W52 DENTAL MILLING MACHINE

USER'S MANUAL

2022-12

2.0 version

CONTENTS

1.Mill machine description

（For your better use of mill machine, please read this manual carefully before use）

1.1 Safety instruction

A. Before operate the mill machine, please read through carefully the following safety instructions.
B. Suitable power is 220V 50/60Hz, and ensure well grounded.
C. The leakage protection switch must be in good contact and stable.
D. Ensure power and power cables are properly managed and undamaged to prevent short circuit trips.
E. Ensure that the external air pressure is continuously input after drying, otherwise the spindle will be burned

1.2 Mill machine parameters

Item	W52 mill machine
Power input	Single phase AC 220V 50/60Hz 8A 2.5KW
Air pressure input	⩾6 bar
flow rate	>90L/min
Dimension	525MM*700MM*784MM 150kg
Spindle speed	60000RPM
Spindle power	1.8KW
Maximum rotation axis	B axis：+30º~-90°， A axis：±360°
Tool shank diameter	6mm
Tool QTY	18
Process mode	Wet

Material suitable	Zirconia、Composite、wax,、glass ceramics 、titanium、Cobalt chromium

1.3 Ports

① Machine interface panel Ports located at bottom left rear of the machine

② Explanation:

From left to right, top to bottom:

① Presents the current air pressure
② Power: Single phase AC 220V 50/60Hz 8A 2.5KW
③ LAN: Internet port through which the device is connected to the Internet
④ FXT: The automatic start-stop port of the vacuum cleaner connects the device to the vacuum cleaner (Only for dry cutting, wet cutting without access)through an aviation plug.
⑤ PUMP:Water pump power connector
⑥ OUTLET:The main shaft cools back water
⑦ INLET:Cool the spindle inlet water.
⑧ CF:Cutting interface
⑨ PROBE:Automatic calibration interface
⑩ CN：air source access port
⑪ CHILLER:Refrigerator interface

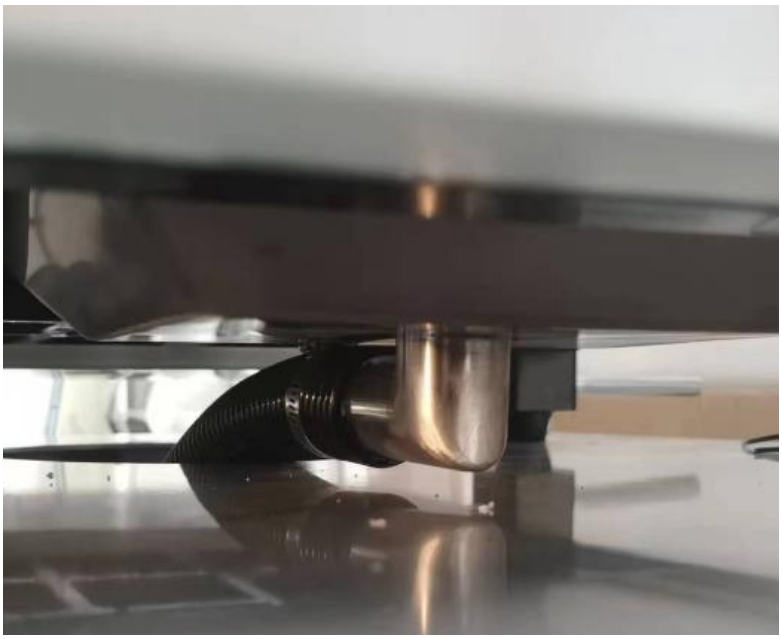
2.Machine tool installation

2.1Machine stand required

2.1.1The workbench for the machine should be able to bear 150KG, and ensure that there is enough space to place the machine
2.1.2 Use tools to disassemble the surrounding plywood boards, pay attention when removing the boards to avoid that the boards fall and hit people or equipment.
2.1.3 After the boards are disassembled, four handling aids are attached to the bottom of the side of the equipment, and four adult males lift the equipment to the workbench.
2.1.4 After placing the machine, assure the feet to be evenly stressed.

2.2 Connect the cutting fluid pipe(wet cutting mode)

2. 2. 1 Connect the return water pipe, connect one end of the return water pipe to the drain pipe at the bottom of the W52 mill machine , and connect the other end to the water return port of the water tank of the base cabinet.Notice:The connections at both ends need to be fastened with throat hoops(In dry cutting mode, this interface is the vacuum cleaner interface)



2. 2. 2 Insert the aviation plug of the water pump part into the PUMP interface（6-core aviation plug）， In dry cutting mode, this connector needs to be unplugged.

2. 2. 3 After cleaning the cutting fluid water tank, inject the cutting fluid into the water tank according to a certain proportion.

2. 2. 4 Connect the water inlet (CF) of the bottom cabinet cutting fluid with the water inlet (CF)of the cutting machine.

2. 2. 5 It is recommended to use low-viscosity cutting oil or synthetic cutting fluid, and avoid open flames and high temperatures in the use environment.

2. 2. 6 When the equipment is used frequently, it is necessary to regularly check the depth and temperature of the cutting fluid every morning and evening.When the cutting fluid level is low, it is necessary to add fresh oil to the oil tank in time to avoid safety accidents caused by excessive cutting oil temperature.

2. 2. 7 When it is necessary to switch between wet and dry, please refer to the guide for switching between dry and wet.

2.3. Connect the spindle water cooler

2. 3. 1Connect the spindle cooling water inlet pipe (INLET) and water outlet pipe (OUTLET) at the rear of the base cabinet to the corresponding pipes of the cutting machine respectively

2. 3. 2Connect the power plug of the spindle water cooler to the CHILLER socket at the rear of the cutting machine（5-core aviation plug）。

2. 3. 3Inject the vehicle engine coolant into the spindle water cooler, and do not directly use tap water and other liquids that contain impurities and are easy to solidify as coolant.

2. 3. 4After filling the coolant, turn on the power button of the water cooler, and the temperature display will light up, which proves that it is turned on successfully.

2.4 Connect to the outer air pressure

2. 4. 1The compressed gas used by the machine should be dried and should not contain moisture, otherwise it will burn the spindle.

2. 4. 2The mill machine applied pipe dia 8mm to connect to the outer air source.

2. 4. 3The air source pressure should be kept above 0.6 MPa, and the air flow should be greater than 90L/min. If the air pressure is too low, the device will stop working and display the low air pressure fault standby

2.5 Connect to the power plug

2. 5. 1 Plug the equipment triangle into the socket and make sure the equipment end connector is firmly connected.

2. 5. 2 Press the "ON/OFF" button on the side of the machine to start the device

2. 5. 3 In an environment with unstable voltage, a voltage stabilizer should be added to the front end of the mill machine to avoid damage to the mill machine due to voltage fluctuations.

2.6 Checks after power on

2. 6. 1 The machine lights work normally, and the fans on the back of the machine work normally.

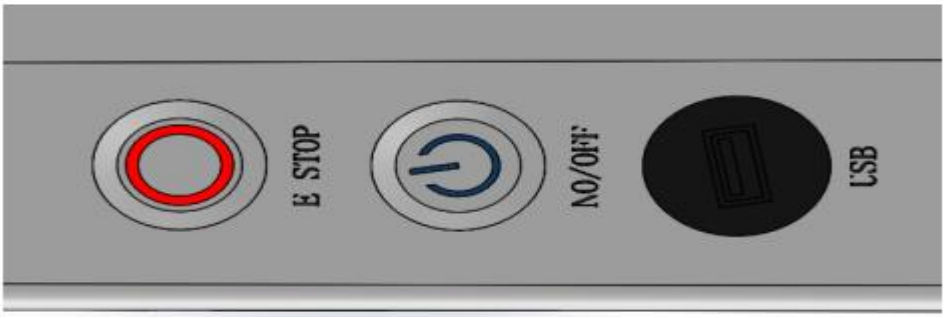
2. 6. 2 The W52 starts up fine.

2. 6. 3 Confirm that there is no foreign matter stuck on the AB axis.

2. 6. 4 Click the "Home" button, and check whether the interface shows that the system is normal after returning to zero.

3.Machine operation

1. Confirm the status of the E-stop button.If the "E-stop" button on the side is in red state, release the "E-stop" button, otherwise the device is in emergency stop state.



2. If the "E-stop" button is not pressed, skip this step;If the "E-stop" button is pressed, after releasing the "E-stop" button, click the "Reset" button in the lower right corner of the automatic mode to reset the system.

3. enter the home page, click the "Home" button, the device will Automatically Return to zero, and the zero return sequence is Z1Z2XYAB. The device has not completed the zero return, and the functional buttons in the manual mode must not be operated.

4. When initially installing the equipment and changing the cutting fluid, you need to enter the manual page-other page，Manually click the corresponding water button，Check whether the sprayed cutting fluid is sprayed on the cutting edge of the bur at the end of the spindle，Since the cutting fluid is affected by factors such as the manufacturer, specification and model,

and the use environment,The strength of the cutting fluid jet will vary,The operator needs to adjust the angle of the spray port before processing according to the actual situation on site.If necessary, you can use the random 8MM air tube to extend the length of the spray port appropriately

5. Check and confirm that there is no abnormality, and then calibrate the axis of the equipment.

4.Panel interfaces explanation

4.1homepage introduce(Mainly introduce the operation of Permission2 .Permission 2 includes the operations of permission 1

4.1.1 Homepage introduce

※DEPRAG: Press the logo on the top left, input the pass code to enter into higher permission

※Tool: Click the “Tool” button to enter the tool life setting page

※Manual: Click the “Manual” button to enter the coordinate setting page.

※Loading: Click the loading button to go to the program loading page

※Breakpoint process: When the machine is stopped and reset, press the Breakpoint Processing button, and the program can continue to be processed after the previously disconnected program line.

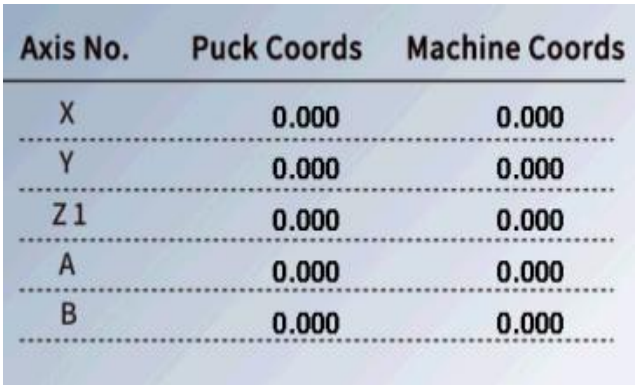
※Start up: Start the programs and files in the schedule list.

※Pause: Click to suspend equipment processing

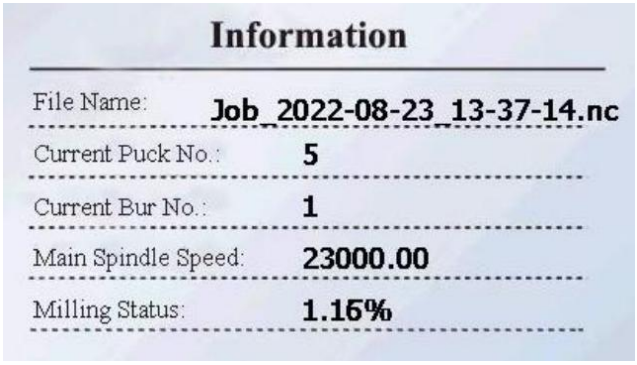
※Reset: Reset abnormal alarm information and reset running program files

※Home: Click the Home button, All axes of the equipment will perform zero return action, and each time the equipment is turned on, it needs to perform zero return once, otherwise there will be a warning prompt to return to zero

4.1.2. Display of coordinate information of each axis

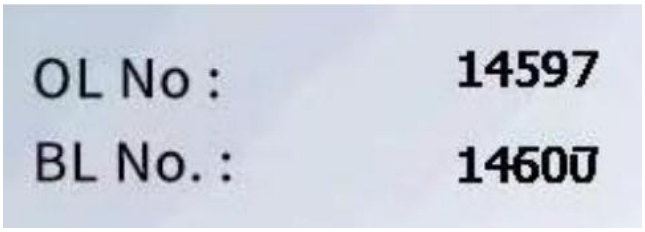


4.1.3 Display the current processing file, material disc number, tool number, Spindle speed and milling status.



4.1.4 Display system status, including alarm information

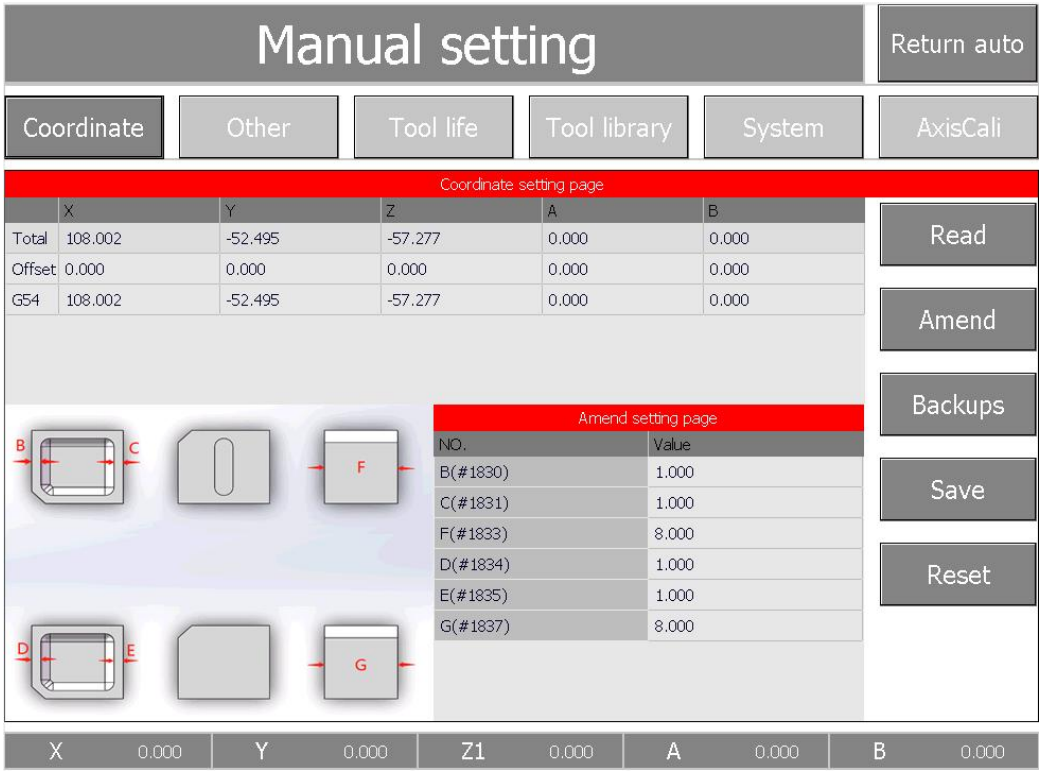
4.1.5 Operating line number and breakpoint line number display



4.1.6 Feed rate progress bar control

4.2 Coordinate setting page introduction

4. 2. 1Click the “Manual” button to enter the coordinate setting page



※Return auto: Click this button to return to the home page

※Coordinate: Click this button to enter the Coordinate Settings page

※Other: Entering the manual page, you can perform manual tool change, tool information change, language switch, etc

※Tool life: Click to enter into the page of setting tool life.

※Tool library: Click this button to enter the tool parameters setting page.

※System: Click the system information button to enter the system information interface, you can update, backup, language switch, etc.

※Axiscali: Click the axis calibration button to enter the axis calibration and setting page.

※Read: read the current coordinates of the device (for debugging).

※Amend: to modify the axis parameters.

※Backups: to view historical coordinate setting records.

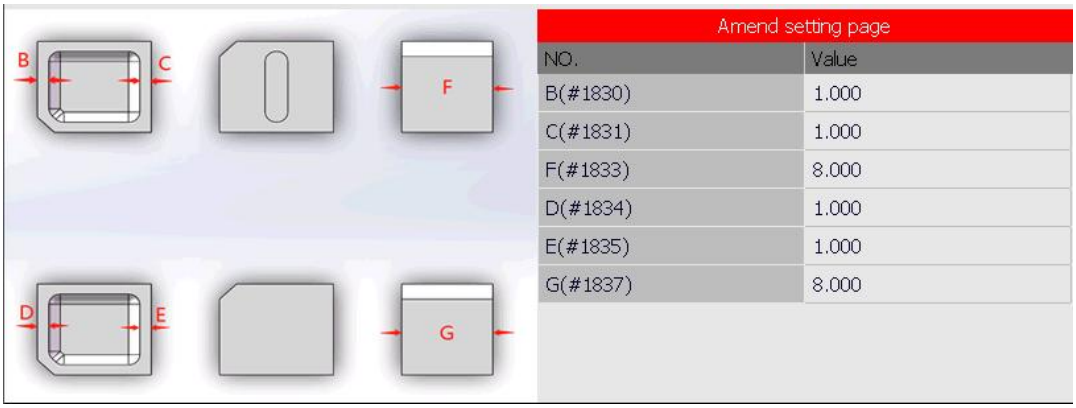
※Save: Used for save operation after parameter.

※Reset: For data reset to factory settings.

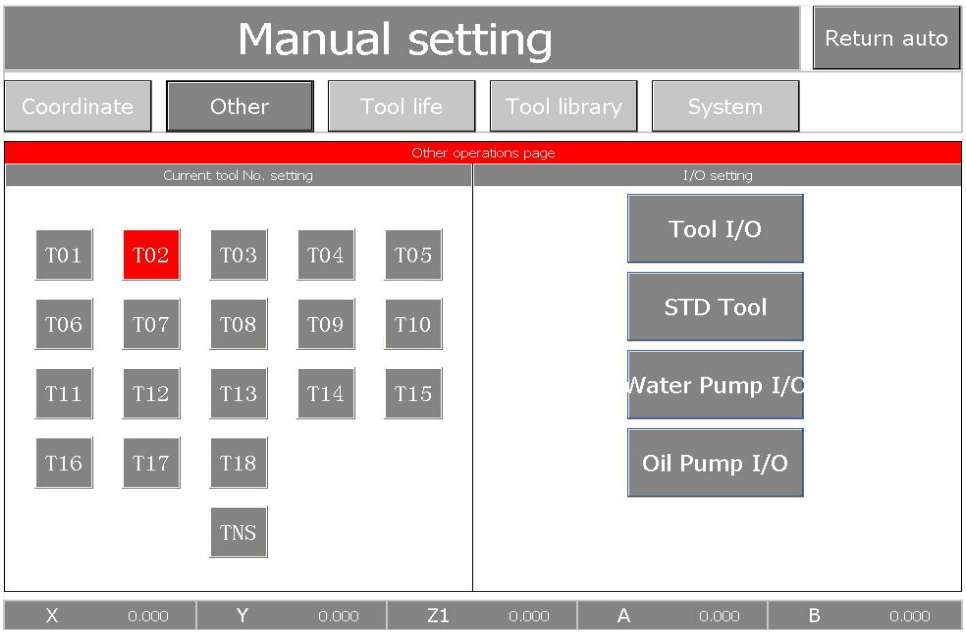
4. 2. 2 Axis coordinate display window

	X	Y	Z	A	B
Total	170.091	-86.119	-65.207	-0.019	0.000
Offset	0.041	0.000	0.064	-0.019	0.000
G54	170.050	-86.119	-65.271	0.000	0.000

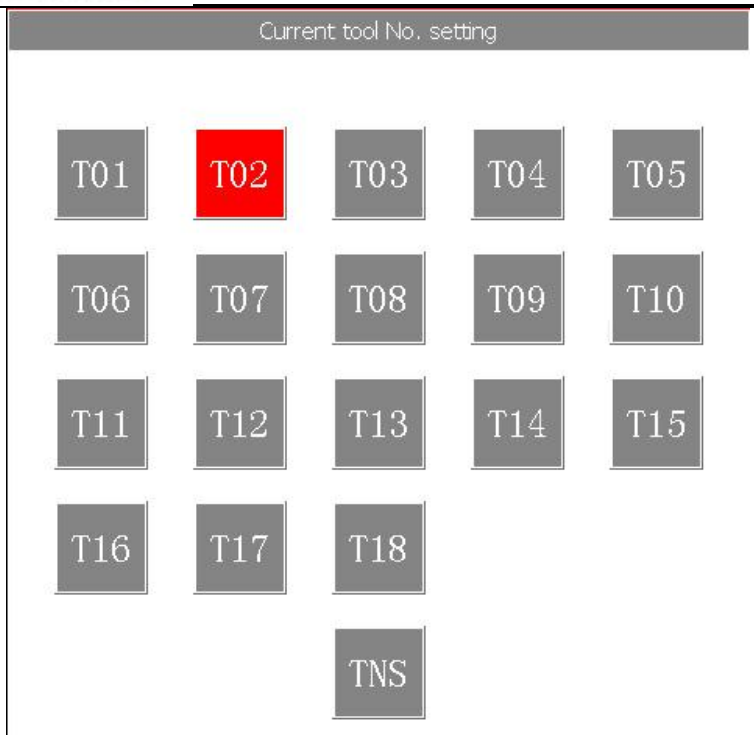
4.2.3 Axis calibration parameter setting window, input various values corresponding to the picture



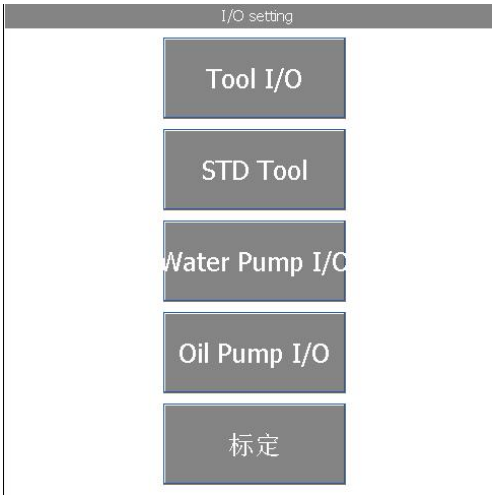
4.3Other Page



4.3.1 Manual tool change and manual resetting of spindle tool number. When the TNS key is gray, click on any number between T01-T18, the device will execute tool change action and grab the selected tool; when TNS is red highlighted, click on any number between T01-T18 to change the spindle current number.



4.3.2 I/O settings window (Input and output settings window)



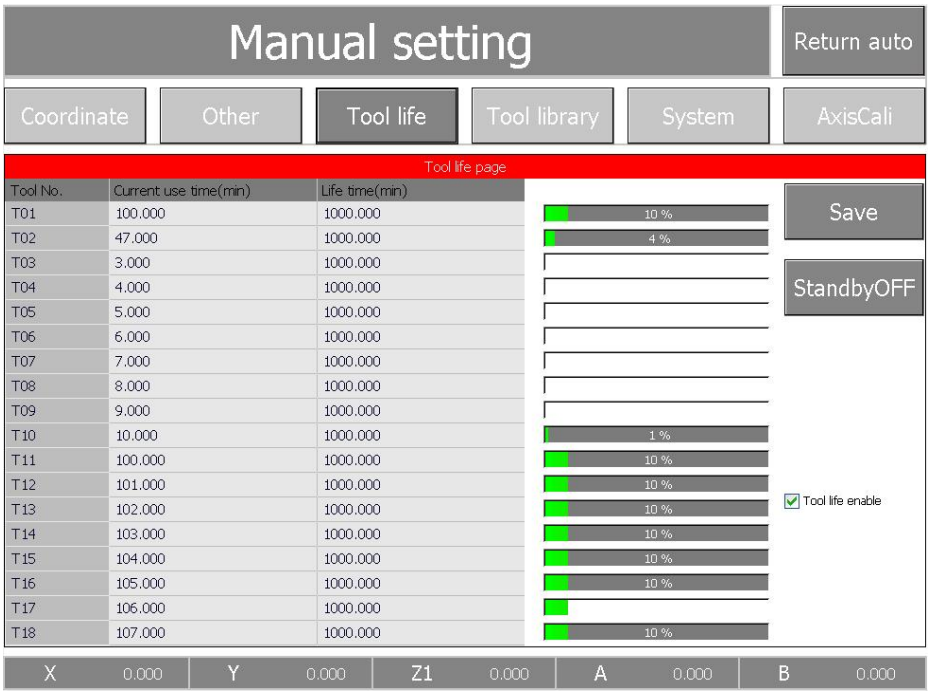
※Tool I/O: opening and locking of spindle chuck.

※STD Tool: Click this button to realize Measuring tool length

※Water pump I/O: Cutting fluid pump switch（Corresponding to M8 code），It is used when changing the cutting fluid and adjusting the water outlet angle.

※Oil pump I/O: Cutting oil pump switch（Corresponding to M7 code）Used when changing the cutting fluid and adjusting the water outlet angle

4.4 Tool life manual setting page, you can set the tool life and OPEN/OFF the standby (standby tool library) function.

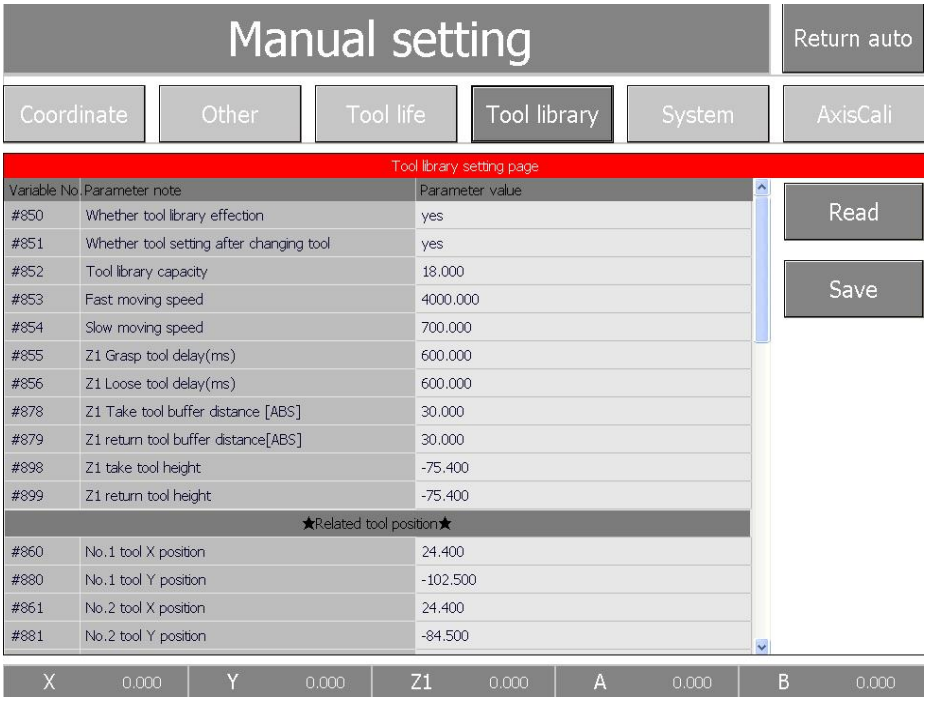


※Save: Saves the current tool life setting.

※StandbyOFF: This button for setting the Standby tool library to open and close.(Metal does not enable this feature)

※Tool life enable: Turn on Tool life enable can Activate tool life count function

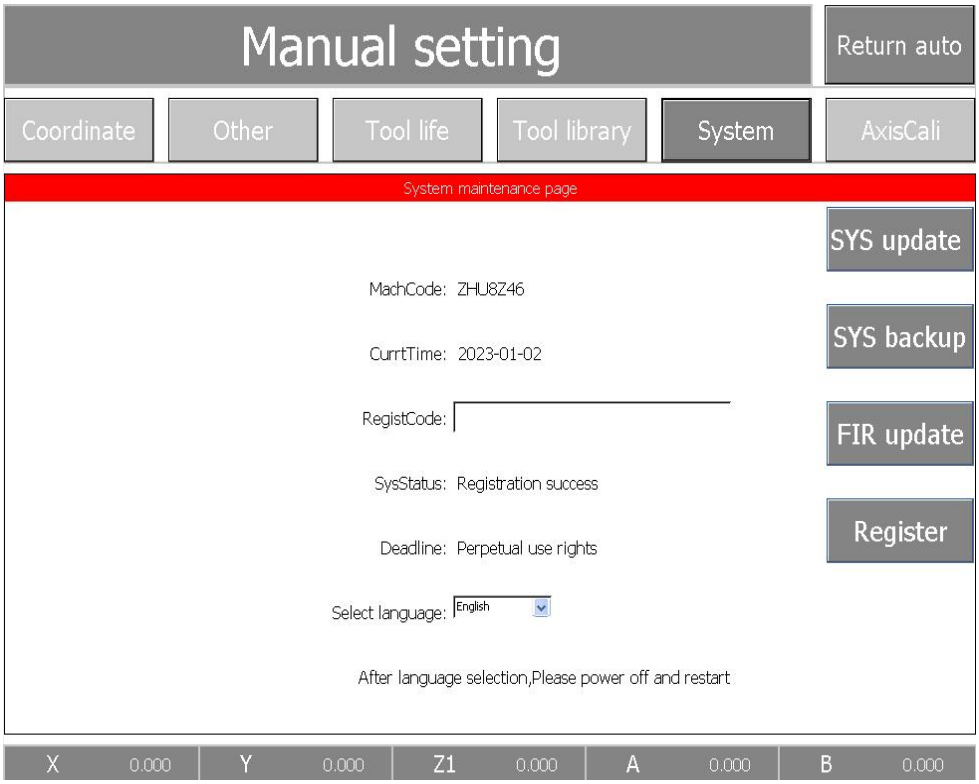
4.5Tool library manual setting page, you can modify the parameters about tool change, Read and Save button function as above.(This page must be operated under the technical guidance of the manufacturer)



※Read: Read the current point coordinates (for debugging)

※Save: Save the modified parameters.

4.6 System Information Page



※SYS update: System update button ， For system updates and upgrades （The manufacturer guides the use）。

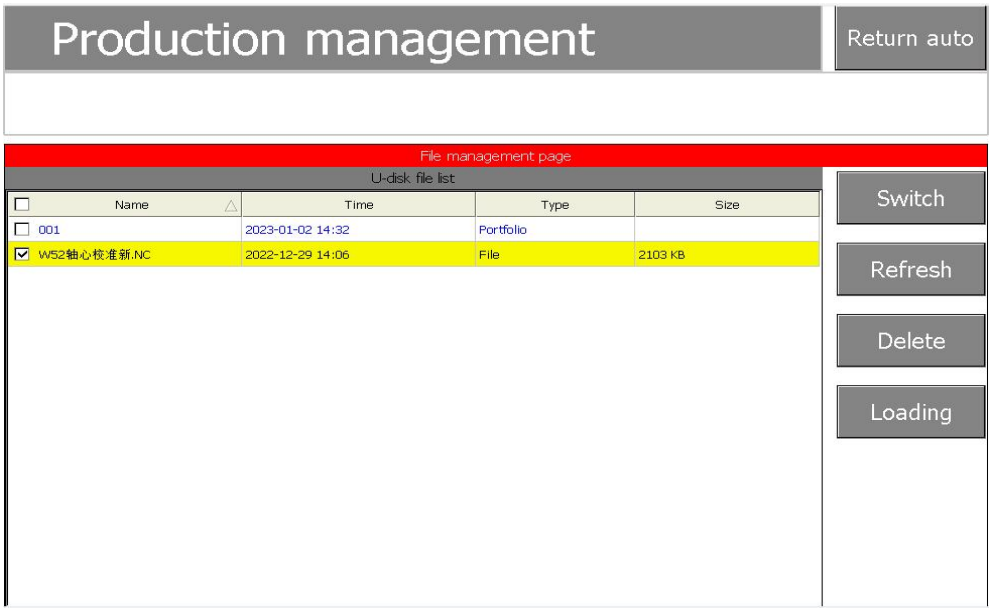
※SYS backup: Data backup button ， For system data backup（The manufacturer guides the use）。

※FIR update: Firmware upgrade button (The manufacturer guides the use)。

※ Register : For system registration (The manufacturer guides the use)。

※Seletc language : Used for language selection,Currently the system supports Chinese, English, French,German, Spanish, Japanese, Korean.

4.7Loading interface It is used to load the local files of the processing files in the U disk and local memory, and delete the processing files in the controller



※Switch: Switch between local memory file list and U-disk

※Refresh: Used to refresh the files on the USB flash drive.

※Delete: Delete the Planning file in the Planning file list.

※Loading: Load the selected file as the next run file

5.Axis Calibration

5.1 Tool information confirmation

NO	Processing material	Tool Type	Tool Shank diameter	Long	Avoid empty	tool specification	remarks
T1	Zirconia	Ball Head	6	50	12.5	T*R1.5*12.5H*6D*50L	
T2	Zirconia	Ball Head	6	50	12.5	T*R1.0*12.5H*6D*50L	
T3	Zirconia	Ball Head	6	50	8	T*R0.75*8H*6D*50L	

T4	Zirconia	Ball Head	6	50	8	T*R0.5*8H*6D*50L	
T5	Zirconia	Ball Head	6	50	4	T*R0.25*4H*6D*50L	
T6	Zirconia	Round nose head	6	50	16	T*D2.0*R0.2*16H*6D*50L	
T7	Zirconia	Round nose head	6	50	16	T*D1.5*R0.1*16H*6D*50L	
T8	Zirconia	Round nose head	6	50	6	T*D1.5*R0.1*6H*6D*50L	
T9	Zirconia	drill Head	6	50	16	T*DR2.5*16H*6D*50L	
T10	Zirconia	drill Head	6	50	16	T*DR1.5*16H*6D*50L	
T11	Zirconia	Flat Head	6	50	6	T*D2.0*6H*6D*50L	
T12	Zirconia	Flat Head	6	50	5	T*D1.0*6H*6D*50L	
T13	Zirconia	Flat Head	6	50	6	T*D2.0*6H*6D*50L	
T14							spare
T15	glass ceramics	Ball Head	6	50	16	G*R1.25*16H*6D*50L	
T16	glass ceramics	Ball Head	6	50	10	G*R0.5*10H*6D*50L	
T17	glass ceramics	drill Head	6	50	10	G*R0.3*10H*6D*50L	
T18							spare

T1-T14are the tool positions used for Titanium，T15-T18are the tool positions used for glass ceramics，are the tool positions used for Titanium，T18are the tool positions used for glass ceramics.

The above tool information will be fine-tuned with the relevant tool numbers and parameters as the process changes, and finally the process of the equipment manufacturer shall prevail.

5.2.Pre-calibration preparation

5.2.1 Calibration material: synthetic wood or plastic disc material (alternative material disc for test calibration)

5.2.2 Disc size: 98.5mm in diameter and 10mm in thickness (depending on fixture specifications to

confirm the size of the alternative material disc)

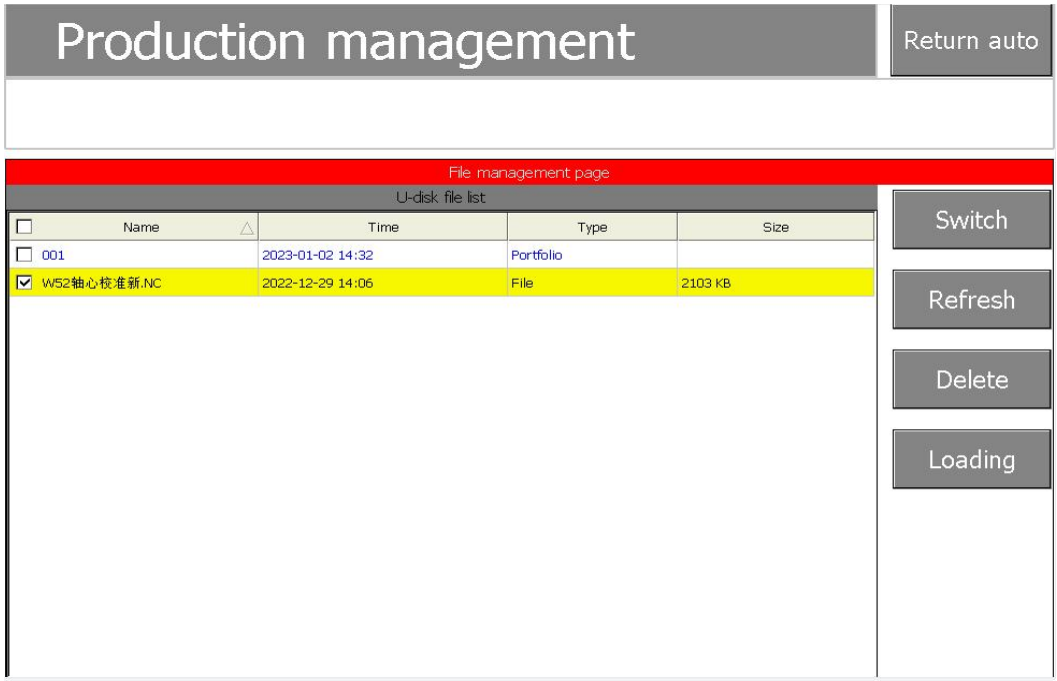
5.2.3 2.0mm Alignment pin: 2.0mm for # 1 tool

5.2.4 Calibration procedure." W52 calibration procedure" document

5.2.5 Clamp the wood on the AB axis, and lock the screw

5.3 Calibration block processing

5.3.1 Import calibration file: Put the "W52 calibration program" into the USB disk, insert the USB disk into the USB port of the machine, click the "Refresh" button, and the processing file in the USB disk will be displayed in the plan list (or send the processing file directly to the plan list through the network transfer software). (or send the processing file to the schedule list directly through the network transfer software)

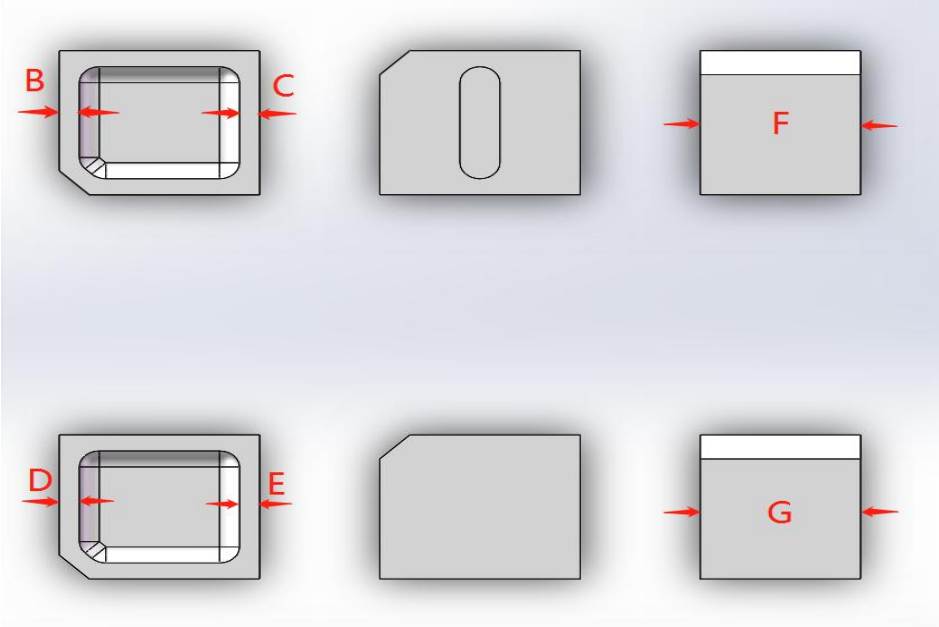


5.3.2 Find the calibration file "W52- Calibration Program", click to select this file, click the "Loading" button,, and then click the "start up" button in the main interface

5.3.3 After the cutting is finished, remove the material disc and use the grinding tool to grind down the two Squares

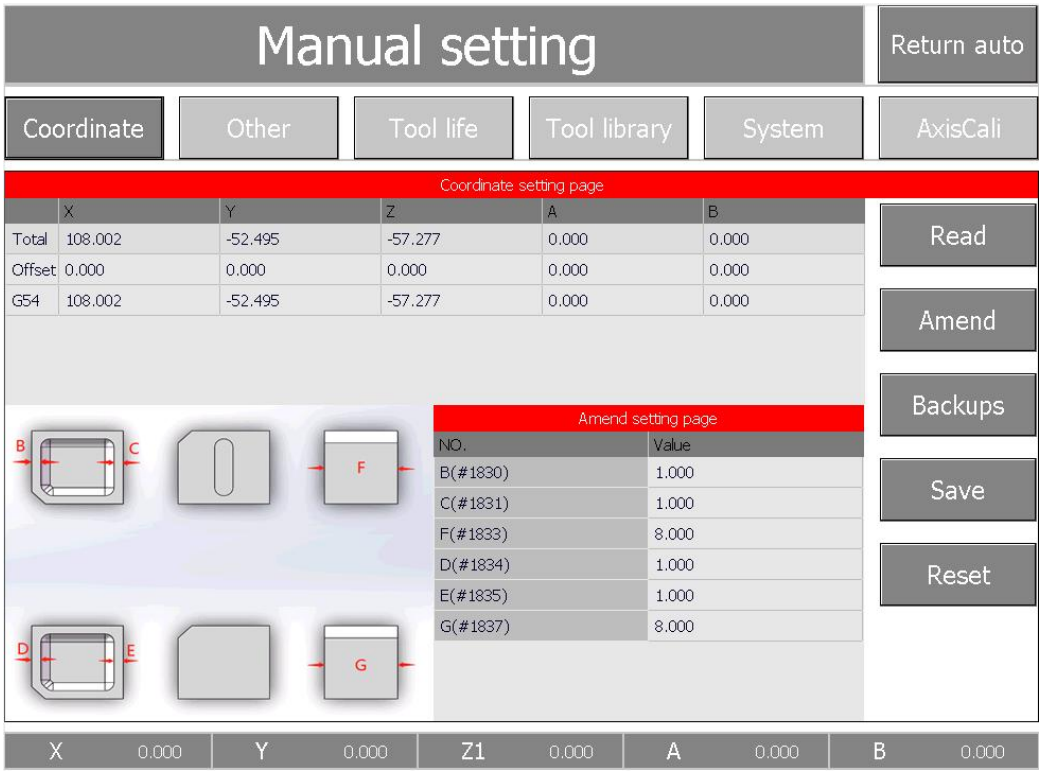
5.4 Calibration block measurement

5.4.1. Prepare digital vernier calipers, measure and record the values of B, C, F, D, E and G in turn.



5.4.2 Enter the “coordinate” to input the record value

1. Click the "Manual" button, and then click the "Coordinate" button to enter the calibration interface



2. Enter the measured values of B, C, F, D, E and G into the corresponding dialog box on the Amend Setting page

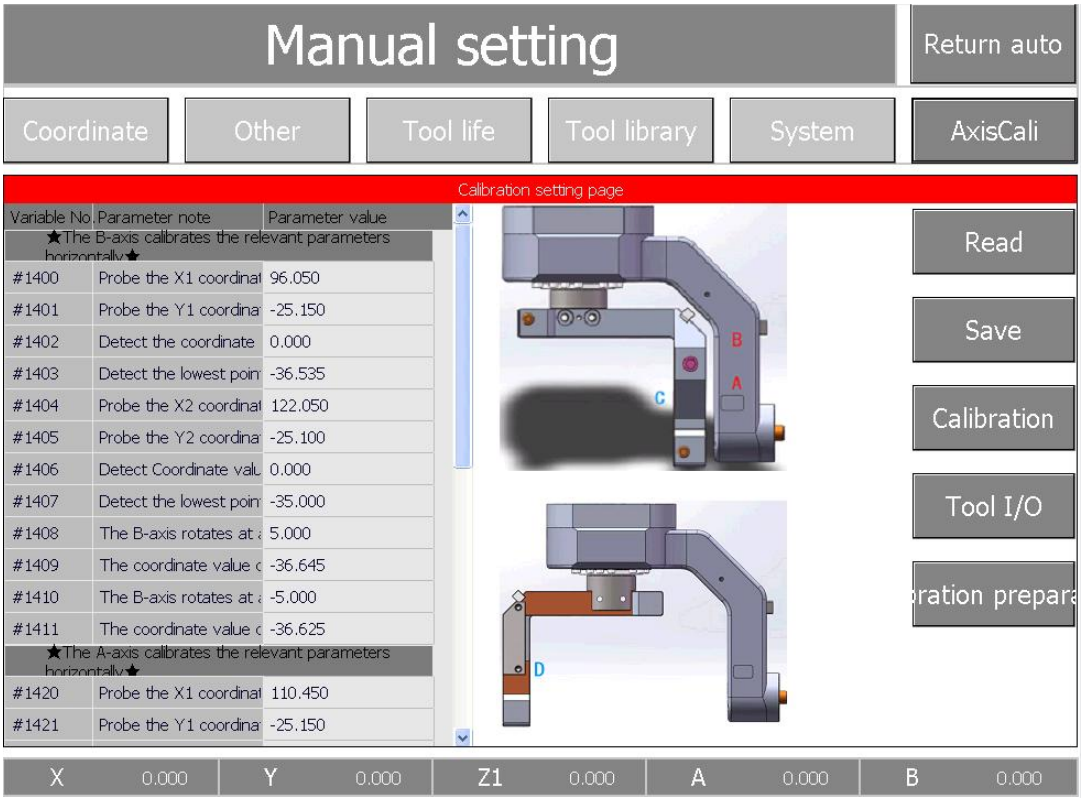
3. Click the "Amend" button after the input is completed, and then click the "Save" button to complete the calibration action

5.5 automatic calibration

Prepare tools to work：Metal calibration disk ， Automatic calibration module ， signal wire

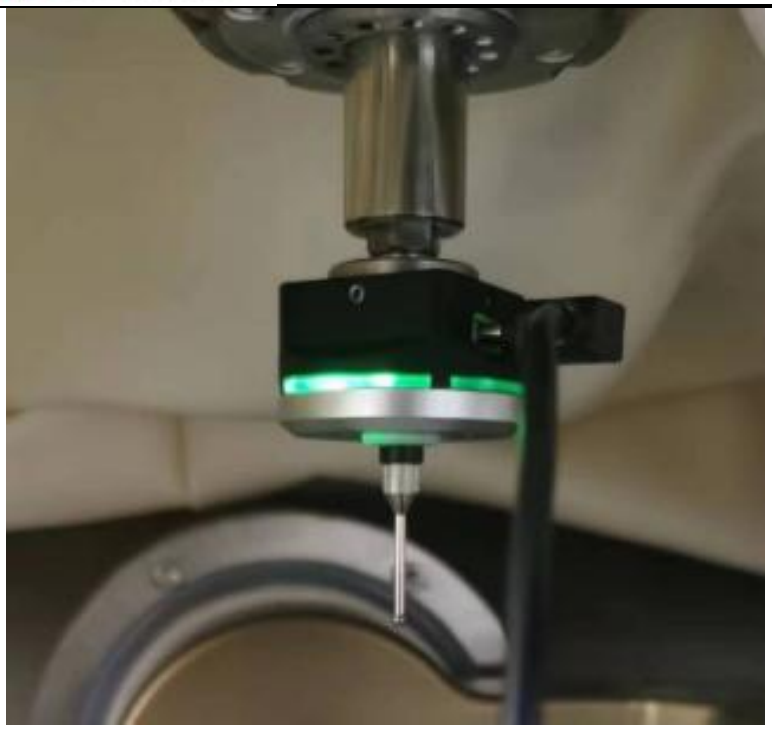


5.5.1Click on the "Manual" button ， Click on "Axiscali" again to enter the calibration interface

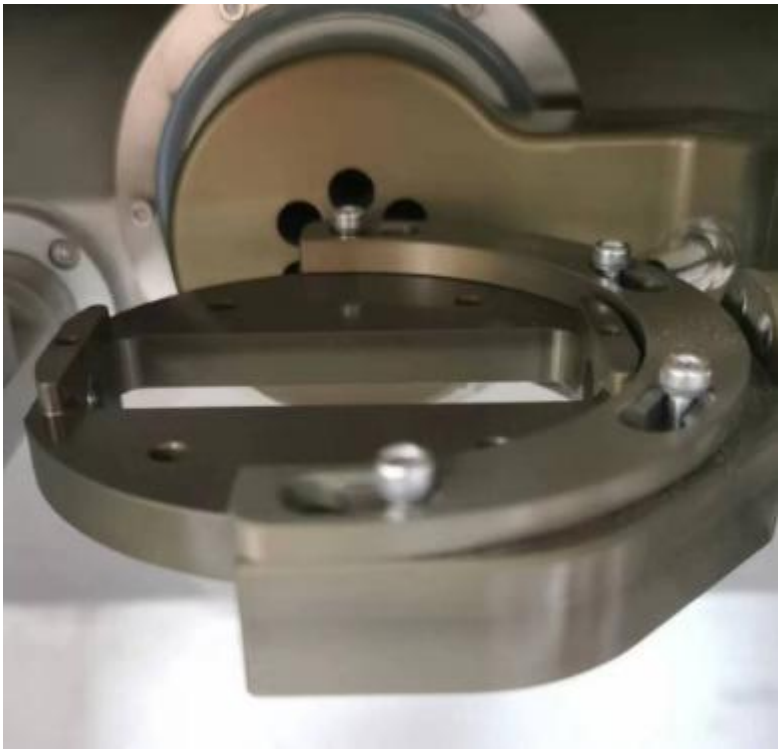


5.5.2Click on the "pration prepara" button.The mill machine spindle moves to the specified position

5.5.3 Hold the tool on the spindle of the cutting machine with the left hand when the spindle is stopped ， Click on the "Tool I / O" button ， Take off the needle ， Install the auto-calibration module on the spindle.Spindle needs to be fully clamped to the clamping part of the auto-calibration module） ， Click on the "Tool I / O" button again.Clamp the spindle to the auto-calibration module ， Then use the signal line to connect the automatic calibration module with the "PROBE" interface at the rear of the cutting machine ， After the connection is successful, the indicator light of the auto-calibration module lights up in green.



5.5.4Clean and dry the AB axis of the cutting machine without dust or debris residues. ， Install the auto-calibration jig onto the A-axis bracket



5.5.5 Click on the "Calibration" button ， The mill machine performs the automatic calibration process of the axis. The whole process takes about 2 minutes. After the calibration is completed, the data will be automatically compensated to the G54 coordinates

5.5.6 After completing the automatic calibration ， Click on the "Tool I / O" button ， Remove the automatic calibration module，Install the original needle back on the spindle through the "Tool I / O" button； Remove the auto-calibration signal line. And put

the automatic calibration module in the box.(The calibration side head is a precision part and needs to be kept well to avoid measurement errors)

5.6.Calibration confirmation instructions (important)

5.6.1 To confirm that the machine coordinates have been calibrated back to within the standard range, it is 22necessary to cut the calibration block again and measure the values of B, C, F, D, E, and G. Standard range: B, C, D, E = 1±0.05mm F, G = 8±0.03mm

5.6.2 If the corrected values are not within the standard range, the calibration procedure needs to be performed again

5.6.3 Calibration cycle:

① The calibration procedure can be performed at any time when the machine has abnormalities such as chipping and not seating.

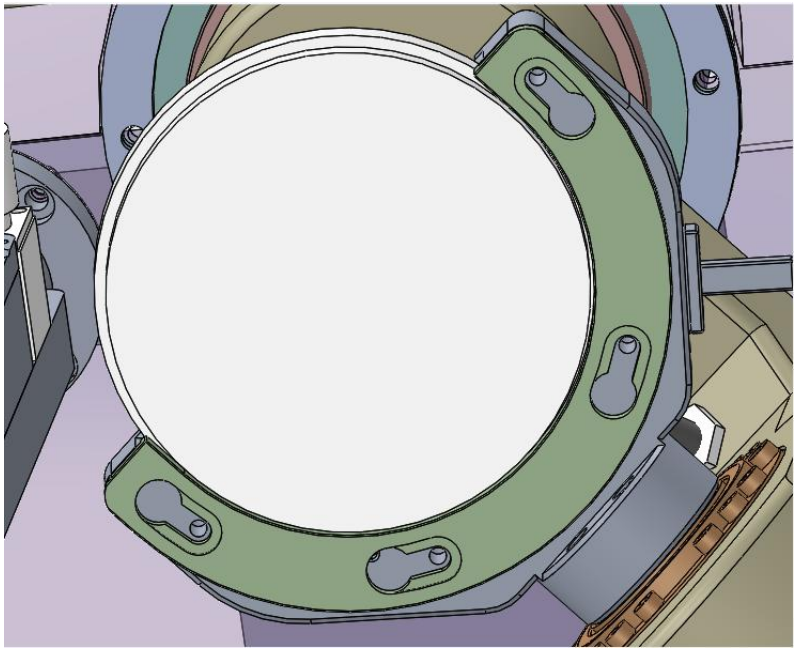
② The recommended periodic calibration operation is once a month.

6.Daily use instructions

6.1.Use process

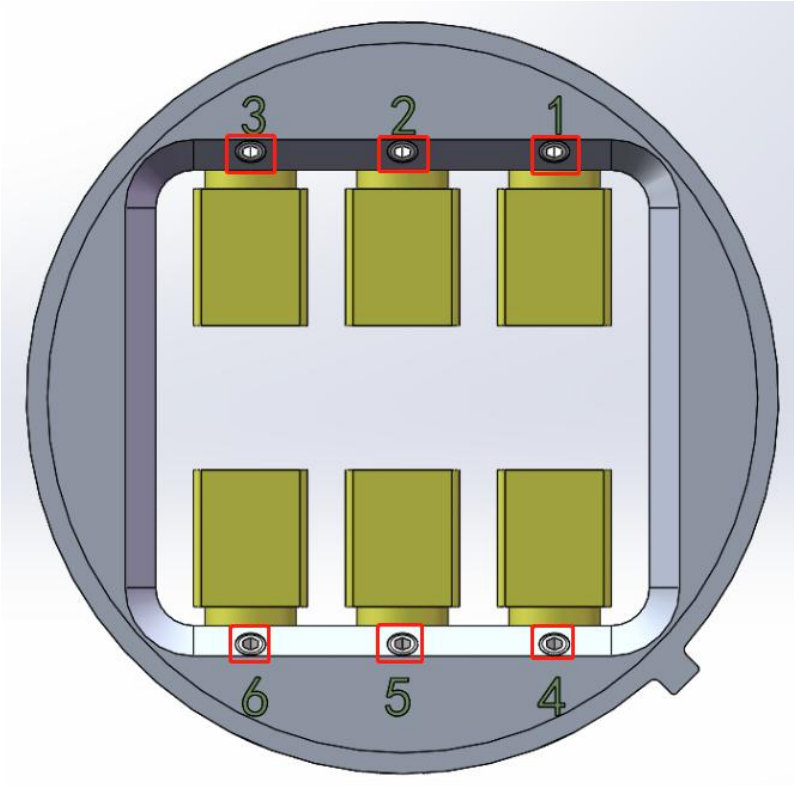
6.1.1Disc holder installation

Clamp the zirconia disk or titanium disk material on the B-axis bracket and install it, Note that different materials have different locking strengths。

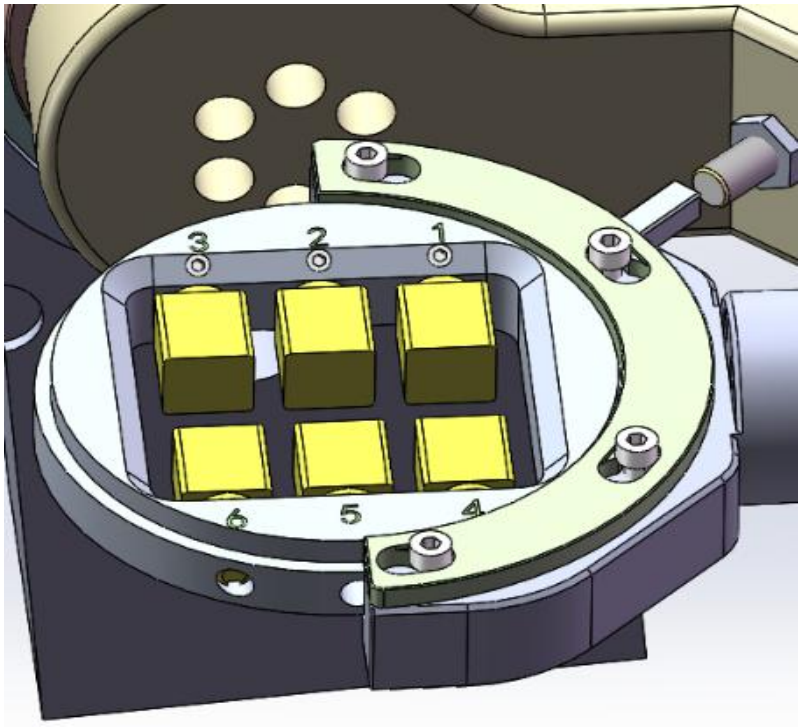


6.1.2 glass ceramic block installation

1. Clamp the glass-ceramic block to the special fixture plate for glass-ceramic,Use the 2.0 hexagon to screw the screws marked in the picture tight

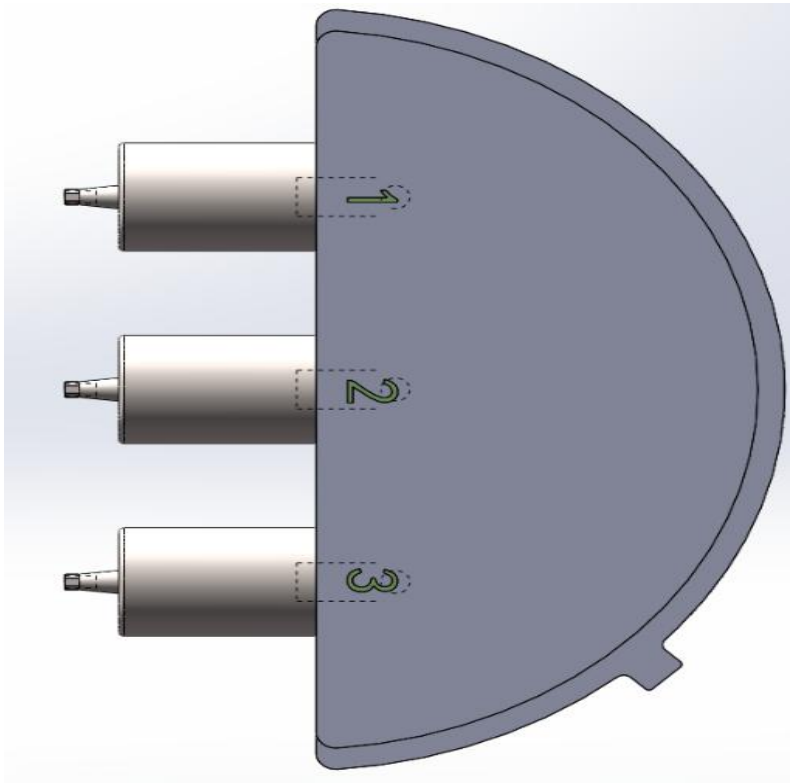


2. Install the installed glass-ceramic special fixture on the A-axis support of the cutting machine, and lock the fixing screw of the material tray.

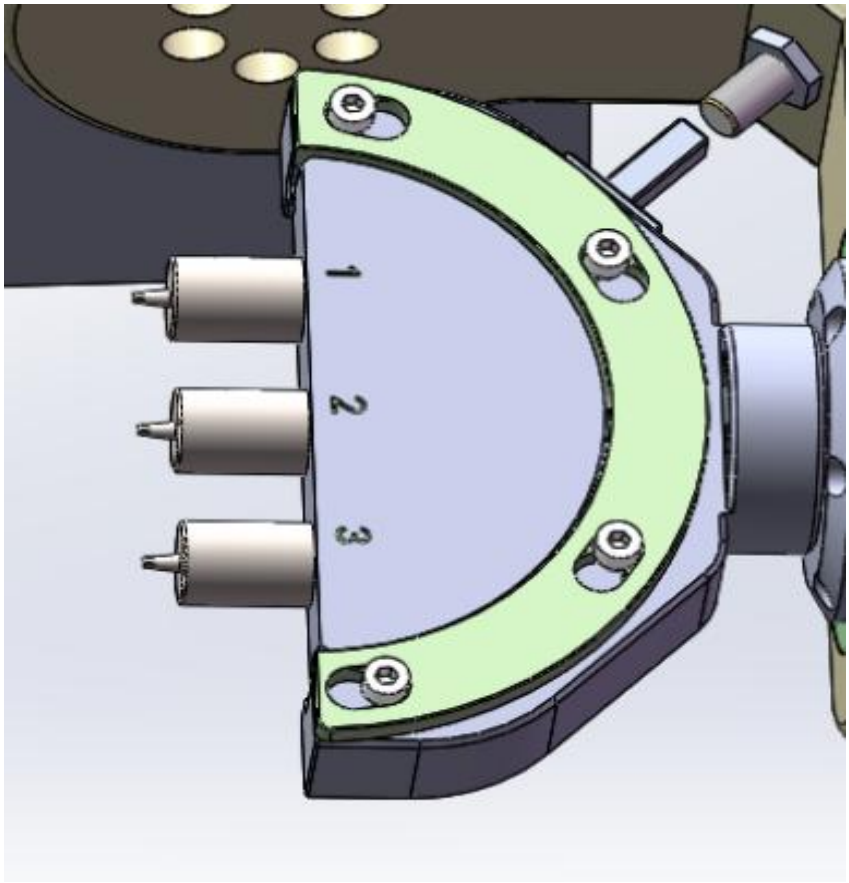


6.1.3Titanium column installation

1. Install the titanium column to the special jig for titanium column,Use the random M5 screws to lock the titanium column from the side hole Titanium column tail



2. Install the fixture with the titanium column on the A-axis of the cutting machine, and lock the fixing screw of the material tray



3. According to the typesetting software template, check whether the bur corresponding to the tool number in the tool magazine is correct, complete and in good condition

4. Click "Loading" in the automatic mode of loading NC files to join the NC file loading page

5. elect the file to be processed in the U disk, and click the "Loading" button on the right to import the program

Please note: If you use a U disk to transfer the program, the system will automatically identify and display all NC files in the root directory of the U disk. You can also send the plan files to be processed directly to the planning file list through the network

6.In automatic mode, "Start-up" is used to start the program processing, and "Pause" is used to pause the current processing program

7. If you encounter any problem during processing, please click "Pause" or "Reset" button first. If there is a red alarm, click "Reset" first, and then click "Breakpoint process" after the abnormal alarm is lifted, and the program will continue to process with the suspended reset lines.

8. Machine shutdown: directly press the "shutdown" button to power off.

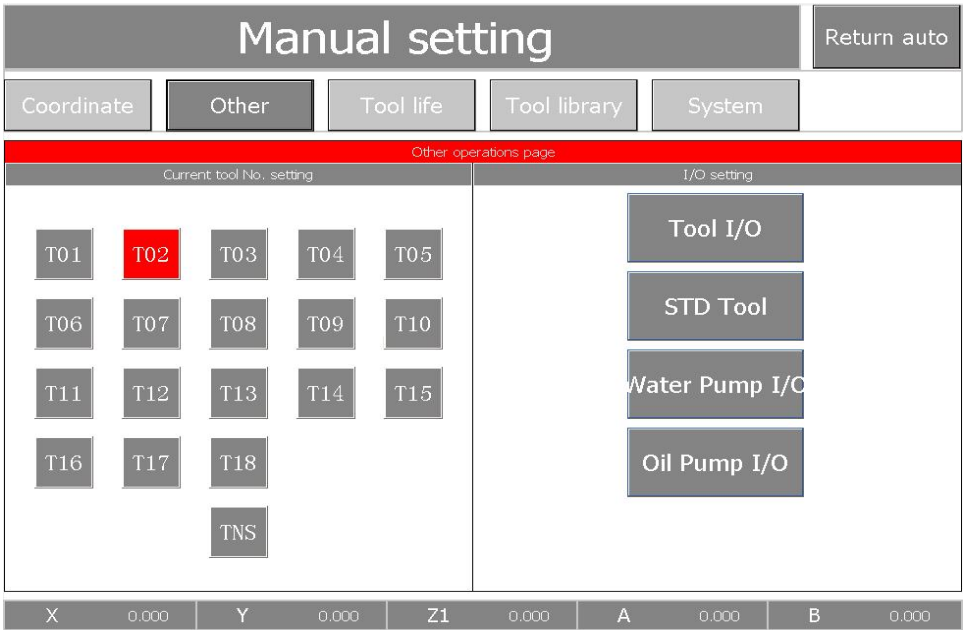
6.2 Tool change

6. 2. 1 The first case: the tool to be replaced is on the tool holder of the tool magazine, the tool can be directly

inserted and removed for replacement!

6.2.2Second case: the tool to be replaced is located on the spindle, take the No. 2 tool as an example for illustration, and so on for other tools.

① In manual mode, confirm that the tool number button shown in red is the tool to be replaced, such as the T02 button in this case.



②In manual mode and the spindle stops, hold the tool on the spindle with your left hand, click the "Tool I/O" button on the touch screen with your right hand, release the spindle chuck, remove the old or broken tool, replace it with a new one, and click "Tool I/O" again to clamp the spindle chuck

③Manual-In "other "setting mode, click "STD Tool ", the machine will automatically measure the tool length of the new tool.

④If there is an abnormal alarm message for "STD Tool ", "Return auto" mode and click "Reset" button to clear and adjust the abnormal tool alarm (there are three abnormal conditions: 1) broken tool; 2) wrong tool clamping position; 3) mismatched tool). If there is no alarm, then skip this step.