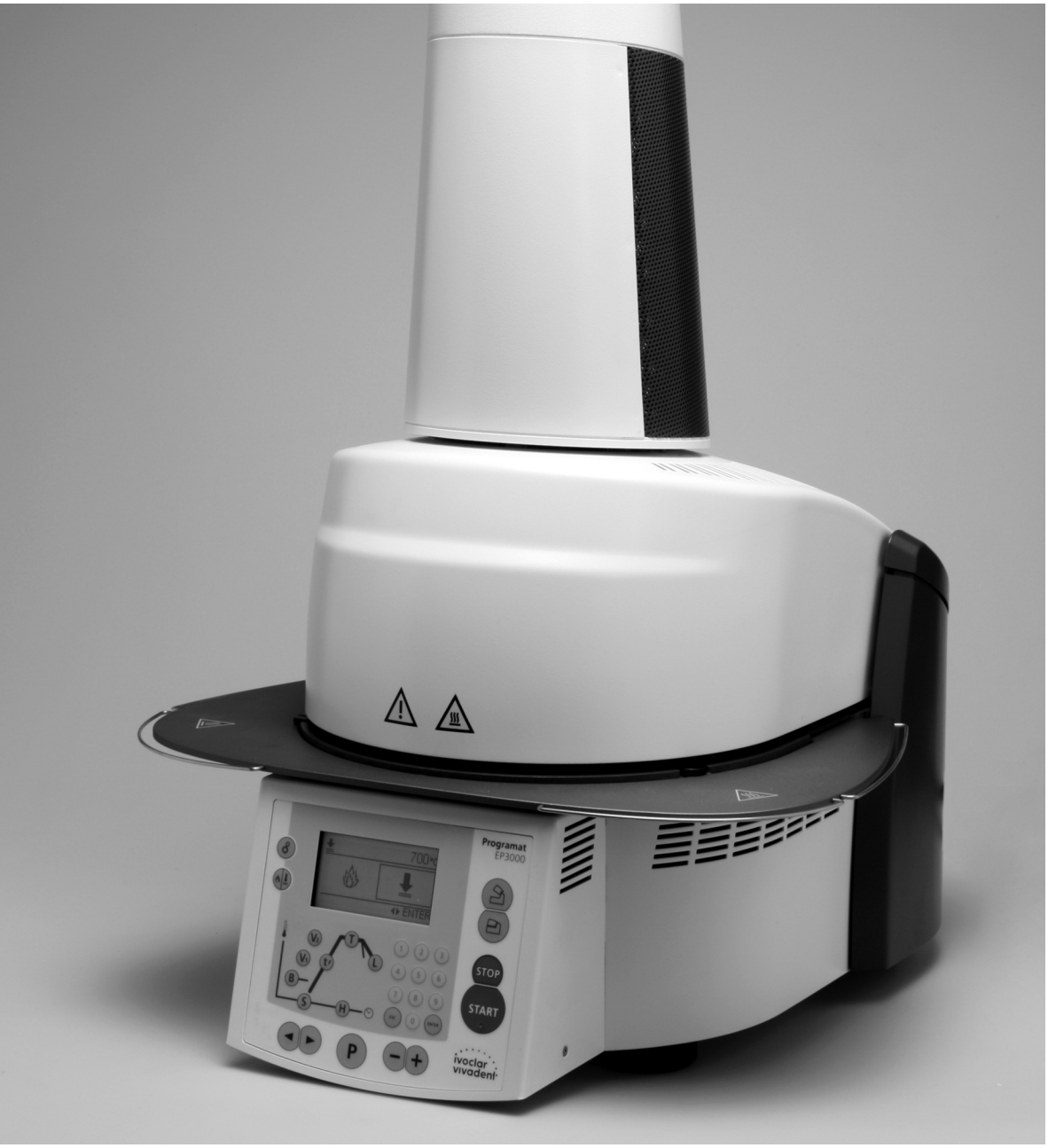
Programat®
EP 3000



Operating Instructions

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 3000

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, 25.02.2008

Siegbert Koch

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

Schaan, 25.02.2008

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

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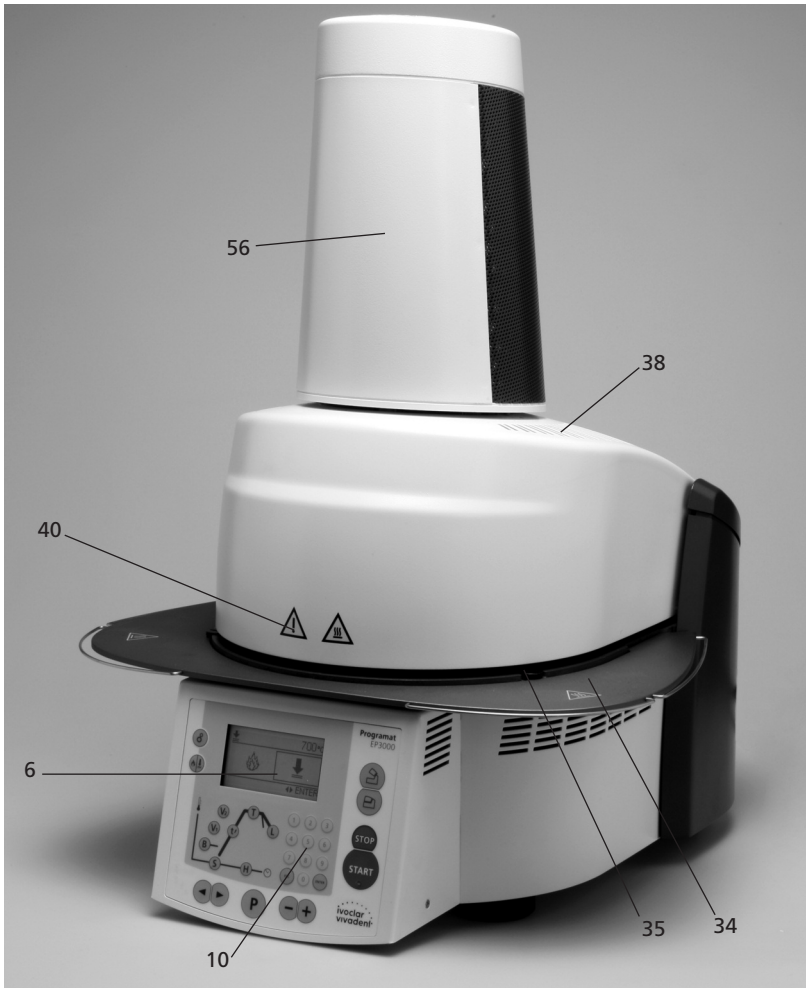
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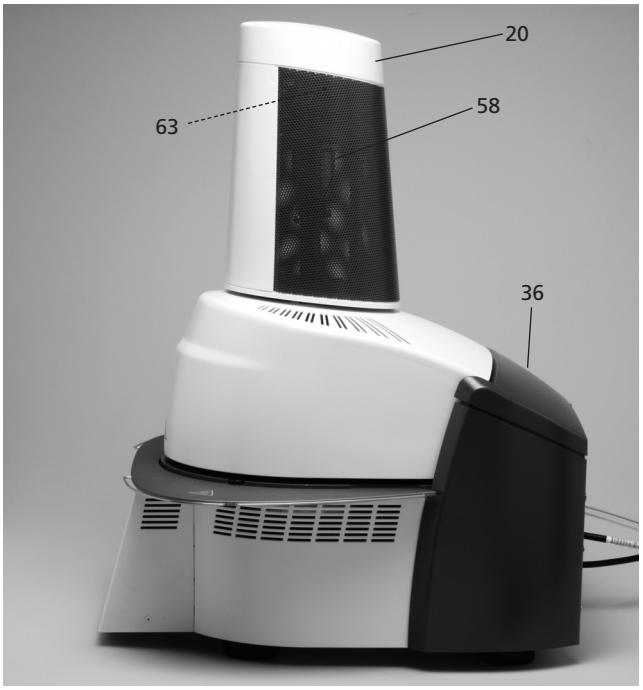
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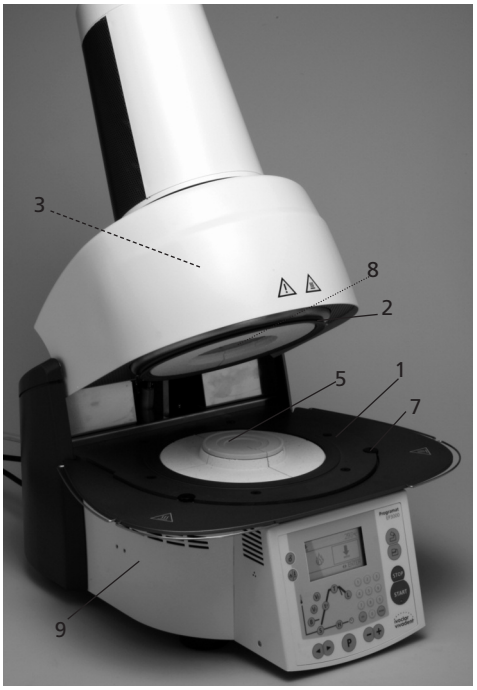
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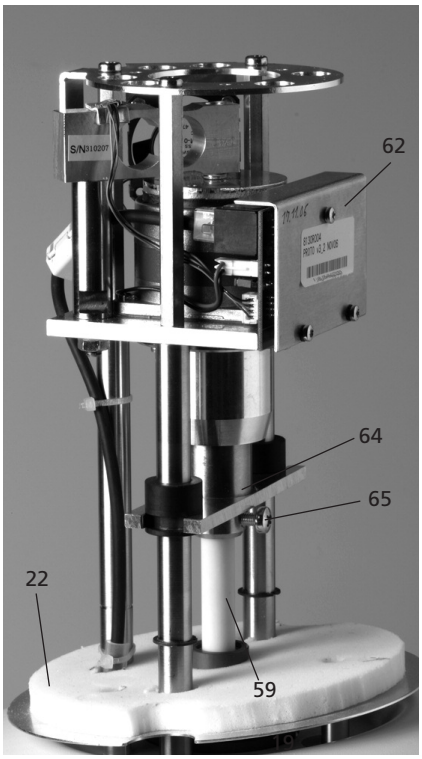
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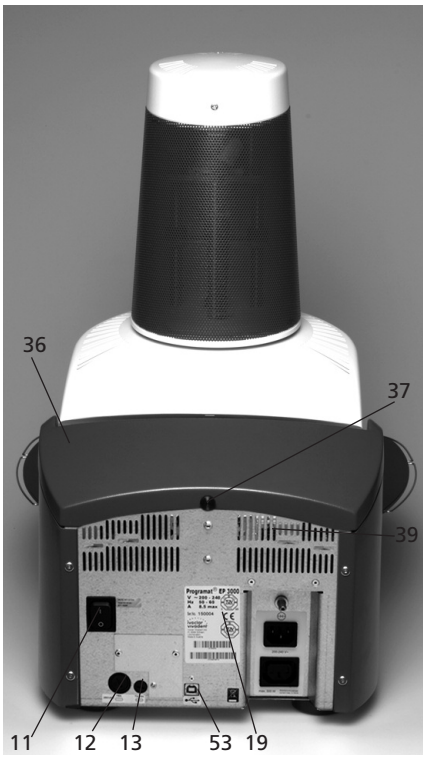
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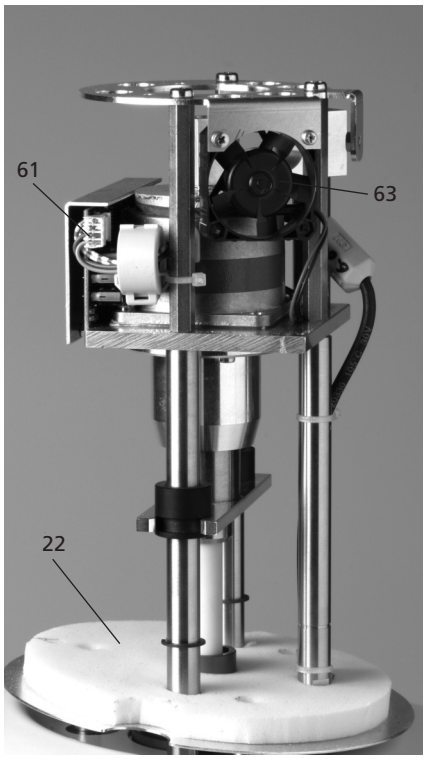
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Programat® EP 3000
V ~ 200 - 240
Hz 50 - 60
A 8.5 max
Ser.No. 150004
ivoclar vivadent
Made in Austria
200-240 V~
max. 300 W
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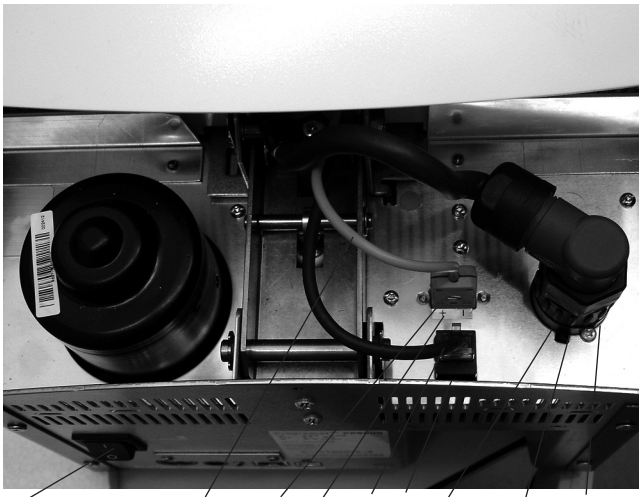
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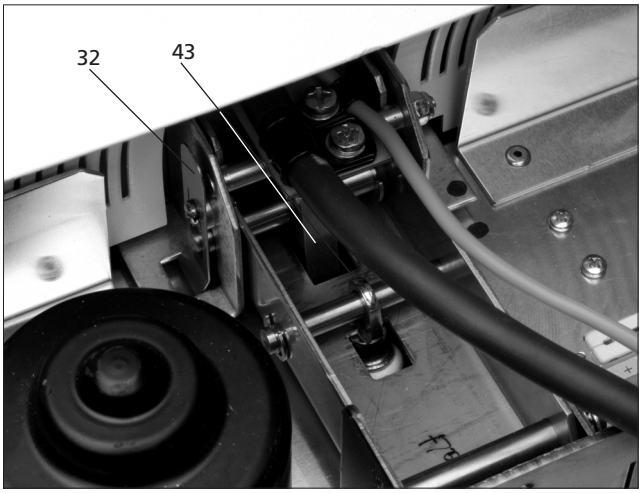
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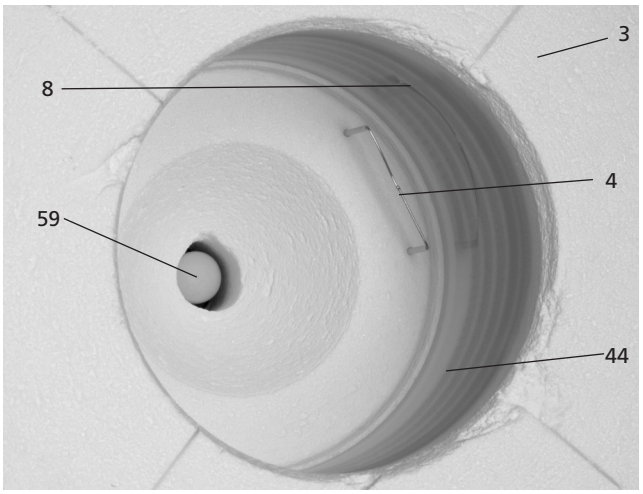

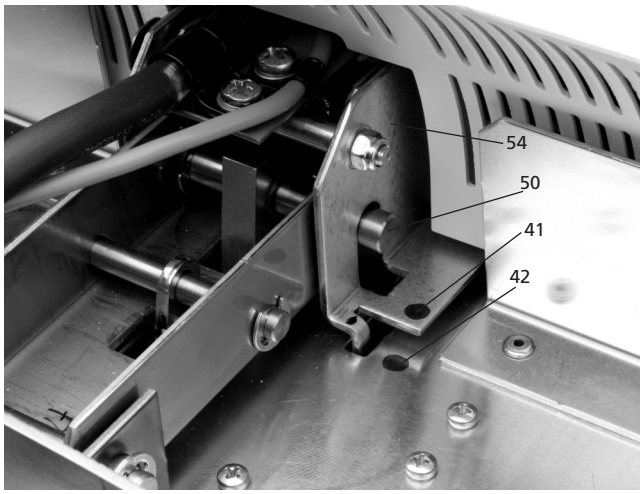

Control unit:

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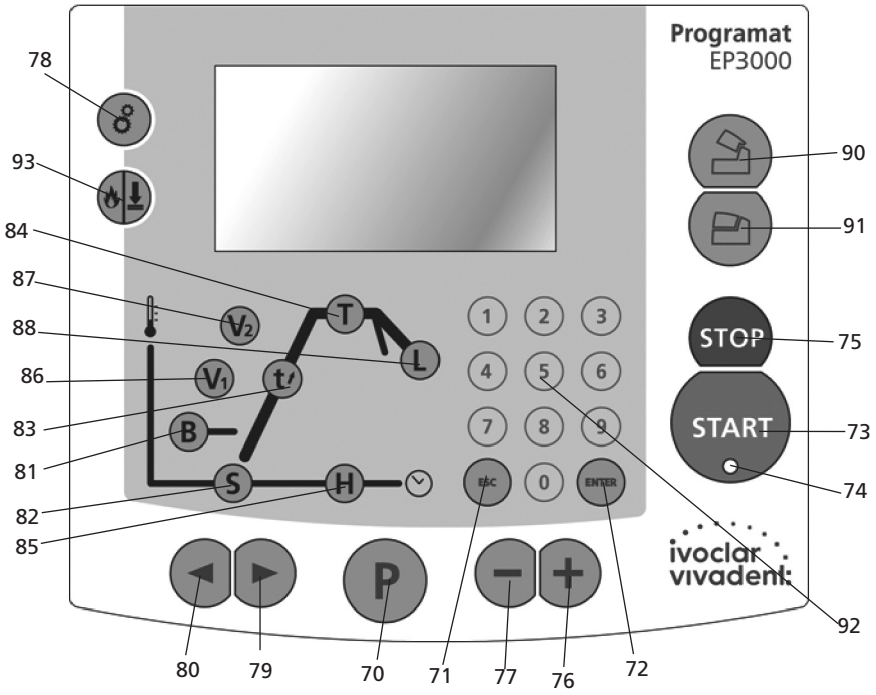
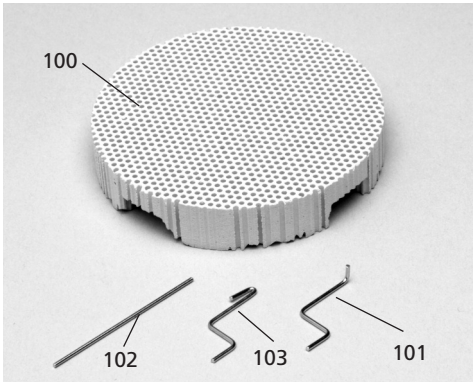
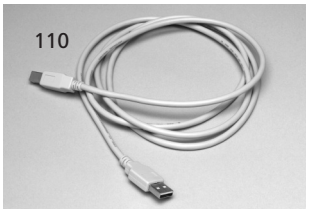


100 Programat firing tray
101 Metal pin A
102 Metal pin B
103 Metal pin C

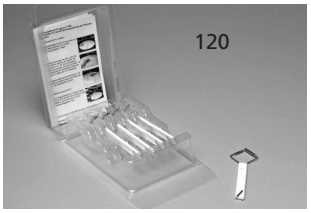


110 USB data cable



115 Cooling grid (complete)

120 Automatic Temperature Checking Set 2 – ATK 2



1. Introduction / Signs and Symbols

1.1 Preface

Dear Customer

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

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

Enjoy working with the Programat EP 3000.

1.2 Introduction

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


Risks and dangers


Important information


Contraindication


Burn hazard


Risk of crushing


The Operating Instructions must be read

1.3 Notes regarding the Operating Instructions

Furnace concerned:
Programat EP 3000
Target group:
Dental technologists

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

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

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 3000 or who have to carry out maintenance or repair work. This chapter must be read and the corresponding instructions followed.

2.1 Indications

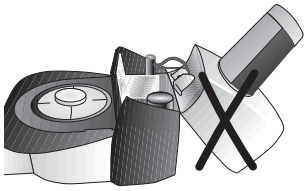
The Programat EP 3000 must only be used to fire dental ceramic materials and it should be used for this purpose only. Other uses than the ones stipulated, e.g. cooking of food, firing of other materials, etc., are contraindicated. The manufacturer does not assume any liability for damage resulting from 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 (see Chapter 9).
- The Programat EP 3000 must be properly maintained.

2.1.1

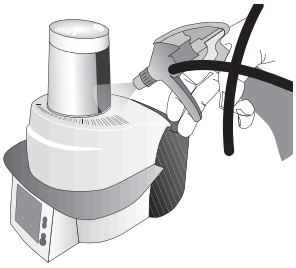
Risks and dangers



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

2.1.2

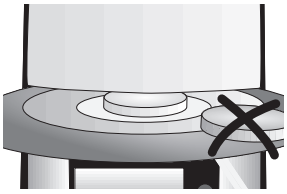
Risks and dangers



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

2.1.3

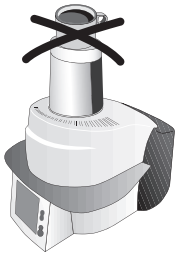
Contraindication



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

2.1.4

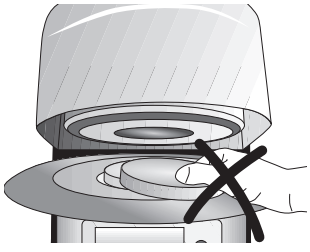
Contraindication



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

2.1.5

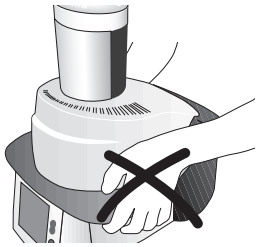
Risks and dangers, burn hazard



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

2.1.6

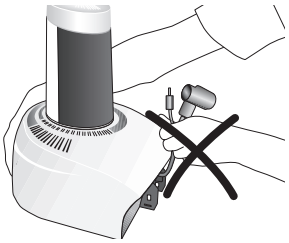
Risks and dangers



Do not carry the furnace by the cooling tray.

2.1.7

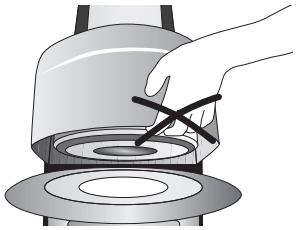
Risks and dangers



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

2.1.8

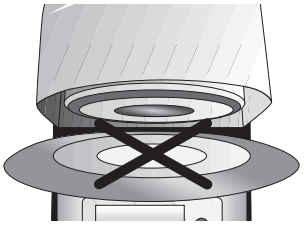
Risks and dangers



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

2.1.9

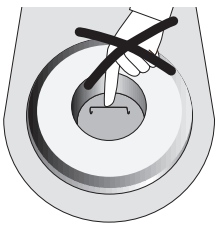
Contraindication



Never use the furnace without a firing table.

2.1.10

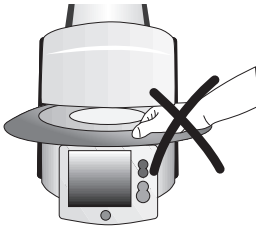
Contraindication



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

2.1.11

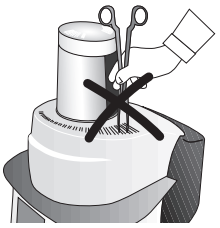
Risk of crushing and burn hazard



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

2.1.12

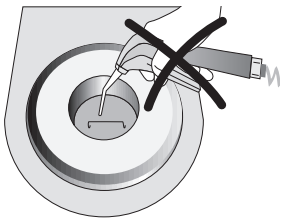
Contraindication



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

2.1.13

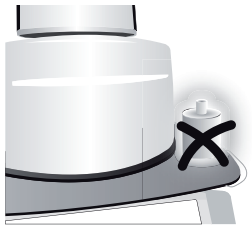
Contraindication



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

2.1.14

Contraindication



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

2.1.15

Risks and dangers

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

2.1.16

Contraindication

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

2.2 Health and safety instructions

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

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

Any disruption of the protective conductor either inside or outside the furnace or any loosening of the protective conductor connection may lead to danger for the user in case of a malfunction. Deliberate interruptions are not tolerated. Materials developing harmful gases must not be fired.

Warnings regarding the removal of the heating muffle

This product contains ceramic fibres and may release fibre dust. Fibre dust has proved to be carcinogenic in animal experiments. The corresponding EU Safety Data Sheet must be observed.

The heat insulation of the firing chamber in the Programat EP 3000 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, procede 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 3000 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 (accessories)

3.2 Hazardous areas and safety equipment

Description of the hazardous areas of the furnace:

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

Description of the safety equipment of the furnace:

Safety equipment	Protective effect
Protective conductor	Protection from electrical shock
Electrical fuses	Protection from electrical shock

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

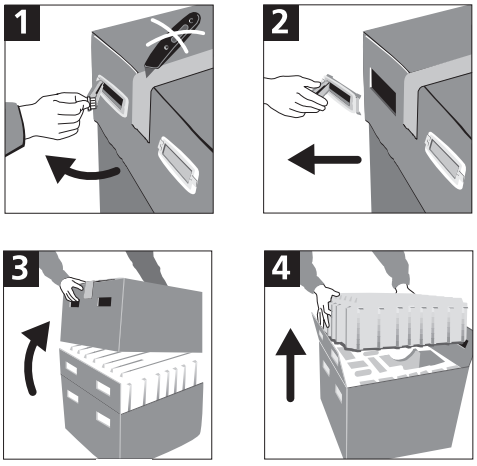
4.1 Unpacking and checking the contents

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)

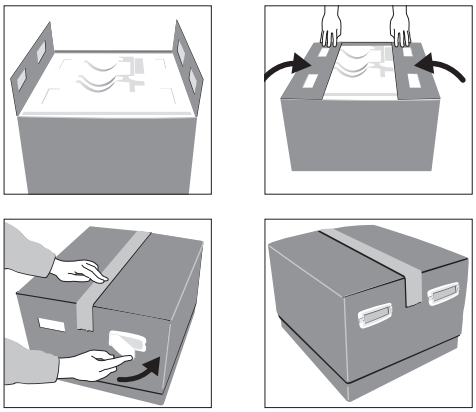
Check the delivery for completeness (see delivery form in Chapter 9) and transportation damage. If parts are damaged or missing, contact your local Ivoclar Vivadent Service Center.

Remove furnace components from their packaging and place the unit 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 3000 permits simple and safe shipping of individual components. Simply use the two corresponding inserts. Fold the side flaps and combine the two parts by means of the transportation flaps. The packaging may be disposed with the regular household refuse.



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

4.2 Selecting the location

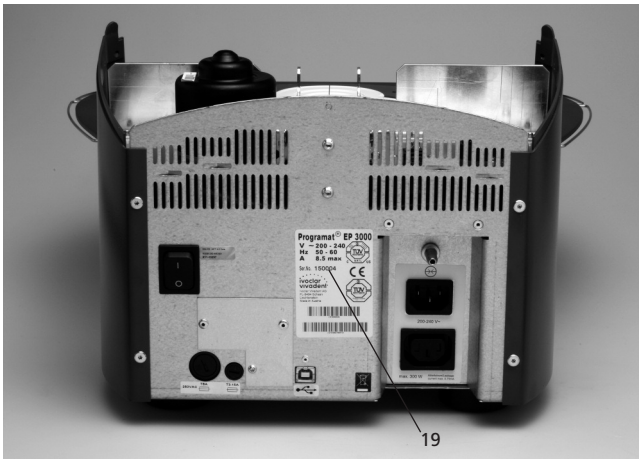
Place the furnace on a flat table using the rubber feet. Make sure that the furnace is not placed in the immediate vicinity of heaters or other sources of heat. Make sure that air may properly circulate between the wall and the furnace.

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

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

4.3 Assembly

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



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

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

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

Step 2:
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).

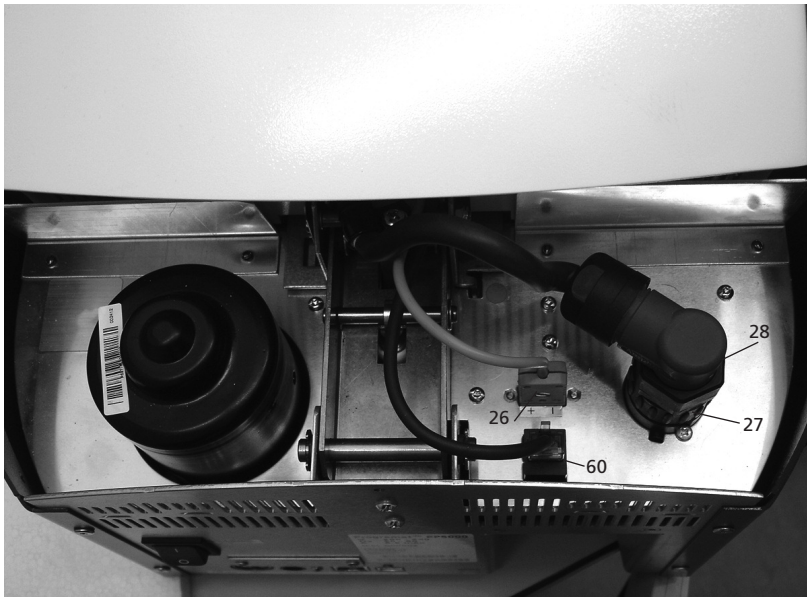
Ensure that the furnace head mounting mark (41) is aligned with the furnace base mounting mark (42).

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

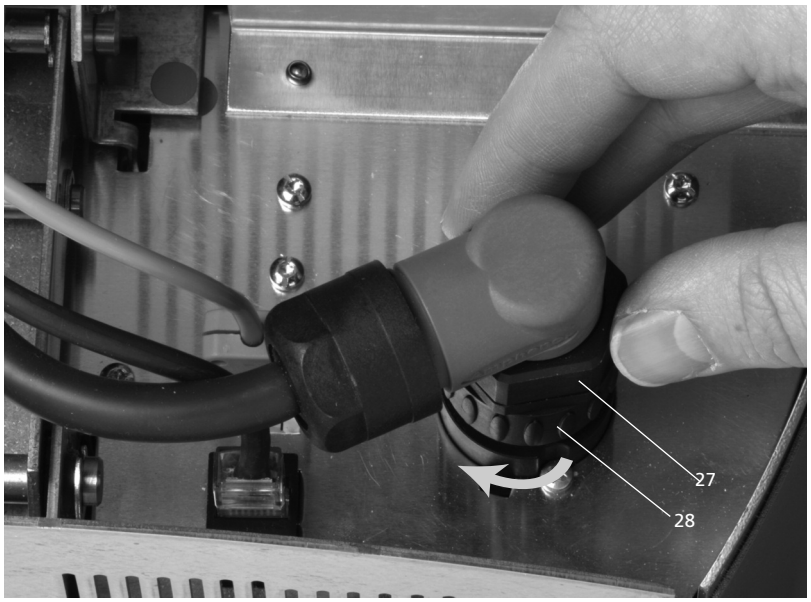
Step 3:
Mounting the furnace head
The complete furnace head (58) is best mounted with the rear panel of the furnace pointing towards the user. Lift the furnace head with both hands (see picture) and carefully position it on the furnace head mounting (43).

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)

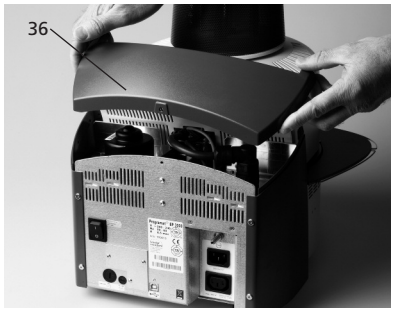


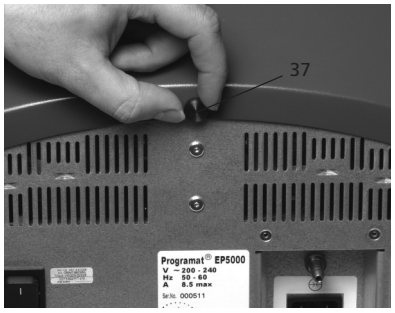
Secure the heater plug (28) with the plug fuse (27) by turning it until the heater plug (28) has been secured.



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.



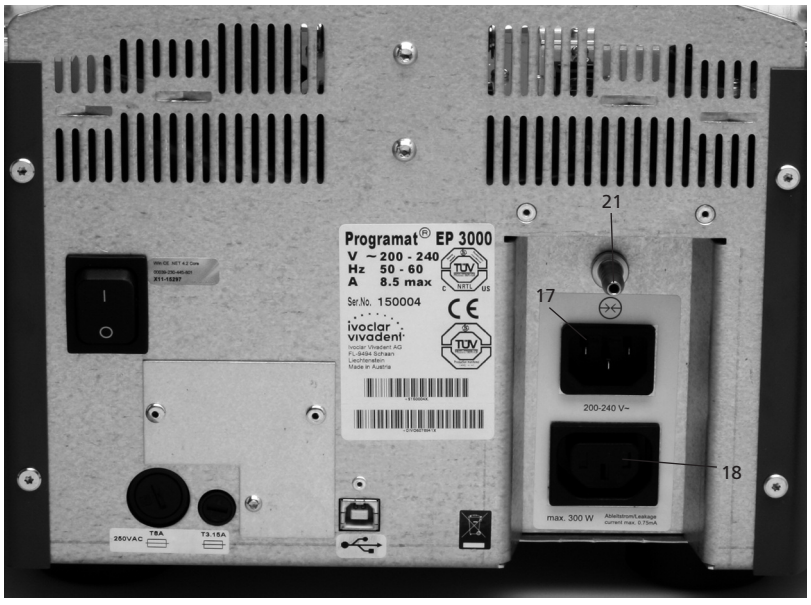


Step 6:
Establishing additional connections

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 of the furnace (17).

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

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

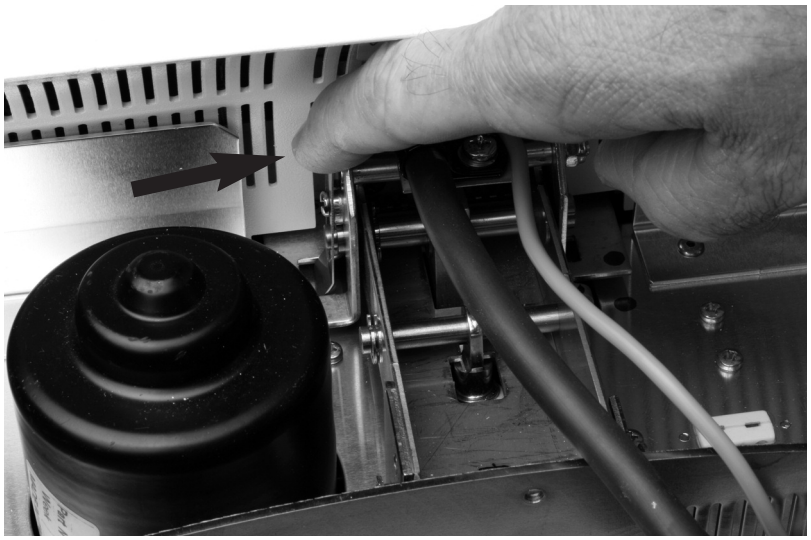


4.4 Removing the furnace head

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 press drive plug (60)
4. Disconnect the thermocouple plug (26)
5. Disconnect the heater plug (28)
6. Press the leaf spring (32) with a finger, lift off the furnace head at the same time and remove it

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

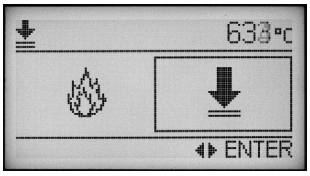


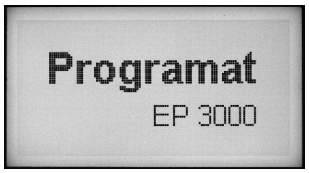
4.5 Initial start-up

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.





4.5.2 Self-test

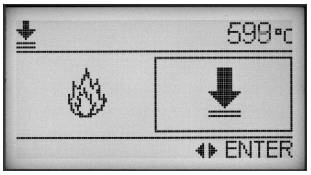
The furnace will automatically conduct a self-test after start. The performance of all furnace components is automatically checked. The display shows the following indications during the self-test:

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

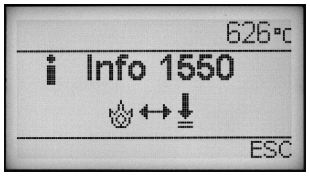
If a component is defective, the corresponding error number (ER xxx) will be indicated in the display.

4.5.3 Selecting the operation mode

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



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

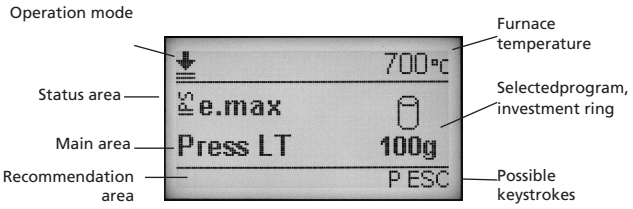


This information is only shown if the operation mode has been changed. Make sure that the furnace runs at the new stand-by temperature long enough before you start a program.

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

4.5.4 Basic build-up of screens

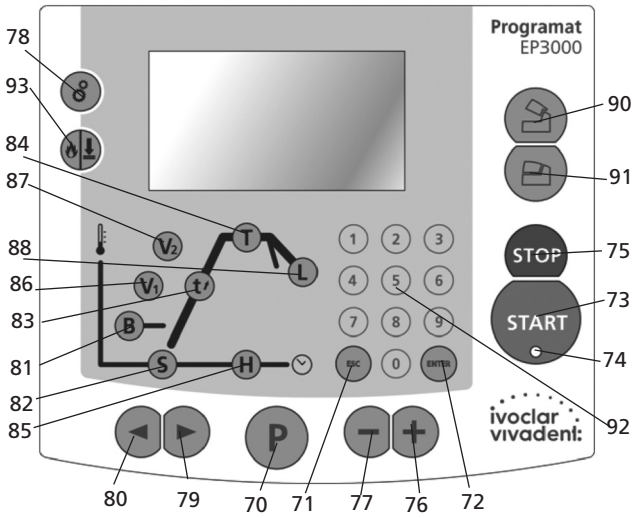
The different areas of the screen are shown with the press program stand-by and operating screens as examples. The uppermost line mainly shows status information. In the central and largest area, important information of the respective screen are displayed. The lowest line provides information about possible activities (keystrokes). The command keys (Open furnace head, Close furnace head, STOP, START keys) are not shown for reasons of clarity.



5. Operation and Configuration

5.1 Introduction to the operation

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



5.2 Explanation of the key functions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5.3 Program structure

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

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

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

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

b) Individual firing programs
The individual firing programs (at least 100) can be programmed freely.

5.3.2 Press programs
a) Standard press programs for Ivoclar Vivadent materials
When the furnace is delivered ex works, the standard press programs already contain the recommended material parameter settings. They cannot be adjusted.

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

5.3.2 Special programs
Varous test programs (calibration, heating test, vacuum test, etc.) are available. Please refer to Chapter 5.5.2 Special programs.

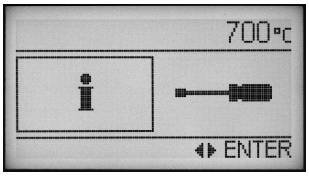
5.4 Adjustable parameters and possible value ranges

Symbol	Parameter	Value range °C	Value range °F
P	Program number	1-120 (1-100)	
B	Stand-by temperature	100-700 °C	212-1292 °F
S	Closing time (min : sec)	00:18-30:00	
t	Temperature increase rate	10-140 °C/min	18-252 °F/min
T	Holding temperature	100-1200 °C	212-2192 °F
H	Holding time (min : sec)	00.01-60:00	
V1	Vacuum on	0 or 1-1200 °C	0 or 34-2192 °F
V2	Vacuum off	0 or 1-1200 °C	0 or 34-2192 °F
L	Long-term cooling	0 or 50-1200 °C	0 or 122-2192 °F
tL	Cooling temperature rate	0 or 1-50 °C	0 or 2-90 °F/min
t	Temperature increase rate 2nd stage	10-140 °C/min	18-252 °F/min
T2	Holding temperature 2nd stage	100-1200 °C/min	212-2192 °F
H2	Holding time 2nd stage (min : sec)	00.01-60:00	
V1 2	Vacuum on temp. 2nd stage	0 or 1-1200 °C	0 or 34-2192 °F
V2 2	Vacuum off temp. 2nd stage	0 or 1-1200 °C	0 or 34-2192 °F

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

5.5 Settings, special programs and information

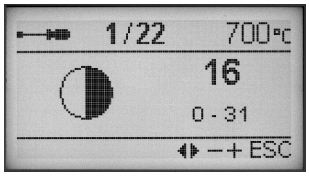
This screen can be selected via the Settings / Information key (78) if no program is active.



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

5.5.1 Settings

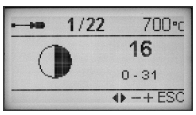
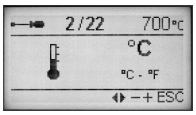
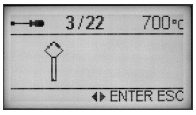
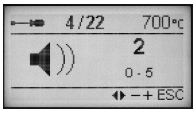
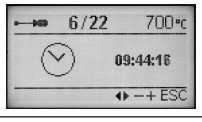
Once the Settings have been selected, the first page of the Settings is displayed. The current page number is shown in the upper line.

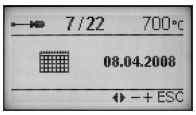
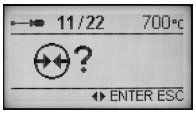
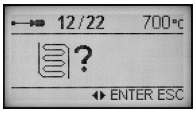
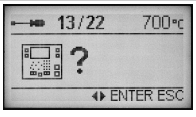
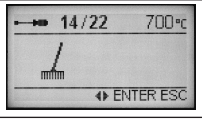
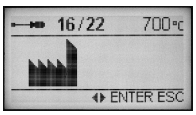


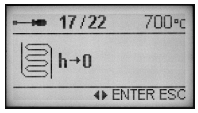
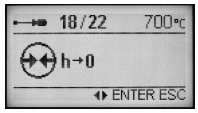
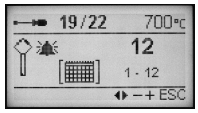
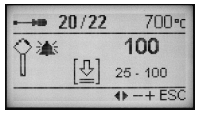
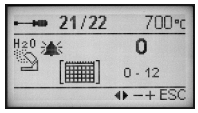
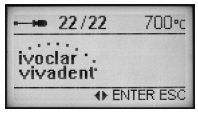
The displayed page (Setting) can be changed using the Cursor keys.

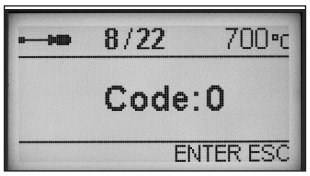
If the Minus/Plus keys are shown, the displayed Setting (e.g. Contrast) can be edited with the Minus/Plus keys.
If the ENTER key is shown, the displayed Setting or Test program (e.g. Calibration) can be confirmed with the ENTER key.

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

Page	Description	Indication on display	Short description
1/22	Contrast		The contrast can be set within the displayed limiting values using the Minus/Plus keys.
2/22	Temperature mode		The Minus/Plus keys can be used to toggle between °C and °F.
3/22	Calibration program ATK2		This program is used to conduct the automatic temperature calibration with the ATK2. Please observe the notes in Chapter 7.4.
4/22	Volume		The Minus/Plus keys can be used to set the desired volume.
5/22	Buzzer tunes		The Minus/Plus keys can be used to set the desired buzzer tunes.
6/22	Time		The time can be entered using the Numeric keys.

Page	Description	Indication on display	Short description
7/22	Date		The date can be entered using the Numeric keys.
8/22	General write protection		The general write protection can be activated or deactivated using the Minus/Plus keys. The general write protection locks all firing programs. The user code is required.
9/22	"Ivoclar Vivadent optimized temperature control"		The STD code is required.
10/22	Predrying		The predrying function can be activated or deactivated using the Minus/Plus keys. This function can only be activated for all the firing programs at once.
11/22	Vacuum test program		See Chapter 5.5.2 Special programs.
12/22	Heater test program		See Chapter 5.5.2 Special programs.
13/22	Keypad test program		See Chapter 5.5.2 Special programs.
14/22	Cleaning program		See Chapter 5.5.2 Special programs.
15/22	Dehumidification program		See Chapter 5.5.2 Special programs.
16/22	Load factory settings		Resets the values and parameters to the factory settings. NOTE: All individual programs you have created and saved will be deleted with this function. The user code is required.

Page	Description	Indication on display	Short description
17/22	Set the firing hours of the furnace head to zero		Resets the determined firing hours. The user code is required.
18/22	Set the vacuum pump hours to zero		Resets the determined vacuum pump hours. The user code is required.
19/22	Calibration interval		Ex works: 12 months (another 1, 3 and 6 months are possible). Afterwards, a reminder for temperature calibration appears.
20/22	Press calibration interval		Ex works: 100 press cycles. Afterwards, a reminder for the temperature calibration appears.
21/22	Dehumidification interval		Ex works: 12 months. Afterwards, a reminder for the dehumidification program appears.
22/22	Ivoclar Vivadent AG		Only for the After Sales Service.



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

5.5.2 Special programs

5.5.2.1 Vacuum test program

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

5.5.2.2 Heater test program

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

5.5.2.3 Keypad test

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

5.5.2.4 Cleaning program

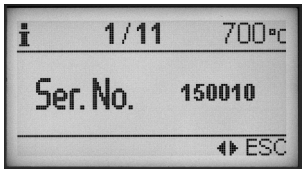
The cleaning program is used to "clean" the heating muffle (duration: approx. 17 min.) After a cleaning program, it is recommended to calibrate the furnace. In case of problems with discolouration of the ceramic, we recommend replacing the firing table or the firing tray material.

5.5.2.5 Dehumidification program

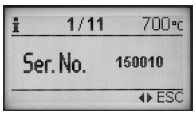
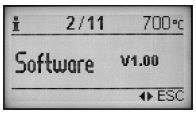
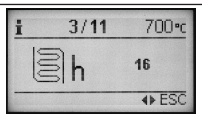
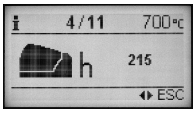
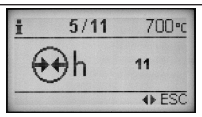
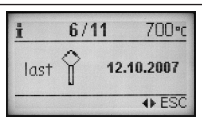
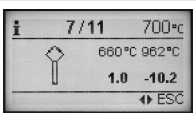
The condensation of water in the insulation of the firing chamber and the vacuum pump will result in a lower vacuum and thus to impaired firing results. For that reason, the furnace head should be kept closed when the furnace is switched off or is below 100 °C, in order to prevent the absorption of humidity.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

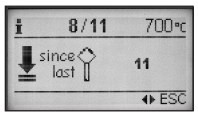
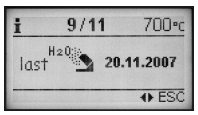
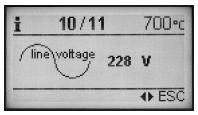
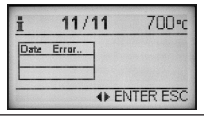
5.5.3 Information

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



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

Page	Description	Indication on display	Short description
1/11	Serial number		Serial number of the furnace, see also rating plate.
2/11	Software version		
3/11	Firing hours of the furnace head		
4/11	Operating hours of the furnace		
5/11	Operating hours of the vacuum pump		
6/11	Last start of the calibration program		
7/11	Calibration values		Calibration values at 660 °C and 962 °C.

Page	Description	Indication on display	Short description
8/11	Press procedures since the last calibration		Number of press cycles since the last start of the calibration program.
9/11	Last start of the dehumidification program		
10/11	Power supply		Shows the current supply voltage.
11/11	Error messages		Shows the last error messages.

5.6 Explanation of the symbols on the display

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

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

5.7 Explanation of the beeper signals

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

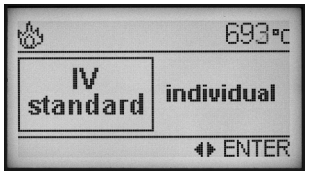
The beeper can only be ended by pressing the STOP key.

- **After the self-test has been completed**
  An acoustic signal sounds to inform the customer that the automatic self-test has been successfully completed.
- **Upon start of the press procedure**
  To inform the customer about the actual start of the press procedure (press plunger moves downwards), an acoustic signal is played.
- **After the program has been completed and if the temperature drops below 550 °C**
  To inform the user that a program has been completed and the furnace temperature has dropped below 550 °C with the furnace head open, an acoustic signal is played (5 seconds).
- **When the furnace head is open and if the temperature drops below 320 °C**
  An acoustic signal sounds to inform the user that the furnace temperature has dropped below a temperature of 320 °C with the furnace head open. If the beeper is not confirmed with the STOP key during the first signal (10 seconds), the second signal sounds after 5 minutes (5 minutes). After that, no further acoustic signal will be played.
  If the STOP key is pressed to confirm one of the two signals, the beeper is switched off immediately. No further acoustic signal will be played.
- **Error messages**
  Error messages are indicated with the error buzzer tune (endless). The beeper can be confirmed by pressing the STOP key, while the error message remains visible. If the error message is confirmed by pressing the ESC key, the beeper is also ended.

6.1 Firing programs

6.1.1 Selecting the type of firing program

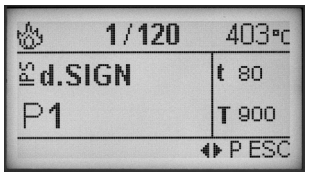
Once the Firing mode has been selected, the firing program type screen is displayed. There is a choice between standard firing programs for Ivoclar Vivadent materials and free, individual firing programs.



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

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

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



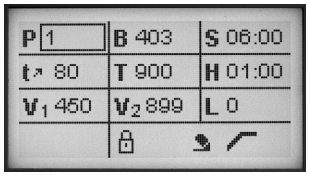
The displayed (selectable) firing program can be changed using the Cursor keys. The displayed firing program can finally be selected using the Enter key.

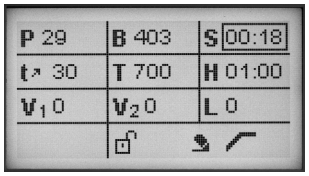
The Program key can be used to change to the parameter screen (firing program).

The ESC key can be used to change to the selection of firing program types.

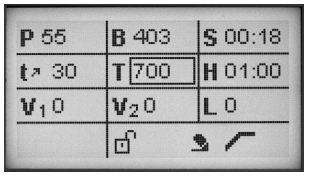
6.1.3 Parameter screen (firing program)

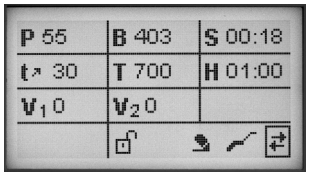
The Program key can be used to change to the parameter screen (firing program) anytime. Every time the Program key is pressed, it is possible to toggle between the stand-by or operation screen and the parameter screen.





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





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

– *Program write protection and general write protection*
  The standard firing programs for Ivoclar Vivadent materials have been locked ex works with an active program write protection (closed lock), which can be deactivated by the user for each program using the Minus/Plus keys.
  The individual firing programs are open ex works, i.e. the program write protection is not active (open lock).
  If the superordinate "General write protection" was activated via Settings and user code, the "General write protection symbol" is displayed instead.

– *Indication of invalid entry*
  The blinking exclamation mark (!) indicates an invalid entry. For further notes please refer to Chapter 6.4.2.

– *Predrying*
  If the predrying function was activated via Settings, the respective symbol is shown in the parameter screen for information purposes. For further notes please refer to Chapter 6.4.6.

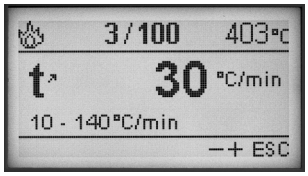
– *Standard / quick opening of the furnace head*
  The opening time of the furnace head at the end of the firing program (standard: 60 seconds, quick: 18 seconds) can be changed by means of the Minus/Plus keys. For further notes please refer to Chapter 6.4.7.

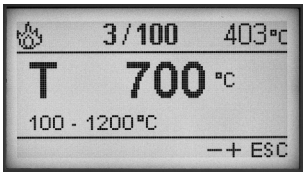
– *One-/two-stage program*
  If the cursor is positioned on the "Program stage symbol", the program can be selected as one- or two-stage program using the Minus/Plus keys. For further notes please refer to Chapter 6.4.8.

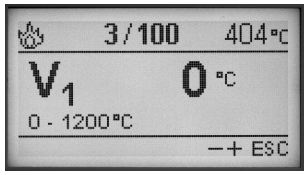
– *Displaying the parameters of the first/second stage (only for two-stage programs)*
  If the cursor is positioned on the "Paging symbol", it is possible to toggle between the parameters of the first and second stage using the ENTER key.

6.1.4 Parameter detail screen (firing program)

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



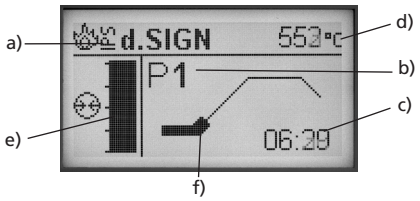




The displayed parameter can be edited with the Minus/Plus keys or via the numeric keys and confirmed by pressing ENTER. The acceptable value range is shown for information purposes to avoid incorrect entries.

6.1.3 Operation screen (firing program)

Operation screen while a firing program is in progress.



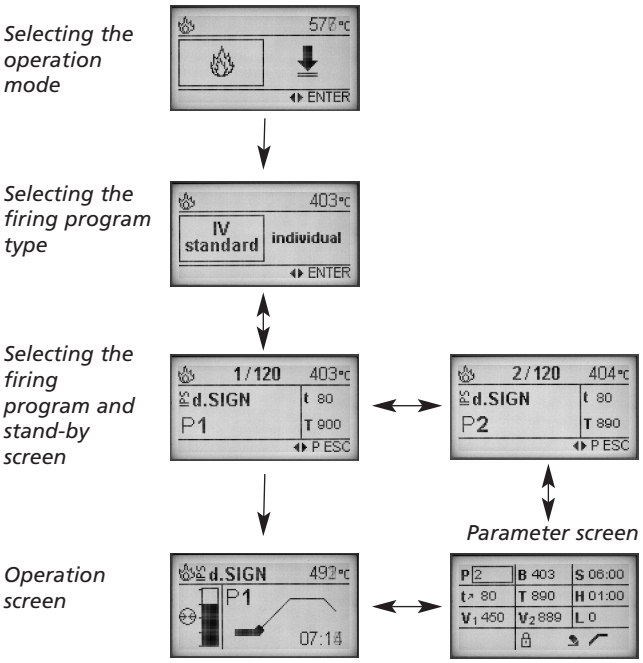
The following information is shown in this screen:
a) Program group
b) Program number
c) Remaining time
d) Current temperature
e) Status of vacuum *)
f) Status bar in the firing curve

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

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

6.1.6 Firing using a standard program

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



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

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

6.1.6 Firing using an individual program

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

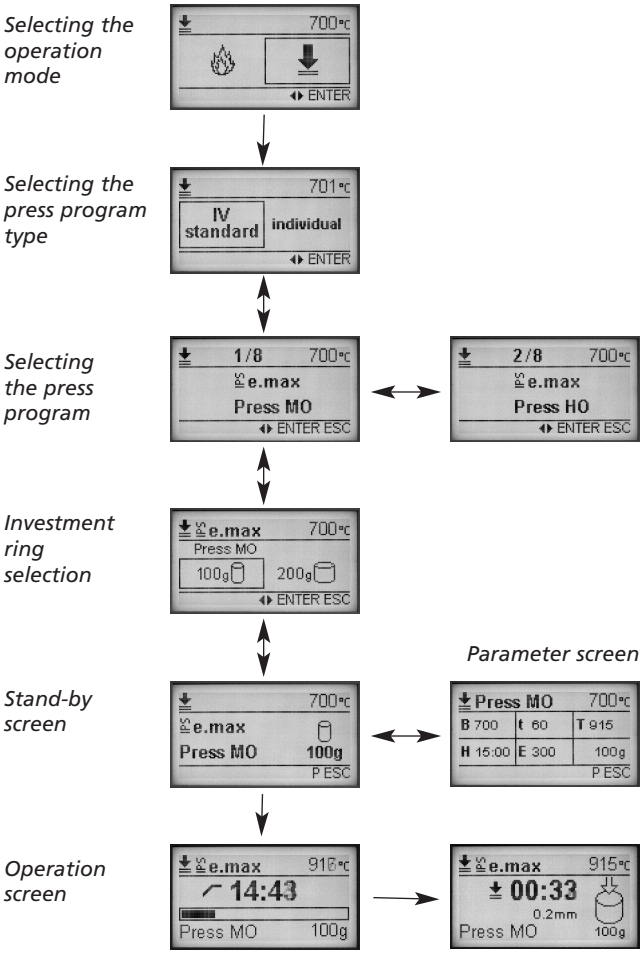
Step 2:
Set the desired parameters either in the parameter screen (see Chapter 6.1.3) or by means of the parameter detail screens (see Chapter 6.1.4).

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

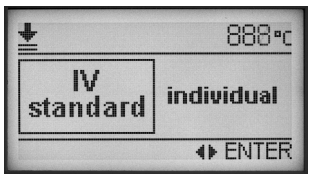
Step 4:
Press START (73) to start the selected program. The status is indicated in the operation screen.

6.2 Press programs

6.2.1 Pressing using a standard program



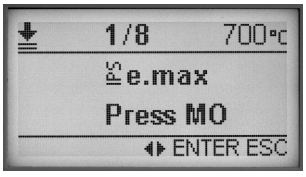
6.2.2 Selecting the press program type



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

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

6.2.3 Selecting the press program

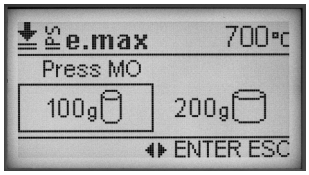


Once the desired press program has been selected, the press program screen is displayed.

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

6.2.4 Selecting the investment ring

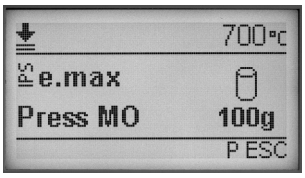
Once the desired type of press program has been selected, the investment ring is selected.



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

6.2.5 Stand-by screen (press program)

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

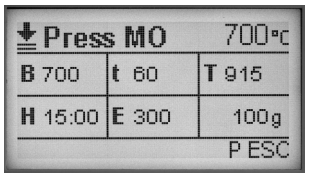


The Program key can be used to change to the parameter screen (press program).

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

6.2.6 Parameter screen (press program)

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



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

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

6.2.7 Operation screen (press program)

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

During the actual press process the following operation screen appears.

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

6.2.8 Notes on the standard press programs

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

6.2.9 Notes on the individual press programs

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

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

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

6.3 Other options and special features of the furnace

6.3.1 Quick selection of the firing program

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

6.3.2 Indication of invalid entry

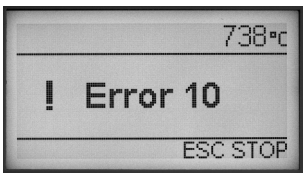
If an invalid value is entered by means of the numeric keys (outside the acceptable value range), the invalid entry still blinks after confirmation.
As error message, an exclamation mark (!) blinks in the bottom line of the parameter or detail screen until the next value is entered and successfully confirmed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

6.3.3 Error message symbol

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

Note, information
Information symbol

Entry error
Exclamation mark symbol



Technical error
Fork wrench symbol

6.3.4 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.

6.3.5 Changing the parameters while the program is interrupted

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

6.3.6 Predrying

This function can be activated/deactivated for all the firing programs at once via Settings. If the predyring function is active, the "pre-drying temperature" is set after the firing program start with the furnace head open (heating or cooling).
This "predyring temperature" corresponds to the stand-by temperature of the active firing program. Once this temperature is reached, the furnace head is closed within the desired closing time.

6.3.7 Quick opening of the furnace head

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

6.3.8 One-stage /two-stage programs

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

6.3.9 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 Software Update Instructions (www.ivoclarvivadent.com).

7. Maintenance, Cleaning, and Diagnosis

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

7.1 Monitoring and maintenance

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

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

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

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

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

IIn 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:

What:	When:	Cleaning material:
Housing (9) and furnace head (25)	if required	soft, dry cloth
Keypad (10)	weekly	soft, dry cloth
Cooling tray S (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

7.3 Special programs

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

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

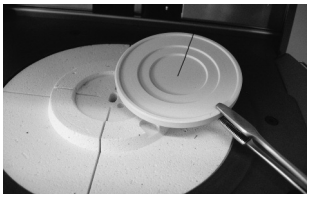
– **Keypad test**
Each time the keypad is pressed, a short beep sounds. The keypad test can be ended by pressing ESC.

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

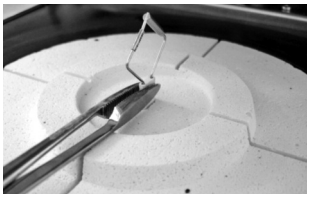
– **Dehumidification program**
The condensation of water in the insulation of the firing chamber and the vacuum pump will result in a lower vacuum and thus to impaired firing results. For that reason, the furnace head should be kept closed when the furnace is switched off or is below 100 °C, in order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

7.4 Temperature calibration

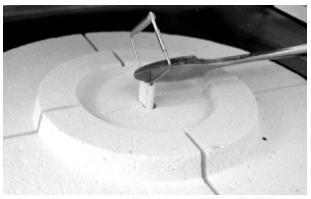
1. Select the calibration program.
2. Remove the firing plate from the furnace using the furnace tongs and place it on the cooling tray.
3. Carefully grip the upper part of the ATK 2 using the furnace tongs (Caution: Fracture risk of the ceramic) and insert it into the holes designated for this purpose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



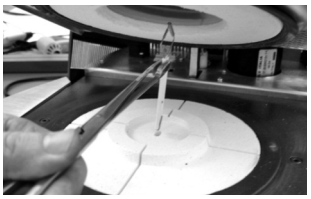
4. If necessary, use the furnace tongs to apply slight pressure to the center of the calibration base until the calibration sample clicks into place. Observe the corresponding markings.



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



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



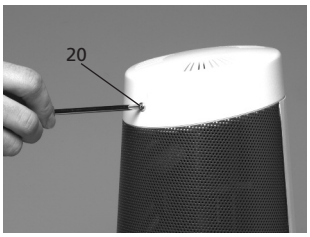
7.5 Stand-by

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 Replacing the press plunger

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

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

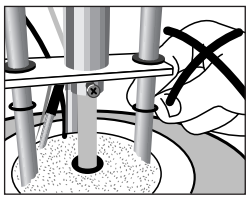


2. Loosen the terminal screw (65) from the press plunger by about half a rotation.
3. Open the furnace head by means of the respective key (90). Once the furnace head is wide open, switch off the furnace, disconnect the power, and allow the furnace to cool to room temperature.
4. Push the press plunger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

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

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

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



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

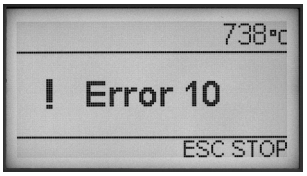
6. Connect the power plug and switch on the furnace with the I/O switch.

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.	Continuation 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.
7	System	Firing chamber temp. >410°C at the start of the calibration program -> too high for calibration progr.	14 *		Temperature too high for calibration. Furnace is cooling down! Try restarting the program later.
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) (8) 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.

Index	Category	Error	ERR No.	Continuation possible	Error Message Text
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	System	Incorrect time settings (date / time)	107		The clock settings are incorrect. Please set a correct date and a correct time!
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 progress
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 firing 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!
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.?
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.
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.
81	System	Reading, calculating the ambient temperature	1202 **,***	no	Error while measuring the ambient temperature

Index	Category	Error	ERR No.	Conti-nuation possible	Error Message Text
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.
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. Contact your Ivoclar Vivadent Service Center.
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.
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? or fractured?	*
	Is the thermocouple correctly connected?	Correctly connect thermocouple.
	Is the thermocouple plug defective?	*
Hairline cracks in the heating muffle	Are the cracks very small and insignificant (hairline cracks)?	Small cracks in the muffle are normal and do not negatively influence the function of the furnace.
	Are the cracks large or have parts of the heating muffle broken off?	*
Cracks in the insulation.	Are the cracks very small and insignificant (hairline cracks)?	Small cracks in the insulation do not negatively influence the furnace.
	Are the cracks large or have parts of the insulation broken off?	*
Cracks in the quartz glass / heating element	Are there cracks in the quartz glass or is the quartz glass sheathing the heating wire broken?	Switch off the furnace *

8.3 Repair

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

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

8.4 Load factory settings

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

9. Product Specifications

9.1 Delivery form

– Programat EP 3000
– Power cord
– Vacuum hose
– Calibration test set
– Operating Instructions
– Programat Firing Tray Kit
– 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 / 50–60 Hz 200–240 V / 50–60 Hz
Overvoltage category II Contamination level 2	
Tolerated voltage fluctuations	+/- 10%
Max. power consumption	12 A at 110-120 V 8.5 A at 200-240 V
Acceptable data for vacuum pumps from other manufacturers	
Max. output:	250 W / max. leakage current 0.75 mA
Final vacuum:	< 50 mbar Use only tested pumps
Electrical fuses:	110–120 V: 250 V / T 15 A (heating circuit) 250 V / T 5 A (vacuum pump) 200–240 V: 250 V / T 8 A (heating circuit) 250 V / T 3.15 A (vacuum pump)
Dimensions of electrical fuses:	110–120 V: Diameter 6.3 x 32 mm 200–240 V: Diameter 5 x 20 mm
Dimensions of the closed furnace:	
Depth: 430 mm / Width: 305 mm / 410 mm (with cooling tray)	Height: 565 mm
Usable size of the firing chamber:	Diameter 80 mm Height 48 mm
Max. firing temperature:	1200 °C
Weight:	Furnace base: 12.0 kg Furnace head: 7.0 kg

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

Radio protection / electromagnetic compatibility	EMC tested

9.3 Acceptable operating conditions

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

9.4 Acceptable transportation and storage conditions

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

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

10. Appendix

10.1 Program table

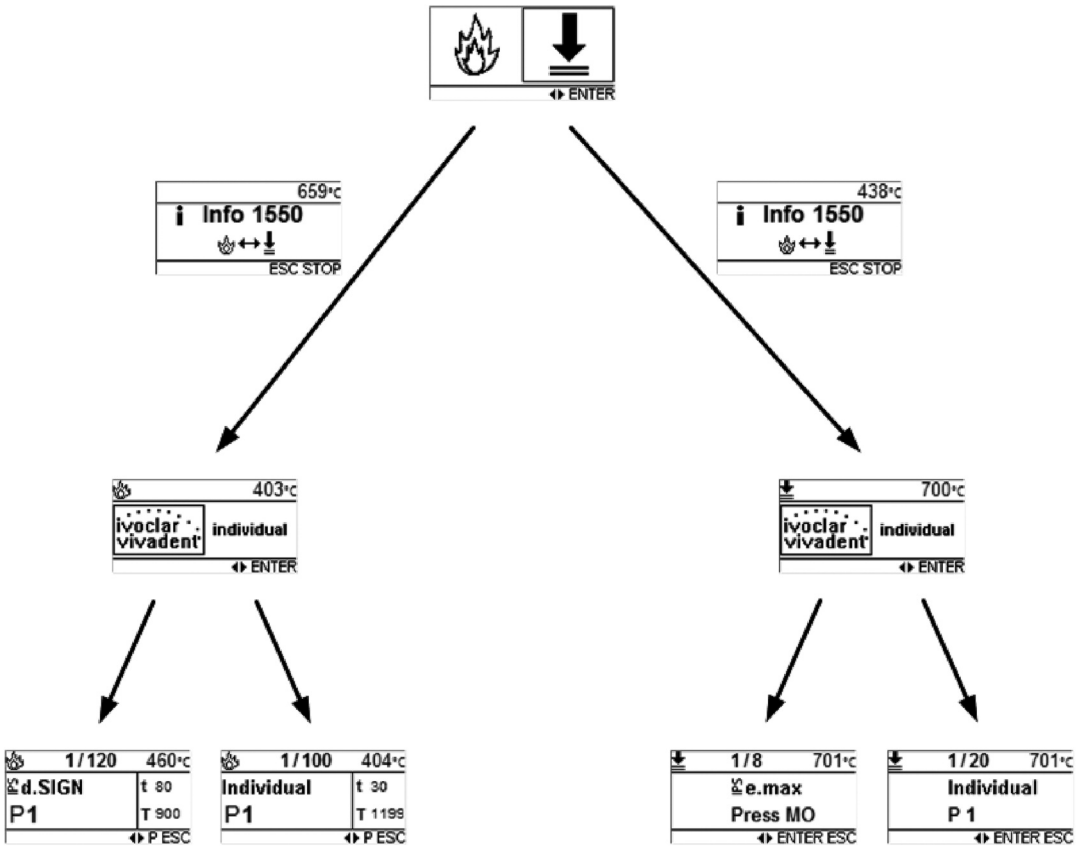
Two program tables (°C / °F) are enclosed in these Operating Instructions. If not, please contact your local Ivoclar Vivadent Service Center.

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

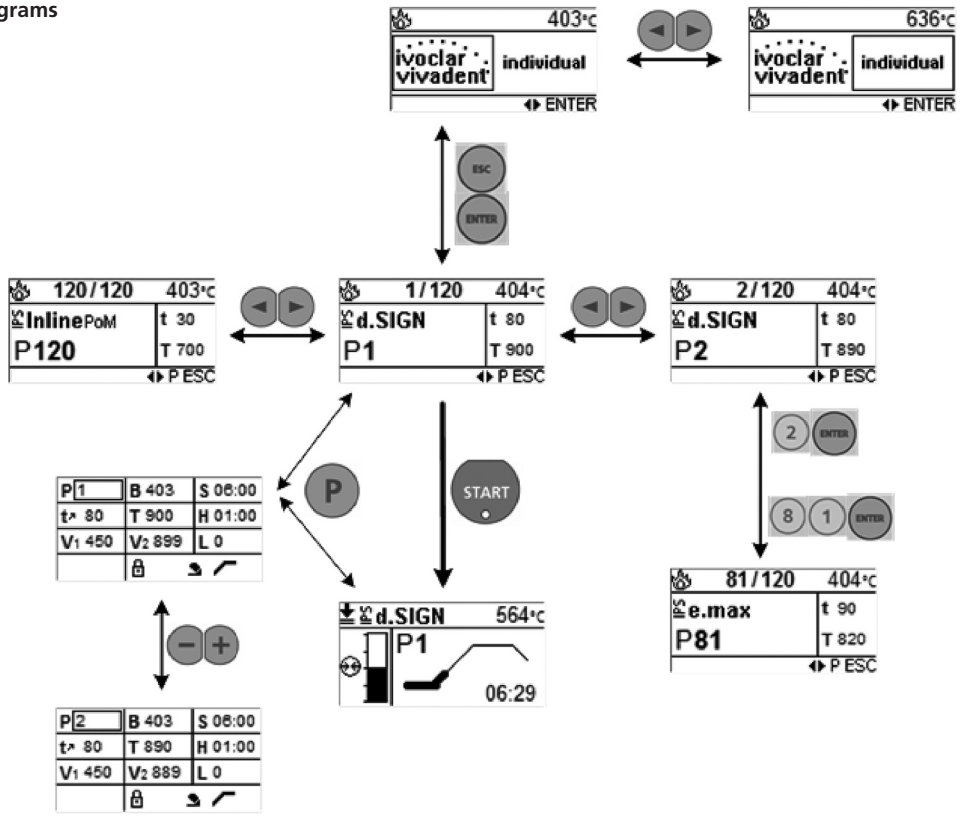
The program tables can be downloaded from the Internet as PDF files. Please make sure that your program table complies with the software version you use, as the table is coordinated with the respective software version.

10.2 Menu structure

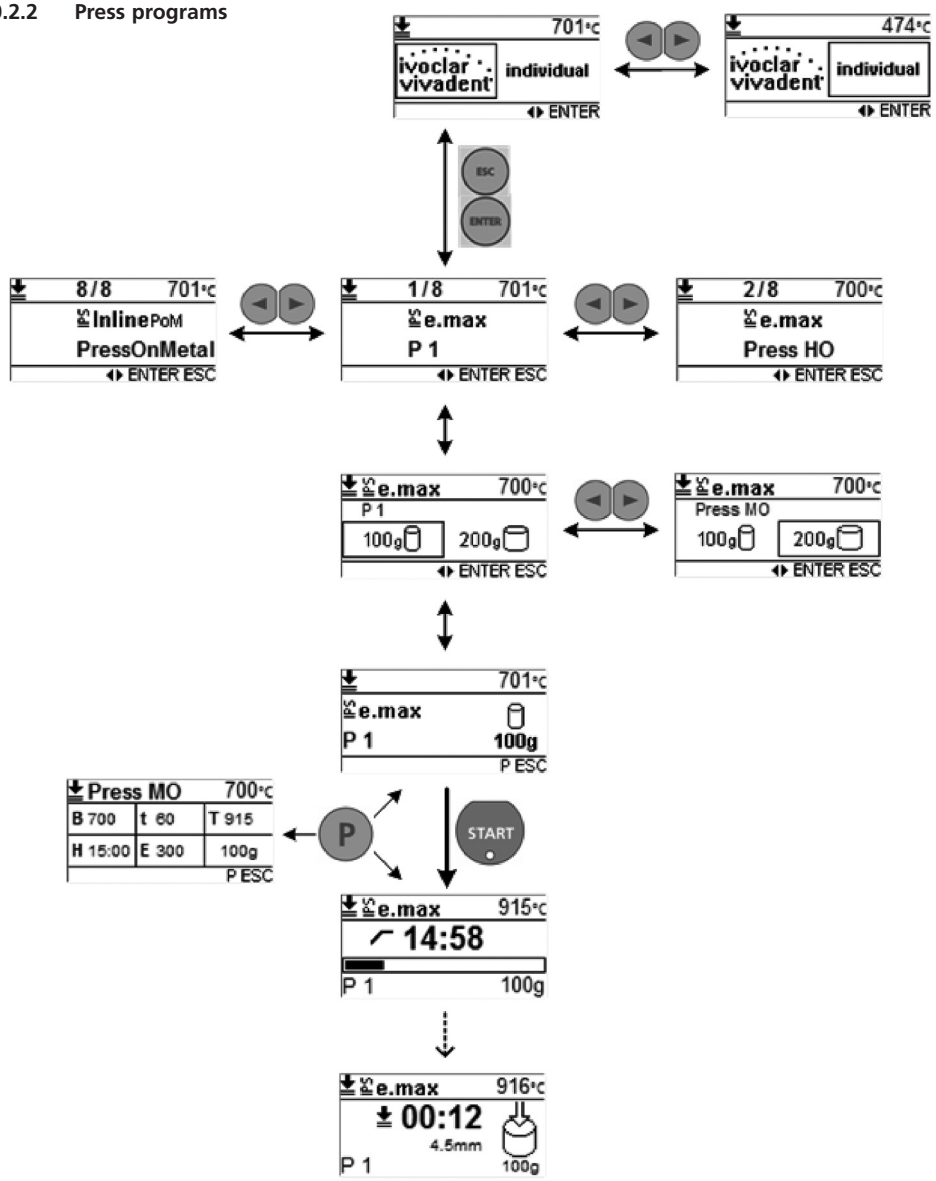
10.2.1 Selecting the operation mode and program type



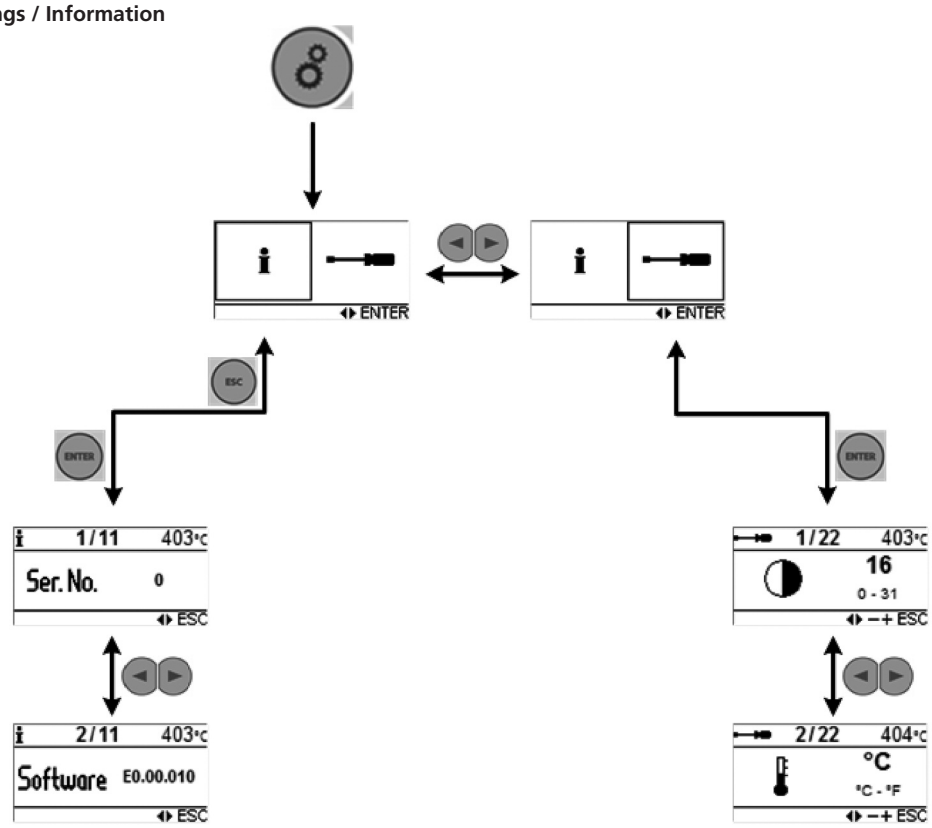
10.2.2 Firing programs



10.2.2 Press programs



10.2.2 Settings / Information



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. (Liaison Office)
503/504 Raheja Plaza
15 B Shah Industrial Estate
Veera Desai Road, Andheri(West)
Mumbai, India 400 053
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.
171 Chin swee road
#02-01 San centre
Singapore 169877
Tel. +65-6535 6775
Fax +65-6535-4991
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 Liaison Office
Ahi Evran Caddesi No 1
Polaris Is Merkezi Kat: 7
80670 Maslak
Istanbul
Turkey
Tel. +90 212 346 04 04
Fax +90 212 346 04 24
www.ivoclarvivadent.com.tr

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

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