressure should be 0.2-0.4MPa and should not be too high or too low. Press the green manual tool change button to change the tool. If the brush does not rise, press **MODE+X+** to lift the vacuum cleaner brush.

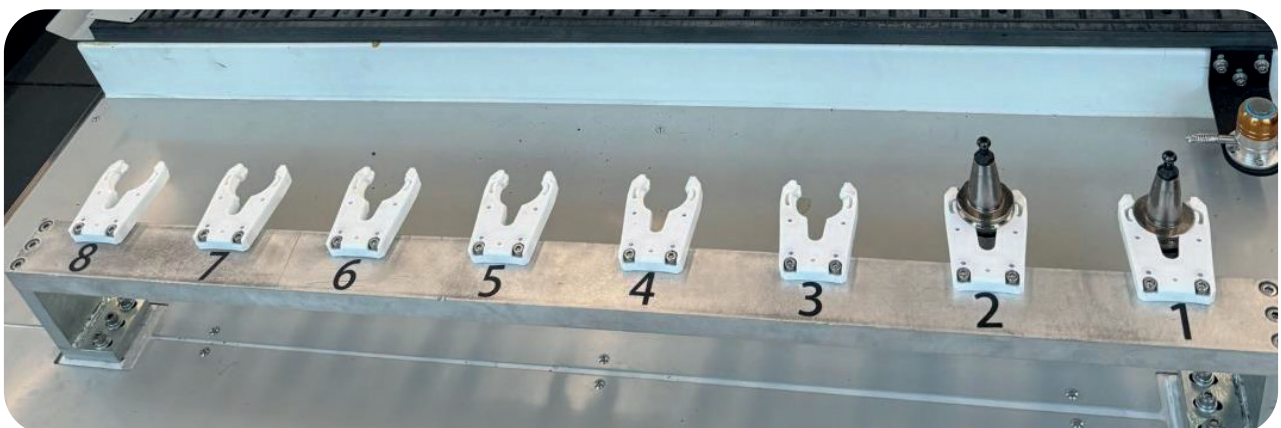


(3) Changing tools using the controller

Press the **"TOOL SWITCH"** key to select the tool and press the **"REF OK"** key to select the required tool (*Please pay attention to the spindle tool currently used to avoid repeatedly placing the tool on the tool holder, thereby damaging the machine. For example: currently using tool No. 3, Tools should not be placed in tool holder No. 3 of the tool magazine.)



The spindle will move to the tool library for switching according to the selected tool (the tools that come with the machine must be installed according to your needs. We recommend placing commonly used tools in tool holder No. 1. If used in combination, use 1+2 tool holders or 1+ Tool holder No. 3 is based on tool No. 1; when a single tool is used for processing, tools 1-8 can be used arbitrarily)



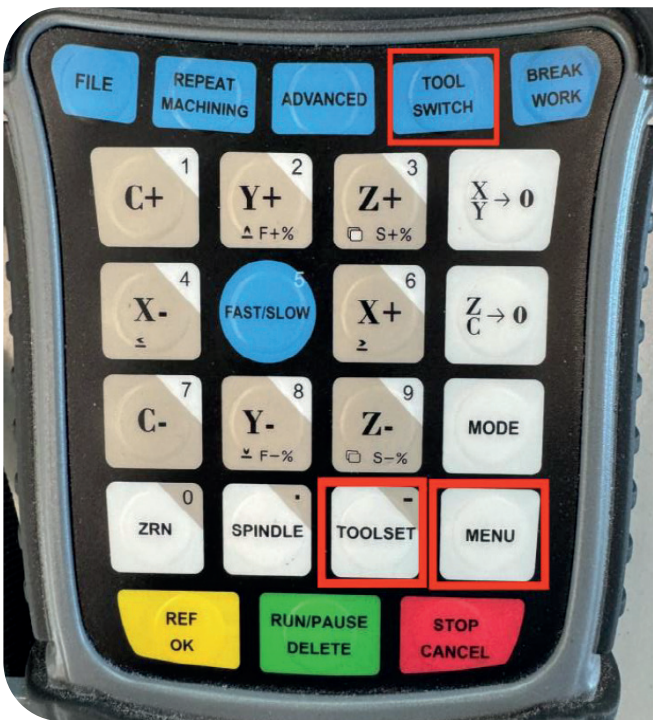
3. Tool setting

The system uses the **"TOOL SET"** + **"MENU"** key combination to calculate the tool Z-direction compensation value.

After the initial plane tool change position is set, Z-direction compensation settings for each tool need to be performed. When performing tool Z-direction compensation, the system compares the Z-direction compensation values of different tools by grabbing a tool and calibrating the tool once. Tool switching and tool setting operations require manual switching.

*Note that the No. 1 tool is used as the basis.

① Switch the current tool to tool No. 1, press **"TOOL SET"** + **"MENU"**, the system will automatically move tool No. 1 to the position of the tool setting table, lower the Z-axis to perform the tool setting action, lift the Z-axis after the tool setting is completed, and move the machine tool to Start tool setting point.



② Press the "TOOL SWITCH" key to switch the current tool to tool No. 2, and press the "TOOLSET" + "MENU" key combination to perform the Z-direction compensation calculation of tool No. 2.

③ Switch to the remaining tools in turn to complete the Z-direction compensation calculation for each tool.

After the tool Z-direction compensation setting is completed, if a tool in the tool magazine is replaced, you only need to switch to the tool separately and perform the Z-direction compensation calculation of the tool separately. If the tool is not replaced, there is no need to perform it.

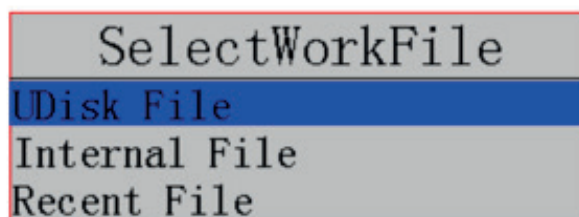
4. Load processing file

Before processing, processing files must generally be loaded according to processing requirements. There are two ways to load processing files: U disk loading and internal loading.

- * Due to different languages and regions, the "G code file" editing software used is also different, so the "G code file" editing method will not be explained here. Please contact us if necessary.



1) Directly import the processing file into U disk, and then run with the U disk inserting in the controller. Press "FILE" key, screen shows:



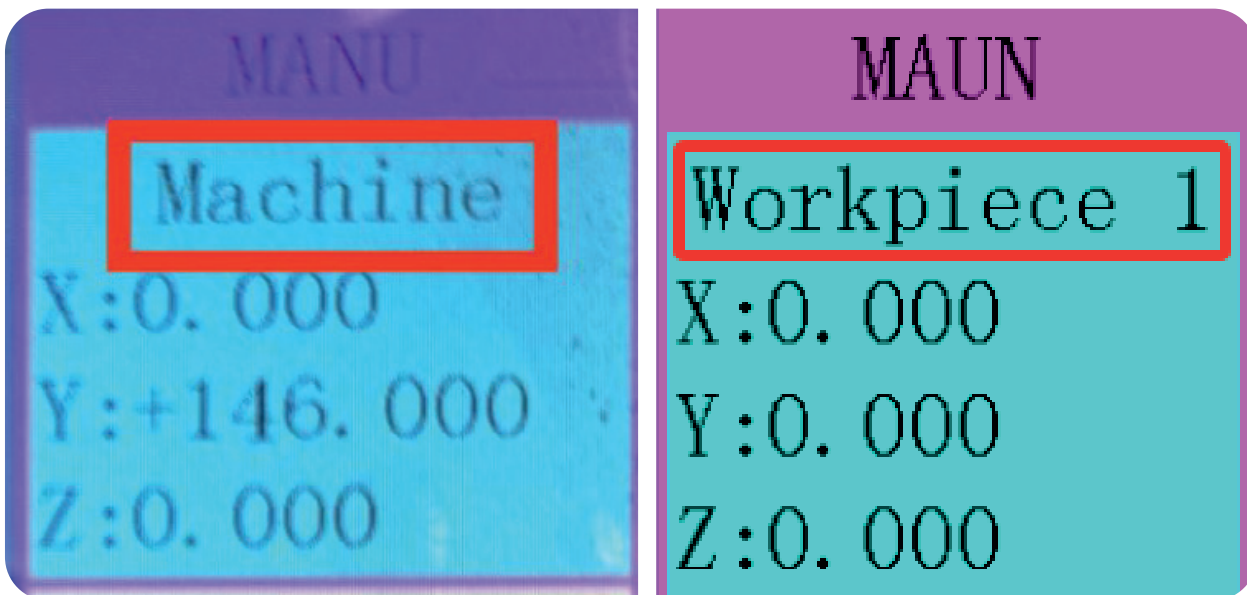
Select the file you need and press "REF/OK" key.

2) Copy the files to handle internal storage area from U disk, and then run the inner file without U disk inserting. After checking the processing file code and drawing path, the screen will show the simulation image of the loaded processing file.

5. Switch between machine coordinates and workpiece coordinates

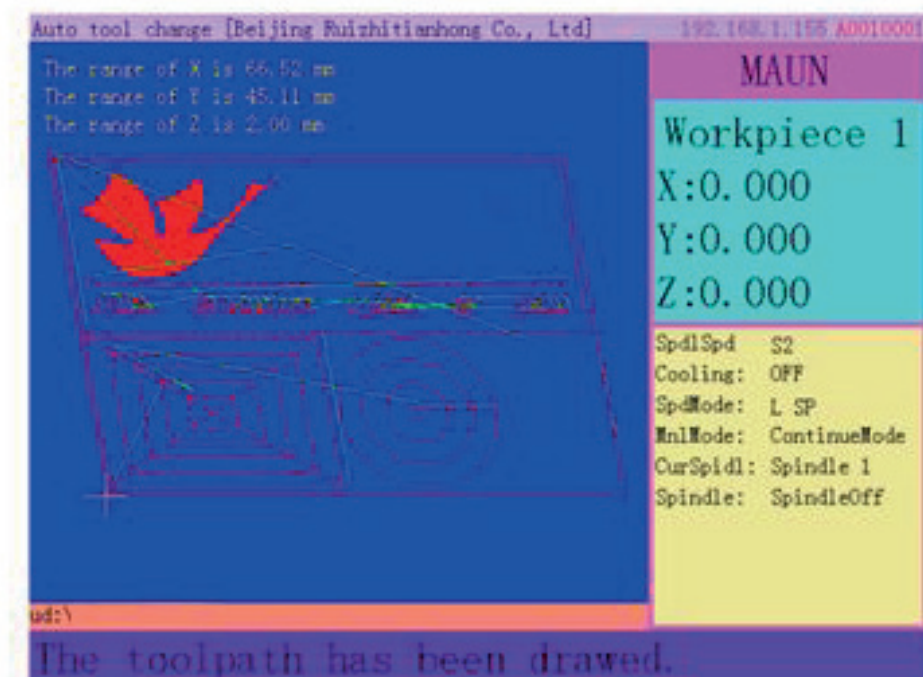
Press "C+" + "MENU" to switch to workpiece coordinates

Press "ZRN" + "MENU" to switch to workpiece coordinates



6. Manual Operation

Manual Operation refers to move the machine tool by pressing the direction key on the keypad. User can change the running speed and set the grid (step distance) in manual mode. System will enter Manual Operation state after returned HOME, and the screen displays:



(1) Manual speed switching and adjustment

1. Speed mode switching

There are 2 speed mode-Fast/Slow speed switching. Press "5 FAST/SLOW" to switch the mode.

E.g.: Suppose the current speed mode is "H SP", press down "5 FAST/SLOW", the screen will change to "L SP" mode. The speed mode status show on screen determines the actual manual moving speed.

2. Speed adjusting

Press "MENU"--"Menu function user interface"--"Auto Pro Setup"-- find "Manual Speed & Grid speed"--"Low Manual Speed" and "High Manual Speed", the screen displays as below:

Unit: MM/ETSec		Unit: MM/ETSec	
XSpeedOfSlow	1200.000	XSpeedOfFast	3000.000
YSpeedOfSlow	1200.000	YSpeedOfFast	3000.000
ZSpeedOfSlow	1200.000	ZSpeedOfFast	3000.000
ASpeedOfSlow	1200.000	ASpeedOfFast	3000.000

The cursor stays at "X SLOW", press " $\overset{\Delta}{Y}+2$ ", " $\underset{\nabla}{Y}-8$ " key and move to the option to be modified and then press "RUN/PAUSE/DELETE" key, the screen prompts:

Input number
3000.00

Enter required value, after that press "REF/ok" key to confirm; Press "STOP/CANCEL" key exit. If there is an error in the inputted value, press "RUN/PAUSE / DELETE" to delete from the last digit, then enter correct value.

High speed mode setting method is the same to low speed mode.

(2) Manual movement modes

To meet the requirements of manual movement in different situations, the system provides 3 manual movement modes: Continue, step, distance. User could press "MODE" under manual mode to switch manual movement mode and view the current movement mode at the "Machine status display area" of the screen.

1. Continue motion mode (Continuous motion mode)

This model has no specific data control, user could press motion direction keys: (" $\overset{\Delta}{X}+6$ ", " $\underset{\nabla}{X}-4$ ", " $\overset{\Delta}{Y}+2$ ", " $\underset{\nabla}{Y}-8$ ", " $\overset{\Delta}{Z}+3$ ", " $\underset{\nabla}{Z}-9$ ", "C +1", "C - ").

The machine continues to move until the direction keys are loosened. The motion speed is determined by current manual speed mode.

2. Step motion Mode

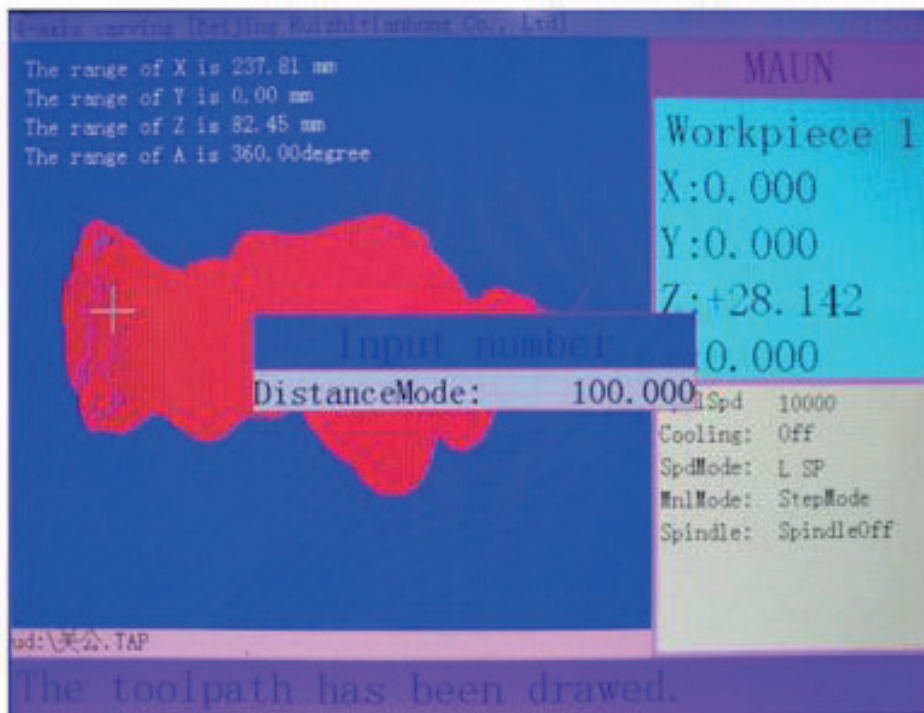
In step mode, machine moves 1 grid every half second. The grid distance is determined by the current speed mode. H SP moves 0.5mm/step, L SP move 0.1mm/step.

Step mode is suitable for fine adjusting the tool bit or position of the mechanical coordinate.

3. Distance motion mode (Fixed distance motion mode)

In Distance mode, the movement depends on the distance value you've set. The machine will move fixed distance (A axis moves by angle) when user presses the direction keys ("X +6", "X -4", "Y +2", "Y -8", "Z +3", "Z -9", "C +1", "C -7").
△ F+% ▽ F-% □ S+% □ S-%

Modification method: Press "MODE" key and switch to Distance motion mode, the screen shows as below:



Enter in the required distance value and press "REF/ok" key to confirm.

-
- * Note: The distance mode is not affected by the step mode grid setting, it means that the machine moves accurately at the set distance (A axis moves by angel), it won't move to the grid point. If the distance value (A axis is angle value) needs to be change, just press "MODE", key three times to enter into the distance mode again, then input new value (A axis is angle).

7. Auto processing operation

Auto processing means the system processes the file in a U disk or inner storage space according to the instructions. It is also called "file processing." Before auto-processing, the user should correctly set the machine tool and system parameters. Auto-processing steps refer to the following content.

* Please, secure the material before proceeding with the operation!

(1) Set work origin

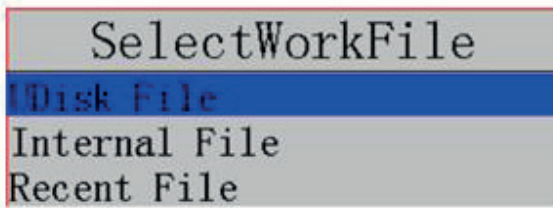
The origin point of X, Y and Z axis in processing file is work origin. Before processing, we should associate that position with the actual location, operate as below:

Manually move X, Y and Z to the position where will start to process the file on material. Afterwards, press " $\overset{X}{Y} \rightarrow 0$ " to set X and Y work origin position. Do the same way to Z and A axis, press " $\overset{Z}{C} \rightarrow 0$ " key so that the system saves the Z and C work origin position.



(2) Load processing file

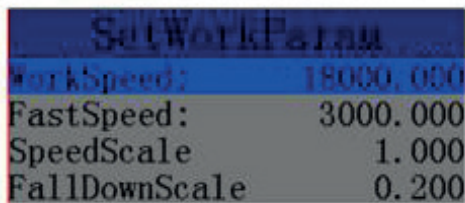
After determined the work origin, press: "FILE" key, the screen shows:



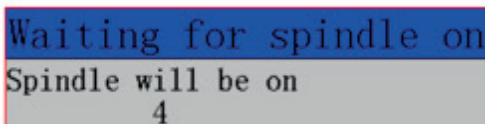
Select required file and then press "REF/OK" key.

(3) Set Auto processing parameters

1) After loading the processing file, press "RUN PAUSE/DELETE" key, prompts a list of auto processing parameters settings:



- 2) User can modify the work parameters, including work speed, fast speed, Speed scale, fall down scale and HW (handwheel guide).
- 3) Modification method: Press " Δ F+%" , " ∇ F-%" , Key to move the cursor to different items, press "RUN/PAUSE / DELETE" key and input new value, and then press "REF/ok" key to confirm the changes. After all options have been modified, press "REF/ok" key, and wait for the spindle start:



5) The system starts to process after the spindle start rotating. During machining, the machining status can be viewed at the machine status area, which contains work speed, work time, file line No., G codes etc. Press "MENU" key to switch the information in machine status display area.

8. Operations during processing

(1) Speed ratio & spindle state adjusting

1) Speed ratio adjustment

During processing, press "Y + 2", "Y - 8", adjust the speed ratio.

The speed ratio increase/decrease 0.1 each press on "Y + 2", "Y - 8", key.

Speed scale (speed ratio): max. is 1.0; min. is 0.1, speed values are also change accordingly except for the time.

Current processing speed = work speed * speed scale

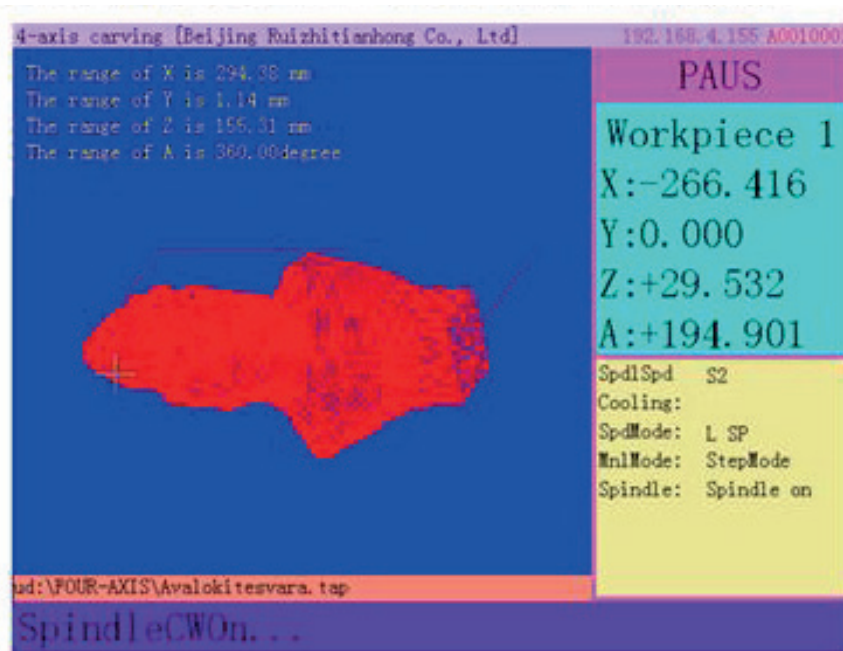
2) Spindle state Adjustment

If user has set multi step speed function, the multi-step speed can be adjusted during processing.

Press "Z + 3", "Z - 9", key to adjust spindle speed from S1 to S8. Each press on "Z + 3", key, the spindle speed increases 1 stage until it reaches S8; Each press on "Z - 9", key the spindle speed descends 1 level until it reaches S1.

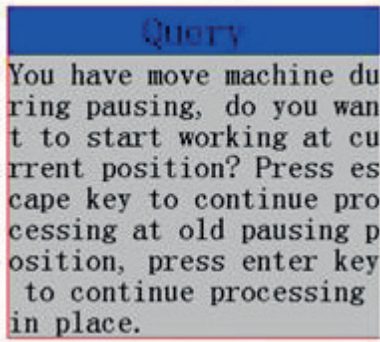
(2) Pause & position adjustment

Pressing "RUN/PAUSE / DELETE" key to pause processing. The top right corner of the screen will change from "MAUN" to "PAUS" and machine suspends processing except for the rotating of spindle. Shown below:



At this moment, the user is allowed to adjust the position of X, Y Z and A axis. The system default manual motion mode is STEP. So that user can fine adjust each axis distance (A axis moves by angle). Machine moves one low or high speed grid distance every step.

When the adjustment is finished, press " RUN/PAUSE/DELETE "again, screen shows:

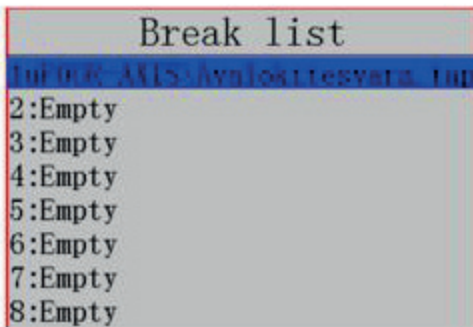
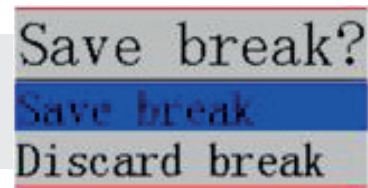


The system asks the operator to confirm whether to save the modified position or not. Press: "REF/ok", "RUN/PAUSE/DELETE", key the system will start processing at modified position; Press "STOP/CANCEL", key the system will start processing at suspend position (before modifying).

(3) Breakpoint processing & power failure recovery

1. Breakpoint processing

If user wants to stop machining during processing, press "STOP/CANCEL", key the screen shows as below:



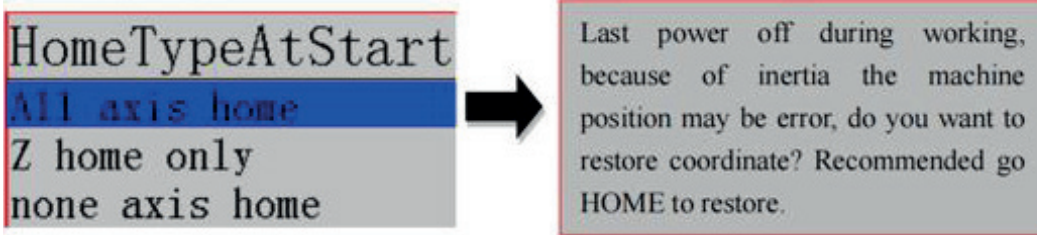
If the stop position has to be saved, user should press "REF/OK", key the screen displays break list (From breakpoint 1 to 8).

Press "Y +2", "Y -8", move the cursor and select, and then press "REF/OK", key to save, system automatically move to work origin. If the user wants to continue processing from the breakpoint, could press the combination keys ("RUN/PAUSE / DELETE" + "corresponding number") keys. First, keep pressing the main function key "RUN/PAUSE / DELETE" and then press corresponding number key, afterwards, release them at the same time, the system will resume processing from the relative breakpoint.

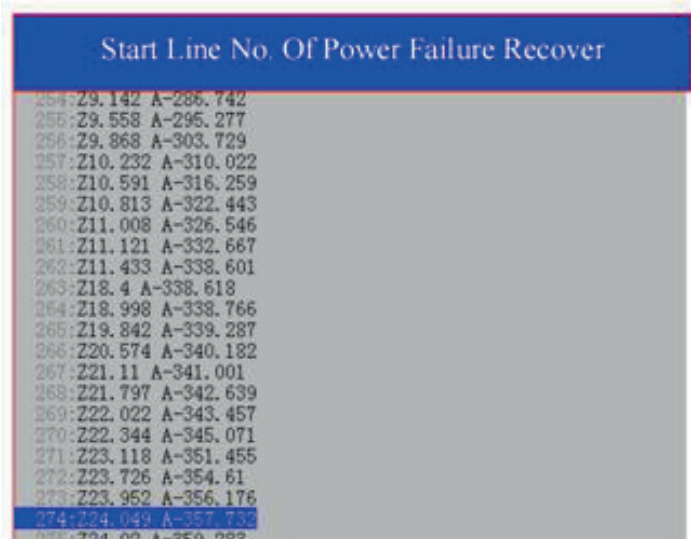
E.g.: To restore from breakpoint 7, press "RUN/PAUSE / DELETE" + "C-7", key press and hold the "RUN/PAUSE / DELETE" and press "C-7" key, the release them together, the system will be processing form breakpoint 7. If the user wants to process from the other g code line where is ahead the breakpoint, shall press "RUN/PAUSE / DELETE" and enter new line no. and then press "REF/OK" key, the system will start to process at the new line. The system must have an action of returning HOME (mechanical origin) during the period of saving breakpoint and before machining.

2. Power of protection

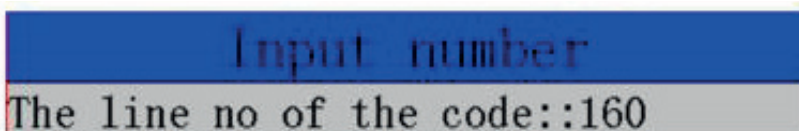
When there is a sudden power failure during processing, system will save current coordinate and parameters and continue the processing when the power is electrify again. After power on, system must return **HOME at once**. Then the screen will prompt:



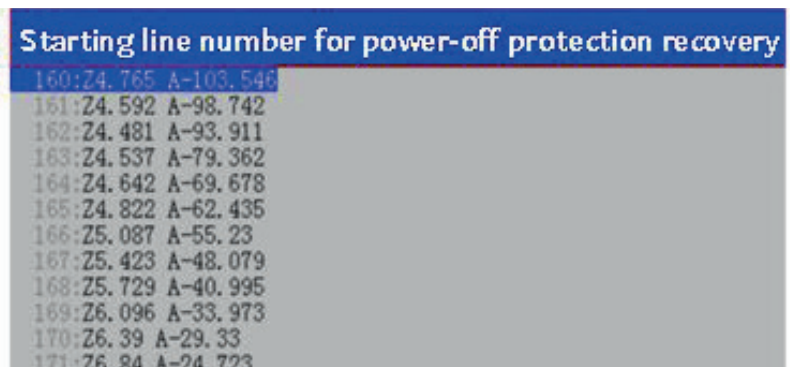
Press "REF/OK" key to continue the unfinished processing, the screen will show stop line, shown as below.



The line number can be chosen. press "RUN/PAUSE / DELETE", the screen pops up:



Enter the line number to be backwards from current position and then press "REF/OK", the operate method is the same to what has mentioned in breakpoint processing. G code cursor will jump to the new line location:



Press "REF/ok" key the system will start processing from the new line.

* Regarding advanced functions, because some commonly used functions can be used through key combinations, and some functions may not be used in actual production, we will not go into details here. If you have any questions or suggestions, please contact us.

Appendix: Controller Operating System Troubleshooting

1. Solution to the fault message prompted on the controller screen

1.1. "The screen flickers or automatically restarts" after the controller is powered on.

Situation analysis and solutions:

1.1.1. The machine tool switching power supply is insufficient. Check whether there is any problem with the switching power supply, which can be solved by replacing it with a high-quality one.

1.1.2. The local power grid is unstable. Detect whether the local power grid voltage is unstable and add a voltage-stabilizing filter device to solve the problem.

1.1.3. The controller power chip is aging.

1.2. The handle cannot be cleared to set the workpiece origin during regular operation.

Situation analysis and solutions:

1.2.1. It may have entered the mechanical coordinate system due to misoperation. The problem can be solved by switching back to the first working coordinate system through the key combination "Menu" + "1".

1.2.2. If the keyboard keys are not working, go to the menu-menu function configuration-system parameter configuration-keyboard detection to check whether they are normal.

2. Frequently asked questions during operation

2.1. After processing is completed, the size of the processed file does not match the actual set size.

Situation analysis and solutions:

2.1.1. The pulse equivalent in the handle does not match the actual pulse equivalent of the current machine.

*All machine parameters have generally not occurred. If this occurs, please get in touch with us to obtain the correct value and modify it.

2.1.2. The engraving tool selected does not match the toolset in the processing file. Replace the processing tool.

2.2. When running the processing file, it prompts that the processing exceeds the limit.

Situation analysis and solutions:

2.2.1. The machine tool did not perform a zero-return operation, resulting in the system's inability to confirm the actual position. This problem can be solved by performing a zero-return operation on the machine tool.

2.2.2. After setting the workpiece's origin, the reserved range is smaller than the file's size. Determine the file's actual size and correctly set the workpiece origin.

2.2.3. The origin of the workpiece set when creating the file path needs to be corrected. Check the path file and re-export it.

2.3. Knife sticking occurs during processing

Situation analysis and solutions:

2.3.1. The processing speed of the file exceeds the actual movement limit speed of the Z-axis. When the tool is raised, the Z-axis loses the step and does not move up. When the tool falls, it starts from the lost-step point and falls to the same depth to form a stab. In the "Machine Parameter Configuration" - "Maximum Speed Limit" option, set the Z-axis movement speed to the safe speed at which the Z-axis can run. (*When the machine leaves the factory, all parameters have been debugged by our technical engineers. This situation generally does not occur. If this happens, please get in touch with us to obtain the correct values and modify them.)

2.3.2. Caused by loose coupling connection or slipping transmission mechanism. Readjust connecting parts.

2.3.3. The signal line connecting the interface board and the driver is interfered with. Readjust the line.

2.3.4. Error in processing file.

2.3.5. The line connecting the Z-axis driver and the Z-axis stepper motor is damaged due to long-term use, or the connecting line path is too thin, and the connecting plug is loose, causing current loss. Change the line.

2.4. When the same processing file is repeated each time after returning to the machine tool origin, the depth of the Z axis is inconsistent.

Situation analysis and solutions:

2.4.1. The machine tool processing table is uneven, or the processing object is not firmly fixed. Re-mill the table to adjust the flatness.

2.4.2. The repeated positioning accuracy of the Z-axis origin detection switch has errors, resulting in position errors every time the Z-axis returns to the origin. Adjust the detection mode of the detection switch or replace it.

2.4.3. The machine tool's interference is too large, forming a false origin during the Z-axis return to origin. Reroute.

2.5. When the machine tool returns to the origin, it does not stop after it is in place, resulting in an axis collision.

Situation analysis and solutions:

2.5.1. Enter the "Input and Output Control Interface" and check whether the signal is triggered or disconnected normally. The origin detection switch is damaged. Replace it.

2.5.2. The distance between the origin detection switch's detection piece and the switch's detection range (standard in photoelectric and proximity switches). Adjust the position of the detection piece.

2.5.3. The wiring between the origin detection switch and the interface board is aging or loose. Readjust the line and check the connection.

2.5.4. There is a problem with the interface board hardware, and the signal cannot be received. Return to the factory for repair can be solved

2.5.5. The HDMI data cable connected between the handle and the interface board is damaged, and the signal cannot be transmitted. Replacement of new data cable can solve the problem

2.6. When returning to the origin of the machine tool, the machine tool does not move in the specified direction but moves in the opposite direction at a constant speed.

3. Situation analysis and solutions:

3.1.1 The selected origin detection switch type does not match the corresponding level definition. This can be solved by modifying the level definition (typically, the open type corresponds to the level definition arrow pointing downward, and usually, the closed type corresponds to the level definition arrow pointing upward).

3.1.2. The origin detection switch is damaged. If the switch is damaged and in the triggering state, replace it with a new detection switch.

3.1.3. The connection between the origin detection switch and the interface board is faulty. Rearrange the wiring and ensure it is correct.

3.1.4. The interference from the machine tool is too large, causing the illusion that the detection switch has been triggered. Re-adjust the circuit to prevent interference.

3.1.5. There is a problem with the interface board hardware, and the signal cannot be received.

3.1.6. The 50-pin data cable connected between the handle and the interface board is damaged. There is an error in signal transmission. Replacement of new data cable can solve the problem

3.2. There is a random movement during processing or a discrepancy between the processing documents and the actual ones.

3.2.1. Program disorder.

3.2.2. Excessive external interference during processing causes the processor to fail to work correctly. Reorganize and adjust the overall circuit. (Strong and weak currents should be tied separately, and the inverter should be grounded independently from other components.)

3.3. After starting the automatic tool setting, the tool head does not stop after contacting the tool setting block.

Situation analysis and solutions:

3.3.1. There is an open circuit between the tool setting signal line and the X5 wiring port on the interface board.

3.3.2. The INPUT SIGNAL-COM wiring port on the interface board is not connected to the spindle wiring shell or has poor contact.

3.4. The transition from one position to another is expected to be smooth but not smooth when returning to the original position.

3.4.1 Check the machine for damage caused by transportation and installation.

4. Electrical components and wiring problems

4.1. After the machine is powered on, one or more axes can only move in one direction.

Situation analysis and solutions :

4.1.1. Check the line.

4.1.2. The interface board is damaged. Replace the interface board.

4.1.3. The drive is damaged. Replace the drive.

4.2. A specific axis motor does not move after the machine is powered on.

Situation analysis and solutions:

4.2.1. The axis driver's upper direction and pulse signal lines are connected in reverse; adjust the wiring sequence.

4.2.2. The axis driver is damaged. You can manually drag the motor after powering it on.

4.2.3. The interface chip on the interface board is damaged, and there is no signal pulse output.

4.3. After powering on, the LCD shows the spindle rotation when the axis stops and displays the spindle stop when the axis starts.

Situation analysis and solutions:

4.3.1 There is a line failure and a short circuit between the shaft start signal line and the common terminal. Check and sort out the routes.

4.3.2 Output level definition is inverted.

4.4. The screen does not light up and has no display after the controller is powered on.

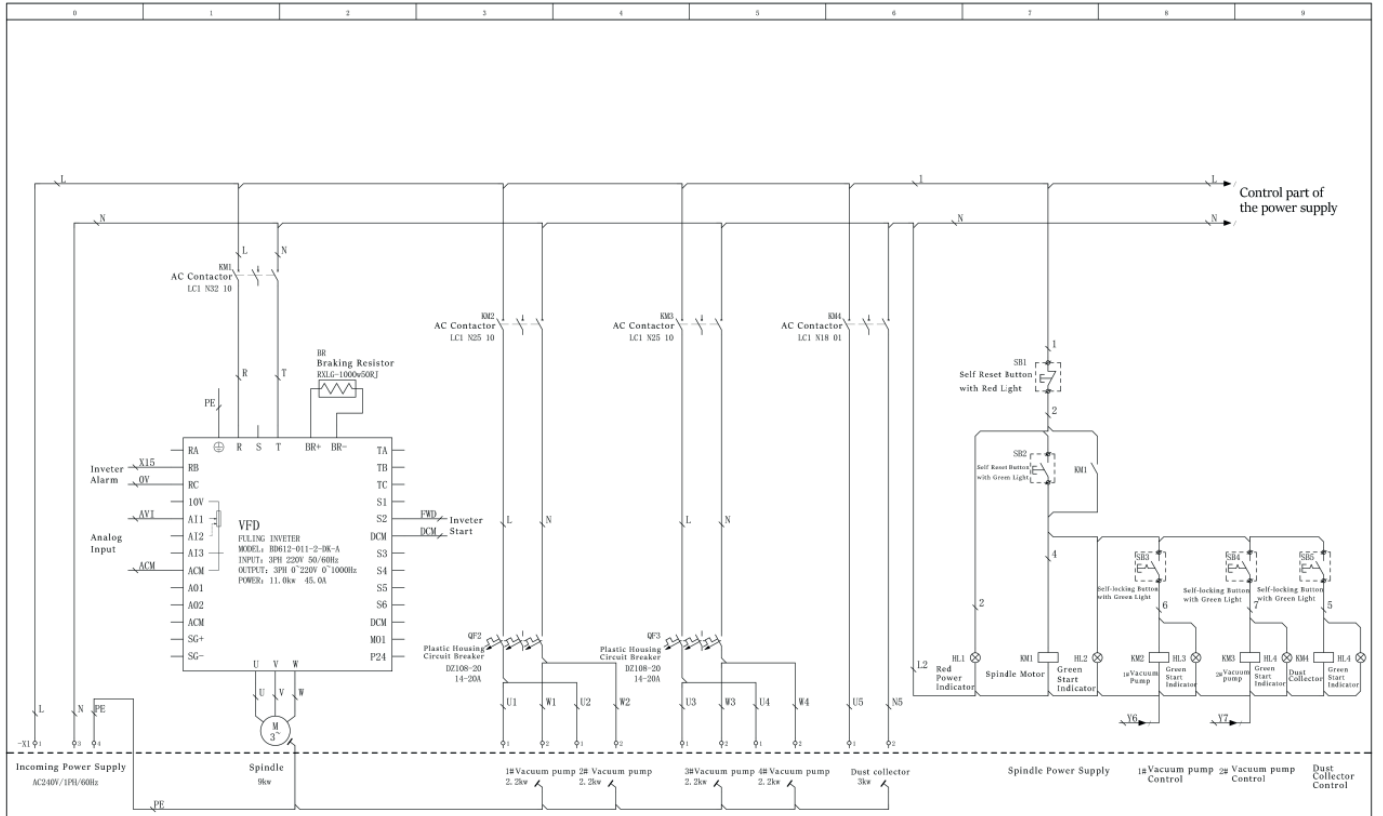
Situation analysis and solutions:

4.4.1 The power supply voltage is too high, or the positive and negative poles are short-circuited. The chipset is burned out and needs to be returned to the factory for repair.

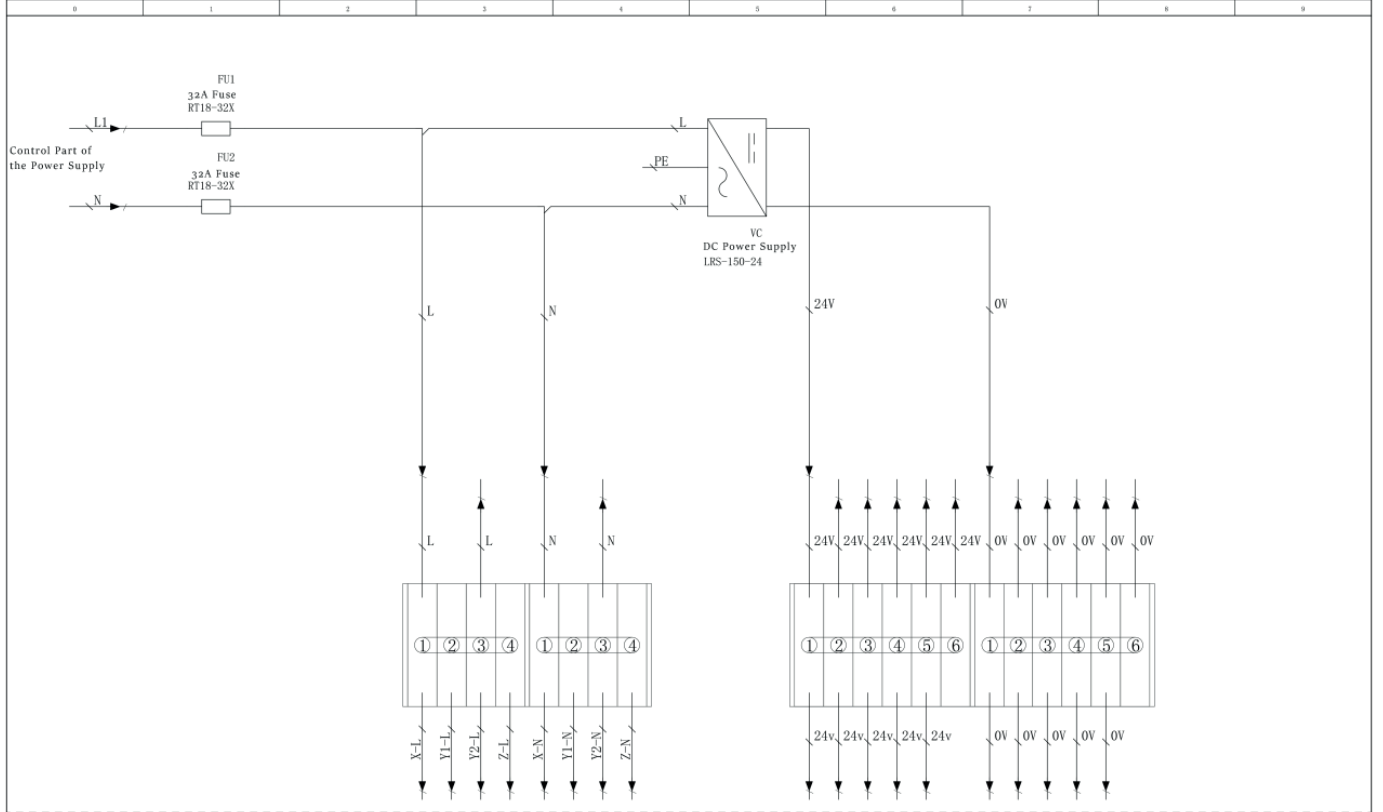
4.4.2. If the power supply is damaged, replace the power supply.

4.4.3. If the data cable is damaged, replace the data cable.

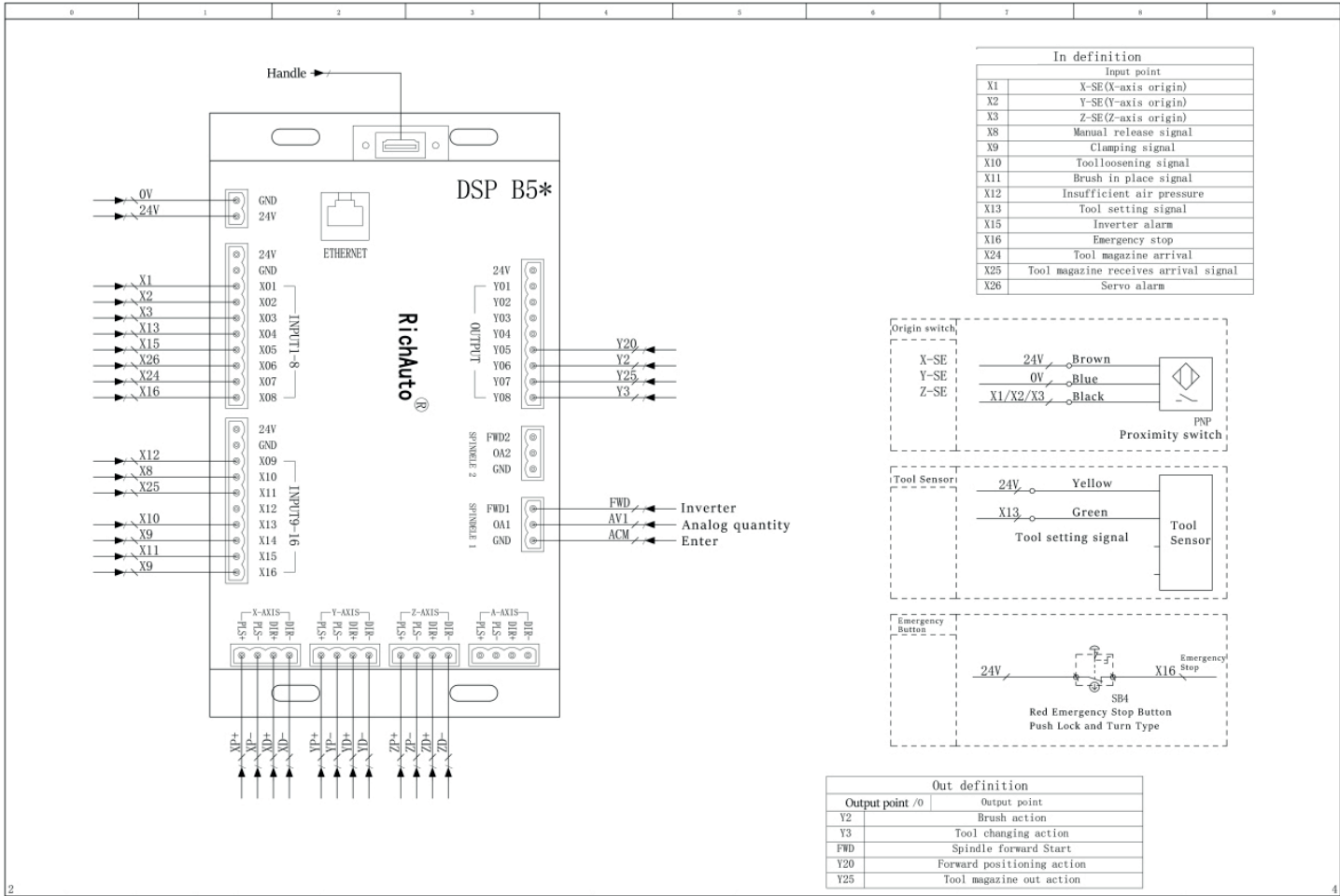
Equipment electrical schematic diagram



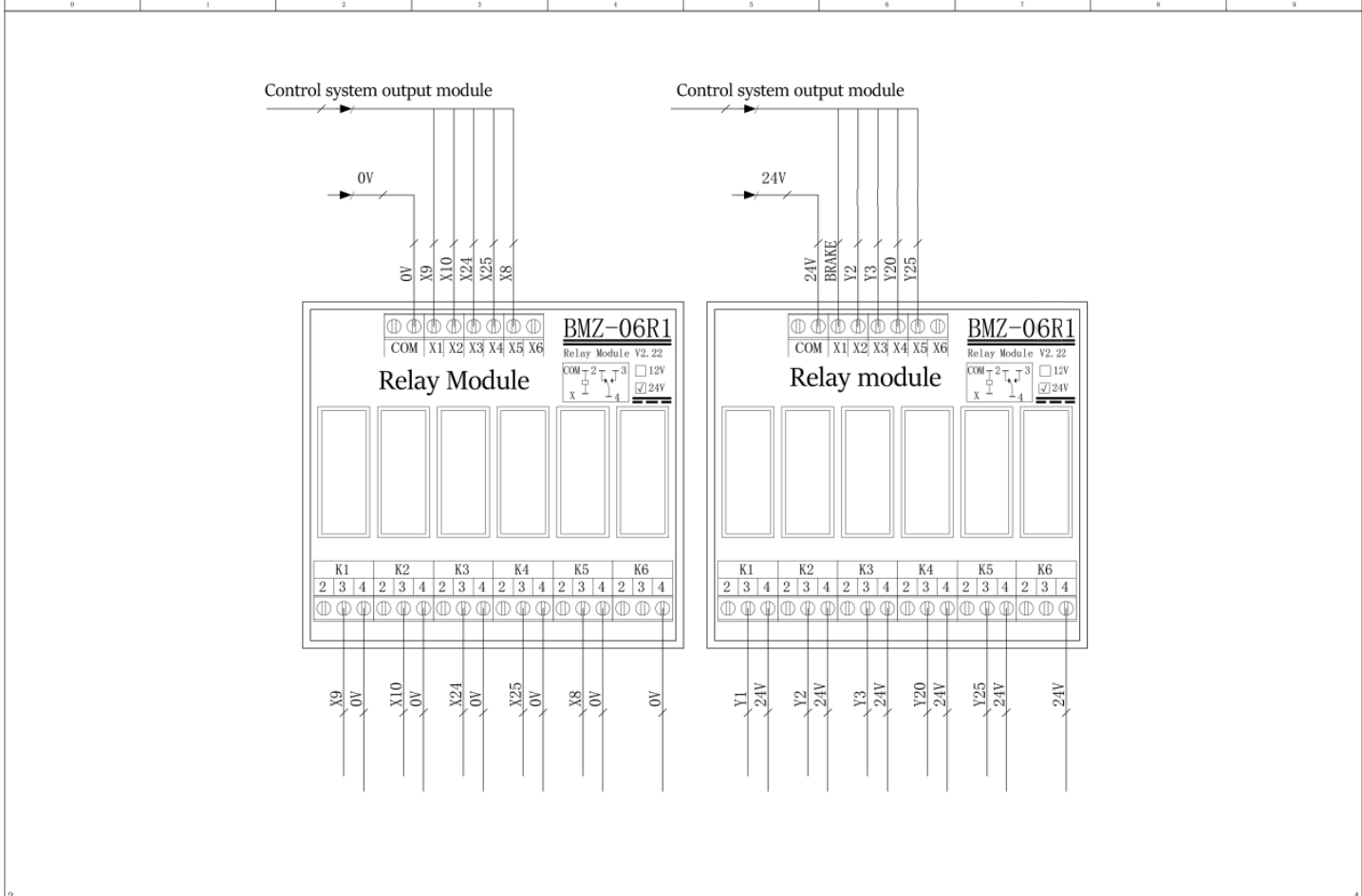
			Date	Strong Current Control Circuit			YOUHAOCNC	
			Proofread	(11KW Spindle Inverter + 2 Vacuum pumps + Dust collector)	Power Loop		Page number 1	
Revise	Date	Name	Change	Replace	Substitute			Page 1/4



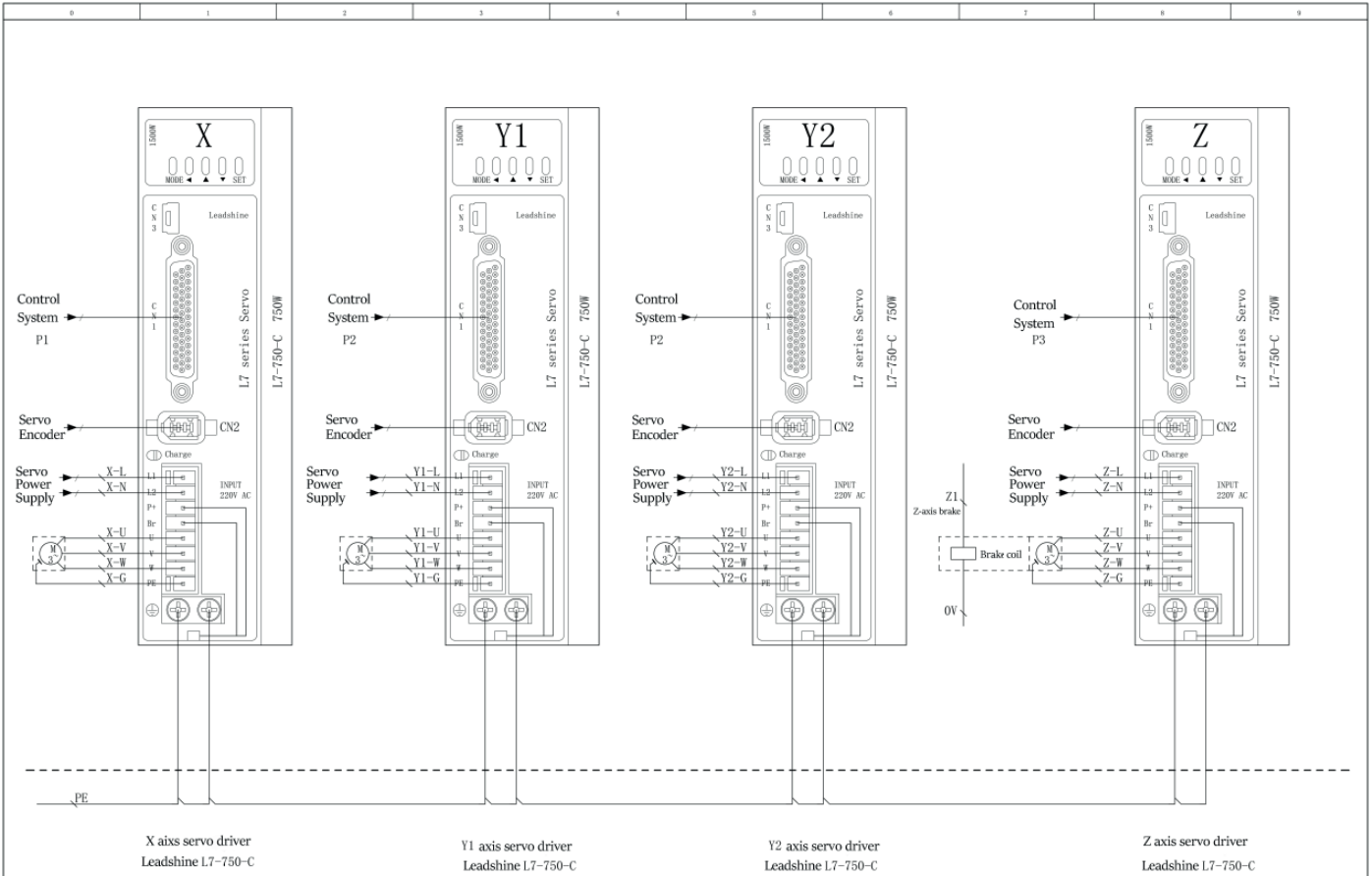
			Date	Control Power AC220V+DC24V	Control Power		YOUHAOCNC	
			Proofread				Page number 2	
Revise	Date	Name	Change	Replace	Substitute			Page 2/4



Date				Control System (Richaut DSP B51 Controller)				Control System				YOUHAOCNC			
Proofread				Replace				Substitute				Page number 3			
Review				Original								Page 3/5			



Date				Relay component (24V Omron 6-way)				Relay components				YOUHAOCNC			
Proofread				Replace				Substitute				Page number 4			
Review				Original								Page 4/5			



X axis servo driver
Leadshine L7-750-C

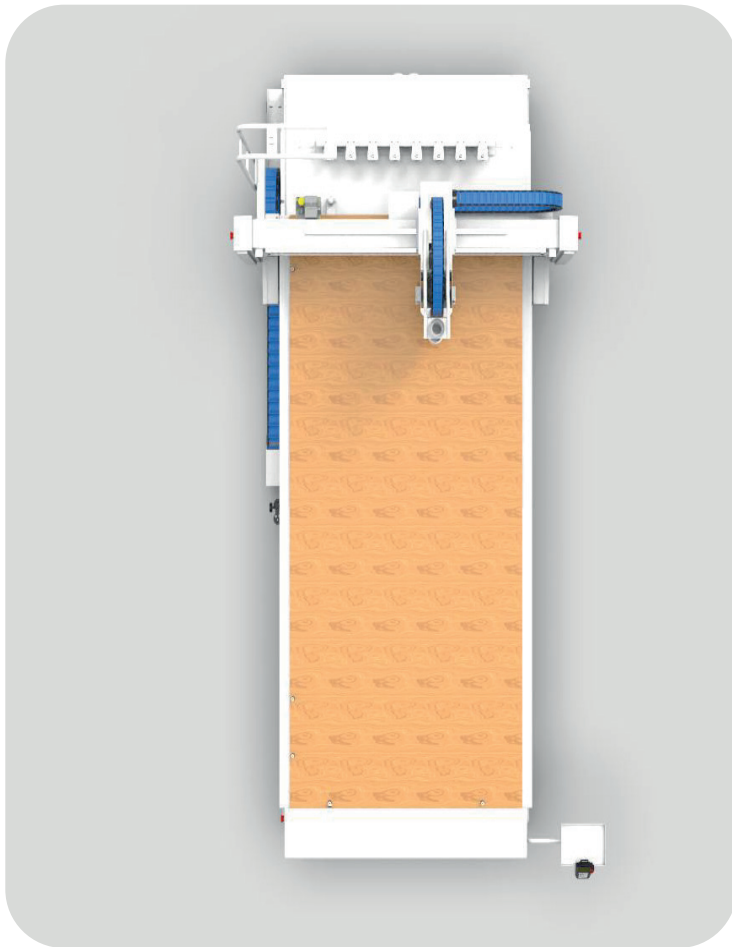
Y1 axis servo driver
Leadshine L7-750-C

Y2 axis servo driver
Leadshine L7-750-C

Z axis servo driver
Leadshine L7-750-C

2								4	
		Date		Servo Driver (Leadshine L7)		Servo Driver		YOUHAOCNC	
		Prove Draft							
Revise		Date		Name		Replace		Substitute	
								Page number: 5	
								Page: 5 / 5	

Machine preview



* For reference only, this picture is a 3D model and does not include buttons, pipelines, etc. Please refer to the actual machine.





* For reference only, this picture is a 3D model and does not include buttons, pipelines, etc. Please refer to the actual machine.

Equipment maintenance and upkeep

1. Maintenance

- (1) Do not make unauthorized changes to machines or electrical appliances if you do not understand or authorize them. Otherwise, they may cause malfunction or damage.
- (2) Please turn off the power first during maintenance. If live inspection is required, professional electricians are required to perform it.
- (3) Regularly check whether the emergency stop button is functioning correctly.
- (4) Repair and replacement parts must comply with the specifications in the technical documentation.
- (5) The cooling and ventilation system of the CNC device should be cleaned regularly, and the cooling fans on the CNC device should be checked regularly to ensure they are working correctly. The workshop environment should be inspected and cleaned every six months or quarterly according to the general situation of the workshop last year.
- (6) Frequently monitor the power supply voltage of the CNC system.
- (7) Prevent dust from entering the CNC device.
- (8) Maintenance of CNC system when not used for a long time. First of all, it should be noted that CNC machine tools should not be stored for a long time. The purchased machine tools must be put into production as soon as possible. If the CNC machine tool is idle for too long, the electronic components will get damp. Accelerate the degradation or damage of its technical performance. Therefore, when the machining center is idle for a long time, the CNC system should be maintained regularly.

2. Lubrication and maintenance

- (1) The lubrication cycle depends on the working environment and machine hours. Generally, the debris should be cleaned up every day after getting off work. Lubricate all parts weekly (32# lubricating oil) and lubricate high-speed idling. Vacuum pump lubricating oil should be added every three months. Please use the designated oil.
- (2) The ball screw's knife screw lubricant should be lubricated once a week.
- (3) Lubricate the spindle and refuel once a week.
- (4) Choose a lubricant; the butter should not be too thick. The lubricating oil should not be too thick or volatile.
- (5) Lubricating part: X and Y two-axis racks and slide rail sliders. Z-axis screw and track slider.
- (6) Rack lubrication: Before lubrication, remove the impurities in the rack first. If any impurities cannot be removed, use a sharp object to pick them out, then inject lubricating oil and gradually increase the speed for idling; do not put the plate and run in the three axes.

3. Other maintenance

- (1) The vacuum pump suction filter must be cleaned daily to prevent debris from entering the pump.
- (2) The vacuum pump outlet filter needs to be cleaned once a week.
- (3) The degree of contamination of the vacuum pump oil should be tested every two months. If the oil becomes dark and sticky, change the oil.

- (4) Clean electrical boxes with an air gun once a week to ensure electrical components are dust-free.
- (5) The mechanical sliding shaft part is usually kept unobstructed, and there is no wood dust to hinder the operation.
- (6) The cooler filter should be cleaned daily to avoid reducing the cooling effect.
- (7) Please keep the cooling fan filter in the electrical box clean occasionally to prevent dust from entering the electrical box and affecting the performance stability of electrical components.





More information
www.goldstarcnc.us



More information
(786) 400-0910

