BIODYNAMIC

SINTHERA SPEED

Use and maintenance

1 – GENERAL INFORMATION

1.1 - Purpose of the manual

This manual has been prepared by the manufacturer and is an integral part of the machine's equipment. The information contained therein is intended for the user and contains safety instructions.
Before using the machine, especially for the first time, it is advisable to read the manual carefully, in order to become familiar with the controls and understand their function and position. It is also advisable to carry out some test runs.
The manual must be kept for future reference.

1.2 - Identification of the machine manufacturer.

The nameplate is affixed to the machine with the name of the manufacturer and the CE mark, which informs the user that the machine is built in compliance with the safety directives of the Community European.

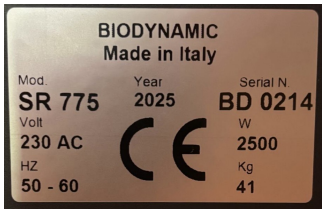


FIG 1

1.3 - Technical information

The SINTHERA SPEED oven is managed and regulated from a control electronic a micro-processor and has been designed and built to carry out sintering, in dental laboratories, of artifacts, such as bridges , crowns, copings.., obtained by milling, using machining centers, of oxide of zirconium (zirconia) in the semi-sintered state. Sintering comes completed, in the aforementioned oven, bringing the material to high temperature (1600 °C) and cooling it slowly. The oven SINTHERA SPEED can operate with 200 heating programs (or cycles) (divided into 4 groups which are identified by the number of phases in ascent: 1 phase, 2 phases, 3 phases, 4 phases) which can be set and stored by the operator following the indications of the zirconium oxide supplier. For each program (or cycle) up to a maximum of 6 phases can be set (max 4 phases in ascent + 2 descent phases: in ascent the phases are variable from 1 to 4 while in descent they are always 2)) and for each phase 3 variables can be set: Temperature, rate of rise, dwell time.

1.4 - Safety devices

The parts of the machine powered by current electric are protected by shelters fixed in way to prevent access to the user. Access to these parts is only permitted to specialized personnel authorized and trained in extraordinary maintenance and repairs.

1.5 - Technical Characteristics

Supply voltage	230V AC 50-60Hz
Power	2500 W
Max temperature	1650°C
Number of programs (or cycles)	200 (4x50)
Max number of phases/program	6
Chamber dimensions	cm11x12x12
External dimensions (mm)	390(L)x500(H)x250(D)
Number of resistors	4
Minimum Rise Time to 1600 °C	35 m ()minutes
Fuses	20A
Magneto-thermal on dedicated electrical line (minimum)	25 A

2 - HANDLING AND INSTALLATION

2.1 - PACKAGING AND UNPACKING

The packaging consists of:

- The machine is placed on a polystyrene sheet that supports and protects it in case of falls or impacts from below.
- Coating with expanded polyurethane to absorb lateral and upper impacts. The material is contained in sealed bags according to law
- Wooden box placed on a pallet
- Strapping

2.2 - Loading and unloading

The packaged machine can be moved with forklifts or even manually by at least 2 people. During handling, absolutely avoid subjecting the machine to shocks, falls or tipping: this could damage it irreparably.
The disposal of packaging materials must be carried out in compliance with the environment and regulations in force.

2.3 - Installation

The machine must be placed on a secure shelf in a horizontal position, in rooms sufficiently ventilated.
Power Supply Electrical System
It is the user's responsibility to ensure, before installation, that the electrical system of the room is built according to current safety standards. In particular, verify the following characteristics of the electrical system:

- Grounding: verify that the grounding of the system is efficient. A grounding system that is not efficient causes malfunctions in the furnace.
- Electrical power supply line: the furnace power supply line must only power this device and must be equipped with a 25 A magnetothermic automatic switch.
- Mains voltage: It is also important to check the mains voltage. If the voltage is too low (less than 210 V), the furnace may have operating difficulties and it may therefore be necessary to install a stabilization unit.

After positioning the furnace and performing the aforementioned checks, proceed as follows:

- Place the furnace's main switch in the OFF (0) position
- Connect the furnace to a 220-230 V AC power outlet

2.4 – Accessories

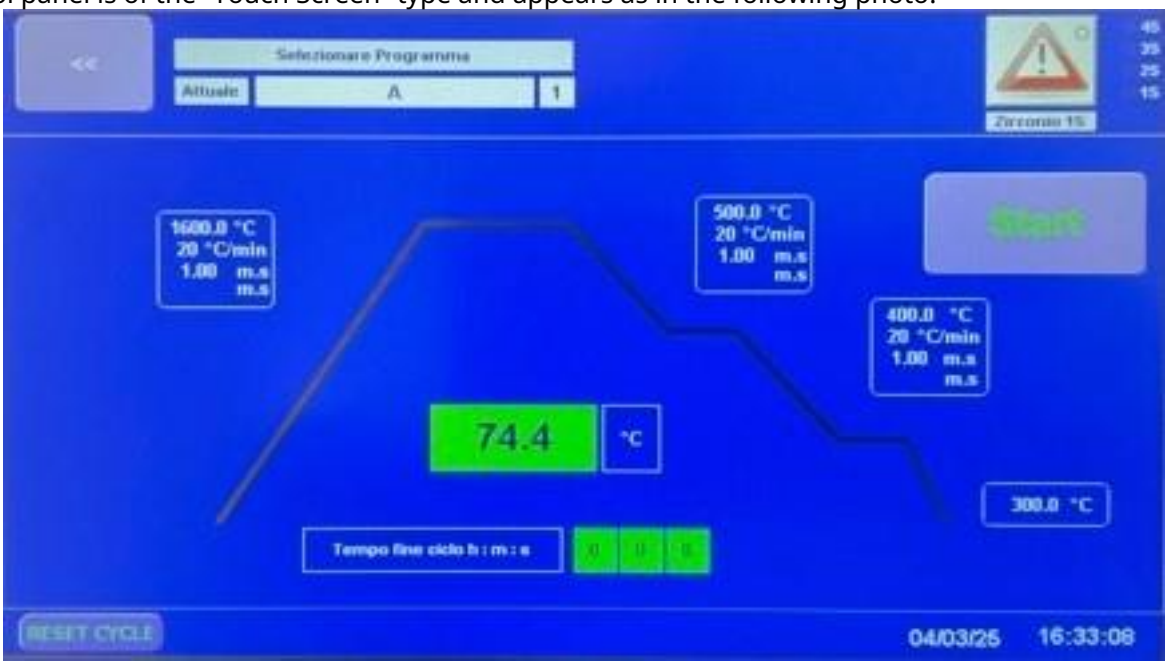

FIG 2

-Workpiece Plate
-Bag of Zirconium spheres (100g)

3 - INFORMATION FOR USE

3.1 – Control panel

The control panel is of the “Touch Screen” type and appears as in the following photo:



X

FIG 3

In theTouch screen display the thermal cycle is shown schematically as in a diagram Temperature/time and, for each phase, the set phase quantities are displayed: Phase temperature, rate of rise, dwell time.

The USB port is used for the following functions:

- Install new software or updates
- Copy programs, store them and install them or send them as files for e-mail
- Install new cooking programs

3.2 Performance and use

4

Let's define some quantities that come into play with the oven:

PROGRAM (or CYCLE): is the trace (or path) that the oven must follow during heating. During a program, the oven increases the temperature inside it with a certain rate of rise established during programming and performs pauses for the set duration. The program is set by the operator during the “programming” phase and is then executed by the oven during the “execution” phase

PHASE: a Phase identifies a part of the cycle. Therefore, the cycle is made up of a certain number of Phases in sequence. A phase is characterized by 3 quantities:

1 – PHASE TEMPERATURE: is the temperature to which the oven tends and at which it makes a stop

2 – RATE OF RISE: is expressed in °C/min and is the temperature increase to reach the phase temperature

3 – DWELL TIME: expressed in minutes and seconds, it is the duration of the stop after reaching the phase temperature.

As already mentioned, the SINTHERA oven SPEED can store and operate with 50 programs of heating for each program mode (1S, 2S, 3S, 4S). In total, therefore, the possible programs are 200. In each program you can set up to max 6 phases for each program (max 4 phases in rise + 2 phases in descent).

WARNING: The preset programs in the oven refer exclusively to BIODYNAMIC zirconia and are already optimized for this material. For the use of other materials, it is necessary to manually set the parameters according to the manufacturer's specifications.

When the oven is turned on, the following screen appears:

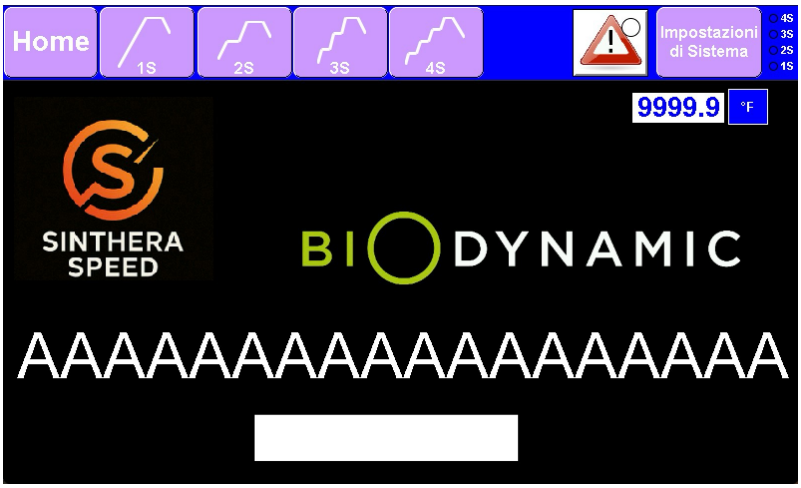


FIG 4

This is the “Home page”.

If you want to set a program, start from this page and select one of the proposed options with the button-buttons 2, 3, 4, 5 as shown in the following fig. 5. The cooling mode is the same for all options and is with 2 phases.

The top band is composed of a series of buttons as displayed in the following FIG.5:

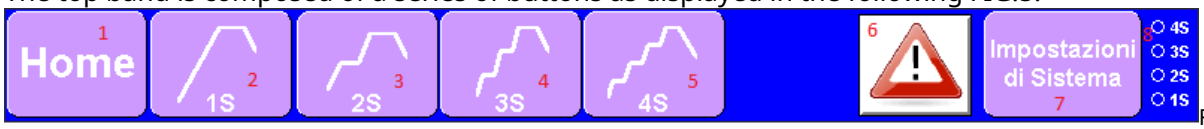


FIG 5

MEANING OF THE BUTTONS

5

1- pressing the HOME button takes you to the HOME page

2- pressing the 1S button takes you to the programming page of cycles with:

N. 1 single phase in heating: direct cycle up to the final temperature, holding + descent with 2 phases (cooling) (FIG 6).

Note on Energy Saving indicative average values:

Parametro	Ciclo Rapido (60 min)	Ciclo Lento (491,7 min ≈ 8,2 h)
Durata totale	60 minuti (≈ 1 h) — Molto breve	491,7 minuti (≈ 8,2 h) — Lungo
Consumo energetico	2,50 kWh — Basso	20,5 kWh — Alto
Costo stimato	0,50 € (a 0,20 €/kWh) — Molto basso	4,10 € (a 0,20 €/kWh) — Alto
Mantenimento	1580 °C per 10 minuti	1500 °C per 120 minuti
Stabilità cromatica	Ottima (grazie a FGZ)	Ottima
Produzione	Velocissima — massima produttività e omogeneità	Lenta — bassa produttività, massima omogeneità
Risparmio energetico	≈ 88% rispetto al ciclo lento	—
Risparmio annuo stimato	864 € (1 sinterizzazione/giorno × 240 giorni)	—

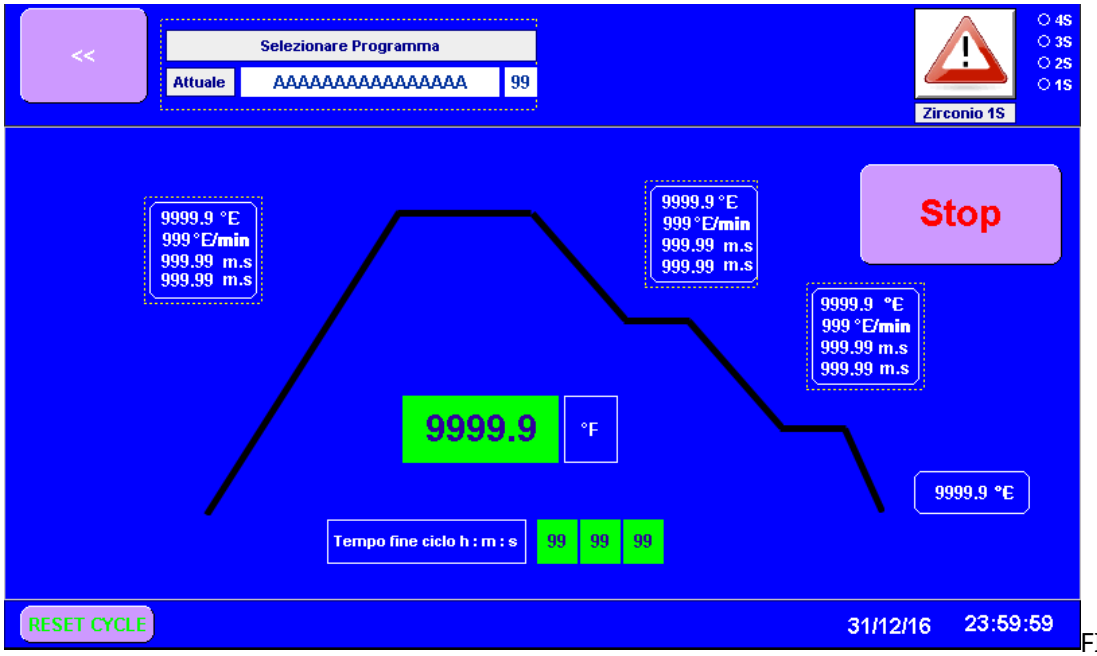


FIG. 6

3- pressing button 2S takes you to the cycle programming page with:

N.2 Heating phases with 1 intermediate stop and final hold + descent with 2 phases (cooling) (FIG 7)

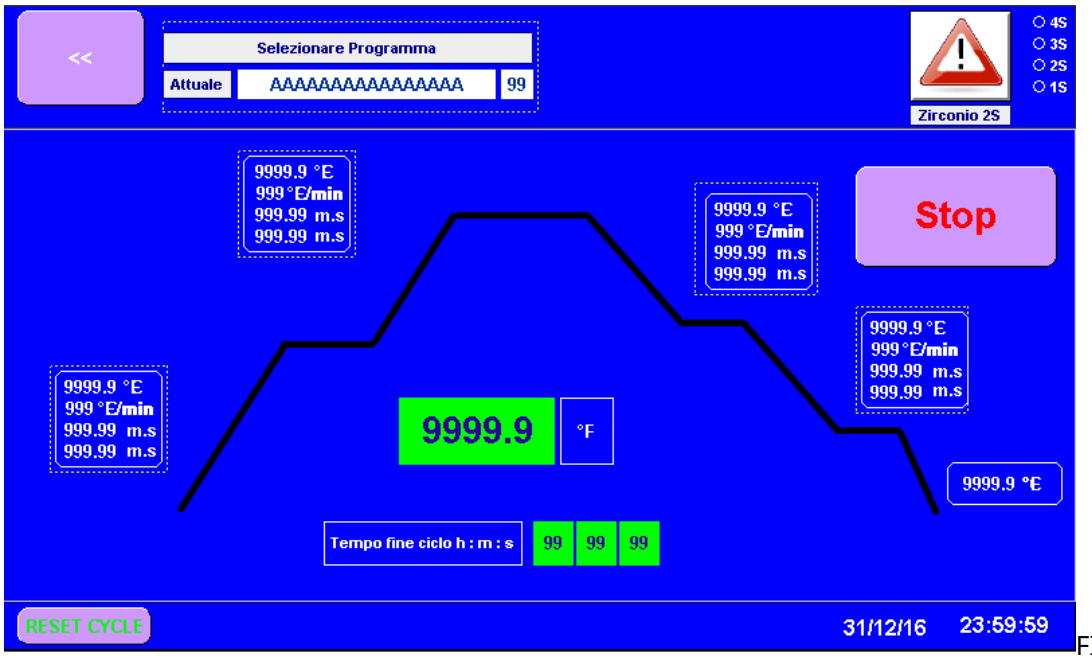


FIG 7

4- pressing button 3S takes you to the cycle programming page with:

N. 3 Heating phases, with 2 intermediate stops and final hold + descent with 2 phases (cooling) (FIG 8).

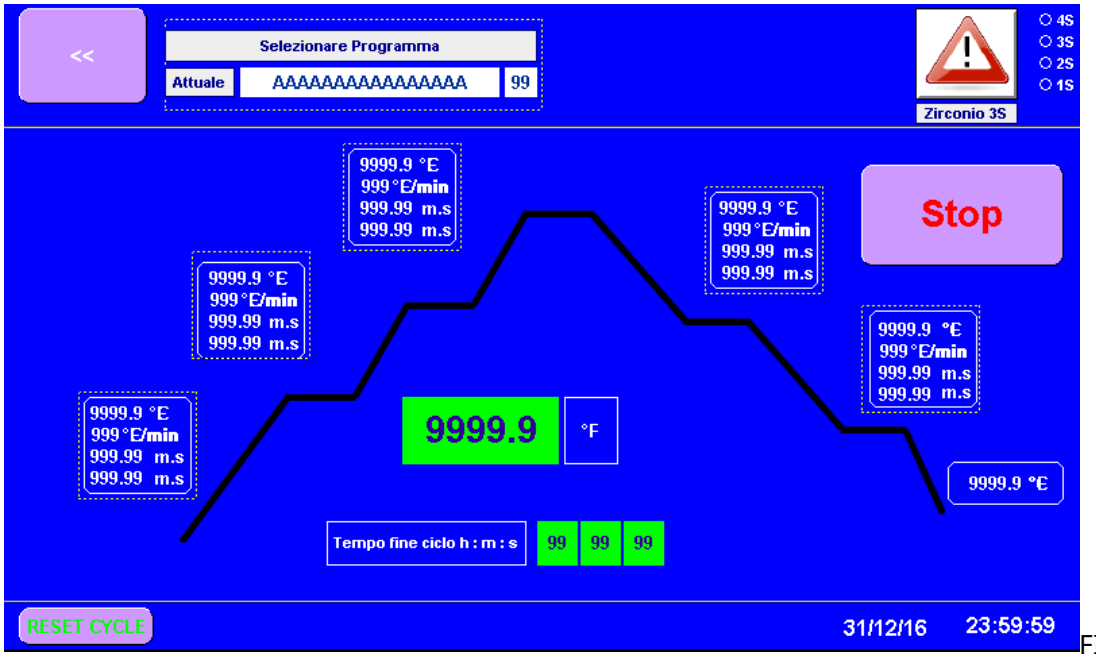


FIG. 8

5- Pressing button 4S takes you to the cycle programming page with:

N. 4 heating phases, with 3 intermediate stops and final maintenance + descent on 2 Phases (cooling) (FIG 9).

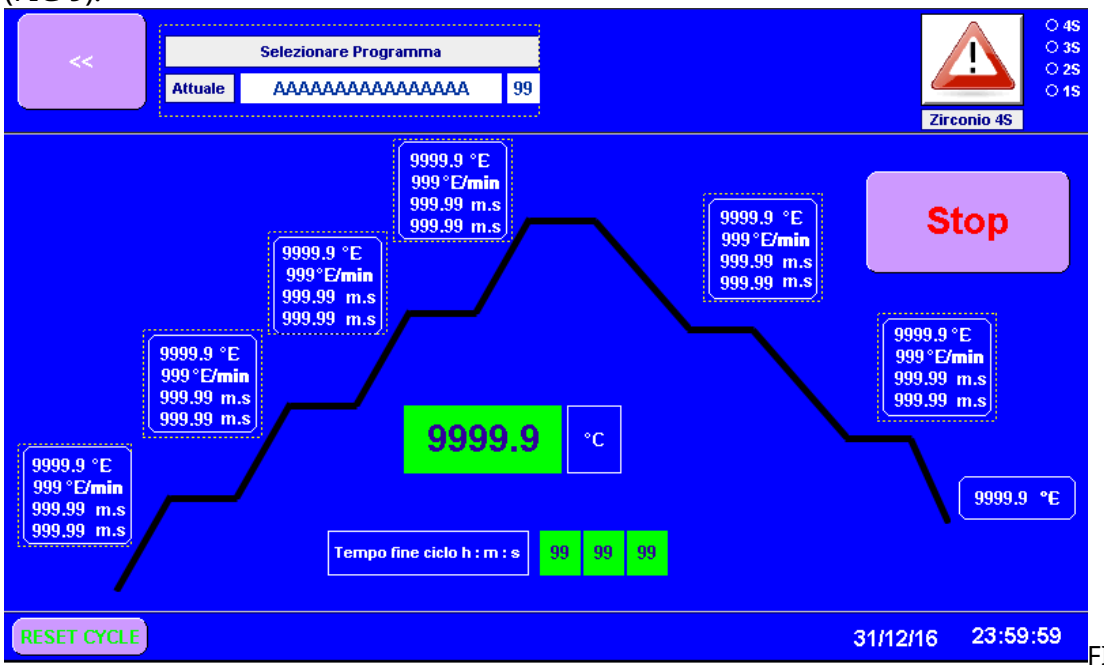


FIG. 9

6- Pressing button N.6 takes you to the displayed ALARMS page

7- pressing the “SYSTEM SETTINGS” button takes you to a page where you can enter some machine operating parameters as explained in the Paragraph

8- The 4 LEDs at the top right indicate which cycle is currently running: 1s cycle with 1 phase, 2s cycle with 2 phases...

3.3 – Switching on

Turn on the oven by placing the general switch in position 1: the screen in FIG 4 appears when switched on (which we show in the following FIG.11)

FIG 10

3.4 – SETTING THE PROGRAMS

To set a cycle (or program) on the “home Page” of fig. 4, press one of the buttons at the top, to select the program with the desired number of phases: for example, press button 1S to set a cycle with only 1 phase. Program 1S consists of only 1 heating ramp-up phase and 2 ramp-down phases (controlled cooling)

Pressing button 1S then opens the page in FIG. 6, shown below (FIG. 11):

Looking at FIG 11, you can see that next to each phase there is a box listing four quantities, namely: 1 - Phase temperature (°C)

2 - Ramp-up/ramp-down rate (°C/min)

3 - Dwell time to be performed (minutes.seconds)

4 - Dwell time performed: this is a time that starts from 0 and increases as time elapses in dwell and at the end of the dwell is equal to time 3.

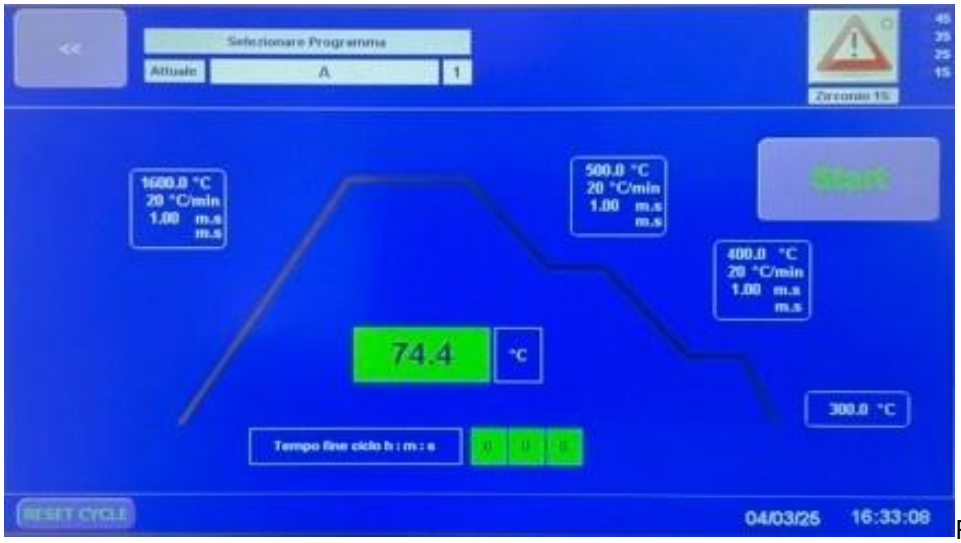


FIG 11

Pressing the “Select program” button at the top opens the following screen in FIG 12:

FIG 12

In the left band, scrolling with the vertical arrows, you can select the program to set (one of the 50 programs identified by the number from 1 to 50), for example program 1: to select it, press on the number and the line turns blue (as in the figure) and in the field on the right, the values to be set are displayed.

- Program name: touch the line and the keyboard appears as in the following FIG 13:

FIG 13

Type the name you want to assign to the program (e.g. “zirco 2”), confirm with ENT and the name is reported in its space.

- Touch “Step 1 T1°C” and set the Temperature of phase 1 (in this case, having cycle 1 single phase, the maximum temperature), for example 1550, press ENT to confirm
- Touch “V1 °C/min” and set the Ramp rate, for example 12 °C/min, and press ENT
- Touch “t1 min.sec” and set the dwell time (in minutes), for example 120, press ENT.

Similarly, the two descending phases Step 1 T1 °C and Step 2 T2 °C are set (they are recognized because before T1 and T2 there is a downward arrow). As for the ascending phase, the values of the variables T1, V1, t1 and T2, V2, t2 are set. At the end, you will reach the following screen:

9
FIG 14

IMPORTANT:

Save the program by pressing the button: “Save Program”

Press the top left arrow

and you will return to the previous page of FIG 6 updated with the set values:

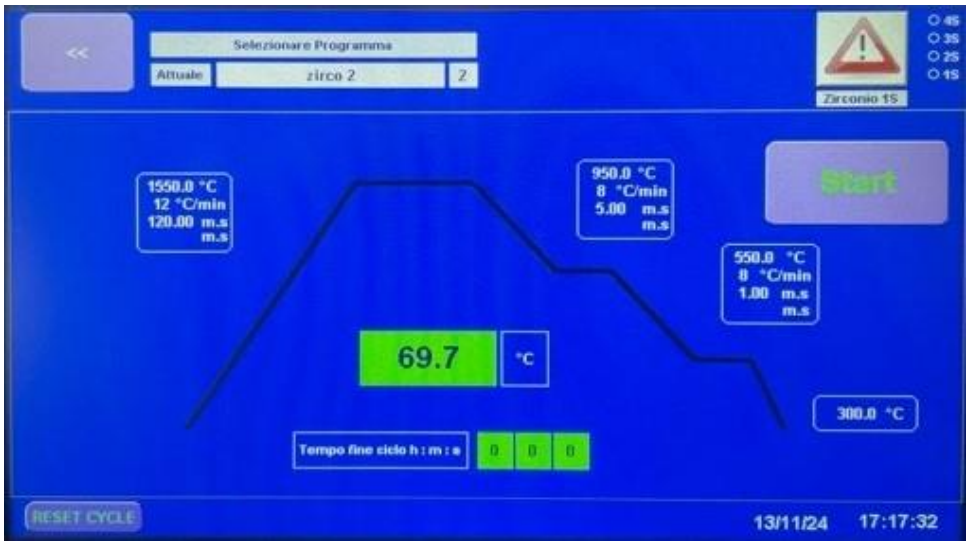


FIG 15

The page has been updated and displays the parameters of the 1-phase (1S) cycle “zirco2” (The name of the program appears in the box at the top). The graph shows the various phases of the cycle.

In the various boxes corresponding to the individual phases, the set values now appear: in each box, the fourth variable does not have a value because it refers to the actual execution of the cycle and shows, in ascending order, the dwell time actually performed. When the dwell has been fully executed, the values of the 3rd and 4th variables coincide.

FIG 16

ATTENTION: the cycle values can also be modified directly from the FIG 11 screen. To do this, touch the box of the FG 16 phase, and it appears:

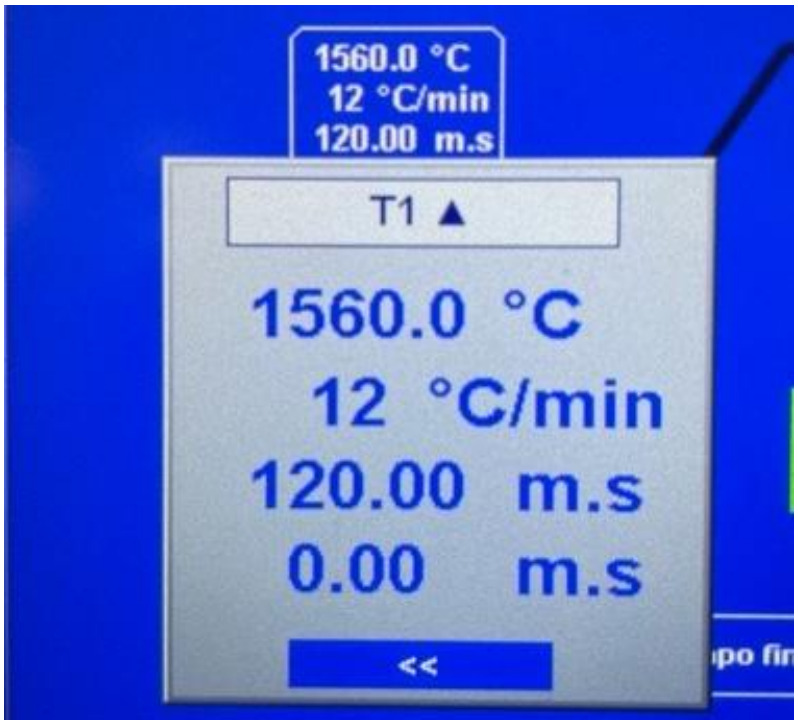


FIG 17

Touch the function to modify (e.g. the Temperature of 1560°C) and the keyboard appears:

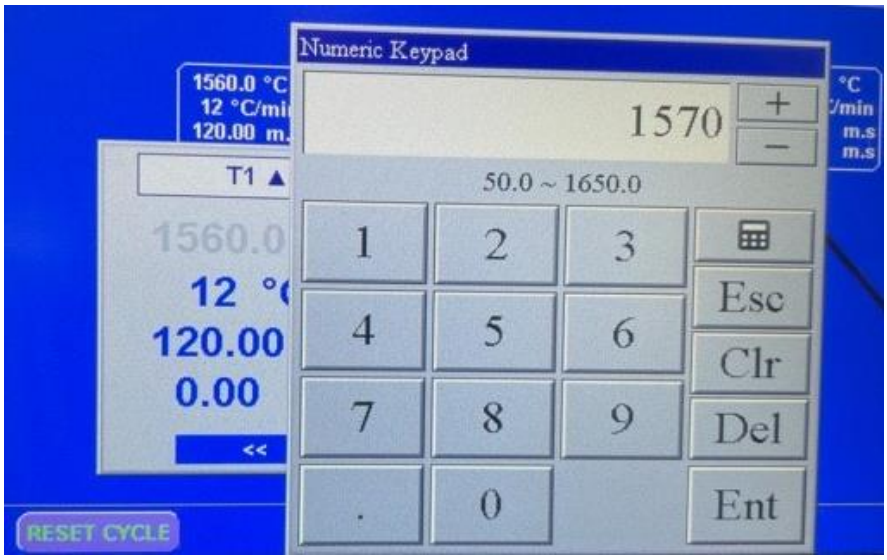


FIG 18

Modify the value with the keyboard (e.g. 1570°C) and confirm with ENT: in the previous screen the value will be updated. Modify the other functions you want and then press <<
to return to the screen in Fig. 15. All modified values will be saved.

To set cycles with 2, 3, 4 phases in heating, follow the same procedure: from the screen in FIG 4, touch the 2S or 3S or 4S button and then proceed as described above. E.g. for a cycle with 3 phases, the following screen appears:

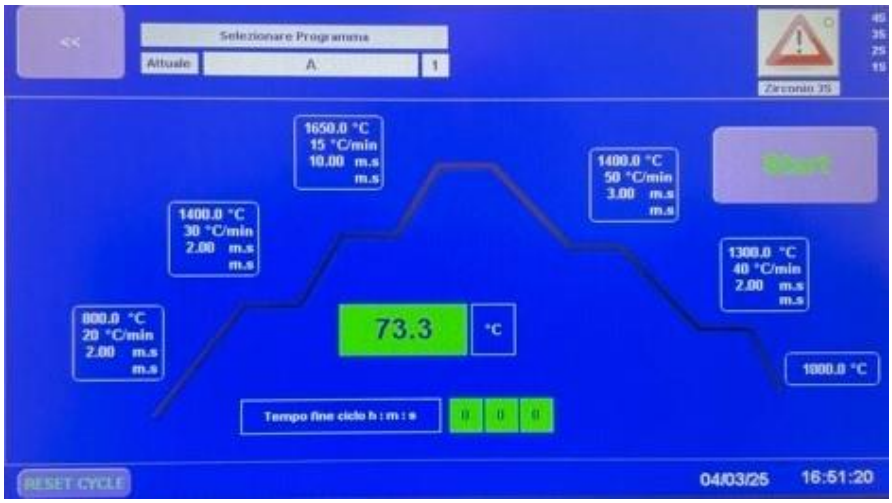


FIG 19

By pressing the “Select Program” button at the top, you can set the name of the program and all the values of the other parameters.

3.5 – EXECUTION OF A PROGRAM

To “Execute” (i.e. start) a program, select the desired program and then press START.

From the screen in FIG 4 (Home Page), touch the button corresponding to the type of program you want to run (1S, 2S, 3S, 4S) and the next screen FIG 20 will appear, showing the last program run or set: to select another program, press the button at the top “Select Program” and choose the program you want to run from the list.

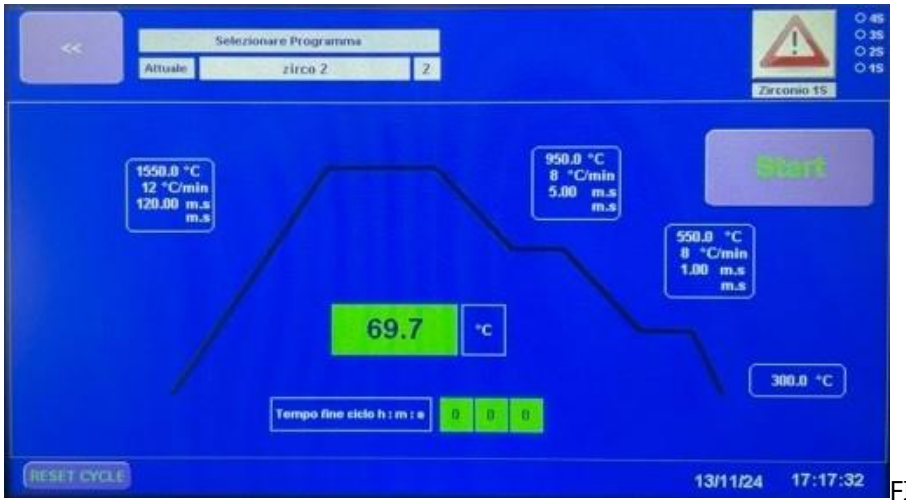


FIG 20

ATTENTION: Before "executing" a program, it is recommended to press the "RESET CYCLE" button to eliminate any disturbances that may have been stored in the previous cycle, especially if the cycle has not been terminated naturally.

If you want to "execute" this program, press START and the oven asks for a CONFIRMATION as in the following FIG 21:

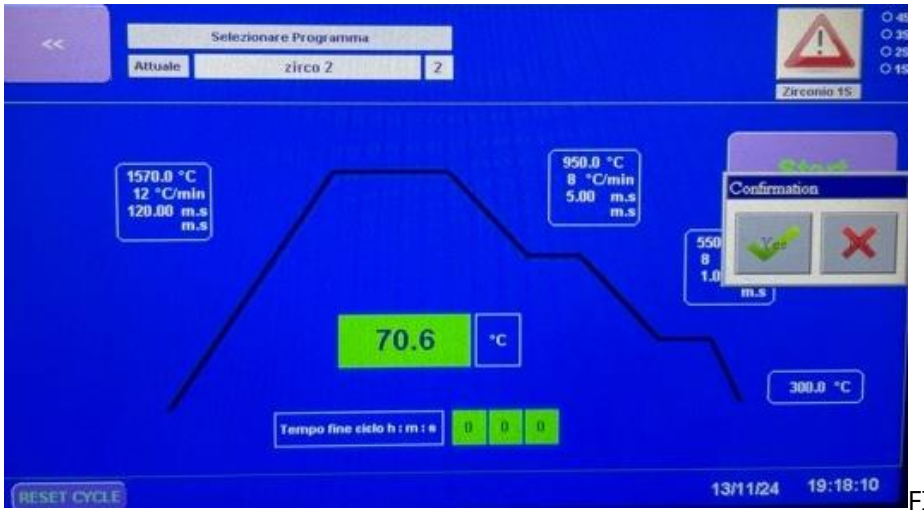


FIG 21

Confirm with YES, and the following FIG 22 appears:

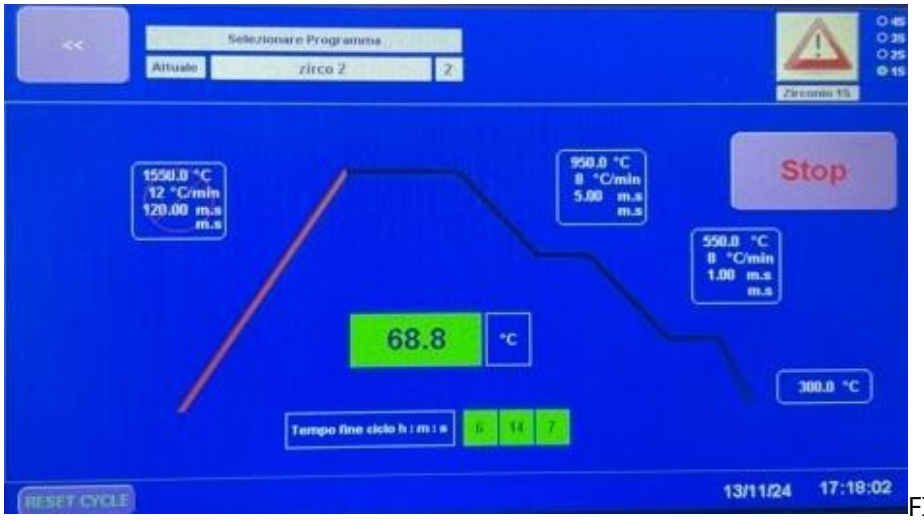


FIG 22

The furnace is performing the first phase of the cycle: the first segment of the diagram (temperature rise up to 1570°C) is illuminated, indicating that it is running. When the rise is complete, the horizontal segment will light up to indicate that it is dwelling at a temperature of 1570°C for a time of 120 minutes. Therefore, the parts of the diagram that have already been executed or are in progress will be illuminated and will remain so until the end of the program.

The internal temperature is displayed in the center of the display, and the remaining time to run is below it. The calculation of the program duration is not precise because it is not possible in the descent phases

to accurately predict the heat dissipation: if low cooling rates are set (less than 20°C), the time calculation is quite accurate; for higher speeds, the cooling time calculation is less accurate.

If, instead, you want to run a program other than “zirco2”, touch the “Select Program” button at the top, and you will enter the screen in FIG 12. Select the desired program and touch the arrow at the top left to return to the previous screen and press START.

If you want to interrupt the program before its natural end, you must press STOP and then confirm the subsequent message (as for switching on).

3.6 – SYSTEM SETTINGS

From the top band of the screen in FIG 4:

press button 7 to enter the screen:

13

FIG 23

In this folder, parameters that regulate the operation of the furnace are set.

Some of these parameters are password-protected because they can only be modified by the manufacturer. The meaning of these buttons is explained below.

Brightness The following keys

FIG 24

are used to decrease or increase the brightness of the Display. The display brightness is, by default, set to an optimal value and we advise against deviating too much from this value.

Language

The following buttons


FIG 25

Are used to change the language of the user interface. The control can communicate in the following languages: Italian, English, German, Spanish, French.

Pressing one of these keys changes the default language to the one desired by the user

AUT Restart

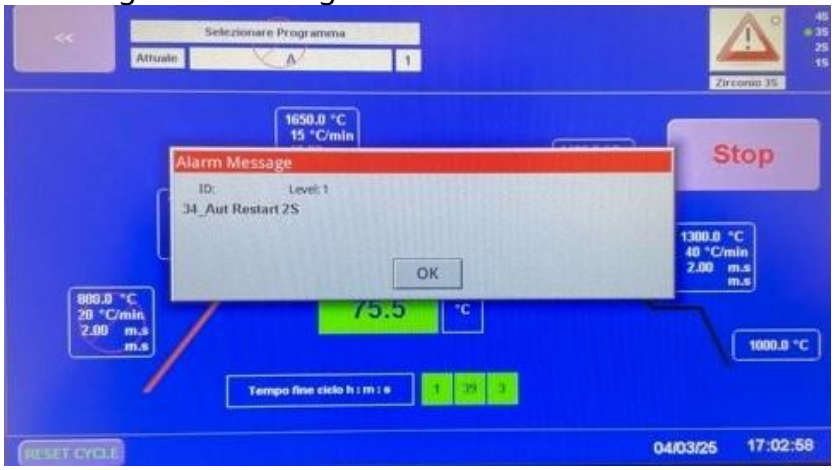
The following buttons

FIG 26

Are used to activate or deactivate the “AUT Restart” function, which is the automatic restart of the cooking program in the event of a power blackout.

If this function is activated (AUT Restart ON), if there is a blackout, when the power returns, the oven resumes the execution of the program from the point where it had reached. If this function is not activated (AUT Restart OFF), if there is a blackout, when the power returns, the oven does not resume the execution of the program. As you can see, there is one of these keys for each type of cycle (1S, 2S, 3S, 4S): if you want to activate the “AUT restart” function, they must all be on ON (as in FIG 26). Touching the key switches from ON to OFF and vice versa.

If during the execution of the program there is a power interruption (Black-Out), when the power returns, the oven restarts (if “AUT Restart ON” is set) but, at the same time, displays the following error message:



Press Ok to confirm reading. The oven, however, has resumed the program from where it left off and the operator must then verify that the product has not been damaged by the Black-Out intervention.

DATA Cycle

The button

FIG 27

Allows you to copy the data of the last program executed to a USB stick.

By inserting a USB stick (Drive), touch the button and confirm with Yes: an Exel file with the data of the last cycle performed will be downloaded to the USB stick.

Parameters

FIG 28

Within these functions are the PID parameters that are the heart of the Temperature control. These Directories are accessible only by the manufacturer and by Password.

Logger

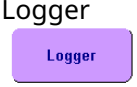


FIG 29

Within this Directory, the latest commands and the latest keys pressed are stored. It is used to see if there have been programming or execution errors.

Alarm History

FIG 30

Shows the list of the latest alarms given by the oven and the time they were launched.

Time Change

FIG 31

Pressing this button brings up a table where you can change the time and date.

Laboratory name

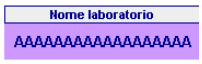


FIG 32

Pressing this button allows you to set the name of the laboratory that uses the oven. The set name will appear on the HOME PAGE (FIG 4).

Temperature scale change °C □°F

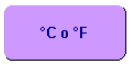


FIG 33

Pressing this button allows you to switch from °C to °F and vice versa.

The operation of switching from one scale to another should only be done when it is strictly necessary because it involves the cancellation of all set programs and, therefore, the need to re-set them all again. For this reason, the operation should only be done when the oven is installed for the first time or only when it is strictly necessary.

To switch the Temperature scale from degrees Celsius (°C) to degrees Fahrenheit (°F), proceed as per the following instructions:

- Press the °C or °F button
- The following screen appears asking you to enter a PIN which is: 2

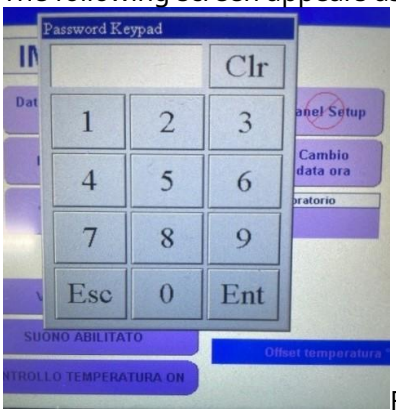


FIG 34

Press ENT

- The following screen appears:

FIG 35

Touch °C or °F depending on whether you want to switch to the °C or °F scale

The following screen appears:

- Touch the screen, wait for the FIG 36 screen to disappear, and then turn off the oven with the main switch

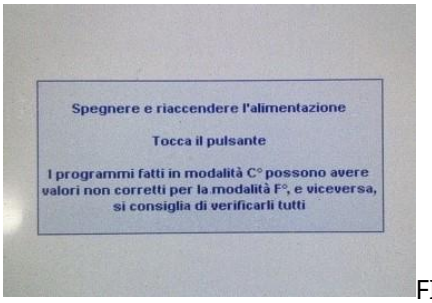


FIG 36

Turn the oven back on and the temperature will be switched to the desired scale. WARNING! All Programs must be reset in the new scale. The values that are displayed in the programs ARE NOT TRUE and are totally random, therefore they must all be reset even those that are equal to the new values: therefore the name of the program and all the phases must be reset.

FAN

FIG 37

Pressing this button turns on the fans: it is a button that is used to test the efficiency of the fans

“BEEP” SOUND

FIG 38

Pressing this button disables or enables the BEEP sound that announces the cycle is finished.

OFFSET

The OFFSET function is used to manually change the calibration of the oven: if the oven reaches a lower temperature than the set one, the OFFSET value must be increased; if, on the other hand, the temperature is higher, the OFFSET value must be decreased. All our ovens are calibrated by measuring the temperature with PTCR pyrometric control rings: after measuring the temperature, the value displayed in the following FIG 39 is modified.

FIG 39

Pressing on the numerical value displays:

FIG 40

Modify the numerical value by entering a number (more or less) equal to the difference between the set temperature and the detected temperature.

WARNING: the number written in large is the offset value in °C, the one in small is in °F. Always correct the number in °C, so if you are working in °F, you need to switch it. Press ENT to confirm and exit.

In our ovens, the OFFSET value is different from zero: this means that the oven has been calibrated and, consequently, the OFFSET value has been modified.

3.6 Open Door ALARM

During the execution of a program, the door MUST remain closed.

If the door is opened during the execution of a program, the oven stops immediately and displays an alarm message like the following:

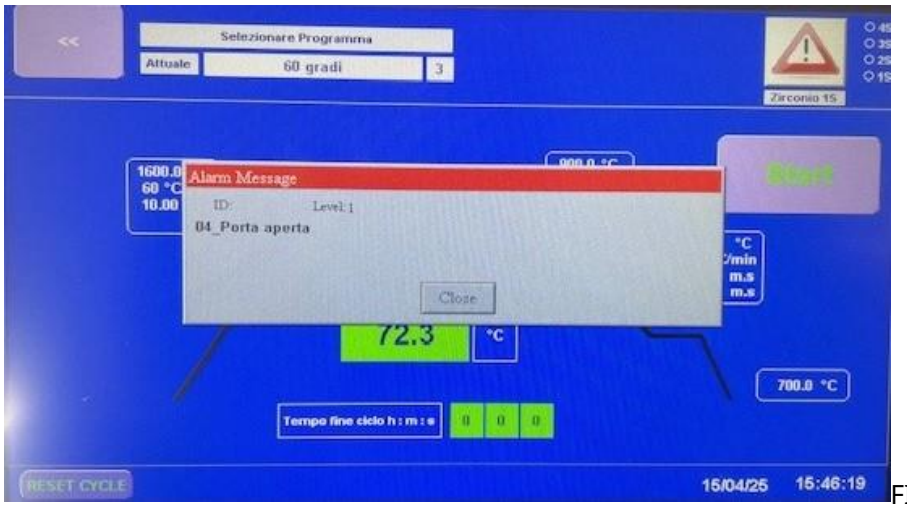


FIG. 41

To resume the program, the error must be removed.

- Press “Close” and delete the message then:
- Press the alarm icon in the upper right corner:

The following screen appears:

FIG 42

- Press RESET and wait a few seconds until the error disappears.

At this point, press HOME and restart the program -

4 – MAINTENANCE INFORMATION

4.1– Cleaning and Routine Maintenance

It is recommended, after each work cycle, to remove any residues left by impurities from the furnace chamber of the sintered material. Any cleaning operation of the furnace must be done when the furnace is COLD, OFF, and with the power plug disconnected.
For cleaning the furnace, do not use thinner, gasoline, petroleum or other flammable liquids or corrosives: they could dissolve the external paint and damage the component materials of the chamber and the resistors.
In addition to this cleaning operation, the furnace does not require any other maintenance.

4.2–Extraordinary Maintenance

For the repair or replacement of parts, contact exclusively qualified repair personnel or directly to the manufacturer
Avoid absolutely opening the guards fixed of the machine without having taken the necessary precautions.
Before carrying out any routine or extraordinary maintenance, unplug the power outlet.

4.3–Replacing the resistors

The resistors of the zirconia furnace are subject to progressive wear and decay that will lead to their breakage, which will then need to be replaced. For the replacement, proceed as follows: way:

- Remove the external cover of the furnace: unscrew the side screws on the left and right sides of the furnace and then slide the cover by pulling it towards the operator until it comes out completely, paying attention to the power cable that remains attached to the body of the furnace
- Once the cover is removed, the resistors are visible in the upper part of the furnace, which, with the normal maintenance tools, can be easily disassembled and replaced

DESIGN AND CONSTRUCTION OF EQUIPMENT
and MATERIALS FOR DENTAL TECHNICIANS and DENTISTS.

DECLARATION OF CONFORMITY

Lesignano de Bagni 01-01-2025

EEC Directives: 2006/42/EC (Ex 89/392 EEC) - 2014/35/EU (Ex 73/23 EEC Low V.) – 2014/30/EU (Ex 89/336 EEC Comp. El.)

The company BIODYNAMIC VIA BASSETTA N.3 LESIGNANO DE BAGNI (PR) in the person of Francesca Ganassi president C.E.O declares that the machine of its construction:

SINTHERA SPEED

complies with the aforementioned directives.

BIODYNAMIC

BIODYNAMIC

VIA BASSETTA N.3 CAP.43037 LESIGNANO DE BAGNI
PARMA E.mail: info@biodynamic.dental
Website:
www.biodynamic.dental

DESIGN AND CONSTRUCTION OF EQUIPMENT
FOR DENTAL TECHNICIANS, DENTISTS AND BEAUTICIANS

WARRANTY CERTIFICATE

MODEL: SS **555** N678
SERIALNUMBER:
567432
WARRANTY DURATION: 12 Months

1 - The warranty starts from the date of purchase of the device certified by a sales document issued by the retailer (delivery note or receipt or fiscal receipt) which clearly shows the model and serial number.

2 - The warranty covers the replacement or repair of defective parts of the device.

3 - Defective parts due to negligence or carelessness in use or in the maintenance, of maintenance performed by unqualified personnel, transport damage or, finally, circumstances that, however, cannot be traced back to manufacturing defects.

4 - The warranty is, however, excluded in case of improper use of the device. 5 - The costs and risks related to the transport of the device are borne by the user.

Lesignano de Bagni date .....

BIODYNAMIC