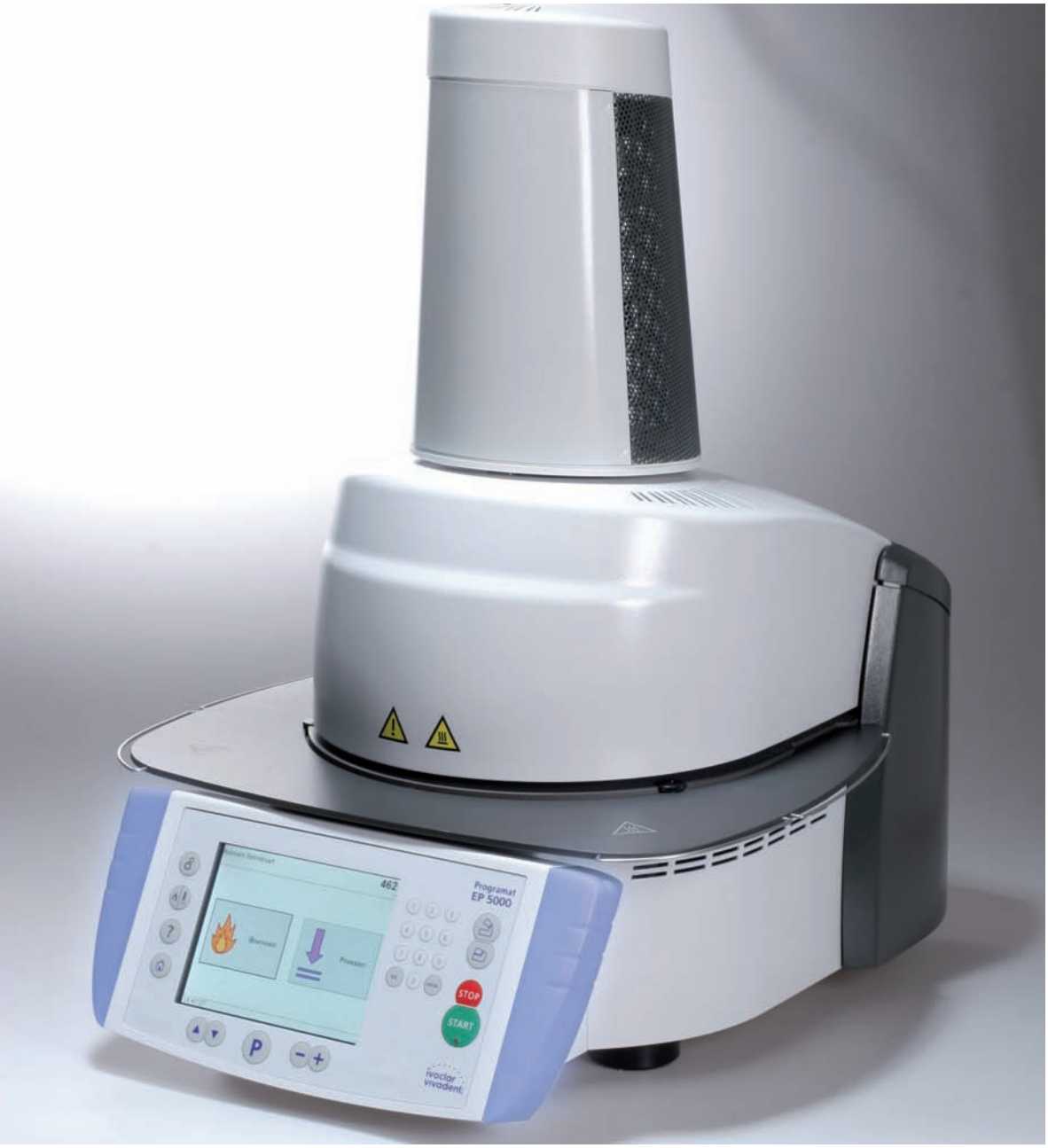
Programat®
EP 5000



Operating Instructions

Valid as of Software Version 3.0

CE

ivoclar vivadent® technical

KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY
CERTIFICAT DE CONFORMITÉ
DICHIARAZIONE DI CONFORMITÀ
DECLARACIÓN DE CONFORMIDAD
DECLARAÇÃO DE CONFORMIDADE

ivoclar vivadent
BENDERERSTR. 2
FL-9494 LIECHTENSTEIN
TEL ++423 / 235 35 35
FAX ++423 / 235 33 60

CE

Produkt / Product / Produit / Prodotto / Producto / Produto

Programat EP 5000

DE Hiermit erklären wir in alleiniger Verantwortung, dass das oben aufgeführte Produkt den erwähnten Normen entspricht.
Gemäss den Bestimmungen der EU-Richtlinie(n):

GB We herewith declare that the product listed above complies with the mentioned standards.
Following the provisions of Directive(s):

FR Par la présente, nous déclarons que le produit ci-dessus indiqué est conforme aux normes énoncées.
Conformément aux dispositions de la (des) Directive(s) CE:

IT Con la presente dichiariamo sotto la nostra responsabilità, che il prodotto sopra menzionato corrisponde alle norme citate.
Secondo le disposizioni della/e Direttiva/e CEE:

ES Por la presente declaramos que el producto arriba indicado cumple con las normas citadas.
Siguiendo las indicaciones de la Directiva:

PT Declaramos que o produto citado cumpre as normas mencionadas.
De acordo com as especificações da(s) Diretriz(es):

73/23/EWG 89/336/EWG 93/68/EWG	EN 61010-1:2001 2nd Ed. IEC 61010-1:2001 2nd Ed. UL/CSA 61010-1:2004 2nd Ed. EN 61010-2-010:2003 2nd Ed. IEC 61010-2-010:2003 2nd Ed. CSA 61010-2-010:2004 2nd Ed. IEC 61000-3-2:2005 IEC 61000-3-3:1994 + A1:2001 IEC 61326-1:2005 EN 61326-1:1997 + A1:1998

Bürs, 17.04.2007

Siegbert Koch

Geschäftsleitung Produktion [1]
Ivoclar Vivadent GmbH, A-6706 Bürs

Schaan, 17.04.2007

Gottfried Rohner

Entwicklungsleitung Geräte[2]
Ivoclar Vivadent AG, FL-9494 Schaan

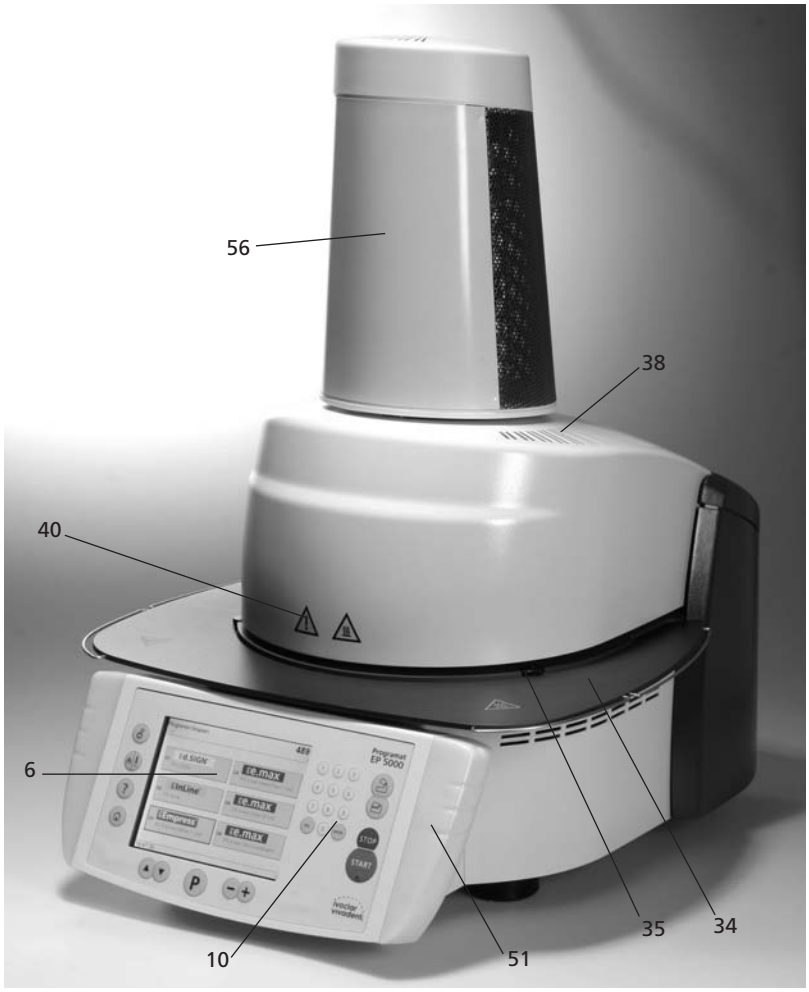
(1) Board of directors Production / Membres du Directoire Production / Direzione Produzione / Miembro consejo administración, Director de Producción / Diretoria de Produção
(2) Head of Equipment Development / Responsable du développement des appareils / Direzione sviluppo apparecchiature / Jefe de Desarrollo de Aparatos / Direcção de Desenvolvimento de Equipamentos

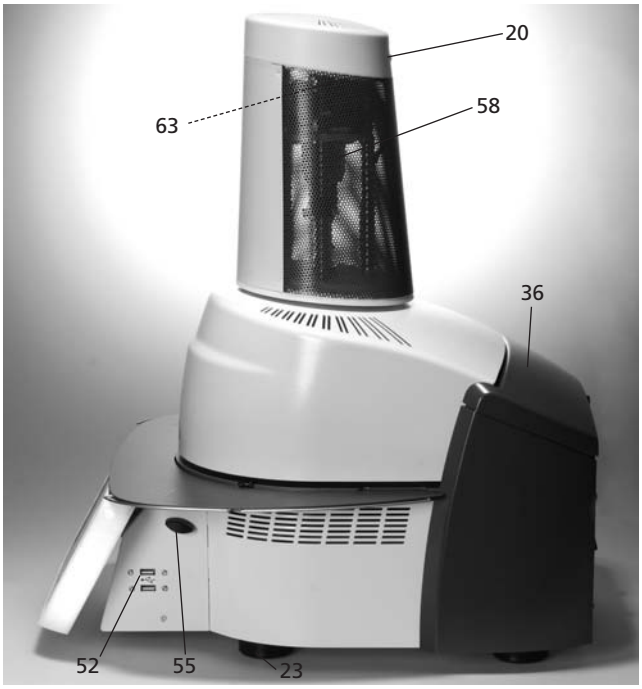
Rev. 0.0

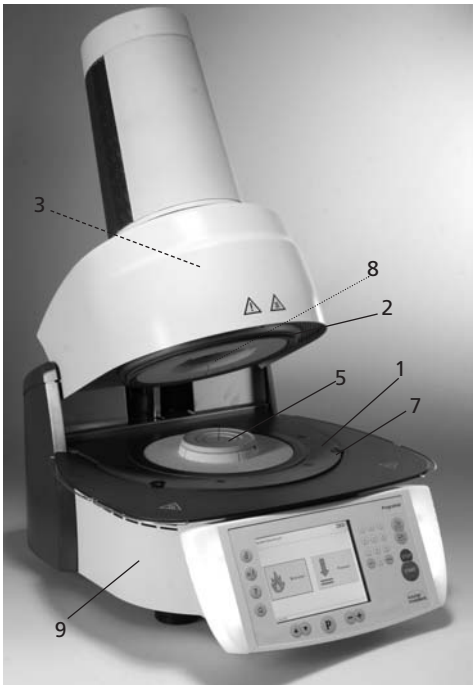
Table of Contents

List of parts

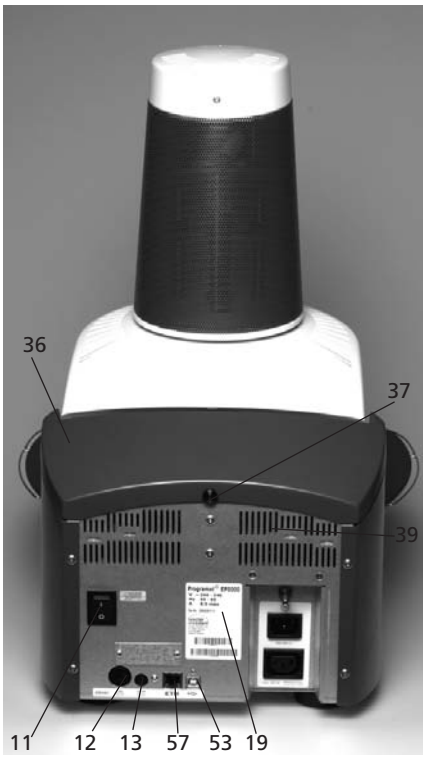
1 Sealing surface
2 Furnace head sealing ring
3 Insulation
4 Thermocouple
5 Firing plate 2
6 Touch screen
7 Frame plate
8 QTK heating muffle
9 Housing base
10 Keypad
11 On/Off switch
12 Heating element fuse
13 Vacuum pump fuse
14 Control unit fuse
15 Fuse holder
16 Power cord
17 Power socket
18 Vacuum pump socket
19 Rating plate
20 Screw for furnace head cover
21 Vacuum hose connection
22 Head insulation
23 Rubber feet
24 Protective cover vacuum
25 Housing
26 Thermocouple plug
27 Plug fuse
28 Heater plug
29 Heater plug socket
30 Thermocouple plug socket
31 Grounding band connector
32 Leaf spring
33 Air vents (base)
34 Cooling tray L
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
51 OSD (Optical Status Display)
52 USB connection
53 USB interface
54 Plug-in console
55 Operating unit fixture
56 Cover for press drive
57 Ethernet Interface
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

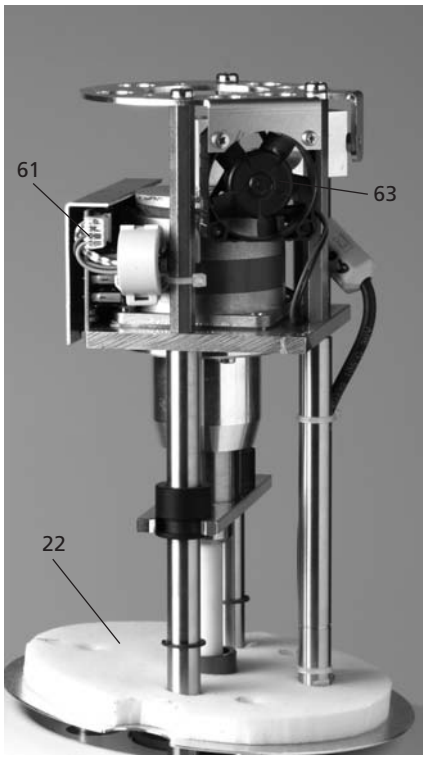

56
38
40
6
10
51
35
34

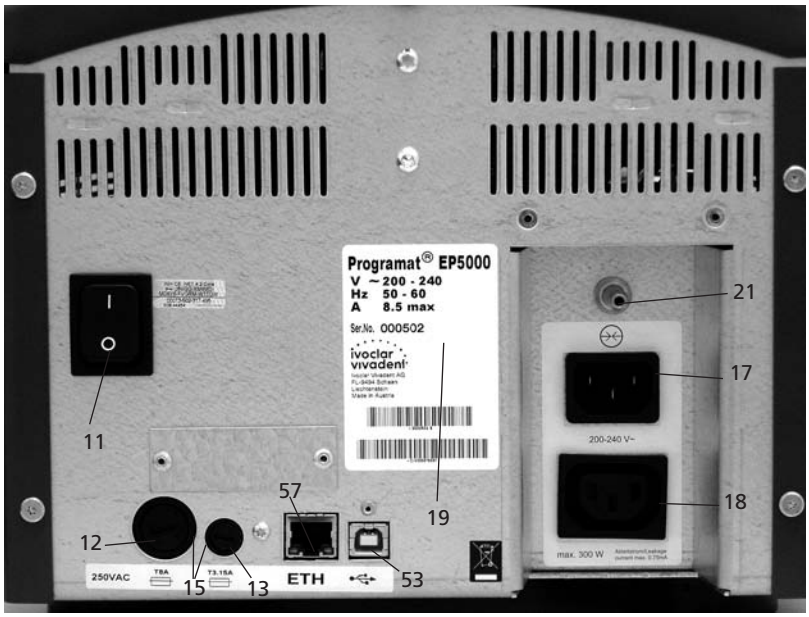

20
63
58
36
52
55
23

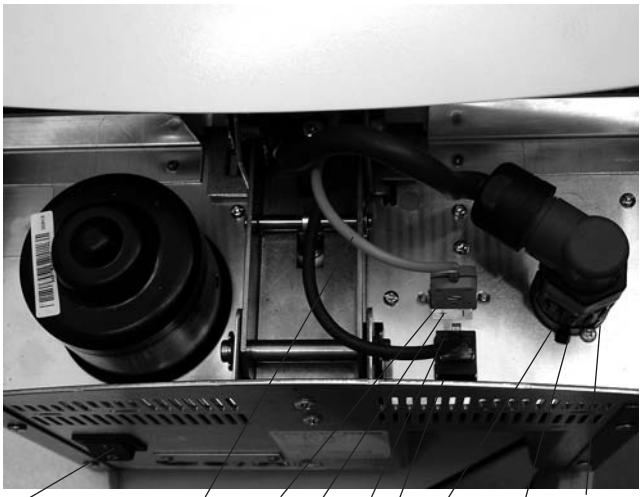

3
8
2
5
1
7
9

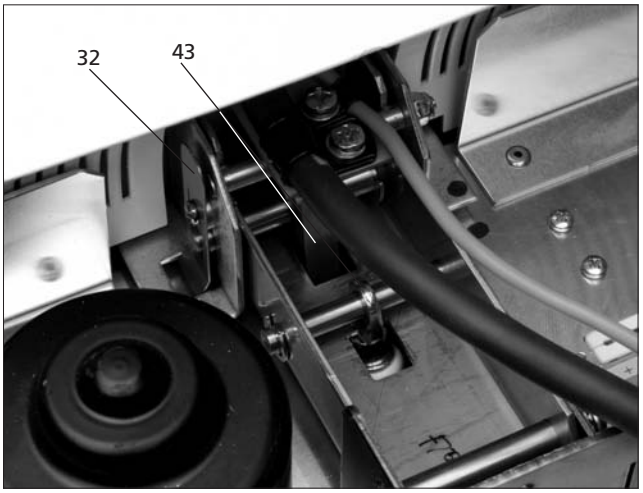

62
64
65
22
59

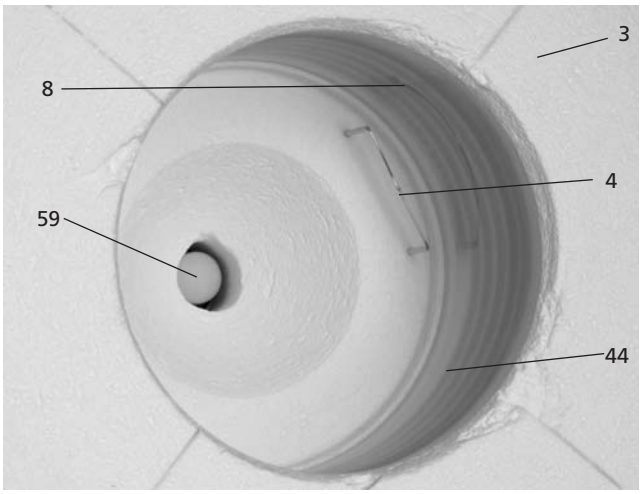

36
37
39
11
12
13
57
53
19

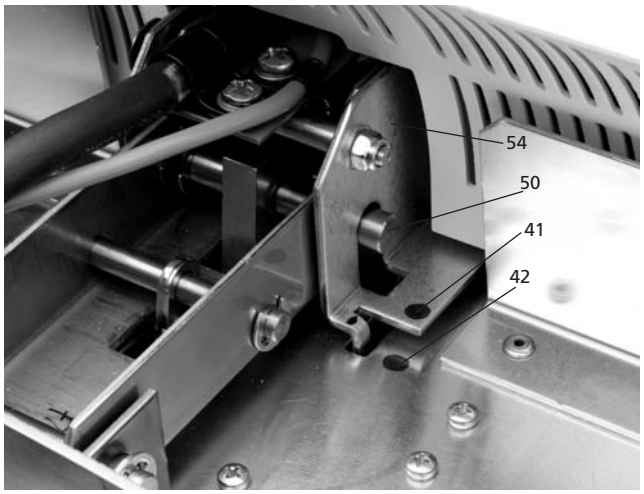

61
63
22


Programat® EP5000
V ~ 200 - 240
Hz 50 - 60
A 8.5 max
Ser.No. 000502
ivoclar vivadent
200-240 V~
max. 300 W
250VAC
ETH
21
17
18
19
11
57
12
15
13
53


11
49
26
30
60
67
29
27
28

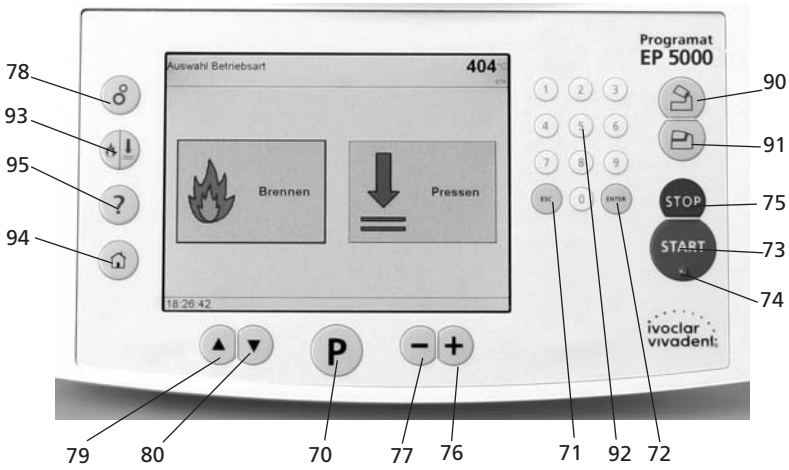

32
43



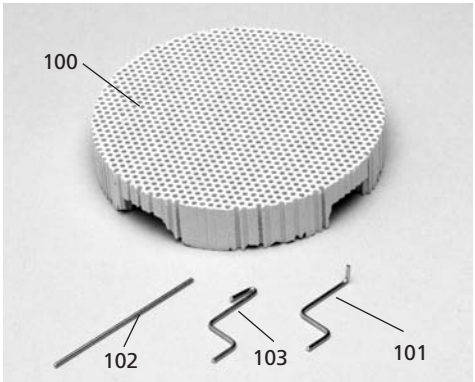


Control unit:

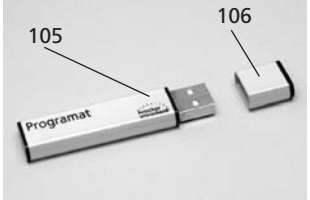
70 Program key
71 ESC key
72 ENTER key
73 START key
74 Start LED
75 STOP key
76 + key
77 - key
78 Settings / information
79 Cursor key up
80 Cursor key down
90 Open furnace head
91 Close furnace head
92 Numeric keys
93 Firing / Pressing
94 Home key
95 Help key



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

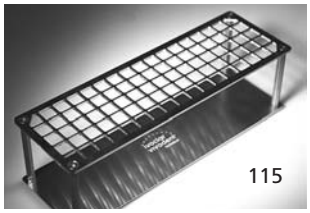


105 USB stick Programat
106 Protective cover

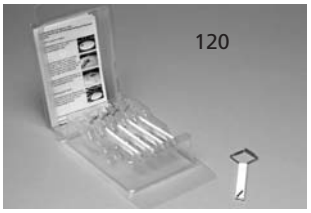


110 USB data cable

115 Cooling grid (complet)



120 Automatic Temperature Control Set 2 – ATK 2



1. Introduction / Signs and Symbols

1.1 Preface

Dear Customer

Thank you for having purchased the Programat EP 5000. 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 these Operating Instructions carefully.

Enjoy working with the Programat EP 5000.

1.2 Introduction

The signs and symbols in these Operating Instructions 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 5000
Target group:
Dental technologists

These Operating Instructions facilitate the correct, safe, and economic use of the Programat EP 5000 furnace.

Should you lose the Operating Instructions, extra copies can be ordered at a nominal fee from your local Ivoclar Vivadent Service Center.

1.4 Notes on the different voltage versions

The furnace is available with different voltage versions.

– 100 V / 50–60 Hz
– 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.

2. Safety First

This chapter is especially important for personnel who work with the Programat EP 5000 or who have to carry out maintenance or repair work. This chapter must be read and the corresponding instructions followed.

2.1 Indications

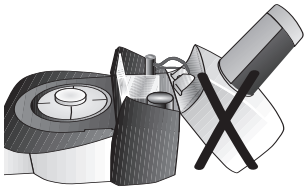
The Programat EP 5000 must only be used to fire dental ceramic materials and it should be used for this purpose only. Other uses than the ones stipulated, e.g. cooking of food, firing of other materials, etc. are contraindicated. The manufacturer does not assume any liability for damage resulting from 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 (Chapter 9).
– The Programat EP 5000 must be properly maintained.

2.1.1

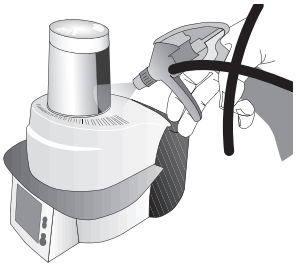
Risks and dangers



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

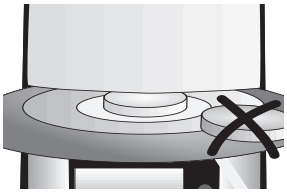
Risks and dangers



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

2.1.3

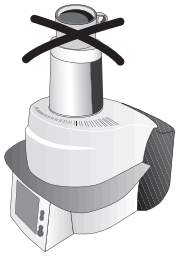
Contraindication



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

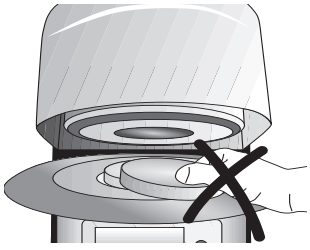
Contraindication



Foreign objects must not be placed on the 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

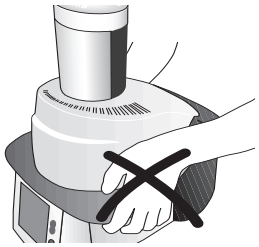
Risks and dangers



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.

2.1.6

Risks and dangers



Do not carry the furnace by the cooling tray.

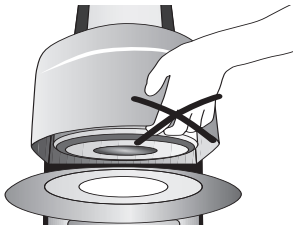
2.1.7

Risks and dangers

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

2.1.8

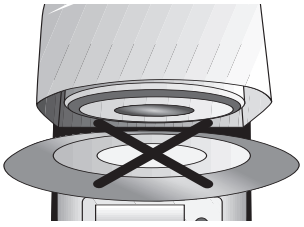
Risks and dangers



The furnace has 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

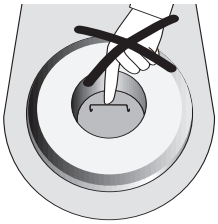
Contraindication



Never use the furnace without a firing table.

2.1.10

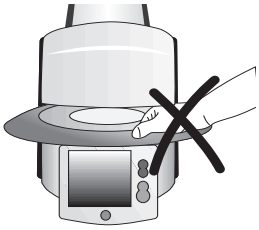
Contraindication



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

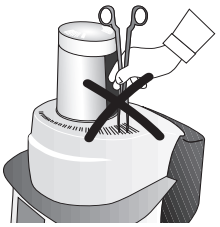
Risk of crushing and burn hazard



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

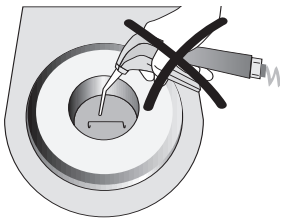
Contraindication



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

2.1.13

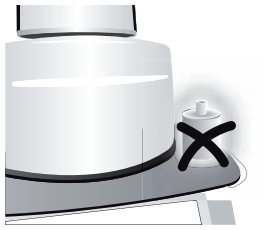
Contraindication



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 and 50 mm) of the investment ring.

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 assure 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 the 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 purposes.
- The user must especially become familiar with the warnings and the 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 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 corresponding EU Safety Data Sheet must be observed.

The heat insulation of the firing chamber in the Programat EP 5000 consists of ceramic fibres. After prolonged use of ceramic fibres at temperatures of over 900 °C (1652 °F), silicogenic substances (Cristobalite) may be produced. In certain cases, e.g. upon changing of the heating muffle, the possible resulting dust exposure may cause irritation of the skin, eyes, and respiratory organs. Therefore, proceed as follows when changing the heating muffle:

- Make sure the corresponding staff wears long-sleeved clothing, as well as headgear, goggles, and gloves.
- Place suction equipment at the source of the dust or, if not possible, provide the staff with FFP3 facemasks or similar items.
- Once the procedure has been completed, any dust possibly adhering to exposed skin must first be rinsed off with cold water. Only after that should soap and warm water be used.
- The corresponding work clothes should be washed separately.

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.

3. Product Description

3.1 Components

The Programat EP 5000 comprises the following components:

- Furnace base with electronic controls
- Furnace head with firing chamber
- Firing table
- Cooling tray
- Power cord and hose for vacuum pump
- Vacuum pump (accessory)

3.2 Hazardous areas and safety equipment

Description of the risk 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

3.3 Functional description

The firing 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 firing process is 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)

- Temperature Checking Set 2
- Programat Accessories Set (large and small firing trays, firing tongs, Temperature Checking Set)
- Vacuum pump

4. Installation and Initial Start-Up

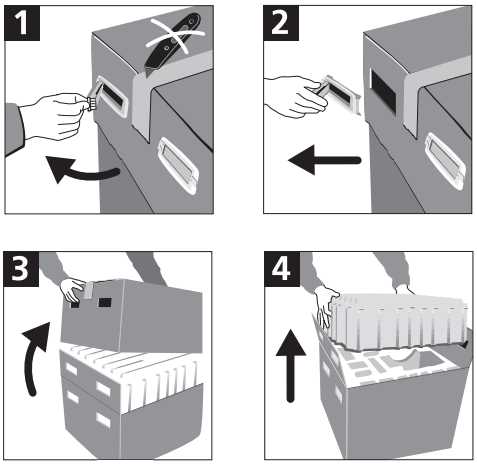
4.1 Unpacking and checking the contents

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)

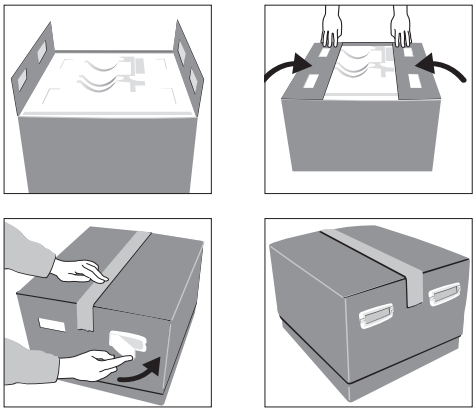
Check the delivery for completeness (see delivery form in Chapter 9) and transportation damage. If parts are damaged or missing, contact your local Ivoclar Vivadent Service Center.

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

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



Packing and shipping of individual components
The packaging of the EP 5000 permits simple and safe shipping of individual components. Simply use the two corresponding inserts. Fold the side flaps (2) and combine the two packaging parts by means of the transportation flaps. The packaging may be disposed with the regular household refuse.



Keep the original packaging for future service and transportation purposes.

4.2 Selecting the location

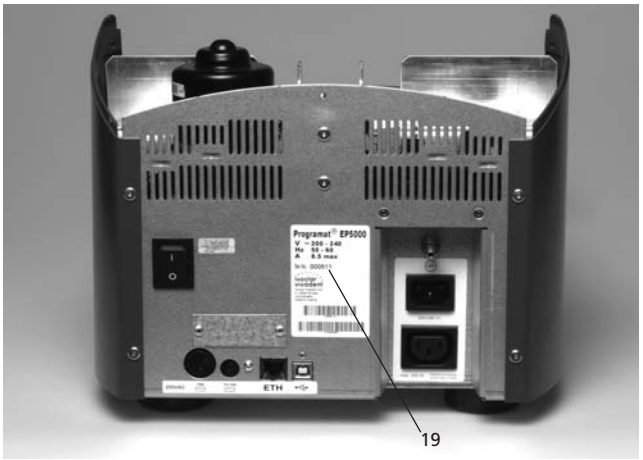
Place the furnace on a flat table using the rubber feet. Make sure that the furnace is not placed in the immediate vicinity of heaters or other sources of heat. Make sure that air may properly circulate between the wall and the furnace.

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.

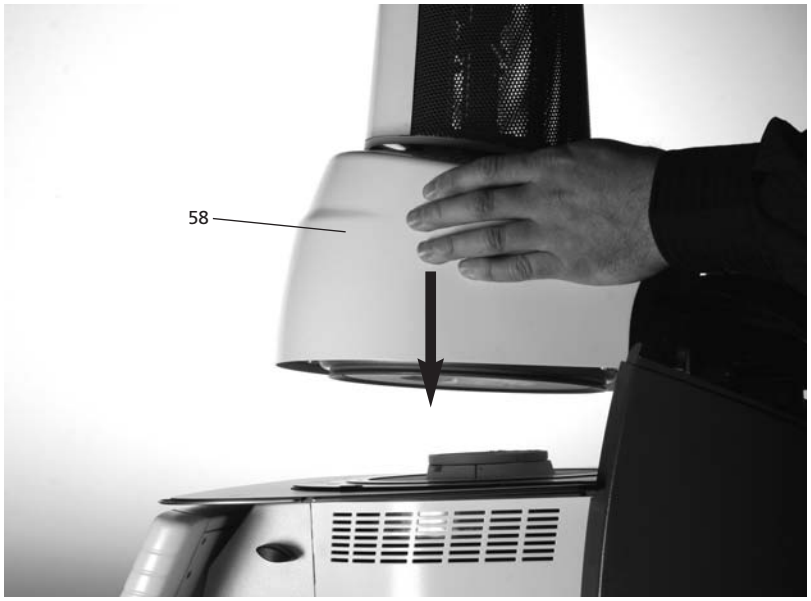


Step 1:
Assembling the cooling tray L (34)
Remove both screws (35) including the silicone washer (47) for the cooling tray (34).

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

Secure the cooling tray L (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).



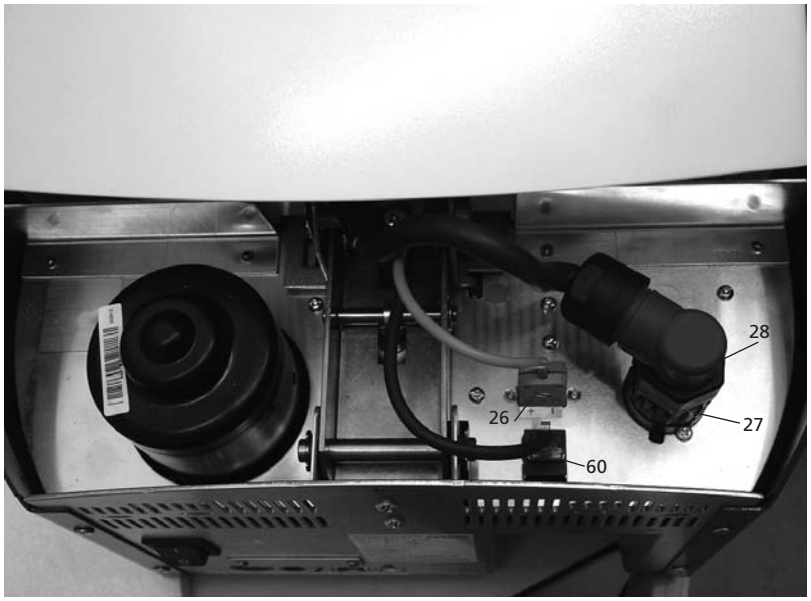
Ensure that the furnace head mounting mark (41) is aligned with the furnace base mounting mark (42).

Make sure that the firing plate (5) is not damaged by mounting the furnace head.

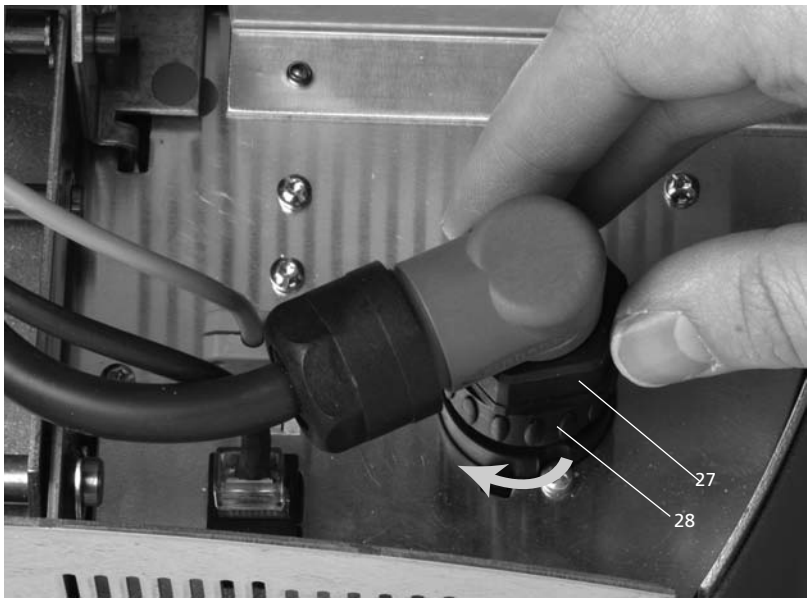
Step 3:
Placing the firing plate for the investment ring (5)
The firing plate for the investment ring (5) can now be placed on the firing plate holder (48).

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)



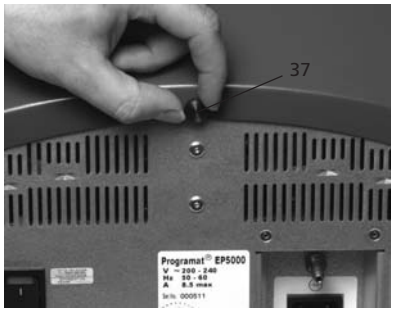
Secure the heater plug (28) with the plug fuse (27) by turning it until the heater plug (28) has been secured.



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.

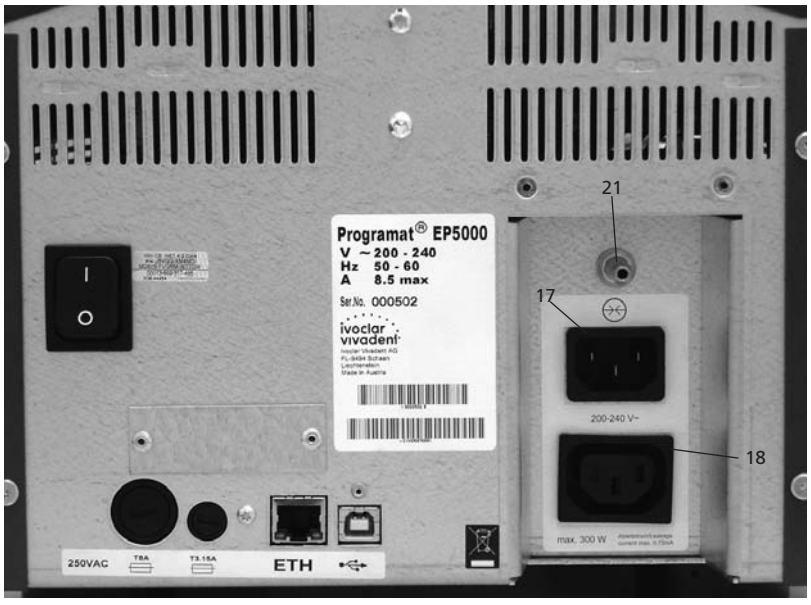


Step 6:
Establishing additional connections

Power connection
Please make sure that the voltage indicated on the rating plate complies with the local power supply. Connect the power cord (16) with the power socket (17) of the furnace.

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.

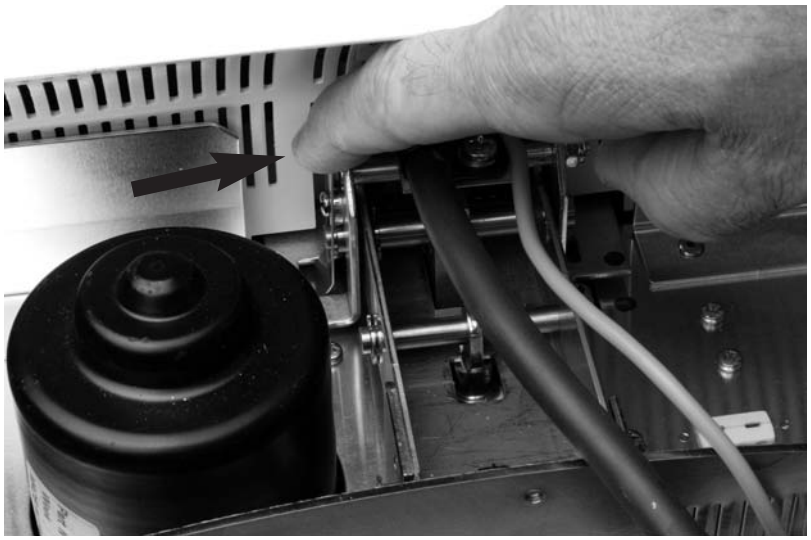


4.4 Removing the furnace head

Before the hood (36) is removed, the furnace has to be switched off and the power cord (16) 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 thermocouple plug (26)
4. Disconnect the heater plug (28)
5. 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).

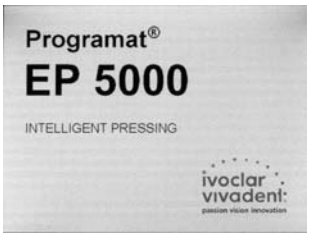


4.5 Initial start-up

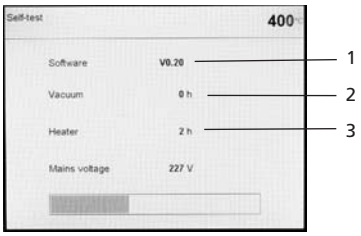
1. Connect the power cord (16) with the wall socket.
2. Put the On/Off switch (11) at the rear of the furnace on position "I" and connect the vacuum pump.

4.5.1 Start screen

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



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



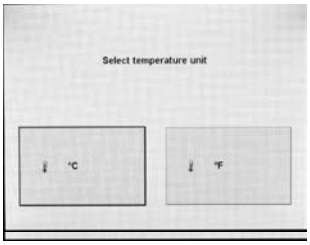
1 SW version
2 Indication of the vacuum pump hours
3 Indication of the heater firing hours

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

4.5.2 Language selection

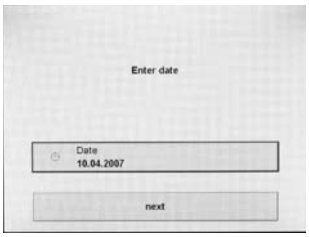
If a new furnace is switched on for the first time, the language selection screen will be displayed. The desired language is set by means of the respective touch button. After that, the next basic setting screen (temperature mode) appears. These settings are then saved and will no longer appear upon the subsequent start-ups.

4.5.3 Temperature mode



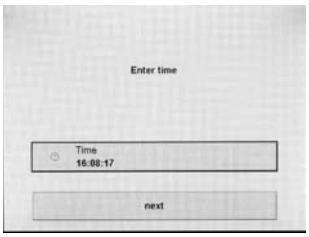
Select the desired temperature mode.

4.5.4 Setting the date



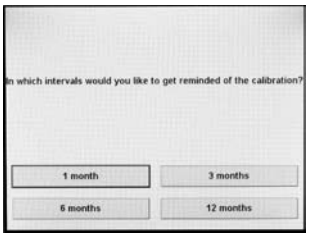
Enter the date (day/month/year).

4.5.5 Setting the time



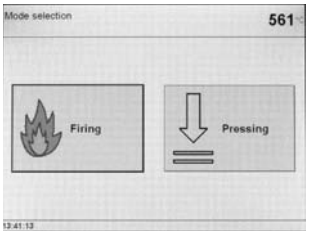
Enter the time (hours/minutes/seconds).

4.5.6 Selecting a reminder for the calibration interval



In this screen, you may define at what interval the furnace should remind you to conduct the next temperature calibration procedure. Additional modifications can be carried out according to the point "Extended settings".

4.5.6 Initial screen or first selection screen (program groups)



Once the language has been selected, the first selection screen is displayed.

4.6 Dehumidification

Before the first firing, the firing chamber should be dehumidified using the dehumidification program.

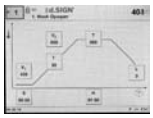
5. Operation and Configuration

5.1 Introduction to the operation

The Programat EP 5000 is equipped with a graphical display with backlighting. The furnace can be operated by means of the keypad or touch screen.
The numeric and command keys can be used to program and control the furnace.

5.2 Explanation of the key functions

Key	Function
P	**Program key** Shows the currently selected program. Pressing the key several times: graphical representation of the program and table-type view with details
▲ ▼	**Up, down** In the parameter list (pressing P two times), these keys can be used to move the cursor.
− +	**Minus, Plus, or changing pages** These keys can be used to change the numeric values. Changing between different pages if a view consists of several pages.
	Settings (selection) Go to the settings menu for: settings, information, special programs, and calibration.
?	**Help** Go to the help feature for the current screen.
	Home Return to "Program Group Indication" (main menu)
	Open furnace head Opening of the furnace head in 5 seconds.
	Close furnace head Closing of the furnace head in 5 seconds.
STOP	**STOP** 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 STOP.

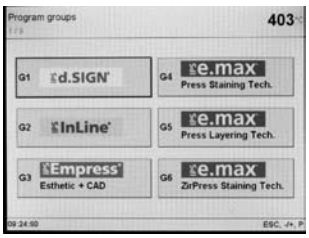
START	**START (Start LED)** Starts the selected program. The fact that a program is running is indicated by the green LED. If the program is interrupted (1 x STOP), the Start LED flashes until renewed pressing of START results in the program being resumed.
ESC	**ESC** Ends an entry without accepting the value. Return from the current to the previous menu. Confirmation of error messages.
ENTER	**Enter** Confirmation of entered value.
1 2 3 4 5 6 7 8 9	**Numeric keypad, 1–9 and 0** Used to enter numeric values.
	**Touch Screen** The display is touch-sensitive. Slightly tapping it with the fingertip will result in the desired button being marked with a thick, black frame. After that, the corresponding function is immediately executed (e.g. the display changes) or the touch button is now ready for an entry by means of the numeric keypad or the +/- keys.
	Pressing or firing Choice between the firing and press mode

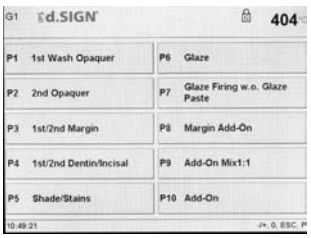
5.3 Program structure

The furnace is equipped with more than 200 firing programs. All the programs are equivalent and, therefore, full-fledged programs. In each program, all the parameters can be adjusted.

a. Standard programs for Ivoclar Vivadent materials
b. Free programs
c. Auxiliary programs

The corresponding program group is selected and displayed by tapping the touch button. After that, another touch button is used to select the desired program.





a) Standard programs for Ivoclar Vivadent materials
Refer to enclosed Program table

When the furnace is delivered ex works, the standard programs already contain the recommended material parameter settings. Moreover, the programs are write-protected. Please refer to the respective list of parameters in Chapter 10.

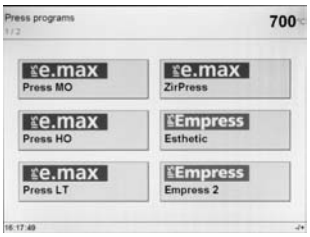
However, the parameters can be changed and overwritten at any time, if the programs are to be used for other purposes. Therefore, these programs are also available as free programs.

b) Free programs
Free, individually adjustable programs

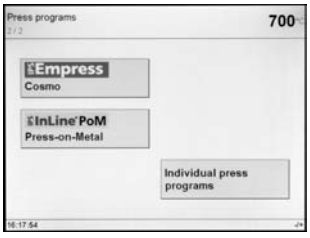
The programs are designed in such a way that they can be either used as conventional, one-stage programs or as two-stage programs, if required. The mode can be changed via the symbol (one- or two-stage program) by using the + or – key.

c) Special programs
Various test programs are available. Please refer to chapter 5.5.5 Special programs.

Press programs
a) Standard press programs for Ivoclar Vivadent materials
b) Individual press programs



The desired press programs can be selected in advance by pressing the respective touch button. The page (1/2, 2/2) can be changed using the Minus/Plus keys. For the selection of a press program, please refer to Chapter 6.3 Press programs.



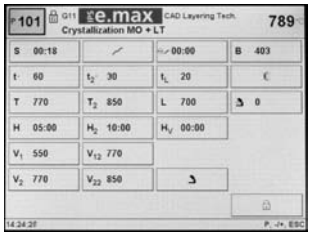
5.4 Adjustable parameters and possible value ranges

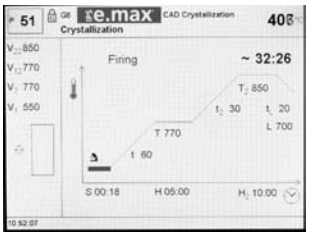
Symbol	Parameter	Value range	Value range
P	Program number P	001–200	
B	Stand-by temperature	100–700 °C	212–1292 °F
S	Closing time (min : sec)	00:18–30:00	
	Pre-vaccum (min : sec)	01:00–05:00	
t↗	Temperature increase rate	10–140 °C/min	18–252 °F/min
T	Holding temperature	100–1200 °C	212–2192 °F
H	Holding 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
t2↗	Temperature increase rate 2nd stage	10–140 °C/min	18–252 °F/min
T2	Holding temperature 2nd stage	100–1200 °C	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
Hv	Holding time Vacuum (min : sec)	00:01–60:00	
	Pre-drying temperature	0 or 100–700 °C	0 or 212–1292 °F
	Pre-drying time	00:00-60:00	

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.

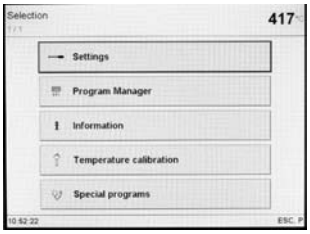
List of parameters
In this screen, the arrow keys can be used to navigate within the list (including program number). An active numeric value can be edited using the – / + keys or the numeric keypad.
An active symbol parameter can only be changed using the – / + keys.

List of parameters – Two-stage program



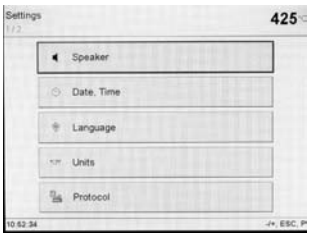


5.5 Settings and information

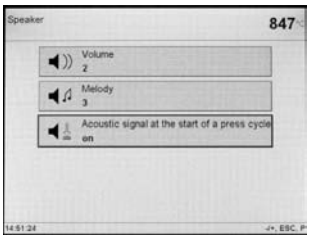


By pressing the "cogwheel" key, you will reach the "Selection" screen. The desired screen is displayed by pressing the corresponding touch button.

5.5.1 Settings



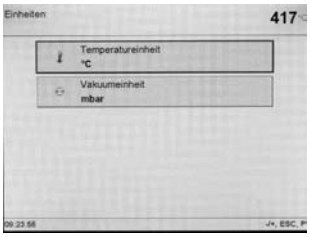
The desired group of settings is displayed by pressing the corresponding touch button. The – / + keys can be used to navigate within these two pages. The desired parameter field is activated by tapping the respective touch button and the settings can be edited using the ""-"/"+" keys.



e.g. Speaker
Pressing the corresponding touch button activates the respective parameter field. The settings may be edited using the ""-"/"+" keys.

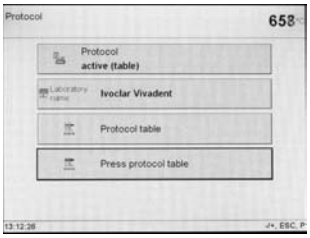
Acoustic signal upon start of the press procedure
In order to inform the user about the actual start of the press procedure (press plunger moves downwards), an additional acoustic signal can be played. For that purpose, the global melody (Example 3) is used.

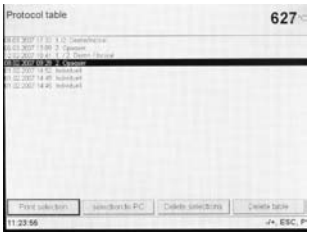
5.5.1.1 Setting the temperature mode



The temperature mode (°C/°F) and the vacuum mode (mbar/hPa) can be changed via *Selection – Settings – Mode*.

5.5.1.2 Protocol

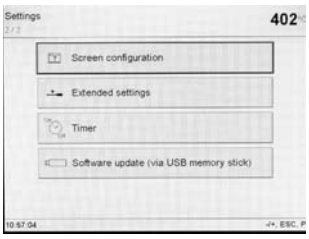


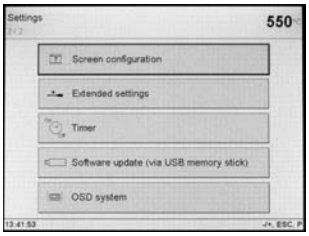


Mark the touch button "Protocol" by pressing it. It can now be edited using the +/- keys. With "Active (table)", the program parameters used are entered into the protocol at the end of a firing program. With "Active (table and printer)", the protocol is also printed with the printer connected to the furnace. By pressing the touch button "Laboratory name", the keypad is displayed and the name of the laboratory can be entered. With "Active (table and PC)", the protocol can be sent to the connected PC software instead of being printed after each firing program.

Pressing the touch button "Protocol table" results in the corresponding screen being displayed. The desired protocol can now be selected using the +/- keys. The selected protocol may either be printed or deleted.

5.5.1.3 Configuration of the displays

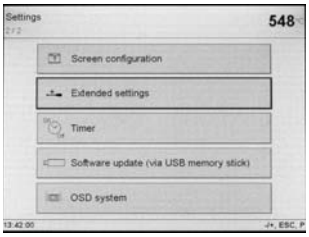


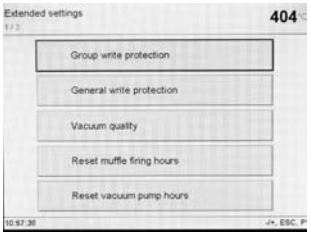


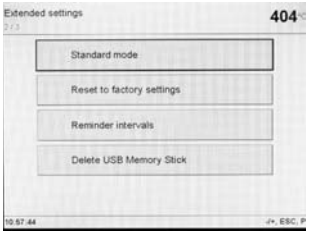
Scroll to page 2/2 in the "Settings" display by means of the "+" key and select "Screen Configuration". After pressing the upper touch button, the "-"/"+" keys can be used to determine which screen should be displayed after a firing program. The user may select either the parameter display of the current program or the program selection display of the corresponding group. By using the lower touch button, a preferred group number can be entered. In this way, the "0" can be used in the program selection display to toggle between the current group and this preferred group.

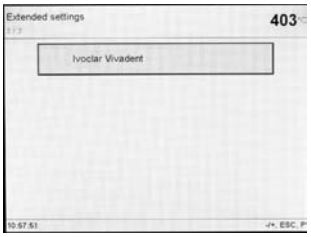
5.5.1.4 Extended settings

Change to page 2/2 in the "Settings" screen using the "plus" key and select "Extended settings".





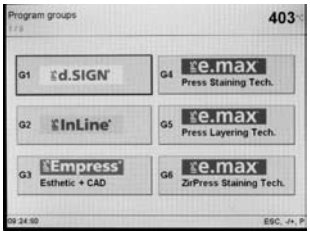




Important information
For most of the "extended settings", the user code (6725) is required.

The most important settings which can be changed under Extended settings are described below:

Group write-protection



Enables the user to lock an entire group (10 programs and group name). The respective group write-protection is activated and deactivated using an individually selected code (1-4 digits). If a group write-protection is active, the write-protection symbol shows the corresponding group.

By deactivating the general write-protection (see specify which subchapter), the write-protection of all groups is deactivated. This function can also be used if the user has forgotten an individual group write-protection.

General write-protection
Enables to release or lock the change of the individual firing programs (name and parameters).

Vacuum quality (absolute)
Defines the vacuum quality (mbar/hPa), which has to be reached by the vacuum pump when the vacuum is built up during the firing program. This value is the basis for calculating the vacuum quality specific to the firing program (see Chapter 5.4 "Parameter vacuum quality").

Set the firing hours of the muffle to "0"
If the (heating) muffle is replaced, the firing hours counter can be reset.

Set the vacuum pump hours to "0"
If the vacuum pump is replaced, the operating hours counter of the vacuum pump can also be reset.

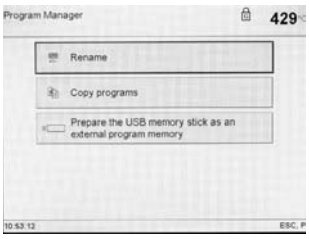
Standard mode
Temperature control according to standard: DIN 13905-1 "Dentistry – Dental furnaces – Part 1: Dynamic test method for temperature measurement with separate thermocouple".

Load factory settings
Resets all settings (see Chapter 8.4).

Reminder intervals
Interval settings to remind you when the next calibration or dehumidification has to be conducted.

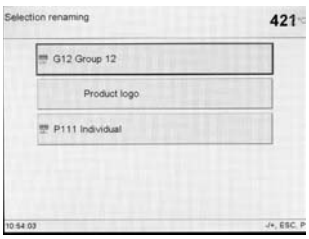
Ivoclar Vivadent
Only used by the Service Center.

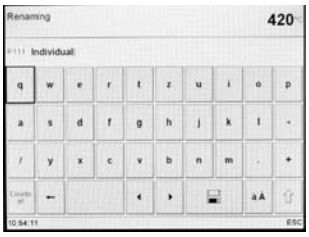
5.5.2 Program Manager



This screen is displayed by pressing the "Program Manager" touch button.

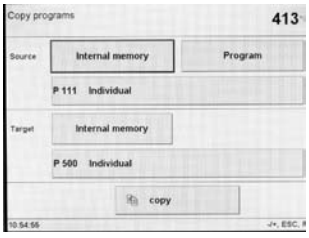
5.5.2.1 Renaming the current program or program group



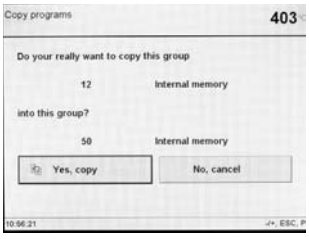


This screen is displayed by pressing the "Rename" touch button. Now, the current program or the current program group can be renamed.
If required, the write-protection has to be unlocked under Settings – Settings – Extended settings.
The keyboard is displayed by tapping the corresponding touch button. The name of the current program or program group can now be edited using the available touch buttons or numeric keypad.
If the process is aborted by pressing the Esc key, the old name is retained.
The blinking cursor can be moved by means of the "arrow" touch buttons. The "Delete" touch button can be used to delete an individual character to the left of the cursor. The entire description can be deleted by pressing the "Delete all" touch button.

5.5.2.2. Copying programs

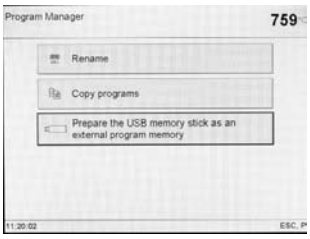


By pressing the "Copy programs" touch button, this screen is displayed.
Here you can set the source and the target of the copy procedure. The desired touch button can be selected (black frame) by slightly tapping on it. Subsequently, the button can be edited using the +/- keys or the numeric keypad.
If a memory stick is used, an additional touch button is displayed.

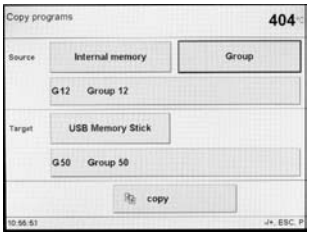


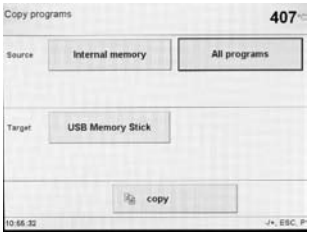
This screen is displayed by pressing the touch button "Copy". The copy procedure is executed by pressing the touch button "Yes, copy".

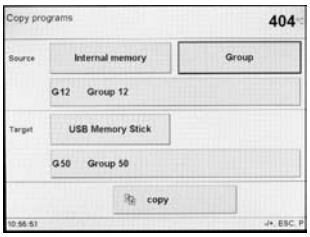
5.5.2.3 Save the firing program / firing group on the USB memory stick



The majority of USB memory sticks can be used as program memory. In order to use the USB memory stick as external program memory, it has to be first prepared as a storage medium. For this purpose, connect the USB memory stick to the furnace. Subsequently, select "Prepare USB memory stick as external program memory" in the program manager. Select /Hard Disk…/ and start the procedure with Open. The process is completed when the message for the successful preparation of the USB memory stick is shown on the display.





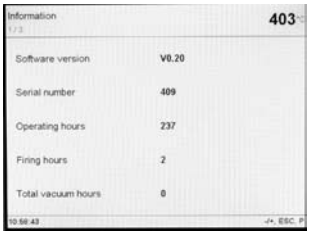


All the existing firing programs (internal memory) of the furnace can be saved on a prepared memory stick. Select Selection – Program manager – Copy programs and make a choice using the +/- keys:

- All programs
- Program (copy a single program)
- Group (copy a single group)

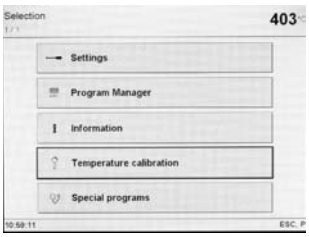
After a USB memory stick is ready for use, the selection menu for "Select program memory" is shown instead of "Program groups" by pressing the Home key.

5.5.3 Information

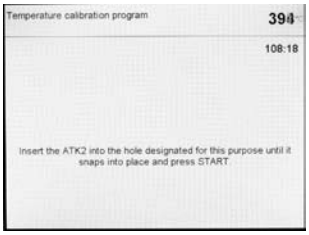


The information pages 1 to 4 provide information on the current software version, operating hours, calibration settings and status of the identified USB devices, such as printer and USB memory stick. The information display also serves to check whether the Programat furnace has identified a USB device.

5.5.4 Calibration

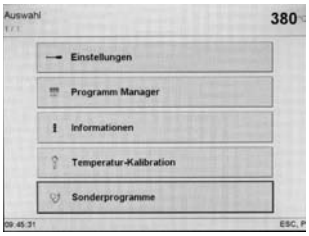


By pressing the "Start calibration program" touch button, the program is automatically started.



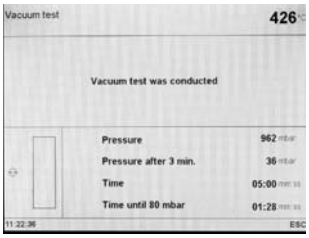
Please see the notes in Chapter 7.4.

5.5.5 Special programs



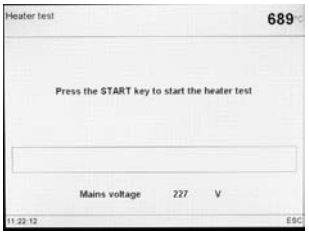
Press the "cogwheel" key, followed by the touch button "Special programs".

5.5.5.1 Vacuum pump test program



With this program, the vacuum performance of the furnace 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.

5.5.5.2 Heater test



The quality of the heating muffle may be automatically checked by means of the heater test (duration: approximately 7 minutes). 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.

5.5.5.3 Cleaning program

The cleaning program is used to "clean" the firing chamber (duration: approximately 17 minutes). 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 table or the firing tray material.

5.5.5.4 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, in order to prevent the absorption of humidity. Start the dehumidification program if required (humidity in the insulation).

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

5.5.5.6 Display test (page 2 / 2)
Two different "chequer-board patterns" are alternately shown on the entire display. This allows the visual check of each individual pixel. The display test can be ended by pressing ESC.

5.6 Description of the symbols in the display

Symbol Name	Meaning	Symbol
Pre-vacuum	Vacuum generation starts before the heating begins.	
"One-stage program"	Abstract firing curve of a one-stage program	
"Two-stage program"	Abstract firing curve of a two-stage program	
"Standard opening of the furnace head"	Furnace head opens in the standard period of time	
"Quick opening of the furnace head"	Furnace head opens in a short period of time, i.e. quicker (arrow)	
Open lock	"Individual write-protection inactive"	
Closed lock	"Individual write-protection active"	
Crossed-out "crescent moon"	"Overnight program inactive"	
"Crescent moon"	"Overnight program active"	
Open furnace head with heat rays	"Pre-drying active"	
"Individual group write-protection active"	All 10 programs of this group are write-protected	
"General write-protection active"	All programs are write-protected	
Press mode or note on the active press procedure	For selecting the Press mode. If the press process has been started, this symbol is shown next to the remaining pressing time.	

5.7 Explanation of the speaker signals

The speaker signal can only be ended by pressing the STOP key.

No.	Description of the occasion	Description of the speaker signal
1	Self-test successfully completed	Short melody selected by the user
2	Furnace head completely open and the furnace temperature having dropped below 320 °C/608 °F	Speaker is switched on and plays the melody selected by the user for 10 seconds. If the signal is not confirmed by pressing the STOP key during this time, the melody is played again after 5 minutes for 5 minutes. After that, no further acoustic signal will be played. If the STOP key is pressed while the signal is played (for 10 seconds or 5 minutes), the speaker is switched off immediately. No further acoustic signal will be played.
3	Error messages	The speaker is switched on and plays the "error melody". The speaker can only be switched off by pressing the STOP key.
4	Keyboard test active	Each keystroke is confirmed with a short beep (approximately 0.5 s. ON)
5	Test or calibration program successfully completed	Short melody selected by the user

5.8 OSD (Optical Status Display)

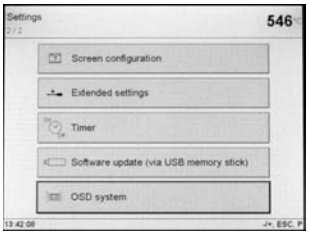
The OSD (Optical Status Display) (51) on the side of the operating unit shows the most important statuses of the furnace. The following activities are shown:

Colour	Activity
white (blinking)	The furnace is in the switch-on mode (self-test active)
white	Stand-by, the furnace is basically ready to use
green	Operating temperature B of the currently selected program was reached by +/- 20 °C
yellow (blinking)	Information, note or error message
orange	Program is in the close-head or preheating mode
red	Program is in the heating mode
magenta	Program is in the holding time H mode
blue	Program is in the long-term cooling or open-head mode
turquoise	Press program is in the press mode

5.8.1 The start procedure

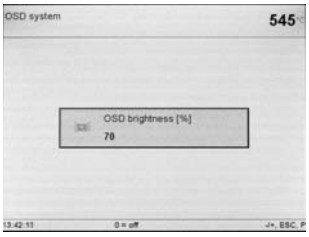
The handles blink white when the furnace is started. Once the starting process is completed, the OSD lights up in white or green.

5.8.2 Setting the brightness



The brightness can be set in 5%-steps in the menu "Settings" (OSD system).

5.8.3 Deactivation

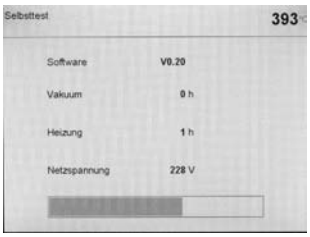


In order to deactivate the OSD, the brightness has to be set to 0%.

6. Practical Use

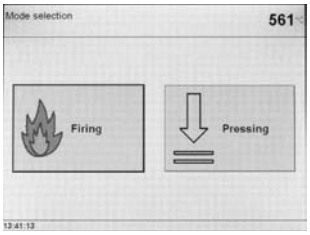
The operating procedure for the Programat EP 5000 will be explained with the help of two examples: one standard and one individual program.

6.1 Switching on/off



Put ON/OFF switch (11) on posi-tion "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.

6.1.1 Main menu



After successful completion of the self-test, the main menu is shown in the display.

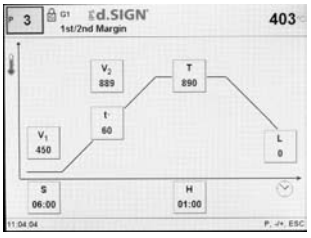
6.2 Firing programs

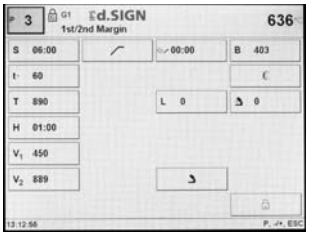
The Firing mode can be selected by means of the touch screen function.

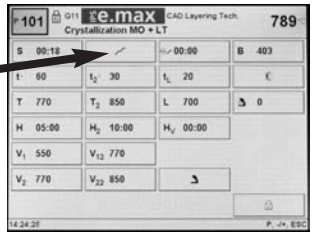
6.2.1 List of parameters

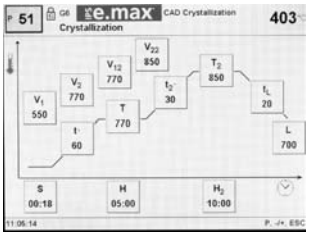
The cursor (black frame) shows the button which is currently active. It can be moved by means of the arrow keys. If the cursor is positioned on the program button, the desired program can be selected using the + or - keys. As an alternative, the program number can also be entered by means of the numeric keypad.

One-stage program
The list of parameters is accessed by pressing the Program key (70). The list shows all the parameters.







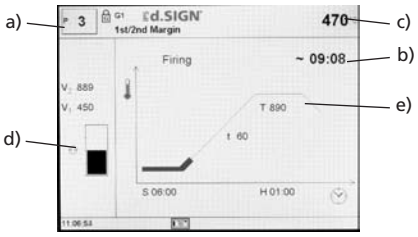


If the cursor is positioned on the "one-stage symbol" and the symbol is switched to the "two-stage symbol" by pressing the + or – key, the program has been set to "two-stage".

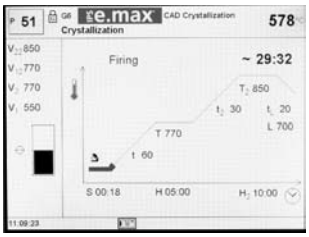
If the cursor is set on the "two-stage symbol" and the symbol is switched to the "one-stage symbol" by pressing the + or – key, the program has been set to "one-stage".

6.2.2 The firing curve display

If the program is started with the START key, the firing curve display with the vacuum status is shown.



The following information is always displayed:
a) Program number
b) Remaining time
c) Current temperature
d) Status of vacuum
e) Status bar

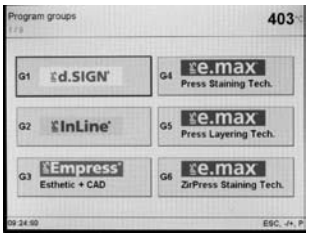


If a two-stage program is selected, two stages are shown.

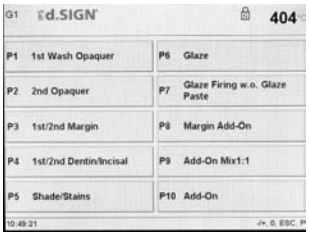
During a firing program in progress, the parameter firing curve may be displayed at any time for information purposes by pressing the "P" key. However, the parameters may only be changed with the program stopped or the furnace in stand-by mode.
The vacuum indication and all the corresponding parameters are faded out if no vacuum is needed. Only the necessary values are displayed.

6.2.3 Firing using a standard program

Step 1:



Select the desired material (e.g. IPS d.SIGN) in the program group of your choice.



Now, select the desired program (e.g. 1st opaquer).

Step 2:
Now, open the furnace head by pressing the "Open furnace head" key (90) and place the firing tray with the object to be fired in the furnace.

Step 3:
Activate the program by pressing the "Start" button (73). The green Start LED starts flashing. The process is indicated in the firing curve display.

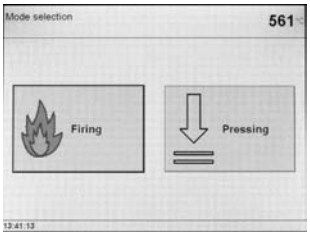
6.3 Press programs

The Programat EP 5000 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.

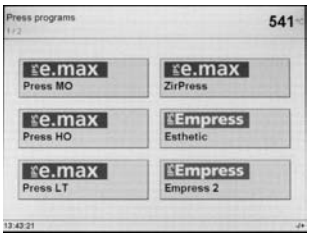
Individual parameters which can be manually adjusted are listed in the table below:

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

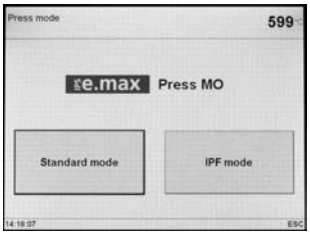
6.3.1 Standard press programs



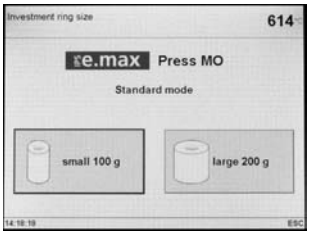
The Operation Mode key can be used to show the selection screen.



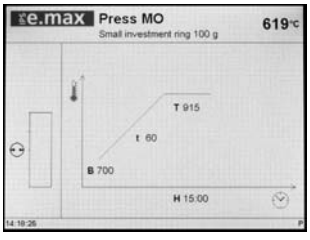
If the press programs are called up, the first page with the Ivoclar Vivadent standard programs is displayed.



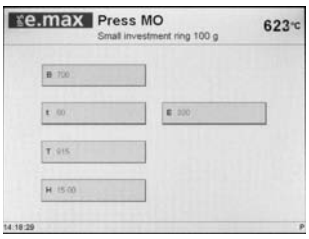
In addition to the popular Ivoclar Vivadent standard programs, certain materials can also be pressed using the new IPF mode (Intelligent Press Function) (see also Chapter 6.3.3). For materials which offer the IPF mode, the shown selection screen is displayed.



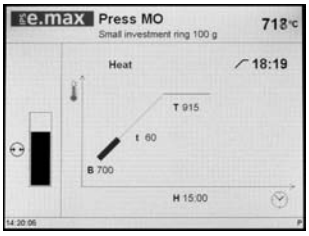
Subsequently, the selected investment ring size (small or large) can be chosen. This selection applies to both standard and IPF programs.



This is the Stand-by screen for a press program in the standard mode.



By pressing the "P" key, you can toggle between the Stand-by and Parameters screen. The shown parameters are displayed for information purposes and cannot be edited.



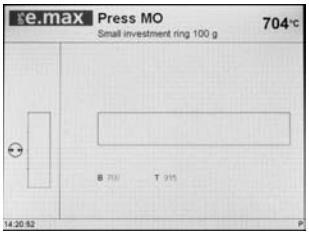
Operation screen during a press program in the Standard mode. Once the press procedure starts, an additional arrow indicates that the press plunger moves downwards. The entire time of the press cycle is displayed once and the path which the press plunger has already covered since the start of the press procedure in the selected measuring unit.

Important information

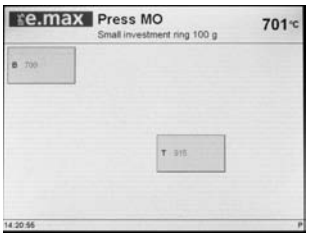
For the abort speed, we recommend using a value of 300 µm/min in the layering technique and 150 µm/min in the staining technique.

- A higher value (abort speed e.g. 300 µm/min) aborts the press procedure earlier.
- A lower value (abort speed e.g. 100 µm/min) aborts the press procedure later and prolongs the press procedure.

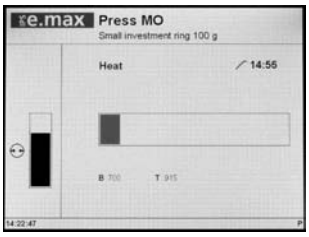
For the all-ceramic systems from Ivoclar Vivadent (IPS e.max, IPS Empress Esthetic), only the original standard programs which are especially coordinated with the materials must be used.



This is the Stand-by screen for a press program in the IPF mode.

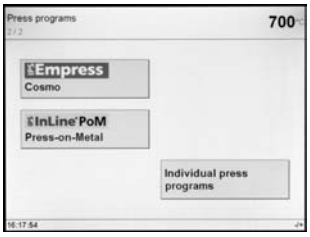


By pressing the "P" key, you can toggle between the Stand-by and Parameters screen. The shown parameters are displayed for information purposes and cannot be edited.



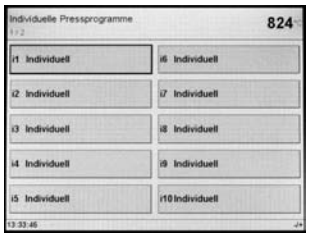
Operation screen during a press program in the IPF mode. IPF is a protected procedure from Ivoclar Vivadent AG for pressing ceramic ingots. Therefore, the process is only shown by means of a status bar.

6.3.2 Individual press programs

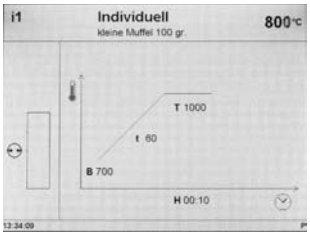


Page 2/2 of the press programs is shown. The -/+ keys can be used to toggle between page 1/2 and page 2/2.

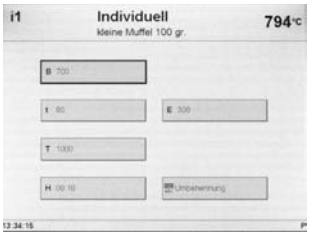
The selection for the individual press programs is also on page 2/2 of the press programs.



The EP 5000 has 20 individually programmable press programs.
.



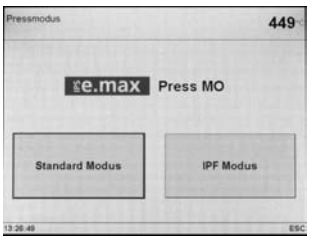
Stand-by screen for individual press programs.



By pressing the "P" key, you can toggle between the Stand-by and Parameters screen. The shown parameters are displayed for information purposes and cannot be edited.

6.3.3 IPF Modus – Intelligent Press Function

In this operation mode, the investment ring is ideally brought to the required press temperature by means of an intelligent temperature control. At the same time, the time until the start of the press procedure is reduced by up to 25% and the temperature in the investment ring is homogenized. The press furnace automatically considers the power supply and possible ageing of the heating element and adjusts the temperature control, if required. In the IPF mode, only a status bar is shown.



If an IPF program is available for a certain material, it is shown after the material selection. You can then select the Standard mode or the new IPF mode.

The IPF mode cannot be selected for individual programs.

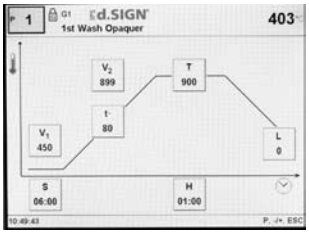
6.3.4 CDS – Crack Detection System

Different failures may occur during the press procedure. The Crack Detection System tries to identify these failures during the press procedure in order to save the dental object or ingot. The Crack Detection System produces the information messages No. 520, 521 on the screen and aborts the press procedure. If such a message appears, check the following points:

- Check the ingot or program selection
- Observe the "sprueing and investment guidelines" according to the instructions for use of the material
- Check whether the investment ring was placed in the center or whether the firing plate is clean or the size of the Alox plunger is correct and the plunger clean
- Check the press plunger for cracks or correct fixation and whether the firing plate is contaminated or fractured
- Otherwise, possible defect of the press drive – please contact your local Ivoclar Vivadent Service Center.

6.4 Further possibilities and special features of the furnace

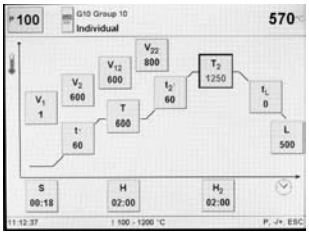
6.4.1 Quick program selection



Each program can be directly selected by its program number. The program number is shown in the upper left area of the program display (e.g. P95). To quickly select a program, press the P key and enter the program number. Confirm with the Enter key.

After pressing the P key, the individual programs can be additionally run through using the +/- keys.

6.4.2 Illogical values or incorrect entries



If an illogical value is entered by means of the numeric keys (outside the current value range), the invalid entry still blinks after confirmation.

As error message (entry error: entry outside the value range), an exclamation mark blinks in the bottom line until the next value is entered and successfully confirmed or the process is aborted with ESC. The old, valid value reappears. Please refer to the parameter details for the value range.

6.4.3 Program write protection

- *Individual program write-protection active*
  Activate/deactivate with the corresponding touch button in the parameter list and the +/- keys.
- *Individual group write-protection active*
  Change to page 2/2 in the "Settings" screen using the + key. Then, select "Extended settings", followed by "Group write-protection". An individual group write-protection can be activated using a random code and deactivated with the same code.
- *General write-protection active*
  Change to page 2/2 in the "Settings" screen using the + key. Then, select "Extended settings", followed by "General write-protection". The general write-protection can only be activated or deactivated with the user code. Each time the general write-protection is deactivated, all the individual group write-protections are also deactivated. The individual program write-protections, however, will be maintained.

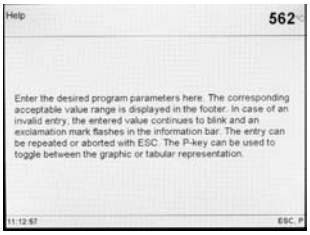
6.4.4 Stopping the running program

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 running
All parameters of the program, which have not yet been executed, can be changed while the program is stopped (green LED blinks).

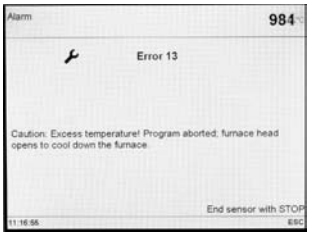
6.4.6 Standard / quick opening of the furnace head
The operator may select the furnace head opening mode by changing the symbol:
– "Standard furnace head opening" symbol visible: (the furnace head opens within 60 seconds at the end of the program).
– Toggle to "Quick furnace head opening" by means of the – / + key
– "Quick furnace head opening" symbol visible: (furnace head opens within 18 seconds at the end of the program).
– Toggle to "Standard furnace head opening" by means of the – / + key.

6.4.7 Help



Help text for the current screen

6.4.8 Error message



The error group symbol should supply a first indication of the type of error (entry error = exclamation mark; technical error = fork wrench; Note = "i" symbol) without the user having to consult the Operating Instructions.

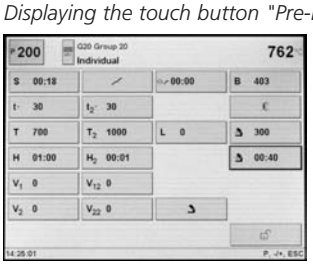
6.4.9 One-stage / two-stage programs
If the cursor is on the "one-stage program" symbol, pressing the – / + key results in the symbol to change to the "two-stage program" symbol. At the same time, the program was also changed to become a "two-stage program".

If the cursor is on the "two-stage program" symbol, pressing the – / + key results in the symbol to change to the "one-stage program" symbol. At the same time, the program was also changed to become a "one-stage program".

6.4.10 Program status indication
The current program status is indicated in the firing curve display: *pre-drying, closing, pre-vacuum, firing, long-term cooling, opening*

If the program is interrupted, "*Pause*" starts flashing as an indicator. If a program is prematurely stopped, "*Vacuum release*" is flashing while the firing chamber is flooded.

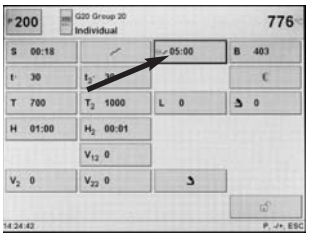
6.4.11 Pre-drying (one-stage or two-stage program)
Displaying the touch button "Pre-Drying Temperature":



Change to page 2/2 in the "Settings" screen using the + key. Then, select the touch button "Preheating with the furnace head open" and use the +/- keys to switch on the "pre-heating" setting.
In this way, the touch button "Pre-drying temperature" is displayed in the parameter list.
The function "pre-heating", however, is not yet activated (temperature = 0).

For a program with individually activated pre-drying, the desired "pre-drying temperature" is set after the program start with the furnace head open (heating or cooling). Once this temperature is reached, pre-drying is carried out during the "pre-drying holding time" Once the holding time has elapsed, the furnace head is closed within the desired closing time.

6.4.12 Pre-vacuum

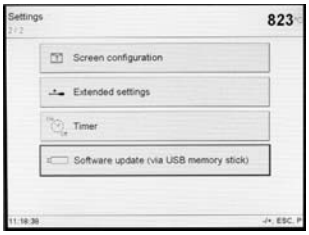


If a firing program with pre-vacuum is conducted, the vacuum pump is switched on at the end of the closing time (as soon as the furnace head is closed). Once the pre-vacuum time has elapsed, the heating phase begins. Upon the start of a program with an individually activated pre-vacuum (value between 1:00 and 5:00), the V1 value is ignored. The vacuum is maintained until V2 is reached. V2 must be higher than the stand-by temperature B.

6.4.13 Overnight program
a. At the end of an "overnight" program (overnight program symbol active), the heater is switched off and the furnace head opens.
b. When the temperature drops below a certain level, no melody is being played.
c. Once the temperature is lower than 100 °C /212 °F, the furnace head closes, the heater remains switched off, and the furnace cools down to room temperature.
d. The green Start LED starts flashing when the furnace head is opened.
e. After a power failure during an overnight program in progress, the furnace no longer heats up, but remains at room temperature.

6.4.14 "Quick cooling"
If the "Open furnace head" key is pressed again with the furnace head already completely open, the "Quick cooling" function is started. This means that the vacuum pump is switched on for 5 minutes. This function can be stopped early by pressing STOP, "Close furnace head", or START.

6.4.15 Software Update
The user will be able to conduct a software update by CD, 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 download center (www.ivoclarvivadent.com).



A further method for updating the software is to use the USB memory stick. This item is available in the Settings menu on page 2.
To update the software, a USB memory stick is required with a current software image in the form of a *.gz file. The software version on the USB memory stick must be newer than the one on the furnace (see Selection – Information).

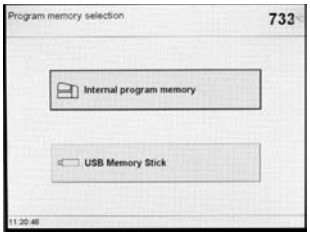
Step 1: Connect the USB memory stick with the current software version to the furnace
Step 2: Select the menu item "Software Update"
Step 3: Select the software image file (the file name has to start with EP 5000_)
Step 4: Start the software update with the "Open" key
Step 5: Wait until the furnace indicates a successful update process
Step 6: Re-start the furnace

6.4.16 USB printer

Each USB-PCL printer can be used to printout the protocol. If a USB-PCL printer is connected to the furnace, the necessary software driver is loaded. After that, the USB printer is immediately ready for use.

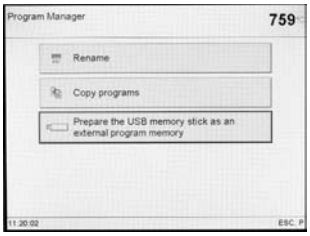
– The status of the USB-PCL printer is shown in the "Information" menu item
– The desired protocol to be printed can be selected in the protocol table.

6.4.17 USB memory stick



Most USB memory sticks may be used to store programs.

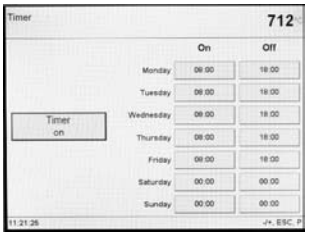
Once the USB memory key has been recognized, "Select program memory" is displayed. In this screen, either the internal programs or the programs on the USB memory key can be activated. If the USB memory is used for the first time with a EP 5000, free programs are saved in this 'empty' memory.
After that, the USB memory stick is immediately ready for use.



– The active status of the USB memory stick is shown in the "Information" menu item (page 3 / 3).
– In the Program Manager, the USB memory stick may now be selected as either the source and/or the target.

In this way, a backup copy of all the programs can be made at any time. Once a USB memory stick is ready for use, the screen connected to the "Home" key (usually "Program Groups") is changed to "Program memory selection" (see chapter 5.5.2.3).

6.4.18 Timer



The timer can be used to put the furnace in an energy saving mode for a defined period of time. During this time, the heating of the furnace is deactivated, so that the power consumption is only minimal. The furnace itself, however, remains switched on. Avoid activating the timer when the furnace head is open.

7. Maintenance, Cleaning, and Diagnosis

This chapter describes the user maintenance and cleaning procedures for the Programat EP 5000. All the 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

Expendable 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
Check if there is condensate in the vacuum hose or firing chamber.	Vacuum hose Firing chamber	monthly

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.

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:

Item	Frequency:	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

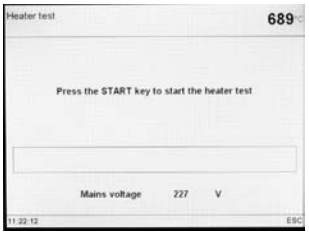
*Never clean with compressed air!

7.3 Special programs

Press the "cogwheel" key, followed by the touch button "Special Programs".

Vacuum pump test program
With the program, the vacuum performance of the furnace 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.

Heater test
The quality of the heating muffle may be automatically checked by means of the heater test (duration: approximately 7 minutes).



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 are conducted. 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.

Cleaning program
The cleaning program is used to "clean" the firing chamber (duration: approximately 17 minutes). 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 table or the firing tray material.

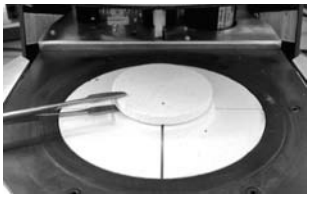
Dehumidification program
The condensation of water in the insulation of the firing chamber and the vacuum pump will result in a lower vacuum and thus to impaired firing results. For that reason, the furnace head should be kept closed when the furnace is switched off, in order to prevent the absorption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

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

Display test (page 2 / 2)
Two different "chequer-board patterns" are alternately shown on the entire display. This allows the visual check of each individual pixel. The display test can be ended by pressing ESC.

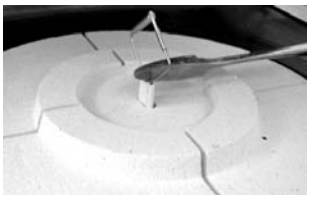
7.4 Temperature calibration

1. Select the calibration program.
2. Remove the firing plate from the furnace using the furnace tongs and place it on the cooling tray.

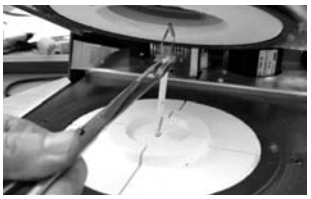


3. Carefully grip the upper part of the ATK 2 using the furnace tongs (Caution: Fracture risk of the ceramic) and insert it into the holes designated for this purpose until it snaps into place.

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.

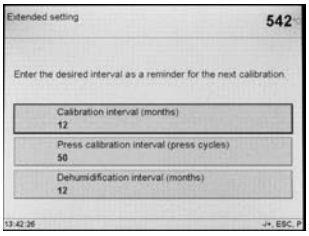


7. Replace the firing plate using the furnace tongs.
8. Close the furnace head and select a firing program.
9. The ATK 2 can only be used once. Use a new calibration set for the next calibration procedure.

7.5 Stand-by

We recommend keeping the furnace head closed, particularly if the temperature drops below 150 °C / 302 °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.

7.6 Press power calibration

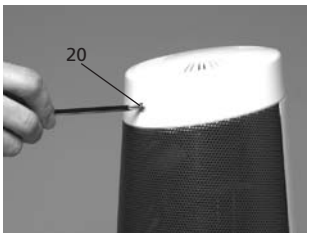


The interval for press calibration can be set in this menu.

7.7 Replacing the press plunger

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

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

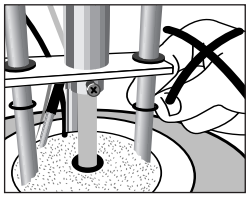


2. Loosen the terminal screw from the press plunger (65) by about half a rotation.
3. Open the furnace head by means of the respective key (90). When the furnace head is wide open, switch off the furnace, disconnect the power plug and let the furnace cool to room temperature.
4. Pull the press plunger (59) with slightly rotating movements from the split taper socket (64) with one hand and pull down the press plunger in the firing chamber 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 the split taper socket (64) and fasten the screw (65).

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



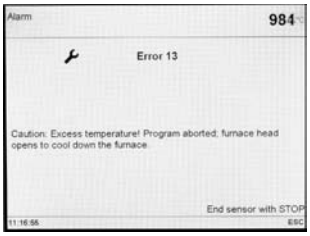
Mount the press drive cover (56) and fasten with screw.

6. Connect the power plug and switch on the furnace with the 0/I switch.

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.

Index	Category	Error	ERR No.	Conti-nuation possible	Error Message Text
1	Entry	T < B	2		Enter a logical value for T
2	Entry	L > T	8		Enter a logical value for long-term cooling L
3	Entry	V2x <= V1x	9		Enter a logical value for the vacuum-on temperature Vx1 or the vacuum-off temperature Vx2
4	Entry	V2x > Tx + 1°C	10		Change either the vacuum values or the holding time T
5	Entry	Incorrect values for V1x, V2x	11		Enter a logical value for V1x, V2x
6	System	Current temperature after Start > Tx + 80 °C	13 *, **		Excess temperature! Program aborted, furnace head opens to allow the furnace to cool down.
8	Entry	T2 < T1	16		Enter a lower value for T1 or a higher value for T2.
9	System	Power failure > 10 s during a firing program in progress	17		A firing program in progress was interrupted for more than 10 s. The program cannot be continued!
10	Entry	T1 > V12	18		Enter a lower value for T1 or a higher value for V12
11	Entry	vV set, but V2 is missing or invalid	19		Pre-vacuum activated! V2 must be higher than B.
12	System	Error in the heating system	20 **	no	Check the heater fuse.
13	System	Heating muffle very old	23		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.
14	System	Heating muffle defective	24		The condition of the muffle is so poor that is has to be replaced immediately.
15	System	Temperature in the furnace base is higher than 65 °C	25		The furnace base is too hot! Make sure that the air vents of the furnace are clean and unobstructed. Maximum temperature 65 °C
16	Entry	T is > B + 160 °C at the start of a firing program	26		Firing chamber too hot to start a firing program.
17	System	Furnace head cannot be initialized	27 **, ***		The furnace head cannot be moved to the final position. It might be blocked by an external mechanical source!
18	System	The furnace head does not reach the target position	28 **		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!
19	System	Temperature > 1225°C (SW) or > 1300°C (HW) EXCESS TEMPERATURE	29 *, **, ***	no	Excess temperature! The temperature in the furnace head by far exceeds the acceptable temperature range (maximum temperature 1200 °C).
20	System	The vacuum is not released	32 **	no	The vacuum cannot be released. The vacuum valve might be dirty or stuck.
21	System	Necessary vacuum (xxxmbar) is not reached within 1 min.	33		The vacuum cannot be established. Check the seal of the firing chamber, vacuum hose, vacuum pump, pump fuse.
22	System	Write error in the firing program memory	43		Error while saving firing program data to the internal memory.
23	System	Read error in the firing program memory	44		Error while reading firing program data from the internal memory.
24	System	Checksum error in the firing program memory	45		Invalid checksum of the memory for firing program data - the firing program data are written to the internal memory using the original values.
25	System	Write error in the firing group memory	46		Error while writing firing group data to the internal memory.
26	System	Read error in the firing group memory	47		Error while reading the firing group data from the internal memory.

Index	Category	Error	ERR No.	Continuation possible	Error Message Text
27	System	Checksum error in the firing group memory	48		Invalid checksum of the memory for firing group data - the firing group data are written to the internal memory using the original values.
28	System	OT1 <> OT2 plausibility check: OT1 = OT2 +/- 10°C	54 **,***	no	Error in the temperature measuring circuit!
29	System	Temperature in the furnace base is lower than 1 °C	56		Temperature in the furnace base is lower than 1 °C. Bring the furnace base to a higher operating temperature.
30	System	Program start blocked	103		Starting a program is not possible due to a technical malfunction.
31	Entry	Timer activated – unit into stand-by mode	106		The program cannot be started, because the unit was put into stand-by mode by the timer (heating turned off). Deactivate the timer or extend the time frame to be able to execute programs.
32	System	Incorrect time settings (date / time)	107		The clock settings are incorrect. Please set a correct date and a correct time!
33	System	Print error	108		An error occurred during printing.
34	Entry	HV > H (H2)	110		Enter a lower value for HV or a higher value for H (H2)
35	Note	Maximum number of firing program protocol entries reached	111		The maximum number of firing program protocol entries has been reached. For the next protocol, an existing entry will be deleted / overwritten.
36	Entry	"Share of the holding time with vacuum" is activated, but Vx2 does not correspond to Tx or Tx+1	120		Activate the vacuum during the holding time Tx or deactivate HV..
37	System	Error pressing time	500		Max. pressing time exceeded
38	System	Error press position	504		Max. position exceeded
39	System	Error press force	505		Max. press force exceeded.
40	System	Error press drive initalized	513		Press drive is not initialized. Please switch the furnace off and on again.
41	System	Error press drive	514		Technical error in press drive
42	Inform.	Error muffle crack	520		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
43	Inform.	Error muffle crack	521		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
44	Inform.	Error muffle crack	522		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 progr
45	Entry	T is > B + 200°C at the start of a IPF press progr.	526		Firing chamber is too hot for the start of a IPF press program.
46	Entry	IPF press program parameters not plausible	527		The set IPF press program parameters are not plausible.
47	Entry	T is < 350°C at the start of a IPF press program	528		The furnace is too deeply cooled down for the start of a IPF press program.
48	Note	IPF press program Error temperature	529		The temperature during the IPF press program does not comply with the specifications. The program may be continued nonetheless.
49	System	Error during logging of press program data	530		An error has occurred during logging of press program data. The storage medium might be full.
50	System	Supply voltage outside the acceptable range	700		The supply voltage is outside the acceptable range. Check the supply voltage.
51	System	Start-up aborted due to an error	701 ***	no	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.
52	System	Brief power failure during a program in progress	702		A program in progress was interrupted by a brief power failure. The program is continued!
53	System	Power failure during a program from the memory stick in progress – memory stick no longer present.	703		A program in progress (started from the USB memory stick) was interrupted by a power failure. The program could not be continued, since the USB memory stick is no longer present!
54	System	Prolonged power failure during an onvernight program in progress	704		An overnight program in progress was interrupted by a prolonged power failure. The overnight program is continued!
55	System	Reading and processing supply voltage	705 **,***	no	Error during measuring the supply voltage.
56	System	Reading the power frequency	706		Error during measuring the supply voltage.
57	System	Incorrect supply voltage	707		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.
58	System	Final vacuum value not reached	800		The required final vacuum value cannot be reached. Check the vacuum pump.
59	System	Vacuum drop	801		An unacceptable vacuum drop has occurred.
60	System	The vacuum does not increase (self-test)	802		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.?

Index	Category	Error	ERR No.	Continuation possible	Error Message Text
61	System	Temp. EXTERNAL T-SENSOR excess temperature (> 1225°C)	1010		Temperature channel EXTERNAL T-sensor excess temperature
62	System	Write error in the furnace configuration data memory	1011		Error while saving furnace configuration data to the internal memory.
63	System	Read error in the furnace configuration data memory	1012		Error while reading the furnace configuration data from the internal memory.
64	System	Checksum error in the furnace configuration data memory	1013		Invalid checksum of the memory - furnace configuration data are written into the internal memory using the original values.
65	System	Write error in the furnace operational data memory	1014		Error while saving the furnace operational data to the internal memory.
66	System	Read error in the furnace operational data memory	1015		Error while reading the furnace operational data from the internal memory.
67	System	Checksum error in the furnace operational data memory	1016		Invalid checksum of the memory – furnace operational data are written into the internal memory using the original values.
68	System	Write error in the firing protocol data memory	1017		Error while saving the firing program protocol data.
69	System	Read error in the firing protocol data memory	1018		Error while reading the firing program protocol data.
70	System	Checksum error in the firing protocol data memory	1019		Invalid checksum of the memory – firing program protocol data are deleted.
71	System	Technical error of the furnace head	1024 **,***	no	Error while reading the stop switch for the furnace head.
72	System	Technical error of the furnace head	1025 **,***	no	Read/write CPLD
73	System	Technical error of the vacuum driver	1026 **,***	no	Error in the vacuum driver
74	System	Technical error in the SBS driver	1028		Error while reading/writing the SRAM.
75	System	Write error in the firing program memory	1143		Error while saving firing program data to the USB memory stick.
76	System	Read error in the firing program memory	1144		Error while reading firing program data from the USB memory stick.
77	System	Checksum error in the firing program memory	1145		Invalid checksum of the memory for firing program data – the firing program data are written to the USB memory stick using original values.
78	System	Write error in the firing group memory	1146		Error while saving firing group data to the USB memory stick.
79	System	Read error in the firing group memory	1147		Error while reading the firing group data from the USB memory stick.
80	System	Checksum error in the firing group memory	1148		Invalid checksum in the memory for firing group data - the firing group data are written to the USB memory stick using original values.
81	System	Reading, calculating the ambient temperature	1202 **,***	no	Error while measuring the ambient temperature
82	System	Reading, calculating the furnace temperature	1203 **,***	no	Error while measuring the furnace temperature
83	System	Reading, calculating the furnace control temperature	1204 **,***	no	Error while measuring the furnace control temperature
84	System	Reading, caluclating the resistance value	1205		Error while measuring the resistance value for the ATK2 calibration.
85	System	Reading, calculating, EXTERNAL T-sensor	1206		Error while measuring the temperature for the EXTERNAL T-sensor.
86	System	Temperature regulator	1207 **,***	no	Error in the temperature regulator.
87	System	ATK2 calibration: Pre-heating to 660 °C	1300 **		Error during calibration.
88	System	ATK2 calibration: Calibration of 660 °C	1301 **		Error during calibration.
89	System	ATK2 calibration: Pre-heating to 962 °C	1302 **		Error during calibration. Sample may not be correctly inserted. Try again with a new sample and make sure the sample makes ample contact.
90	System	ATK2 calibration: Calibration of 962 °C	1303 **		Error during calibration.
91	System	ATK2 calibration: Difference in the calibration values	1304 **		Error during calibration.
92	System	ATK2 calibration: Calibration value range	1305 **		Error during calibration.
93	Note	Calibration reminder	1310		Some time has passed since the last calibration procedure. Calibrate the furance soon.

Index	Category	Error	ERR No.	Conti-nuation possible	Error Message Text
95	Note	Dehumidification reminder	1312		Some time has passed since the last dehumidification. Conduct a dehumidification in the near future.
96	System	Access Board Descriptor: Writing the version number	1400		Error while writing the new version number to the BoardDescriptor (E2Prom).
97	System	Access Board Descriptor: Writing the serial number	1401		Error while writing the new serial number to the BoardDescriptor (E2Prom).
98	System	Access Board Descriptor: Reading the serial number	1402		Error while reading the serial number from the BoardDescriptor (E2Prom).
99	System	Loading of the drivers failed	1500 ***	no	Failure during loading the necessary drivers. The furnace is not ready.
100	Note	Temperature > VT at the start of a firing program	1510		The temperature in the firing chamber is higher than the pre-drying temperature. Press START to continue the program despite the error message.
101	Entry	Software update: Invalid file	1520		The file selected for the software update is invalid. The update cannot be conducted.
102	Entry	Software update: Invalid version	1521		The software to be installed is older or the same as the one installed on the furnace. The update cannot be conducted.
103	System	Software update: Error during update	1522		An error has occurred during the software update. Do NOT switch off the furnace and try again. If the error reoccurs, try conducting the update via the USB interface.
104	System	LED-Print: Error during communication with the LED printed board	1530		An error has occurred upon communication with the LED printed board.
106	Inform.	Change operation mode	1550		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.

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

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.

Description	Double-check	Action
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 *Selection - Settings - Extended settings - Factory settings*. All programs, OSD settings, melodies, navigation settings and volume control settings will be reset to the factory settings.

9. Product Specifications

9.1 Delivery form

– Programat EP 5000
– Power cord
– Vacuum hose
– Calibration test set
– Operating Instructions
– Programat Firing Tray Kit
– Programat USB stick
– USB data cable

9.1.2 Recommended accessories

– Programat Accessories Set
– Temperature Checking Set 2
– Vacuum Pump VP4

9.2 Technical Data

Power supply	110–120 V / 50–60Hz 200–240 V / 50–60Hz
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 pump of 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: 470 mm / width: 305 mm / 400 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: 13.5 kg Furnace head: 7.0 kg

Safety information

The EP 5000 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 is tested for use at altitudes of up to 2000 m (6562 ft.) above sea level.

9.4 Acceptable transportation and storage conditions

Acceptable temperature range	-20 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 original packaging of the Programat EP 5000 together with the respective foam material for shipping purposes.

10. Appendix

10.1 Program table

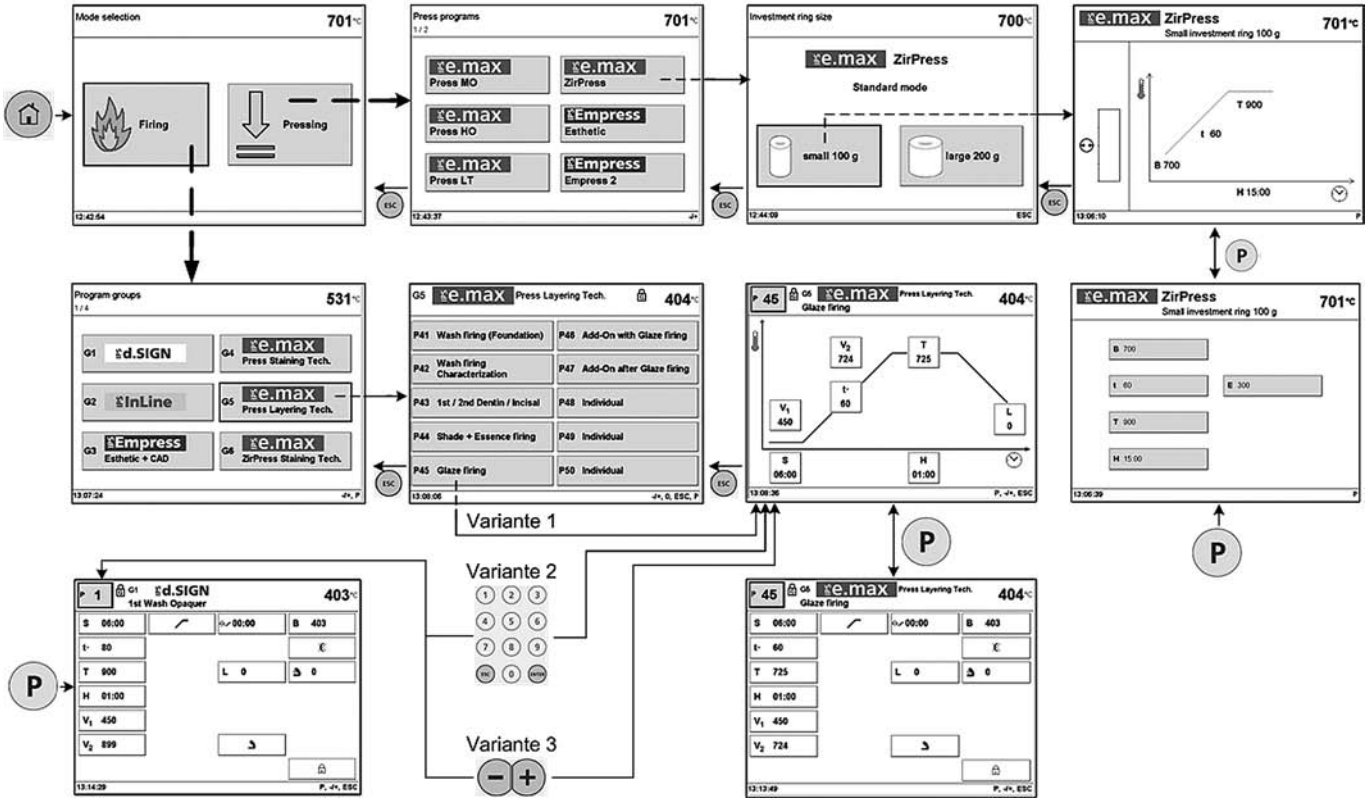
Two program tables (°C / °F) are enclosed to these Operating Instructions. If not, please contact your local Ivoclar Vivadent Service Center.

Important information
The current program table is also available at:
www.ivoclarvivadent.com

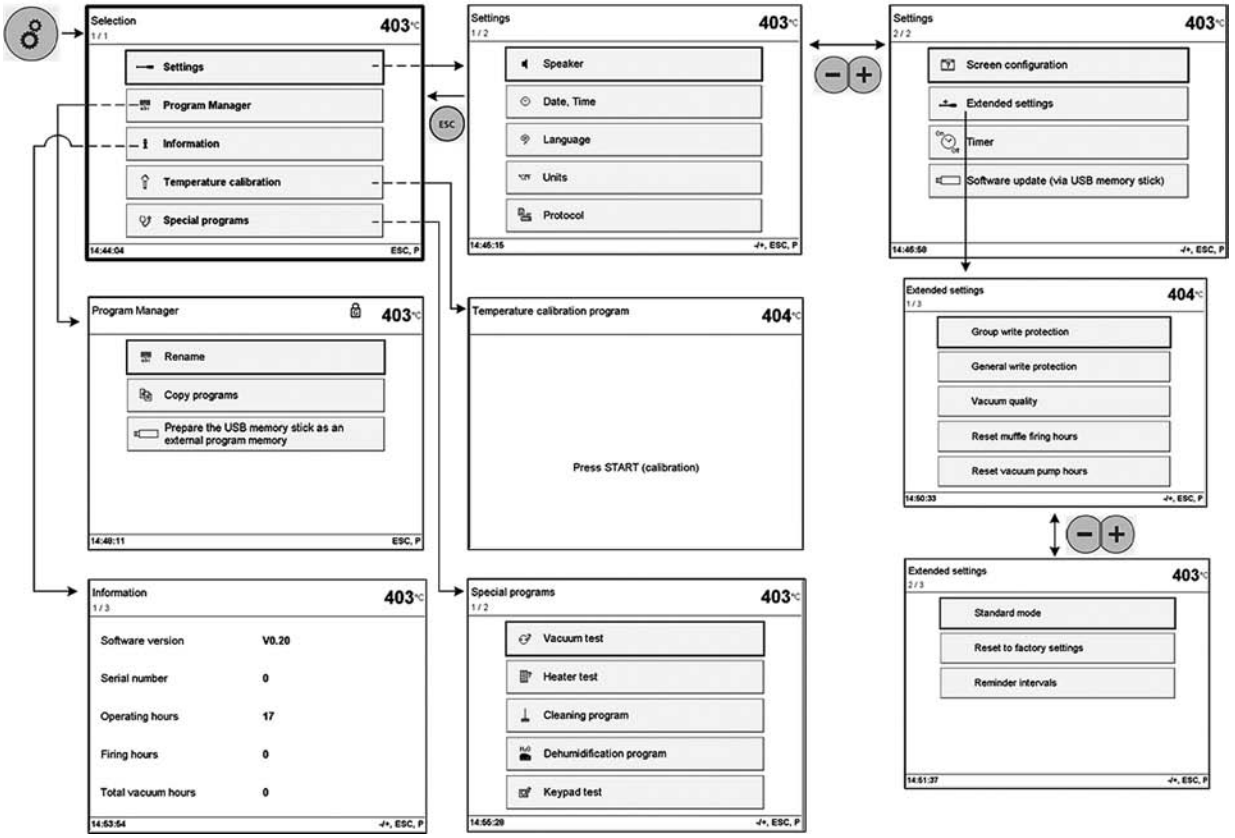
The program tables can be downloaded from the Internet as PDF files. Please make sure that your program table complies with the software version you use, as the table is coordinated with the respective software version.

10.2 Menu structure

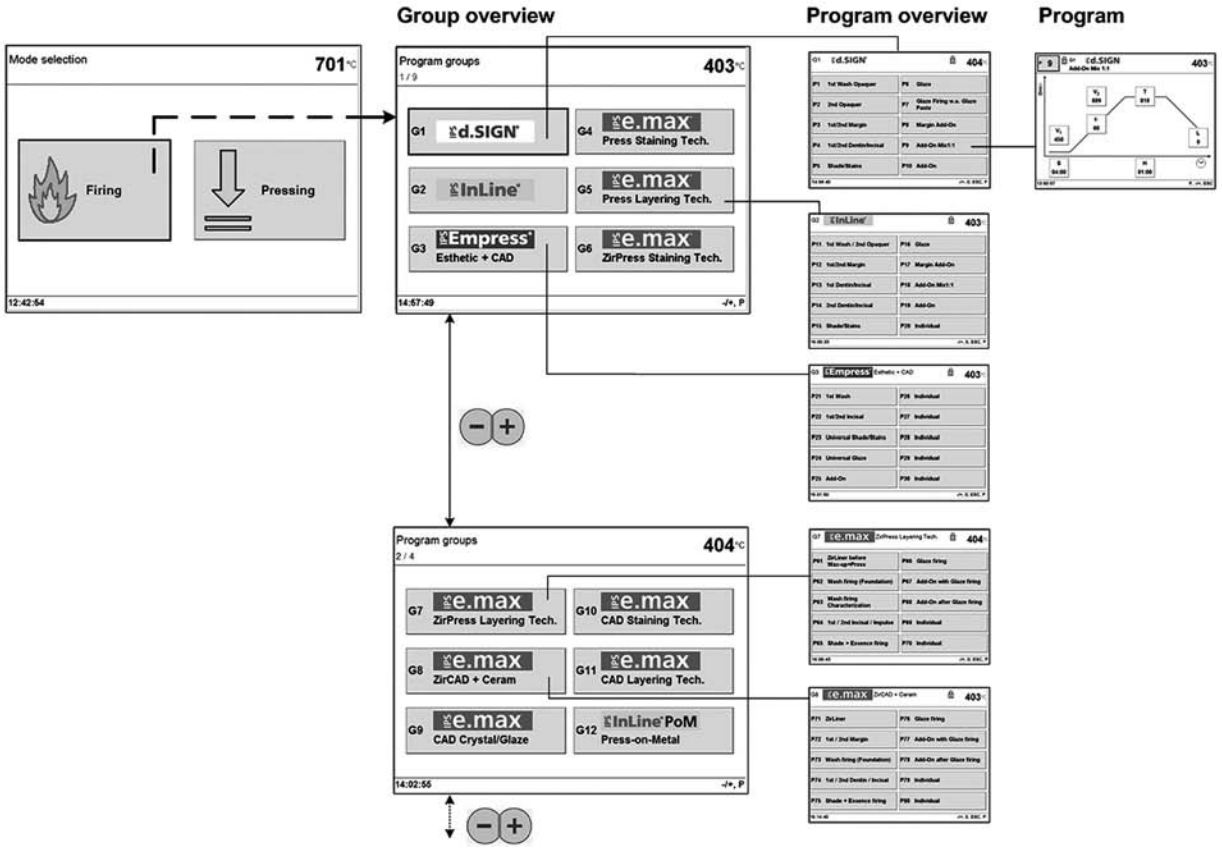
10.2.1 Possibilities of the program selection

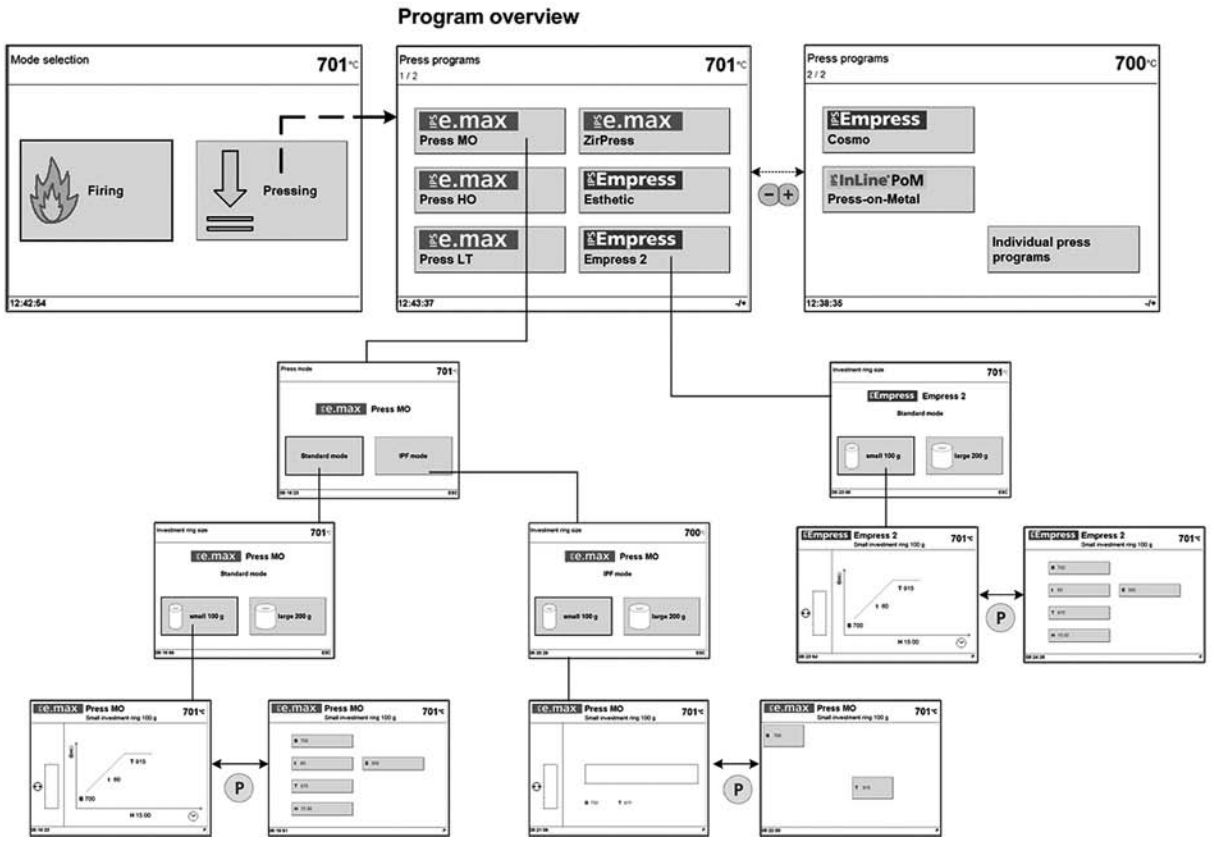


10.2.2 Adjustments / Information



10.2.3 Overview of program groups





Ivoclar Vivadent – worldwide

Ivoclar Vivadent AG
Bendererstrasse 2
FL-9494 Schaan
Liechtenstein
Tel. +423 235 35 35
Fax +423 235 33 60
www.ivoclarvivadent.com

Ivoclar Vivadent Pty. Ltd.
1 – 5 Overseas Drive
P.O. Box 367
Noble Park, Vic. 3174
Australia
Tel. +61 3 979 595 99
Fax +61 3 979 596 45
www.ivoclarvivadent.com.au

Ivoclar Vivadent GmbH
Bremschlstr. 16
Postfach 223
A-6706 Bürs
Austria
Tel. +43 5552 624 49
Fax +43 5552 675 15
www.ivoclarvivadent.com

Ivoclar Vivadent Ltda.
Rua Geraldo Flausino Gomes,
78 – 6.º andar Cjs. 61/62
Bairro: Brooklin Novo
CEP: 04575-060 São Paulo – SP
Brazil
Tel. +5511 5102 2020
Fax. +5511 5102 4704
www.ivoclarvivadent.com

Ivoclar Vivadent Inc.
2785 Skymark Avenue, Unit 1
Mississauga
Ontario L4W 4Y3
Canada
Tel. +1 905 238 5700
Fax +1 905 238 5711
www.ivoclarvivadent.us.com

Ivoclar Vivadent Marketing Ltd.
Rm 603 Kuen Yang
International Business Plaza
No. 798 Zhao Jia Bang Road
Shanghai 200030
China
Tel. +86 21 5456 0776
Fax. +86 21 6445 1561
www.ivoclarvivadent.com

Ivoclar Vivadent Marketing Ltd.
Calle 134 No. 7-B-83, Of. 520
Bogotá
Colombia
Tel. +57 1 627 33 99
Fax +57 1 633 16 63
www.ivoclarvivadent.com

Ivoclar Vivadent SAS
B.P. 118
F-74410 Saint-Jorioz
France
Tel. +33 450 88 64 00
Fax +33 450 68 91 52
www.ivoclarvivadent.fr

Ivoclar Vivadent GmbH
Dr. Adolf-Schneider-Str. 2
D-73479 Ellwangen, Jagst
Germany
Tel. +49 (0) 79 61 / 8 89-0
Fax +49 (0) 79 61 / 63 26
www.ivoclarvivadent.de

Ivoclar Vivadent Marketing Ltd
114, Janki Centre
Shah Industrial Estate
Veera Desai Road,
Andheri (West)
Mumbai 400 053
India
Tel. +91 (22) 673 0302
Fax. +91 (22) 673 0301
www.ivoclarvivadent.firm.in

Ivoclar Vivadent s.r.l. & C. s.a.s
Via Gustav Flora, 32
39025 Naturno (BZ)
Italy
Tel. +39 0473 67 01 11
Fax +39 0473 66 77 80
www.ivoclarvivadent.it

Ivoclar Vivadent K.K.
1-28-24-4F Hongo
Bunkyo-ku
Tokyo 113-0033
Japan
Tel. +81 3 6903 3535
Fax +81 3 5844 3657
www.ivoclarvivadent.com

Ivoclar Vivadent S.A. de C.V.
Av. Mazatlán No. 61, Piso 2
Col. Condesa
06170 México, D.F.
Mexico
Tel. +52 (55) 5062-1000
Fax +52 (55) 5062-1029
www.ivoclarvivadent.com.mx

Ivoclar Vivadent Ltd
12 Omega St, Albany
PO Box 5243 Wellesley St
Auckland, New Zealand
Tel. +64 9 914 9999
Fax +64 9 630 61 48
www.ivoclarvivadent.co.nz

Ivoclar Vivadent Polska Sp. z.o.o.
ul. Jana Pawla II 78
PL-01-501 Warszawa
Poland
Tel. +48 22 635 54 96
Fax +48 22 635 54 69
www.ivoclarvivadent.pl

Ivoclar Vivadent Marketing Ltd.
Derbenevskaja Nabereshnaja 11W
115114 Moscow
Russia
Tel. +7495 913 66 16
Fax +7495 913 66 15
www.ivoclarvivadent.ru

Ivoclar Vivadent Marketing Ltd.
180 Paya Lebar Road
07-03 Yi Guang Building
Singapore 409032
Tel. 65-68469183
Fax 65-68469192
www.ivoclarvivadent.com

Ivoclar Vivadent S.A.
c/Emilio Muñoz, 15
Esquina c/Albarracín
E-28037 Madrid
Spain
Tel. + 34 91 375 78 20
Fax + 34 91 375 78 38
www.ivoclarvivadent.com

Ivoclar Vivadent AB
Dalvägen 14
S-169 56 Solna
Sweden
Tel. +46 8 514 93 930
Fax +46 8 514 93 940
www.ivoclarvivadent.se

Ivoclar Vivadent UK Limited
Ground Floor Compass Building
Feldspar Close
Warrens Business Park
Enderby
Leicester LE19 4SE
United Kingdom
Tel. +44 116 284 78 80
Fax +44 116 284 78 81
www.ivoclarvivadent.co.uk

Ivoclar Vivadent, Inc.
175 Pineview Drive
Amherst, N.Y. 14228
USA
Tel. +1 800 533 6825
Fax +1 716 691 2285
www.ivoclarvivadent.us.com

Version: 3
Date information prepared: 11/2007
Valid as of Software V3.0

Printed in Austria

607802/1107/e

ivoclar vivadent® technical