



Shenzhen UP3D Tech Co., Ltd.

F20 Smart Sintering Furnace User Manual



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1.1 Description

Dear customers: Thank you very much for purchasing F20 smart sintering furnace from UP3D TECH, which is suitable for sintering and crystallization of zirconia restorations. Incorrect operation may damage the equipment and may cause personal injury. Please follow the safety instructions in the manual and read the operating instructions carefully.
Enjoy using the F20!

1.2 Operation Precautions

Sintering Furnace Model: F20
User: Dental lab technicians

This manual can help you use the F20 Furnace accurately, safely and economically. In order to avoid burns, electric shocks, fires and other safety accidents, please be sure to read the following basic safety measures.

- 1) Read the manual carefully before using F20, and place the manual next to F20;
- 2) F20 must use a power socket with reliable protective grounding;
- 3) F20 is heavy and should be placed on a firm and stable work surface to prevent accident ;
- 4) F20 should be kept away from children, and never allow children to play and use accessories;

- 5) No objects can be placed on the top of F20, and no liquids are allowed to enter the interior;
- 6) F20 works at a high temperature, so it needs good ventilation. Do not use it in a humid environment to avoid abnormal accidents;
- 7) When using the F20, pay attention to the operating conditions, and the faulty pop-up window needs to be resolved in time;
- 8) When cleaning and maintaining the F20, the power must be cut off, and do not carry out with electricity;

If you lose the manual, you can contact technical support of UP3D TECH to get it

02 Product Description

2.1 Components

F20 smart sintering furnace is a sintering equipment suitable for zirconia restorations crystallization. The temperature in the chamber can be heated up to 1600 degree, and it is controlled intelligently by the corresponding control system and control software during sintering, and the target and actual temperature in the furnace can be displayed in real time.

The F20 smart sintering furnace includes the following components:

- 1 sintering furnace body
- 1 hearth base and 1 hearth
- 3 sintering tray with cover
- 1 pack of sintering beads
- 1 sintering tweezers
- 1 power cord

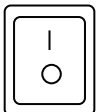
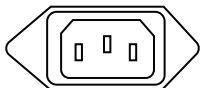
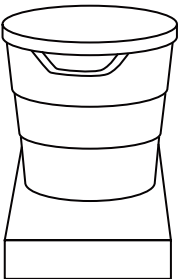
2.2 Hazardous areas

The hazardous area of the F20 sintering furnace is shown in the table below:

Dangerous area	Hazard type
Sides of furnace	Burn hazard
Lifting areas	Crush hazard
Furnace internal parts	Electric shock hazard

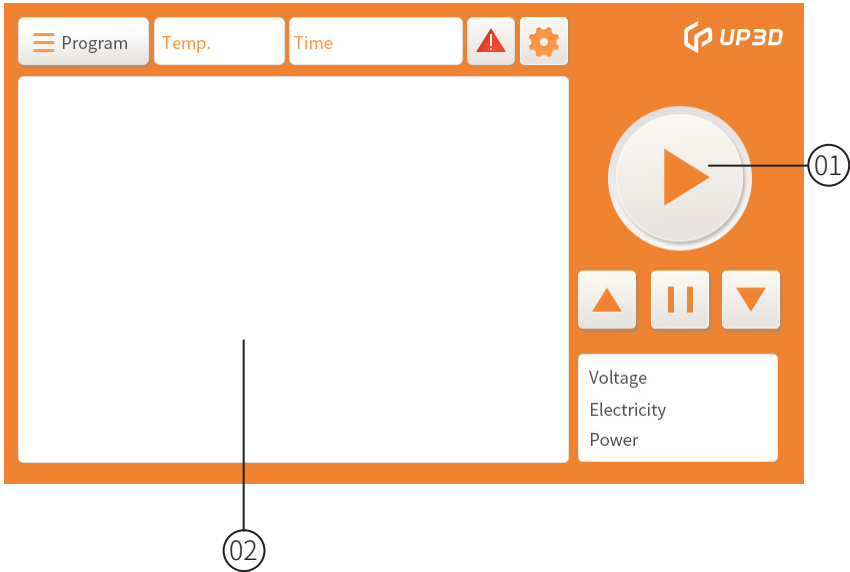
03 Operation and configuration

3.1.1 Operating Instructions

	Power Switch, switch to I to turn on the machine and start using. Switch to O to turn off the machine and stop using.
	Power port, connect the configured power cord to this port (the machine power Power cable is a specific power cable, and there is a risk of wire burning if other power cables are used)
	Place the sintering tray, put the restorations in the tray filled with zirconium beads, and cover the tray cover in sequence (the tray can be stacked up to three layers, and a maximum of 40 single crowns can be placed on each layer)

3.1.2 Control Panel





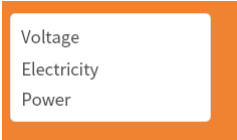





The F20 furnace is equipped with a large colorful touch screen, all operations can be easily controlled via it.



The main user interface is divided into two parts:

1. Operation area (including lift control button, sintering control button, electrical parameter display box, sintering program display box, temperature display box, time display box, fault display box, setting box, etc.)
2. Sintering curve display area (display sintering curve of current sintering program and heating rate of each stage, target temperature, holding time, etc.)

3.1.3 Icon Explanation

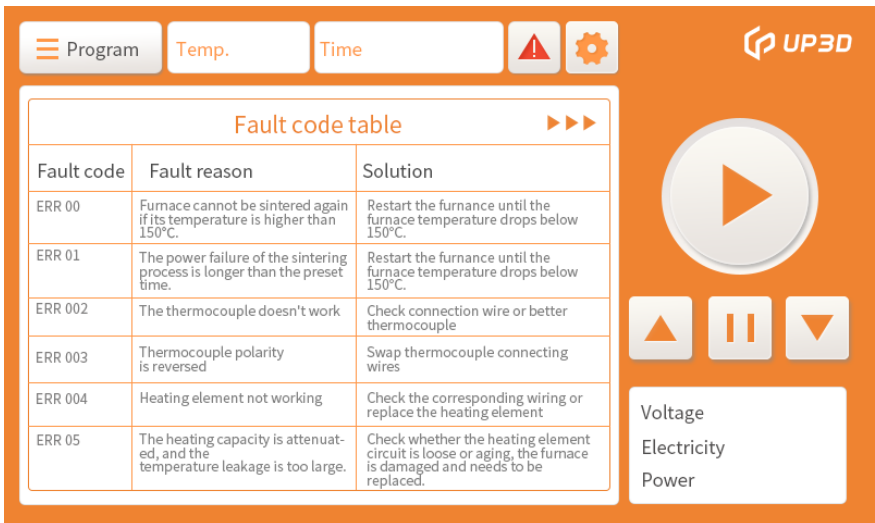
Icon	Functional explanation
	<p>Sintering Control Button: When the hearth is raised to proper position, click this button to start sintering.</p>
	<p>Hearth Up Button: Click this button and the hearth will rise.</p>
	<p>Hearth Down Button: Click this button and the hearth will drop.</p>
	<p>Hearth lift pause button: When the hearth rises or falls, click this button, and the hearth will stop rising or falling.</p>
	<p>Electrical parameter display box: real-time display of voltage, current and power during sintering.</p>
	<p>Sintering program display box: click this box to customize the sintering program or select a defined sintering program.</p>
	<p>Temperature display box: Display furnace temperature in real time.</p>
	<p>Time display box: display the remaining sintering time in real time during sintering.</p>
	<p>Fault display box: 1) Click this box, the fault code table will pop up. 2) When the F20 sintering</p>
	<p>Settings box: Click this box to change password settings</p>

3.1.4 Interface operation

1) Sintering control button: when the hearth is not raised to the proper position or there is a faulty pop-up, the button cannot be activated for sintering; Otherwise, when click the sintering control button, the triangle on it will turn into two vertical lines and the sintering will start; then click it again, the two vertical lines will turn into triangle, and the sintering will be stopped.

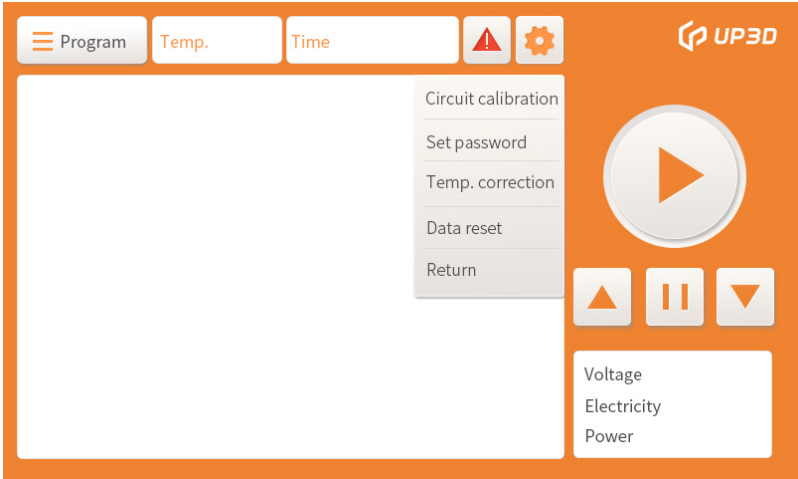


2) Fault display box: Click on the fault display box, and a fault code table will pop up. When the fault code pops up during the use of the F20 sintering furnace, fault cause can be found out from this fault code table, and the fault can be solved according to the corresponding solution.

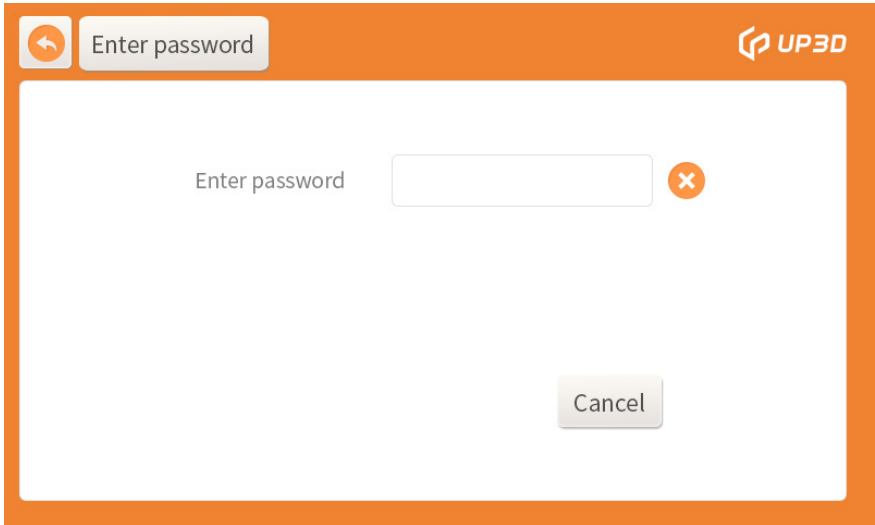


3) Setting box: Click the setting box to pop up the circuit calibration and setting password box. The circuit calibration module is only open to the technical support of UP3D TECH. A password is set for the customer to manage the defined sintering program, preventing others from tampering with the defined program.

Data reset and temperature calibration are not available, please contact the technician if you need to operate.

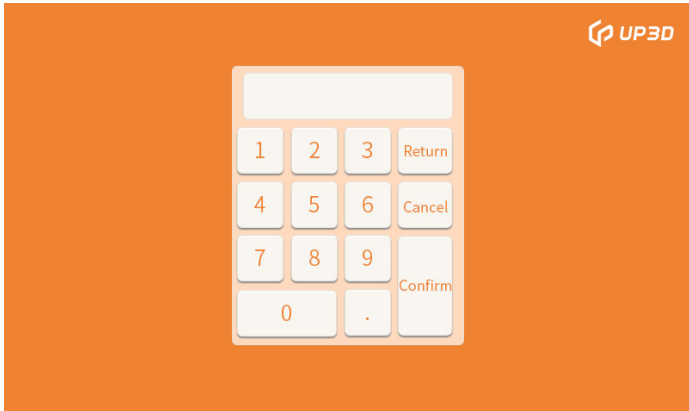


Click the Enter password box to enter the password input interface.

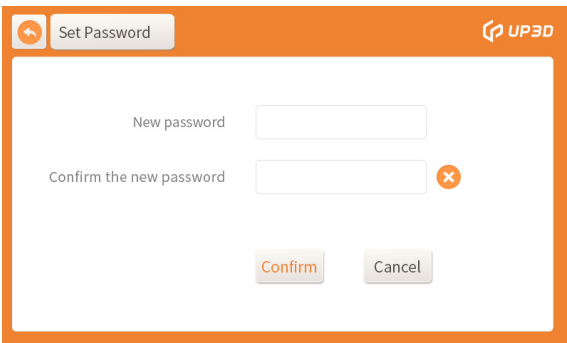


On the password input interface, click the Enter password box, and the numeric keyboard box will pop up.

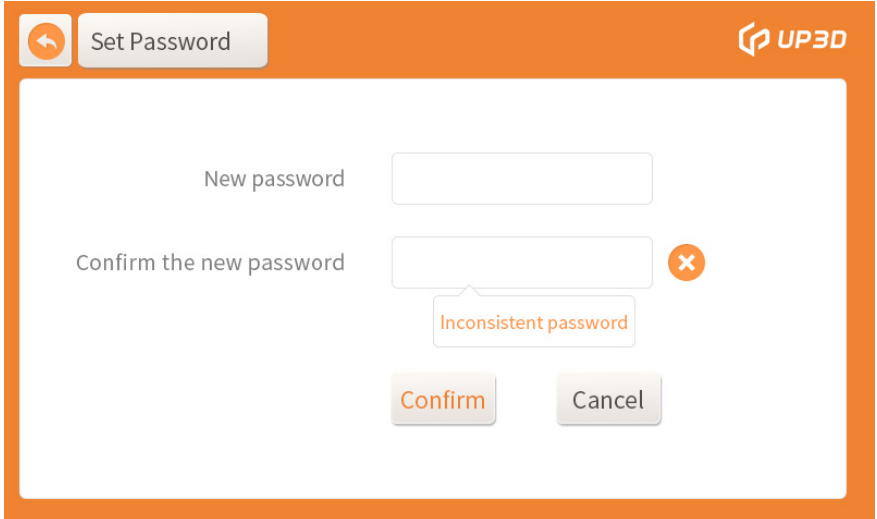
Put in factory password 66666 in keyboard, click OK to enter the password setting interface;



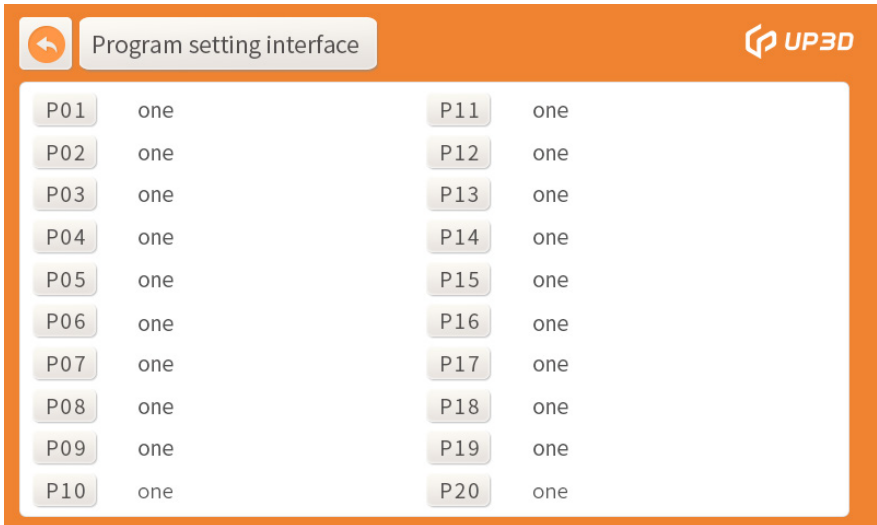
On the password setting interface, click the Enter password box, and the numeric keyboard box will pop up. Put in a new 6-digit password, then click the re-enter the new password box, put in the same 6-digit new password, and click OK. If the two passwords are inconsistent, a password inconsistency box will pop up.



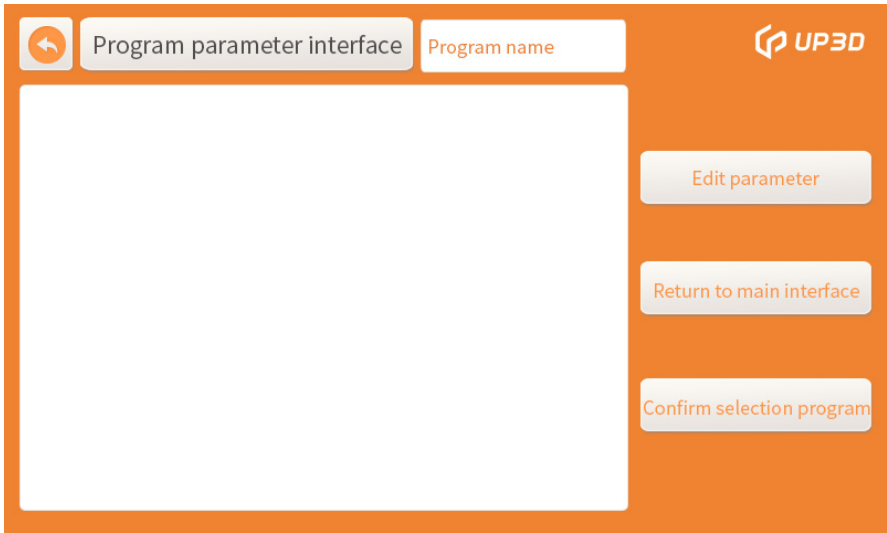
After re-entering the same new password, click OK to complete the password change. Note that you must remember the 6-digit new password after change. If you forget it, you can only restore it and reset it, which will cause the loss of the customized sintering program.



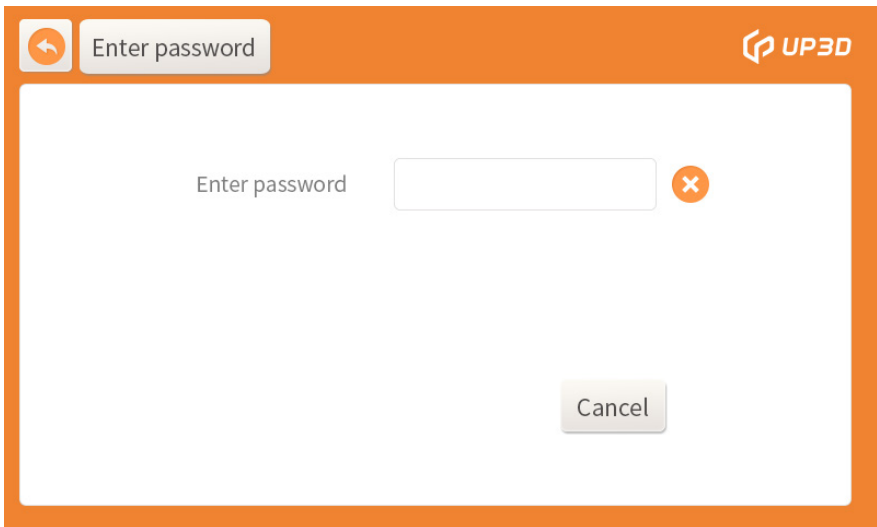
4) Sintering program display box: When you need to customize sintering program or select a defined sintering program, click the sintering program display box to enter the program setting interface.



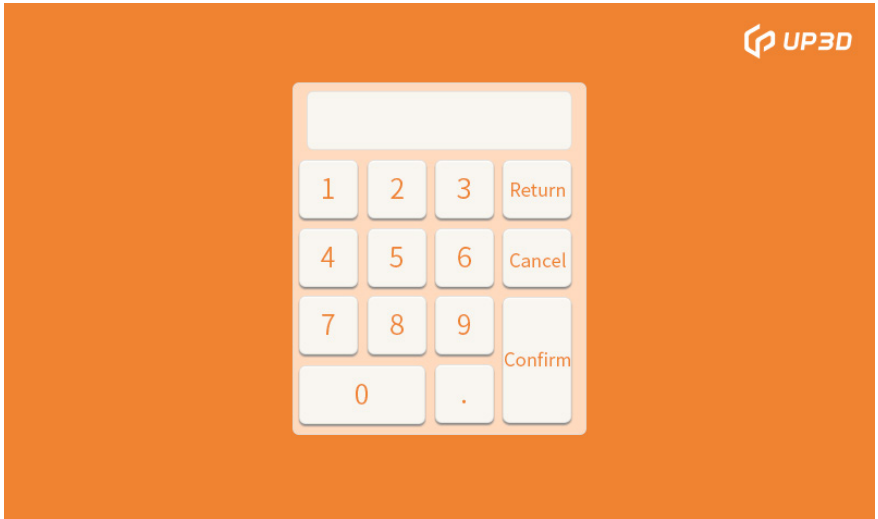
Click the specific program or the serial number on display box to enter the program parameter interface.



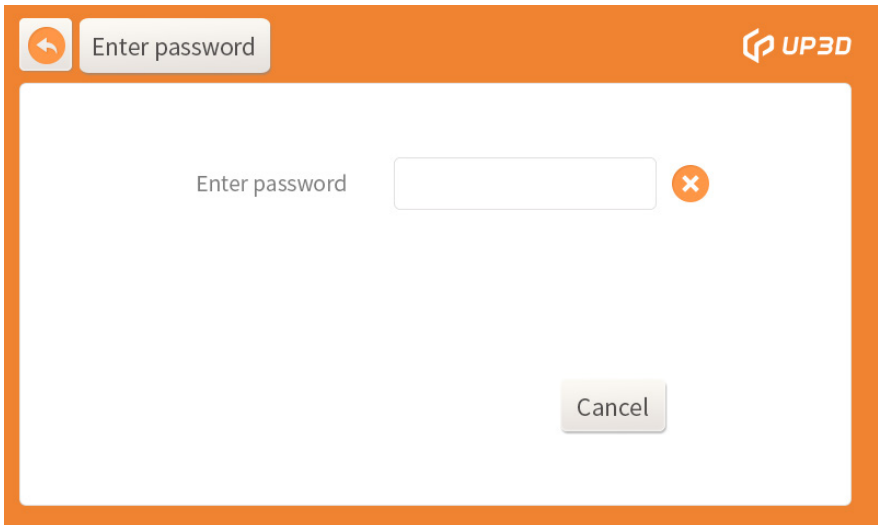
Click the program confirmation box, it means that the program is selected, and it will automatically return to the main interface. When you need to customize and edit the sintering program, you need to click the modify parameter box, and then enter the password input interface.



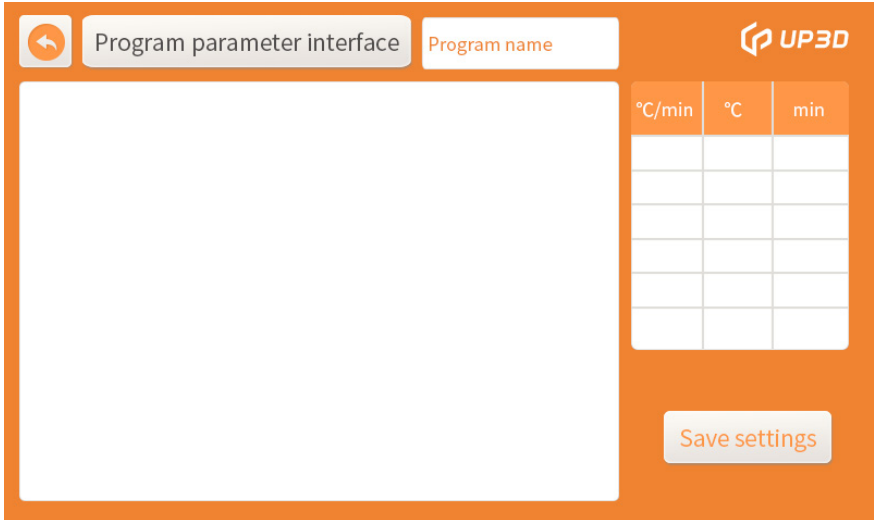
Click the Enter password box, and the numeric keyboard box will pop up.



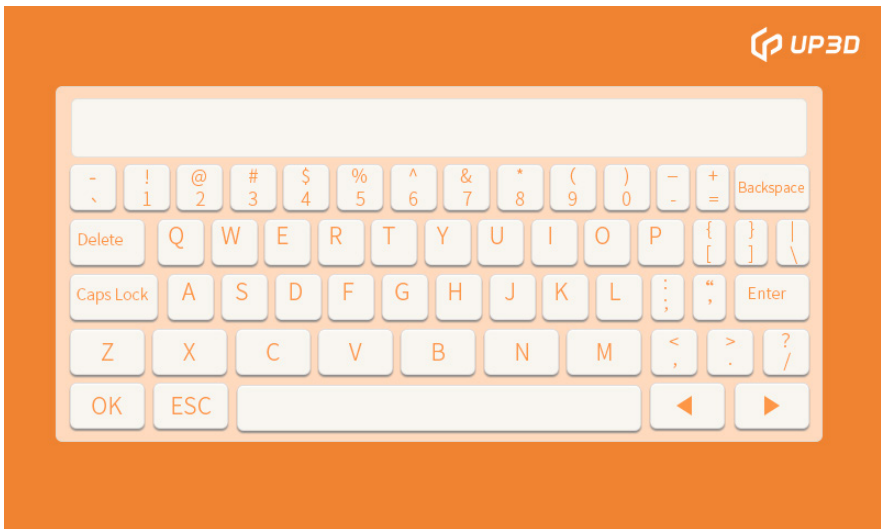
Put in the correct 6-digit password, if incorrect, a reminder box will pop up at the bottom of the password box.



If the 6-digit password is correct, you can enter the program parameter interface where parameters can be edited.



Click the program name box, an alphabetic keyboard box will pop up, click the CAPSLOCK box to switch between Chinese and English input, switch to Chinese to input Pinyin, and click the left and right switching buttons to turn pages. Find the required text and click, you can enter the text, repeat the above operations to input the program name, and click OK to complete the input of the program name. Note that the program name can only input 7 Chinese or 14 English letters.

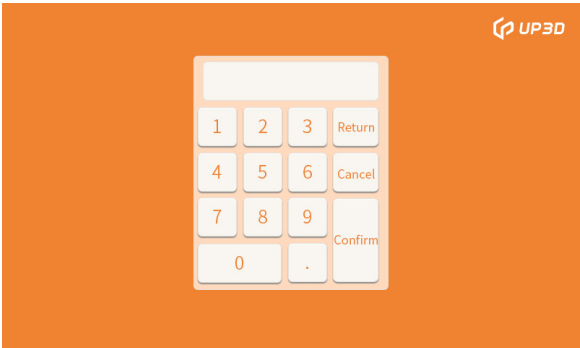


The white boxes in the parameter setting areas of heating, temperature, and temp. preservation in the program parameter interface represent different definitions, and the range of parameter values that can be input is also different. Note that the boxes totally white in below picture is currently undefined and no parameters cannot be put in.



°C/min	°C	min

Click the defined parameter setting box, the numeric keyboard will pop up, enter the appropriate parameter value in the numeric keyboard, click OK, the parameter setting for the defined box is completed, after setting the corresponding parameters according to different zirconia models and different restoration types. Click the save setting box, the program name and corresponding parameter settings are saved.



The definition of each box and the value range of input parameter are shown in the following table:

t1	The first stage heating rate , valid value range: 5-20°C /min
T1	The target temperature of the first stage, the effective value range: 300 °C -500 °C
t2	The second stage heating rate , valid value range: 5-15°C /min
T2	The target temperature of the second stage, the effective value range: 900°C -1200°C
H2	Second stage holding time, valid value range: 0-30min
t3	The third stage heating rate, valid value range: 2-10°C /min
T3	The third stage target temperature, effective value range: 1250°C -1400°C
H3	The third stage of holding time, effective value range: 0-30min
t4	The fourth stage heating rate, valid value range: 2-10°C /min
T4	The fourth stage target temperature, effective value range: 1450°C -1600°C
H4	Fourth stage holding time, effective value range: 0-300min
t5	Cooling rate, effective value range: 5-10°C /min
T5	Control the temperature for stopping cooling, effective value range: 400°C— 1000°C (Note: The input temperature is between 800° C and 1000° C, and the temperature is lowered according to the cooling rate;

3.2 Configuration Instructions

1. Function configuration of F20 smart sintering furnace:

Sintering program:	20 programs can be freely set by the user Easy to search when sintering.
Number of crucibles:	Three layers of sintering tray can be placed at the same time,
Furnace mode:	Lifting open type
Heating method:	Heating evenly on all sides
Maximum heating temperature:	1600°C
Temperature measuring element:	Type B thermocouple
Heating element: Four ultra-pure	Four ultra-pure silicon molybdenum rods
Operation mode:	7 inch true color touch screen
Short-time power off but continuous burning:	If the temperature drops less than 150 ° C during power off, the sintering can be automatically continued when the power on.
Hearth down automatically during cooling:	After cooling down to 800 ° C , the hearth automatically goes down. Increase the cooling rate and save the sintering time.
Screen saver popup	Large words on the screen saver displays the remaining time of sintering, the real-time temperature of the furnace, and automatically adjustment of the target temperature, which can be observed at a distance.
Trouble popup	When a fault occurs, a pop-up window can be displayed in time to show the fault code, and the corresponding problem of the fault code can be found on the screen warning page, which is convenient for maintenance.
False triggering recovery	If any misoperation, sintering recovery can be carried out when the temperature drops less than 150°C

2. Basic factory configuration of sintering curve: (for reference only)

Program code description

Program code	Description
P01	UPCERA ST single crown
P02	UPCERA ST short bridge
P03	UPCERA ST long bridge
P04	Xiangtong, less than 5 units
P05	Xiangtong, more than 5 units
P06	UPCERA color zirconia single crown
P07	UPCERA color zirconia short bridge
P08	UPCERA color zirconia long bridge
P09-P19	Undefined, for sintering curve customization
P20	Cleaning program. when use the new furnace or the one which haven't been used for a long time, please choose P20 to work whole process with an empty sintering plate in .

- Note: 1. When using the sintering program, a maximum of three sintering trays can be placed inside the furnace.
2. it is necessary to heat the empty furnace to clean it every one or two weeks.
3. Raise the lifting platform to the top when not use to prevent foreign objects or dust from entering the furnace to contaminate it.

04 Installation and use

4.1 Unpacking

Unpack the F20 smart sintering furnace to check whether the components are complete and whether they are damaged due to transportation; if there are incomplete components or damage due to transportation, please contact technical support of UP3D TECH for solutions; Note: It is recommended to keep the package for future transportation;

4.2 Assembly

Step 1: Place the main body of the F20 sintering furnace on the workbench surface specified in 1.2 Operation Precautions;

Step 2: Insert the power cord into the main body of the sintering furnace, turn on the power, click the up button on the operation interface, and wait for the lifting platform to rise to a certain level. After the height is reached, click the pause button, the lifting platform stops lifting, and then take out the shock-absorbing foam under the lifting platform.

Step 3: Click the down button to lower the lifting platform to the lowest level, then place the hearth base on it, and finally place the hearth on the hearth base. After the assembly is completed, the F20 smart sintering furnace can be used normally.

05 Electrical parameters

F20 Smart Sintering Furnace Electrical Parameters			
Rated voltage:	110VAC \pm 10% 220VAC \pm 15%	Packing box size: L x W x H:	长 X 宽 X 高: 658*480*755
Rated frequency:	50H/60HZ fuse:		2X~500V 32A
Rated power:	2000W	Net weight:	64kg
Dimensions: L x W x H:	548*389*673	Gross weight:	78KG



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