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## I. INTRODUCTION

**FIREMAGIC FM4+** is a computerized furnace for cylinder, crowns and bridges pre-heat, as well as for temperature processing and casting in temperature range up to 1100 °C.

### Basic Advantages:

1. *10 (ten) User Programmes (power independent);*
2. *5 (five) Temperature Levels;*
3. *Programable Temperature Increase Speed Between Levels - 1 to 10°C/min*
4. *Automatic Parameter Control;*
5. *Standby Mode - up to 99 Hours;*
6. *Saving Insulation With Mineral Wadding (Asbestos Free);*
7. *Option - Programmable Active Air Aspiration;*
8. *Warranty - 12 months.*

### IMPORTANT FOR FURNACE INSTALLATION!

Before connecting the furnace to electrical network make sure whether line voltage is within standard limits and contact is well grounded!

The net switch is on the rear panel, on the right. Put the furnace in a position which enables its easy engaging and turning off from the master switch as well as from the contact.

### 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.



**ATTENTION! Hot surface!** The spot where this symbol is put on has a surface warmed up to dangerous temperature rate. Touch with unprotected hands and other parts of the body must be avoided! Incineration can be caused!

## II. IMPORTANT PRACTICAL INSTRUCTIONS

1. Avoid positioning of furnace and pump in the immediate vicinity of heat sources (radiator).
2. Ensure that no extraneous objects can fall into the furnace base.
3. Avoid placing any objects on the frame plate, place only on the face cooling plate.
4. Clean only with a dry or slightly moist cloth (no solvents!).

**ATTENTION!** When placing the muffles look out not to affect the thermocouple which you can find on the rear wall of the chamber. Switch on and off the furnace from the control block only its supply feeding is stopped.

Occasionally ventilate the aspirational outlet of the furnace. If the furnace is supplied with an aspiration, as a first step take off the aspiration system by removing the two screws which support the furnace from the rear panel.

With the help of a metal spit eliminate the wax layer from the ceramic aspirational outlet as you take care not to damage the ceramic body.

### 5. Maintenance.

5.1. Change the safety locks with the announced values only, namely:

16A, slow (class T).

1A, slow (class T).

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

### 6. Lifting and carrying of the furnace.

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!

### 7. Safety Instructions.

The following instructions must be observed strictly so that injuring of the operator or damage in the equipment are avoided.

- 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 a 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!

**ATTENTION:**

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

**III. TECHNICAL DATA**

1. Power Supply	± 230V 10% 50/60Hz
2. Power Consumption	
- Model FM4+	2000 W
3. Category of overtension	II
4. Maximum Firing Temperature	1100 °C
5. Maximum Programme Time	100 h
6. Effective Firing Chamber Dimentions B/H/L	
- Model FM4+ With Ceramic Stand	100/170/180 mm
7. Closed Furnace Dimensions	
- Model Fm4+	
Width Without Control Panel	360 mm
Width With Control Panel	525 mm
Depth	400 mm
Height	360 mm
8. Weight	
- Model Fm4+	29,5 kg
- Control block	2,7 kg

9. Working temperature

18°C - 30°C

#### IV. WORKING MODES

1. Mode "STOP" - fixed at switching on the furnace.
2. Programming of parameters:
  - Standby time;
  - Working time of the active aspiration;
  - Temperature of every level;
  - Holding time of the assigned temperature of every level;
  - Speed of temperature increase between temperature levels.
3. Programme running - the display shows number of current programme, current temperature, time till the end of programme and current stage of programme running.

#### V. KEYBOARD AND DISPLAY

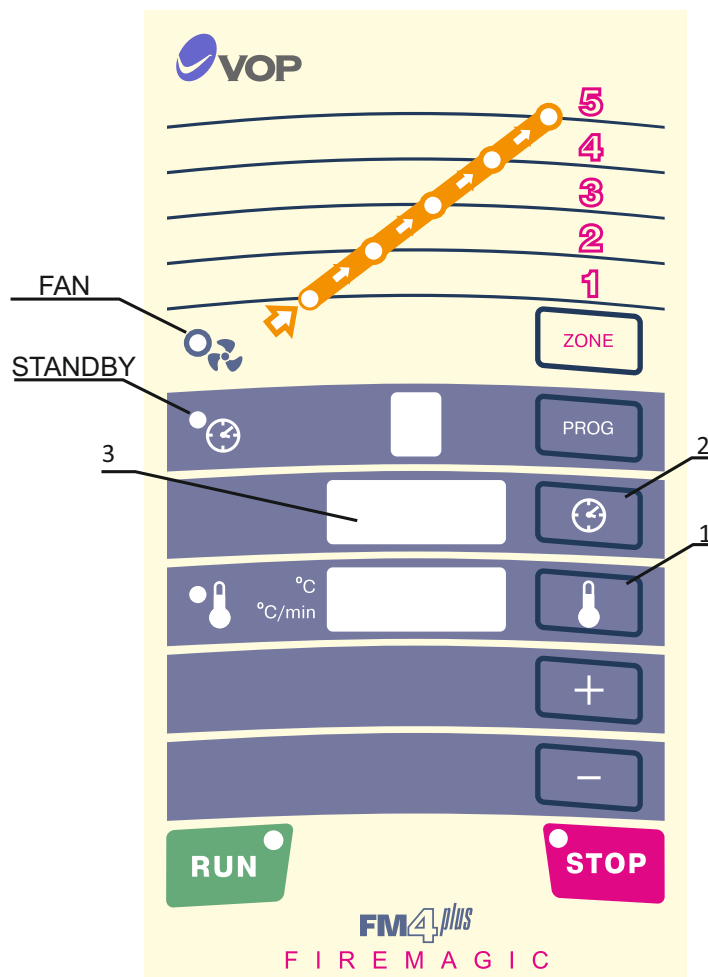


Fig.1 Control Panel

## 1. Indication at mode "STOP"

The mode has been fixed after switching on the power supply or after pushing the button "STOP" irrespective of the furnace conditions. It indicates with red LED "STOP".

In the window "PROGRAM" is indicated the number of selected programme, in the window "°C °C/min" - the chamber temperature, in the window "HH.MM" - the time for performance of the selected program (in case when temperature in chamber is lower than temperature programmed for zone I) or "--.--" (in case when temperature in chamber is higher than temperature programmed for zone I).

## 2. Programming of parameters

**Button "PROG"** - selects next programme. Button pushing causes increasing the programme number indicated in the window "PROGRAM". Its first pushing causes blinking of the lid ZONE5 on the display and every next pushing causes consecutive blinking if lids ZONE4, ZONE3, ZONE2, ZONE1, STANDBY and FAN.

**Button "ZONE"** - selects in succession different stages of currently selected programme.

1. In case when a horizontal section of temperature diagram is selected:

1.1. In the window "°C °C/min" is indicated value of temperature programmed accordingly for zones from I to V °C. Now by pushing button 1 the window "°C °C/min" begins to blink and by buttons "+" and "-" temperature may be changed. The change is to be confirmed by pushing button 1 again. With button "STOP" the introduced changes may be cancelled.

1.2. In the window 3 is indicated time programmed accordingly for zones from I to V in format {hour hour.minutes minutes}. Now by pushing button 2 the window 3 begins to blink and by buttons "+" and "-" time may be changed. The change is to be confirmed by pushing button 2 again. With button "STOP" the introduced changes may be cancelled.

2. In case when vertical section of temperature diagram is selected in the window "°C °C/min" is indicated programmed speed of temperature increase accordingly to I-st zone, from I-st to II-nd zone, from II-nd to III-rd zone, from III-rd to IV-th zone and from IV-th to V-th zone.

Now by pushing button 1 the window "°C °C/min" begins to blink and by buttons "+" and "-" temperature increase may be changed.

The change is to be confirmed by pushing button 1 again.

With button "STOP" the introduced changes may be cancelled.

3. When LED "STANDBY" is flashing in window 3 is indicated programmed standby time. This is the time between starting the programme and heater activation. Now by pushing button 2 the window 3 begins to blink and by buttons "+" and "-" standby time may be changed. The change is to be confirmed by pushing button 2 again.

With button "STOP" the introduced changes may be Cancelled.

4. When LED "FAN" is flashing in window 3 is indicated programmed active aspiration time. Now by pushing button 2 the window 3 begins to blink and by buttons "+" and "-" aspiration time may be changed.

The change is to be confirmed by pushing button 2 again.

With button "STOP" the introduced changes may be cancelled.

### 3. Programme running.

Starting of selected programme is done from mode "STOP" by pushing button "RUN". At this its led is lighted on and indication of selected programme begins to blink. On the LED'S graphic display the stages of running programme are indicated correspondingly. Current temperature in chamber is indicated in the window "°C °C/min" and time till the end of programme - in window 3.

**ATTENTION !** In case when in mode "STOP" in window 3 is indicated "--.--" (see mode "STOP"), for starting the programme it is necessary to push button "RUN" and hold it until the LED "RUN" lights on. So the programme begins from the stage whose temperature is already achieved.

By pushing button "STOP" the running programme is left.

## VI. IMPORTANT PRACTICAL INFORMATION

### ATTENTION!

When putting in the cylinders be careful not to damage the thermocouple, situated at the back of the chamber.

Connect and disconnect control unit to the furnace **ONLY** when power is off.

Occasionally ventilate the aspirational outlet of the furnace. If the furnace is supplied with an aspiration, as a first step take off the aspiration system by removing the two screws which support the furnace from the rear panel.

With the help of a metal spit eliminate the wax layer from the ceramic aspirational outlet as you take care not to damage the ceramic body.

## VII. ERRORS

**E01** – wrong sequence of fixed points when automatically calculating the room temperature factor.

**E02** – Insufficient rate of temperature rise.

**E03** – the temperature is higher than 1250°C in the retention zone.

**E04** – the temperature is higher than 1250°C in the rise zone.

**E05** – the temperature is higher than 1250°C at room temperature.

## VIII. PACKAGE

1. Furnace FIREMAGIC FM4+	1 pc.
2. Control Unit FIREMAGIC FM4+	1 pc.
3. Spare fuses	
16A/250V 6x32	2 pcs.
1A/250V 5x20	2 pcs.
4. User manual	1 pc.





VOP Ltd.  
Made in EU

## FIREMAGIC FM4+ WARRANTY CERTIFICATE

VOP LTD. GUARANTEES THIS FURNACE AGAINST ANY DEFECTIVE PARTS OR MATERIALS FOR A PERIOD OF **12 MONTHS** FROM DATE OF PURCHASE. DURING THIS TIME **VOP LTD.** OR ITS AUTHORIZED DEALERS WILL REPAIR OR REPLACE FREE OF CHARGE ANY DEFECTIVE PARTS, IF SUCH DEFECTS OCCUR IN NORMAL SERVICE AND ARE NOT DUE TO APPARENT MISUSE, ABUSE, ACCIDENT, INCORRECT TRANSPORTATION AND STORAGE OR GRID FAULTS. THE WARRANTY HAS BEEN ABROGATED WHEN DAMAGES ARE REPAIRED BY UNAUTHORIZED PERSONS.

Serial Number.....

Invoice.....

Date .....

General Manager of VOP Ltd.

FIREMAGIC FM4+

NAME.....

ADDRESS.....

.....Tel. ....

Serial Number.....

Invoice.....

Date .....

Please send back to manufacturer