Furnace for NORMAL and PURE ceramics

CeramicMaster **E1000**



USER MANUAL

Dental Servis
Serdar Ayısıt
0555 274 05 51

USER MANUAL

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1. INTRODUCTION

Thank you for having purchased the CERAMICMASTER E1000 furnace which, we are sure will all meet all your needs and will satisfy your high demands.

This furnace has been designed according to the requirements of latest industrial standards and we guarantee that you will use it many years as your closest assistant.

However, inappropriate use may damage the equipment and be harmful to personnel. Please observe the relevant safety instructions and read the Operating Instructions carefully.

We wish you pleasant and fruitful work with the CERAMICMASTER E1000.

SYMBOLS:



This symbol indicates that there is high dangerous tension under the bonnet which it is put on Switch off the furnace before removing the marked cover.



Symbol for HOT SURFACE;
ATTENTION: HOT SURFACE! DO NOT TOUCH!



This symbol indicates that the machine complies with the requirements of the Directives for Low Tension and Electromagnetic Compatibility as well as for the Standards harmonized with them.

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2. SAFETY INSTRUCTIONS

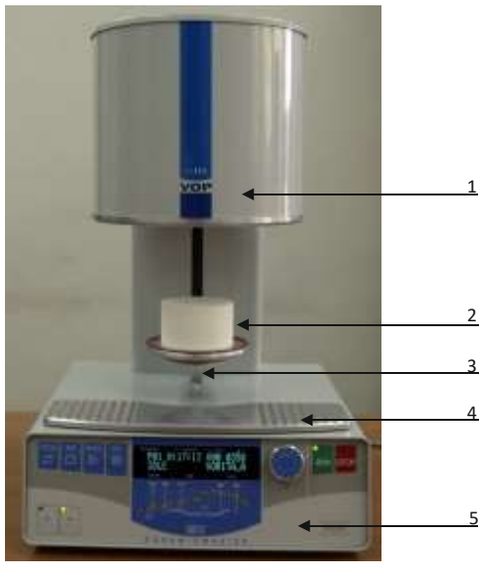
The following instructions must be observed in order to avoid personnel injury or equipment failure.

- the furnace must not be run by an operator who is not acquainted with these instructions;
- before turning on the plug in the net contact check if the voltage in the electrical network correspond to the working tension. In case of discrepancy, consult a specialist;
- on no account do not alter the device;
- the notices and stickers must be kept in good condition so that they are easily readable; they should not be removed!
- the machine must not function in case of being damaged and in position to injure the staff or a third person;
- keep the cables out of heat, oil and coarse objects; do not catch the device by the cable when you move it.
- switch off the furnace and pull out the plug of the feeder cable from the contact before each cleaning or upkeep.
- spare parts which are not specified by the manufacturer cannot be used!

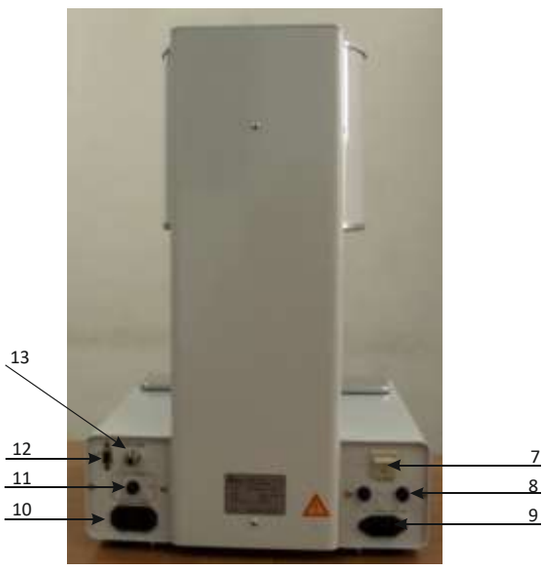
CAUTION! If the machine is used by such means not indicated by the manufacturer, the provided protection can get worse!

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3. DESCRIPTION OF THE UNIT



1 Cover of the chamber
2 Ceramic table
3 Lift table
4 Cooling pad
5 Front panel



6 Fan
7 Mains switch
8 Mains fuses
9 Plug of power cord
10 Plug of pump's power cord
11 Fuse for pump
12 Plug of RS232
13 Nozzle of pump's hose



14 Hose of the pump



15 Vacuum pump

16

4. INSTALATION AND INITIAL START-UP

UNPACKING

- Carefully remove modules from packages;
- Make sure that the mains voltage is ~230V and the contact is reliably grounded.

CONNECTIONS

- Connect pump supply cable to the terminal with label "VACUUM PUMP" on the rear panel;
- Connect the power supply cable to the terminal with label "POWER" on the rear panel;
- Connect vacuum hose to the vacuum fitting with label "VACUUM" on the rear panel.
- The net switch is on the rear panel, on the right. Put the furnace in a position which enables its easy engaging turning off from the master switch as well as from the contact.

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5. PRACTICAL USE

DESCRIPTION OF BUTTONS



PROG - puts the number of the program which is to be performed into programming mode.

SKIP - skips phases DRY1, FIRE1, COOL1 and PRESS into programming mode.

ENTER - stores the changes in the current program but does not save them after the finish of the program.

ESC - cancels all changes.



RUN

- starts the chosen program when the indicator of the button flashes in green;
- permits the change of the chosen parameter value in a programming mode.

STOP

- stops the program at any moment;
- stops the movement of the table at any position;
- cancels all changes of the chosen parameter in a programming mode;
- recovers the normal working mode of the furnace after error.



- closes manually the furnace. The button can increase/decrease the chosen parameter value with 100 by pressing it while turning the multi functional rotary knob.

- opens manually the furnace . The button can increase/decrease the chosen parameter value with 10 by pressing it while turning the multi functional rotary knob.



MFRK - Multi Functional Rotary Knob. It is used for choosing of programs or parameters and set the values.

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DESCRIPTION OF INDICATION



This furnace has 2 LINE VFD display.

The LINE 1 shows following information:

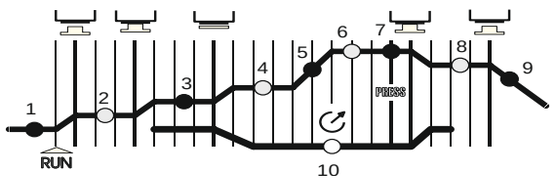
PROGRAM sector shows the number of the chosen program for execution or the program for entering of parameters.

H:MM:SS sector shows the time left till the end of the executed program.

mbar sector shows vacuum value in the closed chamber.

°C sector shows the current temperature value in the firing chamber.

MODE sector is on the second line
On the LEFT you can see information about current stage and on the RIGHT it shows the name of current program.



Indicator 1: the furnace is in the phase when the temperature increases until it reaches the value at which the drying procedure starts.

Indicator 2: the furnace is in the phase of first drying.

Indicator 3: the furnace is in the phase of second drying.

Indicator 4: the furnace is in the phase of first firing.

Indicator 5: the furnace is in the phase when the temperature increases to the value for second firing.

Indicator 6: the furnace is in the phase of second firing.

Indicator 8: the furnace is in the phase of first cooling.

Indicator 9: the furnace is in the phase of second cooling.

Indicator 10: the vacuum pump is switched on.

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In order to change the value of a parameter it is necessary to do the following steps:

- With the multi functional rotary knob choose the program which parameters you want to change;
- Press button PROG. Indicator of the button RUN begins to blink green/red and you can see on the display:

  Pxx : VIEW DATA
  ENTRY TEMP xxxx
- This is the first parameter. Turn left/right the MFRK in order to chose the parameter you want to change;
- Press button RUN in order to chose the value of the parameter you want to change. If you have chosen the first parameter you would see on the display:

  Pxx : EDIT DATA
  ENTRY TEMP xxxx
- Indicator of the button RUN turns off and the red indicator on the button STOP begins to blink.
- Turn the MFRK to change the parameter value.
- Press button STOP in order to leave the programming of the current parameter. Indicator of the button RUN begins to blink again in green/red which means that it is possible to program next parameter.

Some of the parameters can be skipped. This can be done by pressing button SKIP. In this way is skipped not only the given parameter but also the whole phase. The parameters that can be skipped are described later in the text.

There are three possible ways of leaving the programming mode after you have finished with the changes in the parameters' value:

FIRST EXIT: press button ESC. This will CANCEL all the changes that are made in the parameters' value in the program.

SECOND EXIT: press button ENTER. This will save the changes that are made in the parameters' value ONLY FOR THE TIME OF EXECUTION OF THE PROGRAM. After the end of the program all the changes are canceled.

THIRD EXIT: press button PROG. This will SAVE all the changes that are made in the parameters' value permanent.

The indicator of button RUN will flash in green in working mode if the temperature defined by the parameter IDLE TEMP is reached and if the temperature is not reached it will flash in red.

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DESCRIPTION OF PARAMETERS IN ORDER OF THEIR APPEARANCE

IDLE TEMP	the temperature in IDLE mode. This is the temperature which the furnace keeps in STOP mode when the muffle is closed. Its value is from 150°C to 600°C but it can't exceed (ENTRY TEMP-20)°C. If the muffle is opened the temperature inside is 150°C.
PREDRY TIME	during this time the table stays in lower end position when the temperature in the chamber is equal to DRYTEMP. It can be changed from 0 s to 1 h.
ENTRY TEMP	starting temperature. This is the temperature which must be reached in the furnace firing chamber before the table starts moving upward after the start of the program. Its value is from 325°C to 750°C.
DRY1 TIME	the time for moving the table from lower end position to the medium position which is about 1,5cm from the upper end position of the table. It can be changed from 0s to 1h.
DRY2 RATE	increase rate of the temperature at a medium position of the table. Its value is from 30°C /min to 200°C /min. *This parameter can be skipped*.
DRY2 TEMP	drying temperature at a medium position of the table. Its value is from the value of parameter ENTRY TEMP °C to the value of parameter (FIRE1 TEMP – 20)°C. *This parameter can be skipped*.
DRY2 TIME	time for maintaining of the drying temperature at a medium position of the table. It can be changed from 0 s to1 h. *This parameter can be skipped*.
FIRE1 RATE	increase rate of the temperature for first firing. Its value is from 30°C /min to 200°C /min. *This parameter can be skipped*.
FIRE1 TEMP	the temperature for the first firing. Its value is from the value of parameter (DRY2 TEMP + 20)°C to the value of parameter (FIRE2 TEMP – 20)°C. This parameter can be skipped.
FIRE1 TIME	time for maintaining the firing temperature FIRE1 TEMP. It can be changed from 0s to 1h. *This parameter can be skipped*.
FIRE2 RATE	increase rate of the temperature for second firing. Its value is from 30°C /min to 200°C /min.
FIRE2 TEMP	temperature for the second firing. Its value is from the value of parameter (FIRE1 TEMP + 20)°C to 1200°C.
FIRE2 TIME	time for maintaining the temperature FIRE2 TEMP. It can be changed from 0s to 1h.

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COOL1 TEMP

cooling temperature at a medium position of the table. Its value is from the value of the parameter (FIRE2 TEMP – 20)°C to the value of the parameter (ENTRY TEMP + 20)°C. *This parameter can be skipped*.

COOL1 TIME

time for maintaining the cooling temperature fixed by the parameter COOL1 TEMP. It can be changed from 0s to 1h. *This parameter can be skipped*.

COOL2 TIME

time for opening the furnace to the lower end position which starts after the time COOL1 TIME. It can be changed from 0s to 1h.

VRUN TEMP

temperature which defines the start of the time saved in the parameter VRUN TIME. Its value is from 0°C to 1250°C. If its value exceeds the value of the parameter FIRE2 TIME, vacuum will never start. *This parameter can be skipped*.

VRUN TIME

time which defines the start of the vacuum. It starts after the firing chamber temperature reaches the value of the parameter VRUN TEMP. It can be changed from 0s to 1h. *This parameter can be skipped*.

VSTOP TEMP

temperature which defines the start of the time VSTOP TIME. Its value is from 0°C to 1250°C. If its value exceeds the value of the parameter FIRE2 TIME, vacuum will never start. *This parameter can be skipped*.

VSTOP TIME

time which defines the stop of the vacuum. It starts after the firing chamber temperature reaches the value of the parameter VSTOP TEMP. It can be changed from 0s to 1h. *This parameter can be skipped*.

VAC LEVEL

level of the vacuum. You can set values between 100mBar and 970mBar. It will be written "max" on the display when the furnace is in program mode. When the furnace performs a program the maximum vacuum is held up inside the muffle. *This parameter can be skipped.*

PROGRAM NAME

In this parameter you can set a name for the current program. Choose the position for desired letter by using the arrow buttons. Then choose the letter using MFRK.
Values of the parameters FIRE2 RATE, FIRE2 TEMP и FIRE2 TIME can be changed during the execution of the program. This can be done with the buttons PROG, SKIP and ENTER and with the turning of the multifunctional knob.

If you press the button PROG during the execution of a program the value of the parameter FIRE2 RATE will blink on the display and with MFRK will be able to change the programmed value.

Button SKIP changes parameter FIRE2 TEMP, and button ENTER changes parameter FIRE2 TIME.

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When programming the temperature conditions for parameters ENTRY TEMP, DRY2 TEMP, FIRE1 TEMP, FIRE2 TEMP and COOL1 TEMP the program temperature cannot be lower than this of the previous parameter and at the same time higher than this of the next parameter.

Please consider that the data which you initiated in the skipped temperature-concerned parameters (by manipulating with button SKIP) exert influence on the programming of the adjacent temperature parameters.

The difference between the values of the parameters ENTRY TEMP and DRY2 TEMP can't be lower than 20°C! For instance supposing that the defined value of the parameter ENTRY TEMP is 500°C, then the value of the parameter DRY2 TEMP can be 520°C or more.

There is a possibility for fast changing of parameters which have TEMPERATURE and TIME dimensions. When you push the ▲ button and rotate the **MFRK** the value will change by 100 points, and by pushing ▼ and rotate the **MFRK** the value will change by 10 points.

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6. ERRORS

General errors

1 - Missing signal "mains zero", entry 0
2 - Missing signal "mains zero", entry 1
3 - Mains frequency is not 50Hz or 60Hz.

Errors concerning the heating

15 - During running of a program: when the temperature is increasing the needed rate of increasing cannot be achieved.
19 - The required temperature is not reached for the selected time.
20 - The required temperature can not be reached during cooling.
21 - The selected temperature can not be reached during heating.
22 - Temperature is higher than 1200°C.
23 - Temperature is lower than 5°C.
99 - Interrupted thermo sensor or the temperature is higher than 1285°C.

Errors concerning the movement of the table

53, 54 - The position sensor for the table is not reached for a required during drying.
83, 93 - The position sensor for the table for drying is not reached for the required time during opening.
84 - The upper position sensor of the table (closing) is not reached for the required time.
78, 86, 94 - The lower position sensor for the table is not reached for the required time during opening of the furnace.
76 - The time for opening is over during the program controlled mode.
90 - The upper position sensor for the table is not reached for a long time in the MANUAL mode of closing.
91 - The lower position sensor for the table is not reached for a long time in the MANUAL mode of closing.

Errors concerning the vacuum

28 - The selected vacuum is not reached for the required time.

50 - There exists residual vacuum during the initial power on procedure.
51 - After releasing the vacuum, for the required time the vacuum is not released entirely.
75 - The vacuum can not be released in programming mode.

Errors concerning RS232 interface to the PC

40 - A non-number-type symbol has appeared during receiving.
41, 42 - A symbol is received which is not = or ~ during receiving.
160 - Received number for the minutes greater than 59 during receiving.
161 - Received number for the seconds greater than 59 during receiving.
30; 31 - Timeout during receiving of programs
120 - ENTRYTEMP < IDLETEMP + 25
121 - ENTRYTEMP >750
122 - ENTRYTEMP<DRY2TEMP-20
123 - DRY2RATE<30 or DRY2RATE>200
124 - FIRE1RATE<30 or FIRE1RATE>200
125 - FIRE2RATE<30 or FIRE2RATE>200
126 - DRY2TEMP >FIRE1TEMP-20
127 - FIRE1TEMP >FIRE2TEMP-20
128 - FIRE2TEMP >1200
129 - COOL1TEMP<ENTRYTEMP+20
130 - COOL1TEMP>FIRE2TEMP-20
131 - VRUNTEMP>1250
132 - VSTOPTEMP>1250
133 - VACLEVEL>971
134 - VACLEVEL<100
135 - PR_RATE<20 or PR_RATE>30

CAUTION!
When any error appears, it is written on the display and the furnace produces a sound signal. The button STOP has to be pressed in order to exit from this state.

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7. IMPORTANT PRACTICAL INFORMATION

1. Avoid positioning of furnace and pump in the immediate vicinity of heat sources (radiators).

2. Install the vacuum pump in a well-ventilated locations. Ensure that the apertures in the frame plate are free and that no foreign object can fall into the furnace base.

3. Avoid placing any objects on the frame plate, place only on the face cooling plate.

4. Ensure that the sealing ring in the furnace head and the sealing rim of the furnace base are kept clean and undamaged.

5. Always keep the firing chamber closed between firings.

6. It is strongly recommended to use porous ceramic tray (on request - № 81022).

WARNING! For the proper work of the furnace it is necessary to hold the furnace in stand-by mode for at least 0.5 hours. After switching on the furnace close the dome and wait 0.5 hours.

7. If the power supply is interrupted during the working process and:

7.1. If the temperature in the chamber has not decreased by more than 15 degrees, the current program will continue from the stage at which it has been stopped.

7.2. If the temperature in the chamber has decreased by more than 15 degrees, the following message will appear on the display:

LONG TIME POWER OFF

In this case the program cannot continue. You have to press the button STOP in order to exit this state.

The total number of the programs is 200 - with numbers from 0 to 99. Programs from №1 to №18 have parameters for ceramic NORITAKE. The manufacturer has entered equivalent parameters in all other programs.

It is responsibility of the customer to enter the data for the ceramic that he uses before to start working.

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8. TECHNICAL DATA

1. Electrical supply	~230 V, ±10%, 50/60 Hz
2. Power consumption	
2.1. Furnace with vacuum pump	1700 W
2.2. Furnace without vacuum pump	1550 W
3. Category of overtension	II
4. Vacuum pump data	
4.1. Suction capacity	22 l/min
4.2. Regulated vacuum level	от 0.1 до 0.9 bar
5. Maximal firing temperature	1200°C
6. Effective firing chamber dimensions	Φ 95 mm; h 46 mm
7. Overall dimensions of closed furnace:	
7.1. Width	370 mm
7.2. Length	380 mm
7.3. Height	564 mm
8. Model Weight	24 кg
9. Number of programs	200
10. Working temperature	18°C - 30°C
11. Level of environment pollution	2

12. The device is designed for usage in normal dental premises up to 2000 m altitude above sea level.

13. The maximum relative humidity of the air must be 80% for temperatures up to 31°C, decreasing lineally to 50% relative humidity for temperature 40°C.

14. Working modes

14.1. Programming mode

Programming of the parameters is fully described in chapter 7. PROGRAMMING.

14.2. Working mode

It shows the number of the executed program and the parameters' value of the ongoing program phase.

The values of all parameters could be seen if you use the Multi Functional Rotary Knob **MFRK**.

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9. MAINTENANCE

Clean only with a dry or slightly moist cloth (no solvents!).

Change the safety locks with the announced valus only, namely:

T1.25A, slow (class T)
T8A, slow (class T)

No repair activity by a service technician who is not authorized by the manufacturer is allowed!

The lifting and carrying should be made only with the both hands from below as the furnace stands on end.

No carrying and transportation in another state except for vertical position is allowed!

10. DELIVERY SCOPE

Furnace CERAMICMASTER **E1000**	1 pc
Vacuum pump PVD-M22	1 pc
Power cable	1 pc
Flexible tube for the vacuum	1 pc
Spare fuses	
1.25A/250V	1 pc
8A/250V	2 pcs
User Manual	

PRODUCER: "VOP" Ltd.
2140 IZ "Microelectronika"
Botevgrad, Bulgaria
Tel. 0723 66303
Tel./Fax 0723 66304

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"VOP" Ltd.
Microelectronika
2140 Botevgrad
Tel. 0723 66303
Tel./Fax 0723 6304

Ceramic Master E1000

WARRANTY SHEET

"VOP" Ltd. warrants the consumer for proper operation of all parts and materials in this product during a period of **12 months** since the day of its purchase.

During this period VOP Ltd. or its authorized persons will repair on its own account all defects which have occur during the normal operation of the machine.

Defects caused by improper transportation, storage and manipulation of the product or due to malfunction of the electrical mains supply are repaired on the account of the customer.

This warranty shall become void if attempts are made to repair the product by persons not authorized by the producer.

Serial Number _____

Invoice number _____

Date _____



MANAGER of "VOP" Ltd

_____ _____

CLIENT:

Serial Number _____

Invoice number _____

Date _____

Voucher Manufacturer

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