Programat®
EP 3000 G2



Operating Instructions

Valid as of Software Version 6.0

CE

ivoclar vivadent®
technical

Dental Servis
Serdar Ayısıt
0555 274 05 51


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Servis
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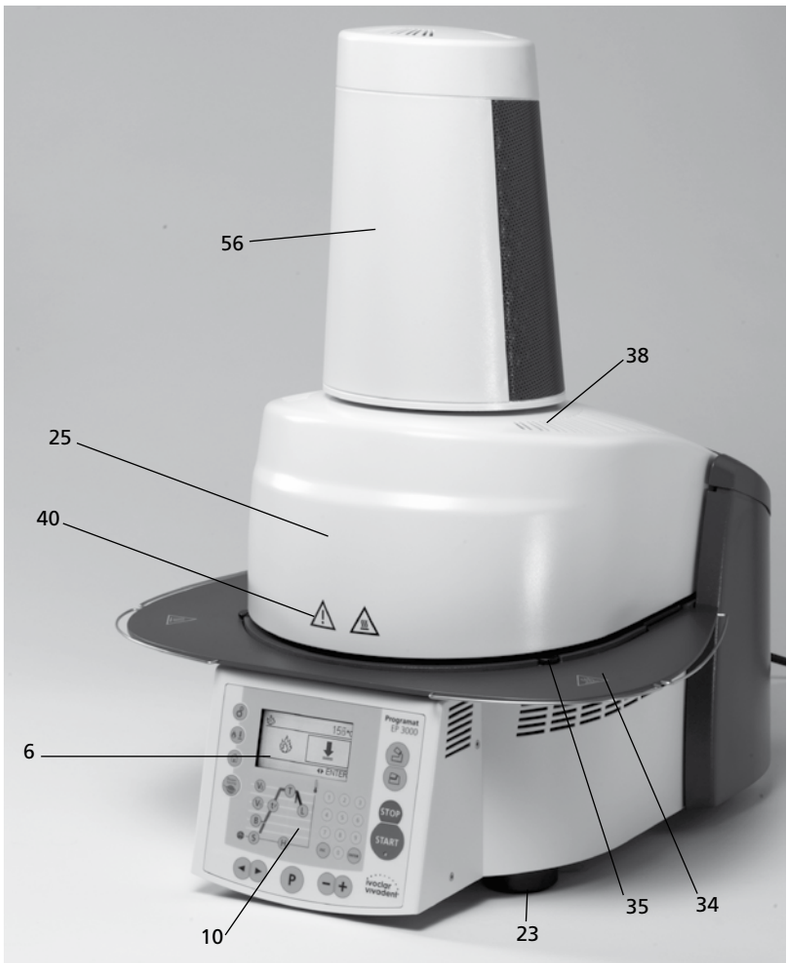
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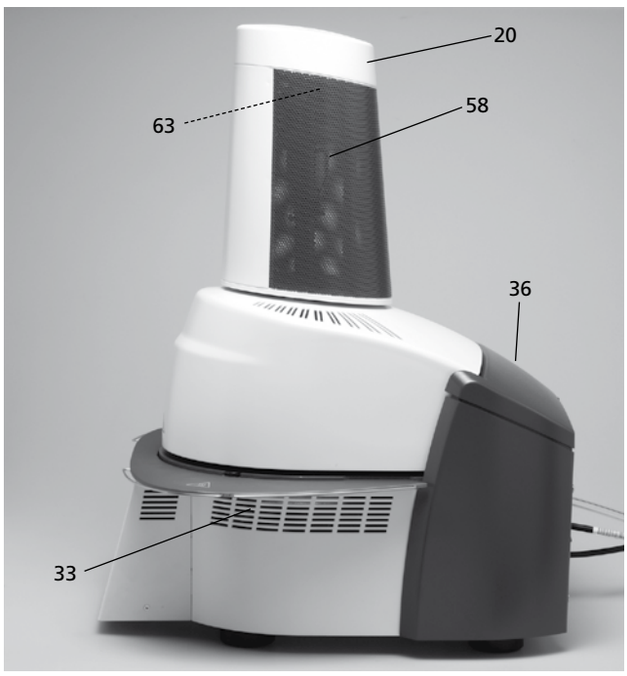
List of parts

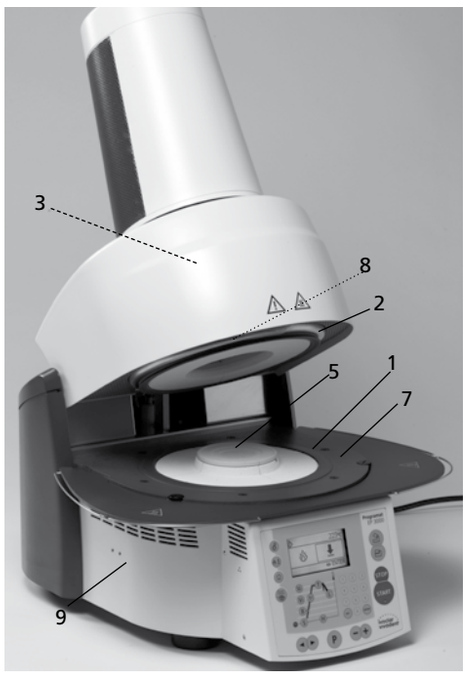
1 Sealing surface
2 Furnace head sealing ring
3 Insulation
4 Thermocouple
5 Firing plate 2
6 Display
7 Frame plate
8 QTK heating muffle
9 Housing base
10 Keypad (membrane-sealed)
11 On/Off switch
12 Heating element fuse
13 Vacuum pump fuse
15 Fuse holder
16 Power cord
17 Power socket
18 Vacuum pump socket
19 Rating plate
20 Screw for furnace head cover
21 Vacuum hose connection
22 Head insulation
23 Rubber feet
25 Housing furnace head
26 Thermocouple plug
27 Plug fuse
28 Heater plug
29 Heater plug socket
30 Thermocouple plug socket
32 Leaf spring
33 Air vents (base)
34 Cooling tray
35 Screw for cooling tray
36 Hood
37 Knurled screw for hood
38 Air vents furnace head
39 Air vents rear panel
40 Warnings
41 Furnace head mounting mark
42 Furnace base mounting mark
43 Furnace head mounting
44 Quartz-glass tube
46 Vacuum hose
47 Silicone washer
48 Firing plate holder
49 Thermocouple cable
50 Connecting rod axis
53 USB interface
54 Plug-in console
56 Cover for press drive
58 Furnace head, compl.
59 Press plunger 120
60 Press drive plug
61 Press electronics
62 Cover for press electronics
63 Fan
64 Split taper socket for press plunger
65 Terminal screw for press plunger
66 Press drive cable
67 Press drive plug socket

Please note that the list of parts applies to the entire Operating Instructions. These parts and their numbers are often referred to in later chapters.

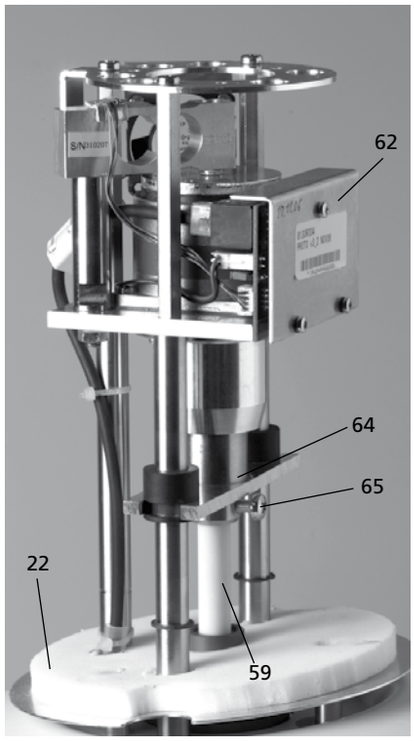
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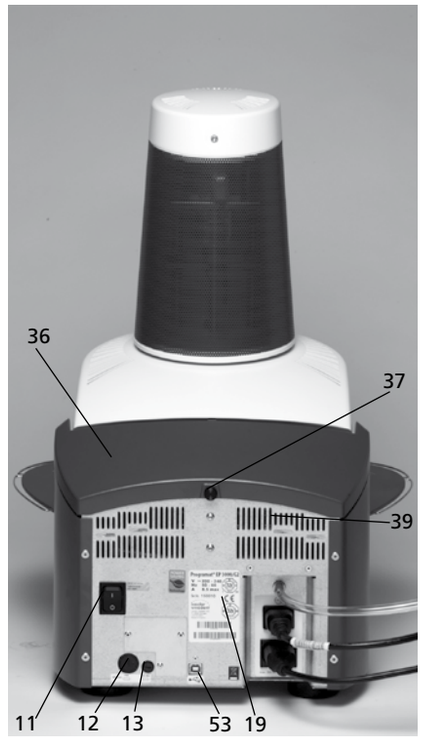


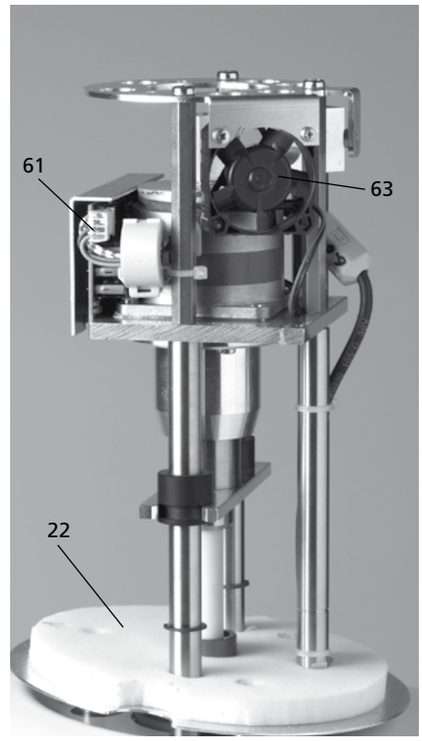


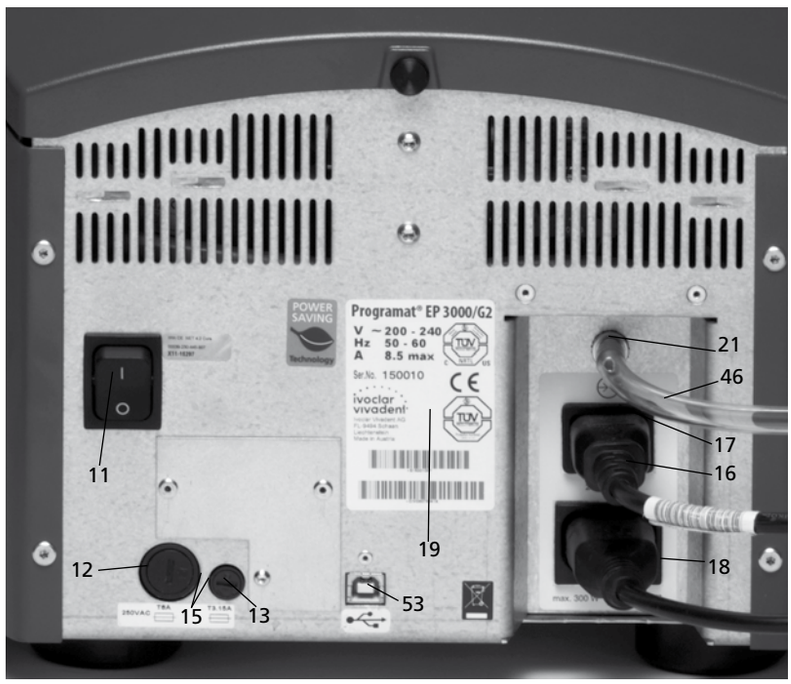


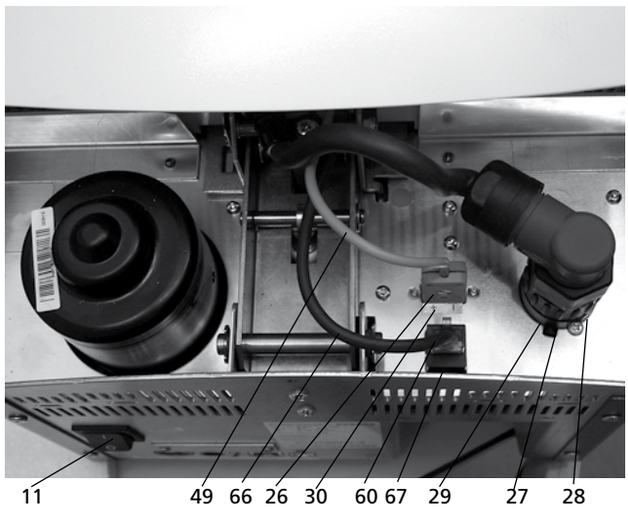
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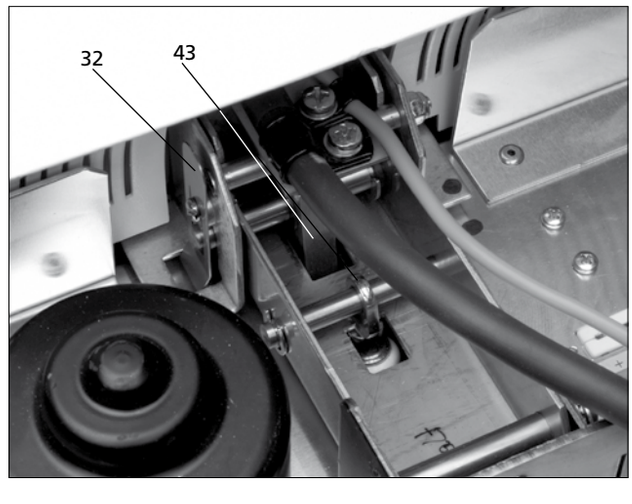




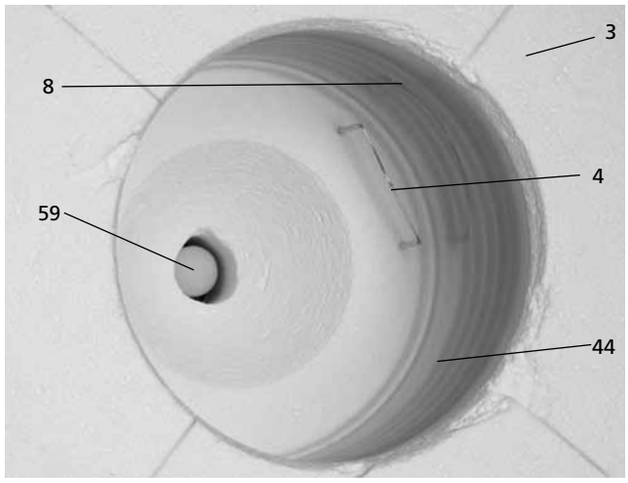


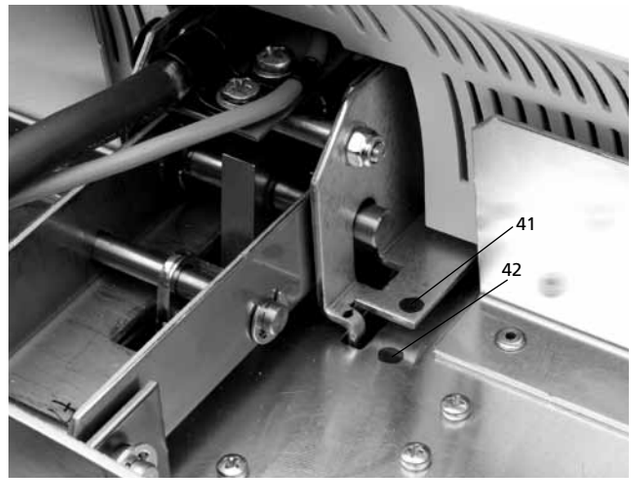






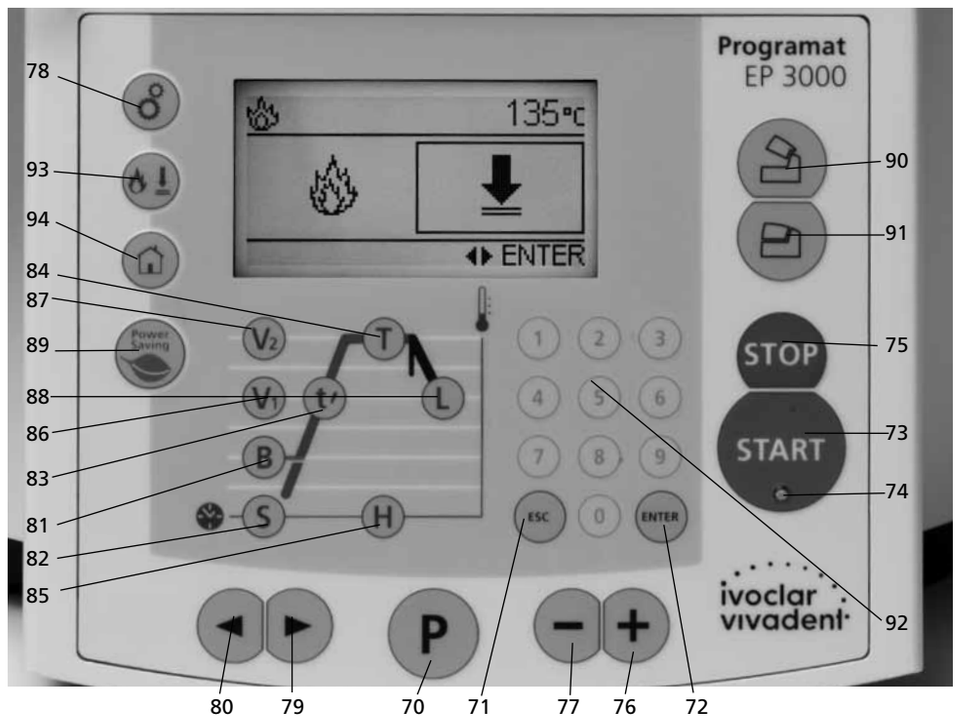
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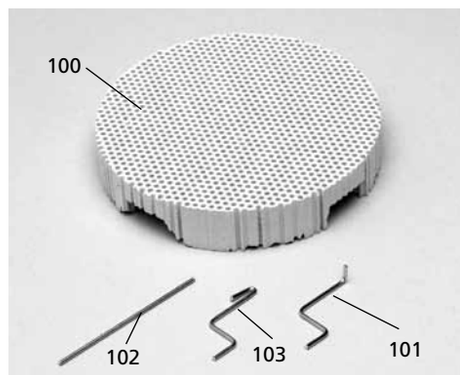


Control unit:

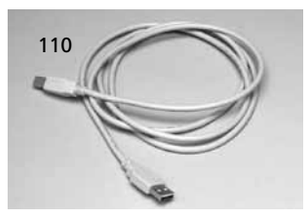
70 Program key
71 ESC key
72 ENTER key
73 START key
74 Start LED
75 STOP key
76 Plus key
77 Minus key
78 Settings / Information
79 Cursor key right
80 Cursor key left
81 Stand-by temperature
82 Closing time
83 Temperature increase
84 Holding temperature
85 Holding time
86 Vacuum on
87 Vacuum off
88 Long-term cooling
89 Power Saving key
90 Open furnace head
91 Close furnace head
92 Numeric keys
93 Firing / Pressing
94 Home key



100 Programat firing tray
101 Metal pin A
102 Metal pin B
103 Metal pin C



110 USB data cable



115 Cooling grid (complete)



120 Automatic Temperature Checking Set 2 – ATK 2



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1. Introduction / Signs and Symbols

1.1 Preface

Dear Customer

Thank you for having purchased the Programat EP 3000/G2. It is a state-of-the-art furnace for dental applications.

The furnace has been designed according to the latest industry standards. Inappropriate use may damage the equipment and be harmful to personnel. Please observe the relevant safety instructions and read the Operating Instructions carefully.

Enjoy working with the Programat EP 3000/G2.

1.2 Introduction

The signs and symbols in these Operating Instructions and on the furnace facilitate the finding of important points and have the following meanings:


Risks and dangers


Important information


Contraindication


Burn hazard


Risk of crushing


The Operating Instructions must be read

1.3 Notes regarding the Operating Instructions



Furnace concerned:
Programat EP 3000/G2
Target group:
Dental technologists

These Operating Instructions facilitate the correct, safe, and economic use of the Programat EP 3000/G2 furnace.

Should you lose the Operating Instructions, extra copies can be ordered at a nominal fee from your local Ivoclar Vivadent Service Center or downladed from www.ivoclarvivadent.com/downloadcenter.

In the Operating Instructions, the furnace is described in the 200–240 V voltage version. Please note that the voltage range shown on the images (e.g. rating plate) may differ depending on the voltage version of your furnace.

1.4 Notes on the different voltage versions

The furnace is available with different voltage versions.

– 110–120 V / 50–60 Hz
– 200–240 V / 50–60 Hz

In the Operating Instructions, the furnace is described in the 200–240 V voltage version.

Please note that the voltage range shown on the images (e.g. rating plate) may differ depending on the voltage version of your furnace.

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This chapter is especially important for personnel who work with the Programat EP 3000/G2 or who have to carry out maintenance or repair work. This chapter must be read and the corresponding instructions followed.

2.1 Indications

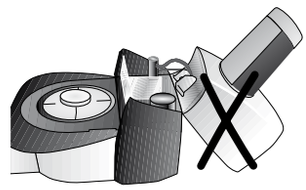
The Programat EP 3000/G2 must only be used to fire and/or press dental ceramic materials and it should be used for this purpose only. Other uses than the ones stipulated, e.g. cooking of food, firing of other materials, etc., are contraindicated. The manufacturer does not assume any liability for damage resulting from misuse. The user is solely responsible for any risk resulting from failure to observe these Instructions.

Further instructions to assure proper use of the furnace:
- The instructions, regulations, and notes in these Operating Instructions must be observed.
- The instructions, regulations, and notes in the material's Instructions for Use must be observed.
- The furnace must be operated under the indicated environmental and operating conditions (see Chapter 9).
- The Programat EP 3000/G2 must be properly maintained.

2.1.1



Risks and dangers

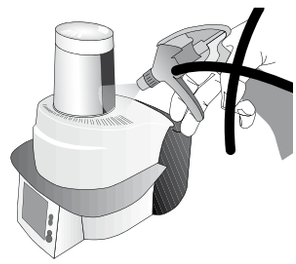


The furnace head should not be removed from the furnace base as long as the furnace head is connected by means of the heater cable.

2.1.2



Risks and dangers

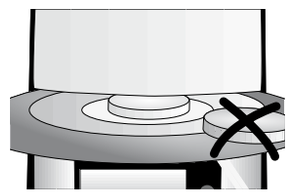


Make sure that no liquids or other foreign objects enter the furnace.

2.1.3



Contraindication

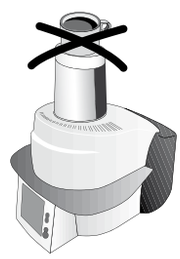


Firing trays must not be placed in the area surrounding the firing table, since this will obstruct the closing of the furnace head.

2.1.4



Contraindication

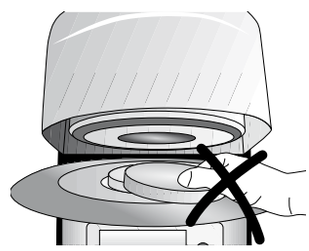


Foreign objects must not be placed on the furnace head or air vents. Make sure that no liquids or other foreign objects enter the air vents, since this may result in an electrical shock.

2.1.5



Risks and dangers, burn hazard

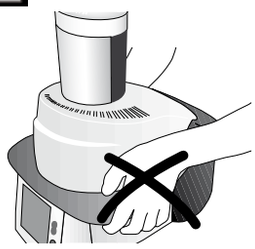


Never place objects in the firing chamber by hand, since there is a burn hazard. Always use the tongs (accessories) supplied for this purpose. Never touch the hot surface of the furnace head, as there is a burn hazard. Please also refer to the warnings on the furnace.

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2.1.6

Risks and dangers



Do not carry the furnace by the cooling tray.

2.1.7

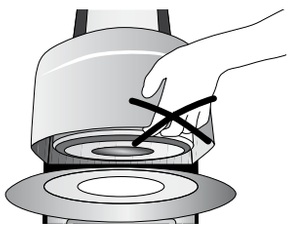
Risks and dangers



Do not carry the furnace head by the cables, since the cables and connections may be damaged.

2.1.8

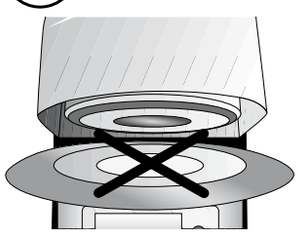
Risks and dangers



The furnace head is equipped with an electric drive and must be operated by means of the electronic controls. Never open the furnace head by hand, since the mechanism will be damaged.

2.1.9

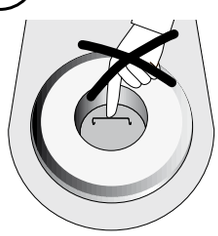
Contraindication



Never use the furnace without a firing table.

2.1.10

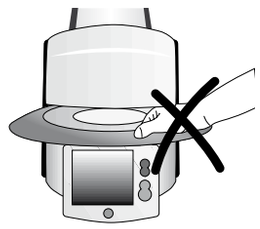
Contraindication



Do not touch the thermocouple or the quartz tube in the firing chamber. Avoid contact with the skin (grease contamination), as the parts may be damaged.

2.1.11

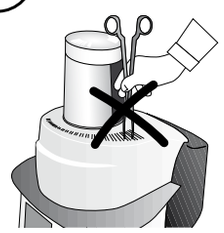
Risk of crushing and burn hazard



Never reach under the furnace head with the hand or other parts of the body during operation, since there is a risk of crushing and a burn hazard.

2.1.12

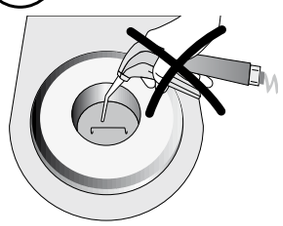
Contraindication



Do not insert any foreign objects into the air vents. There is a risk of electrical shock.

2.1.13

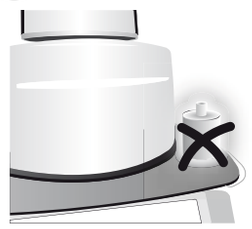
Contraindication



This product contains ceramic fibres and may release fibre dust. Do not use compressed air, or blow on the furnace thus distributing the dust in the environment and observe the additional notes on page 11.

2.1.14

Contraindication



Do not cool the hot investment ring on the cooling tray. Use only the cooling grid for that purpose.

2.1.15

Risks and dangers

The furnace must not be operated if the quartz tube or the insulation in the firing chamber is damaged. There is a risk of electric shock upon contact with the heating wire.
Avoid any damage of the insulation by contact with the investment tongs or firing tongs. Make sure to keep the firing plate for the investment ring clean.

2.1.16

Contraindication

Only use original ring bases from Ivoclar Vivadent. Observe the maximum height (57 mm) and diameter (35 mm, 50 mm and 65 mm) of the investment ring.

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2.2 Health and safety instructions

This furnace has been designed according to EN 61010-1 and has been shipped from the manufacturer in excellent condition as far as safety regulations are concerned. To maintain this condition and to ensure risk-free operation, the user must observe the notes and warnings contained in these Operating Instructions.

- Place furnace on a fire-proof table (observe local regulations, e.g. distance to combustible substances or objects, etc.).
- Always keep the air vents at the rear of the furnace free from obstruction.
- Do not touch any parts that become hot during operation of the furnace. There is a burn hazard.
- Clean furnace only with a dry or slightly moist cloth. Do not use any solvents. Disconnect power before cleaning.
- Use original packaging for transportation purposes.
- The furnace must be cool before it is packed for transportation.
- The user must especially become familiar with the warnings and operating conditions to prevent injury to personnel or damage to materials. The manufacturer is not responsible for damage resulting from misuse or failure to observe the Operating Instructions. Warranty claims cannot be accepted in such cases.
- Before switching on the furnace, make sure that the voltage indicated on the rating plate complies with your local power supply.
- The power socket must be equipped with a residual current circuit breaker.
- The furnace must be plugged into a socket with protected contacts.
- Before calibration, maintenance, repair, or exchange of parts, the power must be disconnected if the furnace is to be opened.
- If calibration, maintenance, or repair has to be carried out with the power connected and the furnace open, only qualified personnel, who are familiar with the risks and dangers, may perform these procedures.
- After maintenance, the required safety tests (high voltage resistance, protective conductor, etc.) have to be carried out.
- Ensure that only fuses of the indicated type and rated current are used.
- If it is assumed that safe operation is no longer possible, the power must be disconnected to avoid accidental operation. Safe operation is no longer possible if
  - the furnace is visibly damaged
  - the furnace does not work
  - the furnace has been stored under unfavourable conditions over an extended period of time
- Use only original spare parts.
- The temperature range for faultless operation is +5 °C to +40 °C (41 °F to 104 °F).
- If the furnace has been stored at very low temperatures or high atmospheric humidity, the head has to be opened and the unit dried or left to adjust to room temperature for approx. 1 hour (do not connect the power yet).
- The furnace has been tested for use at altitudes of up to 2000 m above sea level.
- The furnace may only be used indoors.
- Do not run the furnace via an extension cord.
- When placing and removing the investment ring, make sure not to hit the insulation of the firing chamber.
- There is a burn hazard at the cooling tray if the furnace is continuously operated in the press mode (stand-by = 700 °C).



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. Deliberate interruptions are not tolerated. Materials developing harmful gases must not be fired.

Warnings regarding the removal of the heating muffle



This product contains ceramic fibres and may release fibre dust. Fibre dust has proved to be carcinogenic in animal experiments.

The heating muffle must only be disassembled by a certified After Sales Service Centre. Information regarding the Safety Data Sheet is also available from your After Sales Service Centre.

Warning
The insulation on this product contains refractory ceramic fibres (RCF) which pose a possible cancer hazard, if agitated and inhaled. May be irritating to the skin, eyes or respiratory tract if insulation is cracked or corrupted.

California Proposition 65
Warning: "This product contains Refractory Ceramic Fibres, a substance known to the State of California to cause cancer."



Disposal:
The furnaces must not be disposed in the normal domestic waste. Please correctly dispose of old furnaces according to the corresponding EU council directive. Information on the correct disposal may also be found on your local Ivoclar Vivadent homepage.

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3. Product Description

3.1 Components

The Programat EP 3000/G2 comprises the following components:
- Furnace base with electronic controls
- Furnace head with firing chamber and press drive
- Firing plate
- Cooling tray
- Power cord and hose for vacuum pump
- Vacuum pump (accessories)

3.2 Hazardous areas and safety equipment

Description of the hazardous areas of the furnace:

Hazardous area	Type of risk
Firing chamber	Risk of burning
Opening/closing mechanism	Risk of crushing
Electrical components	Risk of electrical shock

Description of the safety equipment of the furnace:

Safety equipment	Protective effect
Protective conductor	Protection from electrical shock
Electrical fuses	Protection from electrical shock
Housing and covers	Protection from electrical shock, burn hazard and crushing

3.3 Functional description

The firing/pressing chamber may be heated up to max. 1200 °C (2192 °F) by means of a heating element. Furthermore, the firing chamber has been designed in such a way that a vacuum may be created with a vacuum pump. The presssure for the press procedure is generated by a press drive. The firing/pressing programs are controlled with the corresponding electronic controls and software. Moreover, the set and actual temperatures are continuously compared.

3.4 Accessories
(not part of the delivery form)

- Automatic Temperature Checking Set 2 (ATK 2)
- Programat Accessories Set 2 (Programat firing trays, Silicone Nitride Firing Tray “K”, firing tongs, Automatic Temperature Checking Set 2)
- Vacuum pump

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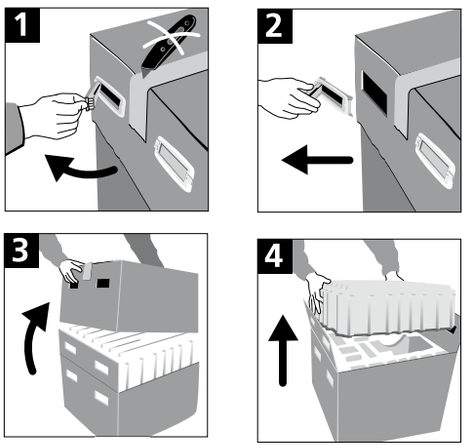
4. Installation and Initial Start-Up

4.1 Unpacking and checking the contents

The packaging provides the following advantages:
– Reusable packaging
– Closing mechanism with integrated transportation grips
– Ideal protection by Styrofoam inserts
– Easy handling / optimum unpacking
– The packaging may be used in several ways (modules)

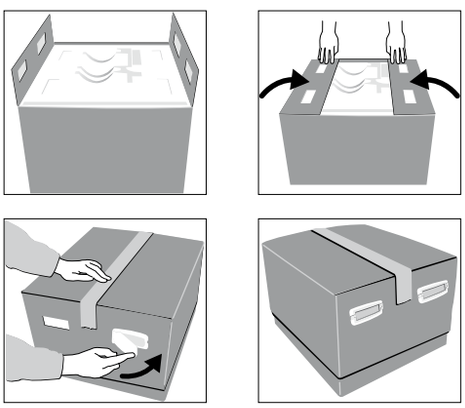
Check the delivery for completeness (see delivery form in Chapter 9) and transportation damage. If parts are damaged or missing, contact your local Ivoclar Vivadent Service Center.

There are no special transportation grips on the furnace. Support the bottom of the furnace to carry it.



Remove furnace components from their packaging and place the unit on a suitable table. Please observe the instructions on the outer packaging.

Packing and shipping of individual components
The packaging of the EP 3000/G2 permits simple and safe shipping of individual components. Simply use the two corresponding inserts. Fold the side flaps and combine the two parts by means of the transportation flaps. The packaging may be disposed with the regular household refuse.



We recommend keeping the original packaging for future service and transportation purposes.

4.2 Selecting the location

Place the furnace on a flat table using the rubber feet. Make sure that the furnace is not placed in the immediate vicinity of heaters or other sources of heat. Make sure that air may properly circulate between the wall and the furnace.

Also ensure that there is enough space between the furnace and the user, as the furnace releases heat during the opening of the furnace head.

The furnace should neither be placed nor operated in areas where there is an explosion hazard.

4.3 Assembly

Make sure the voltage indicated on the rating plate (19) complies with the local power supply. If this is not the case, the furnace must not be connected.



Step 1:
Assembling the cooling tray (34)
Remove both screws (35) including the silicone washer (47) for the cooling tray (34).



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Place the cooling tray (34) on the frame plate (7). Make sure that the cooling tray (34) is correctly positioned on the frame plate (7).



Secure the cooling tray (34) with the two screws (35) including the silicone washer (47).



Step 2:
Mounting the furnace head
The complete furnace head (58) is best mounted with the rear panel of the furnace pointing towards the user. Lift the furnace head with both hands (see picture) and carefully position it on the furnace head mounting (43).



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Ensure that the furnace head mounting mark (41) is aligned with the furnace base mounting mark (42).

Make sure that the firing plate holder (48) is not damaged by mounting the furnace head.

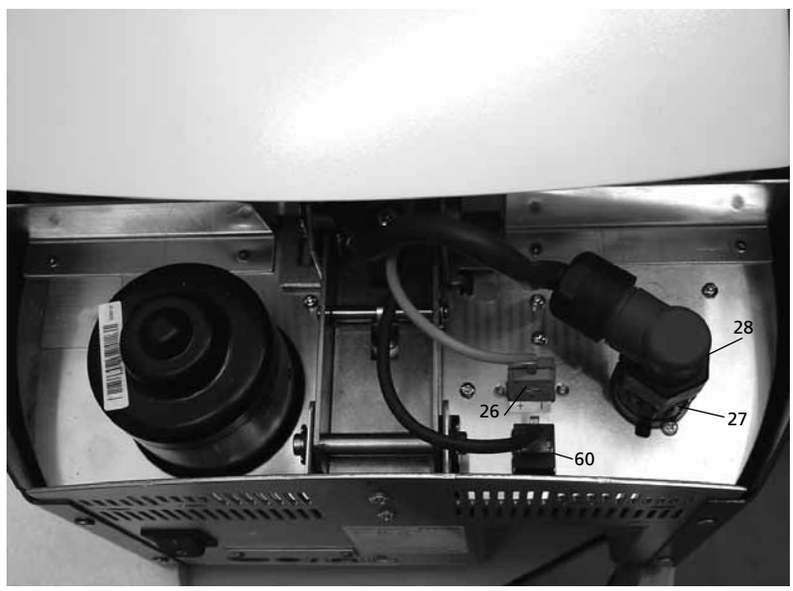


Step 3:
Placing the firing plate for the investment ring (5)
The firing plate for the investment ring (5) can now be placed on the firing plate holder (48).



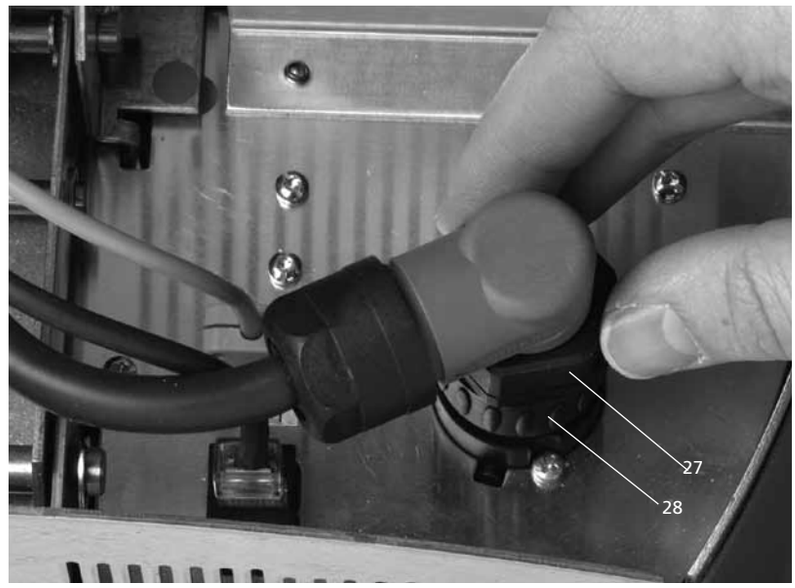
Step 4:
Connections
Connect the cables of the furnace head with the furnace base. Proceed as follows:

- Insert the thermocouple plug (26) (make sure that the polarity of the plug is correct)
- Insert the heater plug (28)
- Insert the press drive plug (60)



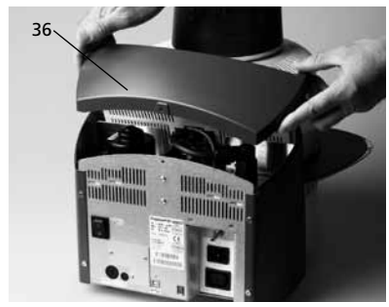
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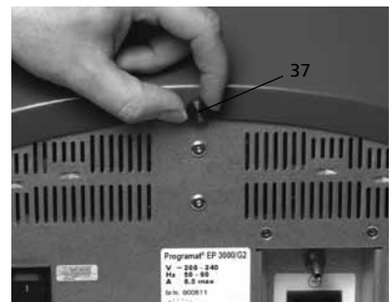
Secure the heater plug (28) with the plug fuse (27) by turning it until the heater plug (28) has been secured.



Step 5:
Mounting the hood (36)
Once all cables are properly connected to the furnace base, the hood (36) can be mounted. Subsequently, secure the hood with the knurled screw (37).

The furnace may only be operated with the hood mounted.





Step 6:
Establishing additional connections

Power connection
Please make sure that the voltage indicated on the rating plate complies with the local power supply. Connect the power cord with the power socket of the furnace (17).

Vacuum pump connection
Connect the vacuum pump plug with the vacuum pump socket (18).

We recommend using only the VP4 vacuum pump from Ivoclar Vivadent, since this pump is especially coordinated with the furnace.
If other pumps are used, please observe and do not exceed the maximum power consumption.



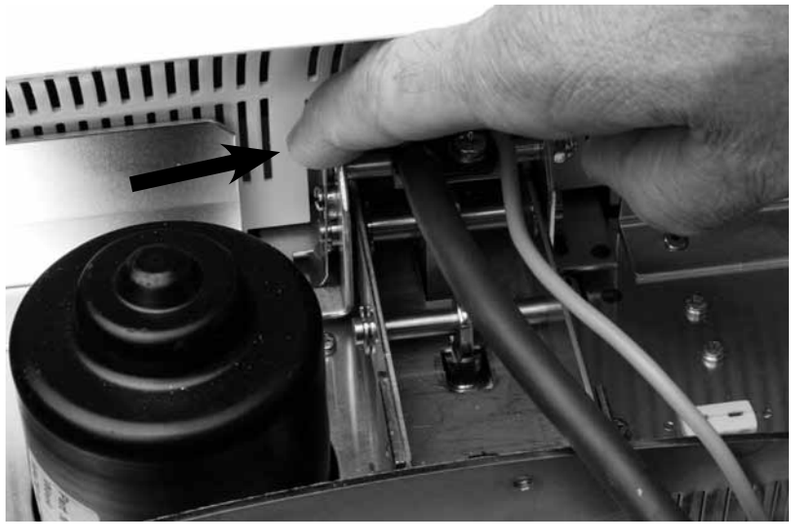
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4.4 Removing the furnace head

Before the hood (36) is removed, the furnace has to be switched off and the power cord disconnected from the power socket (17).

1. Loosen and remove the knurled screw (37) of the hood (36)
2. Remove the hood (36)
3. Disconnect the press drive plug (60)
4. Disconnect the thermocouple plug (26)
5. Disconnect the heater plug (28)
6. Press the leaf spring (32) with a finger, lift off the furnace head at the same time and remove it

Make sure the furnace head has completely cooled down before it is removed (fire hazard).



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4.5 Initial start-up

1. Connect the power cord with the wall socket.
2. Put the On/Off switch (11) at the rear of the furnace on position „I“ and connect the vacuum pump.

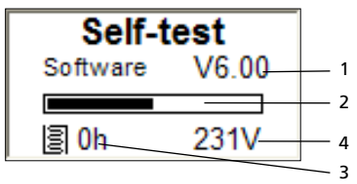
4.5.1 Start screen

Immediately after switching on, the display briefly shows the start screen.



4.5.2 Self-test

The furnace will automatically conduct a self-test after start. The performance of all furnace components is automatically checked. The display shows the following indications during the self-test:

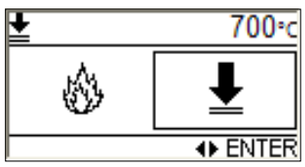


1 Software version
2 Status bar
3 Firing hours
4 Current power supply

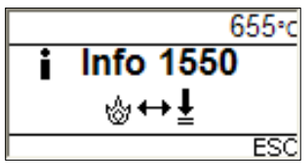
If a component is defective, the corresponding error number (ER xxx) will be indicated in the display.

4.5.3 Selecting the operation mode

After the self-test, the selection screen for the operation mode will be displayed. It is used to select the general operation mode (firing or pressing). The operation mode selection can also be shown via the Firing / Pressing key (93) if no program is active.



The cursor position (frame around the symbol) can be changed by means of the Cursor keys. The marked operation mode can finally be selected using the Enter key.



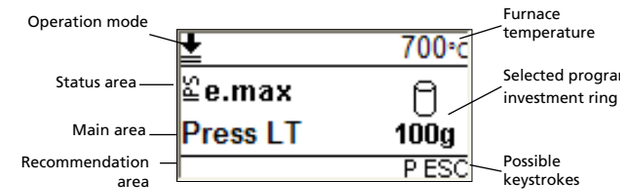
This information is only shown if the operation mode has been changed. Make sure that the furnace runs at the new stand-by temperature long enough before you start a program.

Use the ESC key to quit such messages (Info, Hint, Error). The acoustic signal can be stopped any time by pressing the STOP key.

4.5.4 Basic build-up of screens

The different areas of the screen are shown with the press program stand-by and operating screens as examples.

The uppermost line mainly shows status information. In the central and largest area, important information of the respective screen are displayed. The lowest line provides information about possible activities (keystrokes). The command keys (Open furnace head, Close furnace head, STOP, START keys) are not shown for reasons of clarity.

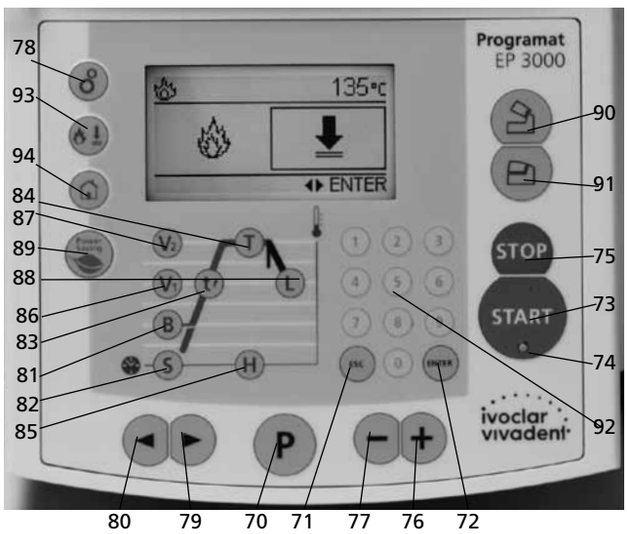


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5. Operation and Configuration

5.1 Introduction to the operation

The Programat EP 3000/G2 is equipped with a graphical display with backlighting. The furnace can be operated by means of the membrane-sealed keypad. In addition, the parameters can be selected directly by means of the Parameter firing curve with the Parameter keys.
The numeric and command keys can be used to program and control the furnace.



5.2 Explanation of the key functions

– **Firing / Pressing (93)**
Selection of the firing or pressing mode

– **Program key (70)**
This key is used to switch between the parameter screen and the stand-by screen (or operation screen).

– **START key (73)**
Starts the selected program. The fact that the program is running is indicated by the green Start LED. If the program is interrupted (1x STOP), the Start LED flashes until renewed pressing of START results in the program being resumed.

– **STOP key (75)**
A program in progress can be interrupted by pressing STOP once. Pressing STOP twice will abort the program. Movement of the furnace head can be stopped at any time by pressing STOP.
The beeper can be confirmed by pressing the STOP key.

– **ESC key (71)**
Ends an entry without accepting the value. Return from the current to the previous screen. Confirmation of error messages.

– **ENTER key (72)**
Confirmation of entered numeric value. Selection of a setting or a test program.

– **Numeric keys (92)**
Used to enter numeric values.

– **Cursor key left, right (80, 79)**
These keys can be used to move the cursor (e.g. for selecting the operation mode, size of the investment ring, parameter programming, etc.). In addition, the displayed program, information or setting can be changed.

– **Minus and Plus keys (77, 76)**
These keys can be used to change the numeric value displayed or marked with the cursor.

– **Settings / Information (78)**
This key shows the selection (Information / Settings). The Left key shows the information screen. The Right key shows the settings screen.

– **Open furnace head (90)**
Opening of the furnace head in 5 seconds.

– **Close furnace head (91)**
Closing of the furnace head in 5 seconds.

– **T = Holding temperature (84)**
Shows the holding temperature (actual firing temperature).

– **H = Holding time (85)**
Shows the holding time (actual firing time).

– **S = Closing time (82)**
Indicates the closing time of the furnace head (preheating time).

– **B = Stand-by temperature (81)**
Indicates the stand-by temperature.

– **t = Temperature increase (83)**
Shows the temperature increase per minute for the heating process (°C/min or °F/min).

– **V1 Vacuum on temp. (86)**
Shows the temperature at which the vacuum is switched on.

– **V2 Vacuum off temp. (87)**
Shows the temperature at which the vacuum is switched off. If this temperature corresponds to the Holding temperature T, the vacuum remains on during the entire holding time.
Special case: If this temperature V2 is exactly 1 °C (or 1 °F) higher than the Holding temperature T while long-term cooling is active, the vacuum remains on during the entire long-term cooling.

– **L = Long-term cooling (88)**
Determines the temperature point at which the furnace head should be opened after completion of the Holding time and free or controlled (tL) cooling.

– **Power-saving key (89)**
Power-saving function activated (only possible with the furnace head closed and the furnace on idle). The display shows the power-saving icon. Pressing any key ends the power-saving function.

– **tL = Controlled cooling - temperature decrease rate (°C/min or °F/min)**

– **Home key (94)**
Return to "Program selection Indication".

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5.3 Program structure

5.3.1 Firing programs

All the firing programs are equivalent and, therefore, full-fledged programs. In each program, all the parameters can be adjusted.

a) Ivoclar Vivadent firing programs for Ivoclar Vivadent materials

When the furnace is delivered ex works, the Ivoclar Vivadent firing programs already contain the recommended material parameter settings. Moreover, the programs are write-protected. Consequently, it is not possible to accidentally overwrite the parameters.

Please refer to the respective program table (list of parameters) in Chapter 10.

However, the parameters are designed in such a way that they can be changed and over-written at any time, if the programs are to be used for other purposes. Therefore, these programs are also available as free, individual programs.

b) Individual firing programs

The individual firing programs (at least 300) can be programmed freely.

5.3.2 Press programs

a) Ivoclar Vivadent press programs for Ivoclar Vivadent materials

When the furnace is delivered ex works, the standard press programs already contain the recommended material parameter settings. They cannot be adjusted.

b) Individual press programs

The individual press programs (20) can be programmed freely.

5.4 Adjustable parameters and possible value ranges

Symbol	Parameter	Value range °C	Value range °F
P	Program number	1-300	
B	Stand-by temperature	100-700 °C	212-1292 °F
S	Closing time (min : sec)	00:18-30:00	
t	Temperature increase rate	10-140 °C/min	18-252 °F/min
T	Holding temperature	100-1200 °C	212-2192 °F
H	Holding time (min : sec)	00.01-60:00	
V1	Vacuum on	0 or 1-1200 °C	0 or 34-2192 °F
V2	Vacuum off	0 or 1-1200 °C	0 or 34-2192 °F
L	Long-term cooling	0 or 50-1200 °C	0 or 122-2192 °F
tL	Cooling temperature rate	0 or 1-50 °C	0 or 2-90 °F/min
t	Temperature increase rate 2nd stage	10-140 °C/min	18-252 °F/min
T2	Holding temperature 2nd stage	100-1200 °C/min	212-2192 °F
H2	Holding time 2nd stage (min : sec)	00.01-60:00	
V1 2	Vacuum on temp. 2nd stage	0 or 1-1200 °C	0 or 34-2192 °F
V2 2	Vacuum off temp. 2nd stage	0 or 1-1200 °C	0 or 34-2192 °F

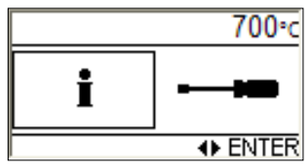
Automatic plausibility check

The furnace is equipped with an automatic plausibility check function. The parameters (e.g. T 960 but L 1000) are checked upon each program start.
In case of contradictory parameter combinations, the program stops automatically and the respective error number is indicated.

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5.5 Settings, special programs and information

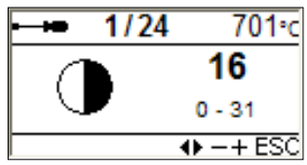
This screen can be selected via the Settings / Information key (78) if no program is active.



The cursor position (frame around the symbol) can be changed by means of the Cursor keys. The marked symbol (Information or Settings) can finally be selected using the Enter key.

5.5.1 Settings

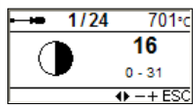
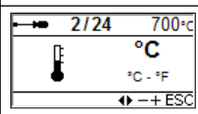
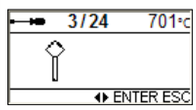
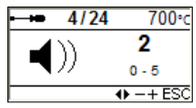
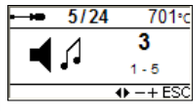
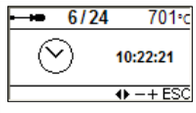
Once the Settings have been selected, the first page of the Settings is displayed. The current page number is shown in the upper line.

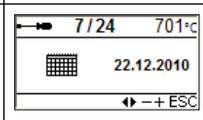
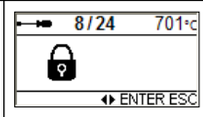
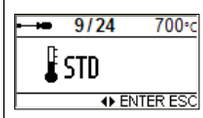
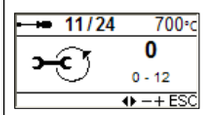
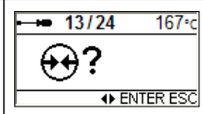
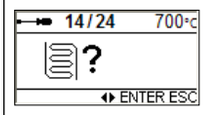
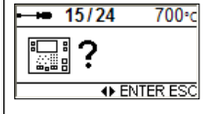
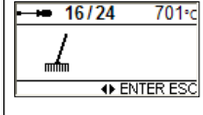
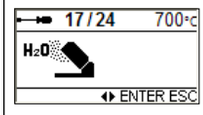


The displayed page (Setting) can be changed using the Cursor keys.

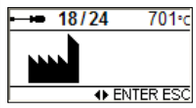
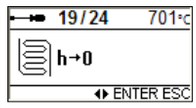
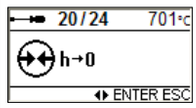
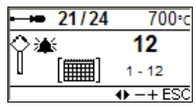
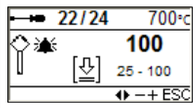
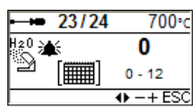
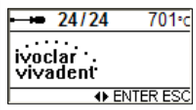
If the Minus/Plus keys are shown, the displayed Setting (e.g. Contrast) can be edited with the Minus/Plus keys.
If the ENTER key is shown, the displayed Setting or Test program (e.g. Calibration) can be confirmed with the ENTER key.

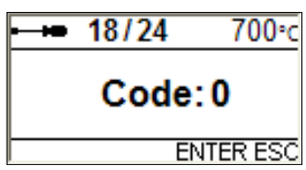
The ESC key can be used to return to the previous screen.

Page	Description	Indication on display	Short description
1/24	Contrast		The contrast can be set within the displayed limiting values using the Minus/Plus keys.
2/24	Temperature mode		The Minus/Plus keys can be used to toggle between °C and °F.
3/24	Calibration program ATK2		This program is used to conduct the automatic temperature calibration with the ATK2. Please observe the notes in Chapter 7.4.
4/24	Volume		The Minus/Plus keys can be used to set the desired volume.
5/24	Buzzer tunes		The Minus/Plus keys can be used to set the desired buzzer tunes.
6/24	Time		The time can be entered using the Numeric keys.

Page	Description	Indication on display	Short description
7/24	Date		The date can be entered using the Numeric keys.
8/24	General write protection		The general write protection can be activated or deactivated using the Minus/Plus keys. The general write protection locks all firing programs. The user code is required.
9/24	„Ivoclar Vivadent optimized temperature control“		The STD code is required.
10/24	Power-Saving mode		The automatic power-saving mode can be activated and deactivated with the + or – key (for additional information, see section 6.3.10)
11/24	Service interval		Here you can set the interval for the service notes to be displayed (Hint 1700).
12/24	Protocolling		The automatic protocol function can be activated or deactivated with the + or – key.
13/24	Vacuum test program		See Chapter 5.5.2 Special programs.
14/24	Heater test program		See Chapter 5.5.2 Special programs
15/24	Keypad test program		See Chapter 5.5.2 Special programs
16/24	Cleaning program		See Chapter 5.5.2 Special programs
17/24	Dehumidification program		See Chapter 5.5.2 Special programs

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Page	Description	Indication on display	Short description
18/24	Load factory settings		Resets the values and parameters to the factory settings. NOTE: All individual programs you have created and saved will be deleted with this function. The user code is required.
19/24	Set the firing hours of the furnace head to zero		Resets the determined firing hours. The user code is required.
20/24	Set the vacuum pump hours to zero		Resets the determined vacuum pump hours. The user code is required.
21/24	Calibration interval		Ex works: 12 months (another 1, 3 and 6 months are possible). Afterwards, a reminder for temperature calibration appears.
22/24	Press calibration interval		Ex works: 100 press cycles. Afterwards, a reminder for the temperature calibration appears.
23/24	Dehumidification interval		Ex works: 12 months. Afterwards, a reminder for the dehumidification program appears.
24/24	Ivoclar Vivadent AG		Only for the After Sales Service.



The user code (6725) is required for some Settings.

5.5.2 Special programs

5.5.2.1 Vacuum test program

With this vacuum test program, the performance of the vacuum system can be automatically tested. For that purpose, the achieved (minimum) pressure in mbar is measured and indicated. If the pressure value is below 80 mbar (hPa), the vacuum performance of the system is adequate.

5.5.2.2 Heater test program

The quality of the heating muffle may be automatically checked by means of the heater test (duration: approx. 7 min.). The heater test should only be conducted with the empty firing chamber, since an object in the chamber (e.g. firing tray) may influence the test result. Conduct the heater test immediately after switching on the furnace and before any actual firing procedures. If the furnace is too hot, an incorrect heating muffle quality will be indicated. If the heating element quality falls below 50%, replacing the heating element is recommended.

5.5.2.3 Keypad test

Each time the keypad is pressed, a short beep sounds. The keypad test can be ended by pressing ESC.

5.5.2.4 Cleaning program

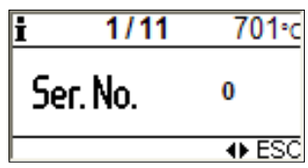
The cleaning program is used to „clean" the heating muffle (duration: approx. 17 min.) After a cleaning program, it is recommended to calibrate the furnace. In case of problems with discolouration of the ceramic, we recommend replacing the firing tray material.

5.5.2.5 Dehumidification program

The condensation of water in the insulation of the firing chamber and the vacuum pump will result in a lower vacuum and thus to impaired firing results. For that reason, the furnace head should be kept closed when the furnace is switched off or is below 100 °C, in order to prevent the absorption of humidity. Start the dehumidification program if required (humidity in the insulation).

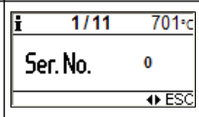
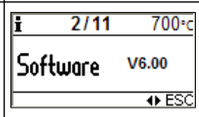
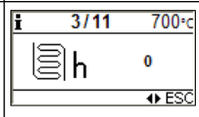
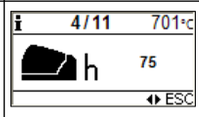
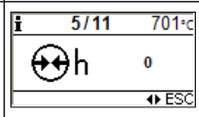
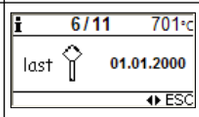
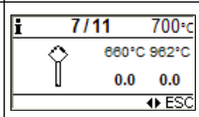
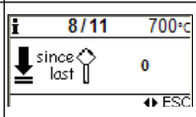
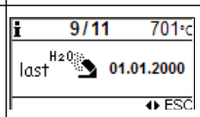
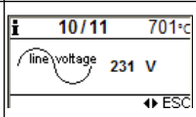
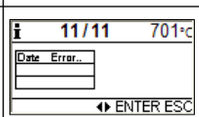
5.5.3 Information

Once the Information has been selected via the Settings / Information key (78), the first page of the Information is displayed. The current page number is shown in the upper line.

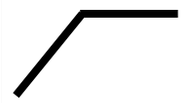


The displayed page (Information) can be changed using the Cursor keys.
The ESC key can be used to return to the previous screen.

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Page	Description	Indication on display	Short description
1/11	Serial number		Serial number of the furnace, see also rating plate.
2/11	Software version		
3/11	Firing hours of the furnace head		
4/11	Operating hours of the furnace		
5/11	Operating hours of the vacuum pump		
6/11	Last start of the calibration program		
7/11	Calibration values		Calibration values at 660 °C and 962 °C.
8/11	Press procedures since the last calibration		Number of press cycles since the last start of the calibration program.
9/11	Last start of the dehumidification program		
10/11	Power supply		Shows the current supply voltage.
11/11	Error messages		Shows the last error messages

5.6 Explanation of the symbols on the display

Symbol name	Meaning	Symbol
„One-stage program“	Shows that a standard one-stage firing program is used	
„Two-stage program“	Shows that a two-stage special program is used. The bold line shows that the values of the **first** stage are displayed.	
„Two-stage program“	Shows that a two-stage special program is used. The bold line shows that the values of the **second** stage are displayed.	
„Standard opening of the furnace head“ (toggle with Minus/ Plus keys)	Shows that the furnace head opens with standard speed after firing.	
„Quick opening of the furnace head“ (toggle with Minus/ Plus keys)	Shows that the furnace head opens quickly after firing.	
Predrying	Shows that the option „Predrying“ was activated.	
„Thermo Shock Protection“	Thermo Shock Protection active	TSP
Standard closing of the furnace head	Predrying and Thermo Shock Protection are inactive	
Open lock	„Individual write protection inactive“	
Closed lock	„Individual write protection active“	
„General write protection active“	All programs are write-protected.	
„Paging“	To change pages in the Parameter screen; only for two-stage firing programs.	
Operation mode Firing	For selecting the Firing mode.	
Pressing or note on active press process	For selecting the Press mode. If the press process has been started, this symbol is shown next to the remaining pressing time.	

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Symbol name	Meaning	Symbol
Information	For selecting the Information screen.	
Settings	For selecting the Settings screen.	

For additional explanations on the symbols and the corresponding functions please refer to Chapter 6.4 „Other options and special features of the furnace“.

5.7 Explanation of the beeper signals

Basically, the buzzer tunes and volume set by the user are used for all acoustic signals.

The beeper can only be ended by pressing the STOP key.

1 **After the self-test is completed**
To inform the user that the automatic self-test has been successfully completed, the selected melody is played.

2 **Furnace head open and temperature below 550 °C / 1022 °F**
To inform the user that the temperature in the open furnace head has dropped below 550 °C / 1022 °F, the selected melody is played (5 seconds). In other words, the furnace head is basically cool enough for the next program start.

3 **Furnace head open and temperature below 320 °C / 608 °F**
To inform the user that the temperature in the open furnace head has dropped below 320 °C / 608 °F, the selected melody is played.
If the first playback (10 seconds) is not acknowledged with the STOP key, a second playback sounds after 5 minutes (for 5 minutes). After that, no further signal is played.
If one of the two playbacks is acknowledged with the STOP key, the signal transmitter is switched off immediately and no further signals indicating the cooled furnace head will be sounded.

4 **For error messages**
Error messages are acoustically supported with the ‚error melody‘ (endless beep). The signal transmitter may be switched off with the STOP key, while the error message still remains visible. If the error message is acknowledge with the ESC key, the signal transmitter is also switched off.

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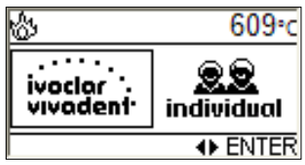
6.1 Switching on/off

Put ON/OFF switch on position "I". The furnace conducts an automatic self-test, which will be indicated in the beginning.
Subsequently, a status bar shows how many % of the self-test have been completed. Make sure that the furnace is not manipulated during this time.
After successful completion of the self-test, the main menu is shown in the display.

6.2 Firing programs

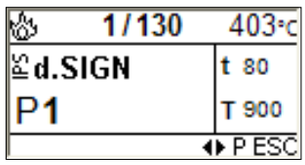
6.2.1 Selecting the type of firing program

Once the Firing mode has been selected, the firing program type screen is displayed. There is a choice between Ivoclar Vivadent firing programs for Ivoclar Vivadent materials and free, individual firing programs.
The cursor position (frame) can be changed by means of the Cursor keys. The marked type of firing program can finally be selected using the Enter key.



6.2.2 Selecting the type of firing program and stand-by screen (firing program)

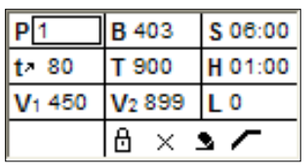
Once the desired type of firing program has been selected, the firing program screen is displayed. This screen corresponds to the stand-by screen of the firing programs.

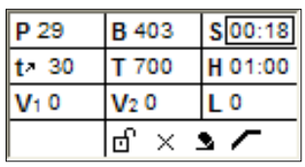


- The displayed (selectable) firing program can be changed using the Cursor keys. The displayed firing program can finally be selected using the Enter key.
- The Program key can be used to change to the parameter screen (firing program).
- The ESC key can be used to change to the selection of firing program types.

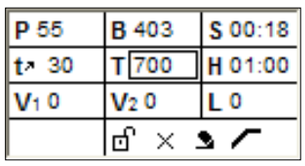
6.2.3 Parameter screen (firing program)

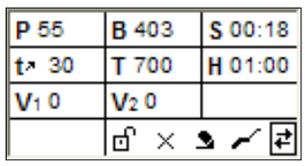
The Program key can be used to change to the parameter screen (firing program) anytime. Every time the Program key is pressed, it is possible to toggle between the stand-by or operation screen and the parameter screen.





The cursor position can be moved between the parameters by means of the Cursor keys. The marked parameter (or function symbol) can be edited with the Minus/Plus keys or via the numeric keys and confirmed by pressing ENTER. Examples:



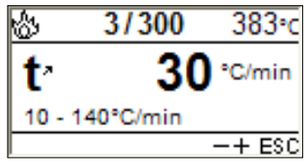


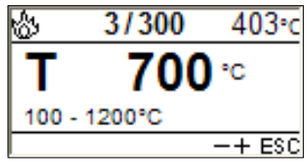
The ESC key can be used to return to the previous screen.

- *Program write protection and general write protection*
  The standard firing programs for Ivoclar Vivadent materials have been locked ex works with an active program write protection (closed lock), which can be deactivated by the user for each program using the Minus/Plus keys.
  The individual firing programs are open ex works, i.e. the program write protection is not active (open lock).
  If the superordinate „General write protection" was activated via Settings and user code, the „General write protection symbol" is displayed instead.
- *Indication of invalid entry*
  The blinking exclamation mark (!) indicates an invalid entry. For further notes please refer to Chapter 6.3.2.
- *Predrying*
  If the predrying function was activated, the respective symbol is shown in the parameter screen. For further notes please refer to Chapter 6.3.6.
- *Standard / quick opening of the furnace head*
  The opening time of the furnace head at the end of the firing program (standard: 60 seconds, quick: 18 seconds) can be changed by means of the Minus/Plus keys. For further notes please refer to Chapter 6.3.7.
- *One-/two-stage program*
  If the cursor is positioned on the „Program stage symbol", the program can be selected as one- or two-stage program using the Minus/Plus keys. For further notes please refer to Chapter 6.3.8.
- *Displaying the parameters of the first/second stage (only for two-stage programs)*
  If the cursor is positioned on the „Paging symbol", it is possible to toggle between the parameters of the first and second stage using the ENTER key.

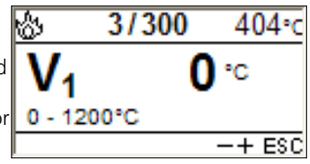
6.2.4 Parameter detail screen (firing program)

These parameter details can be displayed in the firing mode by pressing the corresponding keys ().



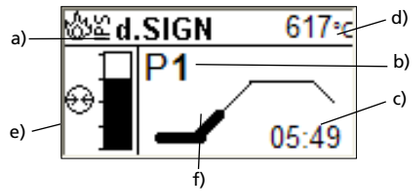


The displayed parameter can be edited with the Minus/Plus keys or via the numeric keys and confirmed by pressing ENTER. The acceptable value range is shown for information purposes to avoid incorrect entries.



6.2.5 Operation screen (firing program)

Operation screen while a firing program is in progress.



The following information is shown in this screen:
a) Program group
b) Program number
c) Remaining time
d) Current temperature
e) Status of vacuum *)
f) Status bar in the firing curve

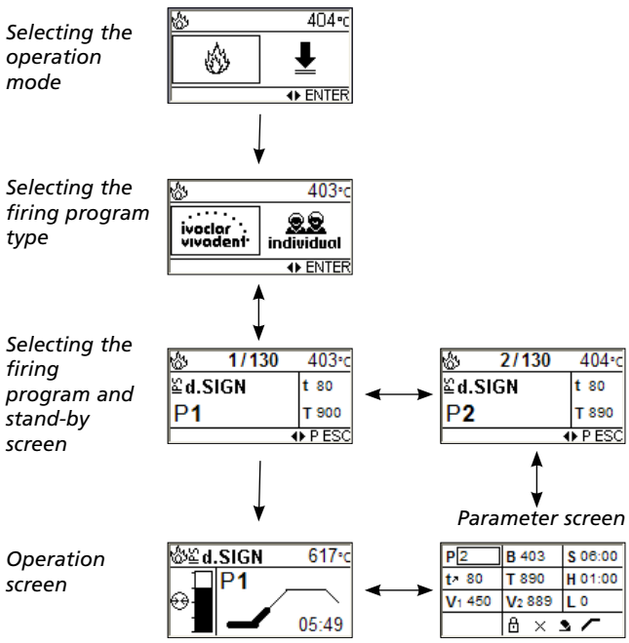
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If a two-stage program is selected, the firing curve is shown in two stages. During a firing program in progress, the parameter screen or operation screen may be displayed at any time for information purposes by pressing the P key. However, the parameters may only be changed with the program stopped or the furnace in stand-by mode.

*) The vacuum indication is faded out if no vacuum is needed.

6.2.6 Firing using an Ivoclar Vivadent program

Step 1:
Select the desired firing program according to the program table (Chapter 10).



Step 2:
Open the furnace head with the „Open furnace head" key (90) and place the firing tray with the object to be fired in the furnace.

Step 3:
Press START (73) to start the selected program. The status is indicated in the operation screen.

6.2.7 Firing using an individual program

Step 1:
Select a free, individual firing program. See Chapter 6.1.1, ...

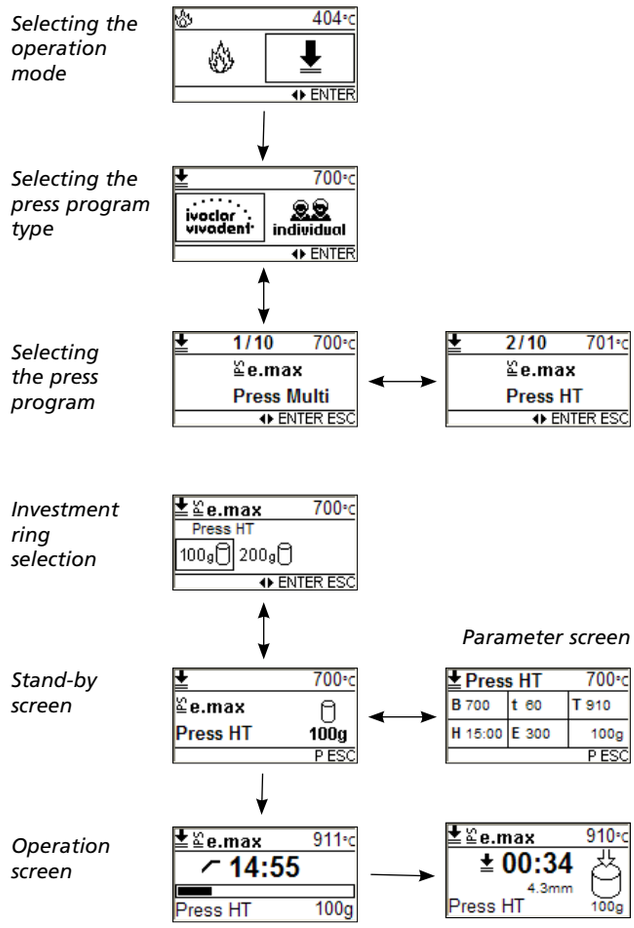
Step 2:
Set the desired parameters either in the parameter screen (see Chapter 6.1.3) or by means of the parameter detail screens (see Chapter 6.1.4).

Step 3:
Open the furnace head with the „Open furnace head" key (90) and place the firing tray with the object to be fired in the furnace.

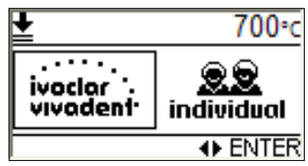
Step 4:
Press START (73) to start the selected program. The status is indicated in the operation screen.

6.3 Press programs

6.3.1 Pressing using an Ivoclar Vivadent program



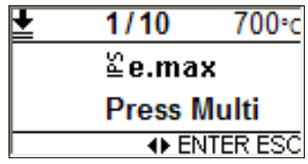
6.3.2 Selecting the press program type



Once the Pressing mode has been selected, the press program type screen is displayed. There is a choice between Ivoclar Vivadent press programs for Ivoclar Vivadent materials and free, individual press programs.

The cursor position (frame) can be changed by means of the Cursor keys. The marked type of press program can finally be selected using the Enter key.

6.3.3 Selecting the press program



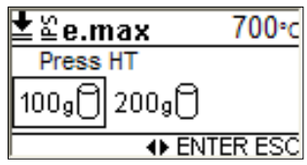
Once the desired press program has been selected, the press program screen is displayed.

The Cursor keys can be used to toggle between the possible press programs. The displayed press program can finally be selected using the Enter key.
The ESC key can be used to change to the selection of press program types.

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6.3.4 Selecting the investment ring

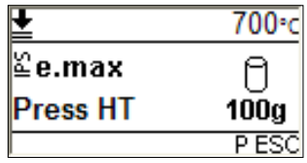
Once the desired type of press program has been selected, the investment ring is selected.



The cursor position (frame around the symbol) can be changed by means of the Cursor keys. The marked investment ring size can finally be selected using the Enter key.
The ESC key can be used to change to the selection of press programs.

6.3.5 Stand-by screen (press program)

Once the investment ring has been selected, the stand-by screen appears (press program).

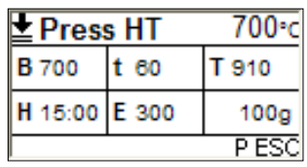


The Program key can be used to change to the parameter screen (press program).

The ESC key can be used to change to the selection of the investment ring.

6.3.6 Parameter screen (press program)

The Program key can be used to change to the parameter screen (press program).

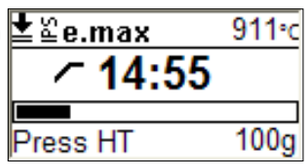


The ESC key can be used to return from the parameter screen to the stand-by screen or to the previous screen.

The cursor position can be moved between the parameters by means of the Cursor keys. The marked parameter can be edited with the Minus/Plus keys or via the numeric keys and confirmed by pressing ENTER.

6.3.7 Operation screen (press program)

The following operation screen appears while a press program is in the heating and holding time phase.



During the actual press process the following operation screen appears.



The animated arrow indicates that the press plunger moves downwards. The entire time of the press cycle is displayed once and the path which the press plunger has already covered since the start of the press procedure.

6.3.8 Notes on the Ivoclar Vivadent press programs

The Programat EP 3000/G2 has been especially coordinated with the materials systems from Ivoclar Vivadent. Therefore, the respective parameters of the different programs have already been set ex works. You only have to select the desired program for the corresponding material.

6.3.9 Notes on the individual press programs

Symbol	Parameter	Value range	Value range
B	Stand-by temperature	100-700 °C	212-1292 °F
t	Temperature increase rate	10-140 °C/min	18-252 °F/min
T	Holding temperature	100-1200 °C	212-2192 °F
H	Holding time (min : sec)	00:00-60:00	
E	Abort speed	0-100000 µm/min	

For the abort speed, we recommend using a value of 300 µm/min in the layering technique and 150 µm/min in the staining technique. A higher value (abort speed e.g. 300 µm/min) aborts the press procedure earlier, while a lower value (abort speed e.g. 100 µm/min) aborts the press procedure later and prolongs the press procedure.

For the all-ceramic systems from Ivoclar Vivadent (IPS e.max, IPS Empress Esthetic), only the original standard press programs which are especially coordinated with the materials must be used.

6.4 Other options and special features of the furnace

6.4.1 Quick selection of the firing program

Each firing program can be directly selected by its program number. To quickly select the firing program, press the Program key and enter the program number. Confirm with the ENTER key.
In addition, the Cursor key Left/Right or Minus/Plus keys can be used in the stand-by screen to navigate through the firing programs.

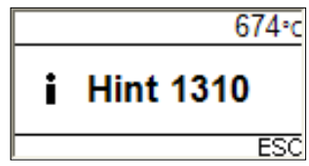
6.4.2 Indication of invalid entry

If an invalid value is entered by means of the numeric keys (outside the acceptable value range), the invalid entry still blinks after confirmation.
As error message, an exclamation mark (!) blinks in the bottom line of the parameter or detail screen until the next value is entered and successfully confirmed or the process is aborted with ESC. The old, valid value reappears.

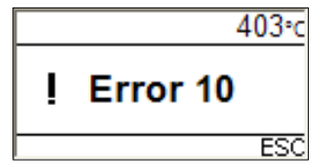
6.4.3 Error message symbol

The error message symbol should supply a first indication of the type of error:

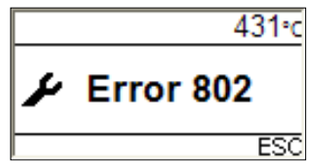
Note, information
Information symbol



Entry error
Exclamation mark symbol



Technical error
Fork wrench symbol



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6.4.4 Stopping the running program

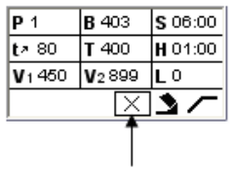
Press the STOP key once to pause a running program. The green LED in the START key blinks. Press the STOP key twice to completely stop the program or press START to continue.

6.4.5 Changing the parameters while the program is interrupted

All parameters of the program, which have not yet been executed, can be changed while the program is interrupted.

6.4.6 Closing of the furnace head

Various functions are available for the closing of the furnace head. If the cursor is on the spot in the parameter list shown in the figure, you can toggle between the following functions by using the + or – key:



– TSP Thermo Shock Protection

– Vortrocknen

– keine Funktion aktiviert

– **TSP – Thermo Shock Protection**
  The TSP function prevents the object from too high of temperatures during the closing process. For this purpose, the TSP function gauges the temperature of the firing chamber in the furnace head upon start of the firing program. If required, the closing path within the set closing time S is adjusted. TSP is only active if no active predrying has been selected or if the temperature in the firing chamber is too high when the program is started. In addition, TSP works only if the stand-by temperature of B = 403 °C/757 °F required for Ivoclar Vivadent materials is used. The active TSP function is shown on the display by means of the symbol „TSP". If programs are started with a temperature of more than 680 °C / 1256 °F, an error message is produced.

– **Pre-drying**
  If the pre-drying function is active, the „pre-drying temperature" is set after the firing program start with the furnace head open (heating or cooling).
  This „pre-drying temperature" corresponds to the stand-by temperature of the active firing program. Once this temperature is reached, the furnace head is closed within the desired closing time.

6.4.7 Quick opening of the furnace head

The opening mode of the furnace head can be selected in the parameter screen of the firing programs. If the cursor is set on „Standard furnace head opening" you can toggle to „Quick opening of the furnace head" and vice versa by means of the Minus/Plus keys (standard opening of the furnace head: in 60 seconds, quick opening of the furnace head: in 18 seconds).

6.4.8 One-stage /two-stage programs

In the parameter screen, the firing program can be set as a one-stage or two-stage program. If the cursor is set on the „one-stage symbol", pressing the Minus/Plus keys results in the symbol to change to the „two-stage symbol". At the same time, the program is also changed to become a „two-stage program".
If the cursor is set on the „two-stage symbol", pressing the Minus/Plus keys results in the symbol to change to the „one-stage symbol". At the same time, the program is also changed to become a „one-stage program".

6.4.9 Software update

The user will be able to conduct a software update by PC and download cable. For that purpose, the software download mode of the furnace is activated by pressing two special keys simultaneously while the power supply is switched on. For further details, please refer to the Software Update Instructions (www.ivoclarvivadent.com/downloadcenter).

6.4.10 Power-save mode

If the power-save mode is activated and the furnace head closed, this function is automatically activated after 30 minutes if the furnace is idle and no key is pressed during this time. The Power Saving icon appears on the display. The power-save mode is terminated by pressing any key.

The energy saving mode (Power Saving Technology) is available in the EP 3000/G2 only in the firing mode. In the press mode, the energy saving function is disabled, as the furnace must fulfil additional requirements.

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7. Maintenance, Cleaning, and Diagnosis

This chapter describes the user maintenance and cleaning procedures for the Programat EP 3000/G2. Only those tasks are listed that may be performed by dental professionals. All other tasks must be performed by qualified service personnel at a certified Ivoclar Vivadent Service Center.

7.1 Monitoring and maintenance

The time for these maintenance procedures depends on the frequency of use and the working habits of the users. For that reason, the recommended times are only approximations.

This furnace has been developed for typical use in dental laboratories. If the product is used in a production enterprise, for industrial applications, and for continuous use, premature ageing of the expendable parts has to be expected.

The expendable parts are as follows:
– Heating muffle
– Insulation material

Expandable parts are not covered by the warranty.
Please also observe the shorter service and maintenance intervals.

What	Part	When
Check all plug-in connections for correct fit	Var. external connections	weekly
Check if the furnace head opens smoothly and without excessive noise.	Opening mechanism	monthly
Check if the thermocouple is straight and in the right place.	Thermocouple (4)	weekly
Check the insulation for cracks and damages. If the insulation is worn down it has to be replaced by a certified Ivoclar Vivadent Service Center. Fine hairline cracks on the surface of the insulation are harmless and do not influence the function of the furnace in a negative fashion.	Insulation (3)	monthly
Check if the sealing rims of the furnace head and the furnace base are clean and undamaged.	Sealing rims of the furnace head (2) and the furnace base (1)	weekly
Check the keypad for visible damage. If the keypad is damaged, it has to be replaced by a certified Ivoclar Vivadent Service Center.	Keypad (10)	weekly
Check temperature. Use the temperature checking set to check and adjust the temperature in the furnace.	Firing chamber	twice a year
Check the quartz glass cylinder to make sure the quartz glass is not defective.	Firing chamber	daily

In general, the furnace head should not be replaced since the components (furnace head and furnace base) have been coordinated with each other. However, if the furnace head must be replaced for maintenance reasons, subsequent temperature calibration is required.

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7.2 Cleaning

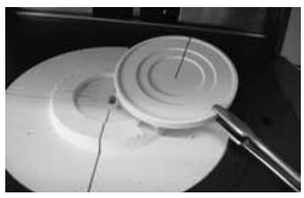
The furnace may only be cleaned when it is cool, since there is a burn hazard. Do not use any cleaning solutions. The following parts have to be cleaned from time to time:

What:	When:	Cleaning material:
Housing (9) and furnace head (25)	if required	soft, dry cloth
Keypad (10)	weekly	soft, dry cloth
Cooling tray (34)	daily	cleaning brush*
Insulation (3)	daily	cleaning brush*
Sealing rim of the furnace head (2) and sealing surface (1)	daily	cleaning brush and a soft cloth
Firing plate	if required	cleaning brush or vacuum cleaner

*Never clean with compressed air!

7.3 Temperature calibration

1. Select the calibration program.
2. Remove the firing plate from the furnace using the furnace tongs and place it on the cooling tray.
3. Carefully grip the upper part of the ATK 2 using the furnace tongs (Caution: Fracture risk of the ceramic) and insert it into the holes designated for this purpose until it snaps into place. The orientation of the calibration sample (left or right) is not important.



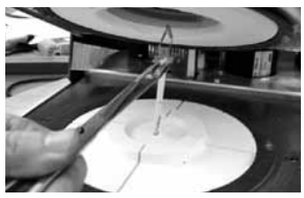
4. If necessary, use the furnace tongs to apply slight pressure to the center of the calibration base until the calibration sample clicks into place. Observe the corresponding markings.



5. Start the calibration program.
6. At the end of the program, open the furnace head and carefully remove the ATK 2 using the furnace tongs and place it on the cooling tray to allow it to cool.



7. Replace the firing plate using the furnace tongs.
8. Close the furnace head and select a firing program.
9. The ATK 2 can only be used once. Use a new calibration set for the next calibration procedure.



7.4 Service note

When the service note (Hint 1700) appears for the first time, two years have passed or the heating muffle has more than 1200 firing hours. For that reason, Ivoclar Vivadent recommends to have the furnace serviced. Please see your Equipment Service Pass for further information. The interval until the next service note can be selected once in the Settings (see Chapter 5.5.1).

7.5 Stand-by

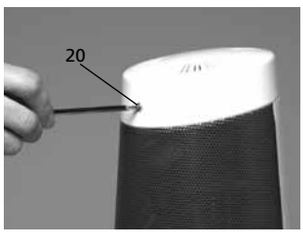
We recommend keeping the furnace head closed, particularly if the temperature drops below 100 °C / 212 °F. This will prevent unintentional moisture absorption and formation of condensate in the firing chamber. Consequently, vacuum problems are avoided and the service life of the heating element is prolonged.

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7.6 Replacing the press plunger

In order to facilitate replacing the press plunger, the following procedure is recommended.

1. Remove the screw (20) and the press drive cover (56) while the furnace head is closed.



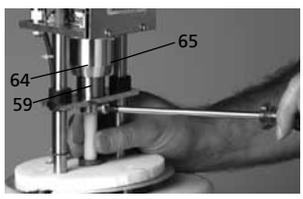


2. Loosen the terminal screw (65) from the press plunger by about half a rotation.
3. Open the furnace head by means of the respective key (90). Once the furnace head is wide open, switch off the furnace, disconnect the power, and allow the furnace to cool to room temperature.
4. Push the press plunger (59) with slightly rotating movements into the firing chamber with one hand and pull from below with the other hand.



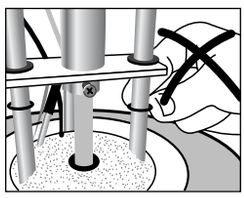
Contraindication:
Do not touch the thermocouple when replacing the press plunger.

5. Push the white press plunger (59) with the taper ahead into the guide bush. Push the press plunger with slightly rotating movements into its split taper socket (64) and fasten the screw (65).





Contraindication:
Never reach into the press drive during operation. There is a risk of burn hazard and crushing.



Mount the press drive cover (56) and fasten with screw.

6. Connect the power plug and switch on the furnace with the I/O switch.

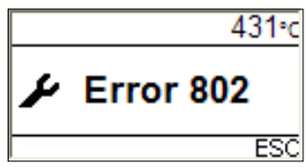
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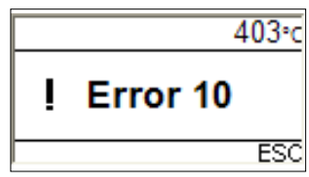
8. What if ...

This chapter will help you to recognize malfunctions and take appropriate measures or, if possible and acceptable, to perform some simple repairs.

8.1 Error messages

The furnace continuously checks all functions during operation. If an error is detected, the respective error message is displayed.





The following error messages may be displayed. If there are any questions, please contact the Ivoclar Vivadent After Sales Service.

Error / Hint No.	Continuation possible	Error	Error Message Text
2		T < B	Enter a logical value for T.
8		L > T	Enter a logical value for long-term cooling L.
9		V2x <= V1x	Enter a logical value for the vacuum-on temperature Vx1 or the vacuum-off temperature Vx2.
10		V2x > Tx + 1°C	Enter a logical value for V1x, V2x
11		Incorrect values for V1x, V2x	Geben sie plausible Werte für V1x, V2x ein.
13 *,**		Current temperature after Start > Tx + 80°C	Excess temperature! Program aborted, furnace head opens to allow the furnace to cool down!
16		T2 < T1	Enter a lower value for T1 or a higher value for T2.
17		Power failure > 10 s during a firing program in progress	A firing program in progress was interrupted for more than 10 s. The program cannot be continued!
18		T1 > V12	Enter a lower value for T1 or a higher value for V12.
19		vV set, but V2 is missing or invalid	Pre-vacuum activated! V2 must be higher than B.
20 **	no	Error in the heating system	Check the heater fuse. If the fuse is i.o. contact your Service Center.
23		Heating muffle very old	The heating muffle is very old. It is recommended to replace it. After the error message has been acknowledged, a firing program may still be started.
24		Heating muffle defective	The condition of the muffle is so poor that is has to be replaced immediately.
26		T is > B + 160 °C at the start of a firing program	Firing chamber too hot to start a firing program.
27 **,***	no	Furnace head cannot be initialized	The furnace head cannot be moved to the final position. It might be blocked by an external mechanical source! If not contact your Service Center!
28 **		The furnace head does not reach the target position	The furnace head does not open/close correctly. The furnace head was manually moved or is obstructed. The furnace head must only be moved using the keys intended for this purpose!
32 **	no	The vacuum is not released	The vacuum cannot be released. The vacuum valve might be dirty or stuck. Contact your Service Center.
33		Necessary vacuum (xxxmbar) is not reached within 1 min.	The vacuum cannot be established. Check the seal of the firing chamber, vacuum hose, vacuum pump, pump fuse.
103		Program start blocked	Starting a program is not possible due to a technical malfunction.
107		Incorrect time settings (date / time)	The clock settings are incorrect. Please set a correct date and a correct time!
110		HV > H (H2)	Enter a lower value for HV or a higher value for H (H2).
120		„Share of the holding time with vacuum“ is activated, but Vx2 does not correspond to Tx or Tx+1	Activate the vacuum during the holding time Tx or deactivate HV.
500		Error pressing time	Max. pressing time exceeded.
504		Error press position	Max. position exceeded.
505		Error press force	Max. press force exceeded.
513		Error press drive initalized	Press drive is not initialized. Please switch the furnace off and on again.
514		Error press drive	Technical error in press drive.

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Error / Hint No.	Continuation possible	Error	Error Message Text
520		Error muffle crack	CDS Crack Detection System has been activated. The program has been aborted and the press plunger has been moved backwards. CDS could probably save your restorations from muffle cracks. Please check your restorations before you continue your working progress.
521		Error muffle crack	CDS Crack Detection System has been activated. The program has been aborted and the press plunger has been moved backwards. CDS could probably save your restorations from muffle cracks. Please check your restorations before you continue your working progress.
522		Error muffle crack	CDS Crack Detection System has been activated. The program has been aborted and the press plunger has been moved backwards. CDS could probably save your restorations from muffle cracks. Please check your restorations before you continue your working progress.
530		Error during logging of press program data	An error has occurred during logging of press program data. The storage medium might be full.
700		Supply voltage outside the acceptable range	The supply voltage is outside the acceptable range. Check the supply voltage.
701 ***	no	Start-up aborted due to an error	The self-test of the furnace was interrupted by an error. It is not possible to work with the furnace! Switch the furnace off and on again, once the error has been rectified.
702		Brief power failure during a program in progress	A firing program in progress was interrupted by a brief power failure. The program is continued!
704		Power failure during an overnight program in progress	An overnight program in process was interrupted by a power failure. The program is continued!
707		Incorrect supply voltage	The furnace is operated with the incorrect supply voltage. Make sure that the furnace is operated with the supply voltage indicated on the rating plate.
800		Final vacuum value not reached	The required final vacuum value cannot be reached. Check the vacuum pump.
801		Vacuum drop	An unacceptable vacuum drop has occurred
802		The vacuum does not increase (self-test)	No vacuum increase could be measured. Check the following points: Is the firing chamber tight (no contamination on the sealing surfaces)? Is the vacuum hose connected? Is the vacuum pump connected? Is the fuse F1 o.k.?
1310		Calibration reminder	Some time has passed since the last calibration procedure. Calibrate the furance soon.
1311		Calibration reminder – press cycles	Some press cycles has been done since the last calibration procedure. Calibrate the furance soon.
1312		Dehumidification reminder	Some time has passed since the last dehumidification. Conduct a dehumidification in the near future.
1550		Change operation mode	The operation mode has been changed! Make sure that the furnace runs at the new stand-by temperature long enough before you start a program.
1700		Service note	Two years have passed or the heating muffle has been in use for more than 1200 firing hours since the last inspection of the furnace. Ivoclar Vivadent therefore recommends that your furnace should be inspected. Please refer to the Equipment Service Passport or the Operating Instructions for further information. The interval until the next appearance of the note can be set in the Settings.

* Furnace head opens when this error occurs.
** A program in progress is stopped.
*** The error cannot be acknowledged; the programs cannot be started.

Please contact the Ivoclar Vivadent After Sales Service, if one of the following error messages is being displayed:

25, 29

43, 44, 45, 46, 47, 48

54, 56

103, 107

143, 144, 145, 146, 147, 148

700, 701, 703, 704, 705, 706, 707

1010, 1011, 1012, 1013, 1014, 1015, 1016

1024, 1025, 1026, 1028

1143, 1144, 1145, 1146, 1147, 1148

1202, 1203, 1204, 1205, 1206, 1207

1400, 1401, 1402

1500

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8.2 Technical malfunctions

These malfunctions may occur without an error message being displayed.
*If there are any questions, please contact the Ivoclar Vivadent After Sales Service.

Fehler	Kontrollfrage	Massnahme
Vacuum is not released or only very slowly	Is the vacuum released within approximately 30 seconds?	Wait until the vacuum is released, remove object. Switch the furnace on and off again. *
Indication on display incomplete	Activate the display test program	*
Writing in the display is very hard to read	Is the contrast properly set?	Adjust contrast
Display not illuminated	Is the furnace properly connected according to the Operating Instructions and switched on?	Correctly connect the furnace and switch it on
Buzzer does not sound	Is the buzzer switched off (Tune = 0)?	Select tune 1–5
Furnace head does not open	Was the furnace head moved manually?	Open the furnace head only by using the corresponding keys. Switch the furnace on and off again.
	Has the vacuum already been released?	Is the program still running? Wait until the program is complete. Switch furnace off and on again. *
Vacuum pump does not start working	Is the vacuum pump fuse defective?	Check fuse and replace if necessary.
	Was the maximum power consumption exceeded?	Use only the vacuum pump recommended by Ivoclar Vivadent
	Is the vacuum pump plug correctly connected?	Correctly connect the vacuum pump to the furnace base.
Final vacuum is not reached	Is the vacuum hose OK?	Check vacuum hose and hose connection
	Is the pump output OK?	Start the vacuum test program
	Humidity/condensation in the vacuum hose?	Start dehumidification program
Incorrect or illogical temperature indication	Is the thermocouple bent or fractured?	*
	Is the thermocouple correctly connected?	Correctly connect thermocouple
	Is the thermocouple plug defective?	*
Hairline cracks in the heating muffle	Are the cracks very small and insignificant (hairline cracks)?	Small cracks in the muffle are normal and do not negatively influence the function of the furnace
	Are the cracks large or have parts of the heating muffle broken off?	*
Cracks in the insulation	Are the cracks very small and insignificant (hairline cracks)?	Small cracks in the insulation do not negatively influence the furnace
	Are the cracks large or have parts of the insulation broken off?	*
Cracks in the quartz glass / heating element	Are there cracks in the quartz glass or is the quartz glass sheathing the heating wire broken?	Switch off the furnace *

8.3 Repair

Repairs may only be carried out by a certified Ivoclar Vivadent Service Center. Please refer to the addresses on the last page of these Operating Instructions.

If repairs during the warranty period are not carried out by a certified Ivoclar Vivadent Service Center, the warranty will be voided immediately. Please also refer to the corresponding warranty regulations.

8.4 Load factory settings

If you want to reset the furnace to its original settings, choose Settings – Factory Settings (see Chapter 5.5.1). All programs (both Ivoclar Vivadent and individual programs) and furnace settings will be reset to the factory settings.

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9. Product Specifications

9.1 Delivery form

– Programat EP 3000/G2
– Programat fring tray Kit
– Firing plate
– Automatic Temperatur Checking Set 2 ATK 2 (Test Set)
– USB download cable
– USB Stick Programat
– PrograBase 2 Software
– Service passport equipment
– Operating Instructions
– Cooling grid

9.1.2 Recommended accessories

– Programat Accessories Set
– Automatic Temperature Checking Set 2 (ATK 2)
– Vacuum pump VP4

9.2 Technical data

Power supply	110–120 V / 50–60 Hz 200–240 V / 50–60 Hz
Overvoltage category II Contamination level 2	
Tolerated voltage fluctuations	+/- 10%
Max. power consumption	12 A at 110-120 V 8.5 A at 200-240 V
Acceptable data for vacuum pumps from other manufacturers	
Max. output:	250 W / max. leakage current 0.75 mA
Final vacuum:	< 50 mbar
	Use only tested pumps
Electrical fuses:	110–120 V: 250 V / T 15 A (heating circuit) 250 V / T 5 A (vacuum pump)
	200–240 V: 250 V / T 8 A (heating circuit) 250 V / T 3.15 A (vacuum pump)
Dimensions of electrical fuses:	110–120 V: Diameter 6.3 x 32 mm 200–240 V: Diameter 5 x 20 mm
Dimensions of the closed furnace:	
Depth: 430 mm / Width: 305 mm / 410 mm (with cooling tray)	Height: 565 mm
Usable size of the firing chamber:	Diameter 80 mm Height 48 mm
Max. firing temperature:	1200 °C
Weight:	Furnace base: 12.0 kg Furnace head: 7.0 kg

Safety information

The Programat EP 3000/G2 complies with the following guidelines:
– EN61010-1:2001 2nd Ed.
– IEC61010-1:2001 2nd Ed.
– UL/CSA61010-1:2004 2nd Ed.
– EN61010-2-010:2003 2nd Ed.
– IEC61010-2-010:2003 2nd Ed.
– CSA61010-2-010:2004 2nd Ed

Radio protection / electromagnetic compatibility	EMC tested

9.3 Acceptable operating conditions

Acceptable ambient temperature range:
+5 °C to +40 °C / +41 °F to +104 °F
Acceptable humidity range:
80% maximum relative humidity for temperatures up to 31 °C (87.8 °F) gradually decreasing to 50% relative humidity at 40°C (104 °F); condensation excluded.
Acceptable ambient pressure:
The furnace has been tested for use at altitudes of up to 2,000 m (6562 ft.) above sea level.

9.4 Acceptable transportation and storage conditions

Acceptable temperature range:	-20 °C to +65 °C / -4 °F to +149 °F
Acceptable humidity range:	Max. 80% relative humidity
Acceptable ambient pressure:	500 mbar to 1060 mbar

Use only the original packaging of the Programat EP 3000/ G2 together with the corresponding foam material for shipping purposes.

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10. Appendix

10.1 Program table

Two program tables (°C / °F) are enclosed in these Operating Instructions. If not, please contact your local Ivoclar Vivadent Service Center.

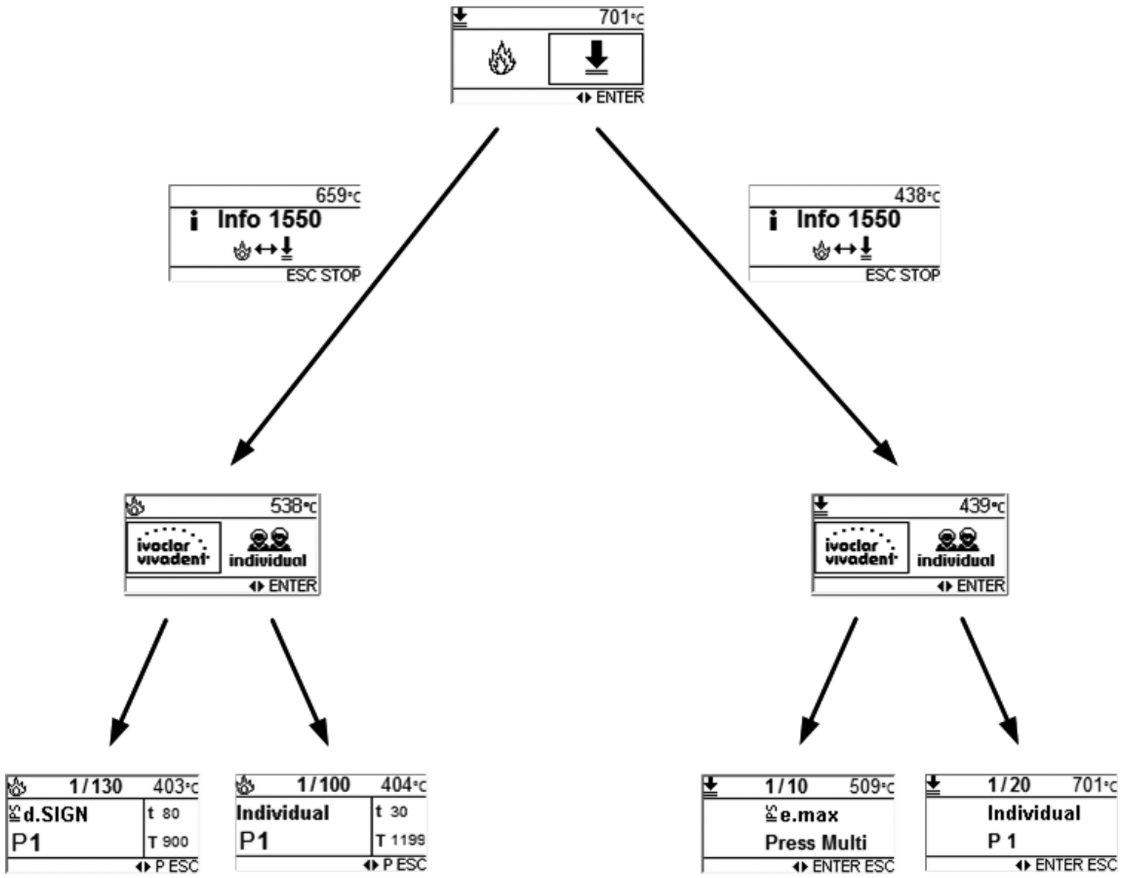
Important information
The current program tables are also available at:
www.ivoclarvivadent.com/downloadcenter

The program tables can be downloaded from the Internet as PDF files. Please make sure that your program table complies with the software version you use, as the table is coordinated with the respective software version.

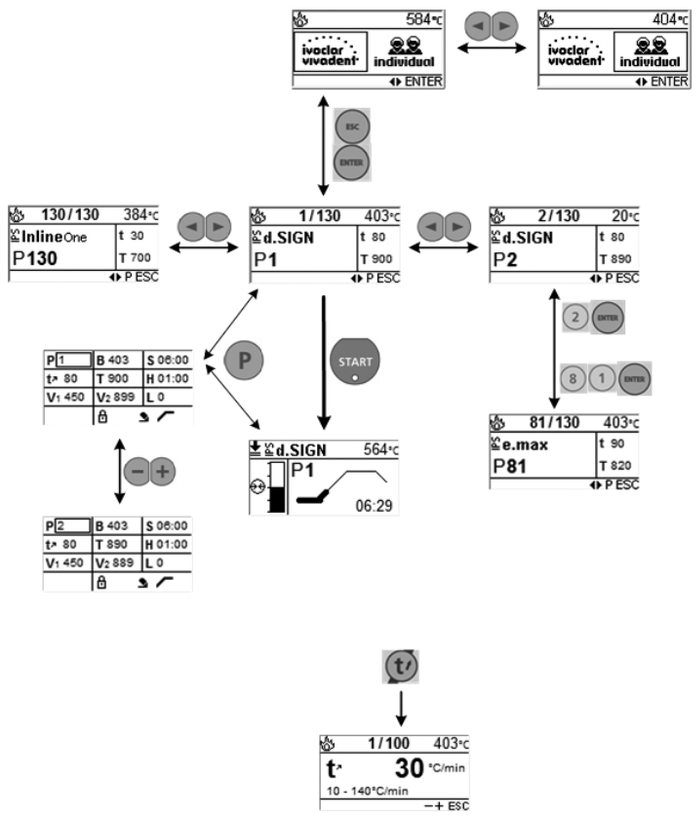
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10.2 Menu structure

10.2.1 Selecting the operation mode and program type

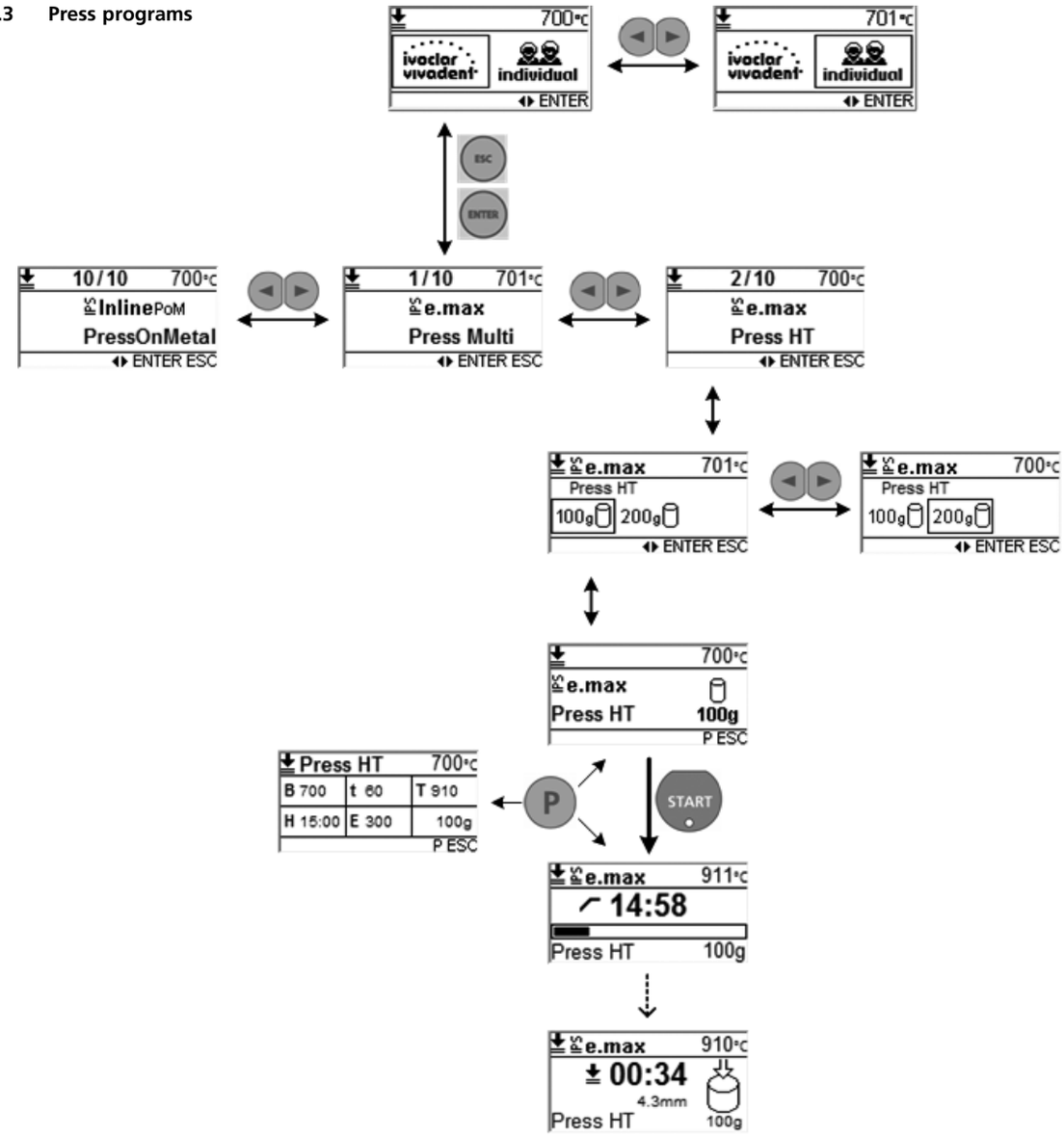


10.2.2 Firing programs

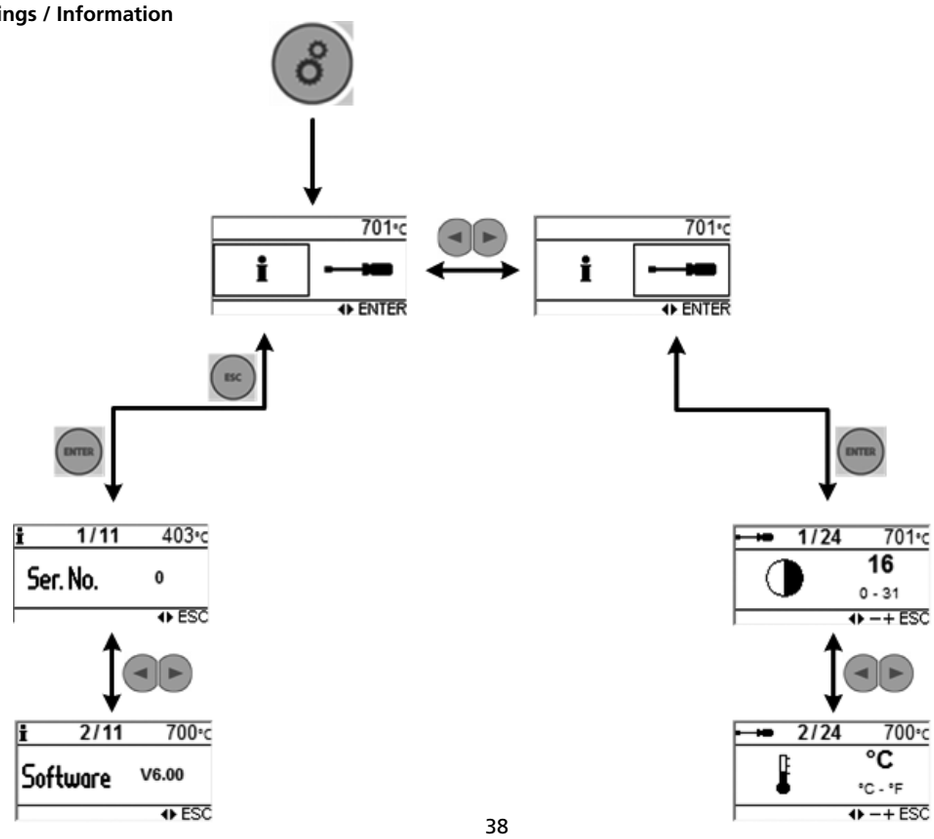


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10.2.3 Press programs



10.2.4 Settings / Information



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