

Shenpaz

SINTRA / SINTRA PLUS **Operating Manual**



Version 0.6.8

Shenpaz

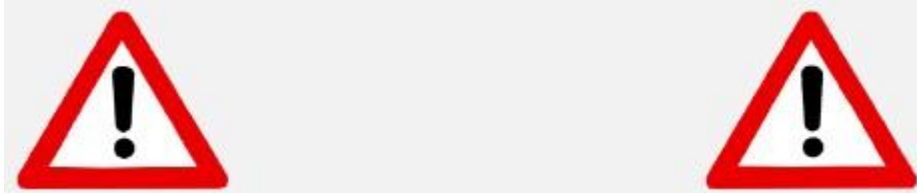
SINTRA / SINTRA PLUS Operating Manual



This instruction manual is for the Shenpaz SINTRA / SINTRA PLUS dental sintering furnace. To ensure the safety, obtain optimum performance and to familiarize yourself with proper use of this machine, we recommend that you read this manual in-depth before operating the dental sintering furnace. Retain this user manual in an easily accessible place for future reference.

CAUTION:

PLEASE READ THE INSTRUCTIONS
CAREFULLY BEFORE OPERATING THE
FURNACE.



ATTENTION!

Caution!

Risk of electric shock



Caution!

Hot surface!



Caution!

**Risk or
danger**

Refer to documentation



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1. Getting to Know SINTRA

Dear Customer,

Thank you for purchasing SINTRA / SINTRA PLUS.

The SINTRA / SINTRA PLUS dental sintering furnace is highly advanced, designed according to the highest standards of quality and performance.

By following the safety instructions and proper operations outlined in this manual, you will prevent damage to personnel and equipment, and benefit from many years of productive use.

Thank You.

1.1. Technical Specifications

Measurements	37 x 43 x 75 cm (14.6' x 17' x 29.5')
Weight	60 kg (132 Lbs.)
Firing Chamber	95 x 140 mm (3.7' x 5.5')
Firing Table	90 mm (3.5')
Voltage: Main Input	110/115V 50/60 Hz 200/230V 50/60 Hz
Temperature Limits	100°C - 1650°C / 212°F - 3000°F
Temperature Units	°C/°F
Voltage Fluctuations	Mains supply voltage fluctuations up to + - 10% of the nominal voltage. Transient over voltages typically present on the mains supply category II.
Applicable Rated Pollution Degree	2

1.2. Location and environmental conditions:

- a) Altitude no limit
- b) Ambient Temperature 5°C to 40°C;
- c) Maximum relative humidity 80% for temperature up to 31°C decreasing linearly relative humidity at 40°C;

1.3. Certification & Standards



Intertek ETL Conforms to UL Std. 61010-1 Certified to CAN/CSA Std.

CE – Tested to EN 61010-1 (Third Edition): 2010

ICES-003 Issue 4:2004 CAN/CSA-CE/IEC CISPR 22:02



This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.

1.4. Safe Usage

The SINTRA / SINTRA PLUS is a dental sintering furnace, indicated only for firing dental zirconia materials. Any other use of the furnace is contradictive, and the manufacturer will not assume liability for damage resulting from misuse.

It is the sole responsibility of the user to assure proper usage according to the instructions in this user manual, or from a certified Shenpaz technician.

Furthermore, it is the sole responsibility of the user to ensure proper maintenance.

The SINTRA / SINTRA PLUS furnace cannot be disposed of with normal waste. Please consult your local government for instructions on how to dispose of an old furnace.

In the event of an external power failure while the furnace is in operation:

- Disconnect the power supply cord from the electrical power outlet.
- Lower the table by inserting the crank supplied, into the hexagonal screw located at the back of the furnace.

Please review the following safety instruction prior to operating the SINTRA / SINTRA PLUS.

Only use furnace with sintering firing table placed on the lift tray.

Please Note: In the event furnace is operated without the sintering firing table, the Shenpaz product warranty will be void, and repair/exchange costs will be upon the user.

Make sure voltage of machine complies with local power supply.

Only use a factory supplied power cord.

Connect the furnace to a grounded power outlet socket.

Be certain that the power supply conforms to the electrical specifications of the SINTRA/SINTRA PLUS.

A single source of electricity must be used.

Place furnace in safe location according to the instructions in this user manual.

Avoid placing or resting any object on the furnace when in operation.

Do not touch furnace, table, or any hot part during operation. Wait until furnace is cool before touching.

Do not place any liquid, body part, or contraindicated material in the furnace.

Use only ZrO₂ material with recognized approval for dental sintering purposes.

Do not eat or swallow sintering beads.

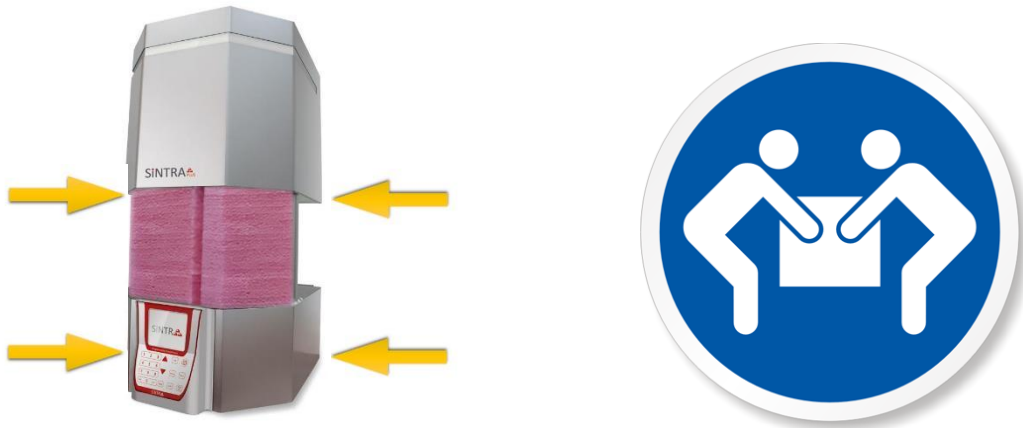
2. Unpacking

2.1. Removing from Box

Carefully take out the furnace from the box by two persons.

NOTE - Do not lift furnace by its lift shaft. Lifting the furnace by its lift shaft or support may cause damage which is not covered under warranty.

Furnace is heavy. It should be lifted by two individuals, each supporting the bottom and top.



2.2. Placement of Furnace

Please follow these important safety points when placing the furnace.

Furnace must only be placed on a non-flammable surface.

Furnace should be placed where temperature range is 5°C - 40°C.

Furnace should be placed where humidity range does not exceed 80% for temperatures up to 31°C, decreasing linearly relative humidity at 40°C.

Furnace must be placed indoors.

Furnace must be placed on flat surface.

Position the furnace at least 10cm from surrounding walls and objects.

To prevent wrong temperature reading, do not place the furnace near open window or any source of strong direct airflow (like ventilator).

Furnace must not be placed in close proximity to combustible or flammable material or objects.

Furnace should not be placed in direct sunlight.

2.3. Checking Parts

Remove all contents from shipping box, and ascertain count of all items.

Electrical mains cord

1 sintering firing table

Sintering tray Set

Emergency wrench

User manual

Air connection tube 6X8 mm with female fitting

Spare fuses according to the following schedule:

230V 50Hz/60Hz, 200V50Hz/60Hz

- 1 x Fuse Mains 10X38 gr (provided for L or N) - Rated: 500V, 16A
- 1 x Fuse Contactor 14X51 gr - Rated: 500V, 20A,

100V, 115V, 60Hz

- 1 x Fuse Mains 10X38 gr (provided for L or N) - Rated: 500V, 20A
- 1 x Fuse Contactor 14X51 gr - Rated: 500V, 25A,

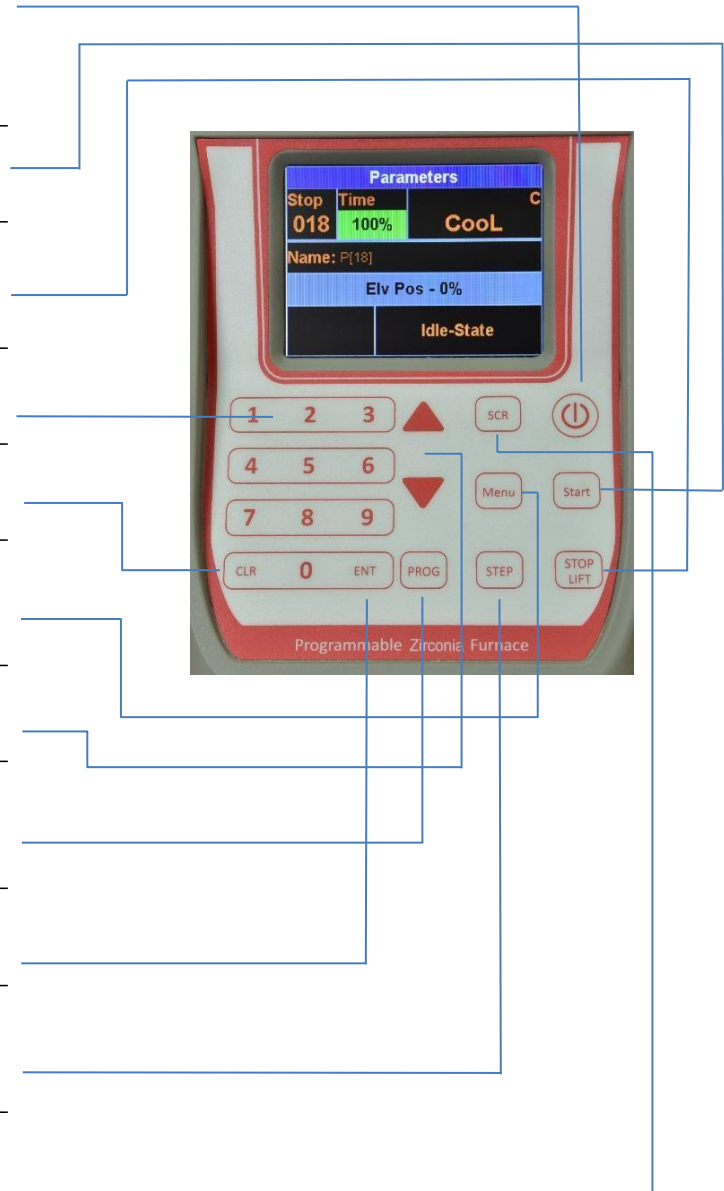
Please store the original carton and polyethylene foam for future use.

3. Controlling the Furnace

3.1. Front Panel

The keys on the front panel allow you to control furnace operation, and edit program parameters.

- | | | |
|----|----------------|--|
| 1 | ON/OFF Key | Turns furnace from Idle Mode and Stand-by Mode. |
| 2 | START Key | Start the firing cycle. |
| 3 | STOP/LIFT Key | Raises and lowers the platform / Stops firing cycle |
| 4 | NUMERIC KEYPAD | Use to enter data or program number. |
| 5 | CLR Key | Deletes chosen entry. |
| 6 | MENU Key | Displays different menu options on the screen. |
| 7 | ARROW Keys | Navigate the menu. |
| 8 | PROG Key | Enables choosing program from memory. |
| 9 | ENT Key | Confirms the parameter entered. |
| 10 | STEP Key | Enables reaching 2 nd , 3 rd , 4 th , and 5 th heating parameters and cooling steps. |
| 11 | SCR Key | Displays graph of current program / Use to return to previous screen. |



3.2. Rear Panel Connections

The main power switch, furnace and air connections are located on the rear panel.

1. Power switch

2. Air pressure connector

3. Power cord inlet



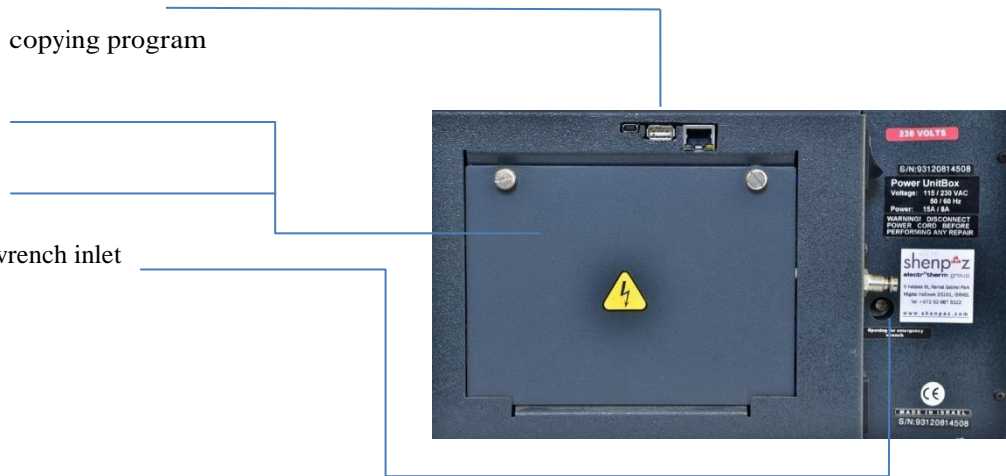
4. USB inlet for uploading

software and copying program

5. Muffle fuse

6. Power fuse

7. Emergency wrench inlet



3.3. Air Pressure Connection

To enable furnace degassing or fast cooling mode (available for programs 1-199), you will need to connect the furnace to your lab's air compressor (max of 10 Bar pressure).

Connection between lab's air compressor and furnace is made using the 6X8 mm nylon air pressure tube (supplied).



4. Setup

4.1. Connecting the Power

Before connecting the furnace to a power source, ascertain main power switch on back of furnace is turned OFF. Then follow these steps.

- 1) Connect electrical power cord from wall socket to electrical cord inlet on rear side of furnace.
- 2) Switch main power switch on back of furnace to ON. A single beep is heard and screen will light up, indicating the furnace is in Stand-by Mode (logo will appear on screen).
- 3) Press the ON/OFF key on front side of furnace to switch from Stand-by Mode to Idle Mode.
- 4) Press the STOP/LIFT key. On first initial start, platform will descend automatically.
- 5) **VERY IMPORTANT!! PLACE SINTERING FIRING TABLE ON LIFTING PLATFORM**

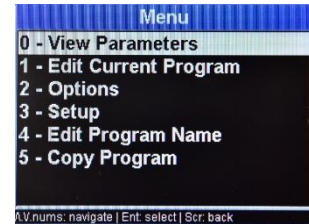


Furnace is now ready for initial set up.

4.2. Initial Setup Options

To customize or change the pre-set parameters to user preference, follow these steps.

- 1) Press MENU key.
- 2) Use ARROW or NUMERIC KEYPAD - #2 key to reach Options.
- 3) Press ENT key.
- 4) Use ARROW keys to toggle between the following optional settings.
- 5) When changing a setting, use ENT key to toggle between the different options, or make use of the numeric keypad for custom entries.



Units of temperature measurement (°C or °F)

Temperature calibration

Language

Time to graph (Time until screen switches from parameters to graph)

Press ENT for saving and SCR key to go back to main screen.

4.3. Setting Up Programs

The SINTRA stores up to 200 programs, and the SINTRA PLUS stores up to 250 programs.

The SINTRA / SINTRA PLUS comes with many pre-set programs installed according to common dental zirconia manufacturer settings.

NOTE: Programs may vary due to client requests, change in materials or other parameter changes. It's the technician's responsibility to check that preset parameters meet the ZrO manufacturer's sintering instructions.

All programs can be modified according to lab needs.

By using pre-set programs or setting custom programs, users can be confident that the results of each firing cycle performed according to a specific manufacturer program will be completely identical. Double check program parameters before starting pre-set program.

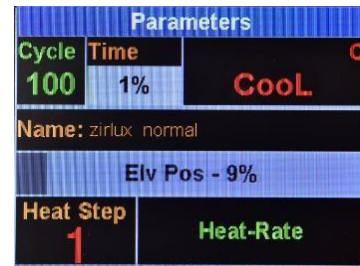
To set up programs according to your preference, perform the following steps:

- 1) Press PROG key.
- 2) Use ARROW key to toggle to a program that is not defined, or choose a pre-set program that can be modified.
- 3) Press ENT key to select program.
- 4) By pressing START key program will begin.



Additional options available from parameters screen:

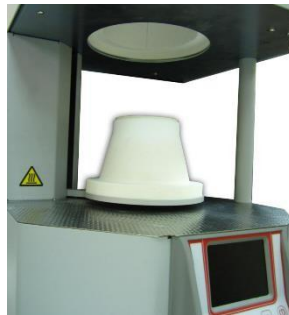
- 5) Press MENU key.
- 6) Press #1 on NUMERIC KEYPAD or use ARROW key to Edit Program and press ENT key.
- 7) Use ARROW keys to toggle between parameters.
- 8) In order to add another step, make sure you are on "HOLD 1", or "HOLD 2", parameter, press STEP in order to add 3 additional firing parameters (New Ramp, New High Temp, New Hold). Program will support up to 10 steps – up to 5 heating steps and 5 cooling steps.
- 9) When finished modifying all parameters, press one time ENT key to save settings.
- 10) Press SCR key to return to main screen.



4.4. Setting Up Tray

The SINTRA / SINTRA PLUS must always be used with a sintering table.



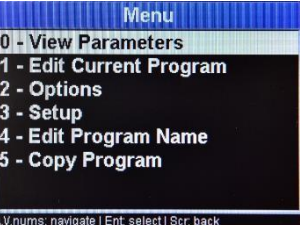
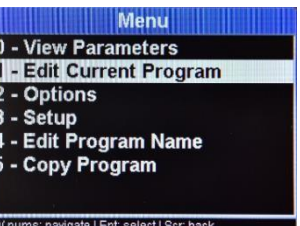
- 1) Place Sintering table on furnace lift



5. Operations

5.1. Furnace Modes

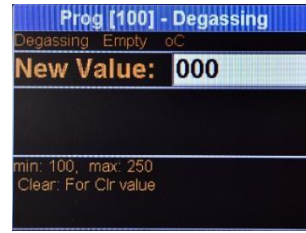
The SINTRA / SINTRA PLUS operates in several different modes.

Welcome screen	<p>The furnace is in Stand-by Mode when main power switch is lifted, and ON/OFF key is off (logo will appear on screen).</p> <p>In this mode, Diagnostics can be accessed.</p> <p>Certified technicians can reach the advanced control panel by pressing SCR key.</p>	
Diagnostics Mode	<p>Diagnostics Mode can be entered when furnace is in Stand-by Mode.</p> <ol style="list-style-type: none"> 1) Press SCR key. 2) Use ARROW key until reaching desired menu. 3) Press ENT key. <p>See section 6.1</p>	
Idle Mode	<p>Idle Mode raises the furnace to 150°C or cold (according to setup version). To place machine in Idle Mode, ON/OFF key is pressed on.</p>	
Operational mode:	<p>The SINTRA / SINTRA PLUS stores up to 200/249 programs.</p>	
Program Selection	<p>Many programs for commonly used materials have been preloaded. To reach a selected program, perform the following steps.</p> <ol style="list-style-type: none"> 1) Press PROG key. 2) Use NUMERIC KEYPAD to enter any number from 0-200/249 or scroll with the ARROW key to chosen program. 3) Press ENT key. 	
Menu	<p>Press MENU key when in Idle Mode to view main menu screen.</p>	
View Parameters	<p>The best way to view the parameters of a chosen program is in the Program Viewing Mode, reached from screen of specific program in use.</p> <ol style="list-style-type: none"> 1) Press MENU key. By default you will be on 0. 2) Press ENT key to see cycle parameters. 	
Program Editing	<p>Perform the following steps to edit programs.</p> <ol style="list-style-type: none"> 1) Press MENU key. 2) Use ARROW key to choose Edit Current Program, and press ENT key. 3) Use ARROW keys to toggle between parameters, and use NUMERIC KEYPAD to make changes in the New Value field. 	

- 4) To add a step, press STEP key when on Temp Hold parameter.
- 5) After all changes, press ENT key to save.

If you do not wish to save changes, press SCR key to return to main screen.

To change between programs, press CLR key and type in a different program number.



Options

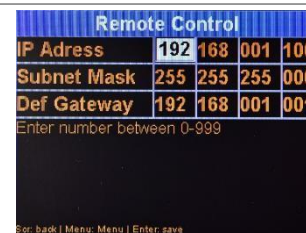
Options Mode is for making changes to personal settings. To reach Options Mode, perform the following steps.

- 1) Press MENU key.
- 2) Choose #2, Options.
- 3) Press ENT key.

Setup (IP)

The SINTRA / SINTRA PLUS can be connected to the Ethernet.

- 1) Press MENU key.
- 2) Use ARROW key or NUMERIC KEYPAD to choose #3, Setup.
- 3) Press ENT key.
- 4) Press ENT key on Remote Control.
- 5) Copy settings to PC to enable connection according to setup protocol on computer.

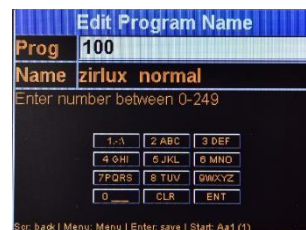
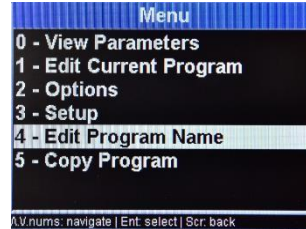


Edit Program Name

Edit Program Name Mode allows user to give a distinct name to a program.

To reach mode, perform the following steps.

- 1) Press MENU key.
- 2) Press #4 on NUMERIC KEYPAD, or use DOWN ARROW to Edit Program Name.
- 3) Press ENT key.
- 4) Use NUMERIC KEYPAD to enter program number.
- 5) Use DOWN ARROW key to next field.
- 6) Press START key to bring up alphabet keyboard.
- 7) Use NUMERIC KEYPAD to control alphabet keyboard.
- 8) Press ENT to save settings.

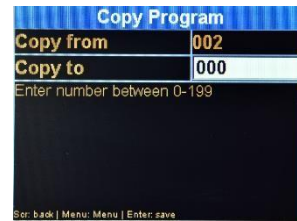


Copy Program

Copy Program Mode is a quick method for creating new programs when there are only slight differences in parameters between the original and new program.

- 1) Press MENU key.
- 2) Press # 5 or use DOWN ARROW key to Copy Program.
- 3) Press ENT key.
- 4) Enter program number to be copied.
- 5) Enter new program number to copy to.
- 6) Press ENT key to save.

Please note: copy of a program does not change your current presented program.



5.2. Sounds

The SINTRA / SINTRA PLUS emits different sounds indicating key selection and changes to machine settings.

Double tone: When there is an incorrect key selection or choice of data.

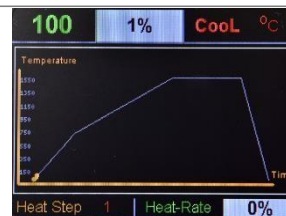
Repetitive tone: Repetitive tone indicates the end of a firing cycle.

5.3. Screens

The SINTRA / SINTRA PLUS has a number of central screen views which you should familiarize.

Program Graph

To switch views during a firing cycle from program data to the graph, press SCR key.



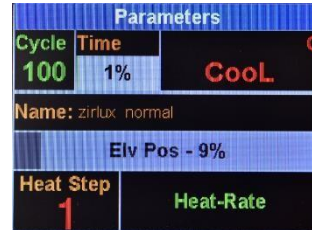
Program Status

Program Status Screen appears upon starting firing cycle program.

The Status display (Upper Left Corner) shows the status of the selected program (Cycle /Stop/ Hold) and program number. *(In image, program #100 is running in Cycle.)*

The Time display (Upper Middle Section) shows what % of cycle time is complete.

The temperature display (Upper Right Section) shows temperature data in cycle. °C is displayed for Celsius, and °F for Fahrenheit. Cool is displayed when furnace is still cool, and from 100 C degree – the real temperature.



Program Name is displayed in (Middle Section)

Position of lift as a % is displayed in (Middle Section) *(In image, lift is 9% raised)*

Step parameter is displayed in (Lower Right Section).

Step number is displayed in (Lower Left Section)

5.4. Parameter Limitations and Editing of Steps

The SINTRA / SINTRA PLUS works on a different principal than other dental furnaces.

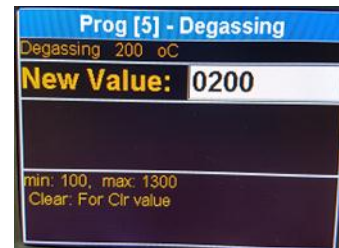
SINTRA / SINTRA PLUS programs are composed of Steps and Phases.

Each Program has up to 5 heating and 5 cooling steps.

Each Step has 3 phases (Ramp/High Temp/Temp Hold).

NOTE: Within the programs, only the first heat and cooling steps are mandatory.

When entering parameters for the 3 phases, use ARROW keys to toggle.



When completed entering correct values for all 3 phases, and you wish to add additional steps, press STEP key to add parameters for additional steps.

When finished adding the heat up steps, press again UP ARROW key without pressing on the STEP key. In order to enter to the next cooling step, press the STEP key and toggle between all cool down parameters in each step via ARROW keys.



Note: Parameters have high and low limits. If data above or below limit is entered, data will not be stored, and appear in red. Furnace will emit a warning tone when pressing START key, and firing cycle will not start.

Parameter	Function	Limit	Notes
*Degassing	Will open table by 1 cm every 100°C until the furnace reaches the set temperature value.	100°C - 1300°C (212°F - 2372°F) 1-70°C /min 33-158°F /min	Not obligatory to run sintering programs. Used to purge muffle within cycle when using acid based colorants, newer translucency ZrO ₂ and pre-shaded ZrO ₂ . Mandatory
Ramp 1	Speed of rising temperature in first step.	Up to 1600°C/3000°F	Mandatory
High Temp 1	Final temperature at completion of ramp.		
Time Delay 1	Time heat will remain at High Temp before cooling.	1 min - 4.5 hrs.	Not Mandatory
Ramp 2-5	Speed of rising temperature in subsequent step.	1-70°C /min 33-158°F /min	Not Mandatory
High Temp 2-5	Final temperature at completion of ramp.	Up to 1600°C/3000°F	Not Mandatory
Time Delay 2-5	Time heat will remain at High Temp before cooling.	1 min - 4.5 hrs.	If entry is not within furnace capability, it will be ignored. Additional optional delay for colored ZR.
Cooling Ramp	Cooling rate	1-70°C /min 33-158°F /min	Mandatory Up to limitations of muffle
Desired Cooling Temp	Final temperature at completion of ramp	Down to 200°C/392°F	Mandatory
Cooling Delay	Time until next Cooling Step begins	1 min - 4.5 hrs.	Mandatory
Cooling Ramp 2-5	Speed of cooling in subsequent step		Not Mandatory
Desired Cooling Temp 2-5	Final temperature in subsequent step		Not Mandatory
Cooling Delay 2-5	Time until next Step begins		Not Mandatory
Active Cooling	Start of active cooling to hasten cooling	Up to 500°C/932°F	Not applicable for SINTRA PLUS.

***Advanced Degassing :**

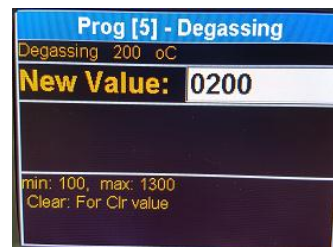
This function is to expel possible oxide fumes caused by pre-shaded zirconia from the furnace's muffle during the sintering cycle. This new function was developed and adapted specially for the new dental zirconia to maintain and improve the quality of the firing for a long period.

This function has been adapted to a high temperature limitation up to 1300°C/2372°F.

The furnace will flush out from the muffle fumes for 30 second at every 100°C/212°F interval according to the set maximum temperature value (not exceeding 1300°C/2372°F). This temperature value is set in the Degassing parameter.

This is an individual setting for each program. A different temperature value can be set for each different program.

A prerequisite for using the Degassing feature is a connection to air pressure. The use of the degassing feature is highly recommended to extend the lifespan of the heating elements.



5.5. Starting & Canceling a Firing Cycle

The firing cycle will not start until the platform is completely lowered.

1. Check that platform is in lowest position. This can be done by pressing DOWN ARROW key or STOP key.
2. Select a program number and press ENT key.
3. Press START key.
4. The firing cycle will automatically start. Firing cycle status and relevant values will appear on screen after 30 seconds [values can be modified (time to graph) in Options Mode].
5. When the firing cycle has finished, the platform will open, and 5 audio beeps will be heard.

To cancel a program in the middle of a firing cycle, press STOP/LIFT key.

The platform will be lowered (only if temperature is below 350°C/662°F), and the furnace will remain set in the selected program.

6. Calibration & Maintenance

6.1. Diagnostics

When a malfunction occurs, diagnosis should be performed prior to requesting service.

Diagnostics Mode can be entered when furnace is in Stand-by Mode via the following steps:

TIP: Stand-by Mode is when power switch on back of furnace is lifted ON, and logo appear on screen.

- 4) Press SCR key.
- 5) Use ARROW key until reaching Diagnostic Menu.
- 6) Press ENT key.



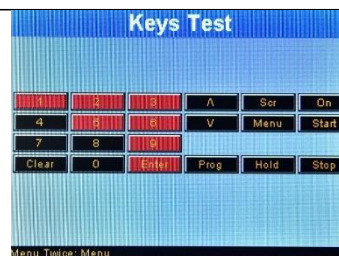
Power Switch

The following list can be reached via Diagnostics Mode, and each function can be reached with the ARROW key or NUMERIC KEYPAD and pressing the ENT key.

0. Oven Data Provides information on the oven.



1. Keys Test Enables the checking of keypad functionality. Press each key and ascertain the corresponding key on screen lights up.

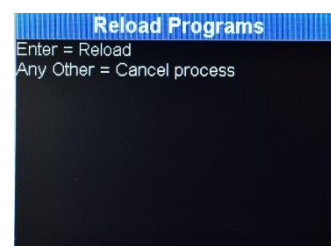


2. HW Tests Used for checking mechanical functionality of elevator and oven.

A long press on the UP-ARROW key raises the platform. During this time, the Arrow Key on the screen will be lit, and after platform is raised, the Up Key will be lit.

A long press on the DOWN ARROW key lowers the platform.

3. Reload Programs After time, there may be a need to clean out the programs which have been added by staff, and revert to the original manufacturer settings. Upon reaching screen, press ENT key to reload.

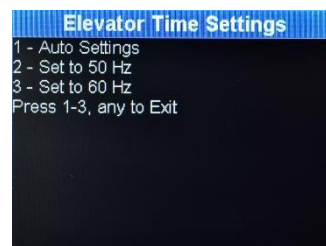


This function will return the furnace to manufacturer's preset programs.

4. Elevator Time Settings

Depending on changes in electric current (subject to country electricity network), there may arise a situation where the Hz settings must be changed. Available options are Automatic, 50 Hz or 60 Hz.

Choosing wrong settings may bring up error message.



NOTE: Certain diagnostic functions may be performed solely by Shenpaz certified technicians, and functions 5, 6 and 8 require access password.



Password will be provided by Shenpaz dental to a certified lab technician upon request.

5. Load USB	Enables the transfer of program data and setting via USB by using password and pressing ENT key.																			
6. Log	Shows the last activities performed on the machine by using password and pressing ENT key.																			
7. Multi Cycle	To be used only by Shenpaz certified technician.																			
8. Hours Meter	<p>Ability to check hours of oven usage via password and pressing ENT key.</p> <p>To be checked periodically for determining if product is still under warranty.</p> <p>Hours meter can be reset by certified technician only.</p>	<table border="1"> <thead> <tr> <th>Action</th> <th>Hours</th> <th>Remaining</th> </tr> </thead> <tbody> <tr> <td>Total hours in 100c</td> <td>89</td> <td>45</td> </tr> <tr> <td>Total hours in 300c</td> <td>87</td> <td>34</td> </tr> <tr> <td>Total hours in 600c</td> <td>40</td> <td>46</td> </tr> <tr> <td>Total hours in 800c</td> <td>2</td> <td>23</td> </tr> <tr> <td>Total hours in 1000c</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Action	Hours	Remaining	Total hours in 100c	89	45	Total hours in 300c	87	34	Total hours in 600c	40	46	Total hours in 800c	2	23	Total hours in 1000c	0	0
Action	Hours	Remaining																		
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Total hours in 1000c	0	0																		
9. Last Auto Tests	To be used only by Shenpaz certified personnel.																			
10. Auto Tests	To be used only by Shenpaz certified personnel.																			

6.2. Temperature Calibration

The SINTRA / SINTRA PLUS furnace is pre-calibrated at the factory.

Should a need arise to calibrate the furnace again, a calibration disk must be purchased.

1. Place calibration disc on table.
2. Choose any empty program.
3. Set parameters according to following:
 - i. Heat Ramp – 3°C per minute
 - ii. High Temp - 1600°C
 - iii. Temp Hold – 1 hour
4. Upon completing cycle, measure calibration disc with caliber measuring tool, and send information to Shenpaz support.

Should it be determined that the temperature within the muffle (as indicated on the calibration disc) is different than the temperature on the screen, it is possible to calibrate the temperature to the correct level via the following steps.

- 1) Press MENU key.
- 2) Choose Options and press ENT key.
- 3) Press DOWN ARROW key until reaching the + of the Temp adjustment parameter.
- 4) Press ENT key to modify the difference in temperature +/-.
- 5) Press DOWN ARROW key to reach appropriate data field to enter numeric value.
- 6) Press SCR key or ENT key to validate your change.

The change will be stored in the memory, and all the firing cycle temperatures will be modified accordingly.

For all other calibrations, we recommend contacting Shenpaz support before making changes to furnace.

6.3. Power Outage

In the event of an external power failure the furnace will continue the full cycle from where the power outage occurred after power is returned. In any case of power outage, the door can be opened manually via wrench.

6.4. Maintenance

Periodic Cleaning	<p>It is important to perform periodical cleaning every 2-3 weeks.</p> <p>If Program Number 0 or 199 is pre-programmed for cleaning, use this program.</p> <ol style="list-style-type: none">1. Heat Ramp – 3°C per minute2. High Temp - 1600°C3. Heat Delay – 4 hours <ol style="list-style-type: none">1. Prior to performing cleaning of the furnace, power must be disconnected, and furnace allowed to cool down.2. Cleaning of the furnace is performed with a soft, dry cloth. <p>NOTE: Do not use cloth within muffle.</p> <p>NOTE: Using any solvents, detergents or other cleaning material or method not approved by Shenpaz will void the warranty.</p> <p>Prior to carrying out maintenance work on the furnace, or in the case of any mechanical failure, device must be shut down, and power mains removed.</p> <p>Before performing maintenance work, consult your Shenpaz device servicing center.</p>
Mechanical Failure	
Replacing Heating Elements	<p>We highly recommend exchanging the heating elements after 2,000 working hours of the furnace above 500°C. Your furnace has a counter showing hours of usage.</p> <p>To maintain optimal heating uniformity, Shenpaz recommends replacing all 3 heating elements at the same time.</p> <p>Replacing heating elements can be easily performed by a single individual in just a few minutes, or in the event that this is not feasible, by contacting your Shenpaz dealer.</p> <p>Before replacing heating elements, ascertain main power is off, furnace is unplugged and muffle is completely cold.</p> <p>Required tools: Philips screwdriver, 4mm Hex key, 7mm wrench.</p> <p>NOTE: Heating elements are very fragile, and may break under minimal force. Please handle heating elements in the most delicate manner.</p> <p>Shenpaz is not responsible for any broken heating elements caused by user.</p> <p>See following page for instructions.</p>

-
1. Unscrew only the 2 screws as shown in picture.



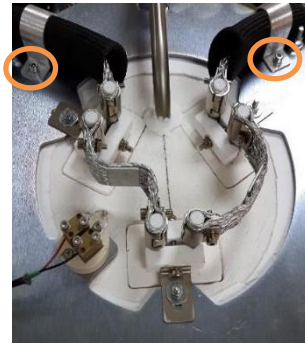
2. Unscrew 2 screws on lower back panel.



3. Lift the hood up slowly using two hands.



4. On top of furnace, unscrew and remove 2 cable holders using an Allen screwdriver



5. Using wrench and Allan screwdriver, release all cable connections.



6. Carefully pull up the heating element assembly.



7. Loosen the screw of the ceramic holder, and separate all parts.



8. Assemble back in reverse order using new heating element.



7. SINTRA PLUS

7.1. Fast Cycle

The SINTRA PLUS program numbers 200-249 enable fast sintering cycles, permitting fast start and rapid opening.

Fast Cycles are recommended for 5-10 single units, or 2-3 bridges of 3 units. For best result, adjust temperature according to material manufacturer requirements.

As opposed to regular sintering cycles which begin at up to 100°C by pressing START key, fast sintering can begin at any temperature up to 300°C by pressing START key a second time.

Furnace will automatically open at 900°C, and cool down to 800°C. From 800°C, there are 3 additional cooling parameters which must be set:

First Opening – How much the door will open after 800°C.

Recommended 10 cm

For following steps -

Distance – A set distance (in round centimeter) of opening for every Step.

Recommended 1 cm

Holding Time – How many minutes to wait after door is opened per Step (round minutes) - Recommended 2 min for each step.

8. Troubleshooting

8.1. Most common technical failures

In the list below described possible technical failures and how do operate when they occur. In any case of uncertainty, please consult with a certified technician.

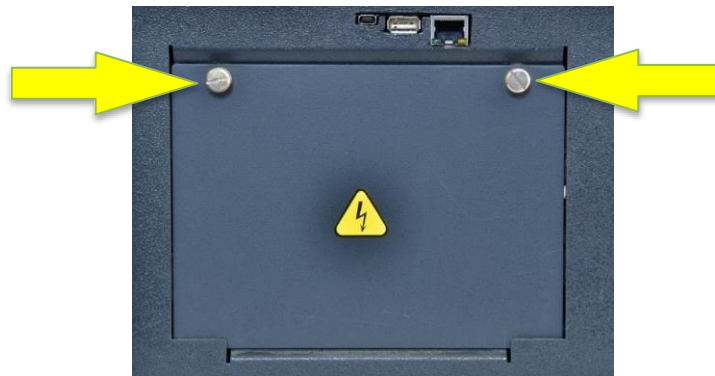
Furnace does not turn on:

- Make sure the furnace is plugged into the electricity, switch the furnace “On”
- In case the furnace does not turned on, proceed to fuse inspection:

Turn the furnace “OFF”

Unplug mains power cable form the electricity socket

Unscrew and remove back door as described in the image:



Locate all three fuses



Pull out fuses housing



Inspect all three fuses using an Ohm meter and replace with new ones if needed.

In case fuses were checked ok, contact a certified technician for further inspections.

No heating – If no heating is detected, in most cases the reason is one of the following:
Burnt fuse or a burnt heating element.

- Fuse inspection – see above guide
- Heating elements inspection:

Turn the furnace “OFF”

Unplug mains power cable form the electricity socket

Make sure the furnace is completely cold before inspection

Visually inspect the heating elements using a mirror

In case a broken heating element was detected - contact a certified technician or replace heating elements according to heating elements replacement instructions on section 6.4

8.2. Error messages

In the list below described possible error messages and how to operate when they occur. In case of uncertainty, please consult with a certified technician.

Order:	Failure Description:	Failure description:	Possible Correction:
1	ERROR MAX HEAT	If current temperature is above 1650 the furnace will restart. In case of the occurrence will repeat 3 times the furnace will turn off automatically.	Contact a certified technician
2	ERROR OVER RAMP	If temperature raise faster than 70 C/Minute - The furnace will shut down after 5 minutes	Contact a certified technician
3	ERROR OUT OF RANGE	Occurs when programing any value which is out of range	Re-enter value within range
4	ERROR MIN HEAT	Occurs when current temperature is < = “Cool” for 20 minutes	Contact a certified technician
5	ERROR HEAT UP	Occurs when temperature can’t reach the desired temperature in a certain amount of time +-10 minutes. In case that the current temperature is < 250 – cycle will be stopped.	Contact a certified technician
6	ERROR TC BROKEN	Occurs when Thermocouple is disconnected / Broken	Contact a certified technician

9. Accessories

9.1. Sintering tables, trays, lids

The Sintra / Sintra Plus furnace is supplied with the following accessories: 1 sintering table, 1 sintering tray set to enable you a quick start operation.

The tray and sintering table undergo internal inspection and validation of a minimum of 78 hours of firing. Today, these trays and sintering tables have been validated with most of the major Zirconia materials on the market.

Depending on user preferred ZrO₂ material, the material manufacturer may recommends using alternative trays and beads.

9.2. Tray and lid/base limitations:

Max. sintering temp: 1600C

Max. Heat ramp: up to 70 c/min where available. (Subject to electric supply)

Cooling ramp: fastest cooling is natural cooling, which is equivalent to 15-25C/min. Not applicable for SINTRA PLUS.

NOTE: Trays should not be used in SINTRA PLUS during fast cycle programs or higher than 1600C.

9.3. Warnings:

In case tray is used during fast cycle, there is a risk that tray will explode or crack due to thermal shock.

Do not attempt to shorten sintering time by inserting trays into a furnace exceeding 300C. The tray may crack or explode.

Do not remove tray from sintering table and place on a cold surface, this will cause cracking or breaking of the tray.

9.4. Side effects:

Lids are thin and have a flat surface that is subject to slight deforming during high temperatures. This is natural. We recommend to extend the lid lifespan, by switching sides when distorted, this will assist in returning to a "flat" surface.

Tray and lids are consumable products. Due to the extensive thermal profile and every lab has a different work load and profile of sintering programs, these are not covered under the furnace warranty.

9.5. Sintering table

Immediately upon lowering the furnace platform door, put the sintering table on the platform.

Check and assure that the first positioning of the table is centered with the muffle opening.

Sintering table is a consumable part and may need to be replaced depending on frequency of use.

NOTE: During storage there might be either a pink or a yellow coloration of the table which will disappear following the first sintering cycle.

Disclaimer

These tray and lid were developed and adapted as an accessory to the SINTRA furnace. There may be adverse side effect between the trays and some sintering beads when in contact with some untested new Zirconia composition on the market.

The sintering table is manufactured with high quality refractory materials and are porous in characteristics. Following repetitive use, the tables will show signs of erosion.

10. Warranty

10.1. Terms

Shenpaz Dental Ltd. Provides a warranty on this muffle for 12 months from date of purchase, or 2,000 firing hours, whichever comes first. Electric circuits are under warranty for 12 months as well.

During the warranty period, Shenpaz Dental Ltd. or its authorized dealers, will repair or replace without charge any defective part, so long as such defects occur in normal service and are not due to apparent misuse, abuse or accident, or as a result of activities specifically stated in this document which will void the warranty.

The warranty does not cover shipping costs to the repair center, and the purchaser shall bear all shipping, packing, and insurance costs when sending the furnace to the repair center.

Upon completion of the repair, the furnace will be returned with freight prepaid.

10.2. Disclaimer

Shenpaz Dental Ltd. hereby disclaims any responsibility or liability for direct or consequential loss or damage as a result of using this product, and cannot guarantee quality of dental products consisting of mixed materials.

Warranty does not cover damage to furnace as a result of improper use of furnace, or unauthorized material placed in furnace, or the performance of any action specifically stated in this document as being forbidden.

The following actions are expressly prohibited, and will result in warranty being void.

- Using furnace without firing sintering table on lift.

- Use of unauthorized material.

- Use of solvents or detergents within muffle.

- Lifting furnace by its shaft.

- Not following the instructions in this manual concerning proper voltage.

10.3. Register Your Furnace

Register your Furnace by one of the following:

1. Scan QR code
2. Fill the enclosed Warranty
3. Send it by regular mail to: Shenpaz Dental Ltd.
5, Hataasia, Ramat Gabriel Ind.
Migdal HaEmek, 23101 ISRAEL



Scan this code

Shenpaz
Dental Furnaces
www.shenpaz.com

PN: DCM019A