CeramicMaster
E20



USER MANUAL

Dental Servis
Serdar Ayısıt
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USER MANUAL

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1. INTRODUCTION

Thank you for having purchased the CERAMICMASTER **E20** 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.

The furnace has a kit for auto calibration that can be purchased separately. For more information, see section 9 - AUTOCALIBRATION.

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 **E20**.

USING SYMBOLS:

 This symbol indicates that there is high dangerous tension under the bonnet which it is put on.

 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



7 Mains switch
8 Mains fuses - 8A/250V
9 Plug of power cord
10 Plug of pump's power cord
11 Fuse for vacuum pump - 1,25A/250V
12 Nozzle of pump's hose



14

14 Hose of the vacuum pump



16

16 Vacuum pump

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4. INSTALLATION AND INITIAL START-UP

UNPACKING

- Carefully remove modules from packages;
- Make sure that the mains voltage is ~220V and the socket 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.

SETTING THE TIME TO AUDIBLE SIGNALS

You can set the duration of the sound signaling at the end of the program. For this purpose it is necessary to perform the following:
Turn off the furnace;
Press RUN and STOP keys simultaneously;
Hold the buttons until the next message appears:

END CYCLE SOUND
00015

The current value can be changed by turning the multifunction knob **MFK**. The new value is stored by pressing the button **PROG**.

IMPORTANT!

After turning the oven on display for a few seconds will show SELF TESTING. Do not release the buttons until this sign stands on display.

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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.

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.



MFK - multifunctional button; It can choose programs or parameters and set values.

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This furnace has 2 LINE LCD display.

The LINE 1 shows following information:

Sector”№ PROGRAM” shows the number of the chosen program for execution or the program for entering of parameters;

Sector "H:MM:SS" - shows the time remaining to the end of the executed program.

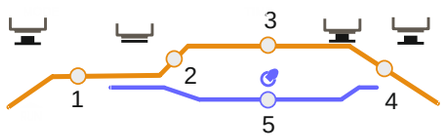
Sector"V %" - shows the depth of the vacuum in %.

Sector"°C" - Indicates the current temperature in the chamber.

The LINE 2 shows following information:

Sector "MODE" – displays information of the current stage;

Sector "PROGRAM NAME" – shows the name of the selected program.



Indicator 1: the furnace is in the phase of **drying**.

Indicator 2: the furnace is in the phase when the temperature increases to the value for firing.

Indicator 3: the furnace is in the phase of **firing**.

Indicator 4: the furnace is in the phase of **cooling**.

Indicator 5: the vacuum pump is switched on.

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PARAMETERS AND PROGRAMMING

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

- With the multi functional rotary knob **MFK** chose 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:

XXX : YYYYYYYYYY SEE
PROGRAM NAME

The letter expressions means:

XXX	- number of program;
YYYYYYYYYY	- name of program;
SEE	- view data;
PROGRAM NAME	- parameter which to be changed.

- **PROGRAM NAME** is the first parameter which is shown when you enter in PROGRAM mode. Turn left/right the **MFK** 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:

XXX : YYYYYYYYYY SET
PROGRAM NAME

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** starts to blink again in green/red which means that it is possible to program the next parameter.

There are two 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 **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

PROGRAM NAME	this is a parameter for setting the name for current program. Choose the position for desired letter by using buttons  and . Then choose the letter using **MFK**.
IDLE TEMP	an idle temperature. This is the temperature which the furnace keeps in STOP mode. Its value is from 150°C to 600°C but it can't exceed (DRY TEMP-20)°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.
DRY TEMP	drying temperature. Its value is from (IDLE TEMP+20)°C to (FIRE TEMP-20)°C.
DRY TIME	the time for moving the table from lower end position to the medium position which is about 1cm from the upper end position of the table. The temperature in the chamber is DRY TEMP. It can be changed from 0s to 1h.
FIRE RATE	increase rate of the temperature for the firing. Its value is from 30°C /min to 200°C /min.
FIRE TEMP	increase rate of the temperature for the firing. Its value is from 30°C /min to 200°C /min.
FIRE TIME	time for maintaining the temperature FIRE TEMP. It can be changed from 0s to 30min.
COOL1 TIME	during this time the table is about 1cm from the upper end position. It can be changed from 0s to 1h.
COOL2 TIME	time for opening the furnace to the lower end position. It can be changed from 0s to 1h.
VRUN TEMP	temperature which defines the start of the time VRUN TIME. Its value is from 0°C to 1250°C. If its value exceeds the value of the parameter FIRE TIME, vacuum will never start.
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.
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 FIRE TIME, vacuum will never start.
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.

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The content of each program can be viewed during the performance. For this purpose the **MFK** should be turned.

The parameter values are displayed in series and stay on the display for 3 seconds. However, if during this time the button ▼ is pressed, the values are displayed while this button is pressed.

Values of the parameters FIRE RATE, FIRE TEMP и FIRE TIME can be changed during the execution of the program. This can be done with the buttons **PROG**, **ESC** and ▲ and with the turning of the multifunctional knob **MFK**.

By pressing the button PROG during program execution, display shows the value of the parameter FIRE RATE and by **MFK** the programmed value can be changed.

If you do not respond within the next three seconds, the display shows the current stage of program execution.

In the same way, by pressing the **ESC** key can be changed parameter FIRE TEMP, and by ▲ button you can change the parameter FIRE TIME.

HINTS

When programming the temperature conditions for parameters IDLE TEMP, DRY TEMP and FIRE 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.

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 -	Mains frequency is not 50 Hz or 60 Hz.
Errors, connected with 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.
Errors, connected with the movement of the table	53 -	The drying sensor is not reached for a certain time when the furnace opens.
	78 -	The lower sensor is not reached for a certain time when the furnace opens.
	83 -	The top sensor is not reached for a certain time when the furnace closes and a program with vacuum executes.
	90 -	it is not possible to reach the sensor for top position.
	91 -	it is not possible to reach the sensor for lower position.
	92 -	the working table cannot open.
	93 -	the drying sensor is not reached for a certain time when the furnace closes.
Errors, connected to the vacuum	28 -	Sufficient vacuum is not reached for 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.

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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. Close the chamber between working cycles, but not tightly, and leave a distance of approximately 1 cm.

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

WARNING! For precise operation of the device is necessary tempering oven for half an hour before the first use of the day. To do this after turning on the furnace, run at least one program with an empty camera and wait another 20 minutes.

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

a. 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.
b. 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 203 - with numbers from 0 to 202. Programs from №1 to №18 have parameters for ceramic NORITAKE**.** The manufacturer has entered same parameters in all other programs.

The program №201 is devoted for calibration of the furnace by means of a silver test.

The program №202 is designed for auto calibration using the optional calibration kit.

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

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8. TECHNICAL DATA

1. Electrical supply	~230 V, ±10%, 50/60Hz
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	0,1 to 0,9 bar
5. Maximal firing temperature	1200°C
6. Effective firing chamber dimensions	Φ 95 mm; h 60 mm
7. Overall dimensions of closed furnace:	
7.1. Width	265 mm
7.2. Length	370 mm
7.3. Height	565 mm
8. Model Weight	20 кg
9. Number of programs	203
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 **MFK**.

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9. AUTOCALIBRATION





The furnace is optionally provided with a kit for autocalibration, which is a ceramic table fitted with special holders. A wire of pure silver 9999 is attached on them. These holders are connected by wires to the other side of which a special connector is mounted.
The auto calibration kit is put in place on the tray. The connector is plugged in the socket labeled ACAL. This socket is located at the rear side of the furnace.
After plugging on the upper left corner of the display the sign * appears.
Start program 202. After about 2 hours the program ends.
If during the execution of the program there was a problem and the silver wire is disconnected, when calculating coefficient was outside the normal range, the display shows:

Err: Bad value = KKKKK
TTTTT RRR AAAAA,

Where

KKKKK is the wanted coefficient
TTTT.T is the temperature at break
RR.R is the ambient temperature
AAAAA is the value measured by ADC

(the normal range of the coefficient is between 10000 and 12000)

If during the execution of the program there was no problem and autocalibration has proceeded normally, the display shows:

Old = OOOOO New = KKKKK
TTTTT RRR AAAAA,

Where

OOOOO is the old coefficient
KKKKK is the new coefficient
TTTT.T is the temperature at break
RR.R is the ambient temperature

The furnace beeps at the end of the program.
Perform the following actions:
Take out the plug from the socket ACAL;
Remove the auto calibration kit;
Place the working ceramic tray again.
Press the STOP button;
Once you press the STOP button, the furnace is restarted and is ready for operation.

ATTENTION: ***This accessory is sold separately.***

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10. USER SOFTWARE

User can connect the oven to a PC via USB interface.

The manufacturer provides a special program ***E20_User_Software***, which can be used for

- Download user programs from the furnace;
- Upload editing programs to thefurnace;
- Updating the system software;
- Programming the furnace directly from the PC;
- Control through the PC.

11. MAINTENANCE

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

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

1.25A, slow (class T).
8A, 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!

12. DELIVERY SCOPE

Furnace CERAMICMASTER E20	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 "Microelectronica"
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Ceramic Master E20

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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