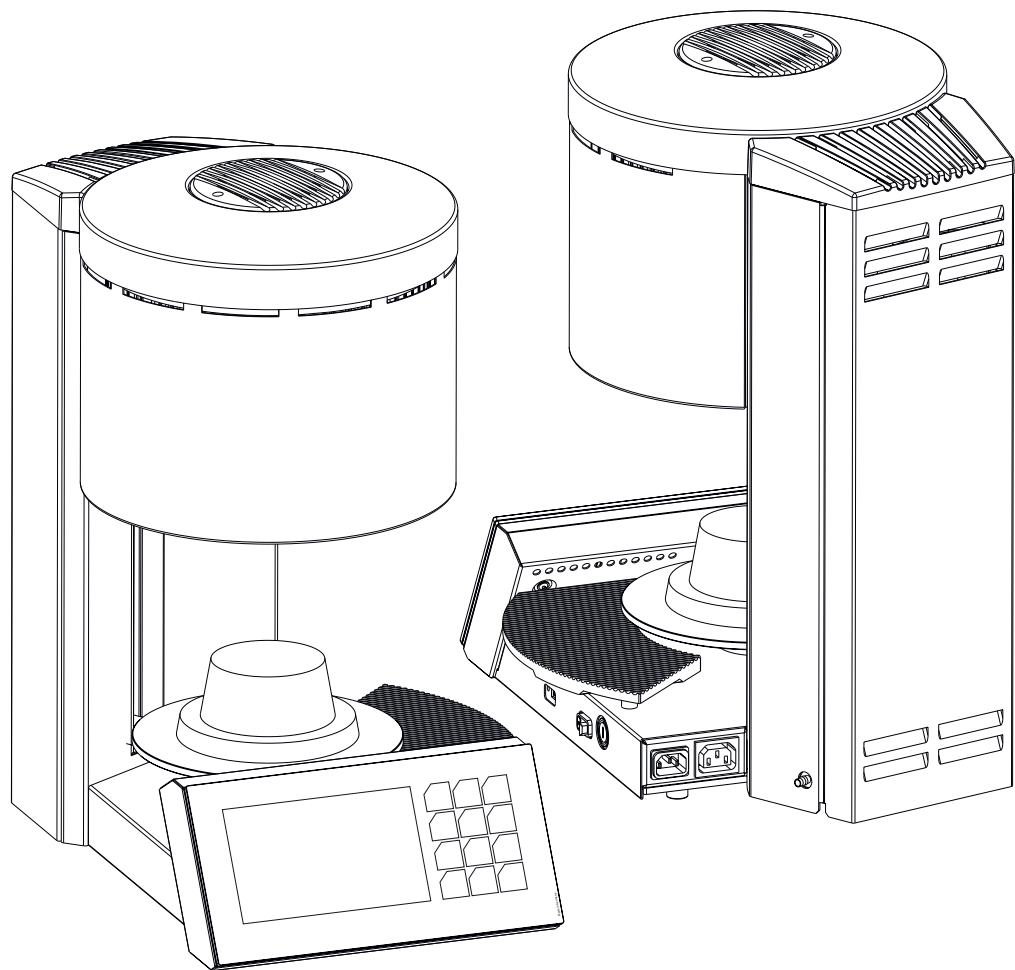


VARIO 230 series



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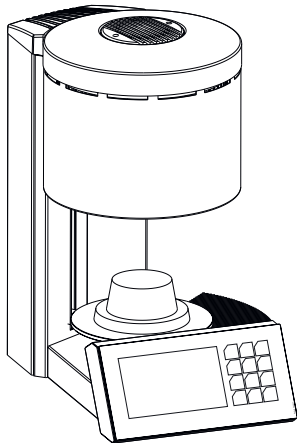
0. Introduction

Dear Sir or Madam,

we are pleased that you have decided in favor of a Zubler furnace VARIO 230 and wish you pleasant work with it. The constant further development of our

technology is based on the cooperation with experienced dental technicians. The focus is on the goal of building furnaces of the highest quality, flexibility and sus-

tainability. Performance and economy are basic requirements. To ensure trouble-free work, you must read the operating instructions carefully.



0.1 Declaration of conformity

We, Zubler Gerätebau GmbH

Buchbrunnenweg 26

89081 Ulm-Jungingen

www.zubler.de

declare that the product "VARIO 230" complies with the provisions of the following EC directives:

2006/42/EC Machinery Directive

2014/35/EU Low Voltage Directive

2014/30/EU EMC Directive

2011/65/EU RoHS.

If the product is modified without our agreement, this declaration loses its validity.

0.2 General

The correct processing of modern ceramic materials places increasing demands on dental technicians. We have taken this into account and combined the latest technology and future-oriented processes in the VARIO ovens. The software installed in the VARIO series allows you

to carry out individual pressing and firing for all dental ceramics available on the market. The use of the highest quality materials increases the service life of the furnace and offers you reproducible results at the highest level. It is now our desire that you use the VARIO furnaces to

produce top-quality dental ceramics for years to come. Therefore we will inform you about changes to the software or additions to the processing options. We are sure that you will have much success with the ceramic furnace and congratulate you on the choice you have made.

0.3 Intended use

- The VARIO series ovens are used exclusively for the firing and pressing of dental ceramics and is only intended for these applications.
- The user is liable for damage resulting from other use.
- When working frequently with temperatures above 1075°C, the service life of the heating chamber is reduced.
- The manufacturer's warranty provisions apply.
- Intended use also includes observing all the information in these operating instructions.
- Repairs may only be carried out by authorized service centers.
- Do not operate the control panel with wet or damp fingers.
- Please unpack the oven with care and transport with two people. Always lift by the base, never by the oven cavity or lift table.
- Do not operate the control panel with hard and/or pointed objects.
- Never operate the furnace without the firing insulation base or press insulation base.
- Do not put your hands between the oven table and the oven chamber during operation. There is a risk of crushing and burns.
- Never place items or hands under the lift table when in use. The oven table must not be obstructed during the opening process.
- The cooling slots must not be covered, otherwise air circulation may not be optimal and the device may overheat.
- No liquids or objects may get into the device or into the ventilation slots, as this could cause a short circuit.
- The oven table has an electric drive and must be operated with the opening and closing button. Do not open or close the oven table by hand.

0.4 Safety instructions

- Position the oven in the up-right position. A clearance of 200-300 mm must be maintained above and on all sides of the oven. Immediately adjoining walls surrounding the device must be made of non-flammable material. The area should be well ventilated.
- In accordance with fire codes, install an appropriate, recommended, multi-purpose, dry foam fire extinguisher near the oven and ensure your employees are trained in its proper use.
- Never wear loose or loose fitting clothing when operating the oven. Be careful when reaching for objects around the oven. Flammable material can ignite if it comes into contact with a hot surface of the device and cause serious burns to the user.
- Do not set up the furnace and vacuum pump in the immediate vicinity of heat sources (e.g. preheating furnaces, sintering furnaces).
- Furnace soldering reduces the service life of the thermocouple and heating muffle.
- Make sure the oven is professionally installed according to our instructions and the chosen electrical connection is properly grounded.
- For 230/240 V, use the grounded mains cable H05VV-F3G1.0 with a non-heating device socket and Schuko plug.
- For 100/120V use the grounded mains cable SJT3xAWG14 with a non-heating device socket.
- The electrical service must be carried out carefully and ensure that the oven is connected to the existing mains with sufficient voltage. Consult a qualified electrician to ensure the power rating is adequate and will not overload an existing circuit.
- Do not use an extension cord with the oven. Ask your electricity supplier about the electrical connection values that apply to your local network.
- In the event of undervoltage, the temperature rise may be slower.
- Hoses and fittings should be checked periodically for proper fit, wear and damage and replaced or re-tightened as necessary.
- All cables and hoses should be located away from walkways and passageways.
- During use, such as when opening the heating chamber, high temperatures may radiate outside the oven chamber.
- Do not touch the surface parts, the heating elements or the inner surface of the oven. The hot surfaces can cause serious burns.
- Immediately after the firing process, do not leave the firing chamber unattended, close it as soon as possible.
- If the furnace is left under vacuum for a long time when it is switched off, the lift plate O-ring may stick easily.
- Only clean the device with a dry or slightly damp cloth. Do not use solvents! Always disconnect the power plug from the outlet before doing this work.
- When the heating chamber heats up, the heating coil may oscillate.
- In the event of defects or damage that no longer ensures safe operation, the device must be secured against unintentional use.
- Before performing any recommended and authorized routine maintenance or service, turn the oven off and disconnect the power plug from the outlet, to avoid risk of electric shock, injury or death. Allow the oven to cool to room temperature.
- Do not attempt to open, repair, or replace any part of your oven until you have read the manual and the repair or replacement is specifically recommended therein. Any unauthorized attempt to repair, replace or open any part of your oven could pose a safety hazard and void your warranty. All service work, whether during or outside the warranty period, may only be carried out by our customer service.
- In the event of service, only original spare parts are to be used.
- Unauthorized modifications to the hardware or software can cause serious safety damage as well as void your right to warranty.
- Never leave children or visitors unattended near an operating oven. Children should never be allowed to stand on or climb up on a surface on which a oven is placed. Objects that could be of interest to children should never be placed near the oven. There is a serious risk of injury.
- Keep the original packaging materials for your VARIO oven and vacuum pump. Only use the original packaging to transport these parts. Improper transport will void the warranty.

1. Installation

1.1 Setting up the device

- Place the oven on a stable and level work station
- Set up the vacuum pump near the oven (remove the rubber cover from the brass nozzle)
- Keep the original box and packaging material for warranty claims and service
- Have the firing or pressing insulation base ready for the further procedure.
- Power connection:
 - The ceramic oven requires 230V/50Hz or 115V/60Hz.
 - Do not use extension cords
 - Connect oven to a dedicated electrical outlet.
 - The main switch should be in the "0" position.
 - Connect the oven to the power supply using the supplied power cord.

Switch on the furnace at the main switch.

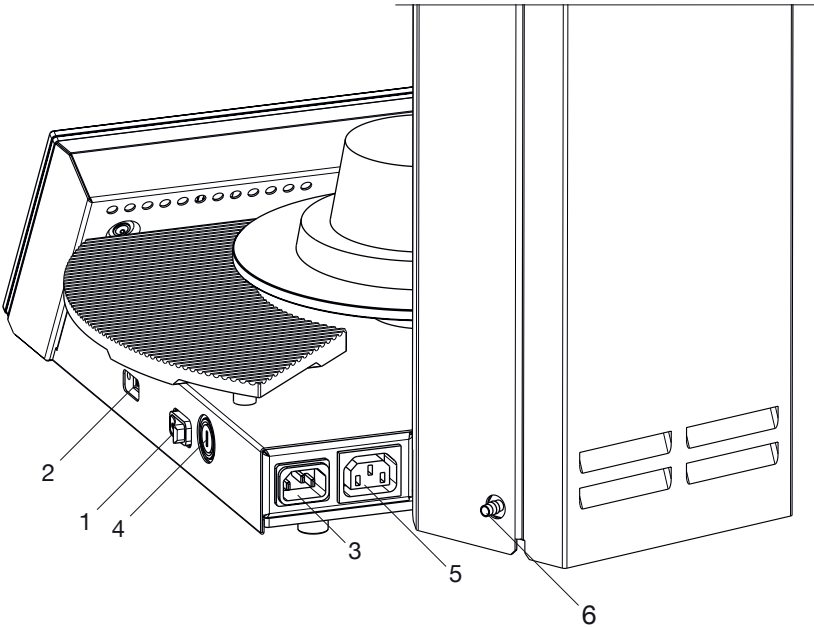
1.2 Initial installation

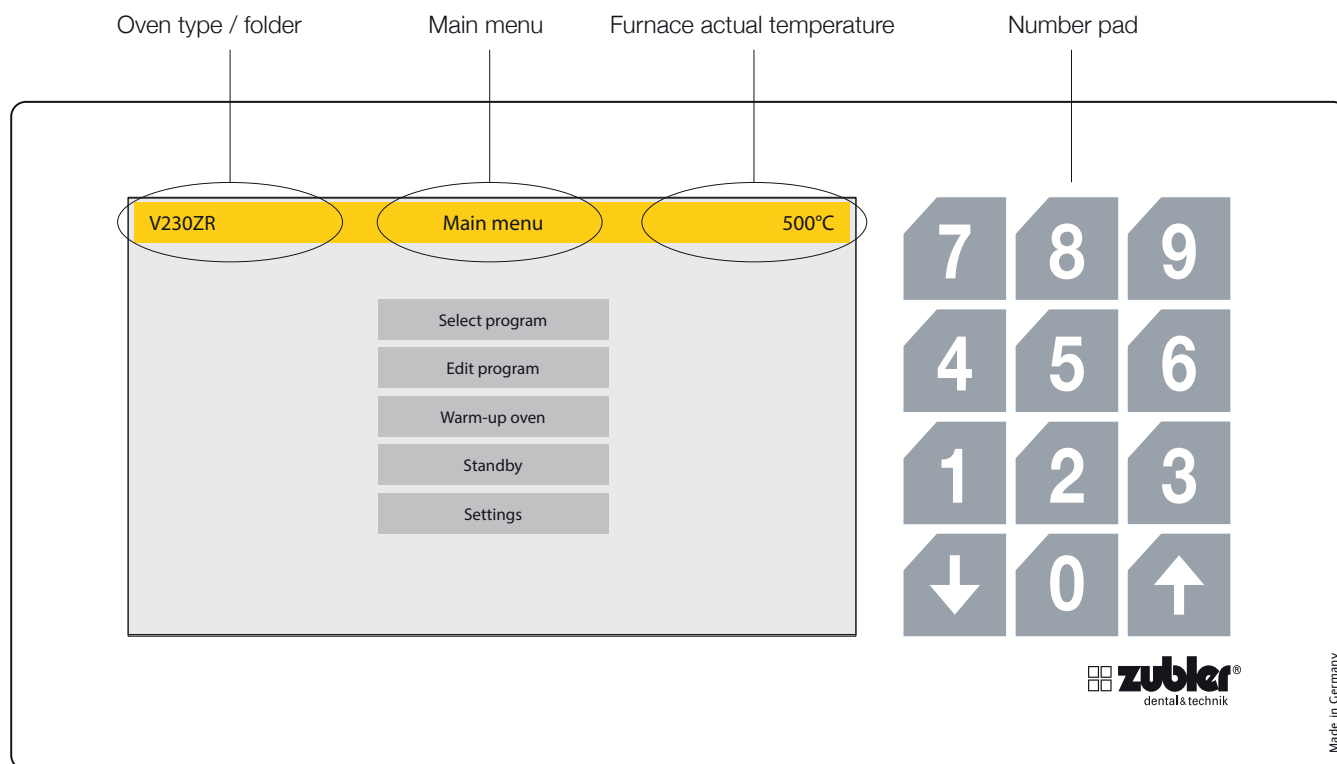
- After switching on for the first time, instructions for the first steps are shown on the display. After that, the initial installation cycle runs automatically. The oven is only ready for operation after a complete set-up (2.5.10).
 - Remove any remaining packaging

Initial installation steps

- Setting the language
- Put on the firing or press insulation base
- Brightness
- Volume
- Connection vacuum pump
- Set date and time
- Setting the unit (°C / °F)
- Idle temperature
- Standby temperature
- Loading programs via USB
- Vacuum test
- Drying program, (process time 20 min)

1	Main switch
2	USB port
3	Power cord connection
4	Main fuse
5	Power cord connection "vacuum pump"
6	Connection for the vacuum hose





1.3 Display

The display of the VARIO furnaces is a full-touch display including an additional number block

The number block is only active when numerical values can be entered.

The "UP" and "DOWN" arrows are active when they can be used. In the top position only the **down** arrow is active, in the lower plate position only the **up** arrow is active. In this way, the proper functioning of the lift and the end positions can be checked.

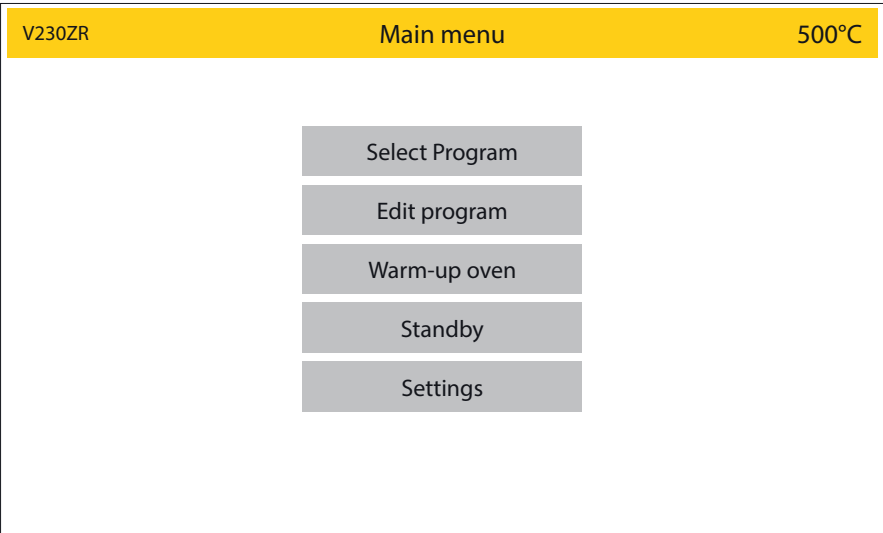
1.4 Diagnostic program

When you switch on the device, the oven starts a diagnostic program to check the function of various sensors. At the same time, the firing chamber is heated to operating temperature. If there is a fault/defect in basic functions, the oven will display a corresponding error message. The total duration of this process is about 20 minutes, with the option of bypassing this step using the red **Abort** function field. This gives you direct access to the main menu.

2. Operation

Selection of the menu parameters

After the furnace is switched on, the main menu with five options appears on the display. Selecting an option takes you directly to it.

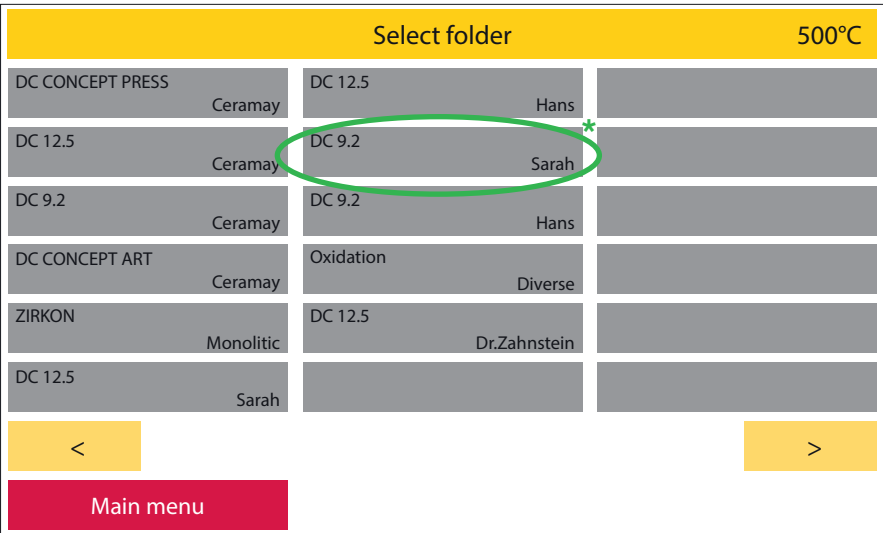


Display, Status: Main menu

Image 08.1

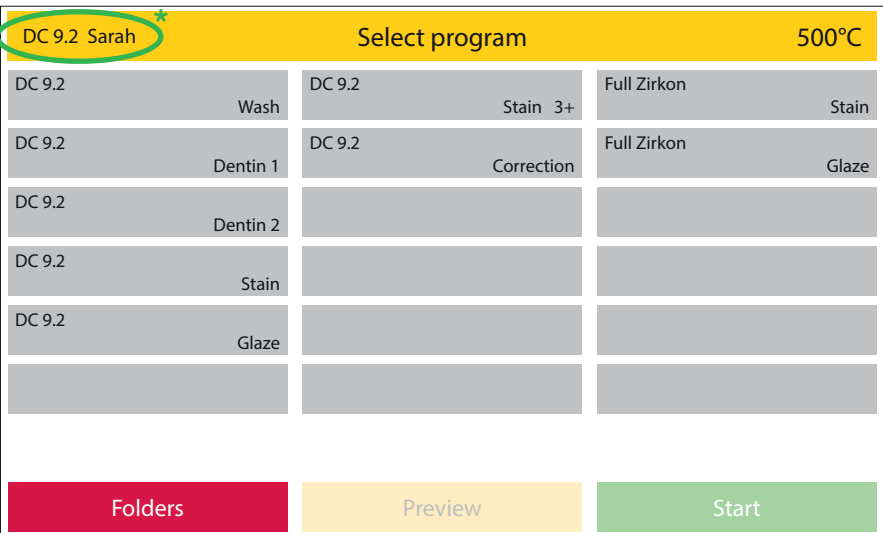
2.1 Program Selection

- The Folder Menu contains a list of customizable Program Folder buttons. This menu will be recognizable by the prompt at the top of the page "Select Folder". Each Program Folder button contains the programs for the listed specific porcelain, or process you desire. Folder Buttons are dark grey, while program buttons are light grey. Example: All DC 9.2 Programs will be in the DC 9.2 Folder. The red **Main menu** button takes you back to the main menu.
- Once a folder has been opened, the Program buttons in that folder are displayed. This menu will be recognizable by the prompt at the top of the page in yellow "Select Program". Press the desired program button. The press the **"Preview"** button to view/change parameters or press the **"Start"** button to start the selected program. The parameters can be changed individually for this one program sequence (see also point 2.1.1).



Display, Status: Select program / folder overview

Image 08.2



Display, Status: Select program / select a folder / program overview

Image 08.3

DC 9.2		Select program	500°C
DC 9.2	Wash	DC 9.2 Stain 3+	Full Zirkon Stain
DC 9.2	Dentin 1	DC 9.2 * Correction *	Full Zirkon Glaze
DC 9.2	Dentin 2		
DC 9.2	Stain		
DC 9.2	Glaze		



Folders

Preview

Start

2.1.1 Preview - change program

Preview			500°C
	DC 9.2	Professional	↓
Start temp.	Heat rate	Opening temp.	
450 °C	35 °C/min	720 °C	
Pre dry	Final temp.	Opening time	
Yes		02:00 mm:ss	
Pre dry time	Hold time	Vacuum	
03:00 mm:ss	01:00 mm:ss	Yes	
Closing time	Temper	Release vacuum	
03:00 mm:ss	No	Heat up ▼	
Soak temp.	Temper temp.	Vacuum end	
450 °C	690 °C	720 °C	
Soak time	Temper time		
01:00 mm:ss	02:00 mm:ss		
Abort	Delete	Start	

Preview			500°C
	DC 9.2	Correction	Professional 
Start temp.	450 °C	Heat rate 35 °C/min	Opening temp. 700°C
Pre dry Yes	Final temp. 700°C		Opening time 02:00 mm:ss
Pre dry time 03:00 mm:ss	Hold time 01:00 mm:ss		Vacuum Yes
Closing time 03:00 mm:ss	Temper No		Release vacuum Heat up 
Soak temp. 450 °C	Temper temp. 690 °C		Vacuum end 700°C
Soak time 01:00 mm:ss	Temper time 02:00 mm:ss		
Select program			Start

2.1.2 Start program

- As soon as a program is started using the green **Start** button, the program sequence is displayed once as a graph and as a list of parameters. The currently active parameter is highlighted in a darker shade of grey in the program slider, while parameters that have already been processed recede into the background (image 10.2). In the graph, the active parameter is also highlighted in a darker shade of grey. In this way, the program status can be seen at a glance, even from a greater distance from the device. The parameter slider provides more detailed information. As already described, the active parameter is highlighted in a darker shade of grey. If a subsequent parameter is controlled, the parameter bar scrolls accordingly. Subsequent parameters can be checked by dragging the process bar to the appropriate positions with a "swiping motion".
- The vacuum status is displayed in %.

Preview500°C

DC 9.2

Correction

Professional ↓

Start temp.450 °C

Pre dryYes

Pre dry time03:00 mm:ss

Closing time03:00 mm:ss

Soak temp.450 °C

Soak time01:00 mm:ss

Heat rate35 °C/min

Final temp.720 °C

Hold time01:00 mm:ss

TemperNo

Temper temp.690 °C

Temper time02:00 mm:ss

Opening temp.720 °C

Opening time02:00 mm:ss

VacuumYes

Release vacuumHeat up ▼

Vacuum end720 °C

Select program

Start

Display, Status: Select program / select a folder / select a program / PreviewImage 10.1

DC 9.2 *Correction *450°C

15:34 mm:ss

Pre dry time03:00mm:ss

Closing time03:00mm:ss

Soak temp.450°C

Abort

Edit program

Display, Status: A running firing programImage 10.2

2.1.3 Change program during a program run

- Parameters can be changed during a program run via the program **Edit program** button. As with the program preview (image 10.2), these changes only apply to the current brand. After the end of the process, the initial values are valid again.
- Only values that the oven has not yet started or completed can be changed. Values that you can no longer change are optically pushed back into the back-ground. Press the green **OK** function field to activate changes and **Continue**, you get back to the parameter slider and the graph.
- Press programs cannot be changed while the program is running.

Edit program			500°C
	DC 9.2	Professional ↓	
	Correction		
Start temp.	450 °C	Heat rate	35 °C/min
Pre dry	Yes	Final temp.	720°C
Pre dry time	03:00 mm:ss	Hold time	01:00 mm:ss
Closing time	03:00 mm:ss	Temper	No
Soak temp..	450 °C	Temper temp.	690 °C
Soak time	01:00 mm:ss	Temper time	02:00 mm:ss
Abort		Delete	OK

Display, Status: Select program / select a folder / select a program / Start / Edit program

Image 11.1

2.1.4 Program abort

- If you want to end a program prematurely or cancel it, you can do this by pressing the red **Abort** function field. In this case, the program abort must be confirmed again by a security prompt (image 11.2).

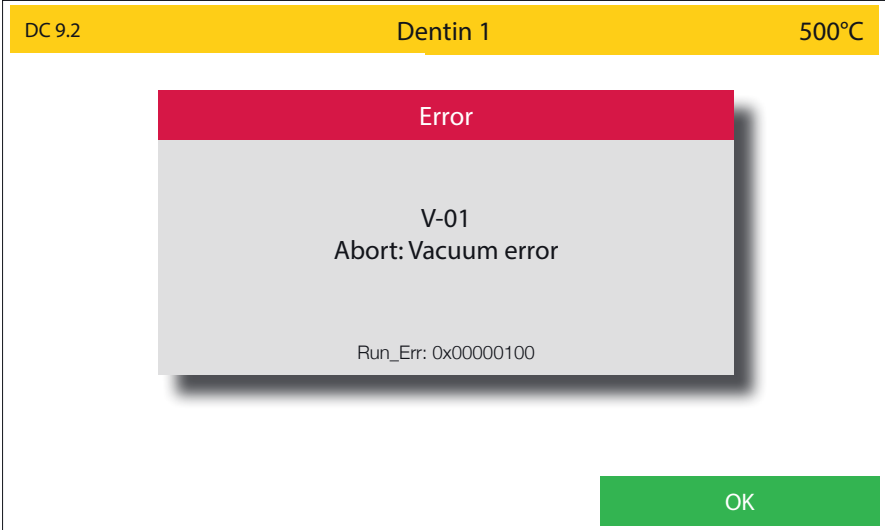
DC 9.2	Dentin 1	500°C
<div>Abort</div> <div>Should the program really be aborted?</div> <div>No</div> <div>Yes</div>		

Display, Status: Program abort, abort confirmation

Image 11.2

2.1.5 Functional error during program execution

- In the event of a functional error, the oven interrupts the work process and displays a window with an error message in plain text and an error code.
- This error message and the program termination must be confirmed with the green **OK** button.
- The error message that was displayed last can be called up later under **Settings, Last error messages**.

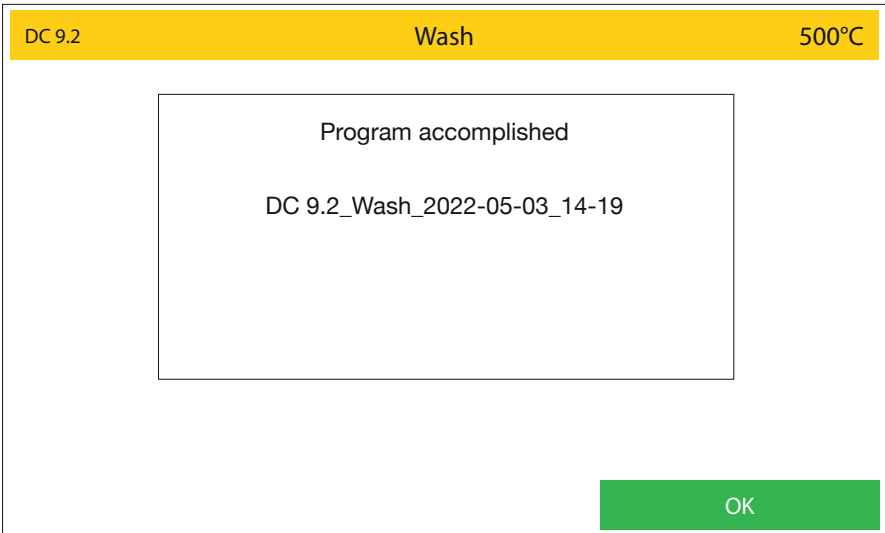


Display, Status: Error message during a running program

Image 12.1

2.1.6 End program

- The end of a program is indicated by an acoustic signal and visually by a text window. The name of the completed program, the time and the date at the end of the process are given in the text window (image 12.2).
- A code is generated (image 12.3) for documentation or quality assurance. This consists of the serial number of the furnace, the date YYMMDD - time (24-hour system). The complete program data can be called up under **Settings - Data transfer - Export protocol files** (image 12.2). The last 50 program sequences are saved here. Older program sequences are overwritten. The log data should therefore be backed up at regular intervals.



Display, Status: Accomplished firing program

Image 12.2

Image 12.3

2.1.7 Program overview and parameter assignment

Professional	Ceramic firing program type with optional tempering function
Professional TTC	Ceramic firing program type with optional, linear, cooling rates - controlled temperature feedback
2-Step	2 - phase firing program (two heating stages including holding time)
2-Step TTC	2-phase firing program with optional, linear, cooling rates - controlled temperature feedback

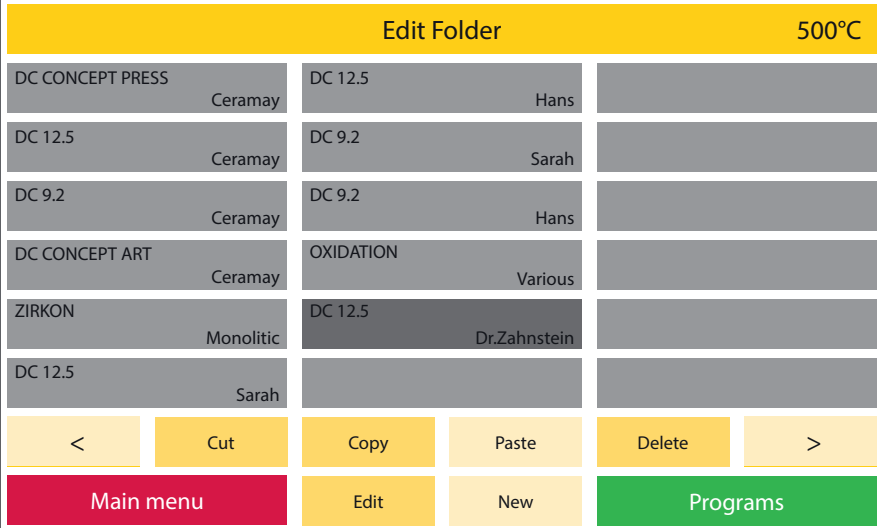
Parameter	Types of burning program			
	Professional	Professional TTC	2-Step	2-Step TTC
Start temperature	●	●	●	●
Pre dry	●	●	●	●
Pre dry time	●	●	●	●
Closing time	●	●	●	●
Soak temperature	●	●	●	●
Soak time	●	●	●	●
Heat rate	●	●	-	-
Final temperature	●	●	-	-
Hold time	●	●	-	-
Heat rate 1 and 2	-	-	●	●
Final temperature 1 and 2	-	-	●	●
Hold time 1 and 2	-	-	●	●
Temper	●	-	-	-
Temper temperature	●	-	-	-
Temper time	●	-	-	-
TTC (Time Temperature Cooling)	-	●	-	●
TTC cool rate	-	●	-	●
Opening temperature	●	●	●	●
Opening time	●	●	●	-
Vacuum	●	●	●	●
Release vacuum / Heat up / Hold time / Cooling	●	●	●	●
Vacuum end	●	●	●	●

2.1.8 Explanation of terms

Start temperature	The temperature in the firing chamber at which the program begins.
Pre dry	Selecting "YES" activates the pre-drying program.
Pre dry time	Enter a time value. In this section, the lift looks for a predetermined position over the entire period, depending on the radiated heat of the heating chamber, in which the object is thus pre-dried at a constant temperature.
Closing time	Specifies the time from the open to the fully closed lift
Soak temperature	At this temperature, the firing object remains in the closed firing chamber to warm it up to the starting temperature. This serves to evenly "burn through" a ceramic work. Soak temperature = Vacuum start.
Soak time	Indicates the dwell time of the object in the heating chamber before the temperature rises and before the vacuum pump is switched on.
Heat rate	Respective temperature increase in °C °F/min to reach the final temperature.
Heat rate 1-2	Respective temperature increase in °C °F/min to reach the final temperature.
Final temperature	The temperature at which the ceramic is fired.
Final temperature 1-2	The respective final temperature at which the ceramic is fired.
Hold time	Residence time of the ceramic at the final temperature.
Hold time 1-2	Dwell time of the ceramic at the final temperature.
Temper	The tempering program is activated by selecting "Yes" .
Temper temperature	The ceramic is tempered at this temperature, i.e. thermally treated with pinpoint accuracy at a constant temperature.
Temper time	Indicates the duration of the thermal treatment with the heating chamber closed.
TTC	Activates linear cooling to the desired temperature using temperature gradients
TTC Cool rate	Cooling in °C °F/min to reach the opening temperature. Recommendation: heating rate = cooling rate
Opening temperature	Indicates the temperature at which the oven opens. When using TTC, the opening temperature must be below the end temperature. The linear cooling in TTC mode takes place until this temperature is reached. Recommendation: opening temperature = starting temperature or Tg of the ceramic used.
Opening time	The time it takes for the lift to fully open.
Vacuum	Activation or deactivation of the vacuum function (is a 2nd holding time at a lower temperature in relation to the final temperature) it determines the time at which the firing chamber is ventilated.
Release vacuum	Limits the time to vent the heating chamber. You can choose from: During the heat up phase: Release vacuum: Heat up During the hold time at final temperature; Release vacuum: Hold time During the cool down period; Release vacuum: Cooling
Vacuum end	Defines exactly when the heating chamber is ventilated. A time or temperature value must be entered here, depending on which phase vacuum was selected.
Save	Save the program

2.2 Edit folder/program

- In the **Edit program** area, folders or programs can be created, edited, copied or deleted. A basic distinction is made between two "levels". The "folder level" and the "program level". For visual orientation, the "folder level" is kept in a darker shade of grey, the "program level" in a lighter shade of grey. These structures can be freely named by the customer. So the folder structure e.g. material or technician - are created related.
- If a folder function field is selected in **Edit program** mode, this is optically highlighted. The corresponding function fields are now active in the lower area of the display (image 15.1). If a free folder function field was selected, this can now be named using the **New** function field. If a folder function field that has already been described is selected, the field and its content can be copied, moved, edited or even deleted. Corresponding function fields are activated as soon as the function is available.
- If a described folder function field was selected, a green **Programs** and a red **Main menu** function field become active, among other things. By pressing the **Programs** field, you get to the program level, by pressing the **Main menu** field, you get back to the main menu.



Display, Status: Edit program / existing folder selected

Image 15.1



Display, Status: Edit program / folder selected / Edit or New

Image 15.2

1 New
The **New** function field is activated as soon as an empty program or folder function field has been selected. If the **New** field is now pressed, the oven opens two lines of text and a keyboard field for entering the desired name. Up to 12 characters or letters can be used per line of text. Letters can be represented in both upper and lower case (image 16.1).

2 Cut
Using the cut function, you can move individual programs or entire folders, including their contents. To do this, the desired program or folder is selected first. This field (program or folder function field) is now highlighted for checking purposes. Now the desired function field **Cut** is selected. The oven now hides all other function fields except for **Paste**. The target storage location must now be selected (in the case of programs, this can also be in a different folder). By clicking on the **Paste** field, the program or the folder and its contents are moved to the desired position.

3 Copy
Here the folder/program is copied to the clipboard. The folder remains unchanged in the same position. the procedure is the same as described under point 2 "**Cut**".

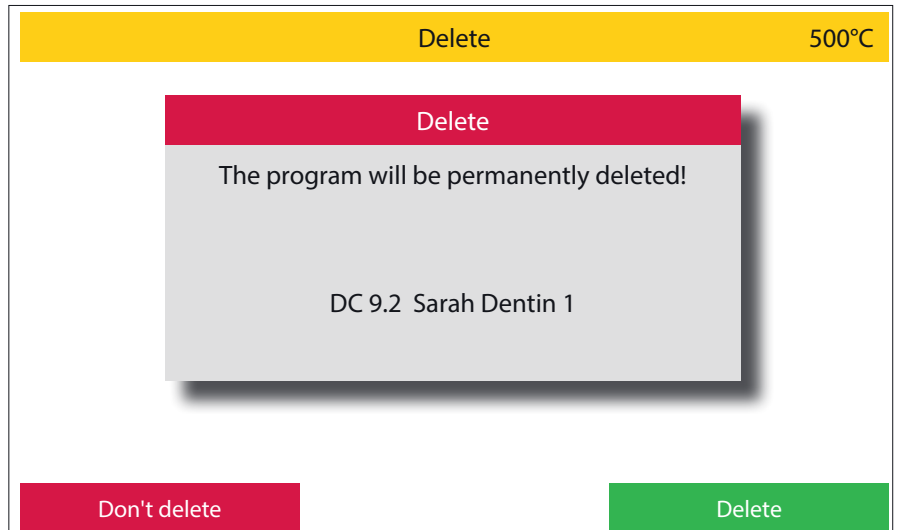
4 Paste
The folder / program from the clipboard is inserted at the activated position. Only free program fields can be activated.

DC 9.2 Sarah		Edit program		500°C	
DC 9.2	Wash	DC 9.2	Stain 3+	Full Zirkon	Stain
DC 9.2	Dentin 1	DC 9.2	Correction	Full Zirkon	Glaze
DC 9.2	Dentin 2	DC 9.2	Dentin 1 6+	Full Zirkon	Stain 3+
DC 9.2	Stain	DC 9.2	Dentin 2 6+	Full Zirkon	Glaze 3+
DC 9.2	Glaze	DC 9.2	Stain 6+	Full Zirkon	Stain 6+
DC 9.2	Dentin 1 3+	DC 9.2	Glaze 6+	Full Zirkon	Glaze 6+
<	Cut	Copy	Paste	Delete	>
Folders		Edit	New		

Display, Status: Edit program / folder selected / Programs / existing program selected Image 16.1

5 Delete

After pressing the **Delete** function field, a security query appears, which you must confirm with **Delete** or **Don't delete**.



Delete		500°C
<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Delete</p> <p>The program will be permanently deleted!</p> <p>DC 9.2 Sarah Dentin 1</p> </div>		
Don't delete		Delete

Display, Status: Edit program / folder selected / Programs / existing program selected / Delete

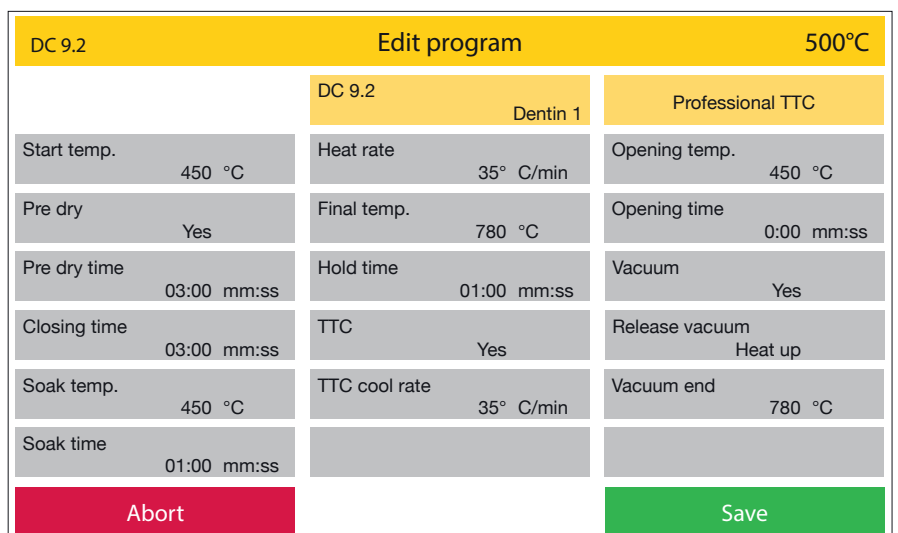
Image 17.1

6 Edit

The name can be changed for existing programs or folders. The number block is active. With programs, additional parameters can be changed and saved permanently. If parameters are changed that have a direct influence on the following parameters (e.g. the opening temperature when the final temperature is lowered), these parameters are adjusted accordingly after the **OK** field has been clicked and highlighted in yellow. These values are accepted and saved with **Save**, and the initial values are called up again with **Abort**.

7 Next / Previous

With the forwards > and backwards < keys you can switch to the next page with further groups or programs. The buttons are only active if there is also another page.



DC 9.2 Edit program 500°C		
	DC 9.2 Dentin 1	Professional TTC
Start temp. 450 °C	Heat rate 35° C/min	Opening temp. 450 °C
Pre dry Yes	Final temp. 780 °C	Opening time 0:00 mm:ss
Pre dry time 03:00 mm:ss	Hold time 01:00 mm:ss	Vacuum Yes
Closing time 03:00 mm:ss	TTC Yes	Release vacuum Heat up
Soak temp. 450 °C	TTC cool rate 35° C/min	Vacuum end 780 °C
Soak time 01:00 mm:ss		
Abort		Save

Display, Status: Edit program / select a folder / Programs / existing program selected / Edit

Image 17.2

8 Name programs / folders

If a new program or a new folder is to be created, a name must first be entered.

Two lines of text, each with a maximum of 12 characters or letters, are available for this purpose (image 18.1). When programs are created, the second step is to select the program type. To do this, as shown in the diagram on the right, activate the arrow in the program type. A list with all available program types opens. After the desired program type has been selected, the oven offers the parameters required for this type. These parameters can now be programmed at will. To do this, select the respective parameter and enter the desired value using the number field that is now active. A green **OK** field is now activated with which this value can be confirmed. The initial value is called up again by pressing the red **Abort** field. If all parameters are named accordingly, they can finally be saved with the green **Save** field.

Edit program500°C

DC 9.2

Dentin 1

QWERTZUIOPÜ

↑ASDFGHJKL

CtrlYXCVBNM.,-←→

Abort

OK

Display, Status: Edit program / select a folder / Programs / select a free program field / New

Image 18.1

Create program500°C

DC 9.2

Dentin 1

Start temp.450 °C

Heat rate35 °C/min

Pre dryYes

Final temp.780 °C

Pre dry time03:00 mm:ss

Hold time01:00 mm:ss

Closing time03:00 mm:ss

TTCYes

Soak temp.450 °C

TTC cool rate35 °C/min

Soak time01:00 mm:ss

Professional TTC↓

Professional

Professional TTC

2-Stepp

2-Stepp TTC

Abort

Save

Display, Status: Edit program / select a folder / Programs / New (after the name is entered)

Image 18.2

Create program500°C

DC 12.5

Dentin 1

Professional

Start temp.450 °C

Heat rate55 °C/min

Opening temp.820 °C

Pre dryYes

Final temp.820 °C

Opening time00:00 mm:ss

Pre dry time03:00 mm:ss

Hold time01:00 mm:ss

VacuumYes

Closing time03:00 mm:ss

TemperNo

Release vacuumHeat up▼

Soak temp.450 °C

Temper temp.690 °C

Vacuum end820 °C

Soak time00:30 mm:ss

Temper time02:00 mm:ss

Abort

OK

Display, Status: Edit program / select a folder / Programs / New (after the name is entered)

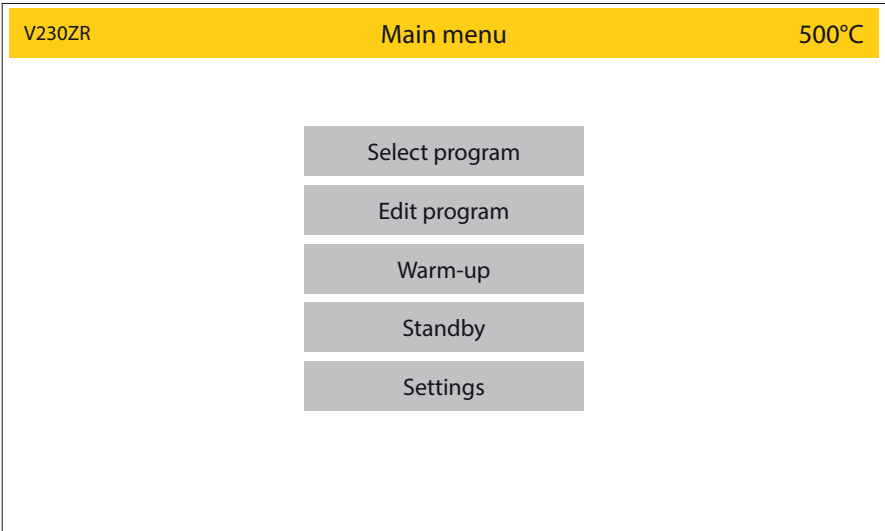
Image 18.3

2.3 Warm-up

- If you select Warm-up, the device starts a program to heat up to the operating temperature. The furnace is preheated to 900°C and held for 10 minutes. The heating chamber is then heated through homogeneously. This guarantees optimal firing or pressing results from the first firing/first pressing.
This process can last up to 20 minutes.

2.4 Standby

- If standby is selected, the furnace opens the firing chamber or leaves the chamber open and cools down to the standby temperature selected under **Settings**. The display is largely switched off, only the text "Standby" is shown. The **Standby** temperature can be set up under **Settings** between 20°C and 100°C. Once this temperature has been reached, the furnace closes the heating chamber and remains there until the display is touched.
- The oven then opens the lift again and heats up to the set **Idle** temperature. When open, this is limited to 400°C.

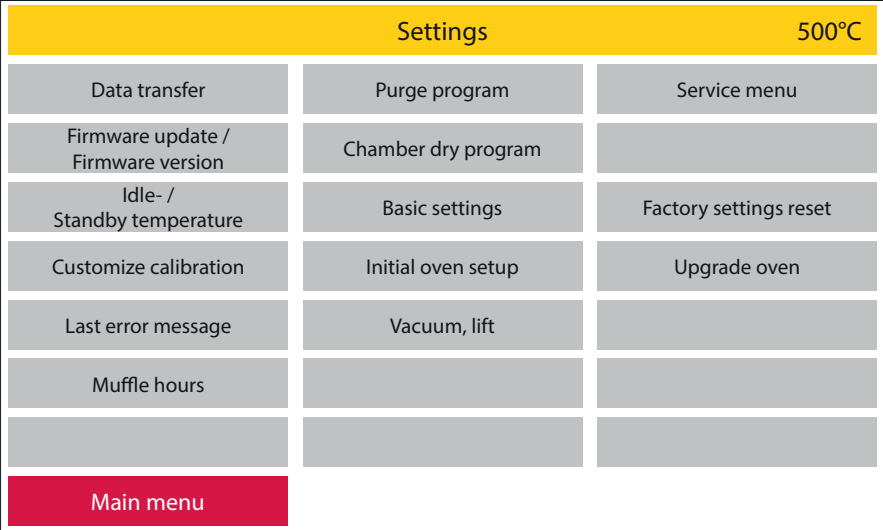


Display, Status: Main menu

Image 19.1

2.5 Settings

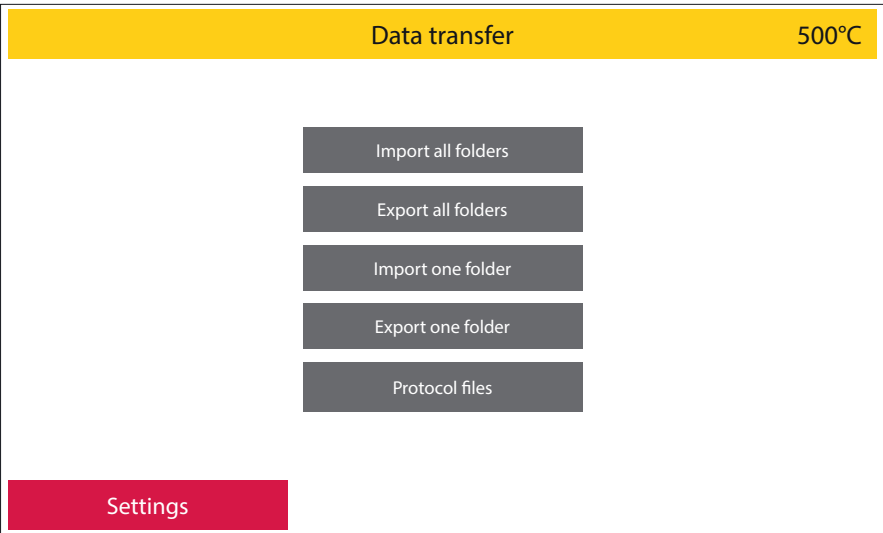
Settings take you to the "Service level" of the menu. Various basic settings can be adjusted here, service programs can be carried out and data can be transferred (software, program and log data). Pressing the red **Main menu** field takes you back to the Main Menu.



Display, Status: Settings Image 20.1

2.5.1 Data transfer

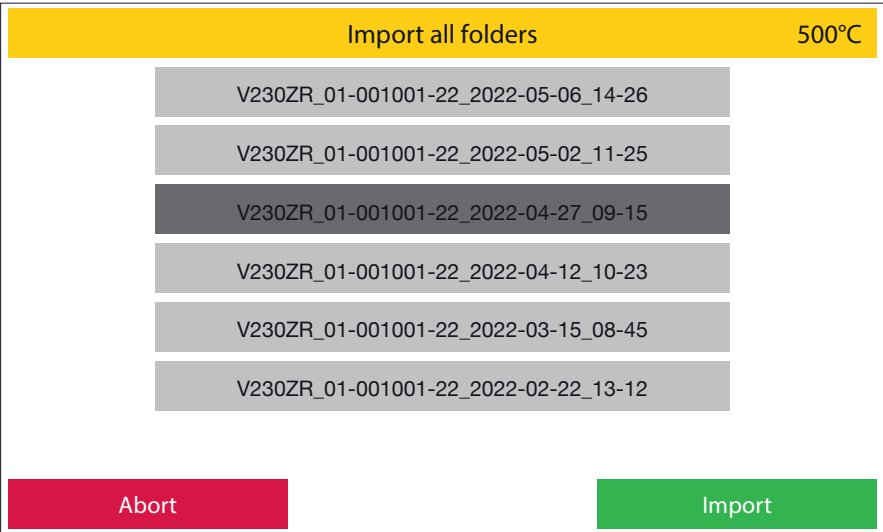
Included with your Zubler ceramic furnace a USB data stick (flash drive) is enclosed. With the help of this USB stick you can transfer program datas (from the oven to USB or from USB to oven) or log datas for quality assurance to save. When the oven detects the USB stick, all active function fields are highlighted (image 20.2). When using a third-party data medium, problems may arise during data transfer. If the USB stick is not recognized, all function fields remain inactive. Pressing the red **Settings** control panel takes you back to the settings area.



Display, Status: Settings / Data transfer Image 20.2

- 1 **Import all folders**
- If there is already a corresponding folder on the USB stick, this will be recognized by the oven and the **Import all folders** function field will be activated (dark grey background) (image 20.2).
 - If this field is now activated, the furnace opens a list with all the corresponding data. Select the desired data record, the green **Import** function field is activated. The required data record is loaded by pressing this button (image 20.3).

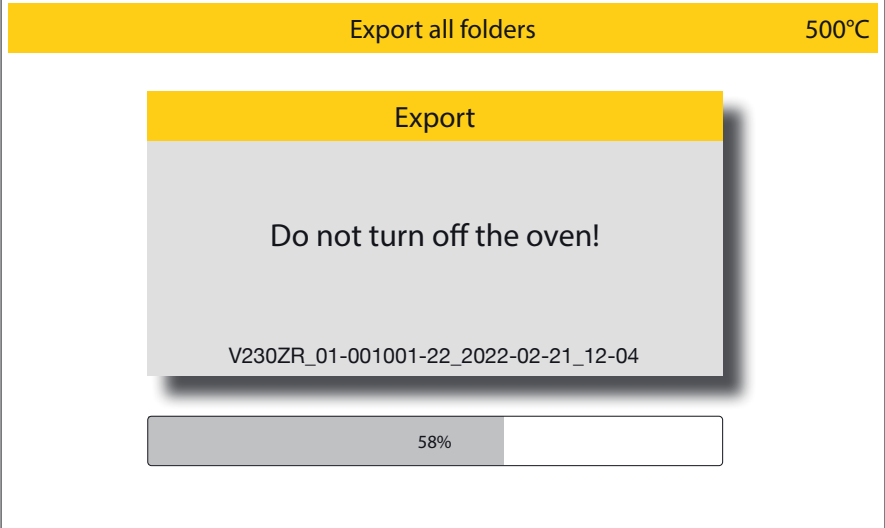
All folders and programs on the furnace will be overwritten!



Display, Status: Settings / Data transfer / Import all folders / one folder selected Image 20.3

2 **Export all folders**

- When the **Export all folders** function field is activated, all folders on the furnace are saved from the furnace to the USB memory and can be transferred to another furnace.
- The furnace creates the file name as model name of the furnace, serial number of the furnace, date and time (image 21.1).

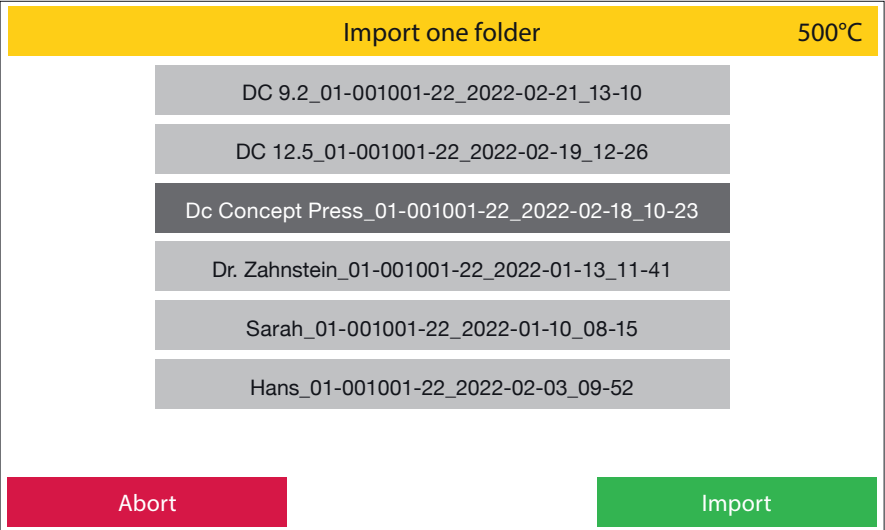


Display, Status: Settings / Data transfer / Export all folders

Image 21.1

3 **Import one folder**

- Individual folders can be copied from the USB memory.
- To do this, select the desired folder and the folder menu will open (image 21.2). Please choose a free folder location here, this will be highlighted and the green **Import** function field will be activated. To complete the process, please press this button.

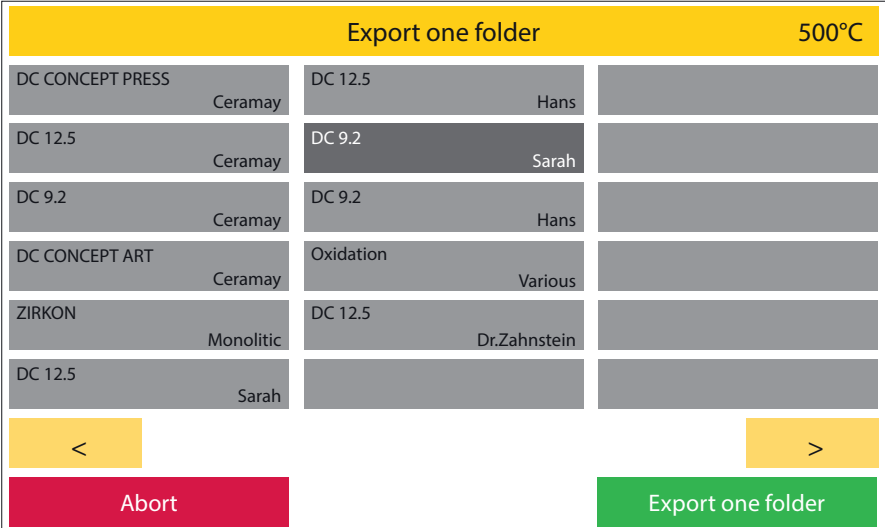


Display, Status: Settings / Data transfer / Import one folder

Image 21.2

4 **Export one folder**

- A single folder can be saved from the furnace to the USB memory here.
- If **Export one folder** is selected, the oven opens the folder menu. As soon as the folder to be backed up is selected, the green function field **Export** is activated. Please activate this field to save the folder and its contents.
- The furnace (Image 21.3) creates a folder file which it names with the folder name to be saved, serial number of the furnace, date and time.



Display, Status: Settings / Data transfer / Export one folder / DC 9.2 Sarah is choosen

Image 21.3

5 Export protocol files

For documentation and quality assurance, the last 50 program runs and results can be downloaded with a csv file.

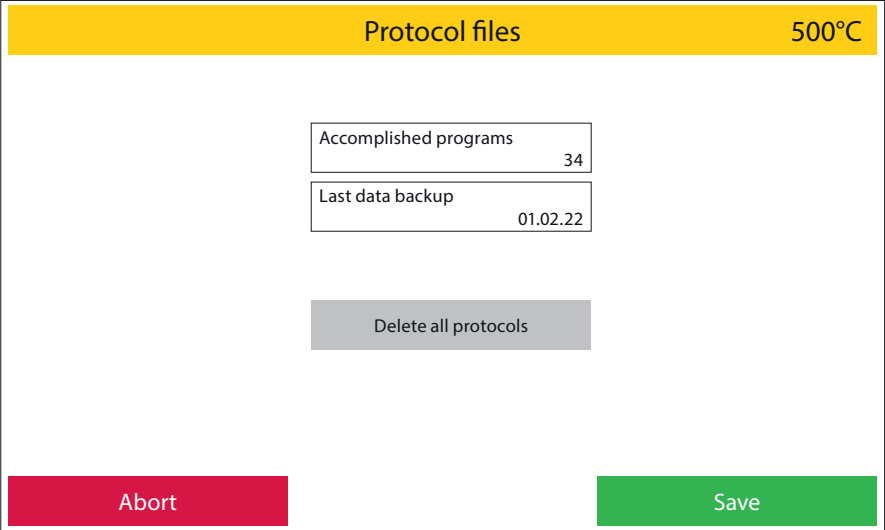
After 50 program sequences have been saved, the furnace overwrites the previous log data, starting with the oldest, in subsequent work processes.

Log data that is exported is deleted from the oven memory in the process.

Here, too, the furnace generates a file name composed of the word protocol, serial number of the furnace, date and time of the storage time (image 22.2).

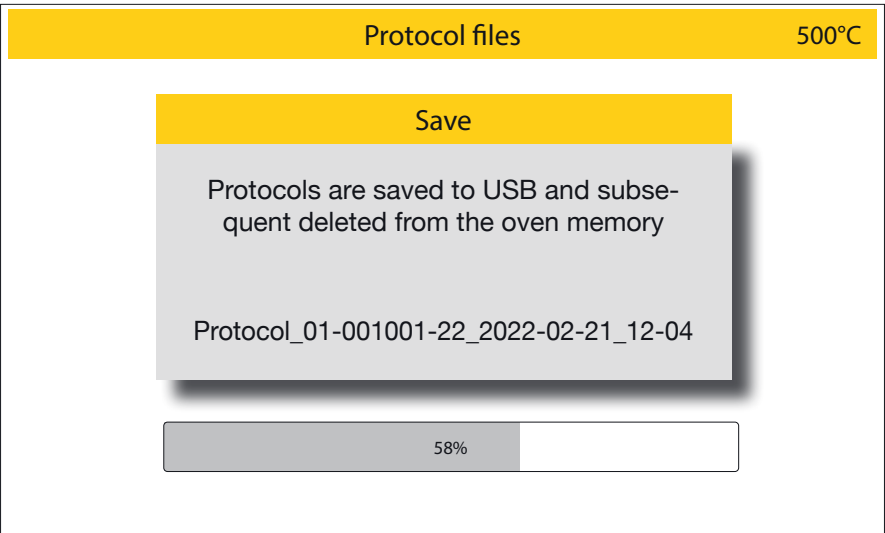
Delete all protocol files

All protocol datas in the oven memory can be deleted here.



Display, Status: Settings / Data transfer / Protocol files

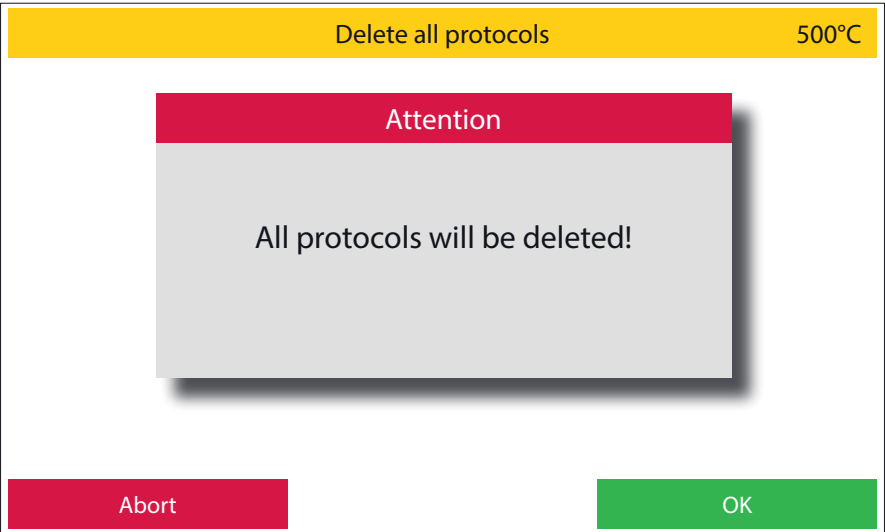
Image 22.1



Display, Status: Settings / Data transfer / Protocol files / Delete all protocols

Image 22.2

- After selecting **Delete all protocols**, a warning window appears. This process must then be confirmed by pressing the green **OK** field or revised with **Abort** (image 22.3).



Display, Status: Settings / Data transfer / Protocol files / Delete all protocols

Image 22.3

2.5.2 Firmware update / Firmware version

1 Firmware version and Firmware update.

The firmware versions of the relative components are displayed here.

A firmware update can be installed on the furnace from the USB memory.

If the USB stick and the firmware stored on it are recognized by the oven, the green function field **Update firmware** is activated. If this is pressed, the furnace displays a list of all firmware versions stored on the USB stick.

■ If a **Firmware update / Firmware version** is now selected (image 23.1), the green **Import** function field is activated. Please press this to start the update (image 23.2).



It is important to ensure that the oven is not switched off or disconnected from power during the firmware update. Loss of power during the firmware update will result in the complete loss of the firmware on your oven.

A restoration can only be carried out by the manufacturer!

V230ZR

Firmwareupdate / Firmwareversion

500°C

Firmware Display Board

00-00-24

I/O Board number of series

123456789-1234-1

Firmware Date

2022-03-18 15:10

Firmware I/O Board

00-00-27

Firmware Date

2022-03-18 15:10

Settings

Update firmware

Display, Status: Settings / Data transfer / Firmwareversion / Firmwareupdate

Image 23.1

V230ZR

Update firmware

500°C

Firmware_00-00-26_00-00-28.imx

Firmware_00-00-25_00-00-27.imx

Firmware_00-00-25_00-00-26.imx

Firmware_00-00-24_00-00-26.imx

Firmware_00-00-24_00-00-25.imx

Firmware_00-00-23_00-00-24.imx

Abort

Import

Display, Status: Settings / Firmware update / Firmware version / Update firmware

Image 23.2

V230ZR

Update firmware

500°C

Installing firmware

Version No. :
Firmware-00-00-26-00-00-28.imx
Do not turn off the oven!

58%

Display, Status: Settings / Firmware update / Firmware version / Update firmware / software has been chosen /

Image 23.3

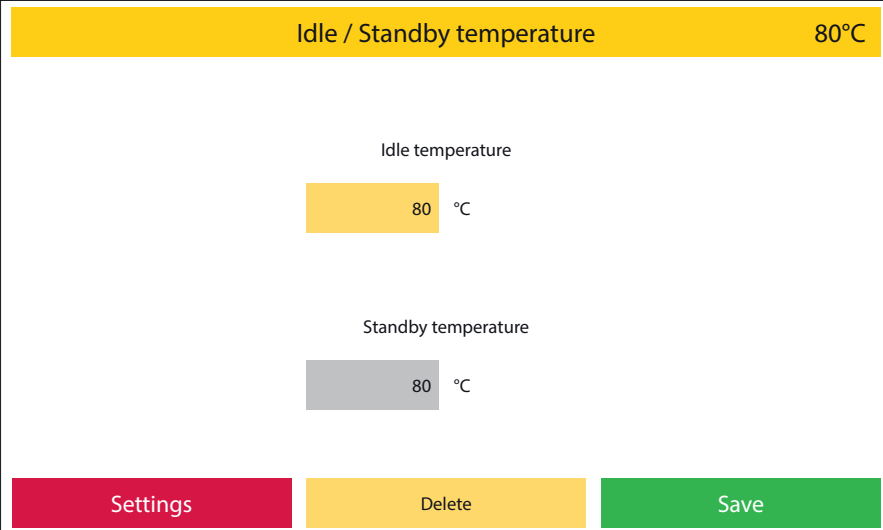
2.5.3 Idle- / Standby temperature

Both the **Idle** and the **Standby temperature** can be set up in this area. The **idle temperature** is the temperature that the oven idles at between programs. This is to maintain the oven at operating temperature. A temperature of 40°C - 700°C can be set.

The **Standby temperature** is the temperature that the oven assumes when no longer in use for a certain period of time and there is no reason to maintain the operating temperature.

This is the case if:

- 30 minutes after a program has ended, the oven is no longer operated. The oven then cools down to the set standby temperature and then closes the chamber.
- 4 hours with the lift closed without the oven being operated
- 2 hours with the lift open outside of a completed program. The oven cools down to the set standby temperature and then closes the heating chamber. The standby temperature can be set between 20°C and 100°C.



Display, Status: Settings / Idle / Standby temperature

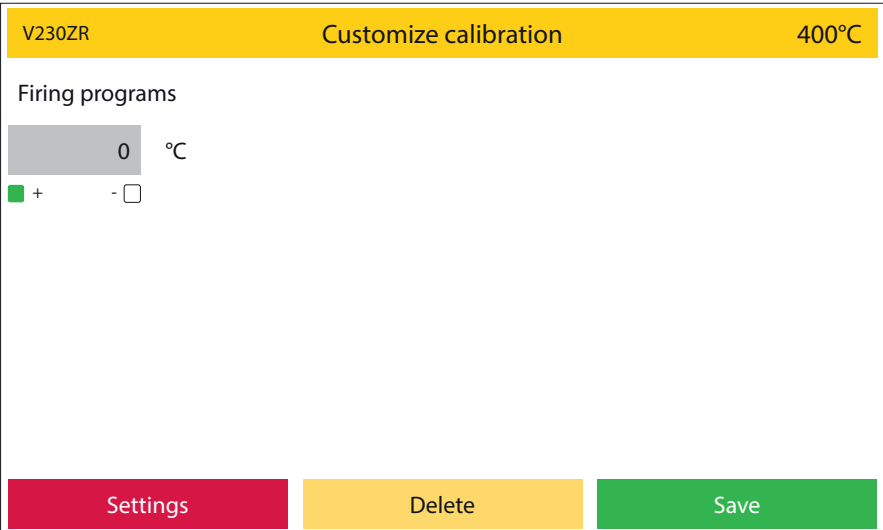
Image 24.1

2.5.4 Custom calibration

With the customize calibration, the basic temperature calibration of the oven can be carried out in the range:

- Firing programs

be readjusted. Using a numeric keypad value can be entered. If (+) is activated, the temperature in the program by the entered value elevated. If (-) is activated, the temperature in the program will be lowered by the entered value. By selecting the field to be changed, the stored value can be removed by pressing the **Delete** button. The values are saved with the **Save** button.

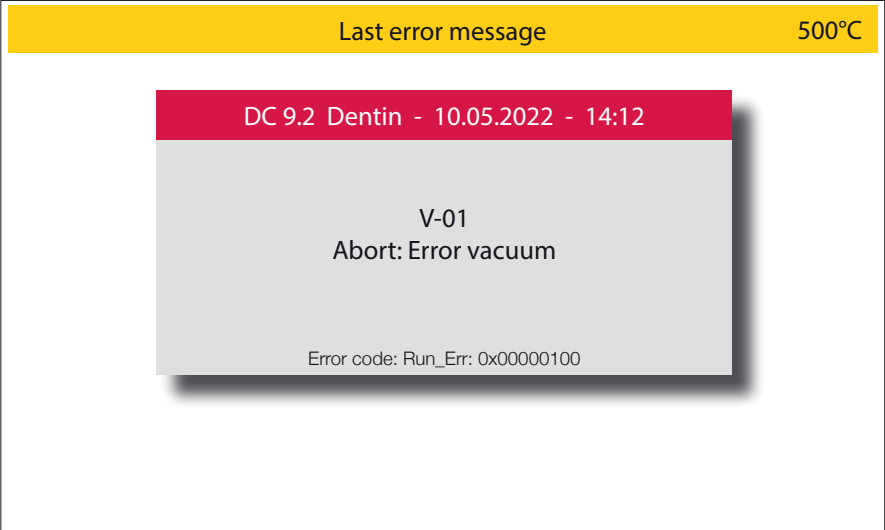


Display, Status: Settings / Customize calibration

Image 24.2

2.5.5 Last error message

The last error message displayed by the oven can be called up again here. This is retained until the oven displays an error message again and is then updated in the process (image 25.1).



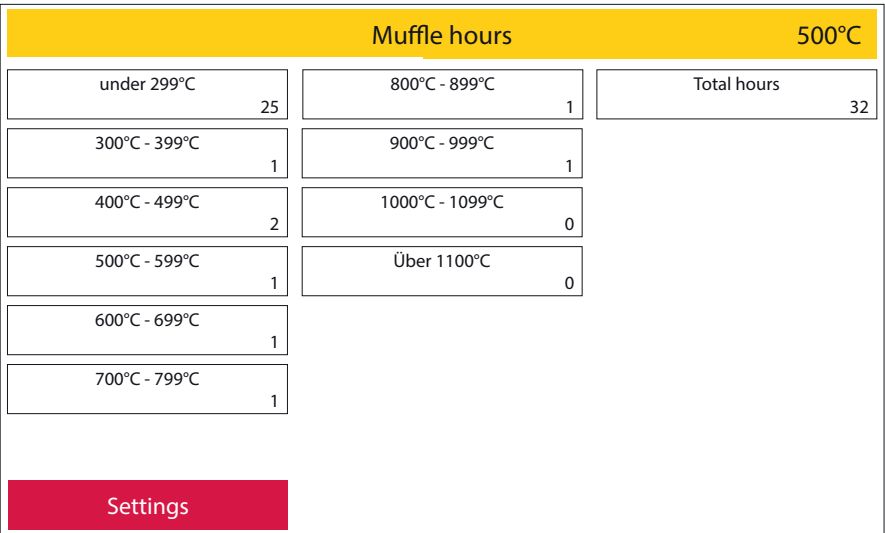
Display, Status: Settings / Last error message Image 25.1

2.5.6 Muffle operating hours

The operating hours in the individual temperature ranges can be viewed here. The information relates to the amount of time in the respective temperature range in hours (image 25.2).

2.5.7 Start cleaning program

If you suspect the heating chamber is contaminated, run the cleaning program. Impurities are burned out at a very high temperature (1150°C). Never use additives such as activated carbon (graphite pellets) to clean the heating chamber!



Display, Status: Settings / Muffle hours Image 25.2

2.5.8 Chamber drying program

(duration: approx. 30 minutes.)

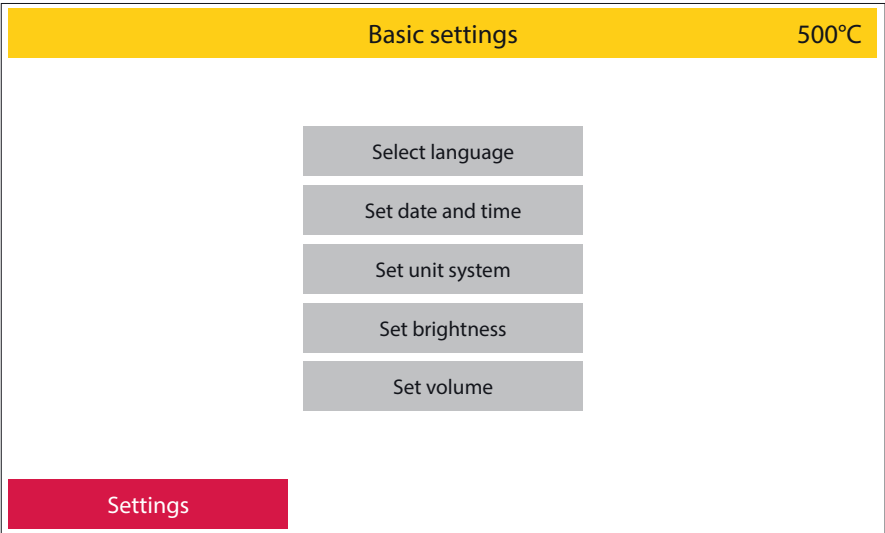
This program is designed to dry the heating chamber insulation.

It is recommended to let this program run after a long vacation period or if the device has not been used for a longer period of time. Here, the furnace holds at 600°C. The heating chamber is not completely closed during this program. The program is part of the initial installation process.

2.5.9 Basic settings

In this area, specific display settings can be made.

These are:

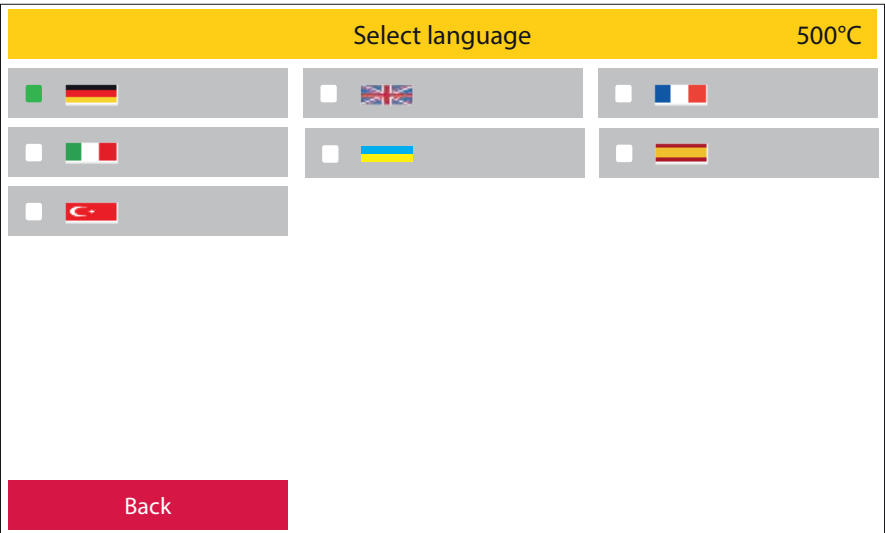


Display, Status: Settings / Basic settings

Image 26.1

1 Select language

Selection of the menu language. To do this, select the desired national language by activating the red **Back** button you'll get back to the **Basic settings**. (image 26.2).



Display, Status: Settings / Basic settings / Select language

Image 26.2

2 Set date and time

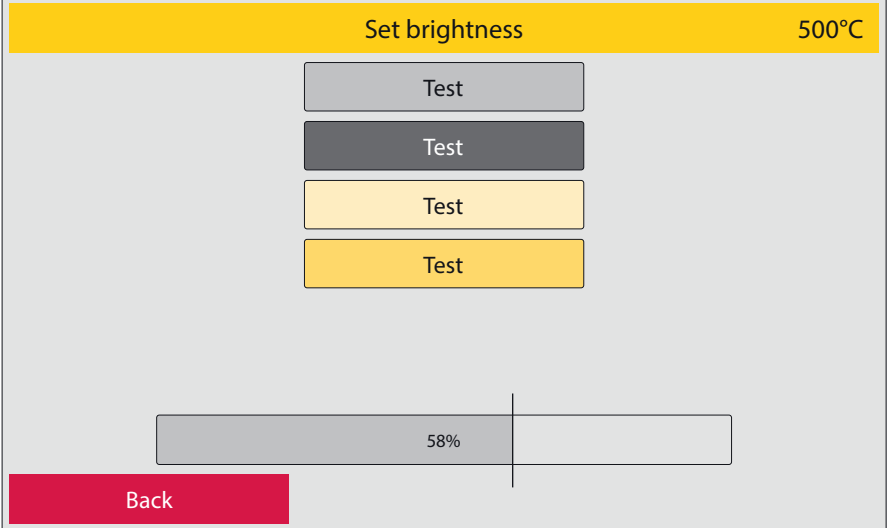
Date and time can be set here. Select with the arrow keys, activate the green **Save** function field to save. Return to the basic settings menu using the red **Back** function field.

3 Set unit system

Choice between metric (°C) and imperial system (°F). Select the desired system and confirm the selection with the green **Save** button or exit the area without making any changes with the red **Abort** button.

4 **Set brightness**

Setting the display brightness using the slider. 4 test color patches are used for orientation. Activate the slider until the display shows the desired values. With the red **Back** function field you'll return to the **Basic settings** level (image 27.1).

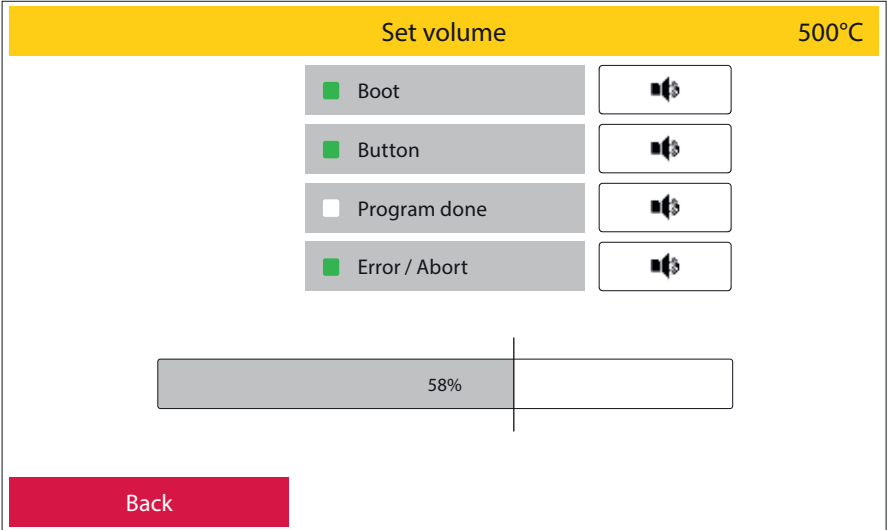


Display, Status: Settings / Basic settings / Set brightness

Image 27.1

5 **Set volume**

In this area, warning and action tones can be activated or deactivated and their volume can be adjusted. As with setting the display brightness, a slider is available for this purpose. The volume for each section can be checked by pressing the loudspeaker field. With the red **Back** function field, you'll return to the **Basic settings** level (image 27.2).



Display, Status: Settings / Basic settings / Set volume

Image 27.2

2.5.10 Initial setup

You will be guided through all the parameters that have to be set up during initial commissioning. In addition, the oven points out all the cables and hose connections that need to be set up. The function fields marked in green must be confirmed.

When starting up the device for the first time, this process must be completed in order to access the main menu.

2.5.11 Vacuum, lift

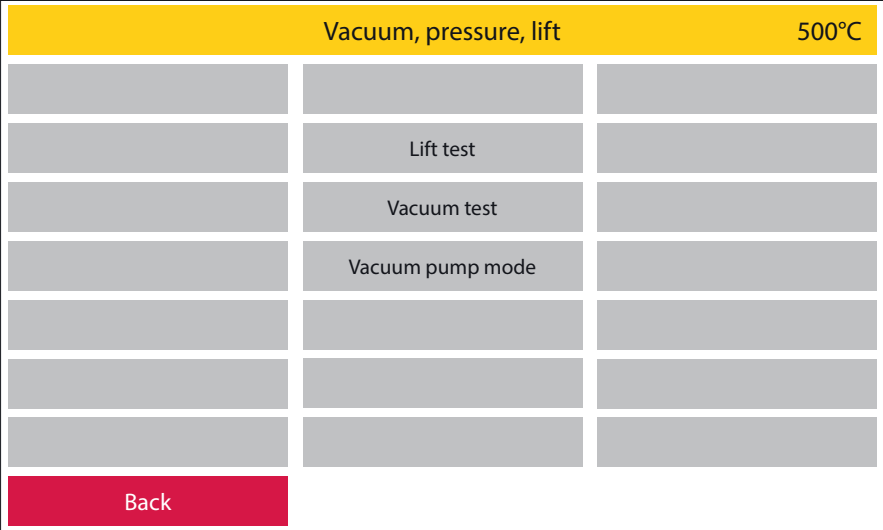
This area is divided into further sub-areas.
These are:

1 Vacuum test

The oven starts the vacuum test by pressing the green function field **Start**. The device determines the maximum vacuum level that can be achieved at the location. After a test period of 2 minutes, this value appears on the display as vacuum start value. The furnace now automatically sets the lower vacuum limit. This is the point at which the vacuum pump kicks in when cycled and provides full vacuum again is chosen as vacuum function

This value is described as **Switch On Point (SWOP)** .If there is the wish to set that value manually, just activate the **Set SWOP** function field and set your desired value.

During the test phase, this can be canceled by pressing the red **Abort** button. Outside of the test phase, this menu area can be exited with the red **Back** field.



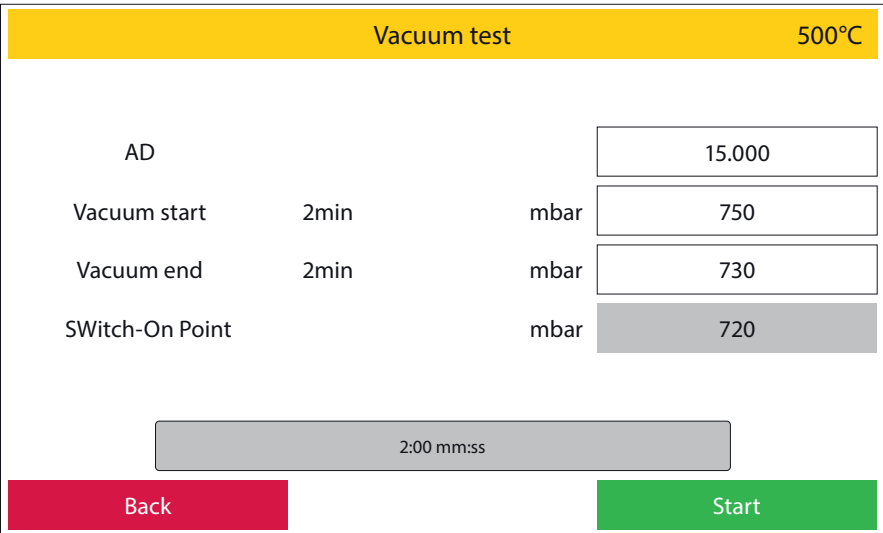
Display, Status: Settings / Vacuum, lift Image 28.1

2 Vacuum pump mode

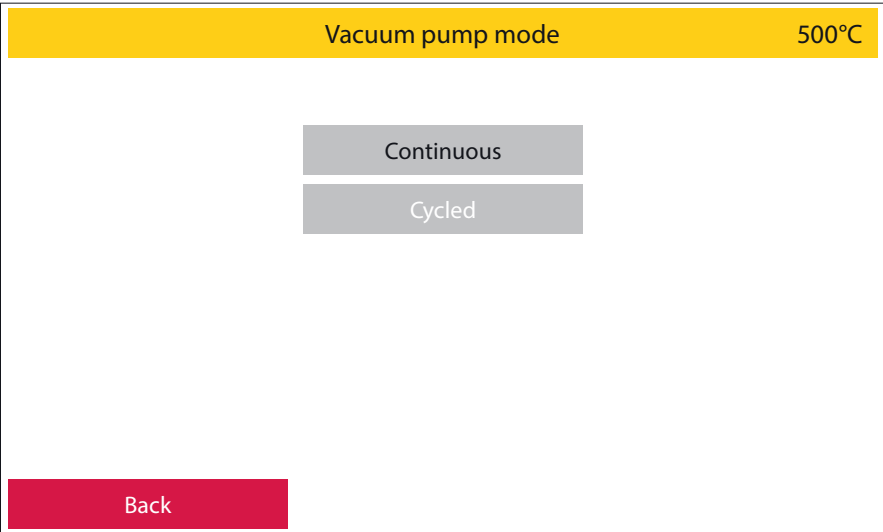
The mode of operation of the vacuum pump can be selected here. There are two options to choose from (image 28.3):

Continuous - the vacuum pump runs from the switch-on point to the switch-off point, regardless of the readings of the vacuum sensor.

Cycled - the vacuum pump is switched on when required. After reaching the maximum vacuum value, the pump switches off. If the vacuum level now drops to the minimum value determined in the vacuum test, the vacuum pump switches on again. This mode of operation protects the vacuum pump and ensures a longer service life.



Display, Status: Settings / Vacuum, lift / Vacuum test Image 28.2



Display, Status: Settings / Vacuum, lift / Vacuum pump mode Image 28.3

3 **Lift test**

The function of the lift system can be checked during the lift test.

Three values are displayed for this:

Top limit switch: when the lift is completely closed, this position is named On. If the lift opens, the information changes to Off

Lower limit switch: when the lift is fully open, this position is described as On. If the lift is closed, the information changes to Off

Lift position: this is described with a code. When the lift is completely closed, the numerical value 100 is displayed; when the lift is completely open, the value is 0.

Corresponding intermediate values are displayed on closing.

Lift test500°C

Top limit switch

Off

Lower limit switch

On

Lift position

0

Back

Display, Status: Settings / Vacuum, lift / Lift test

Image 29.1

2.5.12 Service menu


Password protected service area for customer support

2.5.13 Restore factory settings

All settings are reset to the factory settings here.

This area can be protected by assigning a password.


This cannot be undone.

 All programs on the oven will be deleted.

2.5.14 Oven Upgrade

Your Zubler oven is available in various versions which differ in their functionality. If, after purchasing the device, you wish to switch to a different furnace version (if the device hardware allows this), this can be attained by activating it in the software.

To do this, you request a basic code under this menu item, which you send to your dealer or to us at Zubler Gerätebau GmbH. You will then receive an activation code which you can enter in this menu area. You confirm this code with the green **OK** button and the oven then switches to the desired device version.

 The activation code can only be used for one day at a time.

3. Data

3.1 Technical Data

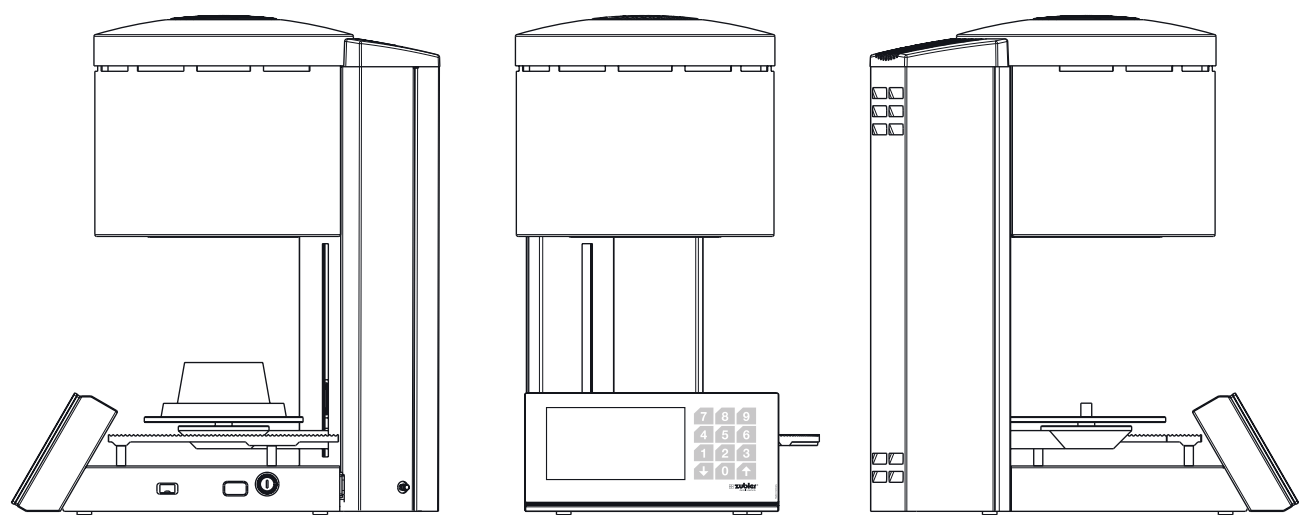


Image 30.1

Width	320mm
Height	550mm
Depth	480mm
Weight	25kg
Voltage	115V AC / 230V AC \pm 5%, 50-60Hz
Power consumption	1600VA
Idle temperature	40°C - 700°C
Temperature	80°C - 1200°C
Colour display	152 x 92mm
Touch	230 x 92mm
Programs	1000

3.2 Scope of delivery

1x Power Cord
1x Connection cable "furnace - vacuum pump"
1x Vacuum hose
1x Fine filter
1x Firing tray
1x Honeycomb tray inclusive 5 pins
1x Long tweezer
1x USB flash drive
1x User manual on USB

3.3 Spare parts , accessories

Filter for vacuum pump	896/0051
Firing tray	898/ 110
Tweezers long	898/ 106
Vacuum pump 220-240V	898/052
Vacuum pump 100-120V	898/053
Power cord (EU)	012/00304
Power cord (US/JPN)	012/00303
Power cord (AUS)	012/0021
Power cord (UK)	012/0026
Power cord (CHE)	012/00304
Connection cable "furnace - vacuumpump" 220-240V	012/00306
Connection cable "furnace - vacuumpump" 100-120V	012/00305
USB-Stick	896/0234
Honeycomb tray	898/104
Pins (individually)	898/1041

4. Status messages

Error indication		Cause	Remedy
H-01	Abort: Heating system error	the oven does not heat up.	<ul style="list-style-type: none">- please contact your for oven service dealer or service company.- Replace heating spiral- Exchange the power relay for the heating
V-01	Abort: Vacuum error	the vacuum level is not increasing	<ul style="list-style-type: none">- check whether the vacuum hose is the pump and the power cord for the pump connected to the furnace and the pump- check whether the sealing ring of the combustion chamber and lift plate are clean- carry out a vacuum test (see page 28) if the vacuum pump fails starts please check the fine-wire fuse on the vacuum pump (small fuse compartment below the power connector on the vacuum pump, a fuse is active here 2nd fuse is provided as a spare)- all the points mentioned do not lead to success, please contact your service partner

5. Warranty

5.1 Filter element for vacuum pump P3



The filter element prevents components of the insulation material of the heating chamber dissolved in the condensate or extremely fine dust from entering the vacuum pump. We recommend replacing this filter element after 3 years at the latest.

5.2 Cleaning the heating chamber

see point 2.5.7

6. Guarantee

If used properly, Zubler grants you a 12-month guarantee on all parts of the device. Exceptions to this are: Firing and press insulation bases, press centering plates, cracks or ruptures in the firing chamber insulation.

Zubler guarantees professional repairs with original spare parts. A guarantee period of 6 months is granted for every repair carried out by a specialist dealer or by Zubler, provided that all maintenance work required for the unrestricted function of the device has been commissioned.

Warranty claims cannot be asserted for:

- Improper use
- Use outside the prescribed operating conditions
- Disregard of operating and connection regulations
- Unrecognizable regular cleaning, maintenance and annually prescribed effectiveness test
- Repairs that were not carried out by a specialist dealer or by Zubler
- Use of spare parts from other manufacturers

7. Disposal instructions



7.1 Disposal of insulation materials (burning and press base)

All materials must be disposed of in accordance with country-specific regulations.

7.2 Disposal of the device

The device must be disposed of by a specialist company. The specialist company must be informed of any hazardous residues in the device.

7.2.1 Disposal instructions for EU countries

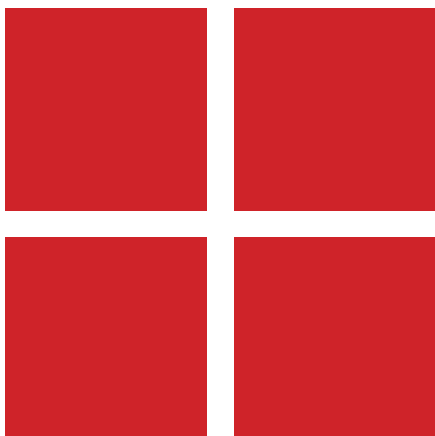
In order to preserve and protect the environment, prevent environmental pollution and improve the recycling of raw materials, the European Commission issued a directive according to which manufacturers can take back electrical and electronic devices so that they can be properly disposed of or disposed of to be recycled.

Devices marked with this symbol must therefore not be disposed of with unsorted municipal waste within the European Union.

Please check with your local authorities for proper disposal.

7.2.2 Special information for customers in Germany

Zubler electrical devices are devices for commercial use. These devices may not be handed in at municipal collection points for electrical devices, but will be taken back directly by Zubler. For information about the current return options, please go to: www.zubler.de



technical changes without notice! 22.2022.en



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