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Instructions for Use

MultimatEasy

CE

DENTSPLY

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Dear customer,

Thank you for your confidence in Multimat® Easy. This furnace for firing and pressing dental ceramics is a safe high-quality device featuring numerous automated functions. It is characterized by ease of handling and minimal training requirements. The device is almost maintenance-free and suitable for continuous operation.

We hope you will appreciate your results with the Multimat® Easy.

➲ *About these Instructions for Use*

Compliance with these Instructions for Use is a prerequisite for the successful and safe operation of the Multimat® Easy. These Instructions for Use contain important information for operating this device in a safe, appropriate and economic manner. Compliance with these Instructions for Use also helps avoid hazards, limits repair costs and downtime and increases the reliability and prolongs the life of the Multimat® Easy.
These Instructions for Use must be continuously present near the unit and must be read by all persons working with the Multimat® Easy.
DeguDent GmbH will not be responsible for any damage caused by improper use or operation of the Multimat® Easy and/or non-compliance with these Instructions for Use.

➲ *Layout elements used in these Instructions for Use*

Safety notes related to personal injury, accidents or property damage:



The unit must be opened only by authorized DeguDent GmbH service personnel!

Step-by-step instructions

1. Remove…
2. Locate…

Designations of user interface elements:
Menu key

Emphasis:
The front of the unit includes the **display (1)** with its...

Additional notes and hints:
Note: You may also use existing programs to…

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➲ ***Device type and year of manufacture***

Multimat® Easy
Year of manufacture: 2008

➲ ***Manufacturer and service addresses***

DeguDent GmbH
Rodenbacher Chaussee 4
63457 Hanau
Germany
Phone +49 180 23 24 555
Fax +49 180 23 24 556

➲ ***Intellectual property rights***

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Violations of these rights will be prosecuted and will make the guilty party liable for damages. All intellectual property, trademark, service mark and other rights are reserved by DeguDent GmbH.

➲ ***Proper use***

The Multimat® Easy is a device for firing dental ceramic materials. Observe the alloy and ceramic manufacturers' directions and recommendations.
Any use outside or beyond these directions or specifications does not constitute proper use. Any damage resulting from such use will be the sole responsibility of the user of the Multimat® Easy. The same applies for any unauthorized changes to the unit. Proper use presupposes compliance with all notes on

- Safety
- Operation
- Care, maintenance and troubleshooting

described in these Instructions for Use. The unit is intended solely for dental laboratory use. Any use in other locations or for other purposes requires prior written approval of DeguDent GmbH.

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➲ *Safety notes*

All DeguDent GmbH devices are designed and produced using **state-of-the-art technology** and following all recognized safety rules.

Nevertheless, using these devices may result in **hazards to operators or third parties** or damage to the Multimat® Easy or other property, e.g. if:

- The unit is operated by untrained or not properly instructed personnel
- The unit is not employed for its appropriate uses
- The unit has not been properly operated or maintained

Use only **qualified and trained personnel** to perform the tasks described in these Instructions for Use. Observe any applicable legal age restrictions!

Personnel to be trained or guided, including vocational trainees, must work with the Multimat® Easy only if **continuously supervised** by an experienced operator!

➲ *Safe transport*

The Multimat® Easy weighs approximately **22.7 kg** and can be lifted and transported by **a single person**.

The unit is shipped in a **cardboard case** and is protected by an upper and a lower **interior foam shell**. These shells are designed such that the **firing chamber** is also **protected** from shock by an elastic foam element. When repackaging the unit, make sure that this protective foam element is properly in place.

➲ *Safe operation*

To ensure safe operation of the unit, read and follow the following instructions:

- Do not place the Multimat® Easy and the vacuum pump (available separately) in the immediate vicinity of sources of heat to prevent overheating of the device!
- Keep the device clear of the nearest wall or object. The minimum distance is **25 to 30 cm**!
- Place the unit only on non-flammable surfaces. Keep flammable objects and liquids away from the unit!
- Position the vacuum pump such that adequate ventilation is assured.
- Protect the unit from moisture and steam!
- Ensure that the unit is connected only to the appropriate mains voltage (see *"Technical specifications and operating environment"*).
- Do not reach into the firing chamber during operation – burn hazard!
- The firing platform moving upward presents a crushing hazard for hands and fingers!
- Opening the unit is prohibited. Electric shock hazard!
- If the Multimat® Easy is not to used for an extended period, disconnect the unit from mains!

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2 Safety notes

➲ *Safe maintenance and troubleshooting*

Observe the following rules during **maintenance, repairs or troubleshooting tasks**:

- All repairs must be performed by authorized DeguDent GmbH personnel only.
- All work on electrical components must be performed by qualified electricians.
- Disconnect from mains before opening the device.
- Use only original replacement parts.

➲ *Safe handling of ceramic fibres*

The **heat insulation** of the firing chamber consists of **ceramic fibres**. Extended use or higher temperatures will result in the formation of silicogenic dust (cristobalite) that, when released into the air, may create a **dust hazard, causing irritation to the skin or eyes or the respiratory tract**.

Never open and expose the heat insulation of the firing chamber. Any repairs in this area must be performed by authorized DeguDent GmbH personnel only.

➲ *Warning decals on the unit*

The **Hot Surface** warning decal alerts the operator to hot temperatures on Multimat® Easy surfaces that may prevail near the firing chamber, especially in the case of higher firing temperatures.



The **Generic Hazard** warning decal is attached near the vacuum pump power connection (see *"Connectors"*). This decal alerts you to the following safety hazards:



- The vacuum pump power connection is intended exclusively for connecting a vacuum pump.
- The vacuum pump power connection carries mains voltage.
- The maximum vacuum pump current is 2 A.

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➲ *Base unit*

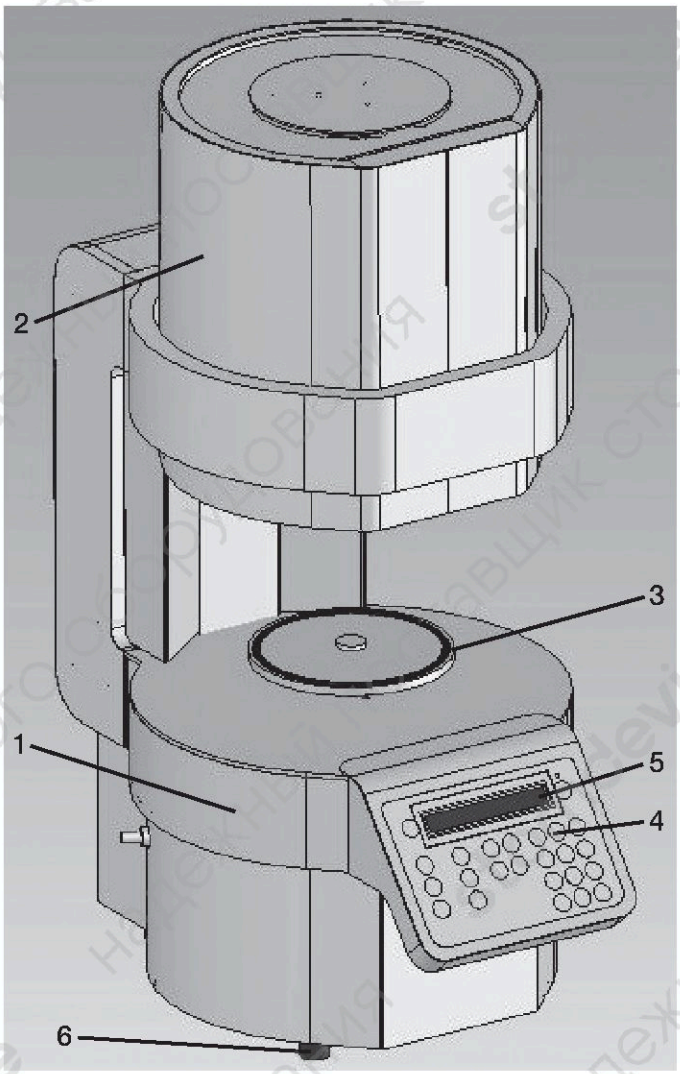
The Multimat® Easy consists of an attractively designed and stable **metal housing (1)** with a **firing chamber top (2)**. The heat inside the **firing chamber (2)** is generated by a **quartz muffle** with an **openly radiating filament winding**. The walls of the heating chamber are filled with **insulating ceramic fibres** to keep the heat loss to a minimum (see also *"Safe handling of ceramic fibres"*).

The firing objects including the firing base and firing support (see *"Optional accessories"*) are placed on the **moving firing platform (3)**. During the firing process, the firing platform is raised into the firing chamber, to be lowered again once the firing process has been completed. The chamber is lowered and raised by a **geared-down stepper motor**.

For easier of handling, the firing object including the firing support can be placed on the U-shaped magnetic rest.

The **control panel (5)** and **display (6)** are ergonomically located at the front of the unit. It allows you to activate the pre-defined firing programs or to define and store your own firing programs. All firing processes are controlled by an electronic **microcontroller** inside the unit.

The unit rests on four **feet (7)** for maximum stability.



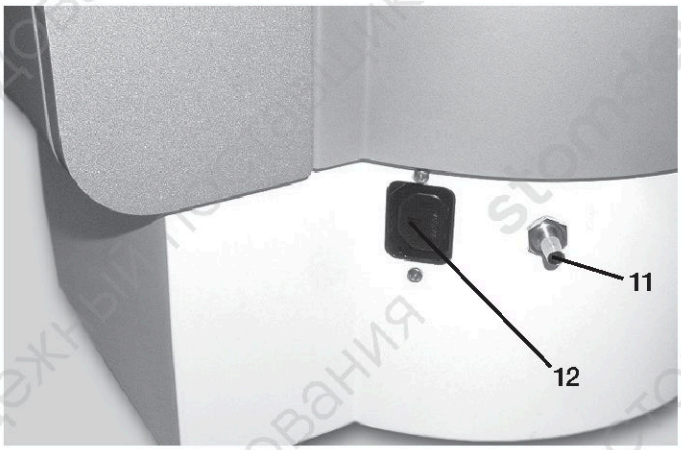
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3 Technical description

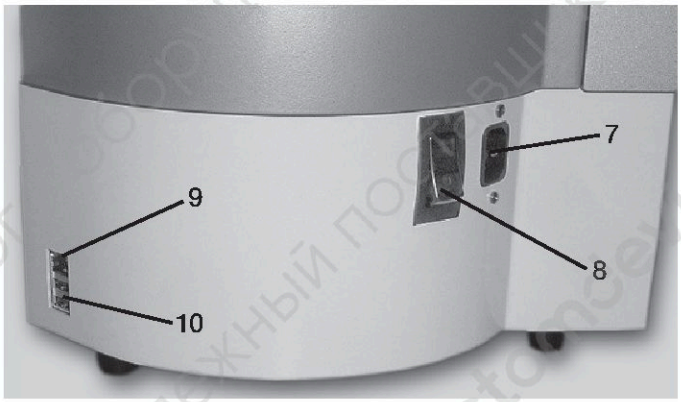
➲ *Connectors*

The following connectors are available:

- **Primary power connector (7)**
- **On/off switch** with automatic circuit breaker **(8)**
- **RJ45 connector (9)** (for service purposes only)
- Two **USB connectors (10)** (for service updates via USB memory stick)
- **Vacuum pump air hose connector (11)**
- **Vacuum pump power connector (12)** to provide the optional vacuum pump with mains power



The vacuum pump power connector is intended exclusively for connecting a vacuum pump.
The vacuum pump power connector carries mains voltage.
The maximum vacuum pump current is 2 A.

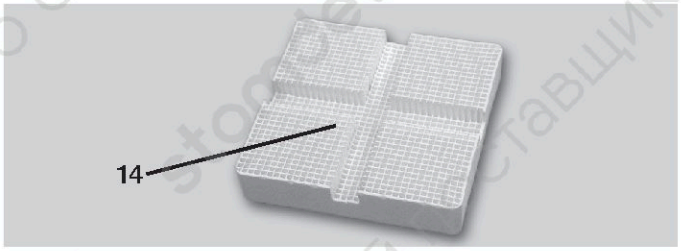


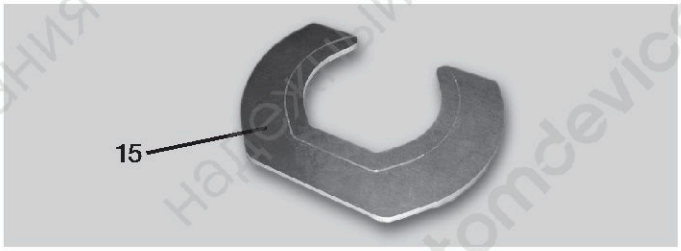
➲ *Scope of delivery*

The scope of delivery includes:

- Multimat® Easy **ceramic firing furnace**
- **Mains cable for high-temperature devices**
- **Instructions for Use**
- One **firing base (13)**
- One **firing support (14)**
- One **U-shaped rest, magnetic (15)**
- One **pair of tweezers**







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➲ *Optional accessories*

The following optional accessories are available from DeguDent GmbH:

- **Vacuum pump (16)**
- **Calibration set (17)** "Silver wire test, manual" REF 03 532 803, consisting of one wire carrier and one length of silver wire (0.3 mm in diameter, 37 mm in length)





➲ *Technical specifications and operating environment*

Power supply:	100–125 VAC, 50/60 Hz or 230–240 VAC, 50/60 Hz
Acceptable voltage fluctuations:	±10% or less
Maximum power consumption:	1,300 W
Power consumption in sleep mode:	18 W
Dimensions (W × D × H):	280 mm x 430 mm x 610 mm
Weight:	Approx. 22.7 kg
Firing chamber clearance:	67 mm
Firing chamber diameter:	85 mm
Deployment:	Indoors only, on a non-flammable surface
Ambient temperature:	0–40 °C – preferably 20 ± 2 °C
Heating element:	Quartz muffle with openly radiating filament winding
Maximum firing temperature:	1,200 °C
Display:	Backlit 2 × 24 character LCD display
Input device:	Membrane keyboard

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3 Technical description

➲ *Features*

- Comprehensive firing data display
- **100 freely programmable and storable programs; numerous predefined sample programs available**
- Programs may be modified during the cycle.
- Existing programs can be modified and saved as special programs
- Copying an existing program to a different program number
- Up to 99 minutes of vacuum time
- Set vacuum display
- Adjustable vacuum
- Up to 99 minutes of firing time
- Up to 25 minutes of firing and pre-heating time
- Heating rates of 1–120°C/minute
- Controlled cooling
- Manual or programmable fast cooling via vacuum pump
- Time-to-completion countdown display
- Overheating protection and muffle monitoring
- High-precision temperature settings
- Standby operation to avoid moisture in the firing chamber
- Vacuum program to avoid moisture in the fibre insulation
- Sleep mode
- Global hours-of-operation counter
- Vacuum pump hours-of-operation indicator
- Language selection
- Error message display
- Automatic continuation after short-term power-outs
- Unlimited data retention after power-outs
- Automatic mains frequency detection
- Beep signals, can be deactivated
- Entering of a calibration offset following calibration with a silver wire

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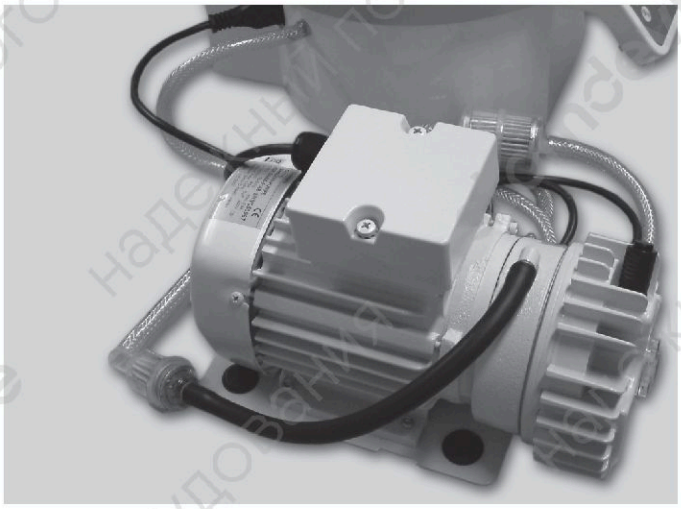
➲ *Unpacking and checking accessories*

1. Check the **Shockwatch sticker** on the cardboard box. If the sticker has turned red, the impact energy during transport was higher than allowed, and your unit could be damaged. Ask the transport agent to confirm the triggering of the Shockwatch label in writing.
2. Open the cardboard case and remove the upper foam shell.
3. Remove the unit including its accessories.
4. Check whether the scope of delivery is complete (see *"Scope of delivery"*) or damaged in transit. Notify DeguDent GmbH immediately of any damage.



➲ *Setting up and connecting*

1. Place the device on a sturdy, non-flammable surface. The minimum distance from the nearest wall or object is 25 to 30 cm (see also *"Safe operation"*).
2. Connect the device end of the **mains cable** to the unit. Connect the mains plug of the mains cable to a properly installed and protected mains socket (see "*Technical specifications and operating environment*"). The Multimat® Easy must be the only device on its circuit. No extension cords may be used.
3. Connect the tubing between the vacuum pump (available separately) and the air inlet that the device (see illustration).
4. Place the firing base on the firing lift; use the magnetic firing platform where appropriate.



➲ *Pre-heating*

Before operating the Multimat® Easy **for the first time** or after **prolonged periods of non-use**, it is recommended to pre-heat the unit once. To do so, choose a **special pre-heating program** from among the pre-defined programs (see *"Menu explanations"*). For instructions on starting a program, see *"Turning on the unit/Starting a firing program"*.

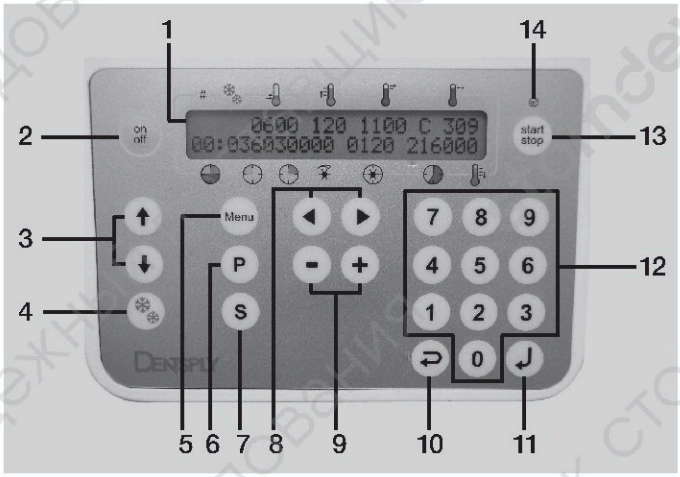
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5 Controls

➲ *Control panel*

All **parameters** are shown on the display and can be **entered or edited** here. Parameters are entered exclusively via the keys of the **control panel** (membrane keyboard). Use the keys of the membrane keyboard to make your entries, which will be reflected in the display (see *"Display"*), or to switch between different **menus** (see *"Moving through the menus/Menu overview"*).

The control panel keys have the following functions:



(1) Display. Shows all firing parameters (see *"Display"*).

(2) on off key. Turns the controller on or off. When turned off, the firing chamber will be closed by the firing platform, and the unit will be in standby mode (vacuum and standby temperature).

(3) ↑↓ keys. Move the firing platform upward down.

(4) * key. Activate fast cooling using the vacuum pump.

(5) Menu key. Calls the configuration menu; from there, additional submenus for system configuration can be invoked (see *"Moving through the menus/Menu overview"*)

(6) P key. Runs a specific program directly.

(7) S key. Saves the parameters shown on the display.

(8) ←→ keys. For moving within menus (See *"Moving through the menus/Menu overview"*)

(9) +– keys. Increases/decreases parameter values

(10) ESC key. Returns without applying changes

(11) ENTER key. Confirms and applies changes

(12) Numeric keypad. For entering parameter values, digits 0 to 9.

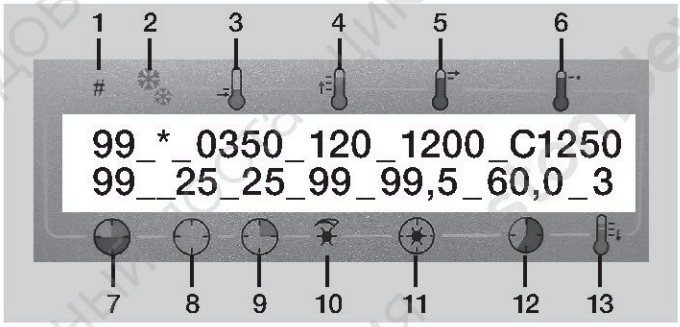
(13) start stop key. Starts/stops the firing program.

(14) Green LED. Lit while firing program is running.

Note: If the controller was turned off with the ***on off*** key, the unit will enter sleep mode (display not let, slow CPU clock) to save energy. Pressing the ***on off*** key again cancels sleep mode.

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➲ *Display*



(1) Program number, max. 100 programs

(2) Fast cooling indicated by *.

(3) Pre-heating temperature, 100 to 1,200 °C

(4) Heating rate, 1 to 120 °C/minute

(5) Preset firing temperature, 300 to 1,200 °C

(6) Actual firing temperature, 0 to 1,250 °C

(7) Remaining firing time, 0 to 99.9 min

(8) Preset drying time, 0 to 25 minutes

(9) Preset pre-heating time, 0 to 25 minutes

(10) Vacuum on/off, amount, 1 to 99 hPa

(11) Vacuum time, 0.0 to 99.9 min

(12) Preset firing time, 0.0 to 99.9 minutes

(13) Cooling stage 1, 2 or 3

➲ *Firing parameters*

(1) Program number: A maximum of 100 programs can be stored. The current number is shown on the display as a two-digit figure.

(2) Fast cooling indicator: Fast cooling means that the vacuum pump is turned on and will suck in air through the firing chamber until the base temperature is reached. If the fast-cooling function is activated, an asterisk is shown. Cooling proceeds until the base temperature is reached (see *"Fast cooling or manual fast cooling"*).

(3) Preheating temperature: The temperature to be reached prior to firing. Select a value between 100 °C and 1,200 °C.

(4) Heating rate: This is the speed of the temperature increase during the heating face. Select a value between 1 °C and 120 °C per minute.

(5) Preset firing temperature: The temperature to be reached during firing. Select a value between 300 °C and 1,200 °C.

(6) Actual firing temperature: The current temperature in the firing chamber. Select a value between 0 °C and 1,250 °C.

(7) Remaining firing time: The remaining firing time in minutes as shown.

(8) Preset drying time: The chamber is heated in order to reach the pre-heating temperature. During this time, the firing chamber will gradually close. Select a duration between 0 and 25 minutes.

(9) Preset pre-heating time: The chamber is heated in order to reach the pre-heating temperature. During this time, the firing chamber will be closed. Select a duration between 0 and 25 minutes in a maximum of two places.

(10) Vacuum on/off, amount: If a vacuum is present, its magnitude is displayed here. The vacuum is displayed as a value between 1 hPa and 99 hPa.

(11) Vacuum time: The time during which the vacuum pump will be running. Select a value between 0.0 and 99.9 minutes.

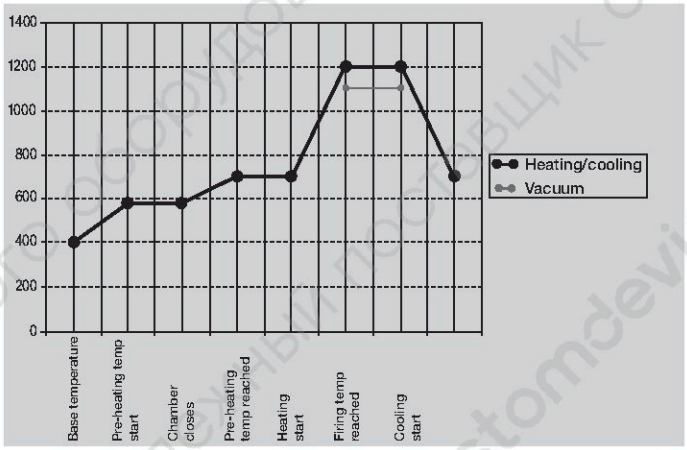
(12) Preset firing time: (holding time). The duration of the firing. Select a value between 0.0 and 99.9 minutes.

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(13) Cooling stage: Cooling in multiple stages results in a gradual release of tension within the ceramic material. If selected under **(2)** the progression of cooling stages will begin immediately after firing **(12)**.

- Stage 0 - Firing platform immediately moves to its bottom position, no cooling
- Stage 1 – Firing object is lowered by approx. 7 cm
- Stage 2 – Firing object is lowered by approx. 5 cm
- Stage 3 – Firing object remains in the chamber

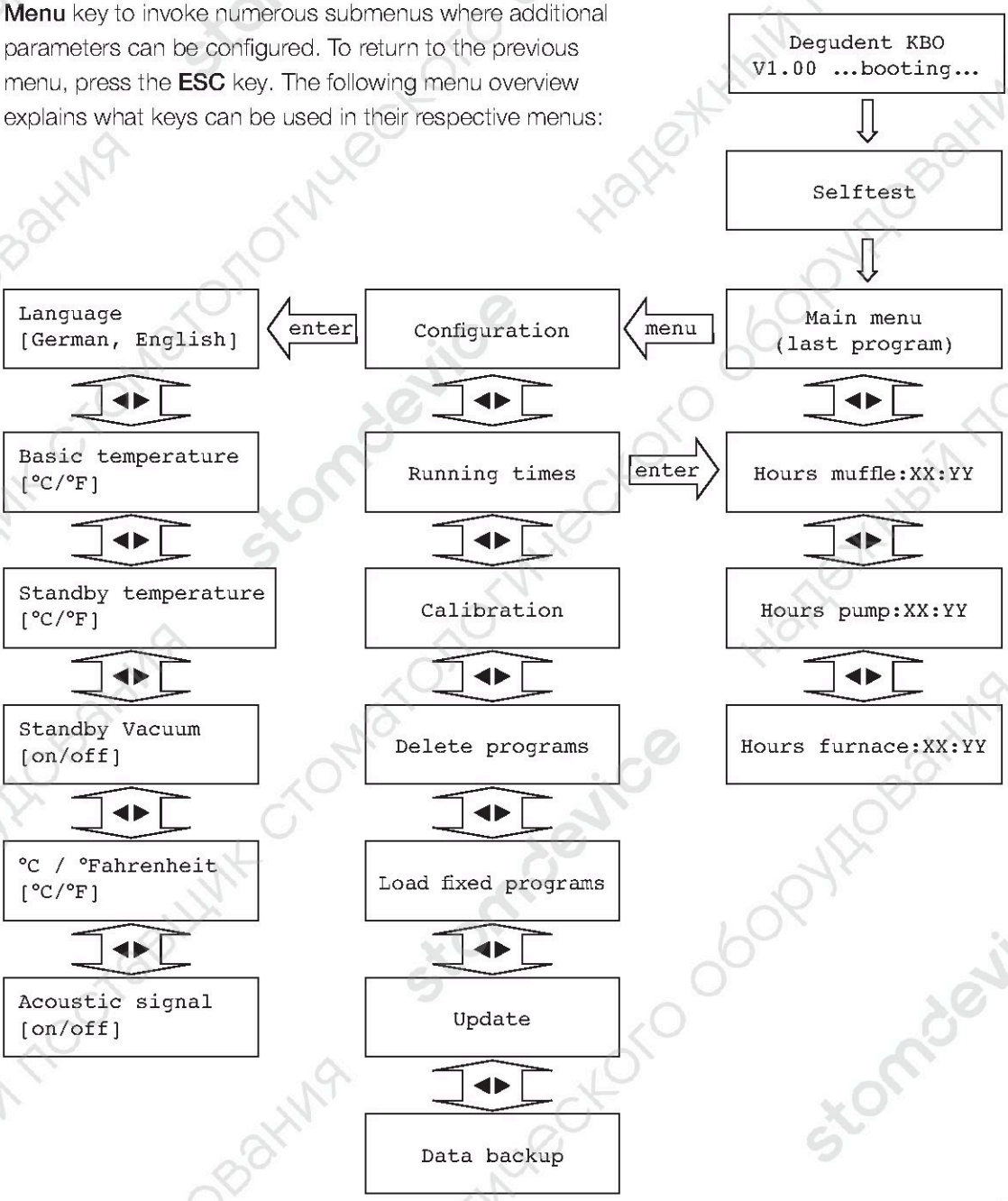
The starting point in each case is the **base temperature** (preset to 400 °C). Once the program has been started, the unit pre-heats to the **preset preheating temperature** (e.g. 575 °C) (see *"Preheating temp start"*). During the **drying phase (8)**, the firing chamber is gradually closed. Closure will be completed at the end of the drying phase, as the **preheating temperature** reaches its preset value. The program then waits out the **preset preheating time (9)**. This is followed by the heating phase at the **preset heating rate (4)** (e.g. 120 °C/minute). Once the **firing temperature (6)** (e.g. 1,200 °C) has been reached, the program enters **the firing phase (12)** (holding phase) during which the vacuum pump will be active for the **preset vacuum time (11)**. The end of the firing phrase is followed by the preset **cooling stages (13)**.



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➲ ***Moving through the menus/Menu overview***

The values discussed in *"Firing parameters"* are shown in the **main menu**, which is always displayed when the unit is operating or when new programs are being programmed. **On power-up**, **additional menus** may appear before the main menu. From the **main menu**, use the **Menu** key to invoke numerous submenus where additional parameters can be configured. To return to the previous menu, press the **ESC** key. The following menu overview explains what keys can be used in their respective menus:



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➲ *Menu explanations*

The first message of the start-up sequence after the unit is turned on.

```
Degudent KBO
V1.00 ...booting...
```

After turning on, the unit performs a self-test to check all systems and input/output connectors.

```
Selftest
```

The values discussed in *"Firing parameters"* are shown in the **main menu**, which is always displayed when the unit is operating.

```
Main menu
(last program)
```

Here you can invoke additional submenus for system configuration (see *"Moving through the menus/Menu overview"*)

```
Configuration
```

Here you can enter a calibration offset determined by a calibration using a silver wire test (see *"Calibration"*).

```
Calibration
```

Here you can delete programs you have saved.

```
Delete program
```

Here you can load programs from internal memory or from a USB memory stick.

```
Load fixed programs
```

Here you can start a software update, provided a USB memory stick with the new software version has been inserted.

```
Update
```

Here you can start a data backup.

```
Data backup
```

Here you can change the language in which the menus are displayed.

```
Language
[German, English]
```

Here you can pre-set the base temperature (default: 400 °C); see the diagram in *"Firing parameters"*.

```
Basic temperature
[°C/°F]
```

Here you can determine whether the muffle will heat in standby mode (see *"Entering standby mode"*).

```
Standby temperature
[°C/°F]
```


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Here you can determine whether the vacuum pump will run in standby mode (see *"Entering standby mode"*).

```
Standby Vacuum
[on/off]
```

Here you can switch between °C and °F as a temperature unit.

```
°C / °Fahrenheit
[°C/°F]
```

Here you can turn the beep signals on or off. If the beep signal is turned on, you get:
A **short tone** each time a key is pressed; a **long tone** for each invalid entry; **three tones** at the end of a program.

```
Acoustic signal
[on/off]
```

Indicates the operating hours for the muffle.

```
Hours muffle:XX:YY
```

Indicates the operating hours for the vacuum pump.

```
Hours pump:XX:YY
```

Indicates the total operating hours for the Multimat® Easy.

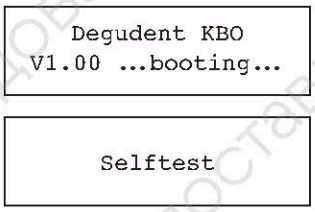
```
Hours furnace:XX:YY
```

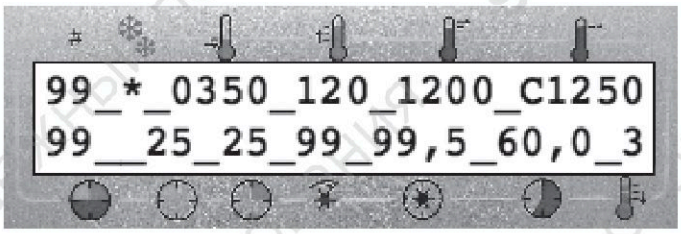

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6 Controls

➲ *Turning on the unit/Starting a firing program*

1. Turn on the unit with the **on off** key. The controller will be started and performance self-test.
2. The main menu will be shown, indicating the program last run.
3. Move the firing platform down using the ↓ key. Place the firing object with firing base and firing support on the firing platform.
4. If you wish to start the program currently shown, press the **start stop** key. The green LED will be lit.

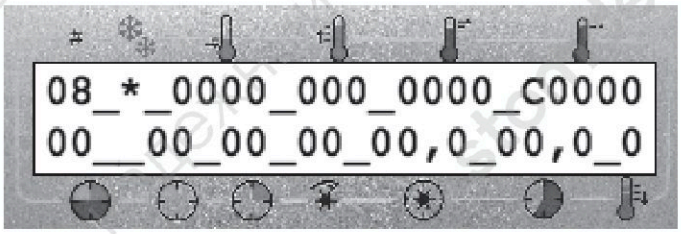




➲ *Designing and starting your own firing program*

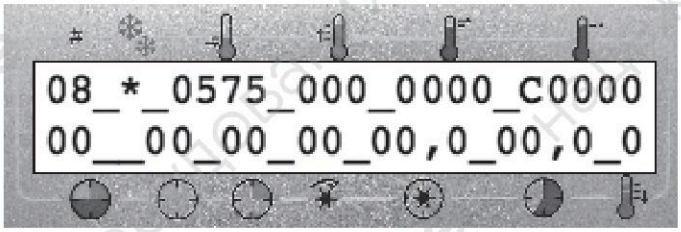
Note: If you try to enter a parameter outside the valid range (see *"Firing parameters"*), you will hear a long beep tone, and the cursor will jump to the parameter you need to change. You have 60 seconds to enter each parameter.

1. The **main menu** is shown.

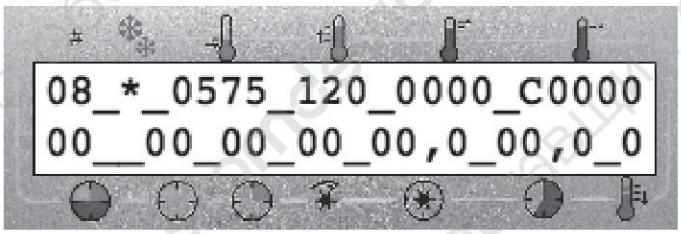


2. Press the **P** key. The program number will be activated. Enter the desired program number via the keypad or the + and – keys.

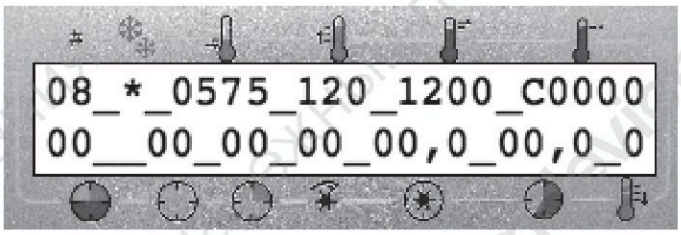
3. Press the ➔ key. The cursor will jump to the next field, **Pre-heating temperature**. Enter the desired value via the keypad or the + and – keys.



4. Press the ➔ key. The cursor will jump to the next field, **Heating rate**. Enter the desired value via the keypad or the + and – keys.

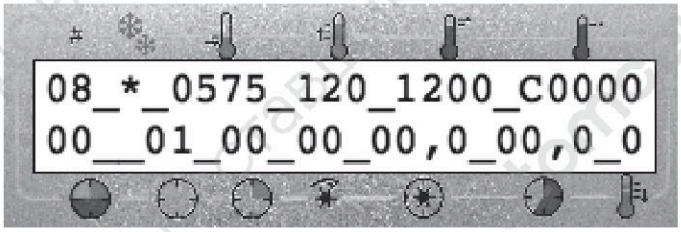


5. Press the ➔ key. The cursor will jump to the next field, **Pre-set firing temperature**. Enter the desired value via the keypad or the + and – keys.

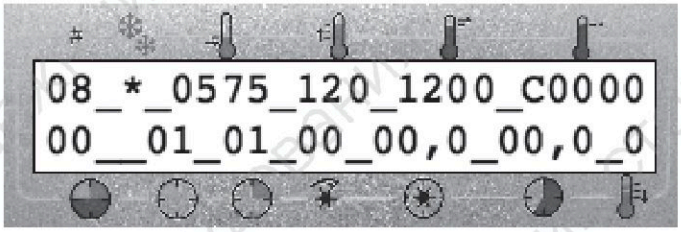


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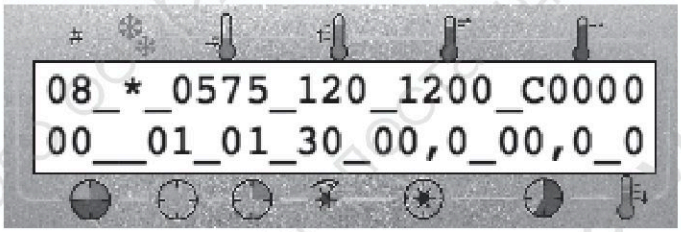
6. Press the ➔ key. The cursor will jump to the next field, **Drying time**. Enter the desired value via the keypad or the **+** and **–** keys.



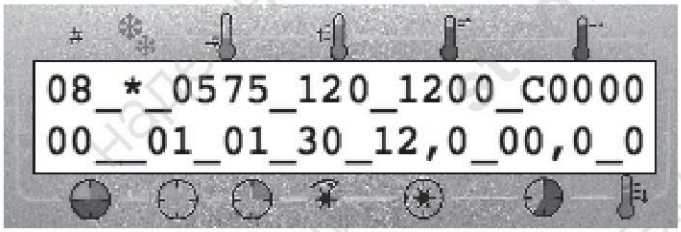
7. Press the ➔ key. The cursor will jump to the next field, **Pre-heating time**. Enter the desired value via the keypad or the **+** and **–** keys.



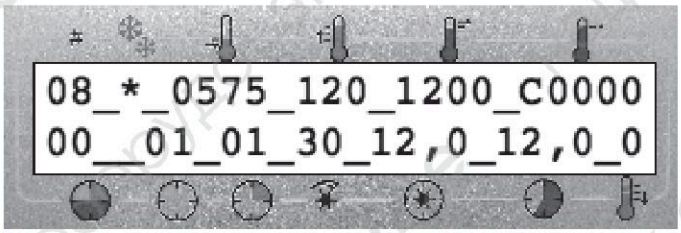
8. Press the ➔ key. The cursor will jump to the next field, **Vacuum**. Enter the desired value via the keypad or the **+** and **–** keys.



9. Press the ➔ key. The cursor will jump to the next field, **Vacuum time**. Enter the desired value via the keypad or the **+** and **–** keys.



10. Press the ➔ key. The cursor will jump to the next field, **Firing time**. Enter the desired value via the keypad or the **+** and **–** keys.



11. Save your new program by pressing the **S** key.

12. To **start** the program, press the **start stop** key. The green LED will be lit (see *"Turning on the unit/Starting a firing program"*). The **remaining firing time** field indicates how long the program still has to run.

Note: The following keys can be used while a program is running:
(3) ↑↓ keys: Firing platform, (5) Menu key: Configuration menu (parameters can be read but not modified),
(13) start stop key: stops the running program.

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➲ *View function (soldering)*

During a firing program **without vacuum**, you can lower the firing platform by pressing the ↓ key to inspect the firing object. Stop the downward movement by pressing the ↑ key.

The **firing time countdown is suspended**, and the cursor will move to the firing temperature. Use the cursor keys to **increase/decrease the firing temperature** as required. Then press the ↑ key to **move the firing platform back off** and to close the chamber. Closing the chamber continues the firing program. After a temperature adjustment, a maximum **post-firing** time of three minutes can be provided; the post-firing time is counted up on the display starting from zero. Post-firing can be terminated at any time by pressing the **start stop** key.

➲ *Entering standby mode*

The Multimat® Easy Standby mode optimizes the **moisture level** inside the firing chamber and keeps **moisture** away from the **insulation**. Standby mode means constant **heating** at a temperature of e.g. 120 °C; **vacuum** may be added if required.

Once you have turned on the unit using the **on off** key, the **standby mode** is entered **automatically** if activated (see below).

Once you use the **on off** key to turn on the control function, **standby mode will be turned off**. As soon as you **turn off** the control function again, the unit will return to standby mode.

To activate the standby function, you will first have to set the standby temperature in the **Standby temperature** menu (see *"Menu explanations"*):

```
Standby temperature
[°C/°F]
```

In the **Standby Vacuum** menu you can select whether the vacuum pump is to be activated in addition to the heater:

```
Standby Vacuum
[on/off]
```

➲ *Fast cooling or manual fast cooling*

Fast cooling means that the vacuum pump is turned on immediately **after termination of the program** once the **firing chamber has opened** and will **suck** in air through the firing chamber until the **base temperature is reached**. As fast cooling is activated, the display shows an asterisk at position **(2)** (see *"Display"*).

If **manual cooling** is required, you need to turn off automatic cooling by setting the corresponding **parameter to 0** (see *"Display"*).

The **fast-cooling mode** can be turned on or off in the menus (see *"Menu explanations"*).

```
Fast cooling
[on/off]
```

To start **manual cooling**, wait for the program to terminate and then press the ↓ key. The firing platform will be lowered, and the vacuum pump will run until the base temperature is reached.

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➲ ***Firing support maintenance***

The **firing support** (see "*Base unit*") serves to seal the bottom of the firing chamber. In addition, the **O-ring** ensures a close seal at the sealing surfaces.
Regularly **check** the surface of the firing support/the O-ring for deposits or damage. **Replace** damaged O-rings immediately.



➲ ***Replacing the firing muffle***

If the quality of the firing process deteriorates or if recalibration becomes necessary more frequently (see *"Calibration using a silver wire test"*), the reason may be that the firing muffle has reached the end of its useful life.

The firing muffle must be replaced only by authorized DeguDent GmbH service personnel!

➲ ***Vacuum pump maintenance***

If you are operating the Multimat® Easy with a vacuum pump (see "*Optional accessories*"), note that this pump will require additional maintenance (e.g. oil change).
For more information, consult the Instructions for Use of the respective vacuum pump.



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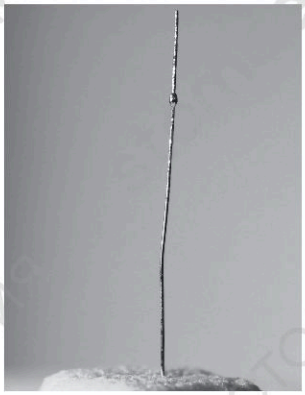
8 Calibration using a silver wire test

➲ ***Calibration using a silver wire test***

The precision of the **temperature control** has been precisely calibrated at the factory. Environmental factors, however, **may cause the selected temperature and the actual temperature** during the firing process to **drift apart over time**. This can be counteracted by **calibrating** the unit and entering a calibration offset. Proceed as follows:

1. Turn on the Multimat® Easy (see *"Turning on the unit/ Starting a firing program"*).
2. Preheat the firing chamber to a pre-heating temperature of 650°C over a preheating time of 60 minutes.
3. While waiting, insert the silver wire into the wire carrier (see *"Optional accessories"*)
4. Open the firing chamber and centre the white carrier on the firing base.
5. Start the calibration program (see *"Silver wire calibration program"*) if you already saved it. Allow the program to run to the end.

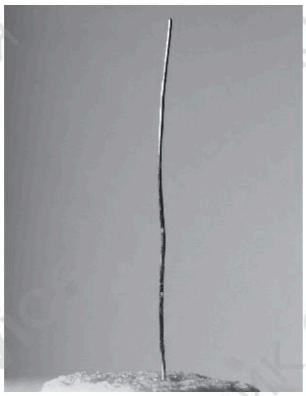
If the selected temperature corresponds to the actual temperature (to within ±2°C), **a small bead of melted silver** will appear at the tip of the silver wire. In this case, it will not be necessary to enter a calibration offset.



If the **silver wire** has partially or completely melted to a clump, this means that the temperature is **too high**.



If the surface of the silver wire does **not show any signs of melting**, the temperature is **too low**.



In the latter two cases, you will need to enter an **offset value** in the **Calibration** menu. You may either start from the existing values and move up or down to the correct firing temperature or **set the offset to zero** and start afresh.

```
Calibration
```


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➲ ***Silver wire calibration program***

The calibration program for the silver wire test is defined just like any firing program (see *"Designing and starting your own firing program"*).

The required firing parameters are:

• Program number	Any
• Fast cooling	Off
• Pre-heating temperature	650 °C
• Pre-set firing temperature	120 °C/minute
• Final temperature	**961 °C** (melting point of silver)
• Pre-set drying time	0 minutes
• Pre-set pre-heating time	3 minutes
• Vacuum	0 hPa
• Vacuum time	0 minutes
• Pre-set firing time	**1 minute**
• Cooling stage	OFF

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9 Error messages and troubleshooting

Various failure states and errors are shown in the display in the form of error messages, which starts with the letter **F** followed by **two digits**. The following table lists and explains these messages:

Example:

```
F 05
```

Display shows	Problem	Possible cause	Potential remedy
Nothing (stays dark)		Unit is not turned on or no mains power. Automatic circuit breaker has been activated.	Turn on the unit or fix the cause of the power outage. Turn the unit off and on
F 05	Vacuum still prevails	No air is entering the system	Notify service technician
F 06	Bus error	Internal system error	If error recurs, notify service technician
F 07	Com error	Error in motor communication	Notify service technician
F 08	Excessive controller temperature	a) Firing support plate above the controller is missing b) Extremely high standby temperature while the chamber is open	Disconnect from mains and allow to cool for about five minutes a) Put support plate in place b) Keep furnace closed when not in use Restart furnace normally once cooled
F 09	Defective heating circuit	Heating muffle or control relay defective	Notify service technician
F 10	Excessive temperature	Current temperature exceeds the pre-set temperature by 35 °C or more	Notify service technician
F 11	Reference error	Reference sensor defective	Notify service technician
F 12	Selected vacuum level not attained	Firing chamber gasket or vacuum system leak	Notify service technician
F 13	Rapid cooling not completed	Stand-by temperature has not been reached	Wait until the stand-by temperature has been reached or terminate rapid cooling by pressing ESC
F 14	Power outage has occurred	Short-term power outage during firing	Not possible – check firing result
F 15	Heat sensor error	Internal measurement error	If error recurs, notify service technician
F 16	Battery error	Backup battery voltage too low	Battery to be changed by service technician
F 19	Access refused	Writing or reading access denied for this file	Safe data in another file or under different name
F 20	Out of memory	The unit's internal memory is full	Delete any data or programs no longer needed

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Display shows	Problem	Possible cause	Potential remedy
F 21	Defective program	Memory error	Controller will delete the defective program automatically; Program must be re-entered
F 23	Vacuum was not relieved	Ventilation valve defective	Notify service technician
F 24	Pressure		
F 25	Heat sensor broken	Heat sensor or heat sensor wiring broken	Notify service technician
F 26	Incorrect polarity of heat sensor	Plus and minus poles were mixed up!	Notify service technician

➲ *Power failure*

The Multimat® Easy offers a **power failure protection feature** that allows the **currently running program** to be continued after a power failure of **less than 60 seconds** as soon as the power returns. You will see error message **F 14** (see *"Error messages and troubleshooting"*).

Note: The firing result must be inspected closely even if the firing program was only interrupted for a very short time.

If the power failure lasts **more than 60 seconds**, the currently running program will be interrupted.

Note: If the firing chamber **has to be opened** during the power outage, you may **carefully push the firing platform down manually**. This will damage neither the motor nor the gear mechanism.



When shipping the Multimat® Easy, please follow the instructions in the *"Safe transport"* section.



Do not reach into the firing chamber – burn hazard!

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10 Pre-defined programs

Note: The parameters listed here have the nature of recommendations. If necessary, conduct your own test firings and adapt the parameters to your own needs. Note that the cooling stages must be defined as per the alloy manufacturers' recommendations.
Base temperature, pre-heating temperature, tempering temperature: in °C, Pre-drying, drying, pre-heating time, holding time, vacuum time, tempering time: in mm:ss, Heating rate: in °C/min, Vacuum: in hPa, Cooling stage: indicated by an asterisk (*)

Ceramco3

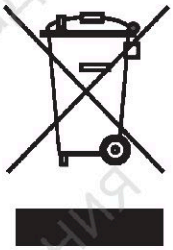
Program no.	Program name	Base temp.	Drying	Pre-heating temp.	Pre-heating time	Vacuum	Heating rate	Final temp.	Holding time	Vacuum time	Tempering temp.	Tempering time	Cooling stage
93	Paste opaque	500	05:00	500	03:00	50	100	975	00:01	00:01	–	–	–
94	Powder opaque	650	03:00	650	03:00	50	70	970	00:01	00:01	–	–	–
95	Shoulder	650	05:00	650	05:00	50	70	965	00:01	00:01	–	–	–
96	Opaque dentine, dentine, effects, enamel	650	05:00	650	05:00	50	45	930	01:00	00:01	–	–	–
97	Glaze firing without glaze	650	03:00	650	03:00	0	45	920	00:30	00:00	–	–	–
98	Glaze firing with glaze	650	03:00	650	03:00	0	55	925	00:30	00:00	–	–	–
99	Correction, Add-on	650	05:00	650	05:00	50	55	920	00:01	00:01	–	–	–

Special programs

Program no.	Program name	Base temp.	Drying	Pre-heating temp.	Pre-heating time	Vacuum	Heating rate	Final temp.	Holding time	Vacuum time	Tempering temp.	Tempering time	Cooling stage
91	Heating program	400	03:00	450	02:00	50	55	980	05:00	05:00	–	–	–
92	Cleaning program	575	03:00	575	02:00	50	55	1200	10:00	09:00	–	–	–

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This device is an electrical device in accordance with the German law on the marketing, return and environmentally compatible disposal of electrical and electronic equipment (ElektroG). The device has been labelled in compliance with the law and marked with the following symbol:



The device is not intended for private or home use.
It has been produced and furnished for commercial use and must be disposed of properly by the last user in accordance with the regulation in the ElektroG.

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DeguDent GmbH
Rodenbacher Chaussee 4
63457 Hanau
Germany

14.02.2008

We hereby declare that the product:

Multimat® Easy

Device for firing dental ceramic materials

conforms to the basic requirements of the following EC Directives:

1. EC machine directive 98/37/EG
2. EC directive on electrical equipment designed for use within certain voltage limits (Low-Voltage Directive) 2006/95/EG
3. EC directive for electromagnetic compatibility 89/336/EWG

The following harmonized standards were applied:

DIN EN ISO 12100-1: 2004-04

DIN EN ISO 12100-2: 2004-04

DIN EN 61010-1: 2004-01

DIN EN 61010-2-010: 2004-06

DIN EN 61326-1: 2006-10

Hanau, 14.02.2008
Dr. Udo Schusser
Research and Development

Hanau, 14.02.2008
Torsten Schwafert
Manager, Dental Technology Division

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