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Shenzhen Up3d Tech Co., Ltd

UP3D
Smart Milling Machines

User Manual

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INSTRUCTIONS

Dear customers:

We are delighted that you have chosen and purchased our dental milling machine!

Read this user manual carefully before using the machine to develop a good use and maintenance habit, which will play a good role in the product and increase the lifespan.

⚠ Notice:

Non-authorized personnel of our company can’t disassemble the milling machine without authorization, otherwise our company and distributors reserve the right to refuse the guarantee of the product if there is any problem!

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01 Product Information

1.1 UP3d digital dental CAD/CAM system

Shenzhen UP3D Tech Co., Ltd started digital dentistry research in 2012. We have a group of specialized technology development and digital core technologies.

Now we have a complete set of digital dental CAD/CAM system, including: high-precision dental scanners, dental CAD design software, dental CAM nesting software, dental milling machines, etc., which are all developed independently, with patents of invention.

1.2 Product introduction

Denture (or dental, prosthetic) engraving machine, or dental processing machine, also called dental milling machine, dental processing machine, dental cutting machine and tooth carving machine.

UP3D intelligent dental milling machine is one of the important products of dental CAD/CAM system, which is intelligent for below two aspects:

1, Auto calibration function. It can compensate the deviation of the milling automatically by calibration, ensuring the milling precision.

2, Highly integrated 5 axis motion control system and intelligent, simplified CNC software.

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1.3 Features

(1) High reliability and stability：

The spindle adopts vertical milling design, which has wider versatility. The key control components are made of internationally renowned original parts, screws and guide rails, etc., which are maintenance-free and reduce equipment maintenance costs.

(2) High precision and high-speed milling:

The maximum spindle speed is 40000~60000RPM, and the maximum feed rate is 5000mm/min (the cutting precision can be controlled within 0.05mm).

(3) High intelligent host computer:

Highly intelligent software, easy workflow operation, one-button milling, one-button automatic calibration process, automatic compensation of milling accuracy.

(4) Highly open and compatible system:

Compatible with a variety of open systems and capable of milling various dental materials, including zirconia, wax, PMMA, etc. Improving efficiency of the equipment utilization, saving costs and increasing returns.

(5) Equipped with intelligent nesting software:

The intelligent nesting software developed by UP3D is highly integrated with the equipment to easily realize data transmission and sharing.

1.4 Application scope of P52

P52 milling machine has certain requirements for its environment when it is running. When turned it on and working after installation. Its environment should be as below:

(1) The indoor temperature range is 5~40℃ ;

(2) Air humidity: 35-80% (no condensation);

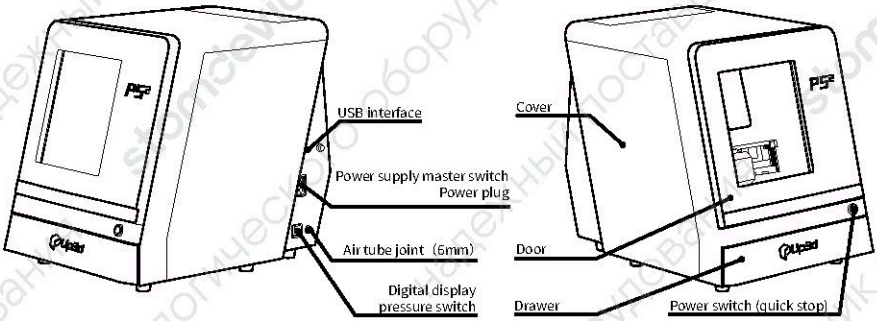
(3) The altitude does not exceed 2,000 meters;

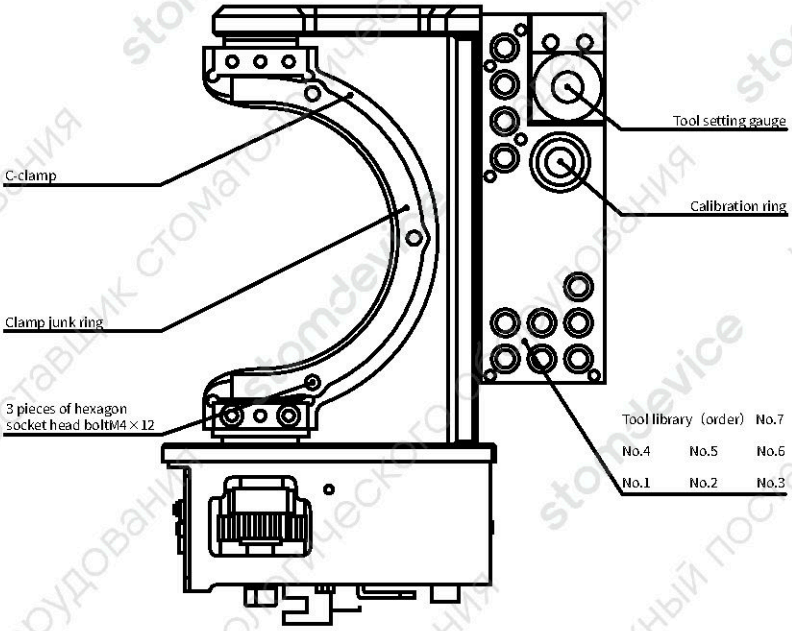
(4) Environmental pollution level: 2 (according to IEC 60664-1);

(5) Instantaneous overvoltage 1,500V;

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1.5 Main structure





intracavity schematic diagram

02 User manual

2.1 Devices connection

A. Remove the milling machine from the wood box and place it on a stable table. Open the door of the milling machine and take out the foam cotton (save it for subsequent maintenance and transportation).

B. Open the accessories box and connect the power cable and data cable to the milling machine and computer.

C. Take out the pressure regulating filter and two M6×10 screws, fix it on the right side of the milling machine.

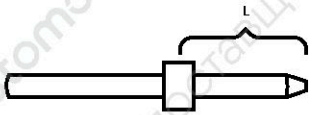
Connect the air compressor and convert the air tube into a 6mm diameter tube from the air compressor and insert it according to the marked position on the pressure regulating filter. At the same time, cut a 6mm tube (about 40cm long), and insert it from the right side of filter to the tube joint on the milling machine.

D.Connect the dust collector.

E.Take out the Φ4mm calibration tool, Φ2mm milling tool, Φ1mm milling tool, and Φ0.6mm milling tool, and install them according to the following picture.

Notice: ensure the length from the upper end of the tool to the upper end of the ring are $15 \leqslant L \leqslant 20$ mm.

Place the calibration tool and another three tools into the specified position in the changer as follows.



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2.2 UPCNC operation instruction

(1) Connection and Window Function Area



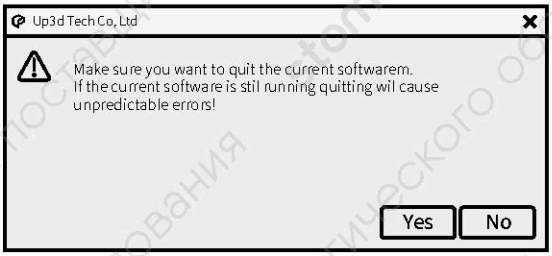
 Refresh: You can click refresh button to connect the device after inserting USB cable.

 Devices: It will display current operational device and it will display multiple icons if there are multiple devices.

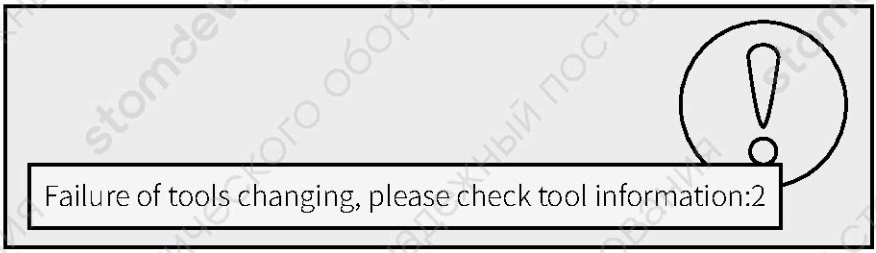
 Soft keyboard: you can type with soft keyboard when you click this button.

 Minimize: the software interface is minimized to the taskbar.

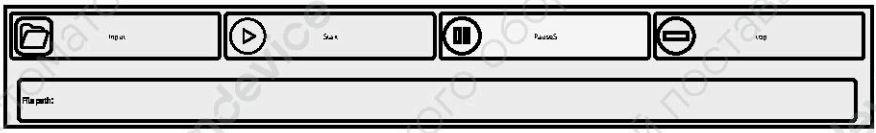
 Close: It will close the software after clicking this button.



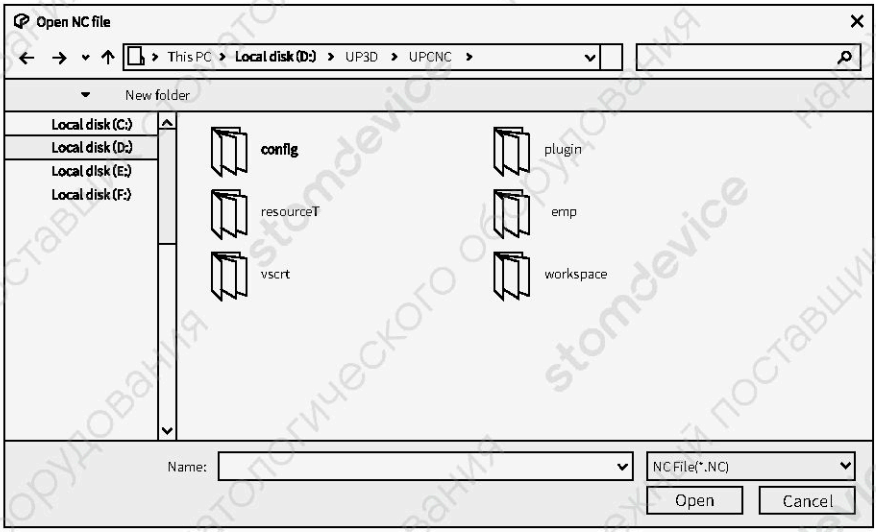
Information display: It will display the information if you put the mouse on the icon when it has abnormal problems during software operation and milling. The icon will turn into a red exclamation mark when there is an exception message.



(2) File loading and start-stop operation area

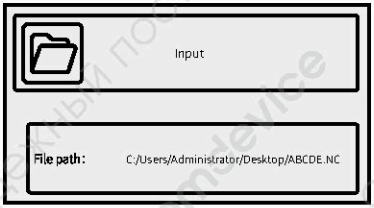


Import: It is used to load the NC (G-code) file. Click this button and Open NC File dialog box will pop up. Then find the file to be loaded.



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We have selected the NC file here is "ABCDE". And the loaded file path and name are displayed.



Start: It will start to mill after you upload the NC file and click this button.

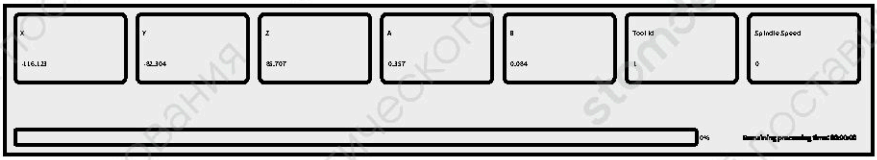
Pause: if you want to check the status or meet some issues during milling.

Main function: stop milling and the spindle stops rotating then returns to the machine origin position.

Stop: click this button to empty the NC file, stop all operations, and then the spindle stops rotating and stops cooling, and retracts to the machine origin position.

(3) Processing progress and information display area

It will display the current axis coordinate, spindle speed and the following progress bar shows the current machining progress and percentage.



(4) Main Function Area



Calibrate: Calibrate automatically, the machine will follow the settled process after clicking this button.

Reset: The machine will be disconnected with PC then be reconnected to the PC when you chick this button.

Dismantling: A-axis rotating shaft swings to facilitate the disassembly and assembly of the material.

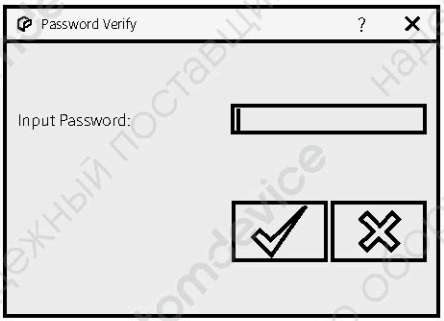
Home: The machine returns to the origin coordinate by touching each axis limit switch after click this button.

Loose/Clamp tools: Click this button to open the spindle chuck. If there is a tool, execute the loose tool command and the tool will drop directly. If there is no tool, it will not respond. Click 1 time to execute the loose tools, then click the other time again to execute the clamping tools, the spindle chuck will lock.

Configuration: Click this button, then type the command, enter the device parameter setting mode. Before entering the advanced mode, pop up the Password Verification dialog box, enter the corresponding command, then you can enter.

The password command is WCD#8A (or 000), however, it is generally not necessary to enter this mode. Adjust the parameters in this mode, you need to operate under the guidance of technical support.

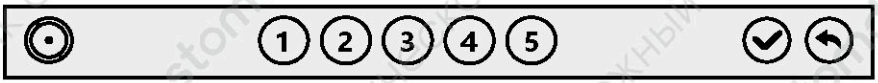
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2.3 Advanced mode settings

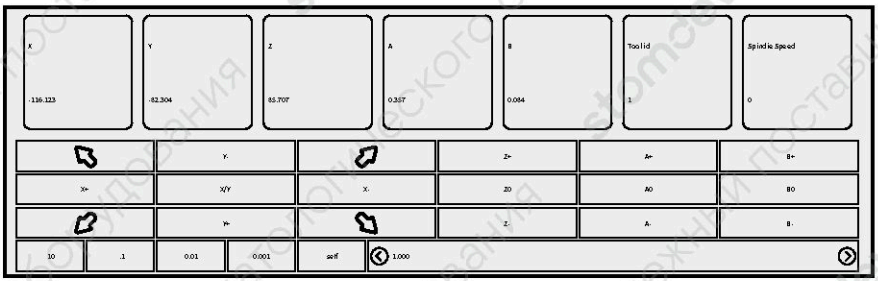
As described in 3.2, click the configure button and enter the password to enter the advanced mode.

Under this mode, there are 6 buttons at the bottom of the interface, which are used to switch and save and return options, etc.



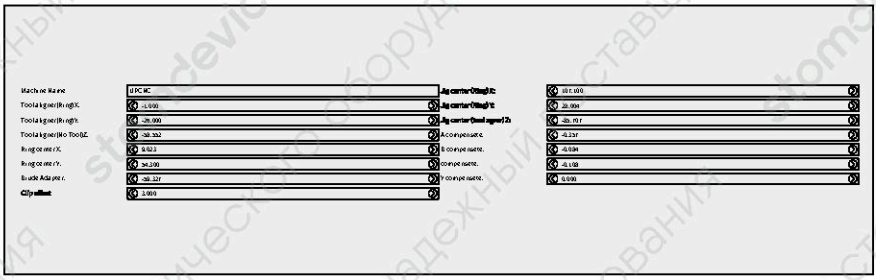

Save all: after clicking this button, set or modify the parameters in the advanced model, save all the parameters and write them to the motion control card of the salve computer.


First phase: click the button to enter the fine-tuning interface, as shown in the figure below:

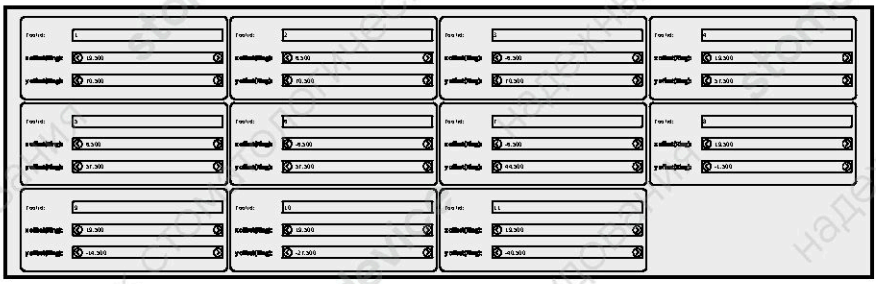


Click the corresponding button to accomplish the fine adjustment of each axis.

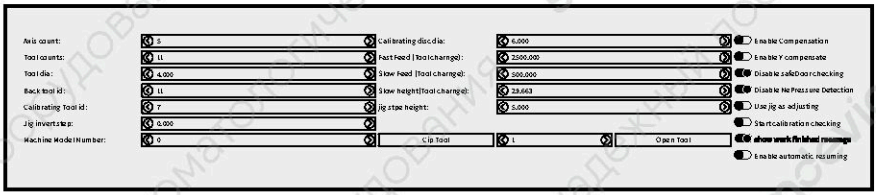
2 second phase: parameter configuration button. The parameters of the current device can be set by clicking the tick button.



3 Third phase: tool configuration button. The tool changer information of the current device is shown under this tab. The tool positions of the current tool changer can be adjusted or filled in, and saved by clicking the tick button.

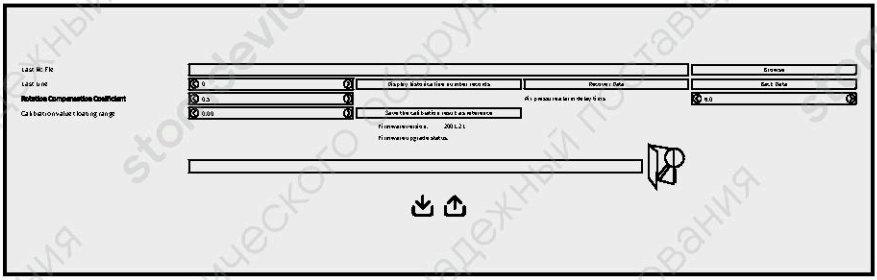


4 Fourth phase: calibration configuration button. The calibration configuration information、toolS changing information、compensation mode and other of information listed under this tab,Could be saved by clicking the tick button.



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5 Fifth phase: Open preview file, configure file and line number, and click open You can start running from a few lines of the file.



Return to normal mode: click this button to return to normal mode.

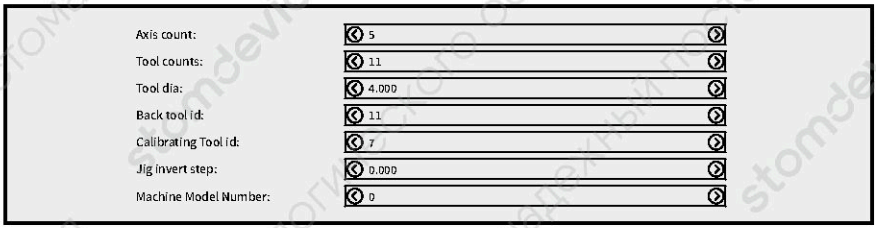
2.4 Automatic calibration operation

After successful connection, automatic calibration is required in the case of first milling, long period milling (more than one month), abnormal milling, long period shutdown (more than two weeks), or large movement of the machine, etc., so as to ensure the milling accuracy.

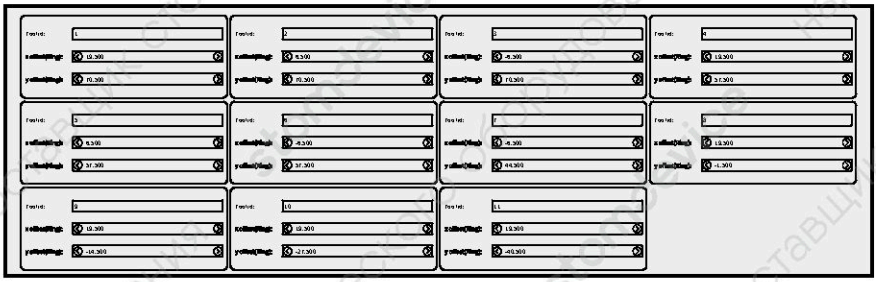
2.4.1 Check the host computer parameters

Click configuration, enter password, enter advanced mode, and check the key parameters of the three button interfaces respectively:

(1) Calibration configuration interface: check machine axis number, tool number, tool diameter, calibration tool NO., standard bar diameter.

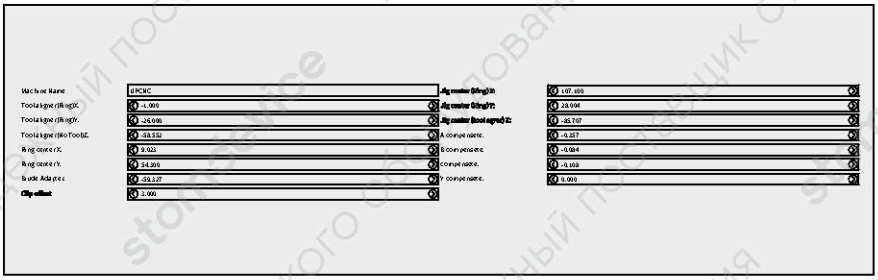


(2) Tool configuration interface: check the tool coordinates of No. 1-4 tools



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(3) Parameter configuration interface: check the calibration ring coordinates



Note: if you make a change, click confirm, otherwise the change is invalid

2.4.2 Clean the tool changer, calibration ring, tool touch sensor and fixtures

Main cleaning parts:

A. Upper plane of tool touch sensor

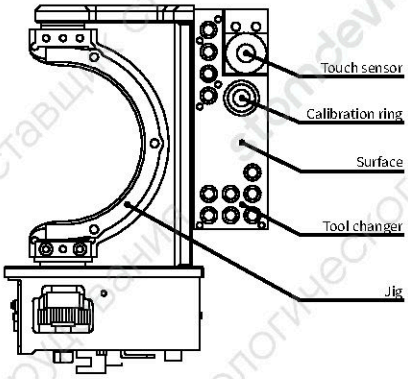
B. Upper plane of tool changer

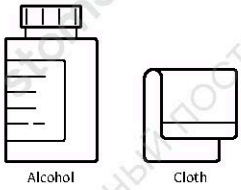
C. Inside + bottom of tool changer

D. inner side of calibration ring

E. Upper surface of fixture + standard block fixing groove

Cleaning method: use a brush or cloth to wipe the above main parts, if not clean, can add alcohol to wipe





2.4.3 Install calibration panel

A. Take out the calibration panel in the accessory box and fix it to the specific jig in the following steps for installation .

B. Position the locating lug of the calibration panel towards you and the flush end of the locating lug on the lower side.

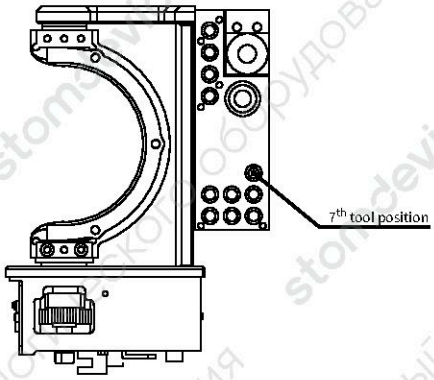
C. The positioning lug of the calibration panel is aligned with the positioning groove, and gently put into the body of the jig, so that make the lower end of the calibration panel stick to the fixture step surface.

D. Push the calibration panel so that the positioning lug fits the positioning groove tightly.

E. Take out the jig ring and align the 3 corresponding bolt mounting holes to the corresponding threaded holes of the jig, and gently place them on the jig (note: place the jig ring with step downward).

2.4.4 Install the calibration bur and put it in the tool library

Before starting calibration, please put the calibration bur at the No.7 tool position in the tool library. For calibration burs installation, please refer to the burs installation and notice described above.



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2.4.5 Auto calibrate

Click Calibration button on the software to auto calibrate the milling machine after above operations finish, it takes about 16 mins to auto calibrate.



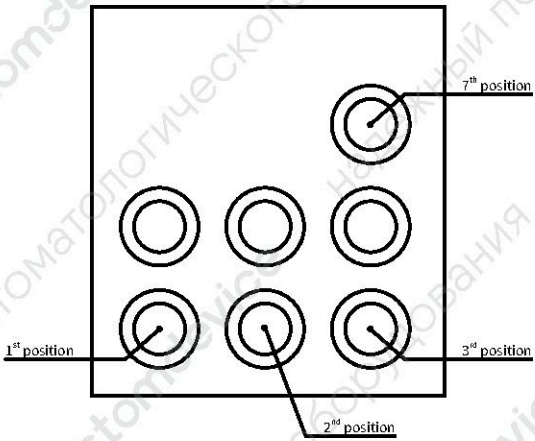
03 Milling operation instructions

3.1 Load NC file

Click the "Import" button in the "File loading and start-stop operation area" of the software interface, and find the path of the pre-made file in the opened dialog box. After selecting the file, click the "Open" button to load the NC file of the model to be processed into the software.

3.2 Tools installation

Before milling, the milling tools need to be put on the correct positions as below:



1st tool position: Φ2mm rough milling tool
2nd tool position: Φ1mm precision milling tool
3rd tool position: Φ0.6mm tooth floss processing tool
7th tool position: Φ4mm calibration tool
Notice: the installation of milling tool and ring please refer to the articles mentioned above.

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3.3 Material loading

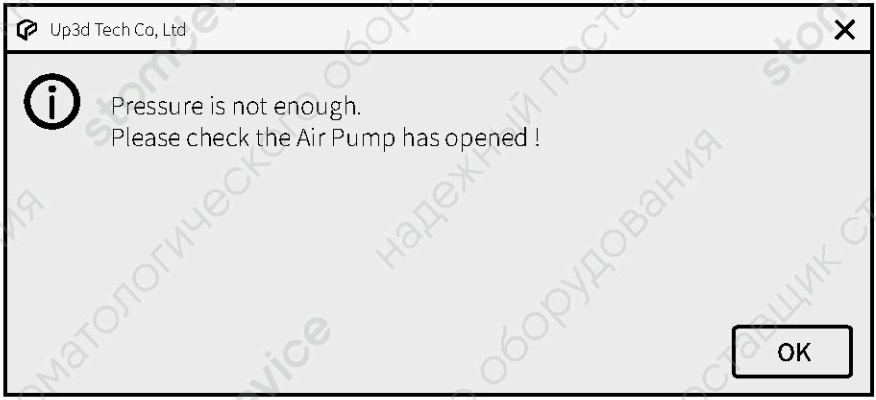
Put the material to be milled on the jig and fix it with the jig ring with 3 pieces M4x12 stainless steel hexagon socket-head cap screws (the operation can refer to the calibration plate loading as mentioned above).

3.4 Milling operation

After above operations finish, click Start button on the software to mill.

04 Errors and solutions

4.1 Air pressure error



When this fault occurs, the software interface pops up the above prompt box, which indicates that when the system detects the air pressure does not meet the minimum value of the digital display pressure switch, when this error pops up, the current operation will be discontinued.

Solution: Click OK and check the reasons below:

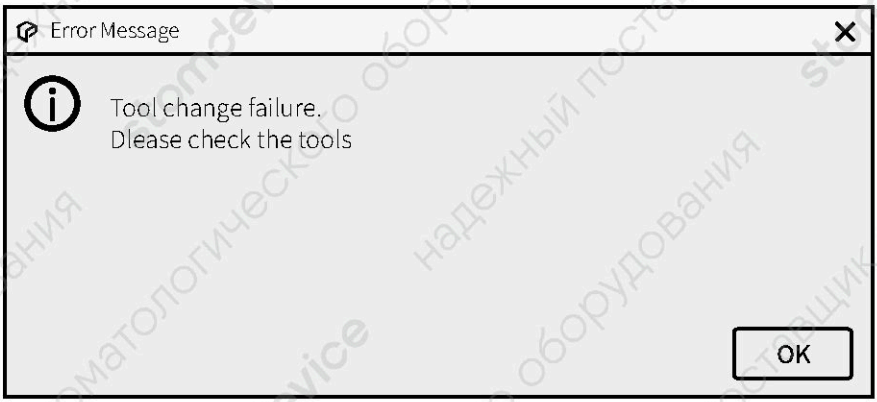
1, Check whether the air pressure supply is enough and the air compressor is on

2, Check if there is air leak of the air pipe

3, Check if the pressure regulating filter is damage or not

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4.2 Tool changing error



When this fault occurs, the software interface pops up the prompt box above, indicating that the tool exchange fails in the process of tool change

Reasons:

1.Working mode

The tool is damage during the milling process or the tool clipping fails of tool changing, this error will pop up and discontinue the milling. The milling needs to be started from the beginning after fix the error.

2.Non-working mode

Tool detection fails during the tool clipping and returning process, including tool changing failures of tool damage, tool not put on the tool changer and clamping head not open due to insufficient air pressure.

Solution:

Click Open/Close cutter button to see if the clamping head of the spindle opens or not, if it does not open, the air pressure needs to be checked. If it opens, the tool in the spindle will fall down, you need to catch the tool to avoid breaking down. Put the tool back to the tool changer and click start to mill again.

4.3 LIMITS



When this error occurs, the prompt box above pops up on the software interface, indicating that the device touches the limit or the motion exceeds the travel.There are 2 kinds of limit problem, the mechanical limit and motion limit.

Mechanical limit

If the hard limit occurs in the direction of X, Y or Z axis, it belongs to the mechanical limit. The reason is that the moving axis impinges on the limit switch in an abnormal state, resulting in machine error.

Solution: click OK to close this prompt box, then click Reset button in the software interface and wait for 10 seconds, or restart the machine.

Motion limit

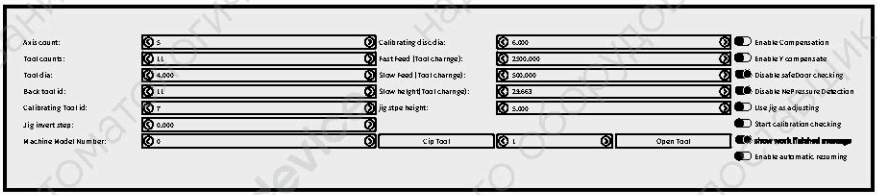
When this prompt appears, it may indicate that the next movement travel of the processing program exceeds the limited travel, resulting in the machine limit. This limit is the movement limit, and the prompt is the warning prompt.

Solution: click OK to close the prompt box, and then click Stop button to revise the NC file or regenerate the NC and proceed to the next step.

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4.4 Compensation process

In the case of continuous processing for a long time, there is a possibility that abnormal processing results will be resolved: When this happens, you can try to turn on the compensation function and click the configuration button to enter the password and enter the device parameter setting mode.As shown in the figure below, after opening the compensation button, the compensation function can be turned on to improve the abnormal processing results to a certain extent. Please use this function under the guidance of our technician.



4.5 Other Problems

If any other problems,pls feel free to contact us,thank you!

05 Technical parameters

5.1Technical parameters

The basic parameters of two kinds of dental milling machines of UP3D are as follows:

Model number	UPMill-P52
Dimension	620×430×560（mm）
weight	75Kg
Input voltage	AC 100~235V、50~60Hz
Max power	0.8KW
Spindle power	0.52KW（max）
Axis quantity	5 axis（simultaneous or 3+2）
Milling range	X/Y/Z：165/135/70mm A：±30° B：360°
Milling mode	Dry milling
Max rotate speed	40,000~60,000rpm
Max feed rate	4000mm/min
Tools capacity	11
Tools changing	Automatic (air pressure>0.5 MPa)
Spindle cooling	Air cooling (air pressure: 0.25-0.35 MPa)
Milling materials	Zirconia, wax, PMMA, wood
Milling time	Zirconia：13min、Wax：10min
Tool diameter	2+1+0.6（3 milling tools and 1 calibration tool）
Packing case size	L*W*H：740×540×850（mm）

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User info

NAME: _____

ADDRESS: _____

CONTACT PERSON: _____

TEL: _____

PRODUCT IDENTIFICATION: _____

PURCHASE DATE: _____

INSTALLATION DATE: _____

REMARKS:

stomdevice



Add: RM202, Block 1, Sunshine Industrial Park, Songbai Road, Xili Street, Nanshan District, Shenzhen, China 518055
Tel：0086-0755-26983278
Website: www.up3d.cn

https://stomdevice.ru - стоматологическое и зуботехническое оборудование с доставкой по России и СНГ