

OPERATING INSTRUCTIONS

AUSTROMAT[®] **354 *press-i-dent*[®]**

COMBINATION FURNACE FOR DENTAL LABORATORIES



DEKEMA
DENTAL-KERAMIKÖFEN



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Exclusion of liability

Although we have reviewed the contents of this document to determine its correspondence with the described hardware and software, some differences may exist. We assume no liability for complete agreement. The information in this document is regularly reviewed. The necessary corrections appear in subsequent editions.

We reserve the right to make changes

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1. Usage, data

1.1. Introduction

Dear Customer,

You are in possession of a new, exceptional AUSTROMAT® press-i-dent® firing furnace. DEKEMA's many years of experience in the field of firing furnace construction have gone into this equipment ensuring a very high level of quality, and exceptional performance and reliability. In order to take full advantage of the possibilities your firing furnace offers to obtain superior results, we would like to ask you to spend a little time studying these instructions.

The technical data and description of the usage of the firing oven can be found in section 1, Usage, data. Before you start working with the firing furnace: It is essential that you read section 2, Safety, to prevent harm to individuals and property. Section 3, Construction and function, provides a short description of the firing furnace. How to set up and start the firing furnace is described in section 4, First startup. Here you will find how to connect the firing furnace to a network or an individual computer. The menu control of the firing furnace is described in detail in section 5, User interface. The operation of the firing furnace is explained in section 6, Use, from the first steps in to the creation of firing programs. Practical examples and tips will help you identify the sources of troubles and assist you in eliminating them. For your firing oven to function well over a long service life, please follow the instructions for service and maintenance in section 7, Maintenance and Service. Finally, the index enables you to quickly find specific functions of the commands.

1.2. Proper use

The AUSTROMAT® press-i-dent® firing furnace was designed for firing and pressing dental ceramic objects with and without a vacuum. In every task that you perform with the firing furnace, observe the safety instructions in the section Safety.

Every use that goes beyond these instructions is held to be improper and can cause serious personal or property damage. We assume no guarantee when the device is improperly used handled or not used according to instructions. DEKEMA assumes no liability for damages that are thereby incurred.

In particular, materials may not be heated that may trigger explosions, implosions and hazardous or hazardous or flammable gases.

Proper use also includes the following:

- Reading and following these instructions for use,
- Observing the technical data (see section 1.5),
- Performing service tasks in a timely manner (see section 7).

1.3. Scope of delivery

The following components are included in the delivery of the firing furnace:

- AUSTROMAT® firing furnace with power cable,
- Vacuum pump with a vacuum hose and connecting cable,
- Firing table and oven tweezers,
- Operating instructions,
- Packaging material:
 - Cardboard boxes,
 - Foam material for protecting against impacts,
- Calibration set for calibrating the temperature.

Ensure that delivery is complete, and that the components have not suffered any visible damage in transport. If this is not the case, please immediately contact your service partner. Please store the packaging in case you need to ship the equipment at a later date.

1.4. Rating plate

The information on the rating plate describes the firing furnace and also offers potential customer-specific adaptations. In all correspondence with DEKEMA, please indicate all of the data that is on the rating plate.

The rating plate is on the back of the firing furnace.



Fig. 1-1 Example of rating plate

1.5. Technical Specifications

The technical data of the firing furnace are summarized in the following table. The cited connection values and tolerances must be maintained for the firing furnace to operate properly and for the warranty to take effect.

Dimensions and weight

- Dimensions: 38.5 x 71 x 28.5 cm³ (width x height x depth)
- Firing chamber useful dimensions: Firing function: 80 mm x 65 mm (diameter x height)
Press function: 52 mm x 87 mm (diameter x height)
- Weight: 24.5 kg without pump
30 kg with pump

Electrical supply data

NOTE:

Only use fuses with the indicated lag and nominal current.

- Supply voltage: depending on the type (rating plate on the rear):
 - ~ 230 V, 220...240 V AC, 50 – 60 Hz
 - ~ 115 V, 110...120 V AC, 50 – 60 Hz
 - ~ 100 V, 95...105 V AC, 50 – 60 Hz
- Fuses: depending on the type (rating plate on the rear):

~230 V: 2 x 6,3 A	T	250 V
~115 V: 2 x 16 A	T	500 V
~100 V: 2 x 16 A	T	500 V
- Delivered vacuum pump: depending on the type (rating plate on the rear):
 - ~ 230 V, 220...240 V AC, 50 – 60 Hz
 - ~ 115 V, 110...120 V AC, 50 – 60 Hz
 - ~ 100 V, 95...105 V AC, 50 – 60 Hz

Performance data

The indicated values are only valid when the delivered vacuum pump is used.

- Power consumption: max. 1,450 W including vacuum pump
- Firing and pressing temperature: max. 1200°C
- Pressing path: max. 26 mm
- Pressure: approx. 30 ... 350 N, electromechanically regulable in 10 steps

Interfaces

- USB interface
- Network interface

1.6. Ambient conditions

NOTE:

The firing furnace should not be operated for some time after sudden change of ambient temperature as otherwise condensation may occur in the electronic components, thus causing damage.

The data for the ambient temperature and humidity are designed for conditions at sea level.

- During operation:
 - Temperature: +15°C ... +35°C
 - Humidity: max. 60 %, non-condensing

- When not operating and during storage:
 - Temperature: +10°C ... +50°C
 - Humidity: max. 80%, non-condensing

- During Transport:
 - Temperature: -10°C ... +55°C
 - Humidity: max. 80%, non-condensing

2. Safety


2.1. This section must be read!


Read this entire section before you start working with the firing furnace! It contains important instructions for your personal safety. This section must be read and understood by all persons who work with this firing furnace in any phase of the product life of the AUSTROMAT® to prevent damage to persons and/or material.

2.2. Organization of the safety instructions

The following safety instructions refer to various hazard levels.

	⚠ DANGER
	DANGER identifies a direct, high risk hazard that can cause death or serious bodily injury if it is not avoided.

	⚠ WARNING
	WARNING identifies a potential, medium-level hazard that can cause death or serious bodily injury if it is not avoided.

	⚠ CAUTION
	CAUTION identifies a low-risk hazard that can cause slight or moderate bodily injury or property damage if it is not avoided.

NOTE:

A note such as this refers to particularly important information that, however, does not concern safety.

2.3. General safety regulations

2.3.1. Operating instructions

Read and understand


Anyone who works on or with the AUSTROMAT® firing furnace in any phase of the product life must read these instructions for use and understand them. This concerns in particular chapter 2: Safety.

Storage

The operating instructions are delivered along with the firing furnace and are considered an essential component of the product. They must be stored with the firing furnace in a highly visible location and be directly accessible. You can order additional copies of the operating instructions from DEKEMA (see page 2).

Completeness

Always use the complete original version of these operating instructions. The instructions in the operating instructions contain cross-references to other sections containing important information. Incomplete copies or copies of individual pages can not provide all the necessary information of the operating instructions.

	⚠ WARNING
	<p>Incomplete operating instructions.</p> <p>A lack of safety instructions due to incomplete operating instructions can cause serious injury and property damage.</p> <p>Always perform work with a complete copy of the operating instructions. Do not copy individual pages.</p>

2.3.2. Operation

Use

The AUSTROMAT® firing furnace may only be used for its intended purpose (see section 1.2). All instructions and procedures that can affect the safety of persons or the firing furnace are forbidden. The branch-specific and local regulations concerning accident prevention must be observed.

Condition

The firing furnace may only be operated when it is functioning properly. Observe the technical data in section 1.5.

If the firing furnace can no longer be operated safely, immediately unplug it and prevent it from being unintentionally operated. Reasons for assuming that the equipment cannot be used safely:

- The error message "TEMPERATURE THRESHOLD EXCEEDED!",
- Visible damage to the housing or power cable,
- Malfunctions,
- Frequently required fuse changes,
- Long storage in a problematic environment (moisture, see section 1.6).

Safety stickers

Safety stickers are affixed to the firing furnace and provide notification of residual danger. The safety stickers may not be removed. They must be replaced if they are lost or are no longer clearly legible.

Workplace


The operator must provide corresponding instructions and inspections to ensure order and cleanliness of the workplace and the surroundings of the AUSTROMAT® firing furnace.

Waste

If polluting waste arises from use, the operator is responsible for the proper disposal.

2.3.3. Maintenance and Service

Replacement parts

	⚠ WARNING
	<p>Non-original replacement parts.</p> <p>Malfunctions can arise if third-party parts are used. In certain circumstances, this can cause serious injury and substantial property damage.</p> <p>Always use original replacement parts from DEKEMA. (see section 7.5).</p>

Retrofitting



Independent retrofitting and changes that affect the safety of the firing furnace are forbidden.

2.3.4. Disposal

The operator must carefully dispose of the firing furnace in accordance with regulations. He can give it to a licensed, private or public collection facility, or recycle it or dispose of it himself (see section 8.2).



2.4. Danger





Observe the following hazard instructions in all of your jobs with the firing furnace.

	 DANGER
	<p>Electrical shock from voltage-conducting parts.</p> <p>The firing furnace is operated using mains voltage. Death may result due to electrical shock from touching voltage-conducting parts.</p> <p>Observe the following instructions:</p> <ul style="list-style-type: none"> • Never contact voltage-conducting parts, • Do not use your hands or any objects to grasp things in the firing chamber, • Maintenance and service jobs may only be performed when a device is not powered. Turn off the firing furnace, and pull the power plug, • The protective conductor (inside and outside of the unit) must always be safe for operation and may never be disabled. The connection may never be intentionally severed.

NOTE:

Only personnel with electrotechnical training and experience handling devices that operate on mains voltage may perform work on the electrical components.

	 WARNING
	<p>Fire hazard.</p> <p>The firing chamber can reach temperatures above 1,000°C during operation. Heat-sensitive materials close to the firing furnace can easily ignite and cause a fire.</p> <p>Observe the following instructions:</p> <ul style="list-style-type: none"> • Never operate the firing furnace without the firing table being mounted, • The vent holes in the cover of the firing chamber must be unobstructed, • Make sure that flammable materials (such as cleaning alcohol, wiping cloths, etc.) or objects that can be damaged by heat are sufficiently distance from the firing furnace. • Never operate the firing furnace without supervision.

 	<p style="text-align: center;">⚠ WARNING</p> <p>Hot surfaces.</p> <p>The firing chamber can reach temperatures above 1,000°C during operation. There is an extreme burning hazard from touching hot surfaces after the firing chamber is opened.</p> <p>Never directly contact hot parts of the firing furnace. The firing furnace requires several hours to cool after it is turned off. Observe the following instructions:</p> <ul style="list-style-type: none"> • Do not use your hands or any objects to grasp things in the firing chamber, • Do not grasp the lift seat, firing table or firing objects with your bare hands, • Use suitable tools (tweezers) to remove the firing objects, or wear safety gloves.
	<p style="text-align: center;">⚠ WARNING</p> <p>Heavy firing furnace.</p> <p>When the firing furnace is transported, there exists the danger of crushing, and the device may become damaged.</p> <p>At least two persons must transport the firing furnace. Wear safety gloves.</p>
	<p style="text-align: center;">⚠ CAUTION</p> <p>Ceramic dust from insulation materials.</p> <p>The firing chamber and firing table consist of ceramic insulating material. Inhaling ceramic dust can be hazardous to your health.</p> <p>Do not inhale the dust. To remove ceramic dust, use a suitable vacuum cleaner.</p>

2.5. Access rights

Three levels are defined for accessing the control of the AUSTROMAT® ceramic furnace. Access levels 1 and 2 (see following table) are password-protected. The passwords are defined in the "Service" menu using the "Password" function. The firing oven normally starts on access level 1.

The access rights should be issued to the users of the firing furnace based on their knowledge, experience and responsibility.

Access levels	Description
General code (level 0)	<ul style="list-style-type: none">• Restricted access to the "Setup" menu.• Selecting blocked programs and starting them,• Edit and create unblocked programs,• Unlocking the General Codes.
Operation (level 1)	<ul style="list-style-type: none">• Select all programs and start them,• Edit and create all programs,• Access to the "Setup" menu.
Service (level 2)	<ul style="list-style-type: none">• Access to the "Service" menu.

Tab. 2-1 Access levels

3. Construction and function

3.1. Front of the device

The following figure shows the front of the AUSTROMAT® firing furnace and identifies the most important components.



Fig. 3-1 Front view of the firing oven (example)

- | | | | |
|---|---------------------------------|---|-----------------------------------|
| 1 | Firing chamber cover | 6 | Lift seat with sealing ring |
| 2 | Top of oven with firing chamber | 7 | Bottom cover plate |
| 3 | Back column | 8 | Bottom oven part with electronics |
| 4 | Pull column | 9 | User interface with touchscreen |
| 5 | Firing table | | |

The top of the firing furnace contains the firing chamber. The firing chamber cover contains ventilation slots for cooling the firing furnace. The area in the bottom of the housing contains the electronic and mechanical furnace components. used to move the lift system comprising the lift rod, lift seat with sealing ring (O-ring), and the firing table on which the objects to be fired are placed.

3.2. Back of the unit

The following figure shows the back of the bottom part of the AUSTROMAT® firing furnace and identifies the most important components.



Fig. 3-2 Back view of the firing oven (example)

- | | | | |
|---|---|---|---------------------------------------|
| 1 | Rating plate with serial number | 5 | Connection socket for the power cable |
| 2 | main switch | 6 | Connection for vacuum hose |
| 3 | Unit safety switch | 7 | Network interface |
| 4 | Electrical connection for the vacuum pump | 8 | USB interface |

The standard equipment on the back of the device comprises:

- The main switch for turning the device on and off,
- Two fuse holders with integrated fuses (see section 1.5),
- The electrical connection socket for the vacuum pump power cable,
- Connection socket for the power cable,
- Connection for vacuum hose,
- Two interfaces :
 - USB interface for connecting a USB device such as a USB stick, USB keyboard or USB mouse,
 - A network interface for connecting an Ethernet cable (connecting the firing furnace to a network) or a crossed network cable (for connecting the firing to an individual computer).

3.3. Touchscreen

NOTE:

Never use hard or sharp objects (such as screwdrivers, tweezers, etc.) to operate the touchscreen. This will scratch and damage the screen surface.

The touchscreen is the user interface and allows you to completely control the firing furnace. The screen display is used for output and input to control the firing furnace. The buttons on the touchscreen are touch-sensitive. Lightly touch the desired button with your fingertip to execute the associated function.

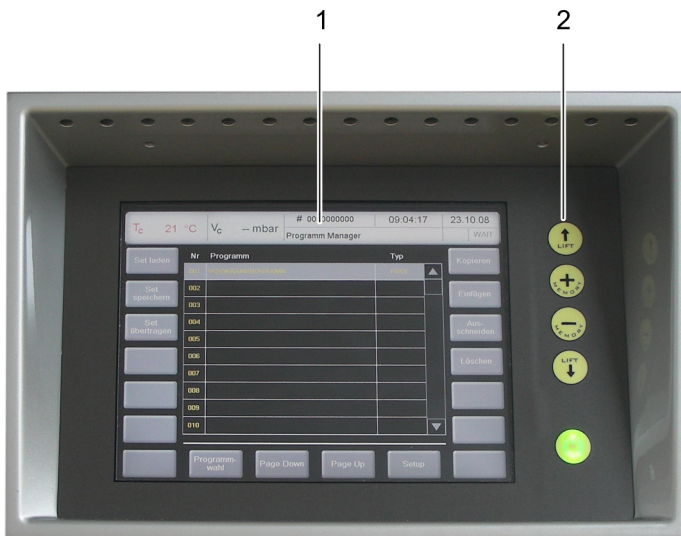


Fig. 3- 3 *Touchscreen and function keys*

1 *Touchscreen*






2 *Function keys*

Note: After the firing furnace is turned on, the control starts. This can take approximately 1 minute. Only then does the display of the touchscreen appear.

The description of the graphic user interface is found in section 5.

Function keys

You can use the function keys next to the touchscreen to execute the basic functions for operating the firing furnace. When the firing furnace is connected to a network or an individual computer and is correspondingly set up (see section 4.4), you can execute these functions using the computer keyboard.

Key	Change	Computer keyboard*)	Description
	[LIFT Up]	[F1]	<ul style="list-style-type: none"> • Press once: The lift moves upward. • Press again: The lift stops moving.
	[MEMORY +]	[F2]	<ul style="list-style-type: none"> • Advances one position forward in the program memory.
	[MEMORY -]	[F3]	<ul style="list-style-type: none"> • Goes back one position in the program memory.
	[LIFT Down]	[F4]	<ul style="list-style-type: none"> • Press once: The lift moves down. • Press again: The lift stops moving.
	[ON/OFF]	[F9]	<ul style="list-style-type: none"> • On/off switch in standby mode. • Turns off all the functions when the firing furnace is in wait mode ("WAIT" in the information bar, see section 5.2).


Tab. 3-1

Function keys

*)In order to use them, the function keys on the PC keyboard must be released; see section 5.7.4.4

4. First startup

4.1. Unpacking and setting up

	⚠ WARNING
	<p>The firing furnace is heavy.</p> <p>When the firing furnace is transported, there exists the danger of crushing, and the device may become damaged.</p> <p>Two persons must transport the firing furnace. Wear safety gloves.</p>

Packaging symbols

The packaging can be identified with the packaging symbols shown below. The symbols must be followed.

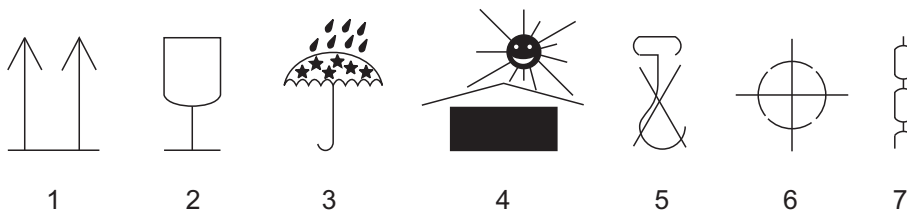


Fig. 4-1 Packaging symbols.

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Top 2 Fragile 3 Protect from moisture 4 Keep away from heat | <ul style="list-style-type: none"> 5 Do not use hooks 6 Center of gravity 7 Lifting point |
|--|--|

1. Remove the packaging, and keep the packaging material for storing the firing oven or for later transport.
2. Make sure that all of the parts listed in the scope of delivery are in the delivered package; see section 1.3.
3. Check the delivery for transportation damage. Notify immediately of any complaints.
4. Transport the firing furnace to the provided setup site (see section 4.2).

NOTE:

It is possible that the firing furnace may not be safe to use when there is visible damage to the housing or power cable.

4.2. Requirements at the setup site

NOTE:

Adjust the firing furnace to the new location each time it is moved or after a repair.

Firing furnace

The setup site of the firing oven must meet the following requirements:

- Set up the furnace on a dry, flat, solid surface.
- The surface must be able to bear the weight of the firing furnace (see section 1.5).
- Materials and objects that can be damaged by heat must be sufficiently distant from the firing furnace.
- The vents in the firing furnace must not be obstructed to enable the circulation of cooling air.
- A power socket must be close to the device and easily accessible.
- The conditions in the environment at the setup site must meet the requirements in section 1.6.

Vacuum pump

The setup site of the vacuum pump must meet the following requirements:

- Set up the vacuum pump at a well-ventilated site protected from dust and dirt.
- Easily flammable and temperature-sensitive materials and objects must be sufficiently distant from the vacuum pump.
- The vents in the vacuum pump must not be obstructed to enable the circulation of cooling air.

4.3. First startup

NOTE:**When connecting the firing furnace and vacuum pump:**

- **The firing furnace is operated using mains voltage.**
 - **Ensure that the connected loads of the vacuum pump (rating plate) correspond to supply data for the firing furnace.**
 - **Use only suitable power sockets with ground contacts, and never use adapter plugs.**
 - **Do not run the connection lines past places of the firing furnace that are hot, and especially avoid direct contact.**
1. Make sure that the firing furnace is turned off. The ON/OFF switch is on the back of the furnace (see section 3.2).
 2. Connect the vacuum pump to the firing furnace:
 - Push the vacuum hose about 2 cm over the hose nozzle at the rear of the firing furnace,
 - Connect the pump plug to the vacuum pump and the corresponding connection socket on the rear of the firing furnace.
 3. If you want to operate the firing furnace through a network (Ethernet): Connect a network cable to the interface on the back of the furnace (see section 3.2).
 4. If you want to operate the firing furnace with a computer (Ethernet): Connect a crossover network cable to the interface on the back of the furnace (see section 3.2).
 5. Plug in the power cable of the firing furnace into a power socket with a ground contact.
 6. Turn on the firing furnace. The control of the firing oven starts up over a period of about 1 minute. The firing furnace performs an internal software and hardware check, and the lift moves down automatically.
 7. Make sure that the firing furnace is mounted on the lift seat. If not: Turn the firing furnace off, and mount the firing table.
 8. If necessary: Remove any ceramic dust from the lift seat and the sealing ring. Brush the dust into a receptacle. Do not blow away the dust, and do not inhale it.
 9. Approximately 3 minutes after the program manager has opened, the firing furnace automatically heats to the starting temperature of the preheating program.
 10. The following ways exist to operate the firing furnace (control software):
 - Operation using the touchscreen and function keys, see section 3.3,
 - Operation using the touchscreen with the USB mouse and USB keyboard (via a USB hub), see section 3.3,
 - Operation using a network computer: Connect the firing furnace to the network (see section 4.4.1).
 - Operation using an individual computer: Connect the firing furnace to the computer (see section 4.4.2).

Installation assistant

The installation assistant is optionally available and may be activated at the plant before delivery. The installation assistant asks you to mount the firing table, and runs an installation routine after you confirm by pressing the [CONTINUE] key. The firing chamber is dried, and the firing furnace is checked. The installation routine takes approximately 45 minutes, and can be terminated at any time with the [ABORT] key. The installation assistant is started each time the furnace is turned on until the entire installation routine has run once.

4.4. Connecting the firing oven to a network or computer

NOTE:

To operate the firing furnace using the web interface, your browser must be Java-capable, and the Java application must be activated.

4.4.1. Connect the firing oven to the network

NOTE:

Consult your network administrator if you are uncertain.

Determine the IP address

1. Make sure that the firing furnace is connected to the Ethernet (interface for the network cable on the back of the unit),
2. Turn on the firing furnace and confirm any error messages. After the furnace is turned on, the Program Manager automatically appears.
3. Click on [Setup] > [Network] in the Program Manager. The window "Network settings" opens.

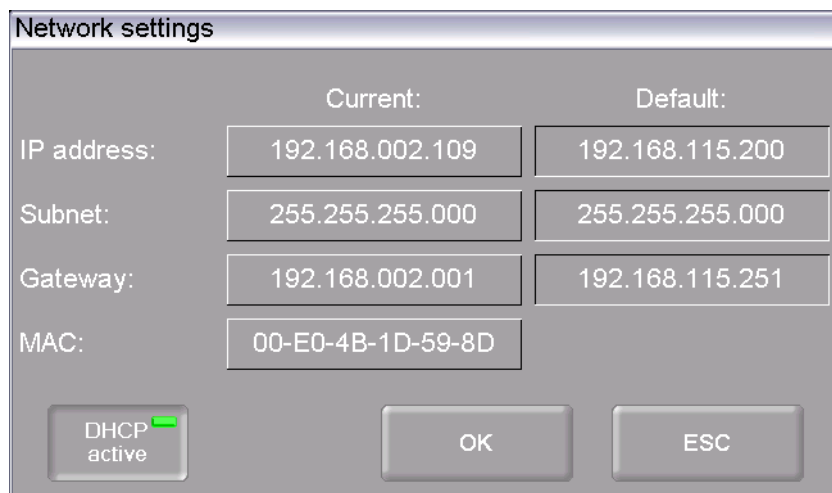


Fig. 4-2

Setup > Network

4. Click the button [DHCP]. Use the button to assign an IP address to the firing furnace from you network server. A green field within the button indicates that the DHCP function is active.
5. Click on [OK]. A warning appears: "Changes active after restart". Confirm the message by pressing [OK]. The message and "Network settings" window close.
6. Turn the furnace off and on. The control accepts the changed network settings, and the firing furnace automatically searches an IP address in the Ethernet network.
7. After restarting, open the "Network settings" menu.
8. Write down the current IP address.

Setting up the operation of the firing furnace using a browser

9. Open a Java-capable browser on a computer network (such as Internet Explorer or Mozilla Firefox).
10. In the address line of the browser, enter the recorded IP address ("http://192.168.002.109" in the following example), and press the Enter key.

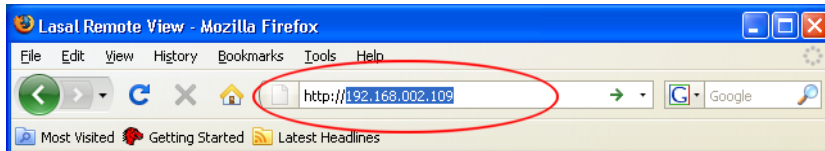


Fig. 4-3 Enter the IP address in the browser (example)

11. The login window appears.
 - a. Enter the password in the "Password" entry line.
 - b. Select the desired data compression for transmitting data between the firing oven and the computer. We recommend using the default setting, "RL encoding".
 - c. Click on [OK].

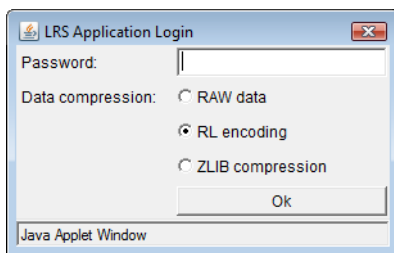


Fig. 4-4 Login window

12. The Program Manager appears in the browser (see section 5.3).

Set up a permanent IP address for the firing furnace

You can now operate the firing furnace using the browser. Depending on the network settings, a different IP address can be used each time the unit is started. So that you do not have to repeatedly find and enter the IP address, the firing furnace should be assigned a fixed IP address in the network.

1. Contact your network administrator, and have him assign an IP address and subnet mask and gateway address for the firing furnace.
2. In the "Setup" menu, open the "Network" function (> Setup > Network).

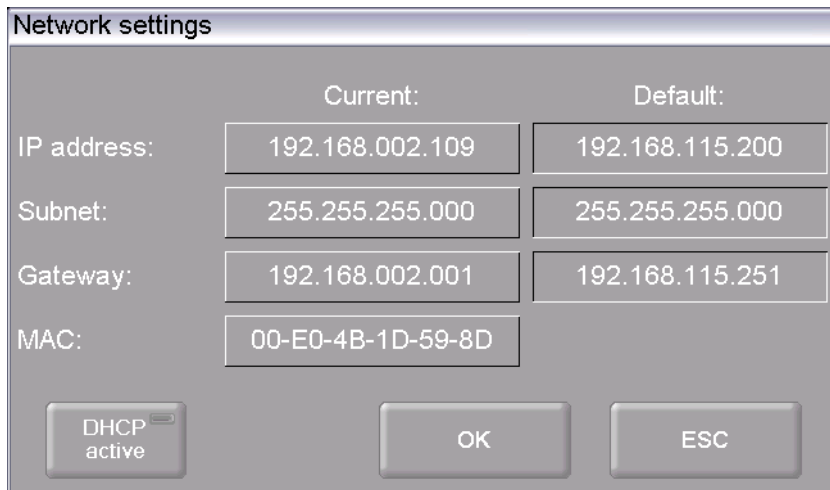


Fig. 4-5 Assign permanent IP address

3. Under "Default IP address", enter the IP address that was assigned to the firing furnace by the network administrator.
4. Under "Default Subnet mask", enter the subnet mask that was assigned to the firing furnace by the network administrator.
5. Under "Gateway", enter the gateway address that was assigned to the firing furnace by the network administrator.
6. Deactivate the DHCP function.
7. Click on [OK].

The firing furnace only has one permanent IP address and can be reached with this address through a browser.

NOTE:

The new IP address is only activated after the firing furnace is restarted.

Recommendation: Define bookmarks in the browser

You can define a bookmark in the browser for easily opening the firing furnace control: In the browser, enter the permanent IP address, and start the Java application. Wait until the Program Manager is displayed. Define the bookmark.

Configuring the firing furnace for network operation

8. In the "Setup" menu, open the "Login data" function (> Setup > Network > Login data) (see section 5.7.4.4).
9. Activate the functions "Start/stop functionality" and "Function keys via the Web server".

You can now operate the firing furnace using the browser. Now set up the authorizations for accessing the firing furnace by the browser (see section 4.4.3).

4.4.2. Connect the firing oven to an individual computer

1. Make sure that the firing furnace is connected to a computer with a crossover network cable (interface on the back of the device).
2. In the plant, the firing furnace was assigned the default IP address "192.168.115.200" by DEKEMA. If this IP address is no longer valid, you have to identify the present default IP address of the firing furnace: (see section 4.4.1).
3. Open a Java-capable browser on your computer (such as Internet Explorer or Mozilla Firefox).
4. In the address line of the browser, enter the default IP address "http://192.168.115.200", and press the Enter key.

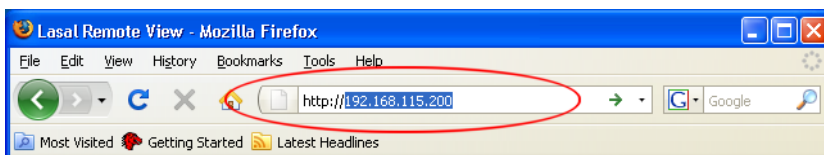


Fig. 4- 6 Enter the IP address in the browser (example)

5. The login window appears.
 - a. Enter the password in the "Password" entry line.
 - b. Select the desired data compression for transmitting data between the firing oven and the computer. We recommend using the default setting, "RL encoding".
 - c. Click on [OK].

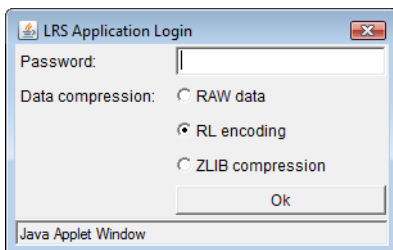


Fig. 4- 7 Login window

6. The Program Manager appears in the browser (see section 5.3). You may have to release this IP address in the firewall of the computer (see the operating instructions of the operating system).
7. In the "Setup" menu, open the "Login data" function (> Setup > Network > Login data) (see section 5.7.4.4).
8. Activate the functions "Start/stop functionality" and "Function keys via the Web server" (see also section 5.7.4.4).

You can now operate the firing furnace using the browser. Now set up the authorizations for accessing the firing furnace by the browser (see section 4.4.3).

Recommendation: Define bookmarks in the browser

You can define a bookmark in the browser for easily opening the firing furnace control: In the browser, enter the permanent IP address, and start the Java application. Wait until the Program Manager is displayed. Define the bookmark.

4.4.3. Setting up browser access authorizations

After connecting the firing furnace to a network or individual computer, each network participant or computer user can access the firing furnace control. You can restrict the access the firing furnace to authorized persons by providing a user ID consisting of a user name and password.

1. In the "Setup" menu, open the "Login data" function (> Setup > Network > Login data) (see section 5.7.4.4).
2. Define the password: In the "Password" field, enter the password,

When opening the firing furnace control through a browser, the password has to be entered to obtain access to the firing furnace, i.e., the firing furnace is password-protected. Communicate the password to the persons who are authorized to access the firing furnace.

NOTE:

If the password becomes lost, contact your service partner or directly contact DEKEMA (see page 2).

5. User interface

5.1. Basic information

5.1.1. Terms




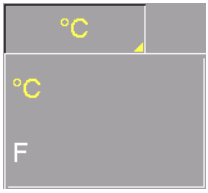
The following table explains some of the basic terms that will make it easier to operate the AUSTROMAT[®].

Term	Meaning
Program (firing program)	Firing programs or other programs contain the individual control commands for the AUSTROMAT [®] . A typical example of a program is the preheating program that is the first program memory for most firing furnaces.
Program parameter (firing parameter)	The individual values within a program are termed the program parameters or firing parameters. Program parameters are for example the starting temperature, drying time, and closing time.
Set	The aggregate of all manufacturer-specific programs (program list).

Tab. 5-1 Definition of terms

5.1.2. Screen elements

The following table contains screen elements that are used in the user interface of the AUSTROMAT[®].

Change	Example	Description
Button		A button is associated with a function. Execute the function by: <ul style="list-style-type: none"> clicking the button.
Checkbox		Select either yes (with a check), or no (without a check) in the checkbox by: <ul style="list-style-type: none"> clicking the checkbox.
Option field		Option fields allow you a single distinct selection. Execute the desired option by: <ul style="list-style-type: none"> clicking the option field.
Drop-down list		Select the desired list entry as follows: <ul style="list-style-type: none"> Click the entry to open the complete selection list, Place the pointer on the desired entry, and click on it. The list closes, and the selected list entry is displayed.
Numeric keyboard window		(see section 5.1.3).
Alphanumeric keyboard window		(see section 5.1.4).
Keyboard window for the classic editor		(see section 5.1.5).

Tab. 5-2 Screen elements

5.1.3. Numeric keyboard window

The numeric screen keyboard is for entering numbers such as firing parameters. The keys automatically appear when the firing furnace control expects a number to be entered.

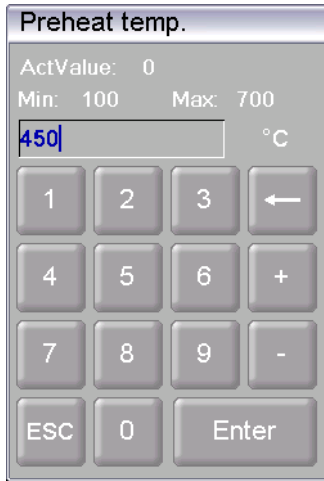


Fig. 5- 1 Numeric keyboard window

Valid values

When entering parameters, the following values are automatically displayed in the numeric keyboard:

- "ActValue" shows the currently set value,
- "Min" shows the smallest permissible value (minimum),
- "Max" shows the highest permissible value (maximum),

Entering the value

- Enter the desired value.
- Click [Enter] to close your entry,
- The value is accepted when it lies within the valid range,
- The numeric keyboard window is closed.

Terminating an entry

- Click [ESC] to terminate the entry,
- An entered value is not accepted, the momentary value ("ActValue") is retained,
- The numeric keyboard window is closed.

5.1.4. Alphanumeric keyboard window

The alphanumeric screen keyboard is for entering text such as the names of firing programs. The keyboard automatically appears when the firing window control expects text to be entered.



Fig. 5- 2 Alphanumeric keyboard window

Entering text

- Enter the desired text.
- Click [Enter] to close your entry,
- The alphanumeric keyboard window is closed.

Terminating an entry

- Click [ESC] to terminate the entry,
- An entered text is not accepted
- The alphanumeric keyboard window is closed.

5.1.5. Keyboard window for the classic editor

The keyboard window for the classic editor automatically appears when you click a command line of a classic program in the program editor to edit the command sequence.

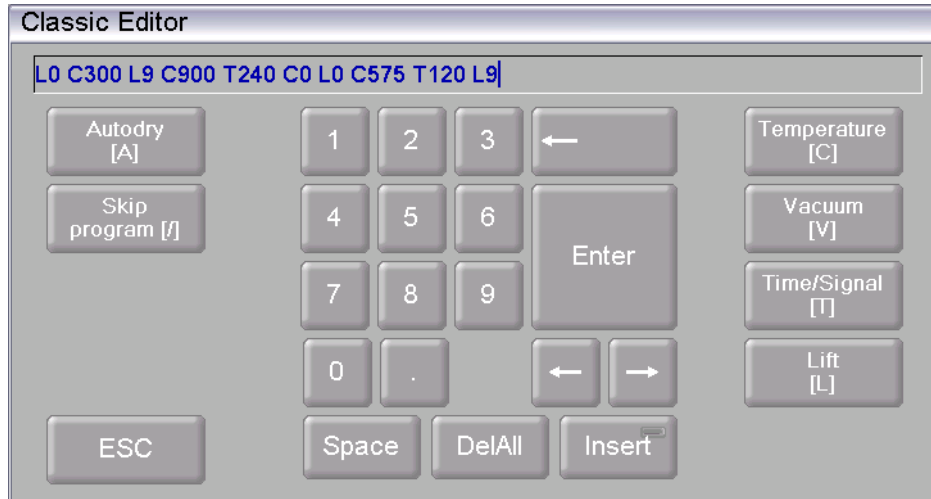


Fig. 5- 3 Keyboard window for the classic editor

Editing the command line

- Click [Edit] to edit the command line. The text appears blue,
- Use the cursor keys to edit the command line at the desired place,
- The existing commands are normally overwritten. Click [Insert] to insert commands,
- Click [Enter] to close your entry,
- The classic keyboard window is closed.

Terminating an entry

- Click [ESC] to terminate the entry,
- An entered command line is not accepted,
- The classic keyboard window is closed.

5.2. Screen display

The screen display for operating the AUSTROMAT® is divided into different areas.



Fig. 5-4 Screen display (example of the Program Manager)

- 1 Information bar
- 2 Function bar
- 3 Display area

Information bar

Shows all of the important parameters:

- The Temperature in the firing chamber: "Tc",
- Vacuum in the firing chamber: "Vc",
- The firing number "#", that is, how many firings have been properly concluded,
- The time and the date of the firing furnace control,
- If a program is selected: Instead of the date, the provisional duration or remaining time of the program,
- The current menu (in this case, the "Program Manager"),
- A lock indicates that a program is protected by the general code,
- The status of the firing furnace:
 "Wait": The firing furnace is in weight status: A program is being processed (run), "Edit": A program is being edited (program editor).

Function bar

The function bar contains the buttons for controlling and operating the firing furnace. The buttons that are displayed depend on the selected menu.

Display area

The display area shows the current menu of the firing furnace control such as the Program Manager.

5.3. Program Manager

Use the Program Manager to select the firing programs or sets and administer the assignment of the individual program memories (copy, delete firing programs).

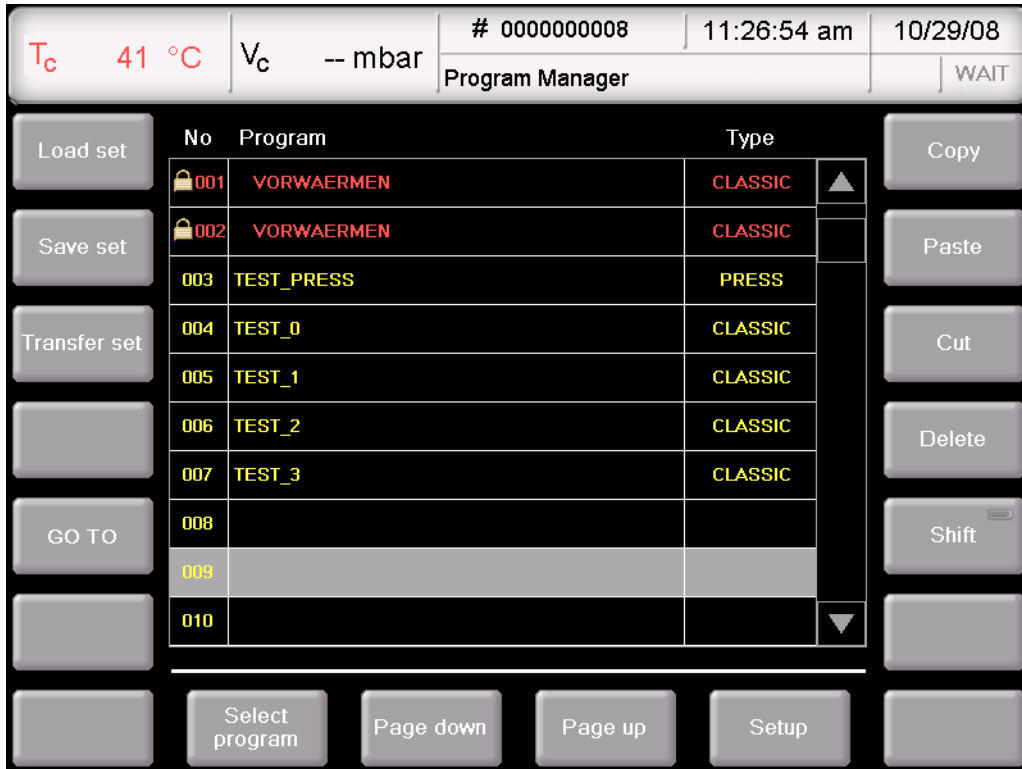


Fig. 5-5 Program Manager (example)

Display area

The display area of the Program Manager includes the following elements:

- Program list. All of the firing programs of the loaded set are listed here in a table.
 - The left column "No" shows the program number,
 - The middle column "Program:" indicates the program name. A lock indicates that a program is protected by the general code,
 - The right column "Type" shows the program type,
- Scroll bar. This allows you to scroll through the table (as with conventional Windows applications).

Select program

- Scroll through the program list until the desired program list is displayed. Click on a program to select it. The corresponding table line appears with a blue background.
Or
- Click on [GO TO]. The numeric screen keyboard appears. Enter the desired program number, and click on [Enter].

Left function bar

The buttons in the left function bar refer to sets of firing programs.

[Load set]:	Opens the window "Select manufacturer" to load the programs of the set into the Program Manager.
[Save set]:	Saves the loaded set. After it is saved, the message appears: "Successfully saved". Click [OK] to close the message.
[Transfer set]:	Transfers a set to the Program Manager. Note that existing programs are overwritten.
[GO TO]:	Opens the numeric screen keyboard to select a program directly via its program number.

Right function bar

The buttons in the right function bar refer to individual firing programs.

NOTE:

Programs that are protected by the general code cannot be deleted or overwritten. See also section 5.7.1.6.

[Copy]	Copies the selected program. Procedure: <ul style="list-style-type: none"> • Select the desired program (source). • Click on [copy]. • Select the number of the program to which the program should be copied (target); • Click on [Insert].
[Paste]	Pastes a program. This function is only relevant along with the commands [Copy] or [Cut].
[Cut]	Moves the selected program. Procedure: <ul style="list-style-type: none"> • Select the desired program (source). • Click on [Cut]. • Select the number of the program where the program should be moved (target); • Click on [Insert].

[Delete] Deletes the selected program. Procedure:

- Select the desired program.
- Click on [Delete].
- A safety query opens. Click [OK] if you want to delete the program.

[Shift] For selecting several programs. Procedure:

- Select the first desired program.
- Click on [Shift].
- Select the last desired program.

The entire block between the first and last program is selected and can be copied, inserted or deleted.

Bottom function bar

The buttons in the bottom function bar refer to individual firing programs.

[Select program] Opens the program display for the selected program.

[Page Down] Scrolls one page down in the Program Manager. You can also use the scroll bar.

[Page Up]: Scrolls one page up in the Program Manager. You can also use the scroll bar.

[Setup] Opens the "Setup" menu (see section 5.7).

5.4. Program display

The program display with the firing parameters appears when you select a program in the Program Manager and click on [Selected program]. The display depends on the type of program that has been selected:

- Program display for easy programs (see section 5.4.1),
- Program display for professional programs (see section 5.4.2),
- Program display for classic programs (see section 5.4.3),
- Program display for pressing programs (see section 5.4.4).

5.4.1. Easy programs

The following illustration shows a typical program display for easy programs.

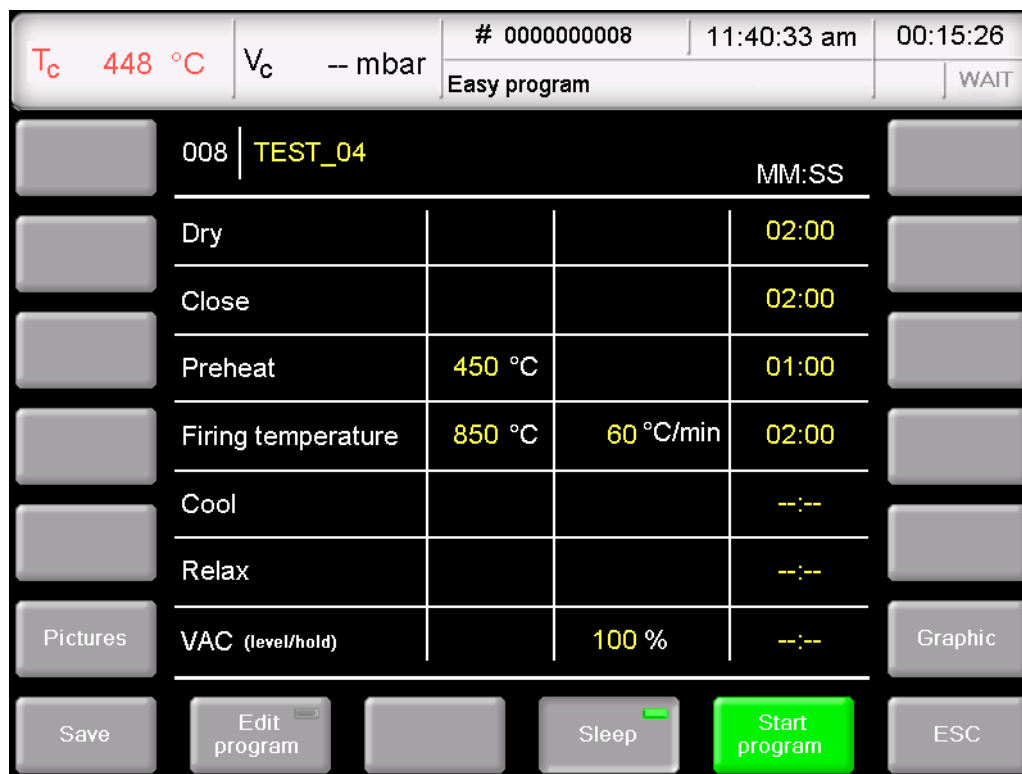


Fig. 5-6 Program display for easy programs (example)

The display is divided into three sections: the information line, the table with the firing parameters and the function bar.

Information line Displays the program number and name.

- Entry mask with firing parameters
- The table contains the entry fields for the respective program steps with the firing parameters.
- Each line corresponds to a program step. The program steps are executed sequentially from top to bottom.
 - The first column contains the name of the program step.
 - The second column indicates the temperature at which the program step is executed.
 - The third column indicates the heating rate at which the temperature in column 2 is activated and the vacuum for firing.
 - The fourth column indicates the holding period for the program step.

An empty entry box in column 2,3,4 means that the respective value is automatically specified by the program step or is not required.

Buttons in the function bar:

- [Pictures], Opens a window for selecting a picture (see section 5.4.6).
- [Save] Saves the program.
- [Edit program] Opens the program editor to change the firing parameters (see section 5.6).
- [Sleep] Click on the button to activate and deactivate sleep mode. A green field within the button indicates that the function is active. See also section 5.5.5.
Only operate the firing furnace under supervision.
- [Start Program] Starts the program. See also section 5.5. The [Start program] button is automatically replaced by the [Abort program] button after the program starts.
- [Cancel Program] Prematurely terminates a running program. The [Cancel program] button is then automatically replaced by the [Start program] button. After a program is canceled, the heating system turns off, and the firing furnace cools down. The firing number is not increased during firing.
- [ESC] Terminates the program display and opens the Program Manager (see section 5.3).
- [Graphic] Graphically represents the program (see section 5.4.5).

5.4.2. Professional programs

The following illustration shows a typical program display for professional programs.

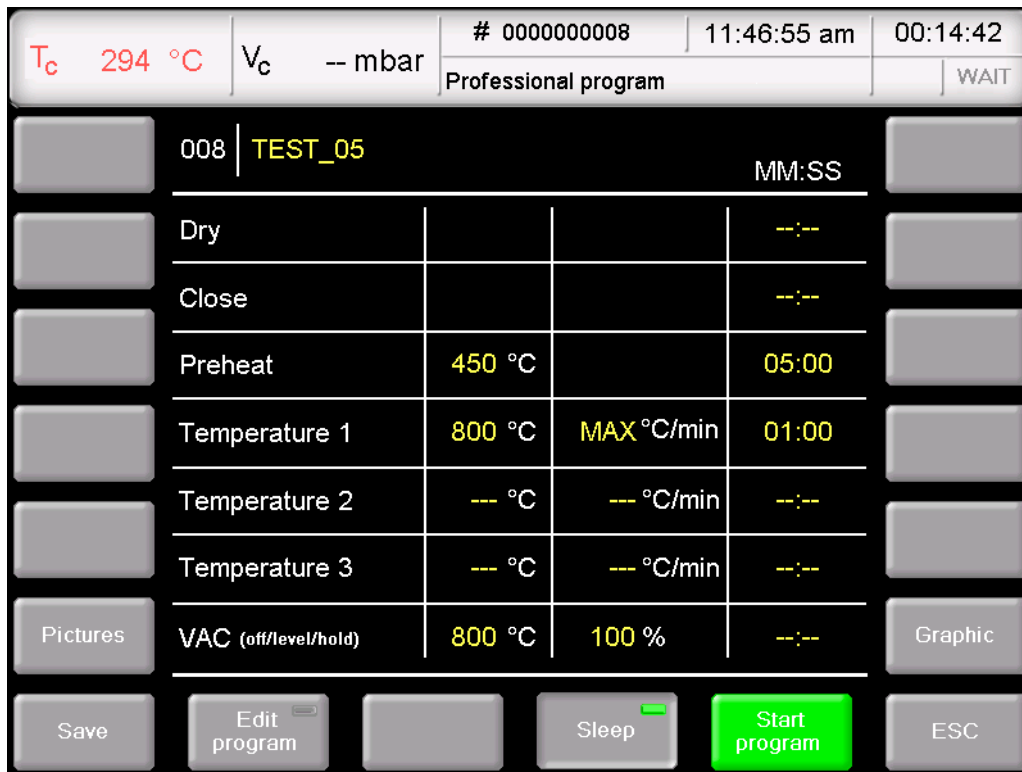


Fig. 5-7 Program display for professional programs (example)

The program display for professional programs corresponds to the one for easy programs. You can find a description in section 5.4.1.

5.4.3. Classic programs

The following illustration shows a typical program display for classic programs



Fig. 5-8 Program display for classic programs (example)

The display is divided into four sections: The information line, the graphic display of the program progress, the command line with the firing parameters, and the function bar.

- | | |
|------------------------------|--|
| Information line | Displays the program number and name. |
| Graphic display | Graphically represents the program progress. You can find a description of the diagram in section 5.4.5. Note that a table with firing parameters for classic programs is not available. The firing parameters are displayed and edited in the command line. |
| Command line | Shows the individual program steps with the firing program in "CVTL" syntax. Click on the command line to open the program editor to change the firing parameters (see section 5.6.3). |
| Buttons in the function bar: | |
| • [Pictures], | Opens a window for selecting a picture. (see section 5.4.6). |
| • [Save] | Saves the program. |
| • [Edit program] | Opens the program editor to change the firing parameters. (see section 5.6). |

- [Sleep] Click on the button to activate and deactivate sleep mode. A green field within the button indicates that the function is active. See also section 5.5.5.
Note that the firing furnace may only be operated under supervision.
 - [Start Program] Starts the program. See also section 5.5. The [Start program] button is automatically replaced by the [Abort program] button after the program starts.
 - [Cancel Program] Prematurely terminates a running program. The [Cancel program] button is then automatically replaced by the [Start program] button. After a program is canceled, the heating system turns off, and the firing furnace cools down. The firing number is not increased during firing.
 - [ESC] Terminates the program display and opens the Program Manager (see section 5.3).
- [<= Sequence] The sequence keys move the cursor through the individual program steps. The intervals have a colored background in the graphic.
[=> Sequence]

5.4.4. Pressing programs

The following illustration shows a typical program display for pressing programs.

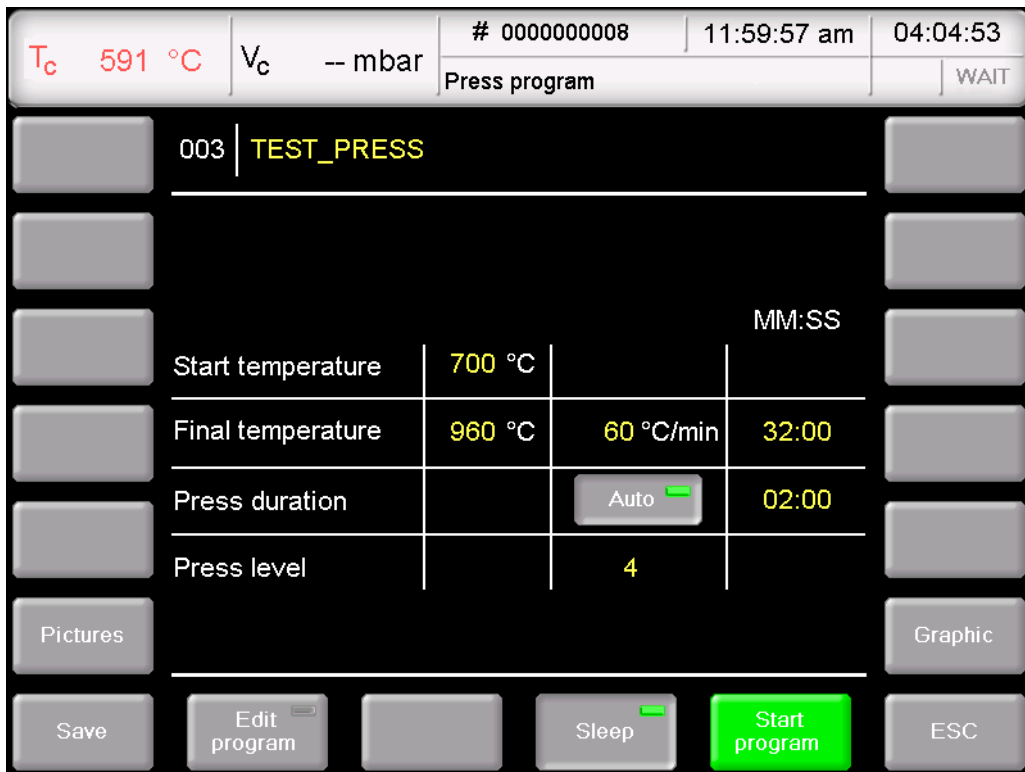


Fig. 5-9 Program display for pressing programs (example)

The display is divided into three sections: the information line, the table with the firing and pressing parameters and the function bar.

Information line Displays the program number and name.

Entry mask with firing parameters The table contains the entry fields for the respective program steps with the firing parameters.

- Each line corresponds to a program step. The program steps are executed sequentially from top to bottom.
- The first column contains the name of the program step.
- The second column indicates the temperature at which the program step is executed.
- The third column indicates the heating rate at which the temperature in column 2 is activated and the pressing parameters for firing.
- The fourth column indicates the holding period for the program step.

An empty entry box in column 2,3,4 means that the respective value is automatically specified by the program step or is not required.

Buttons in the function bar:

- [Pictures], Opens a window for selecting a picture (see section 5.4.6).
- [Save] Saves the program.
- [Edit program] Opens the program editor to change the firing parameters (see section 5.6).
- [Sleep] Click on the button to activate and deactivate sleep mode. A green field within the button indicates that the function is active. See also section 5.5.5.
Only operate the firing furnace under supervision.
- [Start Program] Starts the program. See also section 5.5. The [Start program] button is automatically replaced by the [Abort program] button after the program starts.
- [Cancel Program] Prematurely terminates a running program. The [Cancel program] button is then automatically replaced by the [Start program] button. After a program is canceled, the heating system turns off, and the firing furnace cools down. The firing number is not increased during firing.
- [ESC] Terminates the program display and opens the Program Manager (see section 5.3).
- [Graphic] Graphically represents the program (see section 5.4.5).

5.4.5. Graphic program displays

NOTE:

Easy, pressing and professional programs can not be started and edited in the graphic program display.

In the graphic display, the program progress is graphically displayed instead of the entry fields. The cursor (vertical line) shows the position of a program step.

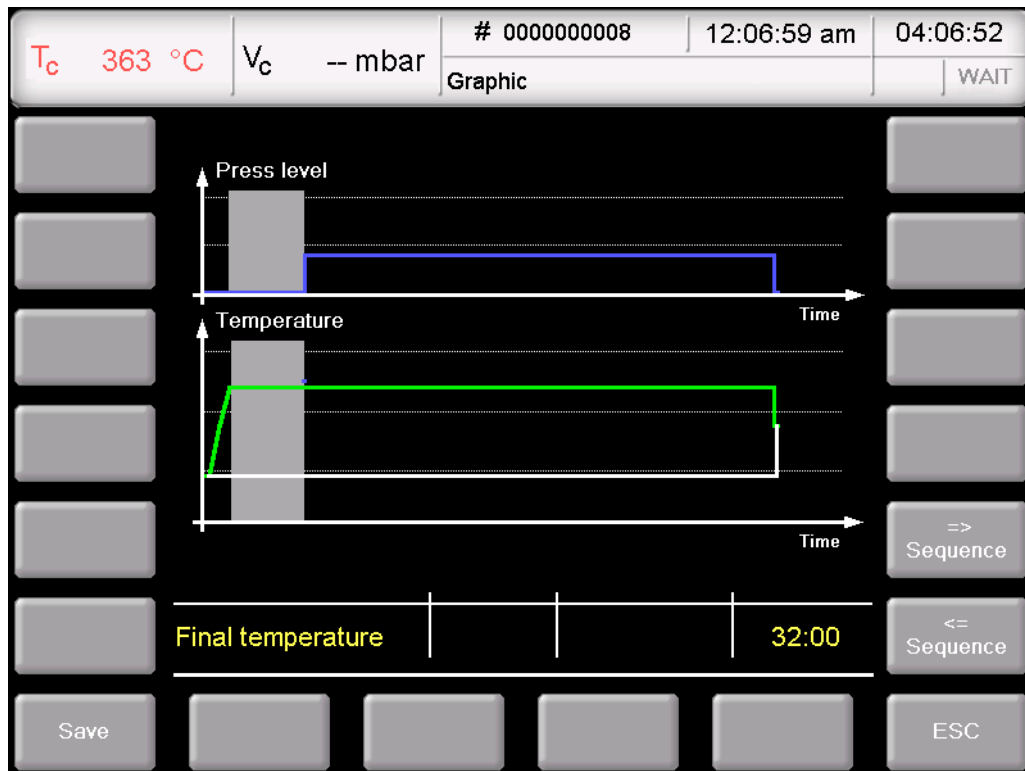


Fig. 5-10 Graphic program display (example)

The display is divided into two sections: The diagram (graphic display), and the function bar.

Graphic display

The graphic display shows the progress of the program and contains the following elements:

- The vertical axis shows the temperature and pressure.
- The horizontal axis shows the time.
- The cursor shows the momentary position (time) in the program.
- The diagram shows the progress of the program as a colored curve. The temperature over time and pressure at the fired object is portrayed.

Buttons in the function bar:

- [Save] Saves the program.
- [<=> Sequence] The sequence keys move the cursor through the individual program steps. The intervals have a colored background in the graphic.
- [ESC]

- [ESC] Ends the graphic display and switches to the normal program display (see sections □, 5.4.2 and 5.4.4).

5.4.6. Pictures

NOTE:

The screen of your AUSTROMAT® press-i-dent® firing furnace is not color calibrated. It is therefore not suitable for accepting color.

You can save pictures in the firing furnace memory, for example to compare the firing results with photographs of sample firings. The screen page offers a simplified functionality for selecting and viewing a picture as in Windows Explorer. To overwrite the pictures, you can use the FTP functionality (see section 5.7.4.6) or a USB stick.



Fig. 5- 11 Program Manager > Pictures

The display is divided into two sections: The table that lists all pictures in the selected directory, and the function bar.

Table

The table provides the following information:

- The current directory,
- The first column contains the name of the pictures,
- The second column indicates the file extension,
- The third column indicates the file size,
- The fourth column shows the date and time of the picture.

Note that only pictures and no other files are listed.

View picture

Double-click the line of the desired picture.

**Buttons in the
function bar:**

- [Folder back] Moves one level up in the directory structure.
- [ESC] Ends picture selection and switches to the normal program display (see sections □ to 5.4.4.).

5.5. Program procedure

A firing program is started from the Program Display by pressing [Program Start]. Note:

- The preheating of the firing furnace depends on the selected program type.
 - Easy, professional and pressing programs:
The firing furnace automatically heats to the required preheating temperature (drying or start temperature). You can terminate this process by pressing the [ON/OFF] key,
 - Classic programs:
The firing furnace automatically heats to the preheating temperature of the last-selected easy, professional, or pressing program (i.e., before the classic program was selected).
All the parameters that were not ended during the program remain active the program is over. They only lose their validity when the firing furnace is switched to wait mode by pressing the [ON/OFF] key, or when they are deactivated or replaced with new parameters (such as program procedure),
- The program steps are executed in the specified sequence in the input mask (see section 5.4),
- Select [Cancel program] to prematurely terminate a running program. In this case, all the commands are stopped and the heat system is turned off. The firing furnace cools down. The firing number is not increased during firing.

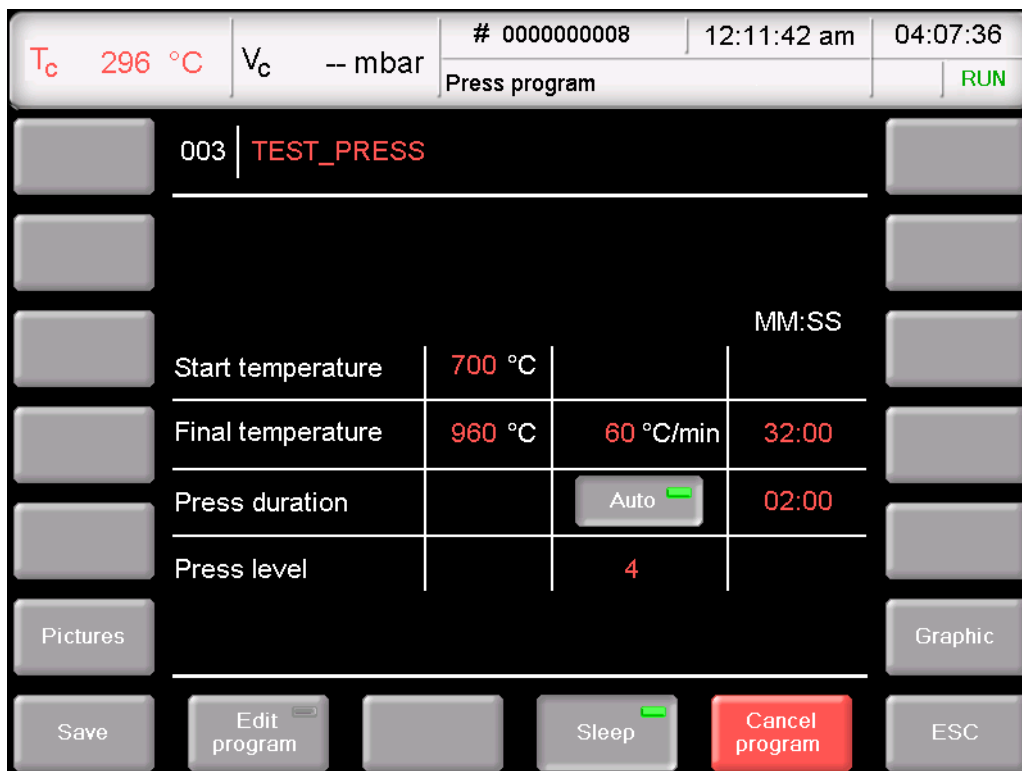


Fig. 5- 12 Example of the program progress for a pressing program

The program sequence in the example of Fig. 5- 12 generates the following firing program:

Step 0: [Start Program]	Program started with an open firing chamber (mounted muffle).
Step 1	The starting temperature is assumed The lift travels upward and closes the firing chamber. The starting temperature (700°C) is assumed, and the maximum vacuum is generated.
Step 2	Set end temperature (960°C) with a rate of 60°C/min (700°C to 960°C) Holding period 32:00 min (holding period for the end temperature)
Step 3	The pressure builds The muffle is pressed at the set pressure (level 4, ca, 20 kg).
Step 4	Press 2:00 min (holding period for pressure)
Step 5	End of program: <ul style="list-style-type: none">• The lift moves downward,• The firing number is automatically increased by one,• The acoustic signal sounds (see section 5.7.2.2),• The standby temperature for the next firing is assumed.

The meaning of the individual program steps will be discussed in the following section:

- For the easy programs, see section 5.5.1,
- For the professional programs, see section 5.5.2,
- For the classic programs, see section 5.5.3,
- For pressing programs, see section 5.5.4.

5.5.1. Easy programs

Specifically, the program steps execute the following functions:

Program step	Meaning
Drying	<p>The firing object is dried for the specified holding time. The drying temperature can be set in the "Setup" menu (see section 5.7.2.3).</p> <p>In the "Drying " program step, the lift is automatically moved to the right position. This position depends greatly on the temperature of the firing chamber. The lift may therefore move up and down several times in small steps.</p>
Close	<p>The firing chamber is completely closed in the specified time, and the firing object is heated to preheating temperature.</p>
Preheating	<p>The firing object is subjected to the preheating temperature in the closed firing chamber for the specified holding time.</p>
Firing temperature	<p>The closed firing chamber is heated up from the preheating temperature to the firing temperature at the entered rate. When the firing temperature is reached, the firing object is subjected to the firing temperature for the holding period.</p>
Cooling	<p>Starting from the firing temperature, the cooling temperature is approached and held for the holding time. The firing chamber may be open. The cooling temperature is approx. 90 % of the firing temperature.</p>
Relaxation	<p>Starting from the cooling temperature, the relaxation temperature is approached and held for the holding time. The firing chamber may be open. The cooling temperature is approx. 65 % of the firing temperature.</p>
VAC (level/hold))	<p>After preheating and before the firing temperature is set, the entered vacuum (level in %) is generated. When the firing temperature is reached, the vacuum is held for the holding period. Then the firing chamber is ventilated.</p> <p>The appendix contains a table with the vacuum values.</p>

Tab. 5-3 *Meaning of the program steps for easy programs*

5.5.2. Professional programs

Specifically, the program steps execute the following functions:

Program step	Meaning
Drying	<p>The firing object is dried for the specified holding time. The drying temperature can be set in the "Setup" menu (see section 5.7.2.3).</p> <p>In the "Drying" program step, the lift is automatically moved to the right position. This position depends greatly on the temperature of the firing chamber. The lift may therefore move up and down several times in small steps.</p>
Close	The firing chamber is completely closed in the specified time, and the firing object is heated to preheating temperature.
Preheating	The firing object is subjected to the preheating temperature in the closed firing chamber for the specified holding time.
Temperature 1	The closed firing chamber is heated up to temperature 1 from preheating temperature at the specified heat-up rate 1. When temperature 1 is reached, the firing object is subjected to temperature 1 for the specified holding time.
Temperature 2	Starting from temperature 1, temperature 2 is activated at the specified heat-up rate 2 and held for holding time 2. The firing chamber may be open (e.g. cooling, relaxation).
Temperature 3	Starting from temperature 2, temperature 3 is activated at the specified heat-up rate 3 and held for holding time 3. The firing chamber may be open (e.g. cooling, relaxation).
VAC (off/level/hold)	<p>After preheating and before the firing temperature is set, the entered vacuum (level in 5) is generated. When the set "off" temperature is reached, the vacuum is held for the holding period. Then the firing chamber is ventilated.</p> <p>The appendix contains a table with the vacuum values.</p>

Tab. 5-4 Meaning of the program steps for professional programs

5.5.3. Classic programs

The individual program steps are displayed in the "CVTL" syntax and processed from left to right in the given sequence.

You can find a description of the "CVTL" syntax in section 5.6.3.

5.5.4. Pressing programs

The program steps execute the following individual functions:

Program step	Meaning
Start temperature	The firing object is heated very quickly to the start temperature when the firing chamber is closed.
Final temperature	The closed firing chamber is heated up from the start temperature to the end temperature at the specified increase rate. When the end temperature is reached, the firing object is subjected to the end temperature for the holding period.
Press duration	The muffle is pressed against the ceramic plate of the firing chamber at the set pressure over the pressing time. Click the [Auto] button to activate automated shortening of the pressing time. The pressing time is automatically shortened when the pressure does not have to be adjusted, i.e., it remains constant. Each change in force interrupts the shortening of the pressing time.
Press level	The pressure is built up to the set value. The muffle is pressed at the pressure level against the ceramic plate of the firing chamber. The appendix contains a table with the pressures.

Tab. 5-5 *Meaning of the program steps for pressing programs*

5.5.5. Sleep mode (long-term ready mode)

NOTE:

Sleep mode is only available when long-term readiness is activated in the "Setup" menu (see section 5.7.2.5).

"Sleep mode" procedure

- After the program ends (lift moves up), an acoustic signal sounds,
- Long-term readiness is displayed in the Program Manager by a green field within the [SLEEP] button. The [Cancel program] button remains available,
- The heating is turned off. The firing furnace cools to the firing chamber temperature of 100°C and then closes. The firing chamber continues to cool,
- The screen saver is activated after a set period (see section 5.7.1.4),
- The power consumption of the firing furnace in "Sleep mode" is approximately 10 W.

Ending "Sleep mode"

"Sleep mode" is ended by pressing any key. The following actions automatically occur:

- The lift moves to the bottom position (L0).
- The furnace heats to the start temperature. The following message appears:
"Long-term readiness aborted. Remove the fired object. The firing chamber is set to the start temperature."
- Confirm the entry by pressing [OK]. The firing furnace normally returns to the last program. After a power failure or restarting, it returns to the start window.

NOTE:

Only operate the firing furnace under supervision.

5.6. Program editor

NOTE:

Programs that are protected by the general code cannot be edited. See also section 5.7.1.6.

With the program editor , you can change existing programs or create new firing programs. Furthermore, it is possible to edit a firing program in progress.

When editing a firing program, note the following:

- The keyboard windows are described in sections 5.1.3, 5.1.4 and 5.1.5,
- An entered value must be confirmed by pressing [Enter]. Otherwise, the entry or changed value has no effect,
- Incorrect values cannot be entered. The original value is retained. The permissible value range is displayed in the keyboard window.

Editing while the program is running

After the program starts you can change the firing parameters while the program is running. When editing the program, you can only change the values of the program steps that have not been processed yet.

5.6.1. Easy programs

Easy programs are characterized by:

- fast and easy programming,
- specified firing with an entry mask that provides the basic program steps,
- only individual firing parameters can be changed. The corresponding entry fields are displayed in the program display (see Fig. 5-6) with a yellow background.

Opening the program editor

- In the Program Manager, select the desired firing program, and click [Selected program]. The program display appears (see section 5.4).
- Click on [Edit program]. A green field within the button indicates that the program editor is active. The editable parameters are green. In addition, the "Edit" status is displayed in the information bar.
- Click on a parameter field to edit it. The corresponding keyboard window is automatically opened.

Closing the program editor

- Click [Save] to save the changes.
- Click on [Edit program]. A green field within the button goes dark to indicate that the program editor is inactive. In addition, the "Edit" status in the information bar disappears.

The following table gives an overview of the permissible values for the individual program steps. The buttons in the function bar correspond to the program display (see section 5.4.1).

Program step	Temperature in °C	Temperature rise in °C/min or vacuum level in %	Holding time in min:sec
Dry			00:00 ... 99:59
Close			00:00 ... 99:59
Preheat	100 ... 700		00:00 ... 99:59
Firing temperature	100 ... 1200	0 ... MAX ¹⁾	00:00 ... 99:59
Cooling	2)	4)	00:00 ... 99:59
Relaxation	3)	4)	00:00 ... 99:59
VAC (level/hold)		0 ... 100 ⁵⁾	00:00 ... 99:59

Tab. 5-6 Permissible value range of the program steps for easy programs

- 1) maximum rise for input 0°C/min
- 2) cooling temperature predefined as 90 % of firing temperature
- 3) relaxation temperature predefined as 65 % of firing temperature
- 4) cooling/relaxation temperature is activated as quickly as possible (opening of firing chamber)
- 5) The appendix contains a table with the vacuum values

For programming examples, go to the download area of the DEKEMA website:

<http://www.dekema.com>

5.6.2. Professional programs

Professional programs are characterized by:

- fast and easy programming,
- specified firing with an entry mask that provides the basic program steps,
- All individual firing parameters can be changed. The corresponding entry fields are displayed in the program display (see Fig. 5-7) with a yellow background.

Opening the program editor

- In the Program Manager, select the desired firing program, and click [Selected program]. The program display appears (see section 5.4).
- Click on [Edit program]. A green field within the button indicates that the program editor is active. The editable parameters are green. In addition, the "Edit" status is displayed in the information bar.
- Click on a parameter field to edit it. The corresponding keyboard window is automatically opened.

Closing the program editor

- Click [Save] to save the changes.
- Click on [Edit program]. A green field within the button goes dark to indicate that the program editor is inactive. In addition, the "Edit" status in the information bar disappears.

The following table gives an overview of the permissible values for the individual program steps. The buttons in the function bar correspond to the program display (see section 5.4.2).

Program step	Temperature in °C	Temperature rise in °C/min or vacuum level in %	Holding time in min:sec
Dry			00:00 ... 99:59
Close			00:00 ... 99:59
Preheat	100 ... 700		00:00 ... 99:59
Temperature 1 ¹⁾	100 ... 1200 ⁴⁾	0 ... MAX ⁵⁾	00:00 ... 99:59
Temperature 2 ²⁾	100 ... 1200	0 ... MAX ⁵⁾	00:00 ... 99:59
Temperature 3 ³⁾	100 ... 1200	0 ... MAX ⁵⁾	00:00 ... 99:59
VAC (off/level/hold)	100 ... 1200	0 ... 100 ⁶⁾	00:00 ... 99:59

Tab. 5-7 Permissible value range of the program steps for easy programs

- 1) Temperature 1 corresponds to the firing temperature in easy programs
- 2) Temperature 2 corresponds to cooling in easy programs, but it can also be higher than temperature 1
- 3) Temperature 3 corresponds to relaxation in easy programs, but it can also be higher than temperatures 1 and 2
- 4) Temperature 1 is higher than appreciating temperature
- 5) maximum rise for input 0°C/min
- 6) The appendix contains a table with the vacuum values

For programming examples, go to the download area of the DEKEMA website:

<http://www.dekema.com>

5.6.3. Classic programs

Classic programs are characterized by:

- variable and flexible programming,
- unrestricted firing control,
- all individual firing parameters can be changed as desired,
- all individual firing parameters can be combined as desired.

Opening the program editor

- In the Program Manager, select the desired firing program, and click [Selected program]. The program display appears (see section 5.4.3).
- Click on [Edit program]. A green field within the button indicates that the program editor is active. The command line is green. In addition, the "Edit" status is displayed in the information bar.
- Click on the command line below the parameter display to edit it. The keyboard window for the Classic editor appears.
- The command line is reentered by default.
- In the keyboard window, click on [Edit] when you want to change an existing command line. Note that the commands are normally overwritten. Click [Insert] to insert commands.

The command line shows the commands in the sequence in which they are processed. However, you will need a bit of practice as well as an understanding of ceramics and firing techniques to program with the CVTL commands.

Closing the program editor

- Click [Save] to save the changes.
- Click on [Edit program]. A green field within the button goes dark to indicate that the program editor is inactive. In addition, the "Edit" status in the information bar disappears.

CVTL commands

In particular, the CVTL commands execute the following functions:

Temperature	"C" defines the temperature in °C in the firing chamber (degrees C elsius)
Vacuum	"V" defines the vacuum (V acuum). The appendix contains a table with the vacuum values. <ul style="list-style-type: none"> • V0 = no vacuum or ventilate the firing chamber, • V9 = maximum vacuum.
Lift	"L" and a single-digit number define the lift position (L ift): <ul style="list-style-type: none"> • L0 = bottom-most lift position, • L9 = top lift position.
Time	"T" and at least a double-digit number define the time (T ime) in seconds.
Autodry	"A" defines the temperature in °C on the firing table (A utodry).
Pressure	"L9" and a single-digit number define the pressure. The appendix contains a table with the pressures. <ul style="list-style-type: none"> • L90 = contact pressure, • L99 = maximum pressure.
Audible signals	"T" and a single-digit number define the number of audible signals,
Skip command	"/x(x)"- causes a direct jump to a different memory with automatic continuation of the program. The program is continued without interruption. <ul style="list-style-type: none"> • xx defines the memory number of the program that is to continue, • Number of characters: 1 to 2-character (0...99). No space may be inserted between the jump command "/" command and the program memory number.
Command connector	". " connects two commands. Temperature ramps, lift ramps, press time shortening and active cooling are possible.
Temperature ramp (temperature, firing chamber)	"T0xx.Cxxxx" defines a temperature ramp in the firing chamber by means of a temperature gradient. <ul style="list-style-type: none"> • T defines the ramp in °C/min, • C defines the end temperature in °C in the firing chamber.
Temperature ramp (time, firing chamber)	"T(x)xx.Cxxxx", (x) <> 0 defines a temperature ramp in the firing chamber by means of time. <ul style="list-style-type: none"> • T defines the time in s, • C defines the end temperature in °C in the firing chamber.

Temperature ramp (temperature, object)	<p>"T0xx.Axxxx" defines a temperature ramp of the firing object by means of a temperature gradient.</p> <ul style="list-style-type: none"> • T defines the ramp in °C/min, • A defines the end temperature in °C at the firing table (firing object).
Temperature ramp (time, object)	<p>"T(x)xx.Axxxx", (x) <> 0 defines a temperature ramp of the firing object by means of time.</p> <ul style="list-style-type: none"> • T defines the time in s, • A defines the end temperature in °C at the firing table (firing object).
Lift ramp	<p>"T(x)xx.Lx" defines a lift ramp.</p> <ul style="list-style-type: none"> • T defines the time in s, • L defines the lift end position.
Press time shortening PTA	<p>"TxxxxX.PTA" defines the press time shortening (Press Time Automatic). They must be entered directly after a press command.</p> <ul style="list-style-type: none"> • T defines the press time in s, • The PTA is a single-digit number and defines the press time shortening in PTA × 10%. <p>The remaining time shown in the PTA command is automatically shortened when the force adjustment has come to a rest.</p> <p>The first time shortening occurs after the pressure has not changed for 35 s. As long the pressure remains constant and the pressing time is not over, the remaining pressing time is shortened after 5 seconds. Each change in force interrupts the process. The current press time continues. The time shortening then restarts after 35 s constant pressure, etc.</p> <p>Tip: You can string several time commands in a sequence; for example, to ensure a safety press time. The pressure remains steady between the time commands and does not drop. You can also work with different pressures if you set additional press commands between the times. You can also apply pressure without a vacuum.</p>
Active cooling	<p>"V.Cxxxx" defines fast cooling when the firing chamber is minimal open. Outside air is conducted through the firing chamber by means of the vacuum pump.</p> <p>Note: The firing chamber must be closed before generating a vacuum (L9 command).</p> <ul style="list-style-type: none"> • V defines the cooling air stream through the opening of an additionally integrated flooding valve, • C defines the temperature in °C in the firing chamber.

Two sequential commands can be separated by a space for clarity.

The syntax is checked when you confirm your entry. If the entered command line contains an error, then a warning appears. In this case, correct for the command line.

Examples

Examples of programming are found in the download area of the DEKEMA website (<http://www.dekema.com>) or in the separate instructions for classic programming.

5.6.4. Pressing programs

Press programs are characterized by:

- fast and easy programming,
- specified firing with an entry mask that provides the basic program steps,
- only individual firing and pressing parameters can be changed. The corresponding entry fields are displayed in the program display (see Fig. 5- 9) with a yellow background.

Opening the program editor

- In the Program Manager, select the desired firing program, and click [Selected program]. The program display appears (see section 5.4).
- Click on [Edit program]. A green field within the button indicates that the program editor is active. The editable parameters are green. In addition, the "Edit" status is displayed in the information bar.
- Click on a parameter field to edit it. The corresponding keyboard window is automatically opened.

Closing the program editor

- Click [Save] to save the changes.
- Click on [Edit program]. A green field within the button goes dark to indicate that the program editor is inactive. In addition, the "Edit" status in the information bar disappears.

The following table gives an overview of the permissible values for the individual program steps. The buttons in the function bar correspond to the program display (see section 5.4.1).

Program step	Temperature in °C	Temperature rise in °C/min or pressing parameters	Holding time in min:sec
Start temperature	100 ... 700		
End temperature	700 ... 1200	0 ... MAX ¹⁾	00:00 ... 99:59
Pressing time		[Auto] ²⁾	00:00 ... 99:59
Pressure level		0 ... 9 ³⁾	

Tab. 5-8 Permissible value range of the program steps for easy programs

1) maximum rise for input 0°C/min

2) Automatic press time shortening

3) The appendix contains a table with the pressures

For programming examples, go to the download area of the DEKEMA website:

<http://www.dekema.com>

5.6.5. Creating a new program

Follow the procedure below to create a new program:

1. Click an empty memory in the Program Manager.
2. The "Program selection" window appears and offers a drop-down list:



Fig. 5-13 "Program selection" window

- Select "Easy" when you want to create an easy program (see section 5.6.1),
 - Select "Professional" when you want to create a professional program (see section 5.6.2),
 - Select "Classic" when you want to create a classic program (see section 5.6.3),
 - Select "Press" when you want to create a press program (see section 5.6.4).
3. Click on [OK]. The program display for the selected program type appears.
 4. Edit the new program. You can find programming suggestions in section 5.6.6.
 5. Click the field for the program name. The alphanumeric keyboard window opens. Enter a program name.
 6. In the program display, click [Save] to save the changes.

5.6.6. Programming Suggestions

You can find non-binding programming suggestions for conventional ceramic materials at <http://www.dekema.com>. The programs are firing programs converted according to manufacturer's instructions for DEKEMA dental ceramic furnaces of the AUSTROMAT® series. You can load these programs into your firing furnace (see section 6.7.4).

The parameters such as rise times, temperatures and hold times indicated by the respective manufacturer are transferred to the programs. These quantities depend on the conditions of use such as the size and material of the firing tray or soft firing cushion, the size and weight of the fired object, or the firing oven used when the ceramic manufacturer was determining the firing - parameters.

To obtain the best firing results, DEKEMA recommends that you carry out a sample firing before the first ceramic firing. If different firing material is fired in your AUSTROMAT®, regular cleaning firings are recommended. This reduces contamination and foreign impurities on the fired material and thermocouple to an acceptable level. Never use additives during the cleaning firing!

5.7. Setup menu

The "Setup" menu is used for system control, to change less frequently used settings of the firing furnace, to launch maintenance programs, and to record data. The "Setup" menu can be opened by clicking on the [Setup] function key in the Program Manager. It is accessible to laboratory users if not blocked by the supplier for a specific customer.

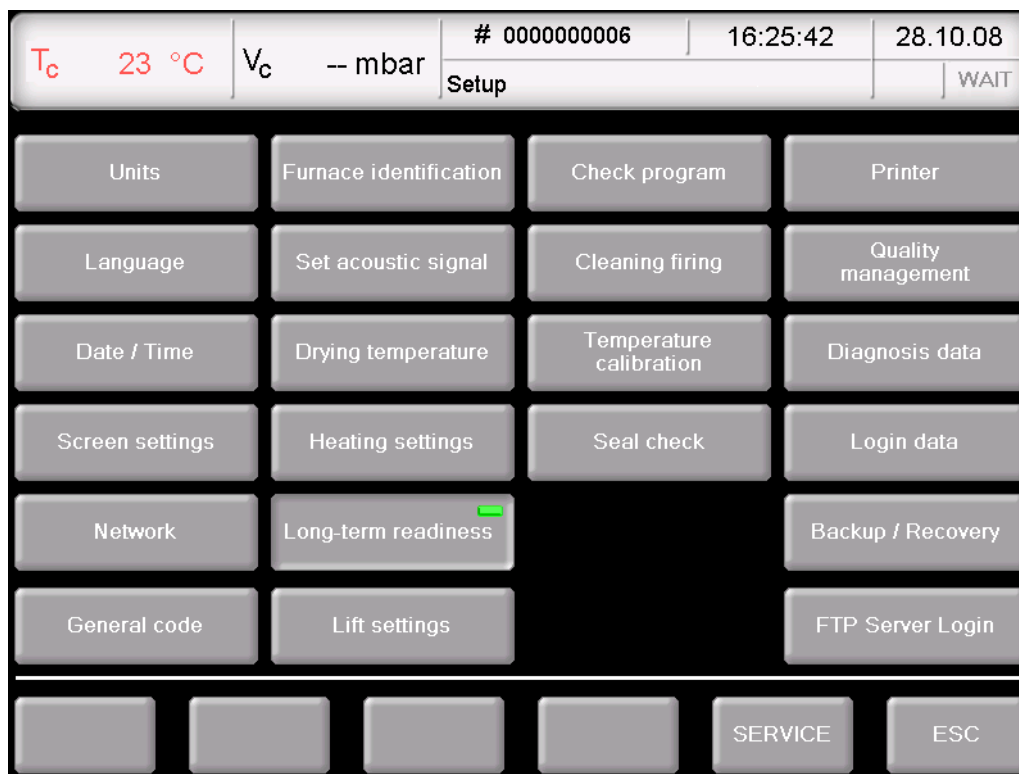


Fig. 5-14 "Setup" menu

Buttons

- [SERVICE]:
Opens the "Service" menu. The "Service" menu is only available when you are authorized for level "2" (see section 2.5).
- [ESC]:
Return to the Program Manager (see section 5.3).

The following table lists the available functions in the "Setup" menu and provides a short description. A detailed explanation can be found in the indicated section in the column "See section".

Function	Description	See section
System control functions		
[Units]	Select the units for temperature, pressure and compression.	5.7.1.1
[Language]	Select a language for the user interface.	5.7.1.2
[Date/time]	Current date and time in the firing furnace control.	5.7.1.3
[Screen setting]	Determines how long to wait until the screensaver is activated after an entry is made.	5.7.1.4
[Network]	Network settings for the firing furnace.	5.7.1.5
[General code]	Access levels for the firing furnace.	5.7.1.6
Settings for the firing furnace		
[Furnace identification]	Enter the furnace ID.	5.7.2.1
[Set acoustic signal]	Set the acoustic signal at the end of the program.	5.7.2.2
[Drying temperature]	Set the drying temperature.	5.7.2.3
[Heating settings]	Defines the maximum temperature rise rates and power consumption.	5.7.4.4
[Long-term readiness]	Specifies if "Sleep mode" is active after the end of a program.	5.7.2.5
[Lift settings]	Specifies if a warning is displayed before opening the lift when the firing chamber is hot.	5.7.2.6
Maintenance programs		
[Check program]	Executes the check program to check the function of the most important components.	5.7.3.1

Function	Description	See section
[Cleaning firing]	Runs a cleaning firing.	5.7.3.2
[Temperature calibration]	Calibrates the temperature and sets the CCF value (calibration factor).	5.7.3.3
[Seal check]	Runs a tightness test of all components in the vacuum system.	5.7.3.4
Data recording and transfer		
[Printer]	Specifies a printer for the firing furnace.	5.7.4.1
[Quality management]	Determines if a QM report is displayed after a program.	5.7.4.2
[Diagnosis data]	Shows the diagnostic data that is created by the check program.	5.7.4.3
[Login data]	Defines the authorizations to use the firing furnace via the web interface.	5.7.4.4
[Backup / Recovery]	Backs up and restores the data in the firing furnace control.	5.7.4.5
[FTP Server Login]	Defines the access to the firing furnace on an FTP server.	5.7.4.6

Tab. 5-9 Functions in the "Setup" menu

5.7.1. System control functions

5.7.1.1. Units

In the "Setup" menu, click the [Units] button. The following window for selecting the units for temperature, pressure and compression appears. The set unit is marked.

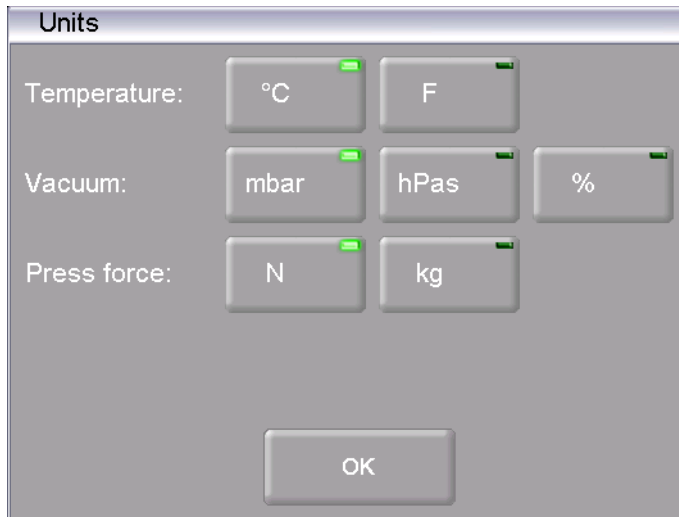


Fig. 5-15 Setup > Units

Buttons

- [OK]: Accepts the settings and switches back to the "Setup" menu.

Select unit

Click on the unit. A green field within the button indicates that the related unit is selected:

- Temperature: Choose °C or F (Fahrenheit);
Conversion formula: $T_F = T_C \times 1.8 + 32$ or $T_F = 9/5 T_C + 32$
- Vacuum (optional only for vacuum ovens): Select mbar, hPa and %; conversion formula 1 mbar = 1 hPa
- Compression (optional, only for press ovens): Select either N or kg;
1 kg approximately corresponds to 9.81 N
- Remaining path: Choose mm or inches;
Conversion formula: 1 inch = 2.54 cm

5.7.1.2. Language

In the "Setup" menu, click the [Language] button. The following window appears for selecting the language of the user interface. The option field identifies the currently set language.



Fig. 5-16 Setup > Language

Buttons

- [OK]:
Accepts the settings and switches back to the "Setup" menu.
- [ESC]:
Closes the window and switches back to the "Setup" menu. The changes will not be saved.

Select language

- Click on the option field for the desired language.

5.7.1.3. Date/time

In the "Setup" menu, click the [Date/Time] button. The following window opens for setting a date and time of the firing furnace control. The current date and time are displayed.

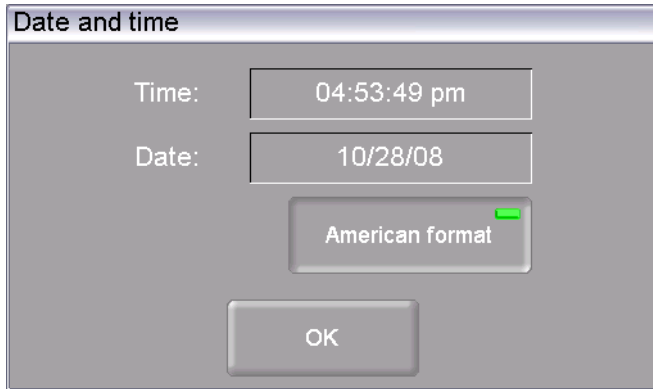


Fig. 5-17 Setup > Date/time

- | | |
|------------------------|--|
| Buttons | <ul style="list-style-type: none"> • [OK]:
Accepts the settings and switches back to the "Setup" menu. |
| Change date/time | <p>You can change the date and time as follows:</p> <ul style="list-style-type: none"> • Click on the date or time. The numeric keyboard window appears. • Enter the desired date or time. |
| Select the date format | <p>With this button, you can choose the European or American format for the date and time. A green field within the button indicates that the American date format is active.</p> <ul style="list-style-type: none"> • European format, such as "14:29:12", and "15.5.2005" for May 15, 2005 • American date format, such as "02:29:12 pm" and 5/15/2005 for May 15, 2005. |

5.7.1.4. Screen setting

In the "Setup" menu, click the [Screen settings] button. The following window appears for setting the screen saver.

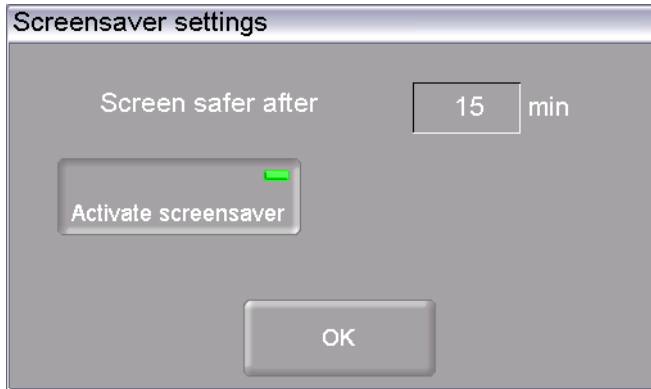


Fig. 5-18 Setup > Screensaver

Buttons	<ul style="list-style-type: none"> • [OK]: Accepts the settings and switches back to the "Setup" menu.
Screensaver after	<p>The screen saver makes the screen go dark after the device has not been used for a while (less power consumption and longer screen life). When you press any key or touch the touchscreen, the original display appears. The screensaver starts after the indicated time without an entry (inactivity of the entry device). Change this time as follows:</p> <ul style="list-style-type: none"> • Click on the time. The numeric keyboard window appears. • Enter the desired time.
Activate screen saver	<p>You can activate and deactivate the screensaver with the button. A green field within the button indicates that the screensaver is active.</p>

5.7.1.5. Network

NOTE:

Consult section 4.4 about connecting the firing furnace with a network.

In the "Setup" menu, click the [Network] button. The following window appears with the network settings for the firing furnace. The current addresses in the network are displayed.

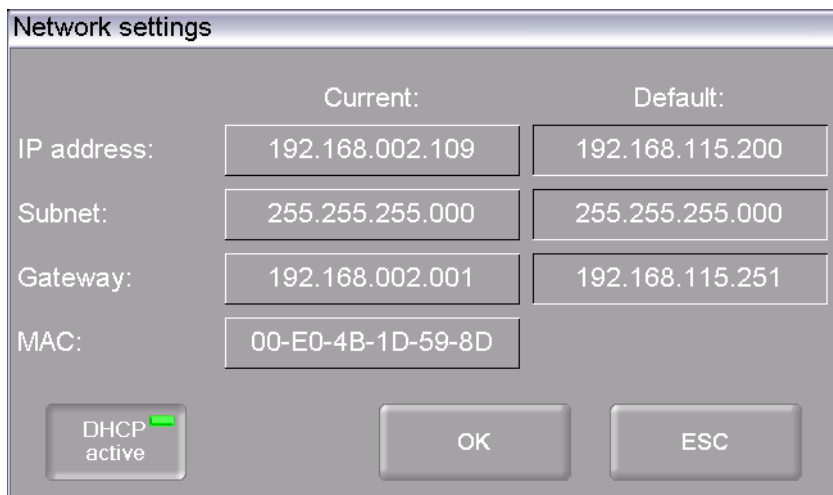


Fig. 5-19 Setup > Network

Buttons

- [OK]: Accepts the settings and switches back to the "Setup" menu.
- [ESC]: Closes the window and switches back to the "Setup" menu. The changes will not be saved.

Change IP address

Change an address as follows:

- Click on the corresponding address. The alphanumeric keyboard window appears.
Note: The current IP address cannot be edited.
- In the keyboard window, click on [Edit].
- Enter the desired program number.

DHCP active

Use the button to assign an IP address to the firing furnace from your network server. A green field within the button indicates that the DHCP function is active.

5.7.1.6. General code

You can use this function to protect firing programs from changes (block) (see also section 2.5). Note the following usage restrictions before activating the general code.

- Programs protected by the general code cannot be edited or changed. The program manager cannot be opened for these programs,
- Programs protected by the general code cannot be deleted.
- Program numbers protected by the general code are not available as targets for copying (Program Manager),
- The functionality in the "Setup" menu is strongly restricted.

Activate general code

- In the "Setup" menu, click the [General code] button. The alphanumeric keyboard window appears.
- Enter the password for the general code. The following "General code" window appears.

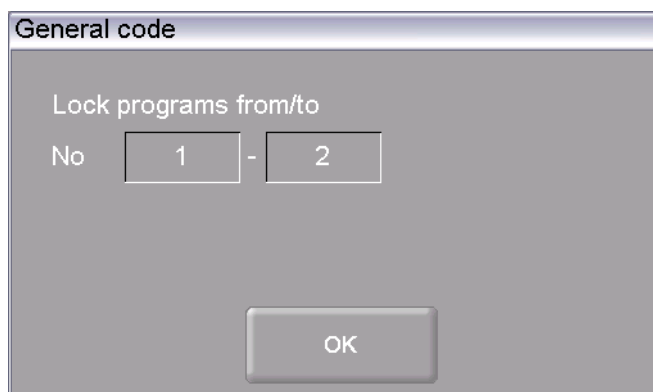


Fig. 5- 20 "General code" window

Buttons

- [OK]: Accepts the settings and switches back to the "Setup" menu.

Protect program memories

Select the protected program memories as follows:

- Click on the corresponding program numbers "from" and "to". The numeric keyboard window appears.
- Enter the desired program numbers.
- Click on [OK].

Programs protected by the general code are marked in the Program Manager with a lock and have a colored background. In the program display, a lock in the information bar indicates that a program is protected.



Fig. 5-21 Lock symbol for protected programs

Deactivate general code

- In the "Setup" menu, click the [General code] button. The alphanumeric keyboard window appears.
- Enter the password for the general code.

The general code is deactivated.

Change protected programs

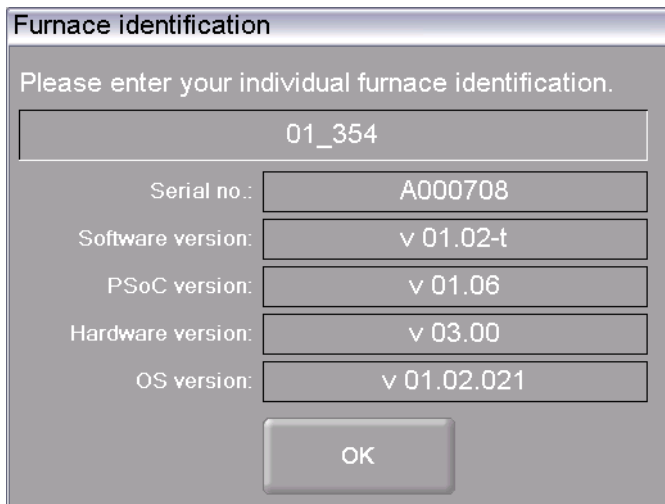
Change the protected program memories when the general code is activated as follows.

- Deactivate the general code.
- Reactivate the general code, and change the protected program range as desired.

5.7.2. Settings for the firing furnace

5.7.2.1. Furnace identification

In the "Setup" menu, click the [Furnace identification] button. The following window appears for entering the furnace ID. The current furnace ID is displayed together with the current, furnace-specific hardware and software versions.



Furnace identification	
Please enter your individual furnace identification.	
01_354	
Serial no.:	A000708
Software version:	v 01.02-t
PSoC version:	v 01.06
Hardware version:	v 03.00
OS version:	v 01.02.021
OK	

Fig. 5-22 Setup > Furnace identification

- | | |
|-------------------|---|
| Buttons | <ul style="list-style-type: none">• [OK]:
Accepts the settings and switches back to the "Setup" menu. |
| Change furnace ID | <p>To prevent confusing firing furnaces from each other (for example when printing records), an individual ID can be entered for each firing furnace.</p> <ul style="list-style-type: none">• Click the entry field for the furnace ID. The alphanumeric keyboard window appears.• Enter the desired furnace ID. |

5.7.2.2. Set acoustic signal

In the "Setup" menu, click the [Set acoustic signal] button. The following window appears for selecting and testing the acoustic signal at the end of the program. The current signal is displayed.

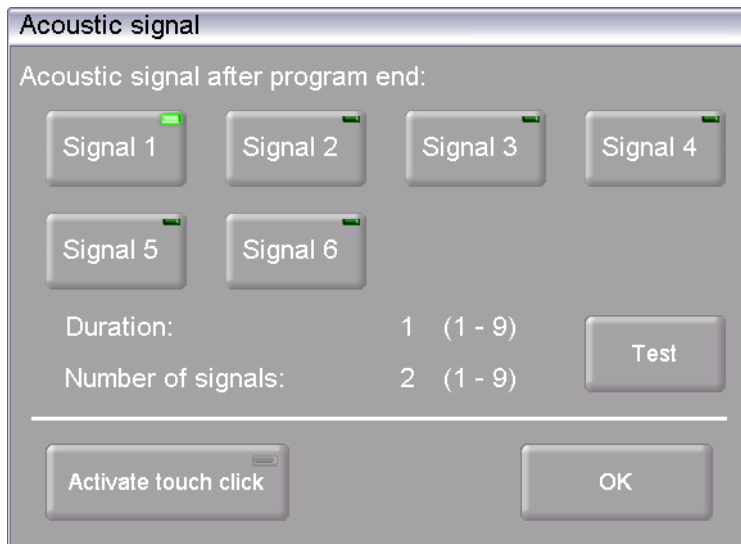


Fig. 5-23 Setup > Acoustic signal

Buttons	<ul style="list-style-type: none"> • [OK]: Accepts the settings and switches back to the "Setup" menu. • [Test]: The selected signal sounds for a test.
Select acoustic signal	<p>There are six default acoustic signals you can select that each consist of individual tones. The duration (in seconds) and number of tones varies from 1 to 9.</p> <p>Click on the appropriate button to select the desired signal. A green field within the button indicates that the function is active.</p>
Activate Touchclick	<p>When touchclick is activated, the firing furnace emits a confirmation signal each time a key is pressed. A green field within the button indicates that the function is active.</p>

5.7.2.3. Drying temperature

In the "Setup" menu, click the [Drying temperature] button. The following window appears for setting the drying temperature of the firing furnace. The current drying temperature is displayed.



Fig. 5-24 Setup > Drying temperature

Buttons

- [OK]: Accepts the settings and switches back to the "Setup" menu.

Change drying temperature

The approximate drying temperature near the firing object applies to all the firing programs. Change the drying temperature if your firing tests indicate that the temperature setting seems too low or too high:

- Click on the temperature. The numeric keyboard window appears.
- Enter the desired drying temperature.

5.7.2.4. Heating settings

In the "Setup" menu, click the [Heating settings] button. The following window is displayed for setting customer-specific maximum levels for the rise rate in [°C/min].

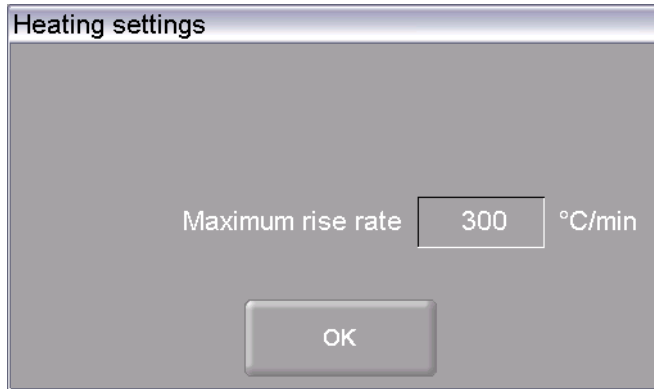


Fig. 5-25 Setup > Heating settings

Buttons

- [OK]:
Accepts the settings and switches back to the "Setup" menu.

Change the maximum rise rate

The maximum rise rate limits the temperature ramp of the firing furnace. Change the maximum rise rate as follows:

- Click on the corresponding entry field. The numeric keyboard window appears.
- Enter the desired value.

A table with the maximum heating speeds can be found in the appendix (see section 9.3).

5.7.2.5. Long-term readiness

When the function "Long-term readiness" is turned on, you can turn on the "Sleep mode" of the firing furnace in the Program Manager (see section 5.5.5).

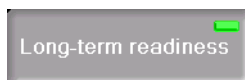


Fig. 5-26 Setup > Long-term readiness

Click on the button to activate and deactivate the "Long-term readiness" function. A green field within the button indicates that the function is active.

The power consumption of the firing furnace in "Sleep mode" is approximately 10 W.

5.7.2.6. Lift settings

NOTE:

For safety reasons, we recommend not deactivating the warning.

In the "Setup" menu, click the [Lift settings] button. The following window to specify the behavior of the firing furnace in critical lift positions is displayed.

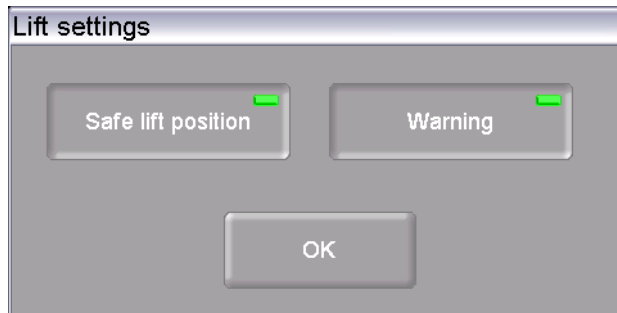


Fig. 5-27 Setup > Lift settings

Buttons

- [OK]:
Accepts the settings and switches back to the "Setup" menu.

Safe lift position

After a pressing procedure, the developed heat can in rare instances (for example when the plunger is not completely clean) cause the plunger to stick to the ceramic plate. The plunger can then fall out of the firing chamber during cooling. To avoid burns, we recommend moving the lift into the safe lift position after pressing, and check if the plunger(s) are in the muffle.

Click the button to move the lift to the save position after pressing is over. A green field within the button indicates that the function is active.

Warning

When the "Warning" function is turned on, a warning appears before you open a hot firing chamber (temperature higher than 200°C). You are asked, "OPEN LIFT?". Confirm the query when you want to move the lift down and open the hot firing chamber.

Click the button to activate the warning display. A green field within the button indicates that the function is active.

5.7.3. Maintenance programs

5.7.3.1. Check program

NOTE:

Start the check program only after running several firing programs, or after a cleaning firing so that the firing oven is warmed up.

The AUSTROMAT® has an internal program, the check program, that checks the function of the major components. Regularly using this non-editable program makes it easier for you and the responsible service personnel to identify aged components (such as heating element wear) and troubleshoot malfunctions. After approximately 2000 firings, the firing oven displays a recommendation on the screen to start the self-check program.

In the "Setup" menu, click the [Check program] button. The following window appears for starting the check program.

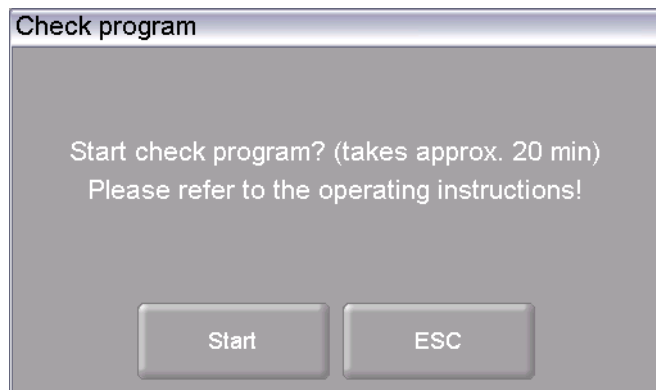


Fig. 5- 28 Setup > Check program

Buttons	<ul style="list-style-type: none"> • [Start]: Starts the check program (duration: approximately 20 minutes). • [ESC]: Closes the window and switches back to the "Setup" menu.
Start program	<p>Click on [Start]. The "Check program" window is displayed as long as the program is running. You can terminate the program at any time when you click the [Stop] button. A safety query appears and asks if you really want to end the program:</p> <ul style="list-style-type: none"> • [OK]: Confirm your decision and in the program, • [ESC]: Change your decision and continue the program.
Check program	You can find instructions on the check program in section 7.3.

5.7.3.2. Cleaning firing

Use the cleaning firing to clean the firing chamber and the thermocouple.

In the "Setup" menu, click the [Cleaning firing] button. The following window appears to start the cleaning firing. The set end temperature is displayed.

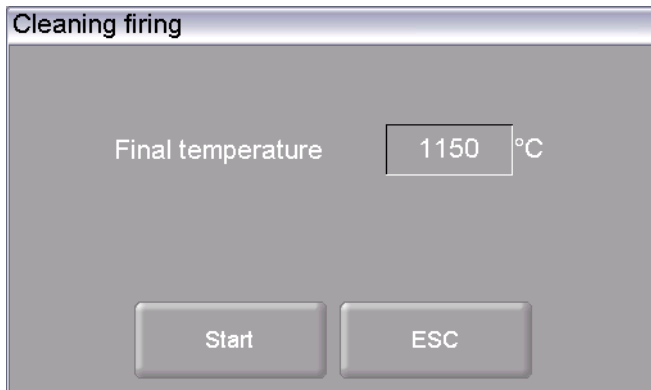


Fig. 5- 29 Setup > Cleaning firing

Buttons	<ul style="list-style-type: none">• [Start]: Starts the cleaning firing (duration: approximately 20 minutes depending on the end temperature).• [ESC]: Closes the window and switches back to the "Setup" menu.
Change end temperature	<ul style="list-style-type: none">• Click on the end temperature. The numeric keyboard window appears.• Enter the desired temperature.
Start program	<p>Click on [Start]. The "Cleaning firing" window is displayed as long as the program is running. You can terminate the program at any time when you click the [Stop] button. A safety query appears and asks if you really want to end the program:</p> <ul style="list-style-type: none">• [OK]: Confirm your decision and in the program,• [ESC]: Change your decision and continue the program.

5.7.3.3. Temperature calibration

NOTE:

For temperature calibration, please use only the DEKEMA calibration set for this device type, and preheat the firing furnace.

In the "Setup" menu, click the [Temperature calibration] button. The following temperature calibration window appears. The set CCF value is shown.

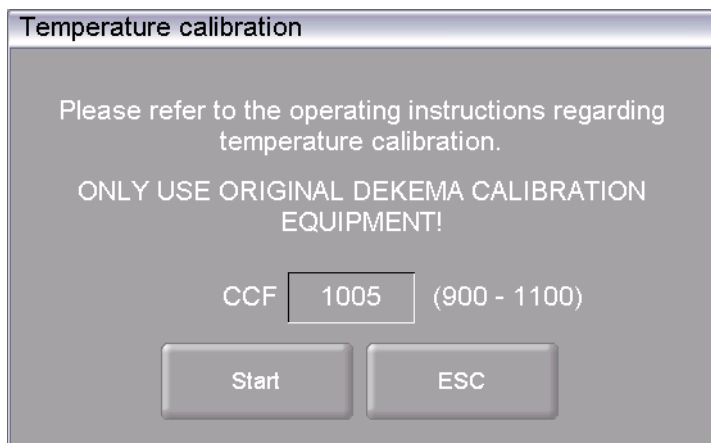


Fig. 5- 30 Setup > Temperature calibration

- | | |
|-----------------------|--|
| Buttons | <ul style="list-style-type: none"> • [Start]: Starts temperature calibration. • [ESC]: Closes the window and switches back to the "Setup" menu. The changes will not be saved. |
| Calibrate temperature | <p>The procedure for calibrating the temperature is in section 7.2. You can terminate the program at any time when you click the [Stop] button. A safety query appears and asks if you really want to end the program:</p> <ul style="list-style-type: none"> • [OK]: Confirm your decision and end the program. • [ESC]: Change your decision and continue the program. |
| Change CCF value | <ul style="list-style-type: none"> • Click on the CCF value. The numeric keyboard window appears. • Enter the desired CCF value. |

5.7.3.4. Seal check

The tightness test checks all the components of the vacuum system and the firing chamber for a sufficient seal and provides an error analysis. Run this program occasionally to prevent improper firing. We recommend cleaning the seals and lift seat before starting the tightness test (see section 7.1).

In the "Setup" menu, click the [Seal check] button. The following window appears to perform the tightness test. The set CCF value is shown.



Fig. 5- 31 Setup > Seal check

Buttons	<ul style="list-style-type: none"> • [Start]: Starts the tightness test. • [ESC]: Closes the window and switches back to the "Setup" menu. The changes will not be saved.
Start program	<p>Click on [Start]. The "Tightness test" window is displayed as long as the program is running. You can terminate the program at any time when you click the [Stop] button. A safety query appears and asks if you really want to end the program:</p> <ul style="list-style-type: none"> • [OK]: Confirm your decision and in the program, • [ESC]: Change your decision and continue the program.
Pressure display	Shows the pressure in the firing chamber.

Perform the tightness test

After the program starts, the firing chamber is closed, heated and evacuated. When the maximum vacuum is achieved, the prompt "Flood chamber?" appears. Monitor the pressure display over approximately two minutes. A rise in pressure of about 20 mbar over two minutes (10 mbar/min) is normal and means that the firing furnace is vacuum-tight. You can now click [OK] in the "Flood chamber?" window. The firing chamber is ventilated and then opened.

When you observe a much higher rise in pressure: Clean and check all the components of the vacuum system (replace the seals and hoses if necessary), and repeat the tightness test.

NOTE:

Always coat the sealing ring on the lift seat (O-ring) with talcum powder after cleaning so that the lift seat holds to the firing furnace housing.

5.7.4. Data recording and transfer

5.7.4.1. Printer

In the "Setup" menu, click the [Printer] button. The following printer settings window appears.

The screenshot shows a dialog box titled "Printer settings". It is organized into sections. The "Communication" section has a drop-down menu currently set to "Network". The "Type of printer" section has a drop-down menu set to "PCL4/5/6 printer". Below these is a section titled "TCP/IP settings" which is separated by a horizontal line. Under this section, the "IP address" field contains "192.168.115.114" and the "Port" field contains "9100". At the bottom of the dialog is an "OK" button.

Fig. 5- 32 Setup > Printer

Buttons	<ul style="list-style-type: none"> • [OK]: Closes the window and switches back to the "Service" menu.
Communication	Specifies the interface for the printer (drop-down list).
Printer type	In the printer type fields, you can specify the printer (drop-down list) for example to print out record data.
TCP/IP settings	Settings for a network printer.

5.7.4.2. Quality management

In the "Setup" menu, click the [Quality management] button. The following quality management window appears.

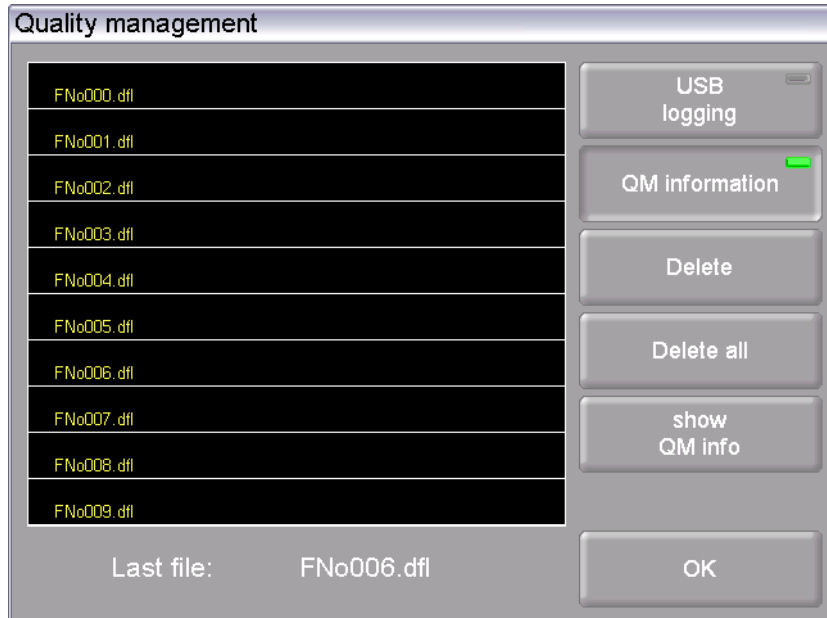


Fig. 5- 33 Setup > Quality management

The firing furnace logs the ten last firing programs that have run. If more than ten firing programs have run, these QM files are overwritten starting with the last one.

Last file	The name of the QM file of the last run firing program.
USB record	Click this button to activate and deactivate the recording of data to an external USB stick. A green field within the button indicates that the function is active. The QM files are additionally updated on the USB stick (USB record).
QM information	Click on the button to display the QM information after each firing program is over. A green field within the button indicates that the function is active. <ul style="list-style-type: none"> • Not active: QM information is logged but not displayed. • Active: After a firing program is over, the related detailed firing information appears on the display.
Buttons	<ul style="list-style-type: none"> • [Delete]: Deletes the selected QM file. • [Delete all]: Deletes all QM files together. • [Display QM info]: Displays the selected QM file. • [OK]: Accepts the settings and switches back to the "Setup" menu.

5.7.4.3. Diagnosis data

In the "Setup" menu, click the [Diagnosis data] button. The following diagnostic data window appears.

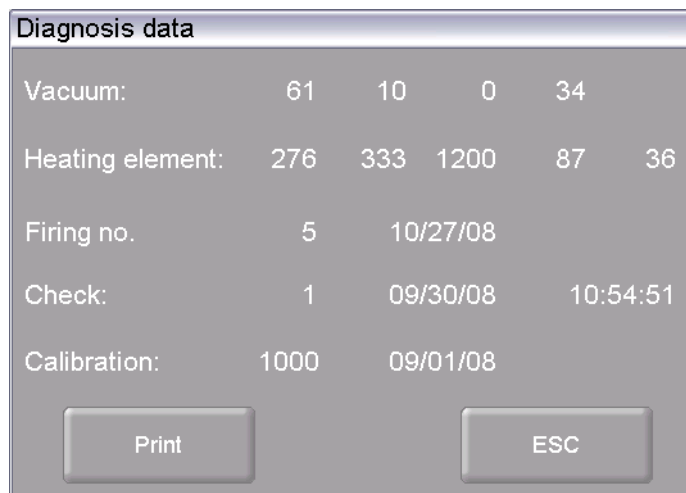


Fig. 5-34 Setup > Diagnostis data

Buttons

- [Print]: Prints the diagnostic data. Note that a printer must be connected and set up (see section 5.7.4.1).
- [ESC]: Closes the window and switches back to the "Setup" menu.

The diagnostic data are created by the check program and saved in a diagnostic file (see section 5.7.3.1). The values and interpretation of the diagnosis data are important for the service personnel. For remote diagnosis, you can output the diagnostic file on the screen or send it by e-mail (see page 2). The data have little significance for the user. They are therefore not detailed here.

5.7.4.4. Login data

NOTE:

As long as no HTML access is defined (that is, the fields "Username" and "Password" are empty, each user of the computer can access the firing furnace.

NOTE:

If the username or password becomes lost, contact your service partner or directly contact DEKEMA (see page 2..

The HTML access authorizes users to access the firing furnace control via the web interface. The password is defined in the "HTML access" window. This password must be entered in the browser on the computer to obtain access to the firing furnace. See also section 4.4.3.

In the "Setup" menu, click the [Login data] button. The following HTML access window appears.



Fig. 5-35 Setup > Login data

Buttons	<ul style="list-style-type: none"> • [OK]: Accepts the settings and switches back to the "Setup" menu.
Password	<p>Specify the password as follows:</p> <ul style="list-style-type: none"> • Click on the "Password" entry field. The alphanumeric keyboard window appears. • Enter the password.
Release the start/stop function via the Web server	<p>In order for you to use the firing furnace via the user interface on the computer (start firing programs, move lift, etc.), the start/stop function must be released.</p> <p>Click the button to release or block the start/stop function via the Webserver. A green field within the button indicates that the function is active.</p>
Release the function keys for furnace commands via the Webserver	<p>In order for you to execute functions of the touchscreen (see section 3.3) via the Webserver, the function keys of the PC keyboard must be released.</p> <p>Click the button to release or block the function keys for the furnace commands. A green field within the button indicates that the function is active.</p>

5.7.4.5. Backup / Recovery

NOTE:

For reasons of data safety and to prevent the loss of firing oven data, it is recommendable to regularly back up all your data.

In the "Setup" menu, click the [Backup/Recovery] button. The following window for backing up and recovering data appears.

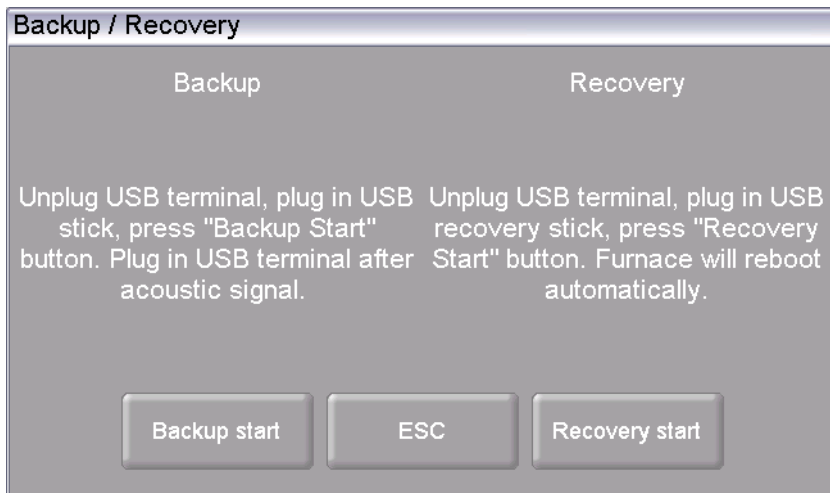


Fig. 5- 36 Setup > Backup / Recovery

Buttons

- [Backup Start]: Starts backing up the data.
- [ESC]: Closes the window and switches back to the "Setup" menu.
- [Recovery Start]: Starts recovering the data.

Backup data

Follow the instructions under "Backup" in the "Backup / Recovery" window:

1. Insert a USB stick (make sure there is enough free memory) into the USB port in the back of the firing furnace.
2. Click on [Backup Start]. All the data of the firing furnace (operating system, software, set parameters and firing programs) are written to the USB stick.
3. Wait until an acknowledgement beep sounds. It signals the conclusion of the backup process.
4. Remove the USB stick.

You have successfully backed up the firing furnace data. If data is lost, you can restore the data with the USB stick. Be sure to carefully store the USB stick and do not accidentally overwrite the backed up data.

Restoring data

Follow the instructions under "Recover" in the "Backup / Recovery" window:

1. Insert the USB stick with the backed up data into the USB port in the back of the firing furnace.
2. Click on [Recovery Start]. All the data of the firing furnace (operating system, software, set parameters and firing programs) are restored from the USB stick.
3. Wait until an acknowledgement beep sounds. It signals the conclusion of the recovery process.
4. Remove the USB stick.

You have successfully restored up the firing furnace data.

5.7.4.6. FTP Server Login

NOTE:

There are many DEKEMA-independent programs available to set up an external FTP server. For further information, please contact your network administrator.

With the FTP functionality, you can access an externally-linked FTP server. You can for example link picture folders and files to the firing furnace and view them while the program is running.

In the "Setup" menu, click the [FTP Server Login] button. The following window for accessing an FTP server appears.

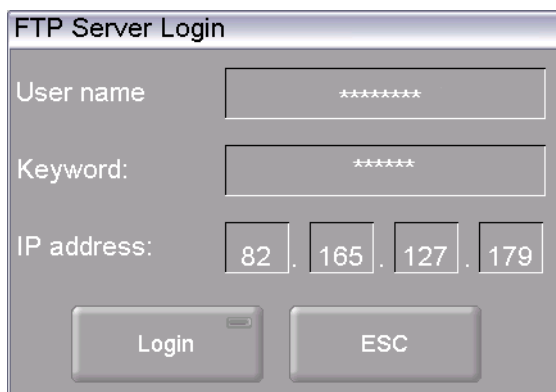


Fig. 5- 37 Setup > FTP Server Login

- | | |
|------------|---|
| Buttons | <ul style="list-style-type: none">• [ESC]:
Closes the window and switches back to the "Setup" menu. |
| User name | User name under which you have access to the FTP server. <ul style="list-style-type: none">• Click on the "User name" entry field. The alphanumeric keyboard window appears.• Enter your user name. |
| Password | Password with which you have access to the FTP server. <ul style="list-style-type: none">• Click on the "Password" entry field. The alphanumeric keyboard window appears.• Enter the password. |
| IP address | IP address of the FTP server. <ul style="list-style-type: none">• Click on the corresponding "IP address" entry field. The numeric keyboard window appears.• Enter the IP address of the FTP server. |
| Login | Click the button to connect the firing furnace to the indicated FTP server. A green field within the button indicates that the connection is active. |

Establish a connection to the FTP server

The connection with an FTP server is only established if all access data (user name, password, IP address) are correct. Proceed as follows to connect the firing furnace to an FTP server.

1. Enter the user name for your FTP access.
2. Enter the password for your FTP access.
3. Enter the associated IP address of the FTP server.
4. Click [Login] to establish the connection between the firing furnace and FTP server.

When you want to terminate the connection, relick [Login].

6. Use

NOTE:

When using the firing furnace, observe section 2, Safety.

6.1. Turning on and off

NOTE:

Never operate the firing furnace without supervision.

Preparations

Check the following:

- if the AUSTROMAT® is connected by a power cable to a socket with a protected contact (see section 4.3),
- the vacuum pump is correctly connected to the firing furnace (see section 4.3),
- the firing furnace is connected via a Web interface to an individual computer or network (see section 4.4).



Switching on

- Turn on the firing furnace:
 - Main switch on the back of the firing furnace: The control of the firing oven starts up over a period of about 1 minute. The firing furnace performs an internal software and hardware check, and the lift moves down automatically. or
 - On/off switch in standby mode next to the touchscreen if the firing furnace is already in standby mode. The firing furnace is ready for use.
- Make sure that the firing furnace is mounted on the lift seat. If not: Turn the firing furnace off, and mount the firing table. Then turn on the firing furnace again.

Switching off

- Close the firing chamber before switching off the firing furnace to avoid unnecessary condensation in the ceramic furnace.
- Turn off the firing furnace:
 - Main switch on the back of the firing furnace, or
 - On/off switch in standby mode next to the touchscreen.

6.2. Mounting and removing a firing object

⚠ WARNING	
 	<p>Hot surfaces.</p> <p>The firing chamber can reach temperatures above 1,000°C during operation. There is an extreme burning hazard from touching hot surfaces after the firing chamber is opened.</p> <p>Never directly contact hot parts of the firing furnace. The firing furnace requires several hours to cool after it is turned off. Observe the following instructions:</p> <ul style="list-style-type: none"> • Do not use your hands or any objects to grasp things in the firing chamber, • Do not grasp the lift seat, firing table or firing objects with your bare hands, • Use suitable tools (tweezers) to remove the firing objects, or wear safety gloves.

Mounting the firing object

- Place the firing object on the firing tray, and place the firing tray in the middle of the firing table.
- When positioning the firing object and firing tray, ensure that no parts jut out over the edge of the firing table. There is a danger of damaging the firing object and thermal insulation material when closing the firing furnace.



Fig. 6-1 Mounting the firing object

- The height of the firing tray including the firing object may not exceed the following dimensions. Otherwise, the thermocouple would be damaged in the firing chamber when the chamber is closed:
 - Firing function: 65 mm height,
 - Pressing function: 87 mm high.

Removing the firing object

- Use suitable tools (tweezers) to remove the firing objects, or wear safety gloves.

6.3. Select programs and start them

6.3.1. With the touchscreen

You can find a description of the touchscreen and function keys in section 3.3.

The control of the firing furnace is identical on the touchscreen and Web interface. (see section 6.3.2).

6.3.2. With the Web interface

NOTE:

To operate the firing furnace using the web interface, your browser must be Java-capable, and the Java application must be activated.

6.3.2.1. Start Web interface

1. Start the browser on the computer.
2. Click on the bookmark for the firing furnace (if available), or enter the IP address for the firing furnace in the address line of the browser (see section 4.4).
3. Enter your login data, that is, the password. The Program Manager opens (see section 5.3).

6.3.2.2. Operating layout for the menu control

The basic operating layout for the menu control is shown in the following illustration. It will help you become familiar with the operation of the firing furnace. The arrows in the diagram indicate how to get from one menu item to another. The individual menus are described in section 5.

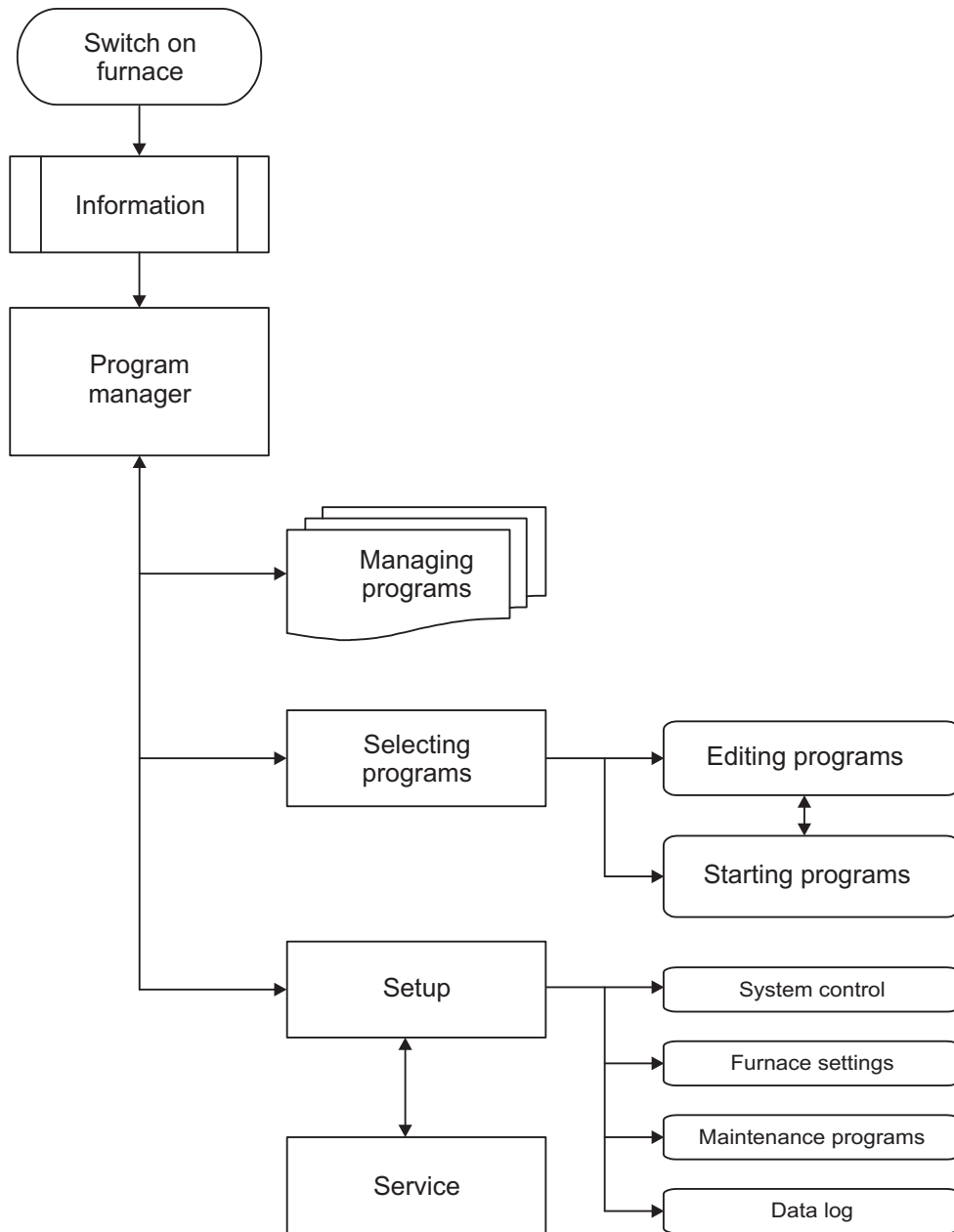


Fig. 6-2 Operating layout for the menu control

6.3.2.3. Select programs and start them

1. After turning on the firing furnace, the Program Manager automatically appears. Select the desired program (see section 5.3.). The firing furnace heats to a preheating temperature that depends on the selected program type (see section 5.5).
2. Click on [Selected program] in the Program Manager. The firing of the selected program is displayed (program display, see section 5.4).
3. Click the program display [Program start]. The program is processed automatically (see section 5.5).
4. While the program is running, the lift automatically moves up and down. Make sure that no objects are in the way that could hinder the lift movement. Also do not attempt to manually stop or accelerate the lift.
5. While the program is running, you can stop the program by clicking [Cancel program].

6.4. Program end

While the program is running, you can stop the program by clicking [Cancel program]. In this case, all the commands are stopped and the heat system is turned off. The firing furnace cools down. The firing number is not increased during firing.

The behavior of the firing furnace after a regular program end depends on the type of program that was run:

- Easy, professional and pressing programs have a specific fixed program structure.
 - An acoustic signal sounds after a regular program end,
 - The lift moves down,
 - The firing number is automatically increased,
 - A log file for the firing is created and printed (if a printer is configured).
- Classic programs are freely programmable. The firing furnace only executes the commands that are in the program.
 - An acoustic signal sounds after a regular program end,
 - The firing number is automatically increased,
 - A log file for the firing is created and printed (if a printer is configured).

You can remove the firing object after the program is over. (see section 6.2).

6.5. Some practical tips

6.5.1. General operation of the furnace

Lift noise

After switching on the firing furnace, the lift moves down and performs automatic lift calibration. The brief buzzing noise is due to technical reasons and is completely normal. Please note that the firing furnace does not react to any commands during this calibration time.

Automatic heating

The firing furnace automatically heats to the temperature required to start the next program when standard and professional and pressing programs are selected. In general, it occurs when the firing chamber is open.

Save energy

Close the firing chamber in the event of prolonged breaks between firings. This saves energy and prevents unnecessary wear of the heating element. In addition, you avoid excessively heating the cover plate.

Condensation

Close the firing chamber before switching off the furnace to avoid unnecessary condensation in the firing furnace.

6.5.2. Heating element

The heating elements are wear-sensitive parts, whose service life depends on how much it is used. Running the check program regularly makes it easier to identify the correct time to replace a heating element. Another way of identifying heating element wear is visual inspection. Look into the open firing chamber from below while the firing furnace is switched off and cold. If the heating strips are deformed or there is strong glass formation, the heating element should be replaced.

6.5.3. Thermocouple temperature calibration

Visually inspect the thermocouple regularly - particularly before temperature calibration - while the firing furnace is cold and switched off and the firing chamber is open. A mirror held at an angle under the firing chamber can be very helpful. The thermocouples are attached to the middle of the back within the firing chamber and jut out horizontally into the firing chamber. Ensure that they are not bent since this influences temperature measurement and hence the firing results.

6.5.4. Programming and program steps

Drying the firing object

The firing table is still very hot immediately after firing. The temperature near the firing object may thus be too high for drying. Wait a few minutes until the firing table has cooled down before placing the new firing object on the firing table for drying.

Standby temperature

Do not worry if the firing furnace sets a stand-by temperature in the firing chamber that is lower than the preheating temperature. If a drying time has been programmed, the furnace automatically sets a temperature in the firing chamber that is necessary for the drying.

Cooling and relaxing

In the program steps "Cooling" and "Relaxing" (easy programs), the respective temperature is approached as fast as possible. The firing chamber is opened in order to move the firing goods out of the hot firing chamber. Since the firing chamber then cools, the fired materials are subjected to less radiated heat than corresponds to the cooling temperature. To offset this effect, the lift moves up slightly closer to the hot firing chamber. When the firing chamber has reached cooling temperature, the lift should be completely at the top, and the firing chamber should be closed again. This ensures that the fired materials are always approximately subjected to cooling temperature during the cooling time.

6.5.5. Firing programs

Firing tray

Every type of firing tray has an effect on the temperature of the firing object due to its color and composition. Using a standardized firing tray can thus ensure constant firing results.

Firing parameters and test firings

Care in creating firing programs and editing firing parameters has a significant effect on the quality of firing results. The recommended firing parameters are thus to be seen only as guidelines. Perform test firings to identify your individual firing parameters based upon these guidelines.

6.6. Backing up and restoring data

For reasons of data security, it is recommendable to regularly back up to the firing programs:

- With a conventional USB stick (USB interface on the back of the firing furnace):
 - Backup (see section 6.6.1),
 - Restoring data (see section 6.6.2),
- You should at least note down your firing program parameters on paper or print it out.

6.6.1. Backup with a USB stick

Use the following procedure to back up the current program list ("set") on a USB stick.

1. Insert a USB stick into the USB port in the back of the firing furnace.
2. Open the Webserver (see section 6.3.2.1).
3. Open the Program Manager.
4. Click the button [Transfer set]. The "Select type of transmission" window opens.

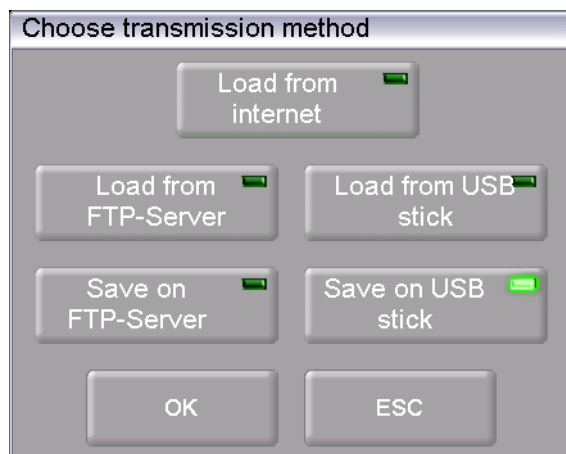


Fig. 6-3 Program Manager > Transfer set

5. To back up the data, select the transmission type "Save on USB stick".
 - "Load from Internet" downloads a set from the Dekema website,
 - Only available when connected to the FTP server:
"Load from FTP server" downloads a set from the FTP server,
 - Only available when connected to the FTP server:
"Save on FTP server" saves a set on the FTP server,
 - "Load from USB stick" uploads a set from the inserted USB stick,
 - "Save on USB stick" saves a set on the inserted USB stick.

6. Click on [OK]. The window "Save as" appears.
(Press [ESC] to return to the Program Manager.)

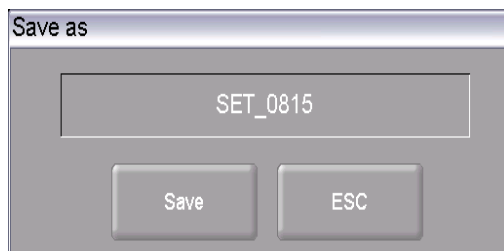


Fig. 6-4 "Save as" window

7. Click in the entry line. The alphanumeric keyboard window appears.
8. Enter the name for the set, and confirm with [Enter].
9. Click the button [Save].
(Press [ESC] to return to the Program Manager without saving the set.)

The message "Successfully saved" appears after the set has been saved. Click [OK] to return to the Program Manager.

6.6.2. Restore data with a USB stick

Use the following procedure to restore a set on a USB stick.

1. Insert the USB stick with the sets into the USB port in the back of the firing furnace.
2. Open the Webserver (see section 6.3.2.1).
3. Open the Program Manager.
4. Click the button [Transfer set]. The “Select type of transmission” window opens.

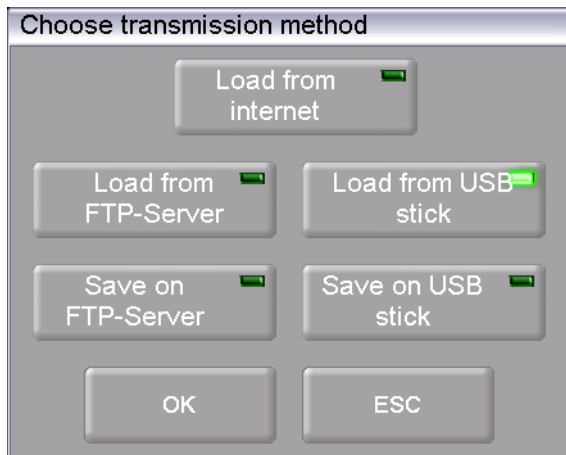


Fig. 6- 5 Program Manager > Transfer set

5. To restore the data, select the transmission type “Load from USB stick”.
 - “Load from Internet” downloads a set from the Dekema website,
 - Only available when connected to the FTP server:
“Load from FTP server” downloads a set from the FTP server,
 - Only available when connected to the FTP server:
“Save on FTP server” saves a set on the FTP server,
 - “Load from USB stick” uploads a set from the inserted USB stick,
 - “Save on USB stick” saves a set on the inserted USB stick.
6. Click on [OK]. The “Set Manager” window appears.
(Press [ESC] to return to the Program Manager.)



Fig. 6- 6 “Set Manager” window

7. Select the desired set.
8. Click on [Load].
(Press [ESC] to return to the Program Manager without loading the set.)
9. The Program Manager displays the "Load set" window.
 - The left table "External set" shows the firing programs of the selected sets,
 - The right table ("Current set") shows the firing programs of the set that is being loaded to the control of the firing furnace (active).
 - Double-click on a firing program in the current set to go directly to the firing program input window.

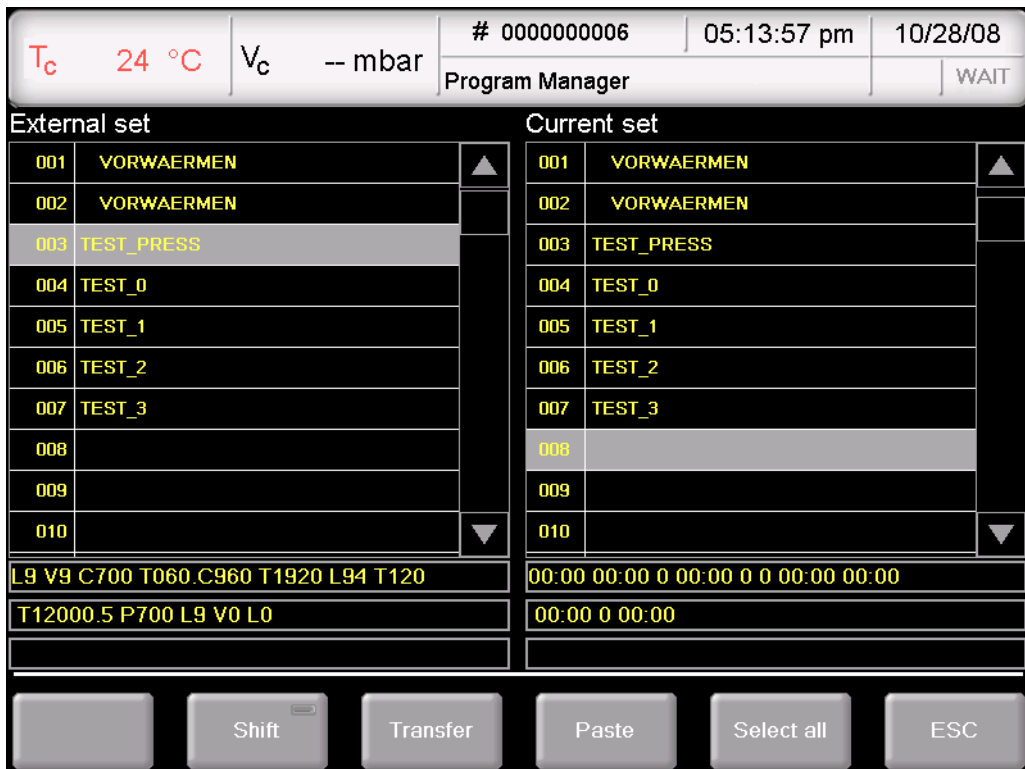


Fig. 6-7 Program Manager > Compile firing programs

10. Select the desired firing program in the external set and click one of the following buttons:

[Shift] Corresponds to the Shift key on a keyboard. This allows you to select associated blocks in the external set:

- Click the first desired program (beginning of the block),
- Press [Shift],
- Click the last desired program (end of the block).

All of the programs in the block are selected.

[Transfer] Copies the selected firing program of the external set to the same program numbers of the current set. A query appears and asks if you want to overwrite the existing programs in the current set. Confirm the query to accept the firing programs.

[Paste]	Copies the selected firing program of the external set to the current set. The firing programs are pasted into the current set starting at the selected program number. A query appears and asks if you want to overwrite the existing programs in the current set. Confirm the query to insert the firing programs.
[Select all]	Selects the firing programs of the external set.
[ESC]	Returns to the Program Manager.

The message "Successfully loaded" appears after the set has been loaded. Click [OK] to return to the Program Manager.

6.7. Loading and saving sets

A “set” is a group of all manufacturer-related firing programs (program list).

6.7.1. Download set from the internal memory

Use the following procedure to load individual firing programs or a complete set from the internal memory of the firing furnace.

1. Open the Webserver (see section 6.3.2.1).
2. Open the Program Manager.
3. Click the button [Load set]. The “Set Manager” window appears.



Fig. 6-8 "Set Manager" window

4. Select the desired set.
5. Click on [Load].
(Press [ESC] to return to the Program Manager without loading the set.)
6. The Program Manager displays the "Load set" window. Continue as described in section 6.6.2.

The message "Successfully loaded" appears after the set has been loaded. Click [OK] to return to the Program Manager.

6.7.2. Load set from a USB stick

The procedure for loading a set from a USB stick is described in section 6.6.2.

6.7.3. Load a set from an FTP server

NOTE:

To load a set from an FTP server, the firing furnace must be connected to the FTP server (see section 5.7.4.6).

The procedure for loading a set from an FTP server is basically the same as loading a set from a USB stick (see section 6.6.2).

Difference:

In the "Choose transmission method" window, select the option "Load from FTP server".

6.7.4. Download set from the Internet

Use the following procedure to download a set from the DEKEMA website.

1. Open the Webserver (see section 6.3.2.1). Make sure that your internet connection is active.
2. Open the Program Manager.
3. Click the button [Transfer set]. The "Select type of transmission" window opens.

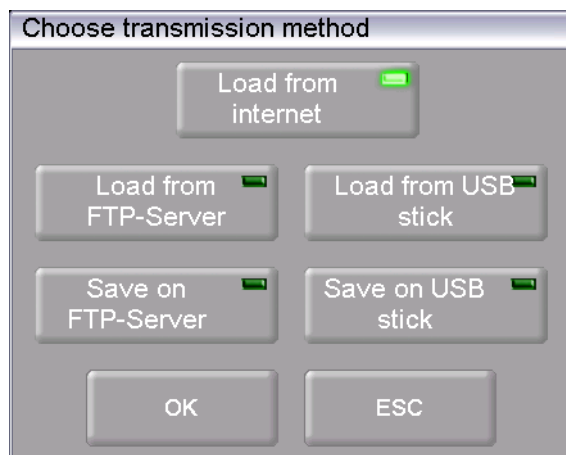


Fig. 6-9 Program Manager > Transfer set

4. Select the transmission type "Download from Internet".
5. Click [OK] (press [ESC] to return to the Program Manager). You are automatically connected to the DEKEMA website. The "Select set" window appears.

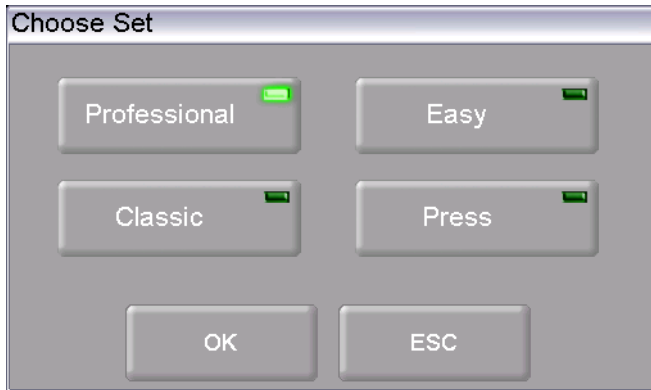


Fig. 6- 10 Program Manager > Select set

6. Select the desired program type Click [OK] (press [ESC] to return to the Program Manager).
7. The "Set Manager" window appears and shows you the manufacturer-specific sets for you firing furnace.



Fig. 6- 11 "Set Manager" window

8. Select the desired set.
9. Click on [Load].
(Press [ESC] to return to the Program Manager without loading the set.)
10. The Program Manager displays the "Load set" window. Continue as described in section 6.6.2.

The message "Successfully loaded" appears after the set has been loaded. Click [OK] to return to the Program Manager.

6.7.5. Internally save set

Use the following procedure to save a set to the internal firing furnace database.

1. Open the Webserver (see section 6.3.2.1).
2. Open the Program Manager.
3. Click the button [Save set]. The window "Save as" opens.



Fig. 6-12 "Save as" window

4. Click in the entry line. The alphanumeric keyboard window appears.
5. Enter the name for the set.
6. Click the button [Save].
(Press [ESC] to return to the Program Manager without saving the set.)

The message "Successfully saved" appears after the set has been saved. Click [OK] to return to the Program Manager.

6.7.6. Saving a set on a USB stick

The procedure for saving a set on a USB stick is described in section 6.6.1.

6.7.7. Save a set from an FTP server

NOTE:

To save a set on an FTP server, the firing furnace must be connected to the FTP server (see section 5.7.4.6).

The procedure for saving a set on an FTP server is basically the same as saving a set on a USB stick (see section 6.6.1).

Difference:

In the "Choose transmission method" window, select the option "Save to FTP server".

6.8. Quality assurance

The AUSTROMAT® allows you to log a completed firing program for quality assurance , documentation.

The log is internally fixed and cannot be changed by the user. The log monitors and documents the progress of the set program, especially the target and actual values of the Firing parameters , as well as fluctuations in temperature during the holding periods (only when the firing chamber is closed).

A precise description of quality management can be found in section 5.7.4.2.

Example of a log:

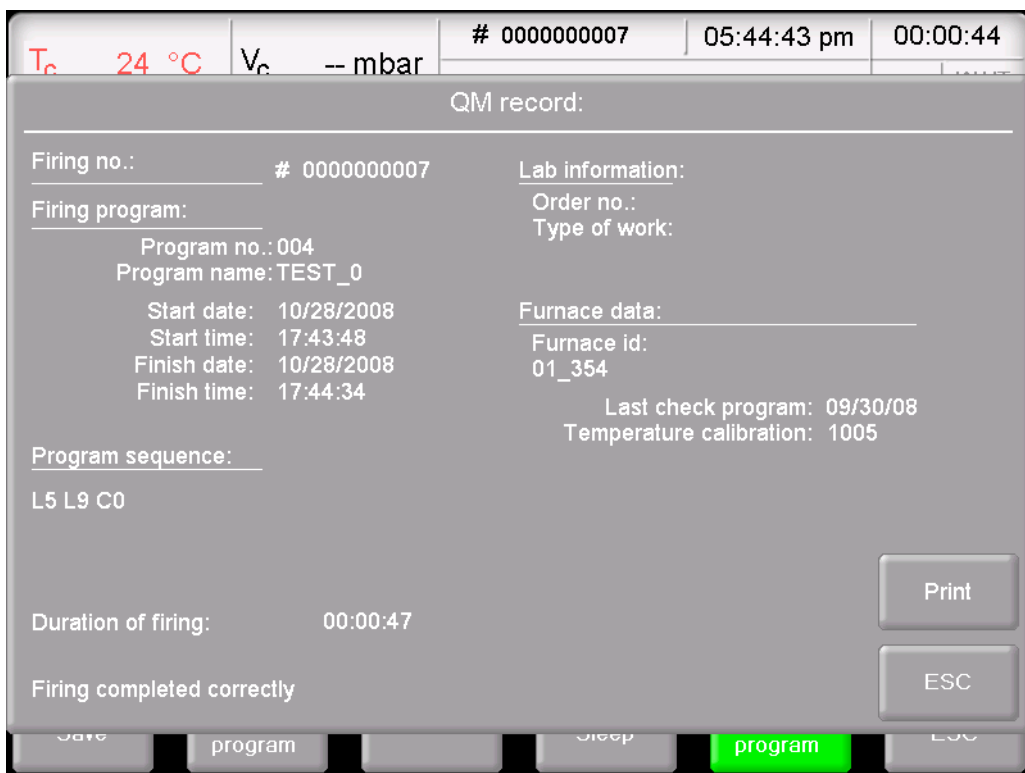



Fig. 6- 13 QM log

7. Maintenance and Service

	⚠ WARNING
	<p>Non-original replacement parts.</p> <p>Malfunctions can arise if third-party parts are used. In certain circumstances, this can cause serious injury and substantial property damage.</p> <p>Always use original replacement parts from DEKEMA.</p>

NOTE:

When performing all maintenance and service tasks, observe section 2, Safety.

If technical servicing or repairs are necessary, they should only be performed by authorized professionals.

NOTE:

After the ceramic furnace has been serviced, check for safety:

- **Federal Republic of Germany: VDE 0701,**
- **International: According to the legal requirements of your own country.**

7.1. Care

NOTE:

Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

- Clean the housing and control elements with a soft cloth moistened with a mild cleanser. Do not use scouring agents, scouring pads or solvents such as alcohol, gasoline or acetone.
- Always keep the sealing ring of the lift seat free of dust to ensure a reliable seal. Use a brush with a receptacle (for ceramic dust), or a moist cloth.

7.2. Calibrate temperature

NOTE:

Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

A number of factors influence the temperature of the firing object. These can include: The color and shape of the firing tray, or the number and type of firing objects. Other major influences can be age-related effects such as heating element wear and changes to the thermoelectric properties of the temperature sensor. To compensate for these factors and ensure normal firing results, we recommend that you calibrate the firing furnace when the firing results change, or at least once a year. Calibration is carried out by means of the calibration factor (CCF) . Observe the following instructions:

- For new furnaces, we recommend that you calibrate the temperature for the first time after approximately six months.
- An internal monitoring program notifies you when you should calibrate the firing furnace temperature.
- Make sure that the heating element and thermocouple are not damaged.
- Only use the DEKEMA calibration set that is for the specific furnace. This consists of a curved silver wire and a white ceramic firing tray.
- Always use the firing table for calibration.
- Make sure that the temperatures of all the firing programs are adjusted when the CCF value changes. The firing temperatures of individual programs may have to be corrected.

Calibrating the temperature with the calibration set::

1. The firing furnace must be thoroughly preheated before calibrating. The thermocouple must be preconditioned. Therefore perform a cleaning firing before calibrating the temperature.
 - In the "Setup" menu, select the program "Cleaning firing", and press [Start] (see section 5.7.3.2).
 - General rule: The side walls of the top oven housing must be warm to the touch.
2. Insert the bent silver wire (silver sample) from the calibration set in the middle of the firing tray (see the following illustration). Place the firing tray on the firing table.

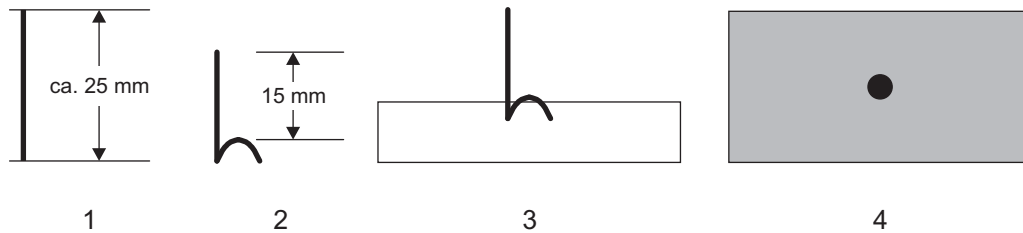


Fig. 7- 1 Mount silver sample

- 1 Silver wire
- 2 Silver sample (bent silver wire)
- 3 Silver sample inserted into the middle of one-half of a DUCERA tray: Side view
- 4 Silver sample inserted into the middle of one-half of a DUCERA tray: Top view

3. Start the Temperature calibration program:
In the "Setup" menu, select the program "Temperature calibration", and press [Start] (see section 5.7.3.3).
4. Evaluate the silver sample after the program using the following illustration.

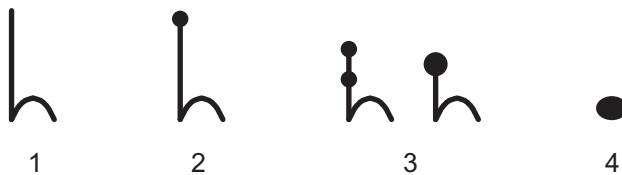


Fig. 7- 2 Evaluate the silver sample

- 1 Effective temperature too low: Increase CCF by approximately 5
 - 2 Effective temperature okay
 - 3 Effective temperature a bit too high: Lower CCF by approximately 3
 - 4 Effective temperature too high: Lower CCF by approximately 5
5. Approach the correct setting of the CCF in small steps of approximately two to three points (such as 1004 to 1006).
 - By increasing the CCF, you increase the firing temperature,
 - By reducing the CCF, you lower the firing temperature.

Change the CCF

Observe the following procedure to change the CCF:

In the "Setup" menu, select the program "Temperature calibration", and enter a new CCF (see section 5.7.3.3).

Minor corrections of the CCF can be made instinctively. If there are very large or sudden deviations from the original CCF, check for technical faults, and inform your service partner.

7.3. Check program

NOTE:

Start the check program only after running several firing programs, or after a cleaning firing so that the firing oven is warmed up.

The AUSTROMAT® has an internal program that checks the function of the major components, the check program. Regularly running this unchangeable program makes it easier on you and the responsible service personnel

- to identify old components such as heating element wear,
- to eliminates malfunctions.

Start check program

After approximately 2000 firings, the device displays a recommendation on the screen to start the self check program (duration: approx. 45 min).

In the "Setup" menu, select the program "Check program", and press [Start] (see section 5.7.3.1).

Results of the check program

The results of the self-check are saved in a diagnosis file (see section 5.7.4.3). If the diagnostic data reveal that a firing program may not be able to be processed correctly, then the AUSTROMAT® automatically points this out when a firing program is started. This is the case for example when the heating element is too old, and you want to reach a firing temperature quickly.

Error messages after running the check program

Error message	Measures
1. "NO ERRORS FOUND"	No errors were found.
2. "CHANGE HEATING ELEMENT"	Contact your service partner (see section 7.5).

Tab. 7-1 Overview of error messages

The error message "CHANGE HEATING ELEMENT" can also arise when the heating element is technically functional. However, the check program requires a nominal power supply to operate. When the power supply is below the nominal value, the error diagnosis of the heating element can be incorrect. This problem generally only occurs in Asian countries. Consult your local power company.

7.4. Change the heating element

NOTE:

Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

NOTE:

Only authorized professionals are permitted to perform any technical measures (see 7.5).

Over time, the heating element wears out from use. This can have a negative influence on your firing results. For this reason, change the heating element at the proper time. If the self-check program is run regularly (see section 7.3), a recommendation will be displayed when the heating element wear has exceeded the permissible limit. Follow the accompanying installation and safety instructions in section 2 to install the replacement heating element. Heating elements should only be replaced by trained professionals.

7.5. Service and Transport

NOTE:

Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

NOTE:

These operating instructions are part of the documentation for the AUSTROMAT® firing furnace. Read the service instructions before servicing.

Service partners

We recommend regular maintenance of the firing furnace by your service partner. This will ensure superior firing results. If wearing parts need to be replaced, contact your responsible service partner. If more extensive repairs to the firing furnace are required, please also contact your service partner.

Replacement parts

Only use original DEKEMA parts for servicing and maintaining the firing furnace. Contact your service partner, or contact DEKEMA directly.

Manufacturer address

Please direct any questions for the manufacturer to the following address:

DEKEMA Dental-Keramiköfen GmbH
Industriestrasse 22
D-83395 Freilassing
Tel. +49-8654-4639-0
Fax +49-8654-66195
E-mail: info@dekema.com
Website: www.dekema.com


Transport

- Turn off to the firing furnace as described in section 8.1.
- To transport the firing furnace, only use the original box and the supplied packaging material.

8. Storage and disposal

8.1. Storage

Turn off the firing furnace

	⚠ WARNING
	<p>Fire hazard.</p> <p>A fire hazard exists when the firing furnace is hot when packaged.</p> <p>Let the firing furnace cool for several hours to room temperature with the firing chamber open after turning it off.</p>

Observe the following procedure:

1. Turn the firing furnace off, and let it cool to room temperature. Note that the device needs several hours to cool down.
2. Turn the firing furnace on, and move the firing table up to close the firing chamber.
3. Turn the device off, and fold the power cable from the plug.

Storage conditions

The firing furnace may only be stored in the original packaging. Observe the packaging symbols (see Fig. 4- 1), and maintain the storage conditions that are specified in section 1.6.

8.2. Disposal

8.2.1. Personnel qualifications

The operator can recycle or dispose of the system in accordance with legal provisions. A good knowledge of mechanics and how to differentiate between waste materials is required to properly disassemble the system and separate the materials.

8.2.2. Legal guidelines

Responsibilities

The operator is responsible for proper disposal of the AUSTROMAT®. The operator can give the firing furnace to a licensed private or public collection facility, or the operator can recycle or dispose of the firing furnace himself.

NOTE:

If the operator gives the AUSTROMAT® to a recycling facility, he must also provide the instructions for use. The instructions for use contain all the important instructions for disposal of the firing furnace.

Reporting requirement

Companies that dispose of or recycle their own waste are subject to official approval and inspection. Under certain circumstances, they can be freed from the approval requirement if they take the requirements of environment protection into account. These companies are subjected to a reporting requirement. You can find out more information at the responsible office for environmental protection.

Environmental protection requirements

Wastes must be recycled or disposed of in such a manner that it does not pose a hazard to human health. Only those procedures or methods may be used that do not harm the environment. In particular, care must be taken that:

- The air, water and earth are not contaminated,
- Animals and vegetable life are not endangered,
- No excessive noise or odor arises,
- The surroundings and the landscape are not impaired.

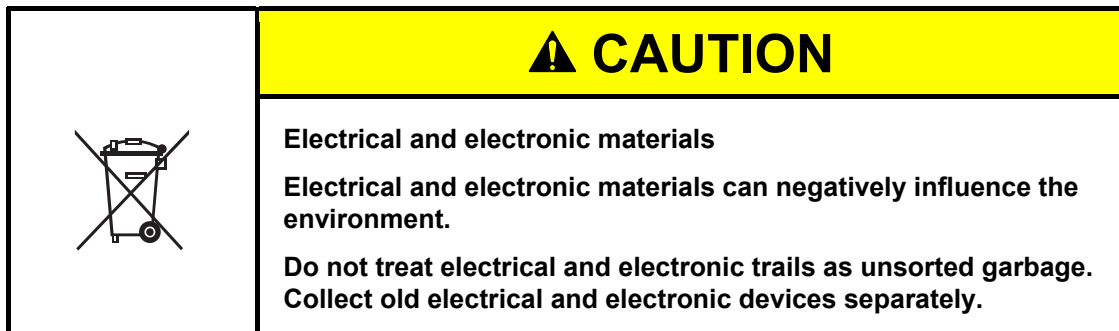
Sorting

After the firing furnace has been disassembled, the individual parts must be sorted into waste groups. This is done according to the list in the current European Waste Catalog (EWC) or comparable documents. The EWC catalog applies for waste independent of whether it is disposed or recycled.

8.2.3. Disposal: Electrical and electronic materials

WEEE

The European Commission has issued a directive on the disposal of electrical and electronic materials (WEEE; 2002/96/EC). According to this directive, manufacturers have been responsible since August 2005 for returning and recycling electronic and electrical devices if no exception has been granted. As a manufacturer of laboratory equipment, DEKEMA Dental-Keramiköfen GmbH is freed from this requirement. Dental ceramic furnaces do not have to be returned to DEKEMA Dental-Keramiköfen GmbH.



8.2.4. Disposal: Other assemblies and components

The components of the AUSTROMAT® are composed of the following materials:

- Metals and alloys
 - Aluminum (housing, cover panels, etc.)
 - Copper (cooling plates, electrical lines)
 - Steel (sections, fastening materials such as screws, etc.)
 - High-grade steel
- Glass and ceramic materials
 - Glass (screens and displays)
 - Ceramic insulation material (firing table, firing chamber).
- Plastics and rubber
 - Plastics (hoses, covers, wheels, etc.)
 - Rubber (seals, silicone hoses)
- Composites
 - Electrical materials (cables, motors, components)
 - Electronic materials (printed circuit boards, computer, predator)
- Packaging
 - Styrofoam (cushion material)
 - Plastic (films)

9. Appendix

9.1. Pressures

Pressure level ¹⁾	Press command ²⁾		Pressure	Force
0	L90	corresponds to	Contact Pressure	
1	L91	corresponds to approx.	108 N	11 kg
2	L92	corresponds to approx.	137 N	14 kg
3	L93	corresponds to approx.	167 N	17 kg
4	L94	corresponds to approx.	196 N	20 kg
5	L95	corresponds to approx.	226 N	23 kg
6	L96	corresponds to approx.	255 N	26 kg
7	L97	corresponds to approx.	284 N	29 kg
8	L98	corresponds to approx.	314 N	32 kg
9	L99	corresponds to approx.	343 N	35 kg

Tab. 10-1 Pressures at different lift positions

1) For pressing programs

2) For classic programs

9.2. Vacuum Table

The values in the following table were measured at a surrounding pressure of 969 hPa.

1 hPa = 1 mbar = 0.015psi

1 psi = 69 mbar = 69 hPa

Vacuum level ¹⁾	Vacuum command ²⁾	Relative pressure ³⁾ hPa/psi		Absolute pressure ⁴⁾ hPa/psi	
0 %	V0	0	0	969	14.0
10 %	V1	52	0.75	917	13.3
20 %	V2	153	2.2	816	11.8
30 %	V3	264	3.8	705	10.2
40 %	V4	365	5.3	604	8.7
50 %	V5	472	6.8	497	7.2
60 %	V6	577	8.3	392	5.7
70 %	V7	685	9.9	284	4.1
80 %	V8	793	11.5	176	2.5
90 %	V9 minimum (= switching point)	866	12.5	103	1.5
100 %	V9 maximum (=45 s after V9 minimum)	> 934	13.5	< 35	0.51

Tab. 10-2 Pressures of the different vacuum levels

1) For easy and professional programs

2) For classic programs

3) Difference between surrounding pressure and absolute pressure

4) Pressure in the firing chamber

9.3. Heating speed

Temperature range	Heating speed
400...500°C	approx. 180°C/min
500...600°C	approx. 160°C/min
600...700°C	approx. 140°C/min
700...800°C	approx. 120°C/min
800...900°C	approx. 100°C/min
900...1000°C	approx. 80°C/min
1000...1100°C	approx. 60°C/min
1100...1200°C	approx. 40°C/min
600...1200°C	Ø ca. 100°C / min

Tab. 10-3 Maximum heating speed (temperature rise rate)

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