VARIO PRESS® 300
VARIO PRESS® 300.e
VARIO 300
VARIO 300s

us 100/120

zubler® dental & technik

Operation Instructions 12-2013 / Rev. 5

Dental Servis
Serdar Ayısıt
0555 274 05 51

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Signs and Symbols

Risks and dangers

This symbol marks safety instructions that must be followed to prevent injury or death

Caution Hot Surface

Burn hazard

Risks of crushing/pinching

Conflict

Risk of electric shock

Attention:

It is critical that the user completely read the operating manual prior to start up!
It contains important information on safety, operation and maintenance that is designed to protect you and prevent damage to the instrument.
Please pay particular attention to the safety information on pages 6 - 11.

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0.1 Conformity Declaration

We, Zubler Geraetebau GmbH
Buchbrunnenweg 26
89081 Ulm-Jungingen, Germany
www.zubler.de

hereby declare, that the ceramic furnace product

VARIO PRESS® 300.e
VARIO PRESS® 300
VARIO 300
VARIO 300s

are in compliance with the protective requirements in accordance with the provisions of the following directives:

2006/42/EG Machines Directive

2006/95/EG Low-Voltage Directive

2004/108/EG EMV Directive.

In the event of any amendments being made to the product without our agreement, then this statement shall no longer be valid.

Ulm, den 15. July 2005

Kurt Zubler
Managing Director

CE

INTERTEK ETL LISTED C US
3Ø89Ø56

ETL LISTED
CONFORMS TO
UL STD 61Ø1Ø-1
CERTIFIED TO
CAN/CSA STD C22.2 NO 61Ø1Ø-1

0.2 General

The correct processing of modern dental ceramic materials is placing even higher demands on dental technicians. We believe that the **VARIO PRESS 300** furnaces meet these requirements by providing the latest technology for current and future ceramic processing.

The software installed in the **VARIO 300** series enables you to optimize firing management for all layered and pressed ceramics available on the market and guarantees maximum levels of performance in processing the **press-to-metal®*** technique.

The use of materials of the highest quality increases the lifetime of the furnace, enabling you to reproduce optimal results over many years.

Our priority is to ensure that you will be able to produce top-quality ceramic prosthesis using our **VARIO 300** furnaces for many years. We will therefore keep you informed of any changes to the software or extension of the processing possibilities.

We hope that the ceramic furnace provides you with great success and satisfaction and congratulate you on the choice you have made.

* press-to-metal® is a registered Trademark of Zubler Gerätebau GmbH Germany

0.3 Setting up the furnace

In the event that the packaging materials and/or the ceramic furnace appear to have been damaged contact your dealer (see Page 32) immediately and do not unpack the product.

Open the large carton and remove the two white boxes. Take out the furnace and place it in the desired location. Note that the furnace is heavy and should always be lifted and transported by two persons.

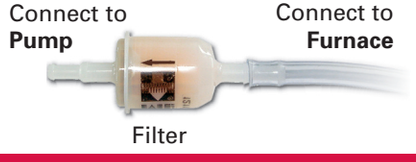
Take the vacuum pump out of its box, place it near the furnace and remove the safety foam.

Please make sure to retain the original cardboard boxes and other packaging materials. You will need to have them handy if returning the device for service.

Vacuum pump connection

Remove the short transparent vacuum hose with its filter from the small white box and attach it to the connector marked "VACUUM" at the back of the furnace.

Attach the long transparent hose to the free end of the filter. Connect the other end of the long transparent hose to the vacuum pump. Finally, connect the vacuum pump and the furnace using the vacuum pump power cord.



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Compressed air connection

The smaller of the white boxes contains the accessories needed for the compressed air connection.

Use the two screws provided to connect the pressure regulator **vertically** to the housing of the vacuum pump or secure it elsewhere in the laboratory in the immediate vicinity of the furnace.

Measure the distances from the compressed air supply to the pressure regulator and from the pressure regulator to the ceramic furnace. Split the blue compressed air hose into two lengths of hose accordingly.

Use one part of the blue compressed air hose to connect the output connector of the pressure regulator ("OUT") to the back of the furnace.

Secure the other part of the blue compressed air hose to the input connector of the pressure regulator ("IN") and connect the entire assembly to the compressed air supply of your laboratory.

The pressure regulator has been pre-set to an input pressure of 0.5 MPa (= 5.0 bar).

If additional equipment (sandblasting units, pressure pots etc.) are connected to the compressed air supply, ensure that the pressure does not drop below 0.5 MPa (= 5.0 bar):

Air pressure 0.6-1.0 MPa in accordance with ISO 8573.1:

	Dust	Water	Oil
Class	**1**	**4**	**1**

CF card

Check to see whether the CF-card has been inserted in its slot on the side of the furnace.

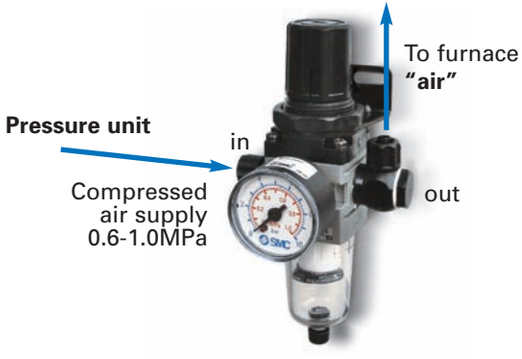
The slide door must be kept closed at all times to prevent dust and debris from entering.

Always turn off the furnace before inserting the CF-card. Do not insert the CF-card while the furnace is on.

Electrical connection

The ceramic furnace is supplied with a 100V or 120V AC 50/60Hz internal power supply. You must connect the furnace to the proper supply voltage. You cannot switch the supply voltage on the furnace. A power cord is supplied together with the ceramic furnace.

Under no circumstances should you use any other power cable or any extension cable. If this ceramic furnace is in a circuit with other furnaces or electrical

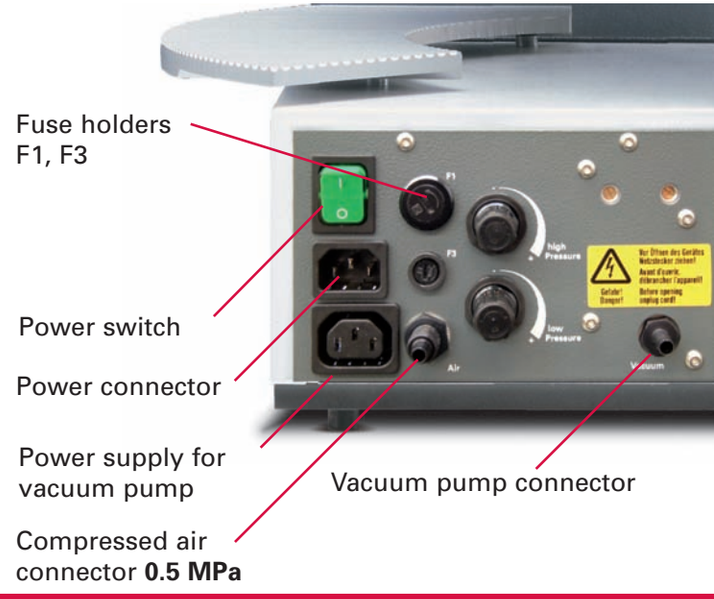


Connect the power cord to the power connector on the reverse side of the ceramic furnace and then connect this with a grounded power outlet.

Switching on the furnace

As soon as the oven is switched on the lift will automatically lower to its maximum open position.

In order to avoid any overheating and resulting deformation of the aluminium lift table, please immediately insert the firing or pressing brick!!!



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0.4 Basic settings

Once you have turned on the device, the display will show the “Main Menu”. Pressing the green “Enter” key will activate the current menu selection. The red “Esc” key will return you to the previous menu, all the way back to the “Main Menu”.

Vacuum test

Main Menu → Set-up oven → Diagnostic tests → Service tests → Vacuum test

The oven starts to generate vacuum. After 2 minutes the pump stops automatically. The leakage test starts. During this test (duration 2 minutes) the decrease of vacuum is measured. After this procedure "Set Vacuum" will appear on the screen. Press the "yes" button and enter the value.

Example: Value achieved: 760 mm; subtract 20 mm; enter 740 mm as your individual vacuum level.

If the vacuum test was performed under conditions of very high barometric pressure, repeat the vacuum test when weather conditions have returned to normal.

Setup program

Before you operate the ceramic furnace for the first time, please run the “Run pre-heat/dry program”. This enables you to ensure that the firing chamber is free of any residual humidity, which could have a negative impact on the firing results.

Main Menu → Set-up oven → Diagnostic tests → Run pre-heat/dry prog.

Select this option and confirm by pressing the green "Enter" key. The device will execute a program that takes approximately 15-20 minutes to run. This is intended to set up the device after storage and transport.

The firing platform will remain slightly open to allow any residual moisture to escape.

Idle temperature

For safety reasons, the idle temperature has been set as low as 80°C for delivery.

Main menu → Set-up oven → Change idle temperature

If using the Vario as a combination or dedicated ceramic furnace we recommend setting the idle temperature to the lowest entry temperature of your ceramic brands.

If using the Vario as a dedicated pressing oven, we recommend setting the idle temperature to the lowest entry temperature of your pressable ceramic brand (700°C / 1292°F).

General notes

If you are using the **VARIO PRESS®** 300 strictly as a firing oven, make sure the device is constantly connected to compressed air. Otherwise the position of the pressing plunger may stay in it's extended position and damage objects on the firing tray

The warm-up program on the "Main Menu" has been pre-defined as a pre-heating program and should be executed at the beginning of each working day. This program ensures that the firing chamber is heated homogeneously to a uniform temperature and removes any condensation inside.

0.5 Use within specifications

Caution

Read manual before using

The **VARIO PRESS®** 300 / **VARIO** 300 furnace series was exclusively designed for firing and/or pressing dental ceramics.

The user is liable for all damages resulting from usage other than that specified by the manufacturer.

At temperatures above 1075°C/1967°F, the working life of the heating muffle is reduced.

In case of defect of the furnace, the stated warranty will apply provided that use conforms to the specifications within this manual.

Repairs and maintenance may only be performed by our authorized Customer Care Center.

Do not touch the screen with wet fingers. Never use hard or sharp objects to operate the touch screen.

Soldering inside the oven will negate the warranty.

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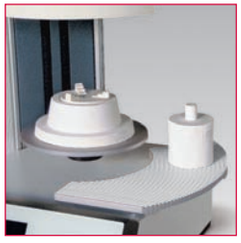
- Please unpack the oven with caution. The oven should always be carried by two persons. Always lift the device at the bottom, never at the furnace chamber or table slide bar.
- **The oven must always have a firing or pressing Tray on the lift table.**
- A furnace with a pressing function must **always** be conneced to compressed air, even during normal vacuum firing, so the pressing plunger remains "up" in its starting position.

- During operation never place your hand between the lift table and the furnace chamber. There is a risk of pinching your hand and a burn hazard.

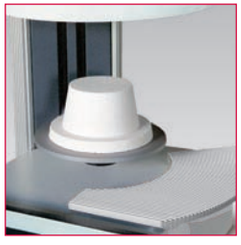
- During operation never place your hand under the furnace table and do not put an investment ring or other objects under the lift table.

  Do not block the lift table during the opening process.

  There is a risk of pinching your hand.



- Use the special cooling grid to cool the investment ring after a pressing process.



- For firing porcelain, use only the firing tray.

- For pressing, use only the pressing tray with the insert.

- The insert must be correctly positioned in the pressing tray.

Conflict

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0.6 Safety Precautions

- The flash card door at the side of the furnace must always be closed.

  The system - CF - card must remain in the furnace, except during a back-up sequence. If saving firing data, please use a separate CF-card (optional) for back-up. After saving, please re-insert the system - CF - card.
- Always turn off your furnace before attempting to exchange either a primary or back-up CF-card.
- Always turn off the device before inserting or removing the CF-card.

- The air vents must be kept free from obstruction and clean at all times to allow proper air circulation. If this is not done, there is a risk of overheating the furnace.

  Conflict

- Make sure that no liquids or other foreign objects enter the furnace or the air vents, as this may result in an electrical shock.

  Conflict

- The lift of the furnace has an electrical lift drive and has to be operated by the "Open" and "Close" Keys. Do not open or close the lift manually.

ATTENTION
Safety warnings !

Never put any potentially flammable materials such as paper, brushes or similar things, as well as easily flammable substances like alcohol, insulation sprays or die spacers close to the furnace.

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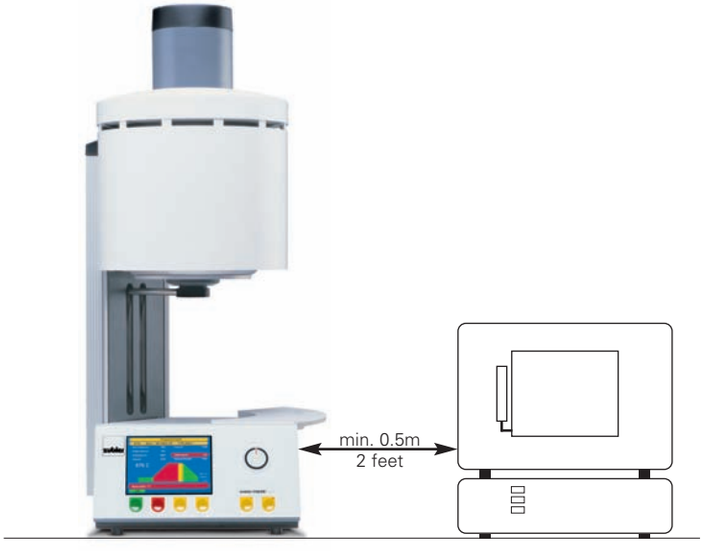
- Use this furnace only for its intended purpose as described in this Owner's Manual and carefully remove all packing materials and tape during installation.
- The furnace may only be used indoors.
- Materials developing harmful gases must not be processed in this furnace.
- This furnace must be plugged into a properly grounded circuit. If you have questions regarding the proper circuit, contact a licensed electrician.
- Any disruption of the protective conductor, either inside or outside the furnace, or any loosening of the protective conductor connection may lead to danger for the user in case of a malfunction.
- After any extended period without use as well as high humidity or low temperatures, it may not be possible to generate a sufficient vacuum initially. This is normal.
- Leave at least 8" – 12" of free space around and above the unit. Adjacent structures surrounding the unit should be non-flammable and the area should be well-ventilated.
- Follow fire department guidelines, always store a multi-purpose dry chemical fire extinguisher in your laboratory in proximity to the furnace and ensure that your employees have been properly trained in its use.
- Never wear loose fitting or hanging garments while using this furnace. Be careful when reaching for items stored around the furnace. Flammable material could be ignited if brought into contact with any of the unit's hot surfaces and may cause severe burns.
- Any potentially flammable materials, such as (but not limited to) paper, brushes, alcohol, sprays and solvents, should not be used or even stored next to the furnace and no materials should ever be placed on top of the unit.
- Do not set the furnace or vacuum pump next to uninsulated heat sources. (e.g. Other furnaces or ovens)
- Soldering in this furnace will considerably reduce the life of the thermocouple and muffle and will void the warranty.



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- Be sure that the furnace is properly installed per our instructions and that the selected electrical outlet is properly grounded.
- The electrical service provided must be a dedicated line of the proper size according to local electrical codes. Consult a qualified electrician to ensure that your amperage is sufficient to prevent burdening of any existing circuit.
- Do not use an extension cord with the furnace. Check with your utility provider for electrical codes, which apply in your area.
- In case of undervoltage, the temperature increase may be delayed.
- Compressed air systems must meet the listed requirements for use with the unit. Connections should be made by qualified personnel and all fittings attached and used in accordance with manufacturer's instructions.
- Hoses and connections should be checked periodically for fit, wear and damage and replaced or tightened, as needed.
- All cords and hoses should be located away from walkways and aisles.
- During certain operations, such as high-temperature soak or when the chamber is opened after firing, high temperature convection currents are created.
- Do not touch the surface of the heating chamber, the heating elements or the interior surface of the heating chamber. These surfaces may cause severe burns.
- Always keep the chamber closed with the lift in the up position between processes or when the unit is not in use.
- If the furnace is under vacuum in the "Off" state for an extended period of time, the O-ring of the lift plate may adhere slightly.
- Clean the furnace with a dry or slightly damp cloth. Do not use any solvents. Always disconnect power before cleaning.
- When heating the firing chamber, there may be vibration noises from the heating elements, this is normal.
- In the case of faults or damages that prevent safe operation, the equipment should not be used, until the problem is resolved or repaired.
- Turn off the furnace, disconnect the power cord and wait for the furnace to cool to room temperature before performing any recommended and authorized routine maintenance or service, due to the risk of electrical shock, personal injury or death.
- Do not attempt to repair, replace or open any part of your furnace, unless 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 furnace could present a safety hazard and void your warranty. All other servicing, either in-warranty or out-of-warranty, should be referred to our Customer Care Center.

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- In case of a service, use only original spare parts.
- Unauthorized changes or modifications to hardware or software can create severe safety hazards, as well as terminate your warranty.
- Children and untrained visitors should never be left alone or unattended in the area where a furnace is in use. They should never be allowed to climb or stand on any surface, where the furnace is situated and being operated from. Items of interest to children should not be stored in and around the furnace. Children climbing on and around the surface where furnace operates could be seriously injured.
- **Do not discard the original packaging materials and shipping carton of your VARIO furnace.**

  When transporting the furnace, use the original packaging, otherwise you could negate some of your rights under the warranty for failure to transport and/or return your unit in the original packaging.

Muffle Dust Exposure

This furnace contains respirable refractory ceramic fibers (RCF) and crystalline silica in its thermal muffle insulation. These materials may be in the form of fiber blanket or felt, vacuum formed board or shapes, mineral wool slab or loose fill fiber.

- Normal use of the furnace does not result in any significant level of airborne dust from these materials. However, when it becomes necessary to replace the muffle, the person doing this maintenance and repair work may be exposed to much higher levels.
- Given conflicting evidence of any long term health hazards, we must recommend that safety precautions are taken whenever the materials are handled by authorized repair personnel.
- Exposure to dust from fiber which has been used at high temperatures may cause respiratory disease. When handling fiber always use an OSHA or NIOSH approved and HEPA filtered respirator, eye protection, gloves and long sleeved clothing.
- Avoid breaking up waste material. Dispose of fiber waste in sealed containers.
- After handling, rinse exposed skin with water before washing gently with soap (not detergent). Wash work clothing separately.
- Because this product and many similar products on the market today contain crystalline silica and ceramic fibers, it is necessary under the statutes of California Proposition 65 that the following statement be included:

  "This product contains substances known to the State of California to cause cancer. Material Safety Data Sheets for RCF materials supplied upon request."

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Selection of menu parameters

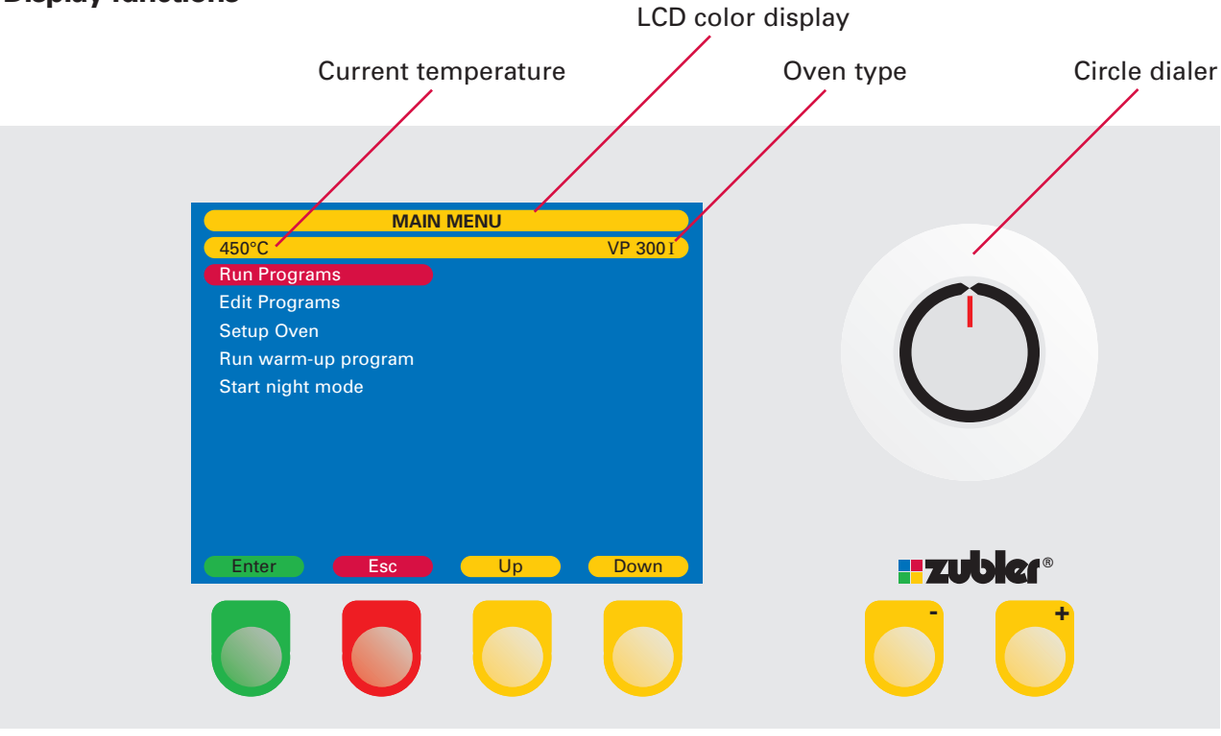
❶ Once you have switched on the oven, the Main Menu will appear on the display with the following five items:

1.1	Run programs
1.2	Edit programs
1.3	Setup oven
1.4	Run warm-up program
1.5	Start night mode

❷ Please select your desired menu parameters using the dialer or the +/- keys

❸ Confirm your selection with the green "Enter" key

Display functions



Section for selecting parameters
Confirm / cancel key
Lift movement Up/Down

Section for changing values
Rapid selection (circle dialer)
Step by step (yellow keys)

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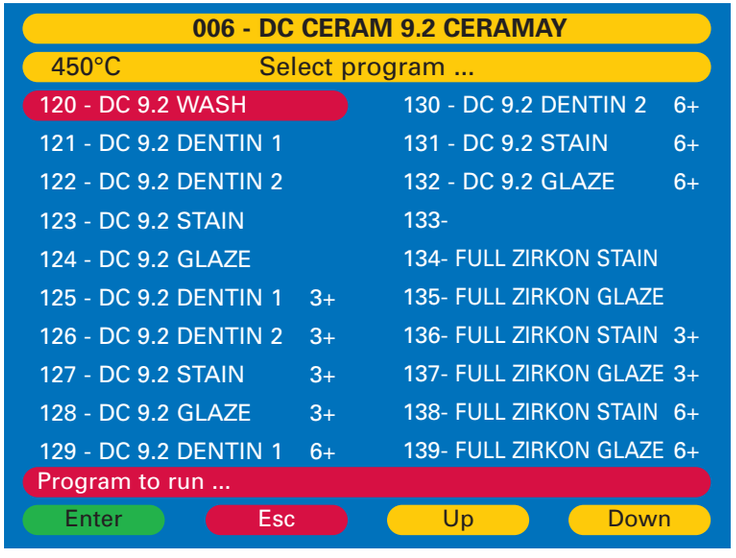
1.1 Run Programs

Program start

- After selecting "Run Program" from the Main Menu and confirming this selection with the green “Enter” key.
- The Program Group is displayed. The most recently activated program will be highlighted. 19 other program addresses will also be displayed.
- Each of the 500 programs (=25 brands with 20 programs each) can be easily selected.
- Depending on the ceramics or technique used, it is always recommended to allocate a complete block to one brand or technique.
- Use the dialer or +/- keys to highlight the program you wish to run. Touch the green “Enter” key to activate the program.
- To switch to another program group, press the red "Esc" key and return to the brand page (see page 15, “working with the brand page”)
- The operator using the furnace must close the lift after completing a firing or pressing program.
- After closing the lift, the unit will remain at the programmed idle temperature for four hours. If the unit is not used, it will automatically go into the stand-by mode.



Caution:

Close the furnace after completing a firing or pressing!!!

- If, at the end of the program, the chamber is not manually closed, the device will automatically cool down to the safety temperature of 400°C, independent of the idle temperature selected. Once this temperature has been reached, the device will remain in this state for 30 minutes.

  At the end of this time, the device will enter stand-by mode and close automatically after the defined stand-by temperature of 100°C has been reached.

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Overwriting a program during operation

Should you find that you have to temporarily change one or more parameters while a program is running, you can do this by pressing the yellow "Edit Prog." key below the display.

In general, you can only change parameters that have not already been started when you press the key.

By pressing the "Edit Prog" key, you activate the edit mode. You can now change all the parameters not yet processed.

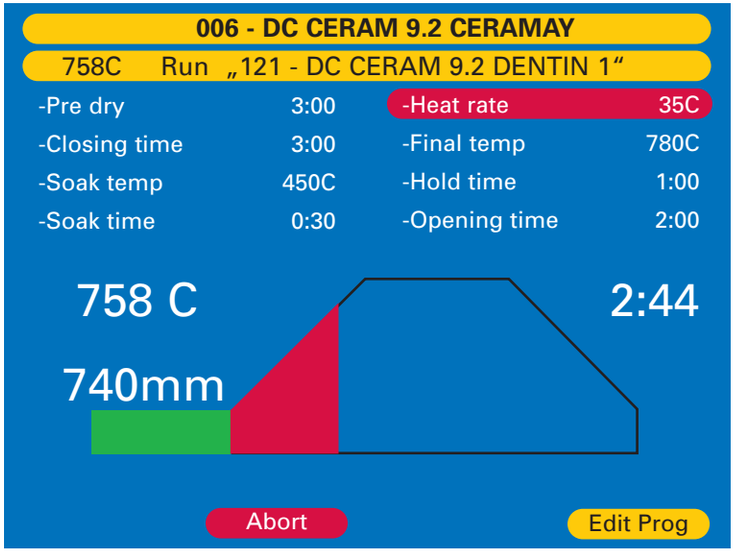
Once the "Edit Prog" function has been activated, the first modifiable parameter will be highlighted in red. Use the dialer or +/- buttons adjust the highlighted parameter as needed.

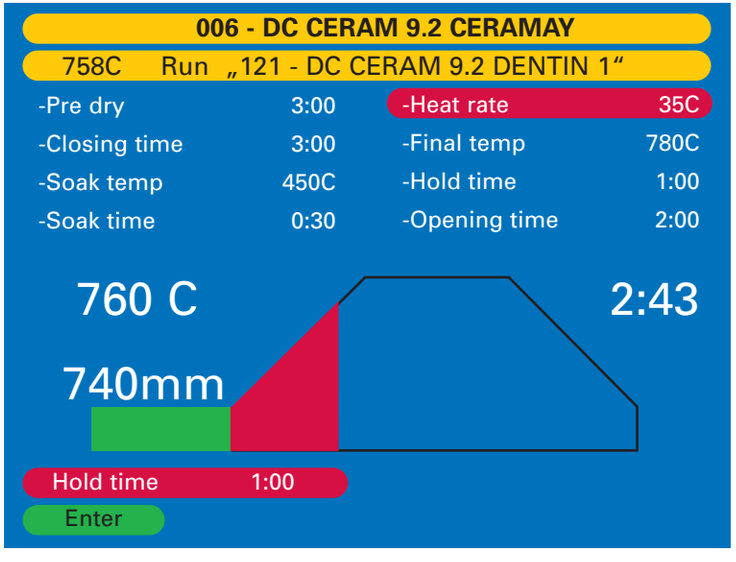
Now confirm the changes with the green "Enter" key to get to the next parameter.

The program sequence will be shown in its usual form on the display.

The changes you have made are temporary and apply only to the current firing cycle.

Editing can be carried out only once per firing cycle.





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Explanation:

The Brand menu indexes programs by Brand name, thus allowing users to more efficiently organize their programs. This two tier menu structure also alleviates the need to scroll through unnecessary program clutter making it easier to access programs quickly.

There are 25 Brand addresses. Each Brand contains 20 program slots.

006 - DC CERAM 9.2 CERAMAY

450°C Select Brand ...

000 - AUTHENTIC CERAMAY	010 - E.MAX ADV.PRESS *
001 -	011 - E.MAX CERAM IVOCLAR
002 - PULSE MC CERAMAY	012 -
003 - PULSE ZR CERAMAY	013-
004 -	014-
005 - DC CERAM 12.5 CERAMAY	015-
006 - DC CERAM 9.2 CERAMAY	016 -
007 - DC CERAM 9.2 PRESS TO	017-
* 008 - DC CONCEPT ADV.PRESS	018-
009 -	019-

Program to run ...

Enter Esc Next

006 - DC CERAM 9.2 CERAMAY

450°C Select program ...

120 - DC 9.2 WASH	130 - DC 9.2 DENTIN 2 6+
121 - DC 9.2 DENTIN 1	131 - DC 9.2 STAIN 6+
122 - DC 9.2 DENTIN 2	132 - DC 9.2 GLAZE 6+
123 - DC 9.2 STAIN	133-
124 - DC 9.2 GLAZE	134- FULL ZIRKON STAIN
125 - DC 9.2 DENTIN 1 3+	135- FULL ZIRKON GLAZE
126 - DC 9.2 DENTIN 2 3+	136- FULL ZIRKON STAIN 3+
127 - DC 9.2 STAIN 3+	137- FULL ZIRKON GLAZE 3+
128 - DC 9.2 GLAZE 3+	138- FULL ZIRKON STAIN 6+
129 - DC 9.2 DENTIN 1 6+	139- FULL ZIRKON GLAZE 6+

Program to run ...

Enter Esc Up Down

Working with the Brand page

- In the Brand index, programs are indexed into groups or "Brands". (see 1.2.6 page 25)
- To navigate away from the most recently run program to another program in a different brand group, leave the page by pressing the red "Esc" key.
- The first of two Brand (Brand) pages (0–19) will open.
  To move to the next page of Brands use the yellow button indicated as "Next", Brands 20-24 will be displayed.
- Use the dialer or the +/– keys to move the red cursor to the selected brand and confirm by pressing The green “Enter” key.

- The programs contained in the selected Brand will be displayed.
- Continue as described under 1.1, “Run programs”.

* The Advanced Press Programs for lithium disilicate are only available with the **VARIO PRESS** 300.e or as an upgrade for the Vario Press 300.

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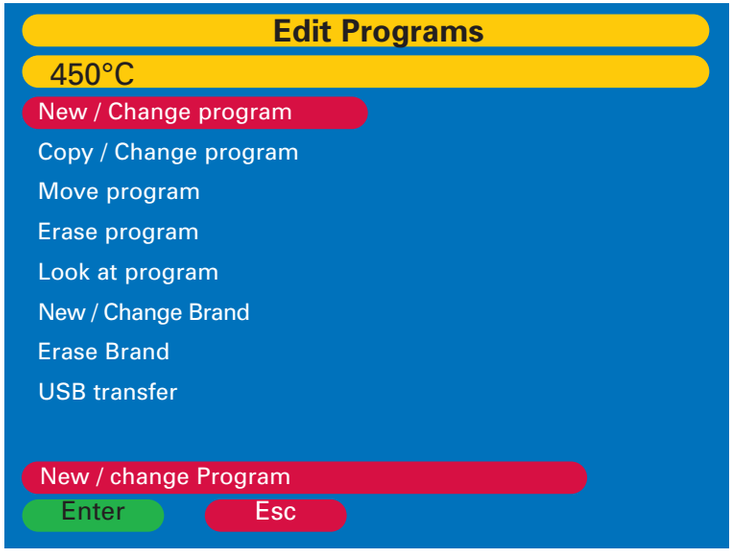
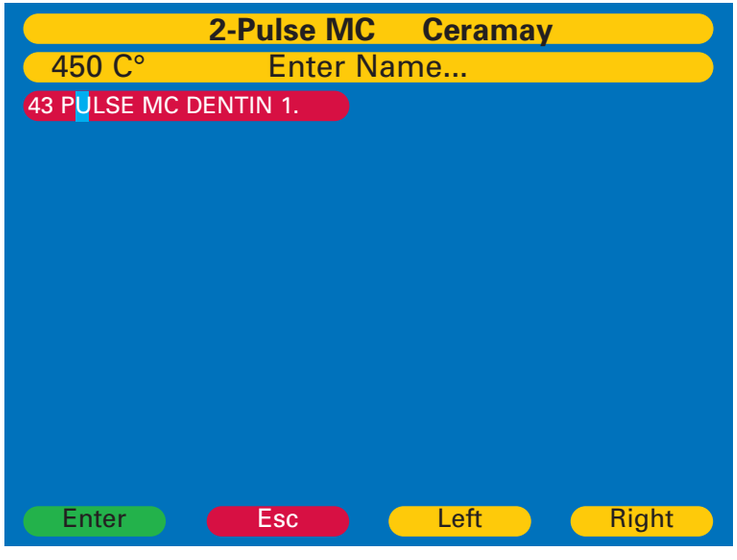
1.2 Edit Program

1.2.1 New/change program

- After selecting "Edit Programs" from the Main Menu and confirming this selection by pressing the green "Enter" key.
- "New/Change program" appears in the next window. Confirm this by pressing the green "Enter" key. You will then arrive at the brand page.
- Select a brand and confirm by pressing the green "Enter" key.
- Select the program name or program number of which you wish to create or change and confirm this by pressing the green "Enter" key.
- The first letter to be changed is highlighted in blue.
- Select the desired letters or figure with the dialer or the +/- keys and confirm by pressing the "Right" key.
- The cursor will move one position to the right.
- Continue as previously described until you have entered the desired name.
- Use the "left" or "right" keys to move the cursor to another character.
- You cannot store a program name already stored in the memory.
- Press the green "Enter" Key to save the name and begin editing the program parameters.
- If you wish to change only the name of a program, press the green "Enter" key to save it and then the "Last line" key. Select the "Yes" option in the active "Save" field and confirm this by pressing the green "Enter" key.
- If you fail to select the save option in the active "Save" field prior to pressing the green "Enter" key, you will loose your input data.

  Remember to select the save option.





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Changing the firing parameters

You can select the program type in the first line:

1. **Professional** program: individual firing management with 16 programmable parameters for processing all dental ceramic materials perfectly.
2. **Standard** program: a standard firing management in accordance with the guidelines for the dental ceramics available on the market.
3. **Special** program: this firing program is recommended for processing ceramic materials, which require two holding times under vacuum and/or two different heat rates. (specially for crystallization programs).
4. **I-Press** program: Intelligent mode for processing all pressable ceramics for producing all ceramic restorations and press-to-metal® technique.

   The press time is automatically determined via the intelligent I-Press sensor system.
5. **Press** program: The traditional timed Press mode for processing pressable ceramics.
6. **Sinter** program: Used for sintering alumina framework ceramics (such as Vita® InCeram*). This program will be made available by the manufacturer only on special request.

006 - DC CERAM 9.2 CERAMAY

748C Edit „121 - DC 9.2 DENTIN 1“

Program type Professional		-Temper	No
-Start temp	450C		
-Pre dry	Yes	-Open temp	780C
-Pre dry time	3:00	-Opening time	2:00
-Closing time	3:00	-Vacuum	Yes
-Soak temp	450C	-Release vacuum	Heat up
-Soak time	0:30	-Vacuum End	780C
-Heat rate	35C	-Edit done ?	No
-Final temp	780C		
-Hold time	1:00		

Enter Esc

We recommend the Professional program for all firing tasks. Perfect pre-drying and uniform heating ensure excellent firing results.

We recommend the I-Press program for all pressing tasks. The I-Press function optimizes pressing results.

VITA In-Ceram® is a registered Trademark of Vita Zahnfabrik H.Rauter GmbH & Co.KG

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❶ The Professional Program

Start temperature	Temperature in the firing chamber at which the program starts.	
Pre-dry	Selecting "YES" activates the special pre-drying program.	
Pre-dry time	Enter a time. In this section, the lift identifies a predefined position for the entire time, depending on the heat radiated by the firing chamber. The object can thus be pre-dried at a constant temperature.	
Closing time	Time in which the lift moves in 10 increments into the firing chamber.	
Soak temperature	At this temperature the object remains in the closed firing chamber in order to achieve an even temperature distribution. Soak temperature = Vacuum start	
Soak time	States the retention period of the object in the firing chamber before evacuation and the temperature increase.	
Heat rate	Temperature increase per minute in order to reach the final temperature.	
Final temperature	Temperature at which the ceramic is sintered.	
Hold time	Period for which the ceramic is maintained at the final temperature.	
Temper	Selecting "YES" activates the special tempering program.	
Temper temperature	Temperature at which the ceramic is tempered, i.e. subjected to precise thermal treatment at a constant temperature.	
Temper time	States the duration of the thermal treatment in the firing chamber when closed.	
Open temperature	Temperature at which the device opens the firing chamber.	
Opening time	Decent time of the lift from the chamber to the fully open position.	
Vacuum	Selecting "YES" activates the vacuum parameter (firing under vacuum).	
Vacuum release	During the heating up stage	→ release Vacuum Heat up
	During the hold time at final temperature	→ release Vacuum Hold time
	During the cooling stage	→ release Vacuum Cooling
Vacuum end	Displays the temperature or time at which the vacuum is released.	
Edit done?	Saving of the program.	

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❷ The Standard Program

Start temperature	Temperature in the firing chamber at which the program starts.
Pre-dry	Selecting “YES” activates the special pre-drying program.
Pre-dry time	Enter a time. In this section, the lift identifies a predefined position for the entire time, depending on the heat radiated by the firing chamber. The object can thus be pre-dried at a constant temperature.
Closing time	Time in which the lift moves in 10 increments into the firing chamber.
Heat rate	Temperature increase per minute in order to reach the final temperature.
Final temperature	Temperature at which the ceramic is sintered.
Hold time	Period for which the ceramic is maintained at the final temperature.
Opening time	Decent time of the lift from the chamber to the fully open position.
Vacuum	Selecting “YES” activates the vacuum parameter (firing under vacuum).
Vacuum start	Temperature at which the vacuum pump begins to evacuate the firing chamber.
Vacuum end	Temperature at which the vacuum release occurs.
Edit done?	Saving of the program.

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❸ The Special Program (Firing Program with two heeting rates, e.g. crystallization for IPS e.max®CAD)

Start temperature	Temperature in the firing chamber at which the program starts.
Pre-dry	Selecting "YES" activates the special pre-drying program.
Pre-dry time	Enter a time. In this section, the lift identifies a predefined position for the entire time, depending on the heat radiated by the firing chamber. The object can thus be pre-dried at a constant temperature.
Closing time	Time in which the lift moves in 10 increments into the firing chamber.
Soak temperature	At this temperature, the object remains in the closed firing chamber in order to achieve an even temperature distribution.
Soak time	States the retention period of the object in the firing chamber before evacuation and the temperature increase.
Heat rate 1	Temperature increase per minute in order to reach the final temperature 1.
Final temperature 1	Temperature 1 at which the ceramic is sintered.
Hold time 1	Period for which the ceramic is maintained at the final temperature 1.
Heat rate 2	Temperature increase per minute in order to reach the final temperature 2.
Final temperature 2	Temperature 2 at which the ceramic is sintered.
Hold time 2	Period for which the ceramic is maintained at the final temperature 2.
Open temperature	Temperature at which the device opens the firing chamber.
Opening time	Decent time of the lift from the chamber to the fully open position.
Vacuum	Selecting "YES" activates the vacuum parameter (firing under vacuum).
Vacuum release	During the heating up stage → release Vacuum Heat up During the hold time at final temperature → release Vacuum Hold time During the cooling stage → release Vacuum Cooling
Vacuum end	Display shows temperature at which the vacuum is released.
Edit done?	Saving of the program.

IPS e.max® is a registered Trademark of Ivoclar Vivadent

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❹ The I-Press Program

Start temperature	Temperature in the firing chamber at which the program starts.
Heating rate	Temperature increase per minute in order to reach the final temperature.
Final temperature	Temperature at which the ceramic is pressed in the ring.
Hold time	Period during which the ring is maintained at final temperature before pressing.
Extra press time	Additional press time after there has been no movement at the end of the I-Press Process.
Max. Press time	Is the maximum press time desired. Once this time is reached, the press process will stop, independent of the sensor.
Pressure	Select between low and high pressure (2 g pellets = low, 5 g pellets = high pressure 300g ring only).
Vacuum level	Level of vacuum during the pressing program.
Opening time	Decent time of the lift from the chamber to the fully open position.
Edit done	Saving of the program.

006 - DC-CERAM 9.2 Press

700C „131 - DC CERAM 9.2 200G“

Program type	I-Press	-Edit done ?	No
-Start temp	700C		
-Heat rate	60C		
-Final temp	885C		
-Hold time	20:00		
-Extra press time	0:00		
-Max press time	8:00		
-Pressure	Low		
-Vacuum level	720mm		
-Opening time	0:00		

Enter Esc

We always recommend using the I-Press program for pressable ceramics.

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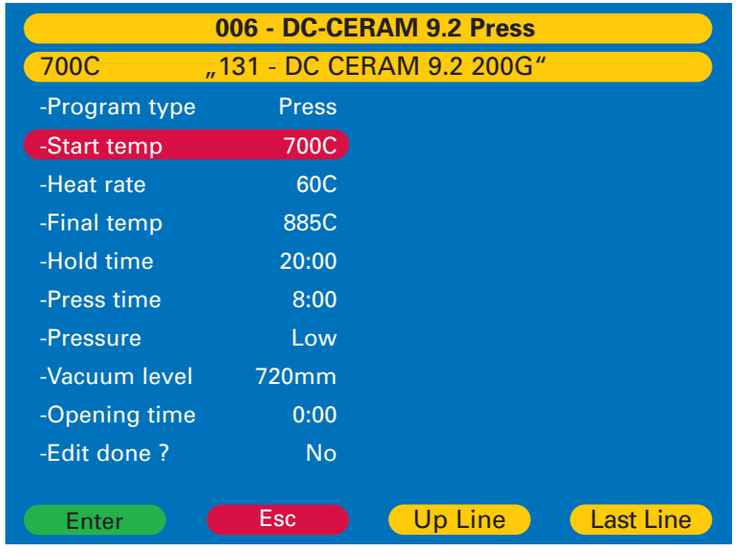
❺ **The Press Program** (Standard)

Start temperature	Temperature in the firing chamber at which the program starts.
Heating rate	Temperature increase per minute in order to reach the final temperature.
Final temperature	Temperature at which the ceramic is pressed in the ring.
Hold time	Period during which the ring is maintained at final temperature before pressing.
Press time	Is the press time before the press process will stop.
Pressure	Select between low and high pressure (2 g pellets = low, 5 g pellets = high pressure 300g ring only).
Vacuum level	Level of vacuum during the pressing program.
Opening time	Decent time of the lift from the chamber to the fully open position.
Edit done	Saving of the program.



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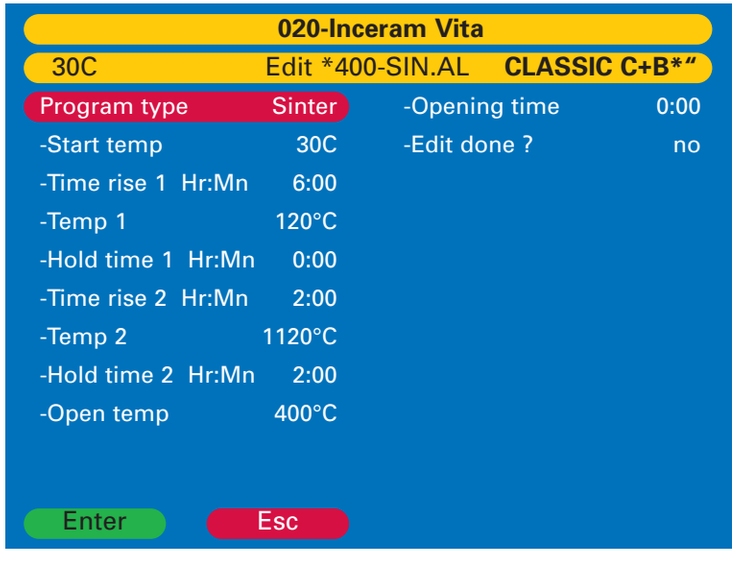
❻ Sintering Program

(Contact dealer to enable sinter programs)

Start temperature	Temperature in the firing chamber at which the program starts.
Timerise 1	The first temperature increase (entered as hours and minutes)
Temp. 1	Temperature at the end of ramp-up time 1
Hold time 1	Time for which the object is maintained at final temperature 1 (entered as hours and minutes)
Timerise 2	The second temperature increase (entered as hours and minutes)
Temp. 2	Temperature at the end of ramp-up time 2
Hold time 2	Time for which the object is maintained at final temperature 2 (entered as hours and minutes)
Open temp.	Temperature at which the device opens the firing chamber
Opening time	Decent time of the lift from the chamber to the fully open position.
Edit done?	Saving of the program



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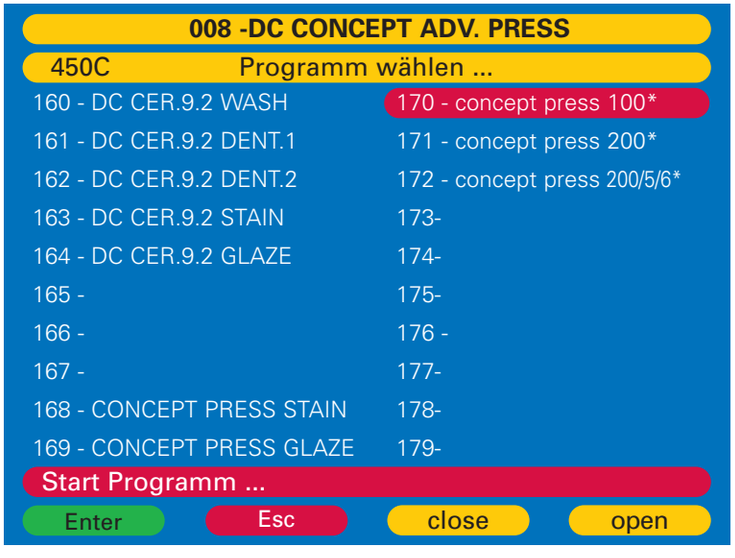
The Advanced Press Program for Lithium Disilicate Pressable Ceramics

Advanced Press was patented in 2010 and offers a completely new approach to pressing cycles especially for lithium disilicate pressable ceramics. Based on the mathematical analysis of the thermal behaviour of the materials involved in the pressing process, an optimal heat curve resulted, which substantially differs from the classical heating method of a pressable ring (see graphic).

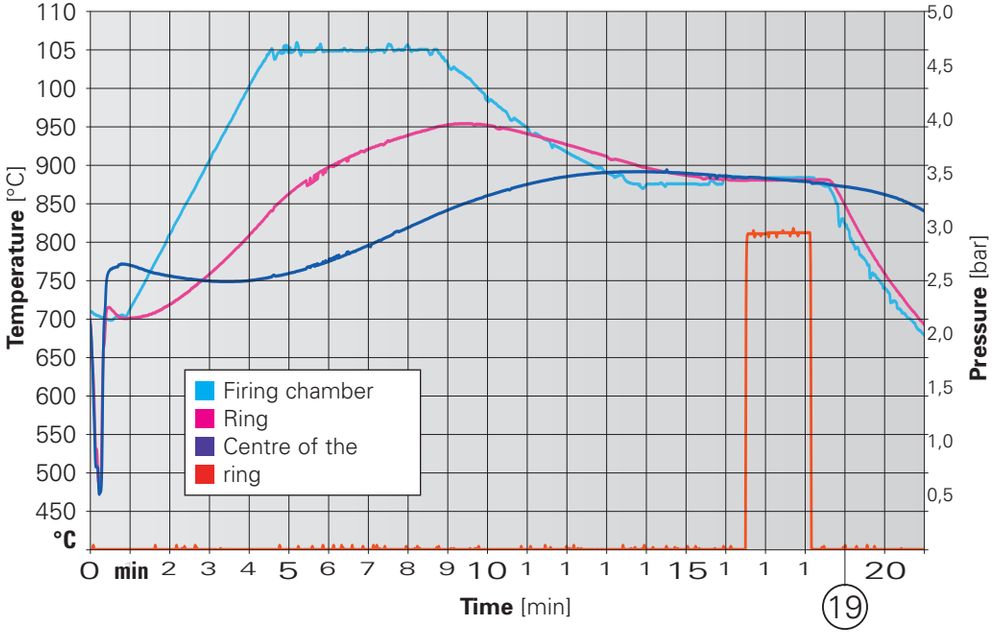
During the heating process more energy is briefly supplied to the ring. Although the chamber temperature will rise beyond the predefined level for ceramic processing, the object is still exposed to a lower temperature inside the ring. Once sufficient energy has been supplied for a specific (pre-calculated) time, the heating element of the furnace will shut down. From that point on, the heat from the external portion of the ring will continue to be transmitted toward its centre. At the moment when absolute thermal homogeneity has been obtained, the furnace starts the pressing process.

This patented process leads to extremly short pressing cycles and consequently to a substantially minimized reactive layer on lithium disilicate ceramics.

The mathematically calculated pressing process allows no change of the data of the single parameters. Should it be necessary to make corrections in the pressing process in order to obtain a perfect result, please contact our technical support.



Temperature sequence LDS Advanced Press



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Note:

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1.2.2 Copy/change program

- Copy from: select the program to be copied using the dialer or the +/- keys.
- By pressing the green “Enter” key, you can confirm the program selected for duplication.
- You now return to the brand page. Select the brand and confirm by pressing the green “Enter” key.
- Select the place to which the program is to be copied using the dialer or the +/- keys.
- Fix the program at its new position by pressing the green “Enter” key.
- You may now change the name and program parameters, as described on 1.2 of Page 16.

  The name must be changed. Duplicate program names are not allowed.
- If programs are not moved or copied to an empty position, the existing program will be replaced.

1.2.3 Move program

- Move from: Select the program to be moved using the dialer or the +/- keys.
- Press the green "Enter" key to confirm the selection.
- You now return to the brand page. Select the brand to which the program is to be moved using the dialer or the +/- keys and press the green “Enter” key.
- Select the place to which the program is to be moved using the dialer or the +/- keys and press the green “Enter” key.
- Press the red “Esc” key to return to the edit mode.
- If programs are not moved or copied to an empty position, the existing program will be replaced.

1.2.4 Erase program

- Within a program group, select the program to be deleted by using the dialer or the +/- keys.
- Press the green “Enter” key, to confirm the program selected for deletion.
- The program is displayed with all its parameters together with the question: “Delete program?”
- Confirm the deletion by pressing the “yes” key.
- Now press the red “Esc” key to return to the input mode.

1.2.5 Look at program

- Within a program group (brand) select a program using the dialer or the +/- keys.
- Confirm the selected program by pressing the green “Enter” key.
- The individual parameters are shown on the display, but cannot be changed.
- Press the “OK” key to return to the “Look at” mode.

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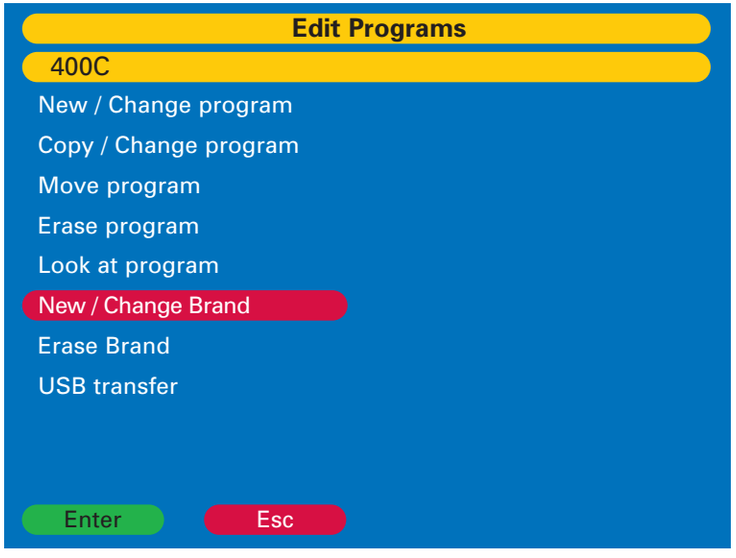
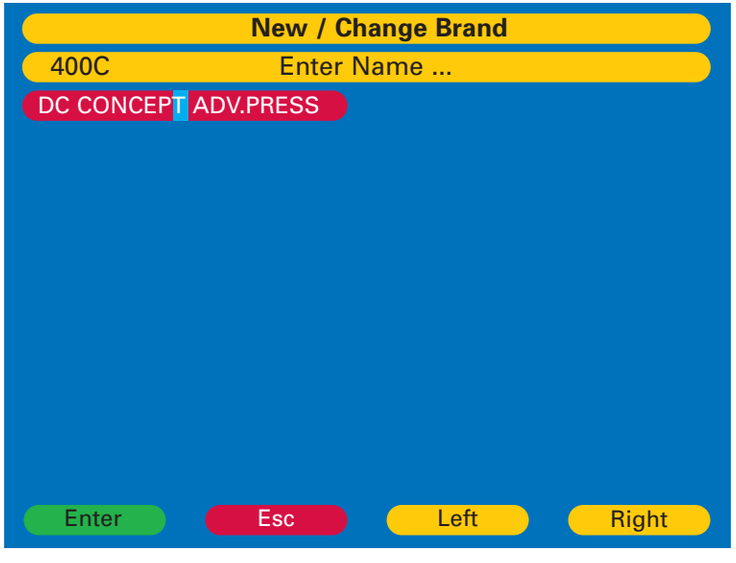
1.2.6 Brand page New/Change

The brand page facilitates access to any firing or pressing program you select. Each brand contains a block of 20 programs, that can be freely defined by the user. In the brand page. As an example: All dentin, pressing, glazing other cycles for a brand of porcelain will be contained in one brand on the brand page.

Setting up the brand page

- In the “Edit Programs” menu, select “New / Change Brand”, and confirm by pressing the green “Enter” key. The brand page and first 20 brands will appear on the display. **Example:** As you have edited your ceramic (in this case DC Ceram 12.5) on the program places 60-66, you want to store the name ‚DC Ceram 12.5‘ on the respective brand page (No. 3)
- Move the red selection bar to the brand you wish to edit and confirm by pressing the green “Enter” key.
- You can now enter a name in the corresponding field, which will be displayed on the New / Change Brand - Enter Name.. page.
- The first letter to be changed is highlighted in grey.
- Use the dialer or the +/- keys to select the desired letter or number and press the “Right” key to move the cursor one position to the right.





- Once the desired name is entered. Press the green “Enter” key.
- Press the red "Esc" button to return to the “Edit Programs” screen.
- Press the red "Esc" key to return to the Main Menu.

1.2.7 Erase brand

- Use the dialer or the +/- keys to select the brand name to be erased and confirm by pressing the green "Enter" key. Then a security query appears which you can confirm by pressing the green "Enter" key or cancel by pressing red “Esc” key.

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1.2.8 Compact Flash (CF) card: Loading and saving firing programs

Important:
Back-up your programs on the CF-card from time to time.

The CF-card should remain in the furnace at all times!
Always turn off the device before inserting or removing the CF card!

- Main menu → Edit programs → CF transfer
- Press the green "Enter" key to confirm the selected option.
- A new menu will appear, showing the following options:

  Send programs to CF-card
  Load programs from CF-card
  Erase all programs on CF-card
- Select the desired option using the "+" or "–" key and confirm by pressing the green "Enter" key.
- Back-Up = Send Programs to CF-card: You can save consecutively numbered blocks of programs to your CF card.
  A menu with the following options appears:

  - Start with program: Enter the number of the first program and confirm by pressing the green "Enter" key (usually 0).
  - End with program: Enter the number of the last program and confirm by pressing the green "Enter" key (usually 499).
  - Save brand names: Confirm by pressing "Yes" to save the brand page or press "Erase all programs on CF": here you can erase all programs selected with "No" to save just the programs
  - Your programs are now ready to save to your CF-card.
  - Confirm your selection by pressing "Yes" or cancel by pressing "No".

  Once your programs have been saved, the device will return to the "Edit Programs" menu.
- Restore = Load programs from CF-card: You can load consecutively numbered blocks of programs from your CF-card.
  A menu with the following options appears:

  - Start with program: Enter the number of the first program and confirm by pressing the green "Enter" key (usually 0).
  - End with program: Enter the number of the last program and confirm by pressing the green "Enter" key (usually 499).
  - Save from program: Enter the number of the first program to overwrite and confirm by pressing the green "Enter" key (usually 0).
  - Load brand names: Confirm with "Yes" to load the brand page or decline with "No" to load just the programs
  - Your programs are now ready to load from your CF-card.
  - Confirm your selection by pressing "Yes" or cancel by pressing "No".
    Once your programs have been saved, the device will return to the "Edit Programs" menu.
- Erase all programs on CF-card; Here you can erase all programs on the CF-card. The operating system remains on the CF-card.

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1.3 Set-up oven

Users can enter their individual requirements here. The following table depicts the individual settings, together with their impact on the function of the ceramic furnace.

1.3.1 Idle temperature

This is a temperature reached by the furnace following the conclusion of a firing program. During normal operation, this temperature is entered as the start temperature for individual firing cycles.
(see 0.4,"Basic Settings", on page 6)

1.3.2 Night mode temperature

This value displays the temperature maintained by the furnace during night mode (see section 1.5 page 30 "start night mode").
We recommend setting the temperature to 100°C to avoid accumulation of moisture in the muffle.

1.3.3 Customize calibration

This allows the user to adjust the calibration within certain temperature ranges. This feature changes all the final temperatures of programs in the respective temperature ranges (pressing below/above 1000°C, firing porcelain below/above 800°C).

1.3.4 Vacuum pump

This section determines whether the pump is maintained in continuous operation, or is switched off when the required vacuum level has been reached.
(see 0.4,"Basic Settings", on page 6)

1.3.5 Vacuum level

In this section, you can set the vacuum level for the programs.

Run a vacuum test to check for the allowable vacuum level.

(see 0.4,"Basic Settings", on page 6)

1.3.6 Diagnostics/tests

❶ Pre-heat / dry program

This program is run prior to the first operation of the furnace.
(see 0.4,"Basic Settings", on page 6)

❷ Run purge program

Use this high temperature program to remove contaminates and impurities.

Never use ANY purging additives such as carbon (graphite pellets) for cleaning the firing chamber!

Using additives will significantly reduce the life of the thermocouple and heating element.

❸ Software version

Displays the software version currently installed.

❹ Update software

Requires the entry of a password.
We will provide the password and instructions with software updates.

❺ Service tests

- **Vacuum test:** determines the available vacuum for your location and performs a leakage test.
- **Lift Test** Control of the starting and closing position of the lift
- **Test low pressure** (3.0 bar)
- **Test high pressure** (4.5 bar)
- **Test press sensor:** shows the values for the pressing plunger and its function.
- **Factory tests:** for use by service center.

1.3.7 Customize country

This section sets the language as well as the date, time and units (metric/imperial).

1.3.8 Display

The brightness of the display is set using this function (recommended value: 34).

1.3.9 Audio beeps

Turns audio beeps on/off.

1.3.10 Activate Preview

With this function you can look at the parameters of the selected program before starting it.

1.3.11 Initial Setting

See point 0.4

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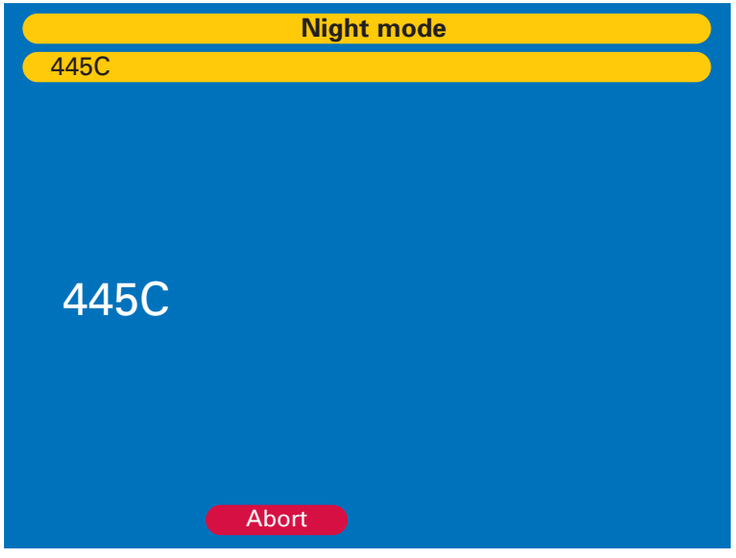
1.4 Run Warm-up program

Before starting work in the morning, activate the "warm-up" program to ensure homogeneous, uniform heating.

1.5 Start “night mode”

Instead of switching the furnace off, use night mode to prevent moisture and contamination from entering the firing chamber while the furnace is not in use.

The “night mode” program is started by pressing the green “Enter” key. If you start the “night mode” program and the oven is open, the oven cools down to the programmed temperature and closes automatically. The program is ended by pressing “abort”.



1.5.1 Stand-by temperature

To save energy and prevent impurities or condensation inside the furnace, we advise you to keep the firing chamber closed when it is not being used.

Should you be prevented from closing the furnace yourself, stand-by is automatically activated 30 minutes after a program has finished if the oven is not closed.

If the oven is closed after the last firing, it will remain at the idle temperature for 4 hours. After 4 hours the oven automatically starts “stand-by” mode.

Warning recommendation:
The 1st. program initiated after “night mode” should be the warm-up program.

- First you hear an acoustic signal
- The temperature in the firing chamber is lowered to the 100°C stand-by temperature.
- Once stand-by temperature has been reached, the lift closes and remains in a closed position.
- Touching any key will return the oven to the idle temperature.
- The stand-by temperature is a fixed temperature and cannot be changed.

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2.1. Water separator maintenance

After having put the furnace into operation, please monitor the container for water separation (approx. 4 weeks). Any water must be drained by loosening the locking screw. Should any of water accumulate regularly, the quality of compressed air in your laboratory must be improved by the use of a more powerful air-drying apparatus. With dried compressed air, water separation can be avoided.

2.2. Filter element for compressed air supply

The service life of the filter element for compressed air depends on the quality of the compressed air in your laboratory. The filter element must be exchanged after 2 years at the latest, even if high-quality compressed air is being applied. A dirty filter element can lead to a reduction of the fixed maximum pressure and negatively affect pressing.

Exchange of the filter element:

- separate the pressure-reducing unit from the compressed air supply of the laboratory
- unscrew the water container and clean with damp cloth
- loosen the setscrew of the filter
- pull-off the filter
- insert the new filter, tighten and screw on the water container

Fuses:

VARIO 300 series furnaces require the following fuses: slow blow

	100/120V - Unit
F1	15.0A
F2	-
F3	5.0A

2.3. Filter element for vacuum pump P3

The filter element prevents dissolved particles and/or condensation from clogging the vacuum pump.

We recommend you replace this filter element at least every 3 years.

2.4 Purging of the firing chamber

see 1.3.6 ❷ page 29

2.5 Spare parts

Filter for compressed air	501/0084
Filter for vacuum pump	556/072
Pressing tray	898/108
Insert for pressing tray	898/109
Firing tray	898/110
Long tweezers	898/106
Ring forceps	898/4136

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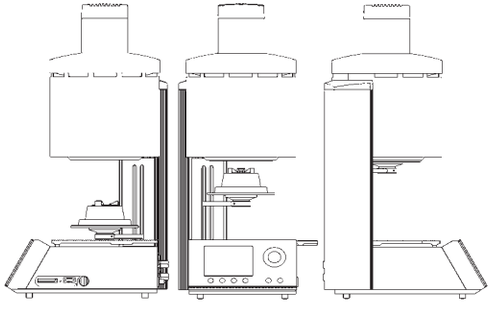
	VARIO PRESS® 300 / VARIO PRESS® 300.e	VARIO 300
Technical Data:		
Width x depth	14.2″ x 16.9″	14.2″ x 16.9″
Height	30.1″	24.6″
Weight	57.3 lbs.	52.9 lbs.
Voltage	100/120V 50Hz/60Hz	100/120V 50Hz/60Hz
Current	14A max. incl. pump	14A max. incl. pump
Performance Data:		
Idle temperature	68°F - 1292°F	68°F - 1292°F
Temperature	68°F - 2192°F	68°F - 2192°F
Color display	4.7″ x 3.5″	4.7″ x 3.5″
	320 x 240 dots	320 x 240 dots
Programs	500	500
Pressing pressure low	3.0bar	-
high	4.5bar	-

	Vacuum pump **P3**
Technical Data:	
Width x depth	12.6″ x 7.3″
Height	10.8″
Weight	26.4 lbs.
Voltage	100/120V 50Hz/60Hz
Current	3,5A
Vacuum max.	985mbar

Environmental condition

Ambient temperature 65°F - 86°F



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3.1 Scope of supply

VARIO PRESS® 300

1x Power cord
1x Operating system CF - card (green)
1x Ring tong
1x Firing tray
1x Pressing tray incl. press insert
1x Compressed air hose 2m (blue)
1x Pressure reducer (water strainer) with fixing bracket
1x Long tweezer
1x Inline filter for vacuum hose
1x Vacuum hose
1x Connecting cord cold instrument plug for P3 vacuum pump
1x Warranty cards
1x Operating instructions
1x Spare fuses
1x Honey comb tray and 5 pins
1 x Flex Ring System 100g with base 13mm
1 x Flex Ring System 200g with base 13mm

Accessories:

P3 Vacuum pump

VARIO PRESS® 300.e

1x Power cord
1x Operating system CF - card (green)
1x Ring tong
1x Firing tray
1x Pressing tray incl. press insert
1x Compressed air hose 2m (blue)
1x Pressure reducer (water strainer) with fixing bracket
1x Long tweezer
1x Inline filter for vacuum hose
1x Vacuum hose
1x Connecting cord cold instrument plug for P3 vacuum pump
1x Warranty cards
1x Operating instructions
1x Spare fuses
1 x Flex Ring System 200g w/12mm base
1 x Flex Ring System 200g w/13mm base

Accessories:

P3 Vacuum pump

VARIO 300

1x Power cord
1x Operating system CF - card (green)
1x Firing tray
1x Long tweezer
1x Inline filter for vacuum hose
1x Vacuum hose
1x Connecting cord cold instrument plug for P3 vacuum pump
1x Warranty cards
1x Spare fuses
1x Operating instructions

Accessories:

P3 Vacuum pump

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If more help is needed

We hope you will have many years of trouble-free service from your furnace. If you do have problems with the furnace or if you have questions about the furnace not covered in the manual, contact:

Zubler Gerätebau GmbH
Buchbrunnenweg 26
89081 Ulm-Jungingen
Phone: +49(0)731-14520
Fax: +49(0)731-145213
Mail: vp300@zubler.de
www.zubler.de

Zubler USA L.L.C.
4220 Steve Reynolds Blvd.
Suite 24, Norcross, GA 30093
Phone: +1.770.921.2131
Fax: +1.770.339.3188
Mail: sales@zublerusa.com
www.zublerusa.com

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5. Program examples

5.1 Press Programs* *I-Press Program*

Pressceramic	Ring size	Start tempe-rature [°C]	Heat rate [°C/min]	Final tempera-ture [°C]	Hold time [min]	Extra press time [min]	Maximum press time [min]	Pressure	Vacuum level	Opening time [min]
Authentic	**100g**	700	60	930	18:00	0:00	6:00	low	710mm	0:00
Authentic	**200g**	700	60	940	20:00	0:00	8:00	low	710mm	0:00
DC Ceram 9.2 PTZ	**200g / 2g**	700	60	885	20:00	0:00	10:00	low	710mm	0:00
DC Ceram 12.5 PTM	**200g / 2g**	700	60	920	20:00	0:00	10:00	low	710mm	0:00 **
DC Ceram 12.5 PTM	**200g / 5g**	700	60	925	20:00	0:00	10:00	low	710mm	0:00 **
DC Ceram 12.5 PTM	**300g / 2g**	700	60	925	25:00	0:00	15:00	low	710mm	0:00 **
DC Ceram 12.5 PTM	**300g / 5g**	700	60	930	25:00	0:00	15:00	high	710mm	0:00 **
conceptPress	**100g / 2 und 3g**	700	60	910	18:00	0:00	3:00	low	710mm	0:00
conceptPress	**200g / 2 bis 4g**	700	60	915	20:00	0:00	3:00	low	710mm	0:00
conceptPress	**200g / 5 bis 6g**	700	60	920	20:00	0:00	3:00	low	710mm	0:00
IPS e.max Press HT	**100g**	700	60	910	15:00	0:00	6:00	low	710mm	0:00
IPS e.max Press HT	**200g**	700	60	915	25:00	0:00	8:00	low	710mm	0:00
IPS e.max Press LT	**100g**	700	60	915	15:00	0:00	6:00	low	710mm	0:00
IPS e.max Press LT	**200g**	700	60	917	25:00	0:00	8:00	low	710mm	0:00
IPS e.max Press MO	**100g**	700	60	915	15:00	0:00	6:00	low	710mm	0:00
IPS e.max Press MO	**200g**	700	60	920	25:00	0:00	8:00	low	710mm	0:00
IPS e.max Press HO	**100g**	700	60	910	15:00	0:00	6:00	low	710mm	0:00
IPS e.max Press HO	**200g**	700	60	915	25:00	0:00	8:00	low	710mm	0:00

*All press programs are only recommendations of the ceramic producer and can be modified individually

** Press-to-metal on non precious alloys can require an opening time of 5 minutes

press-to-metal® is a trademark of Zubler Gerätebau GmbH

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5.2 Firing Programs* *Authentic®*
Professional Mode

	Start tempe-rature [°C]	Pre dry	Pre drying time [min]	Closing time [min]	Soak tempera-ture [°C]	Soak time [min]	Heat rate [°C/min]	Final tempera-ture [°C]	Hold time [min]	Temper tempera-ture [°C]	Temper time [min]	Opening tempera-ture [°C]	Opening time [min]	Vacuum	Release vacuum	Vacuum end [°C]
Opa. paste 845°C	450	yes	3:00	3:00	450	0:30	55	845	1:00	--	--	845	0:00	yes	Heat-up	845
Opa. paste 950°C	450	yes	3:00	3:00	450	0:30	55	950	1:00	--	--	950	0:00	yes	Heat-up	950
Margin 1	450	yes	3:00	3:00	450	0:30	45	780	1:00	--	--	780	0:00	yes	Heat-up	780
Margin 2	450	yes	3:00	2:00	450	0:30	45	770	1:00	--	--	770	0:00	yes	Heat-up	770
Dentin 1	450	yes	3:00	2:00	450	0:30	45	760	1:00	--	--	760	1:00	yes	Heat-up	760
Dentin 2	450	yes	3:00	2:00	450	0:30	45	750	1:00	--	--	750	1:00	yes	Heat-up	750
Stain	450	no	-	3:00	450	0:30	45	740	1:00	--	--	740	1:00	yes	Heat-up	740
Glaze without Vac.	450	no	-	3:00	450	0:30	45	745	1:00	--	--	745	1:00	no	--	--
Glaze with Vac.	450	yes	3:00	3:00	450	0:30	45	715	1:00	--	--	715	1:00	yes	Heat-up	715
Correction	450	yes	3:00	3:00	450	0:30	45	710	1:00	--	--	710	1:00	yes	Heat-up	710

*All firing programs are only recommendations of the ceramic producer and can be modified individually
** Refer to the alloy manufacturer's instructions

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5.2 Firing Programs* DC Ceram 12.5

Professional Mode

	Start tempe-rature [°C]	Pre dry	Pre drying time [min]	Closing time [min]	Soak tempera-ture [°C]	Soak time [min]	Heat rate [°C/min]	Final tempera-ture [°C]	Hold time [min]	Temper tempera-ture [°C]	Temper time [min]	Opening tempera-ture [°C]	Opening time [min]	Vacuum	Release vacuum	Vacuum end [°C]
Opaque 1+2	450	yes	3:00	3:00	450	0:30	80	950	1:00	--	--	950	0:00	yes	Heat-up	950
Margin 1	450	yes	3:00	3:00	450	0:30	55	880	1:00	--	--	880	0:00	yes	Heat-up	880
Margin 2	450	yes	3:00	3:00	450	0:30	55	870	1:00	--	--	870	0:00	yes	Heat-up	870
Dentin 1	450	yes	3:00	3:00	450	0:30	55	820	1:00	--	--	820	1:00	yes	Heat-up	820
Dentin 2	450	yes	3:00	3:00	450	0:30	55	810	1:00	--	--	810	1:00	yes	Heat-up	810
Stain	450	yes	3:00	2:00	450	0:30	55	760	1:00	--	--	760	1:00	yes	Heat-up	760
Glaze firing	450	no	--	3:00	450	0:30	55	780	1:00	--	--	780	1:00	no	--	--
Glaze with powder	450	yes	3:00	2:00	450	0:30	55	770	1:00	--	--	770	1:00	no	--	--

*All firing programs are only recommendations of the ceramic producer and can be modified individually
** Refer to the alloy manufacturer's instructions

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5.2 Firing Programs* DC Ceram 9.2

Professional Mode

	Start tempe-rature [°C]	Pre dry	Pre drying time [min]	Closing time [min]	Soak tempera-ture [°C]	Soak time [min]	Heat rate [°C/min]	Final tempera-ture [°C]	Hold time [min]	Temper tempera-ture [°C]	Temper time [min]	Opening tempera-ture [°C]	Opening time [min]	Vacuum	Release vacuum	Vacuum end [°C]
Liner	450	yes	2:00	2:00	450	1:00	45	970	1:00	--	--	970	2:00	yes	Heat-up	970
Dentin 1	450	yes	3:00	3:00	450	1:00	45	780	1:00	--	--	780	2:00	yes	Heat-up	780
Dentin 2	450	yes	3:00	3:00	450	1:00	45	770	1:00	--	--	770	2:00	yes	Heat-up	770
Shade/Stain	450	yes	2:00	2:00	450	0:30	45	740	1:00	--	--	740	2:00	yes	Heat-up	740
Glaze firing	450	no	--	3:00	450	0:30	45	750	1:00	--	--	750	2:00	no	--	--
Glaze with powder	450	yes	3:00	2:00	450	0:30	45	750	1:00	--	--	750	2:00	no	--	--

*All firing programs are only recommendations of the ceramic producer and can be modified individually
** Refer to the alloy manufacturer's instructions

Please consider, that with larger structures of zircon oxide or with onlays of lithium disilicate glass ceramics the values can change. For exact indications please refer to the instructions for use of the DC Ceram 9.2 dental ceramics.

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5.2 Firing Programs* Ivoclar IPS® e.max ceram / e.max® CAD

	Start tempe-rature [°C]	Pre dry	Pre drying time [min]	Closing time [min]	Soak tempera-ture [°C]	Soak time [min]	Heat rate [°C/min]	Final tempera-ture [°C]	Hold time [min]	Temper tempera-ture [°C]	Temper time [min]	Opening tempera-ture [°C]	Opening time [min]	Vacuum	Release vacuum	Vacuum end [°C]
Opaque 1 (Galvano)	403	yes	3:00	3:00	450	0:30	100	940	2:00	--	--	940	0:00	yes	Heat-up	940
Opaque 2 (Galvano)	403	yes	3:00	3:00	450	0:30	100	930	2:00	--	--	930	0:00	yes	Heat-up	930
Zirliner	403	yes	2:00	2:00	450	0:30	60	960	1:00	--	--	960	0:00	yes	Heat-up	960
Wash	403	yes	2:00	2:00	450	0:30	50	750	1:00	--	--	750	0:00	yes	Heat-up	750
Dentin/Incisal 1	403	yes	2:00	2:00	450	0:30	50	750	1:00	--	--	750	0:00	yes	Heat-up	750
Dentin/Incisal 2	403	yes	2:00	2:00	450	0:30	50	750	1:00	--	--	750	0:00	yes	Heat-up	750
Margin 1	403	yes	2:00	2:00	450	0:30	50	800	1:00	--	--	800	0:00	yes	Heat-up	800
Margin 2	403	yes	2:00	2:00	450	0:30	50	800	1:00	--	--	800	0:00	yes	Heat-up	800
Stain (Stain tech.)	403	yes	3:00	3:00	450	0:30	60	770	1:00	--	--	770	0:00	yes	Heat-up	770
Glaze (Stain tech.)	403	yes	3:00	3:00	450	0:30	60	770	1:00-2:00	--	--	770	0:00	yes	Heat-up	770
Stain (Layering tech.)	403	yes	3:00	3:00	450	0:30	60	725	1:00	--	--	725	0:00	yes	Heat-up	725
Glaze (Layering tech.)	403	yes	3:00	3:00	450	0:30	60	725	1:00	--	--	725	0:00	yes	Heat-up	725
ADD-ON with glaze	403	yes	3:00	3:00	450	0:30	60	725	1:00	--	--	725	0:00	yes	Heat-up	725
ADD-ON after glaze	403	yes	3:00	3:00	450	0:30	50	700	1:00	--	--	700	0:00	yes	Heat-up	700

*All firing programs are only recommendations of the ceramic producer and can be modified individually

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5.2 Firing Programs* Ivoclar e-max® CAD Crystallization
Special Mode

	Start tempe-rature [°C]	Pre dry	Pre drying time [min]	Closing time [min]	Soak tempera-ture [°C]	Soak time [min]	Heat rate 1 [°C/min]	Final tempera-ture 1 [°C]	Hold time 1 [min]	Heat rate 2 [°C/min]	Final tempera-ture 2 [°C]	Hold time 2 [min]	Opening tempera-ture [°C]	Vacuum	Release vacuum	Vacuum end [°C]
Crystalliz. HT / LT	403	no	–	6:00	550	0:00	90	820	0:10	30	840	7:00	700	yes	Hold time	7:00
Crystalliz. MO	403	no	–	6:00	550	0:00	60	770	0:10	30	850	10:00	700	yes	Hold time	10:00
Correction	403	no	–	6:00	550	0:00	90	820	0:10	30	840	3:00	700	yes	Hold time	3:00

*All firing programs are only recommendations of the ceramic producer and can be modified individually

5.2 Firing Programs* Ivoclar e-max® CAD ZirCAD
Special Mode

	Start tempe-rature [°C]	Pre dry	Pre drying time [min]	Closing time [min]	Soak tempera-ture [°C]	Soak time [min]	Heat rate 1 [°C/min]	Final tempera-ture 1 [°C]	Hold time 1 [min]	Heat rate 2 [°C/min]	Final tempera-ture 2 [°C]	Hold time 2 [min]	Opening tempera-ture [°C]	Vacuum	Release vacuum	Vacuum end [°C]
Regeneration bake	403	no	–	0:18	403	0:00	65	1050	15:00	–	–	–	750	no	–	–

*All firing programs are only recommendations of the ceramic producer and can be modified individually

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foreword

For the dental technician to achieve consistent high quality results when processing lithium disilicate ceramics, it is important to use a high quality investment, no matter the ceramics manufacturer.

Only a few products in the market lead to consistently good press results, which is measurable in the amount of reaction layer formation.

Another indicator of good press results is the thermal conductivity of the investment material used.

The patented Advanced Press process requires the use of the recommended investment to ensure perfect soaking for an extremely short press time. This will allow the ceramic to obtain the perfect surface.

Reaction layer is dictated by the amount of time lithium disilicate is in contact with investment material under the influence of temperature. Shorter times improve results; reducing reaction layer and improving surface texture.

6.1 Investment

- Recommended investment with respective quantity of liquid:
  - "Zubler 144"

„**Speed investing**":

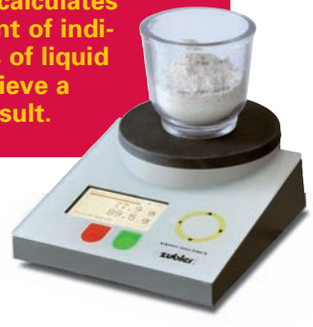
- The processing temperature of the investment, the liquid and the water should be between 20-23°C. Do not store in a refrigerator!!!
- Check the best-before-date of the investment and liquid.
- Use distilled water only.
- The concentration of the liquid/water mix influences the hydration expansion and consequently the fit.

6.2 Mixing of Investment

- Always follow the material's usage instructions.
- From time to time check the vacuum efficiency of the mixing device.
- The vacuum must always have maximum "performance". Insufficient vacuum can cause rings to crack or break.

TIP:

The VARIO BALANCE programmable scale precisely calculates the required amount of individual components of liquid and powder to achieve a constant perfect result.



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6.3 Preparation of the ring

- Spruing of the pattern:

  Molar, premolar,
  3-unit bridge: Ø 3,5mm
  Front, inlay: Ø 3,0mm

  Length of sprue: 3 – 8mm
- Single objects with one sprue.
- 3-unit bridges on both bridge abutments, no sprue at the pontic.
- Always attach the sprues in the direction of the ceramic flow and at the thickest part of the wax-up.
- The maximum combined height of the sprue and waxed objects must not exceed 16mm.
- Sprue angle: 45° - 60°

Choice of ring size:

- 100g ring for 3g pellets
  200g ring for 3g or 6g pellets
- Bridges can only be pressed in a 200g ring.
- Design of the attachment points: Round and slightly tapered, no sharp angles or edges.
- Minimum distance between the objects: 3mm
- Minimum distance to the silicone ring: 10mm
- Wax Weight / Pellet Selection:

  3g Pellet ⇒ Max 0.75g
  (100g or 200g Ring)

  6g Pellet ⇒ Max 2.00g
  (200g ring only)

6.4 Investing

Review the attached brochure re-garding the VARIO BALANCE dosing device.

- The mixing bowl should be moist.
- Choose the desired concentration
- The components will be weighed in the following order: Liquid, water then powder
- When the powder is being put into the mixing bowl, start the timer.
- With every investment the total setting time is different
  (e.g. "Zubler 144" 25min.)
- To achieve repeatable results, all steps should always be carried out in the same way.
  - For the same quantities, always use the same mixing bowl.
  - Using different size mixing bowls will result in different expansion results.
  - Spatulate by hand (e.g. 10 sec.)
  - Depending on the investment, always choose the same mixing program.
- Using light vibration while pouring the investment into the ring.
- Seat the levelling top at an angle, to avoid trapping air (blisters) at the bottom of the ring.
- While setting, place the filled ring in a vibration-free place.
- The setting time must be followed exactly (e.g. 25 min for "Zubler 144")
- Remove the top and base of the ring with a rotating movement.
- Remove the investment ring from the silicone ring former. Let the ring set for a minimum of 1 minute to ensure complete moisture evaporation before placing it in the burnout furnace.

6.5 Burnout furnace

Set burnout temperature to 850°C

- Keep in mind that the distribution of temperature depends on the volume of the furnace chamber, the number and position of the heating elements and the number of the rings.
- Maintain the burnout furnace according to the manufacturer's instructions.
- Check the temperatures on a regular basis and calibrate when necessary
- Pay attention to the correct position of the ring inside the burnout furnace (see schema of the burnout furnace)
- Depending on the number of rings inside the chamber, increase the hold time by 15 minutes for each additional ring.
- When the door is opened the temperature in the burnout furnace decreases by up to 80°C, the effective holding time starts only when the oven reaches the set temperature
  (e.g. at 850°C) for a

  100g ring: minimum 45min.
  200g ring: minimum 60min.

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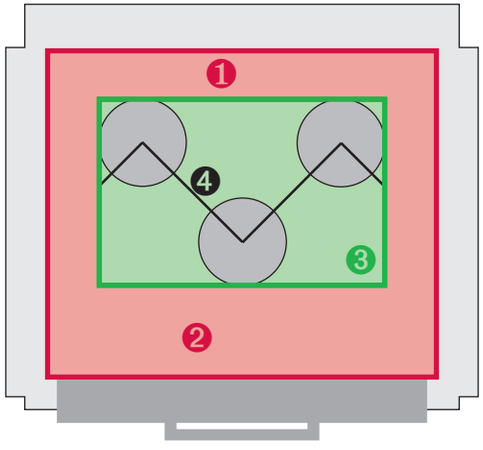
How to position rings in a burnout furnace



1. The distance of the rings to the inside walls and to each other must be at least 2,5cm (1inch). This is shown in the illustration as red zone 1.
2. The door of the furnace makes a homogeious distribution of heat impossible. Therefore, the ring may not be placed in the front third of the furnace (for large furnaces, this applies to one quarter of the front area). This is shown in the illustration as red zone 2.
3. Place the rings in the remaining area of the furnace chamber left over from points 1) and 2). This is shown in the illustration as the green zone.
4. To avoid the development of shade among the rings, do not position them in a strait line.

6.6 Pressing

- Do not pre-heat the ingot
- Do not pre-heat the plunger
- Use separator to facilitate separation.
- Make sure to use the correct program for the ring size and ingot size.

Advantages of using disposable plungers:

- The same cooling behavior as investment
- No need to remove ceramic remains
- No separator needed
- The condition of the disposable plungers is always optimal
- Easier and faster devesting

VARIO PRESS® 300

With the **VARIO PRESS® 300** you should use the standard programs prescribed by the manufacturer. e.g. Ivoclar: (See page 33)

- E.max LT/MO/HO 100g
- E.max LT/MO/HO 200g
- E.max HT 100g
- E.max HT 200g

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VARIO PRESS® 300.e

With the **VARIO PRESS® 300.e** you have at your disposal the innovative Advanced Press programs for processing lithium disilicate.

- If the VARIO PRESS 300 is used as a combination furnace or with an idle temperature below 700°C, it will be necessary to wait for approximately 10 minutes after the furnace indication, before placing the ring on the platform.
- The total time allowable for removing the ring from the burnout oven, placing the ingot and plunger into the ring and placing the combined elements on the Vario Press platform, should not exceed 40 seconds.

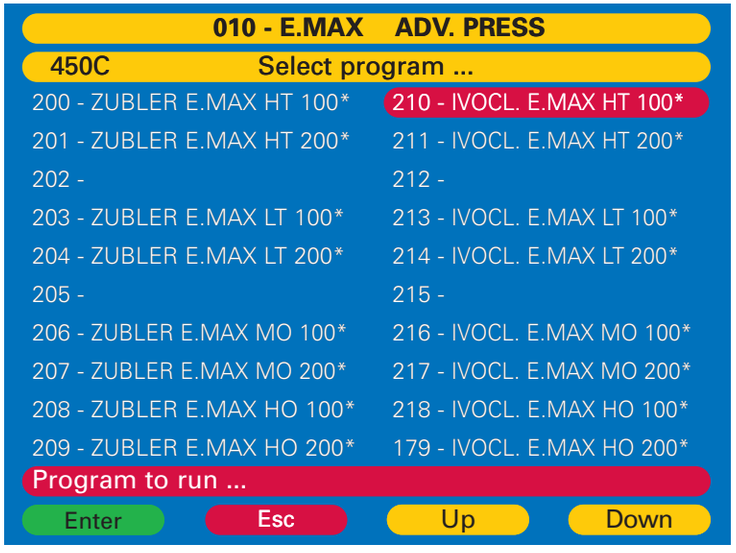
Note: Always place the ingot into the ring, print side up.

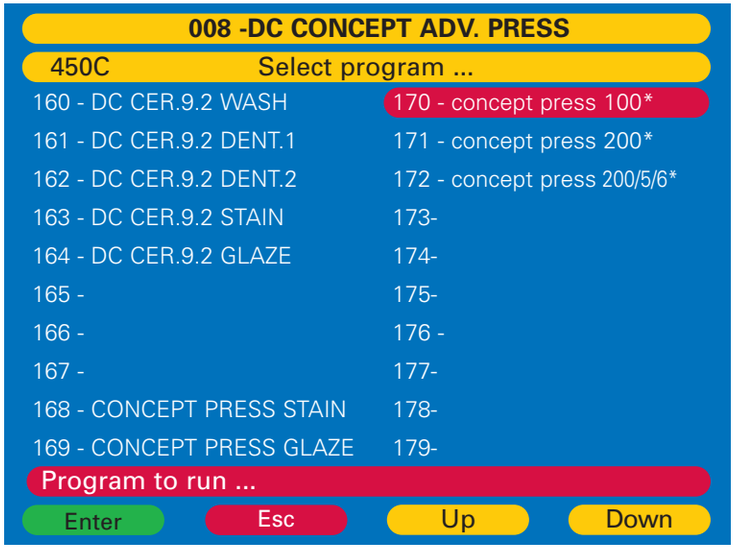
- At the end of the pressing process remove the ring and let it cool in a "draft" free area or a place without moving air. Never try to decrease the cool time by using compressed air.

Always pay attention to the press time displayed on the screen at the completion of a program. It is a good indicator of press completion.

Optimal press time:

- 23 - 53 sec for 3g pellets
- 0:42 - 1:32 min for 5/6g pellets





The E.MAX ADV. PRESS Brand contains two types of Advanced Press program sets.

The left side indicated as "ZUBLER" and the right side indicated as "IVOCL.".

The "ZUBLER" indication specifies the programs for usage with Zubler investment material while the "IVOCL." indication specifies programs for usage with Ivoclar investment material.

These separate program types (indications) are designed to cater to the specific thermal conductivity of the corresponding investment material to produce the optimum results.

6.7 Divesting

Always follow the manufacturer's instructions. For e.max, follow Ivoclar's recommendations.

- Separate the ring with a cutoff wheel at the height of the plunger. By using a gypsum knife you can break the ring at the predetermined breaking point.
- Rough divesting is carried out with polishing beads at 4 bar (58 psi) pressure.
- Fine divesting is carried out with polishing beads at 2 bar (29 psi) pressure.
- Observe the blasting direction and distance to prevent damage to the object margins during divesting.

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Intentionaly blank

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Zubler®
Disposable plungers

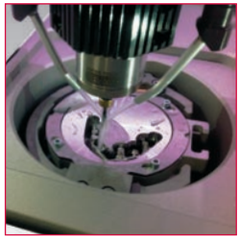
Ceramay
Concept Press

Zubler® Flex Ring
Pressing accessories

VARIO 200ZR
Ceramic firing furnace

VARIO BALANCE
Dosage device

Zubler® HS-PC™
Speed investment for
press ceramic



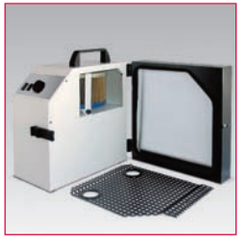
DC5
CAD / CAM
Dental Concept Systems

FZ VARIO
Central suction systems

FZ2 VARIOmatic®
Multi suction unit

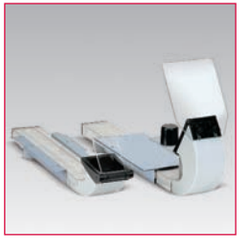
FZ1 VARIOmaster®
Multi suction unit

V4000
Single suction unit



AV 1000
Prep station box

R1200+R1250
suction funnel



VARIOstar
Micromotor

US 100/120

M - vp 39-2014
technical changes without notice!

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