

Fast Zirconia Sintering Furnace TR-DLC01

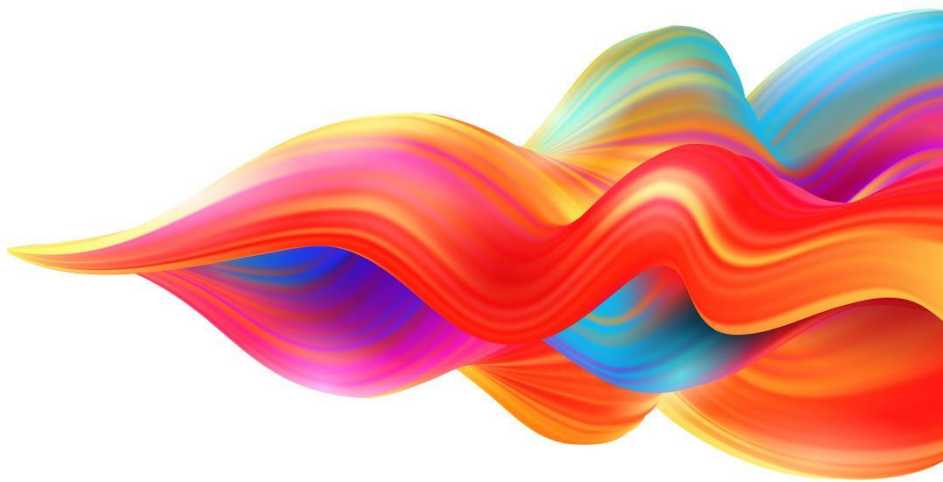


TABLE OF CONTENTS

1. SAFETY AND CLEANING	2
2. THE INTRODUCTION FOR THE SINTERING FURNACE	4
2.1 THE FUNCTIONS OF USTHERMO SINTERING FURNACE	4
2.2 THE INTRODUCTION OF SPECIFICATIONS	4
2.3 AMBIENT CONDITIONS	5
2.4 DEVICE IN BOX COMPLETE WITH	5
3.SAFETY INSTRUCTIONS	6
3.1 PICTOGRAMS	6
4. INSTALLMENT AND START UP	7
4.1 THE PLACE OF INSTALLMENT	7
4.2 CONNECTING THE DEVICE TO THE MAINS POWER SUPPLY	7
4.3 FAST SINTERING:	8
4.4 SINTERING FURNACE STAND BY MODE INTRODUCTION	8
5. FURNACE HARDWARE (AND ACCESSORIES) INSTRUCTIONS	9
5.1 FUSES	9
5.2 FAN	9
5.3 SPARE PARTS	9
6. WARRANTY AND LIABILITY	9
7. DESCRIPTION OF THE FURNACE	10
7.1 OPERATION PANEL	10
7.2 BUTTONS NAMES	10
7.3 THE DISPLAYS INTERFACE	11
7.4 CHOOSE A CURRENT FIRING PROGRAM	11
7.5 SET PARAMETERS FOR A FIRING PROGRAM	12
7.6 COMPREHENSIVE PARAMETER SETTING	14
7.7 BUTTONS NAMES	15
7.8 HEARTER LIFE	16
7.9 TEMPERATURE FIX	17
7.10 IDEL TEMPERATURE	18
7.11 MOTOR SPEED	19
7.12 PAN POS	20
7.13 RESTORE FACTORY	21
7.14 CLEAN MODE	22
7.15 SOUND	23
7.16 ABOUT	24
7.17 START A SINTERING PROGRAM	24
7.18 STOP A SINTERING PROGRAM	24
8.TROUBLE SHOOTING	25

1.SAFETY AND CLEANING

1. Sintering furnace is use for firing ceramic materials of teeth.
2. The device must be put at least 25-30cm away from the wall.Be assure that the sintering furnace must be under normal ventilation environment.
3. The sockets must be put near the power source.The instrument board behind must be connected firmly.
4. Do not operate near by inflammable.
5. Please use dry or a little wet cloth clean the surface of the sintering furnace.Do not use solvent or other liquid cleaner to purify the control panel.Please do not let the liquid seep into the sintering furnace.
6. Damages caused by mis-operation can not be included in warranty scope.
7. In order to the best work environment,we suggest you use a exclusive circuit. The socket use an overload resistant protector would be best.The three-phase circuit must have a dedicated line for a reliable grounding wire.
8. Before any maintenance,you must plug off from the electrical socket .
9. In order to avoid any accident of serious scald,please use proper instrument to put in or move the objects .
10. Do not use nippers or other instrument to operate the furnace,these instruments may damage the screen or the membrane.
11. The firing deck is a movable (up or down)part.The to-and-fro motion is controlled by the program.
12. The inner place of the furnace include fireproof ceramic-fiber and porcelain dust,these may be released by the movement of opening.Once these materials are inhaled by human,it may cause cancer.The dust can irritate the skin and eyes,cause the respiratory tract hoarse or fester.Do not use condense air blow the dust into the work environment.

CAUTIONS:

1. Please read the instruction carefully before you use the furnace. If you do not use the device according to the manual, the life span of the Sintering furnace may be reduced.
2. The producer do not take the responsibility of lost caused by fault operation or misunderstand of the instruction.
3. Before move or assemble the furnace, please cool down the temperature.
4. Be careful for the part of high temperature when the device is operating.
5. The device is constructed according to a state of the art design and recognized safety regulations. However, if it is used inappropriately, hazards for the health and safety of the user or third parties may arise as well as the risk of damaging the device and other valuable assets.
6. After the back-plate has been removed, a voltage of up to 400 volts may still exist in components in the area of the power supply unit on the circuit board, even when the device is switched off.

The manufacturer is not liable for accidents to the user occurring when the device is open!

1. The standard for the user disassemble the instrument privately is depend on whether the easily damaged sticker is damaged.
2. Never start up the device without the firing socket attached.
3. In continuous operation (max. final temperature, max. firing time), some parts of the firing chamber may reach high temperatures (above 70 °C).
4. Do not reach into the open firing chamber when the device is switched on. There is a risk of touching electrically live or hot parts.

2、 THE INTRUCTION FOR THE SINTERING FURNACE

21 THE FUNCTIONS OF SINTERING FURNACE:

- Voice prompt function.
- High quality temperature automatic adjustment function, to ensure the actual temperature error within + / - 2 degrees.
- It is easy to operate and small in size. At present, it is one of the smaller furnaces in the world.
- Precision stepper motor drive, smooth free operation and no jitter.
- High purity silicon carbide rod / silicon molybdenum rod heater.
- Hyperbolic sintering system, automatic temperature calibration before each sinter process.
- Low noise tray and the speed is programmable.
- Fast sintering zirconia with full anatomical morphology.
- The pre-drying time can be set for baking zirconia denture.
- The maximum temperature can be set to 1550 °C.
- The maximum heating rate is 200 C/min.
- There is no need to preheat the sintering furnace in advance. Ready to use in any time.
- Automatic fast cooling technology.
- Up to 30-50 restorations (90mm tray) can be sintered.
- True color touch screen, easy to operate.
- 50 custom programs and built-in programs.
- Status indication.

22 THE INTRODUCTION OF SPECIFICATIONS:

OPERATION:

The velocity of temperature increasing: 200°C/min max.

The max temperature: 1550°C max

The time which can be kept at the max temperature: 2 H

ELECTRIC POWER:

Operation range: 100-120V 50/60HZ 230V 50/60HZ

Electric current: 30ampere@110V 20ampere@230V

Power: max 3000w

TYPICAL SPECIFICATION:

WXDXH :width 36cm Depth 46cm Height 59cm

Usable measure (firing chamber): 9cm

Net weight: 40Kg

Weight include the package:45Kg

23 AMBIENT CONDITIONS

- Indoor use
- Ambient temperature: 2°C to 40°C
- Relative humidity 80% at 31°C
- Maximum altitude: 1500 m (**Special Model:3500m**)
- Rated voltage fluctuations must not exceed plus/minus 10% of the rated voltage

24 DEVICE IN BOX COMPLETE WITH:

- 1 firing pan
- 1 connection cable for the mains power supply
- 1 instructions
- 1 Burning rack

3. SAFETY INSTRUCTIONS

3.1 PICTOGRAMS



This pictogram warns injured voltage. Before opening the device, it must be pulling out the mains plug.



This pictogram warns the hot surfaces. Burn injuries may occur.



This pictogram warns may cause personal injury or damage to the device.



This pictogram show useful tips, explanations and additional information.

4.INSTALLMENT AND START UP

4.1 THE PLACE OF INSTALLMENT

- The sintering furnace must be installed in the dry room,and it must be put at least 25cm away from the wall.
- If the temperature is below 15 °C (59 °F) (e.g. after transport), leave the device to stand for approx. 30 minutes before using it for the first time at room temperature.
- Ensure that the device is on a heat-resistant surface. The radiation and heating of the device is in the non-hazardous range. However, heat-sensitive surfaces of furniture and veneers could become somewhat discolored over time due to the constant influence of heat.
- Please avoid direct sunlight.
- MUST NOT put flammable around the sintering furnace.

4.2 CONNECTING THE DEVICE TO THE MAINS POWER SUPPLY

- A. Take out the sintering furnace core from the accessories for standby (it must be placed in a safe place)
- B. Insert the plug of the sintering furnace.
- C. Turn on the power switch of sintering furnace.
- E. When the sintering furnace starts and display the main interface (when the temperature is displayed), press the down button, and the sintering platform moves downward (do not place any obstacles on the track of the sintering platform)
- F. Assemble the baking core on the sintering platform.

Never start up the device without baking core!

4.3 FAST SINTERING:

Powerful power is the guarantee for rapid temperature rise of sintering furnace. The limit power of 3000W instantly releases a large amount of heat energy. Make the furnace temperature rise rapidly, and the high-purity silicon molybdenum rod / silicon carbon rod has strong heat-resistant load capacity. However, it is necessary to provide 2.5mm (220V) or 6mm (110V) cable for power supply, and only one sintering furnace can be used on this wire.

4.4 SINTERING FURNACE STAND BY MODE INTRODUCTION

Idle temperature:

Idle temperature is sintering furnace not in firing ,a temperature value user hope to it static.The furnace will automatically adjust the idle temperature according to the current mode.

(when the silicon molybdenum rod is a heating body, it is not allowed to set the idle temperature, otherwise the heating rod will be damaged.)

Sound:

If sound function on,there will be a sound that press any key.

5. FURNACE HARDWARE (AND ACCESSORIES) INSTRUCTIONS

5.1 FUSES

On the back of the device, there are 2 device fuses. The identification plates show information about the fuse ratings used in the device. Fuses with other ratings must not be used.

230V **T20H250V** 100/110V **T30H250V**

5.2 FAN

The device is equipped with a fan. Activation, deactivation of the fan are controlled automatically. The fan prevents excessive heating of the device and contributes to its general operating safety. For safety reasons, the device must not be operated without a fan. The upper cover of the firing chamber and the openings in the rear cover must not be closed or blocked.

5.3 SPARE PARTS

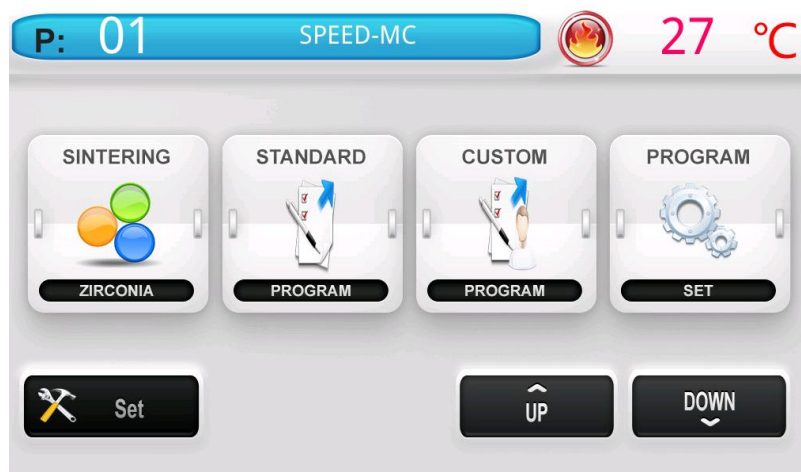
Spare parts must comply with the technical requirements determined by the manufacturer. This is always assured when using original spare parts .

6. WARRANTY AND LIABILITY

The USTHERMO furnace provide 1 years (except heating body) limited warranty: warranty starting from goods delivery for the first vendors.

7. DESCRIPTION OF THE FURNACE

7.1 OPERATION PANEL



7.2 BUTTONS NAMES:

[SPEED/GLAZE] :Sintering interface.

[STANDARD]:Standard procedure selection.

[CUSTOM]:Custom program selection.

[PROGRAM]:Program parameter setting interface.

[SET]:Other settings.

[UP]:The tray rises.

[DOWN]:Tray down.

7.3 THE DISPLAYS INTERFACE

P 01: The current chosen program ID is 01. The following is the name of the programme.

TEMPERATURE 27C: The furnace temperature 27°C.

7.4 CHOOSE A CURRENT FIRING PROGRAM

Press **[CUSTOM]** enter program ID choose interface , as follow



Press program number ,then it will jump a soft keyboard. Use the key 0-9 input a program ID which you want, input the number, press OK complete the current program number choose.

If input wrong program number ,press BACK to cancel.

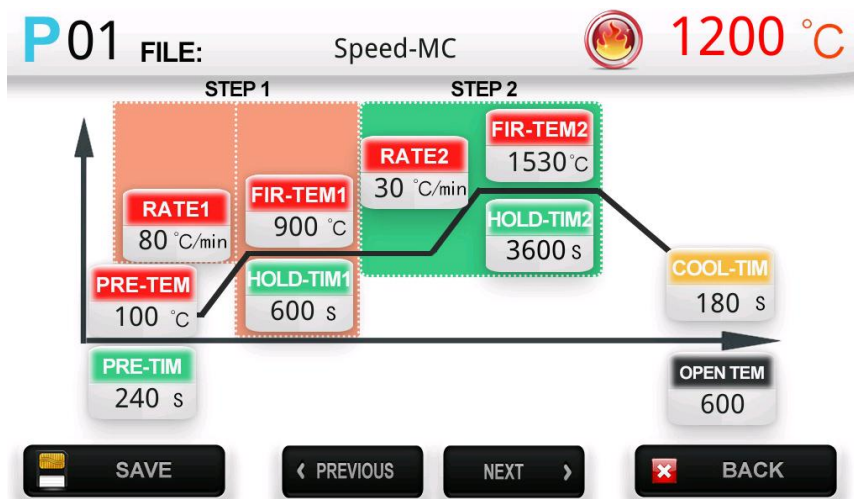
You can also use the **PROGRAM SETING** interface to select the program with "**previous page, next page**" button.

You can also press "**STANDARD PROGRAM**" to call the built-in program directly.

NOTE:The built-in program of Standard Program corresponds to the program number, and the standard program 1 corresponds to the program number 1. The parameters of standard built-in program 1 can be edited by editing program 1.

7.5 SET PARAMETERS FOR A PROGRAM

Press **[program-set]** to enter the program parameter setting interface. Press **"previous page, next page"** to select a program, and finally input 11 parameters in turn to complete the parameter setting of the current program.



Input parameters ok then please press key **[SAVE]** to save, Press **[CANCEL]** back.

Parameters table:

Parameter prompt	Description	Unit	
1.1 PRE-TEM	Pre drying temperature	℃	
1.2 PRE-TIM	Pre drying time	s	
1.3 RATE1	Temperature rate of the first temperature curve	℃/min	
1.4 FIR-TEM1	Maximum temperature of the first temperature curve	℃	
1.5 HOLD-TIM1	High temperature holding time of the first temperature curve	s	
1.6 RATE2	Temperature rate of the second temperature curve	℃/min	
1.7 FIR-TEM1	Maximum temperature of the second temperature curve	℃	
1.8 HOLD-TIM2	High temperature holding time of the second temperature curve	s	
1.9 COOL-TIM	Cooling time	s	
1.10 OPEN TEM	Opening temperature of furnace door	℃	When the furnace temperature is lower than this temperature, the cooling program will be started; otherwise, it will be waiting for cooling
1.11 FILE	File name		

Error parameters remind:

When you input a program parameter or other parameters, you input a parameter the system can not run, or the parameter with Logic errors, system will automatic change into the maximum/minimum limit value.

7.6 COMPREHENSIVE PARAMETER SETTING

Press [SET] into SET interface,as follow:



7.7 BUTTONS NAMES:

[ELEMA] Heater life and sintering furnace life.

[TEM FIX]: Fix the temperature correction.

[IDEL TEM]: Input the idle temperature. Idle temperature is Sintering furnace not in firing , a temperature value user hope to it static.

[MOTOR SPEED]: Pan speed set. Too fast or too slow will cause noise.

[PAN POS]: Starting the program, in the Pre-dry stage, the pan will up two times , this set are two up position.

[RESTORE FACTORY]: Restore to factory settings.

[CLEAN MODE]: Sintering furnace impurity.

[SOUND]: Set Sound ON or OFF.

[ABOUT]: About Sintering furnace.

[BACK]: Back to main interface.

7.8 HEARTER LIFE

ELEMA Information

The image shows a digital display interface for 'ELEMA Information'. It features two horizontal bars representing 'TOTAL LIFE' and 'ELEMA LIFE', both showing a value of '0'. Below these bars are two buttons: 'Engineer interface' on the left and 'ELEMA RECOUNT' on the right. At the bottom center, there is a confirmation button with a green checkmark icon and the text 'OK'.

TOTAL LIFE : Overall service life of equipment.

ELEMA LIFE: The heater life.

ELEMA RECOUNT: Please reset this data every time you replace the heating rod.

7.9 TEMPERATURE FIX

TEMPERATURE CORRECTION



Temperature adjustment automatically before every firing procedure. But we still provide manual methods of temperature correction.

Fix value 200 as the center, to increase this number means that reduce the actual temperature, reduce this number means increasing the actual temperature, usually this value is 200 .

Press [**SAVE**] to save temperature fix.

Press [**BACK**] to back to main interface.

7.10 IDEL TEMPERATURE

IDLE TEMPERATURE

ONLY FOR GLAZE/CRYSTALLIZATION



500



SAVE



BACK

Idle temperature is sintering furnace not in firing ,a temperature value user hope to it static.



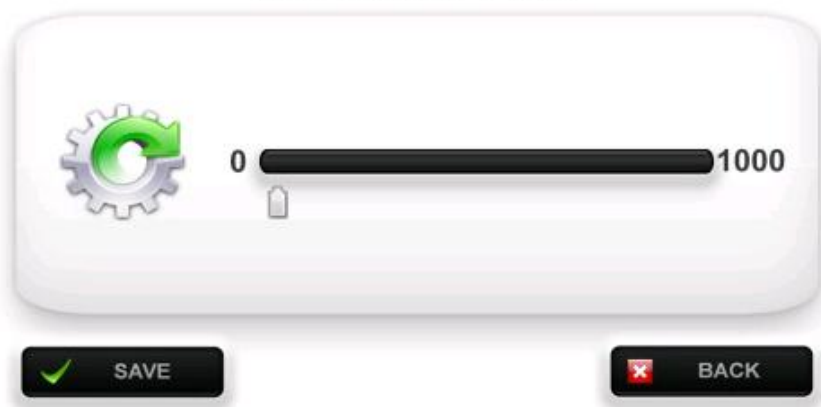
If the sintering furnace using si-mo bar as heating body, please set the idle temperature to 0 as possible, the idle temperature will shorten the service life of heating body!

Press **[SAVE]** to save idle temperature.

Press **[BACK]** to back to main interface.

7.11 MOTOR SPEED

MOTO SPEED



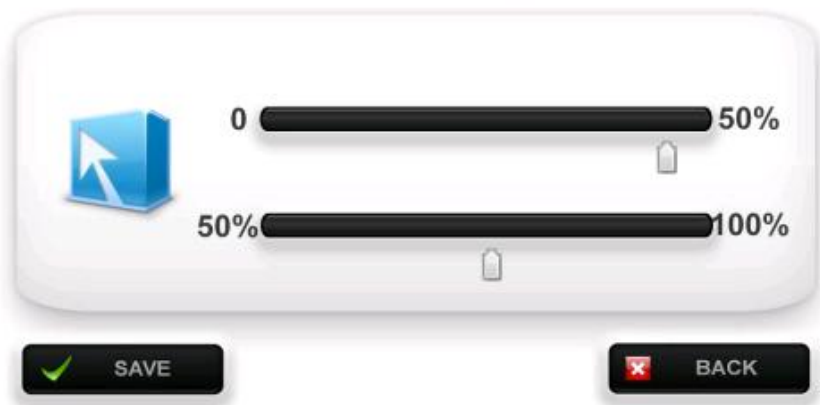
Pan speed set.

Too fast or too slow will cause noise.

Press [**SAVE**] to save motor speed.

Press [**BACK**] to back to main interface.

PALLET POSITION



Starting the program, in the Pre-dry stage, the pan will up two times , this set are two up position.



This tow parameters is very useful for steam Pre-evaporation,adjusted according to practical experience required.

Press **[SAVE]** to save Pan position.

Press **[BACK]** to back to main interface.

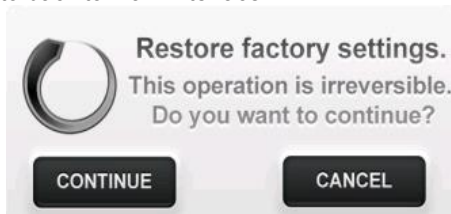
7.13 RESTORE FACTORY

FACTORY SETTINGS



Press **[RESTORE]** to restore to factory setting .

Press **[BACK]** to back to main interface.



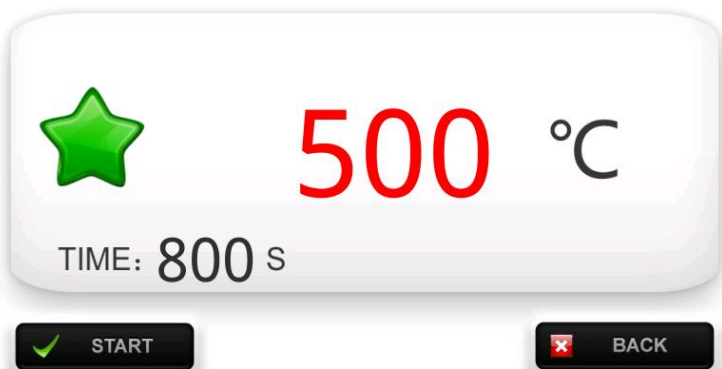
Press **[RESTORE]**A dialog box will pop up for asking the user continue or NOT,press **CONTINUE** to restore the factory data.**CANCEL** to abort.



This operation will restore all parameters back to factory set.

7.14 CLEAN MODE

FIRE CLEANING



Press **[START]** to start clean mode .

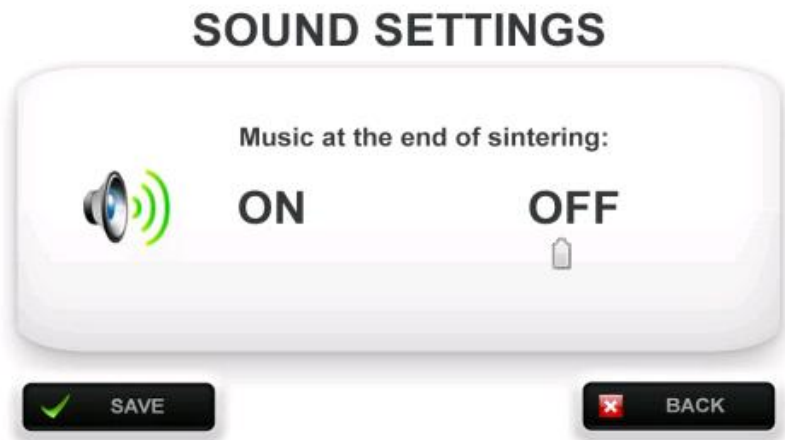
Press **[BACK]** to back to main interface.

User must placed the activated carbon on the pan,then up the pan upper.



User must proper treatment the activated carbon which is used, discarded will occurrence fire.

7.15 SOUND



Use the scroll bar select sound ON or OFF.

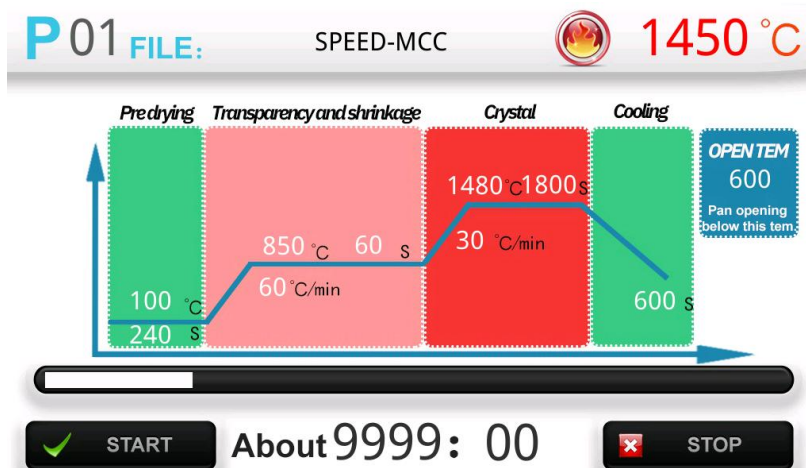
Press [**SAVE**] to save sound statu .

Press [**BACK**] to back to main interface.

7.16 ABOUT

Contains the version dates and other information.

7.17 START A SINTERING PROGRAM



Press [**SINTERING**] in sintering interface, press [**START**] to start a sintering program, the current firing program number which is the Program ID display number, pan will automatic down to the bottom, after ,you can put the porcelain teeth in the firing pan, It will automatically complete the firing process.

7.18 STOP A FIRING PROGRAM

When a firing program is running, press [**STOP**] to stop a firing program, system will back to the main Interface and temperature will stable at stand by temperature when the program end.

8.TROUBLE SHOOTING

Sintering process fault and treatment:

1. **Prompt program selection error:** It is because the currently selected program is not consistent with the sintering interface to be entered. For example, if the current setting program is hyperbolic program, it is unable to enter the single curve interface. Please select the appropriate program to operate.
2. **Prompt program logic error:** Program parameter setting requires that the temperature of the first stage must be greater than or equal to the starting temperature, and the temperature of the second stage must be greater than or equal to the first stage. If the parameter is not set in this way, an error will be reported.
3. **Dullness / dull color of denture crystal:** It is caused by low crystallization temperature or too short crystallization time. Generally, zirconia ceramic blocks begin to transform from square crystal to cubic crystal (crystallization starts) from 1300, and the zirconia crystal is incomplete in short crystallization time. Performance for the contraction is not in place, the color is dim. At this time, it is necessary to increase the crystallization temperature or extend the crystallization time.
4. **Excessive gloss / color whitening of denture:** this phenomenon is mainly manifested in the fast crystallization of zirconia ceramic block. Because the fast zirconia ceramic block stabilizer is too much. The temperature is too high, or the crystallization time is too long, resulting in the precipitation of glass components, which shows that the denture is too smooth, and the color components volatilize from the block, resulting in the denture color is lighter. At this time, it is necessary to reduce the crystallization temperature or shorten the crystallization time.

5. **Opaque glass ceramics:** The crystallization temperature is too low, or the crystallization time is too short, please refer to the instructions of glass ceramics for details.
6. **Glass ceramic deformation:** The crystallization temperature is too high. Reduce the crystallization temperature.
7. **Glaze without luster:** If the glaze coating is too thin or the maximum temperature is not enough, please spray appropriate thickness or increase the maximum temperature.
8. **The glaze is water like (water mark),** The coating is too thick or the glaze temperature is too high.
9. **Fracture of denture after sintering:** It is always caused by too fast cooling, so please increase the cooling time appropriately. If it is zirconia crystallization, it is generally suitable to set it to 600 seconds of cool time. If it is glass-ceramic crystallization or glazing, it is suitable to set it to 180 seconds for cool time.
10. **There are blue spots and green spots after denture sintering:** due to metal ion pollution, please clean the denture to be sintered, and ensure that the CNC engine room is cleaned after the metal denture is finished, and ensure that the metal fragments do not stick to the denture to be crystallized. Make sure the cut metal shop is away from the denture . **Green dot:** iron, nickel, cobalt, chromium metal ion pollution; **blue dot:** copper ion, titanium ion pollution; **gold dot:** titanium ion pollution.

