VITA - VACUMAT 100

Operating Manual
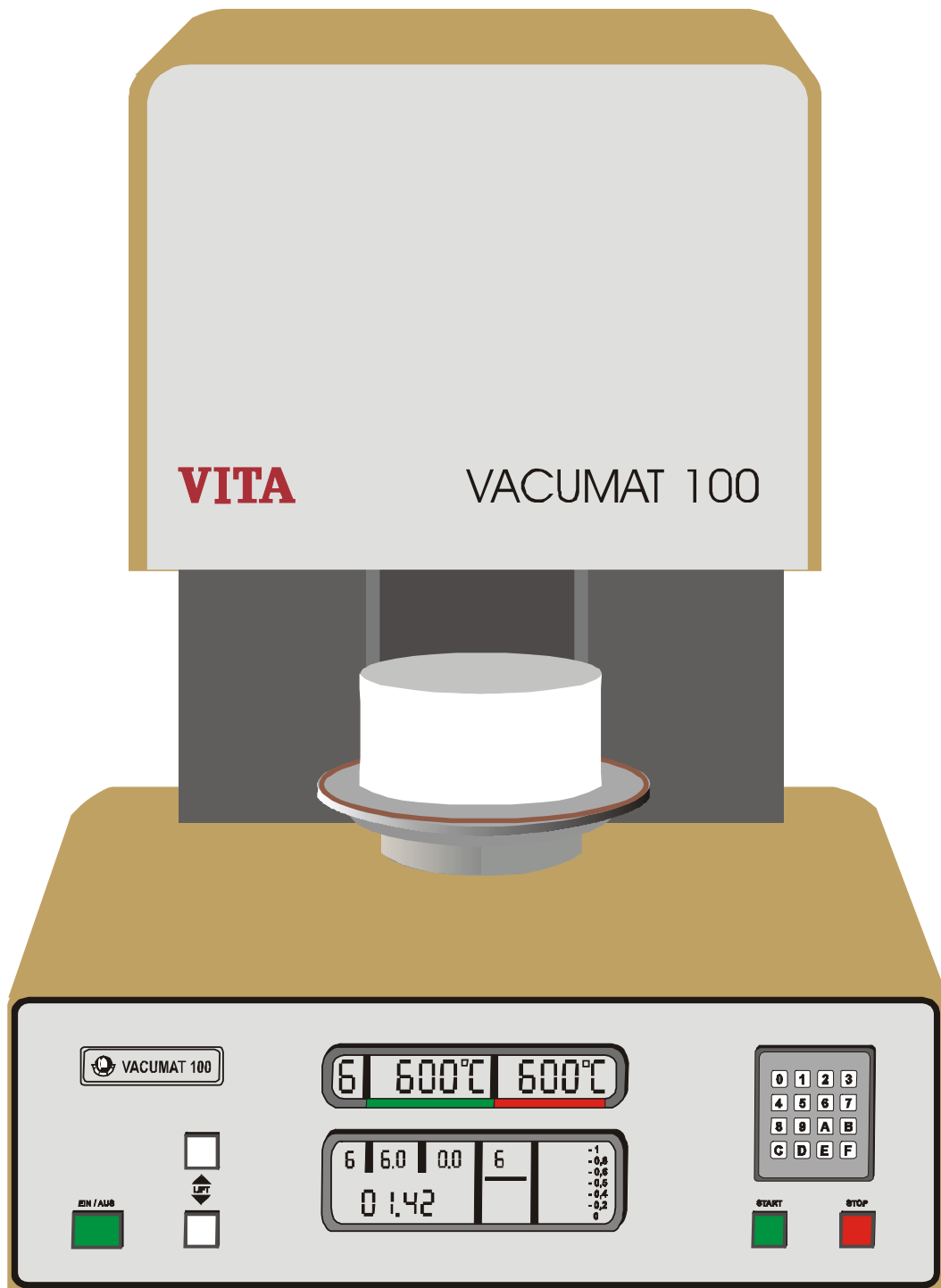
Contents

1. Technical Specifications

Dimensions:	height	50,0 cm
	width	35,0 cm
	depth	36.5 cm

Weight (excluding pump):   22 Kg

Firing chamber (utilizable space):	diameter	9.6 cm
	heigh	7.0 cm

Power Supply: 240 Volts A.C., 50 / 60 Hz
220 Volts A.C., 50 / 60 Hz
110 Volts A.C., 50 / 60 Hz

Maximum power consumption: 1600 Watts / 8 Amps

Maximum temperature: 1200°C

Vacuum Pump: Typ: PM 29, 220 Volts A.C., 50 / 60 Hz
Typ: PM 29, 240 Volts A.C., 50 / 60 Hz
Typ: PM 29, 110 Volts A.C., 50 / 60 Hz
Weight: 6.4 Kg

Supply Schedule:

1 special packing case containing:

1 VITA Vacumat 100 furnace   **plus as an optional extra**
1 firing tray   1 vacuum pump type PM 29
1 pair of 25cm furnace tweezers   complete with 1 vacuum hose
1 main power lead complete with plugs
1 set of firing trays A and B, grey
1 set of porcelain trays G, grey
1 operating instruction manual
1 firing charts

All specifications subjects to change without notice.

2. Setting the Furnace Up for Use

Note: When positioning the furnace, a minimum of 25cm space should be allowed for between it and any wall, either to the rear or sides.

1. Using the supplied main power lead, connect the furnace up to an electrical power supply that is apppropriate for the model, i. e. either 240 Volts A.C., 50 / 60 Hz; 220 Volts A.C., 50 / 60 Hz; 110 Volts A.C., 50 / 60 Hz.
2. Connect the plug of the vacuum pump up to the round socket(13) at the rear of the furnace, and then press the vacuum hose onto the nozzel (14) also at the rear of the furnace.
3. Press the power on/off switch (9) in. The green indicator light inside the switch will then come on, and the firing tray lift (3) will descend to its lower position.
4. Place the supplied firing tray (2) onto the lift support plate.
5. Press key „A" of the programing input keys (4), which will send the firing tray lift up into the firing chamber. The temperature inside will then rise until it reaches the starting temperature and then remain steady.

 Once the starting temperature has been reached, the furnace is ready for firing using any program.

3. Operating the Furnace

The Power On/Off Switch:
By pressing in the power on/off switch (9), the furnace is turned on, which is indicated at all times by the green light inside the switch. In addition to this green indicator light, the current temperature display indicator will also light up the showing the temperature inside the firing chamber. The furnace is turned off by re-pressing the power on/off switch (9).

The Manual Control Keys for the Firing Tray Lift:
By pressing the upper lift key (8), the firing tray can be raised up into the firing chamber, and by pressing the lower lift key (8) the firing tray can be brought down out of the firing chamber. To operate either of these lift keys (8), the appropriate one should be pressed continuosly until the lift has reached the desired position.

The Program Activate Key „START":
All programs are started by pressing the program activate key „START" (5).

The Pogram Interrupt Key „STOP":
Pressing the program interrupt key „STOP" (6) will result in the following sequence:

1. The firing tray lift will descend out of the firing chamber to its lower position. This applies even if the program is interrupted during a firing sequence, although if vacuum is existing, the firing chamber will first be fully flooded with air to equalize the atmospheres;
2. The acoustic signal will then sound to indicate the end of the program, and should be cancelled by pressing key D.

The Programing Input Keys:
Figures 0 to 9 on the programing input keys are used to select a program, as well as to set or alter the end temperature setting and all the time settings in a program.

For programing, the following values can be set:

Pre-drying time:	0 to 99 min. (in full minutes only)
Heating-up time:	3.0 – 20.0 min.
	(in full minutes and tenths of a minute)
End temperature firing time:	0 to 40.0 min.
	(in full minutes and tenths of a minute)
Vacuum firing time:	0 to 60 min. (in full minutes only)
Endtemperature:	maximum 1200°C

Key A – The Starting Temperature Key is used first of all, before any other program, to prepare the furnace for firing by raising the firnig tray lift, heating the firing chamber up to the starting temperature, and then continue to hold it steady.

Key B – is non functional

Key C – The Corrector Key can be usede to correct the end temperature setting or any the time setting if they have been wrongly programed. Immediately after an incorrect number or numbers have been pressed, key C should be pushed, which will cancel that particular setting so that the correct one can then be newly programed.

**Key D –** The Acoustic Signal Cancel Key is used to cancel the acoustic signal at the end of a program.

Key E – The Zone Access Symbol ▲ Immediate Cancel Key
After having pressed the key F to store a setting, key E can then be pressed to immediatly cancel the zone access symbol ▲. This therefore avoids having to press key F until the zone access symbol ▲ no longer appears on the display indicator panels.

Key F – The Zone Access Symbol Key
is used to call up, to move, and to cancel the zone access symbol ▲ on the display indicator panels. Moving the zone access symbol ▲ on to the next program sequence zone also stores a setting that has just been altered.

4. The Display Indicator Panels

a   (Progr.)   = the program indicator

b   = the end temperature indicator

c   = the current temperatur indicator

d   ⟹▶   = the pre-drying time indicator

e   ⟋▼   = the heating-up time indicator

f   ⟹▶   = the end temperature firing timr indicator

g   „VAC."   = the vacuum firing time indikator

h   „bar"   = the vacuum indicator

i   = the time elapsed indicator

k   „F"   = the fault localization indicator
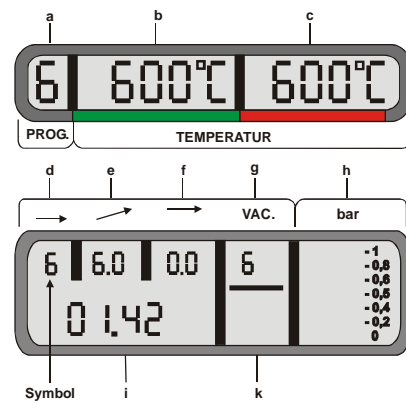
**The program Indicator a** (PROGR.) shows:

1.   The number of the program that is currently in operation (i.e. numbers 1 to 9);
2.   The termination or end of a program (i.e. E for End)
3.   That the furnace is in a standby condition with the starting temperature being held steady
     (i.e. H for Hold).

The End Temperature Indicator b shows:
The end temperature that has been programed, between 20 and 1200°C.

**The Current Temperature Indicator c (underlined in red) shows:**
The current temperature inside the firing chamber, between 20 and 1200°C.

Indicator d ⟹▶ shows:
The pre-drying time that has been programed, in full minutes.

Indicator e ⟋▼ shows:
The heating-up time that has been programed, in full minutes and tenths of a minute
(0.1 min. = 6 secounds).

Indicator f ⟹▶ shows:
The end temperature firing time that has been programed, in full minutes and tenths of a minute
(0.1 min. = 6 secounds).

Indicator g „VAC" shows:
The vacuum firing time that has been programed, in full minutes.

Indicator h „bar" shows:
The degree of vacuum existing in the firing chamber, from 0 to minus 1 bar.

Indicator i shows:
The time that already elapsed within each sequence of a program, the sequence that is operating being indicated by the zone functioning symbol ▲

Indicator k shows:
„FEHLER" gives notice of certain malfunctions an misprogramings, and at the same time also localizes them using the following code numbers:

5. Error messages

Error 0   pry-drying-temperature lower than 50°C (only in program no. 9)

Error 01   over-temperature or break-down of thermocouple
Error 02   break-down of thermocouple

Error 03   no or lower vacuum after 20 sec.
Error 04   actuell-temperature higher as calculated / adjusted rising temperature
Error 05   rising time   > 20 minutes
Error 06   firing temperature   < pry-drying-temperature
Error 07   vacuum time   = („0000")
Error 08   firing time within firing chamber   > 30 minutes
Error 09   firing temperature   > 1.200°C
Error 10   pry-drying-temperature   < 200°C or > 700°C

Error 20   temperature-off-set   > 20°C

Error 30   pry-drying-temperature   unvalid sign
Error 31   firing temperature   unvalid sign
Error 32   pry-drying-time   unvalid sign
Error 33   rising-time   unvalid sign
Error 34   firing-time   unvalid sign
Error 35   vacuum-time   unvalid sign
Error 36   cooling-temperature / program 7   unvalid sign
Error 37   cooling-temperature / program 8   unvalid sign

Error 40   pry-drying-temperature   value = „0000"
Error 41   firing temperature   value = „0000"
Error 42   pry-drying-time   value = „0000"
Error 43   rising-time   value = „0000"
Error 44   firing-time   value = „0000"
Error 45   vacuum-time   value = „0000"
Error 46   cooling-temperature / program 7   value = „0000"
Error 47   cooling-temperature / program 8   value = „0000"

Error 50   cooling-temperature / program 7   choosen value too high (> 1.200°C)
Error 51   cooling-temperature / program 8   choosen value too high (> 1.200°C)
Error 52   cooling-temperature / program 7   firing temperature is missing
Error 53   cooling-temperature / program 8   firing temperature is missing

Error 66   pry-drying-temperature   is about 100°C too high
Error 67   actuell IST-temperature   is about   30°C too high

Error 98   error within the furnace   faulty memory
Error 99   error within the furnace   faulty memory
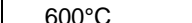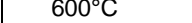
The Zone Acccess / Zone Functioning Symbol ▲
appears under the end temperature, and the other time settings, when key F is pressed following one of the numbered program keys. The first time key F is pressed, it will appear under the end temperature indicator, and the secound time it is pressed, it will appear under the time setting of the first sequence zone of the program that has been keyed. The setting under which the symbol appears can then be changed using the programing input keys. Once the required setting has been changed, either keys F should be pressed until the symbol ▲ no longer appears on eighter of the display indicator panels, or first key F to store the setting and the key E to immediately cancel the symbol.

When a program is in operation, the symbol ▲ will again appear, but as the zone functioning symbol. In this case it purely indicates which of the program sequence zones is currently in operation. It should no be confused with the zone access symbol.

6. The Programs

NOTE: The pre-drying temperature is always the same as the starting temperature. If the starting temperature has been changed from the orginal 600°C setting, the pre-drying temperature will have been changed, and will correspond to whatever the new starting temperature is.

Program	Program Cycle	Pre-Drying	Heating-Up	End tem. Firing	Slow Cooling
A	This is for use before any of the other programs and heats the firing chamber up to the starting temperature				
1	Heating-up to a given end temperature, in as short a time as possible (non-programable) followed by continued firing in the end temperature for a given time period.				
2	The same as program 1, but with a period of the firing cycle in vacuum			+ VAC.	
3	Heating-up to a given end temperature, in a given time period, followed by continued firing at the end temperature for a given time period				
4	The same as program 3, but with a given period of the firing cycle in vacuum.			+ VAC.	
5	Pre-drying for a given period of time, then heating-up to a given end temperature in a given time period, all followed by continued firing at the end temperature for a given period of time.	600°C			
6	The same as program 5, but with a given period of the firing cycle in vacuum.	600°C		+ VAC.	
7	The same as program 5, but with an additional controlled slow cooling sequence for lowerling the temperature back to the starting temperature. i.e. After the firing cycle proper has finished, the firing tray will lower itself to the middle pre-drying level, and will only lower itself completely when the temperature inside the firing chamber has sunk back to the starting temperature.	600°C			
8	The same as program 6, but with the same additional controlled cooling sequence that is described in program 7	600°C		+ VAC.	

9 This speeds up the cooling of the firing champer back to the starting temperature. To beginn with, the firing tray will remain in its lower postion, whilst the vacuum pump switches itself on, and remains on until the temperature inside the firing champer has been lowered to 50°C below the starting temperature. The vacuum pump will then turn itself off, and the firing tray will be raised up into the firing chamber, closing off the entrace and therby ensuring that the starting temperture is held steady.

7. Changing the Information Stored in a Program

Once a program has been selected, all time setting, as well as the end temperature setting, that are stored in that particular program, will be shown on the diseplay indicator panels. (When new, the VITA Vacumat 100 is factory pre-programed with the temperature and time settings that are required for firing VITA VMK 68 procelain). Each of these settings can be changed individually using the following instructions:

By Pressing key F, the zone access symbol ▲ will first appear under the end temperture setting. This then allows a new end temperature setting to be made using the numbered programing input keys. By re-pressing key F, this new end tmperature (or the old unchanged one) is stored into the program, and the zone access symbol ▲ automatically moves on, to position itself under the next time setting that is part of the program that has selected. This time setting can then also be altered (or not) in exactly the same way as the first one. If no other setting in the program is to be altered, providing key F has first been pressed to store a changed setting, key E can then be pressed to immediately cancel the zone access symbol ▲. The basic rule is that a setting can always be changed if the zone access symbol ▲ is lit up under it.

The heating-up and endtemperature firing times are programed in full minutes, followed by tenths of a minute. Therefore, if 17 is programed, it will result in the time setting of 1.7 min. (1minute and 42 secound).

The pre-drying an vacuum firing times, however, are only programed in full minutes. Therefore, if 17 is programed, it will here result in the time setting of 17 minutes.

In order to then be able to start a program once it has been selected and altered, the zone access symbol ▲ should no longer be visible under any of the program setting. If necessary, therefore, key F should first be pressed to store any new setting, followed by key E to immediatly cancel zone access symbol ▲. As an alternative, key F can simply be pressed until the symbol no longer appears on either of the display indicator panels.

Once a program has been started, the same symbol ▲ appears as the zone functioning symbol on the lower display indicator panel, under the setting in the sequence zone that is currently in operation. This should not be confused with the zone access symbol.

Note: The starting temperature has been factory pre-set at 600°C. If so desired, however, this temperature can be altered, for which the furnace casing has first to be operend up. For precise details on this (only be carried out by, or under the supervision of VITA autorized personnel).

8. Example for Pogram 4.

Program 4 includes: Heating-up to a given end temperature in a given time period; continued firing at the end temperature for a given time period; with a given period of the firing cycle in vacuum.

The furnace should first be switched on and them be heated up to the starting temperature. The firing tray lift should then be completely retracted to its lowest position.

Press key 4.

Are the end temperture and all time settins correct?

Yes   **No**

Press key F to make the zone access symbol ▲ appear under the end temperature setting

Is the end temperature setting correct?

Yes   **No**

Change the end temperature (max. setting is 1200°C)

Press key F to set the end temperature and move zone access symbol ▲ on to appear under the heating-up time setting

Is the heating-up time setting correct?

Yes   **No**

Change the heating-up time (give new setting in full minutes and tenths of a minute)

Press key F to set heating-up time and move the zone access symbol ▲ on to appear under the end temperature firing time setting

Is the end temperature firing time setting correct?

Yes   **No**

Change the end temperature firing time (give new setting in full minutes and tenths of a minute)

Press key F to set end temperature firing time and move zone access symbol ▲ on to appear under vacuum firing time setting

Is the vacuum firing time setting correct?

Yes   **No**

Change the vacumm firing time (give new setting in full minutes only)

Press key F to extinguish the zone access symbol ▲ from the display indicator panels

Press the program activate key „START"

As a short-cut, if no other program setting is to be altered, providing the last setting changed has first been stored using key F, key E can then be pressed to immediately cancel the zone access symbol ▲.

The programme will now commence and run automatically trough to completion using all the instructions shown on the display indicator panels.

9. Firing Chart

Material	Firing	Progr.	°C	→	↗	→	VAC
VITA VMK 68 with precious metal alloys	Oxidation	1	960			5.0	
	Paint-On 88 opaque	4	930		3.0	1.0	3
	Main vacuum	6	930	6	6.0	1.0	6
	1st correction	6	920	6	6.0	1.0	6
	2nd correction	6	910	6	6.0	1.0	6
	Glaze	3	930		3.0	1.0	
	Glaze, using VITACHROM „L" Stains and Fluid	5	930	6	3.0	1.0	
	Glaze, using VITACHROM „L" Glaze No. 725	5	900	6	3.0	1.0	
VITA VMK 68 with non precious metal alloys	Paint-On 88 opaque	4	930		3.0	1.0	3
	Main vacuum	8	930	6	6.0	1.0	6
	1st correction	8	920	6	6.0	1.0	6
	2nd correction	8	910	6	6.0	1.0	6
	Glaze	7	930	6	3.0	1.0	
	Glaze, using VITACHROM „L" Stains and Fluid	7	930	6	3.0	1.0	
	Glaze, using VITACHROM „L" Glaze No. 725	7	900	6	3.0	1.0	
VITADUR - N	Core and Vita Pt opaque	4	1120		6.0	2.0	6
	Core, using a Vitadur profile	6	1120	6	6.0	2.0	6
	Main vacuum	6	960	6	6.0	1.0	6
	1st correction	6	950	6	6.0	1.0	6
	2nd correction	6	950	6	6.0	1.0	6
	Glaze	3	940		3.0	1.0	
	Glaze, using VITACHROM „L" Stains and Fluid	5	940	6	3.0	1.0	
	Glaze, using VITACHROM „L" Glaze No. 725	5	920	4	3.0	1.0	

Note: Times are given in minutes or minutes and tenths of a minute (i.e.6:0). Where a full minute is followed by a decimal point and then a nought (i.e. 6:0), this nought **must** be included in the programing! Otherwise the result will be in tenths of a minute (i.e. 0:6 min.).

Programing examples: For pre-drying time and vacuum firing time 6 min., press key 6 only; for heating-up time and temperature firing time 6:0 min., press key 6 followed immediately by key 0.

VITA Spectra – Seal

Program settings: 5, end temperature 1040 °C, pre-drying time 2 Min., heating-up time 6,0 Min., endtemperatre firing time 0,0 Min.

VITA Metall - Corrector

Program settings: 5, end temperature 1040 °C, pre-drying time 2 Min., heating-up time 6,0 Min., endtemperatre firing time 1,0 Min.

Soldering in the VITA VACUMAT

Method 1 - In-Furnace Soldering

Preheat the restoration,complete with flux and beads solder, in a preheating furnace for 15 – 20 min. at 400°C.

Program no. 5

Set final temperature by adding 50 °C to melting point of solder.

Pre-drying time: 5.00 min
Heating-up time: 5.00 min
Hold time: 3.00 min

Method 2

Preheat the restoration, with flux but without solder, in apreheating furnace for 15 – 20 min. at 400°C.

Program no. 5

Set final temperature by adding 50 °C to melting point of solder.

Pre-drying time: 1.00 min
Heating-up time: 3.00 min
Hold time: 4.00 min

10. Eliminating Program Faults

(only be carried out by, or under the supervision of VITA autorized personnel)

a) The temperature does not rise:

1. The first possobillity is that the fuses (11) at the rear of the furnace have blown, for which the remedy is simply to replace the fuses.
2. The secound possibility cause is that the muffel is defective, for which the remedy is to replace the muffel.

b) No vacuum is produced:

Check and clean the ring seal around the edge of the firing tray lift, and then also check and clean the lower rim of the firing chamber where the lift seal meets it.

Note: This fault will be shown by code number 3 on the fault localization indicator (k).

c) Other problems with the programing

Most other problems that might occur with the Vita Vacumat 100 can be corrected simply by replacing one or more of side-in control modules. For advice and diagnosis of any problems, you should contact your Vita dealer, or in case of difficulty:

    The Furnace Servicing Dept.
    VITA Zahnfabrik
    Postfach 13 38
    D – 79713 Bad Säckingen
    West Germany
    Telephone 07761 – 562 222

Caution! Before opening the furnace for any reason, **always** isolate it from the electricity supply!

11. Changing the Muffle

(only be carried out by, or under the supervision of VITA autorized personnel)

1. The furnace should first of all be isolated from its electrical power supply by removing its plug from the socket.
2. The 4 screws on the sides of the anodized top cover of the furnace should next be unscrewed and then removed together with their srew cups, and then the cover itself be lifted off.
3. The 6 screws in the top cover of the firing chamber should next be unscrewed, and then this also be lifted out.
4. After removing the insulating disc and insulation slab, the wires from the thermocouple can then be disconnected and the insulation stone complete with thermocouple be lifted out.
5. The wires from the defective quartz glass spiral muffle should now be disconnected, and then this also be lifted out.
6. The new muffle can now be placed into position, and then the furnace be reassembled in reverse order to that given above.

CAUTION! Do not forget to reconnect the earthed conductor wire to the anodized furnace top cover!!

12. Altering the Starting Temperature

(only be carried out by, or under the supervision of VITA autorized personnel)

12.1. Altering the Starting Temperature – Version lower than 8.0:

The starting temperature of the Vita Vacumat 100 has been factory pre-set at 600°C. Using the instructions that follow, however, it is possible to alter this internally, in 50°C steps, to any temperature between 200 and 600°C.

NOTE: The pre-drying temperature is always the same as the starting temperture. Changing the starting temperature therefore also changes the pre-drying tempera-ture.

The furnace should first of all be isolated from the power supply by removing its plug from the socket. The 6 screws securing the cover of the lower instrumentation section of the furnace should next beb unscrewed and remove together with their screw cups, and then the cover itself be lifted off.

The plug of the slidein module nearest to the front control panel on the left-hand side of the furnace, the CPU microprocessor module, should now be released by simultaneously pushing the upper lever on the plug upwards and the lower level downwards. This operation also partly disengages the plug which should them be pulled off completely.

CPU - microprocessor module

The module´s red safety locking deviced can now be pushed downwards, and the module itself be pulled completely out. On the right-hand side of the front of the module there is a switching unti with 8 individual small slide switches. It is trough the positions of these switches that the level of the starting temperature is determined. The various temperatures are written just below each switch. For 200°C, all switches should be in the upward setting.
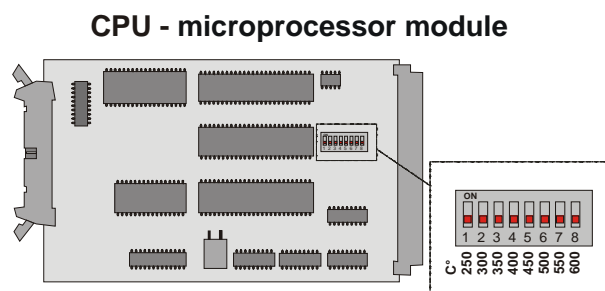
To alter the starting temperature, the switch that is already down should first be pushed upwards, and then the switch for the required temperature be pushed downwards in the direction of the written temperature numbers. All other switches except this one should now be in the upper position away from the temperature numbers.

The furnace´s starting temperature will now correspond to that temperature which is written below the switch that has been pushed downwards. If none of the switches are down, the starting temperature will automatically be 200°C.

CAUTION! There should only be **one** of the eight switches pushed downwards at any one time, as otherwise incorrect temperatures will result.

Having had the starting temperature satisfactorily altered, the CPU mocroprocessor module can now be slid back into position, its plug be fixed back into place, with the upper lever pushed downwards again and the lower level pushed upwards again, this securing the plug in position. The cover of the furnace's lower section should then be replaced and secured in position with its screws.

Note: The two longer screws belong in the two holes at the rear of the upwards facing flat surface.

CAUTION! Do not forget to reconnect the earthed conductor wire to the anodized lower section cover!!

12.2. **Altering the Starting Temperature – Version 8.0 onwards:**

1. Switch furnace on.
2. Press button „**E**", Display will show last used temperature.
3. Insert new stand-by-temperature (max. 700°C).
4. Press button „**F**", new value will be stored.
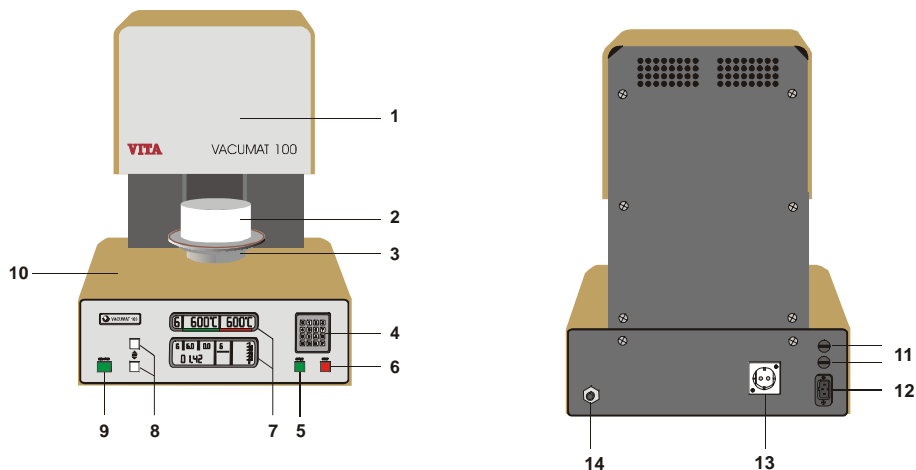
1. firing chamber
2. firing traynsockel
3. firing tray lift
4. programming input keys
5. programming activate key „START"
6. programming activate key „STOP"
7. display indicator panels
8. manual control keys for firing tray lift
9. power on/off switch
10. heat resistant surface for placing object when removed from firing tray
11. furnace fuses
12. socket for main power lead
13. socket for vacuum pump
14. nozzle for vacuum pump hose