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Operating Manual

Biometra TOne
High-performance thermal cycler for DNA amplification by PCR

Manufacturer

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Implementation of the Technical Documentation

Analytik Jena GmbH

Contents

1 Basic information

1.1 Notes on the operating manual

The Biometra TOne is intended for operation by qualified specialist personnel observing this operating manual.

The operating manual contains information about the design and operation of the Biometra TOne and provides personnel familiar with PCR technology with the necessary know-how for the safe handling of the equipment and its components. The operating manual further includes notes on the maintenance and service of the device and potential causes and remedies of any faults.

Conventions

Instructions for action which occur in chronological order are numbered and combined into action units and furnished with the corresponding results.

Lists which are not in chronological order are shown as itemized lists, sub-listings as bullet points.

Safety instructions are indicated by pictographs and signal words. The type and source of the danger are stated together with notes on preventing the danger. The meaning of the pictographs and signal words used is explained in the chapter "Safety instructions".

Symbols and signal words used

The operating manual uses the following symbols and signal words to indicate hazards or instructions. The safety instructions are always placed before an action.

WARNING

Indicates a potentially hazardous situation which, if not prevented, can result in death or most serious injuries (incapacitation).

CAUTION

Indicates a potentially hazardous situation which, if not prevented, can result in light or minor injuries and material damage.

ATTENTION

Indicates a potentially hazardous situation which, if not avoided, can result in damage to the product or items in its vicinity.

Symbol for waste disposal in accordance with WEEE directive:

Do not dispose of in household waste

CE marking

China RoHS marking

1.2 Purpose

The Biometra TOne is an end-point thermal cycler. It is designed to amplify nucleic acids by repeated cycles of heating and cooling using DNA polymerases in a PCR reaction.

The thermal cycler is developed for Research Use Only (RUO).

The Tone combines modern design with user-friendly software. The user interface consists of a touchscreen with a graphical or spreadsheet display that shows the time, the status and the temperature program for each run. Using the touchscreen keyboard, information and program parameters can be entered directly on the screen. Due to the high ramp rates, the TOne thermal cycler is suitable for fast PCR applications, thereby helping to shorten program run times.

1.1 Warranty and liability

The warranty duration and liability comply with the legal requirements and the provisions in the general terms and conditions of Biometra.

Deviations from the intended use described in this manual result in limitations of warranty and liability in the event of damage.

Warranty and liability claims are excluded for personal injury and property damage due to one or several of the following causes:

- use of the Biometra TOne other than intended
- improper commissioning, operation and servicing of the device
- modifications of the Biometra TOne without prior consultation with Biometra GmbH
- unauthorized intervention in the Biometra TOne
- operation of the Biometra TOne with faulty safety equipment
- use of other than original spare parts, wearing parts or consumables
- improper repairs
- improper transport and storage of the Biometra TOne
- faults due to the non-observance of this manual

2 Safety and warning instructions

2.1 General notes

For your own safety and to ensure error-free and safe operation of the Biometra TOne, please read this chapter carefully before commissioning.

Besides the safety instructions in this user manual and the local safety regulations that apply to the operation of the device, the general applicable regulations regarding accident prevention, occupational health and safety and environmental protection have to be observed and complied with.

References to potential dangers do not replace the work protection regulations which must be observed.

2.2 Safety markings on the Biometra TOne

Damaged or missing safety symbols can cause incorrect actions leading to personal injury or material damage. Do not remove safety symbols! Replace damaged safety symbols immediately!

The following safety symbols are attached to the inside of the heated lid and the rear of the device:

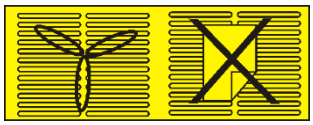
CAUTION! Hazard area!

Proceed with due care when handling samples and working with the Biometra TOne.

CAUTION! Risk of burns!

There is a risk of burning at the heated lid, the thermal block, the samples, and the rear of the device.

The following sign is attached to the underside of the Biometra TOne:



ATTENTION! Keep ventilation slits clear!

Keep the ventilation slits on the underside and at the rear of the device clear. Make sure that there are no objects underneath the device (e.g., paper) that may be sucked against the ventilation slot and thus interfere with ventilation.

2.3 Technical condition

The Biometra TOne has been built and certified according to safety standard EN 61010-1. Do not modify the device in any way. Any modification of the device will lead to a loss of warranty and the EN 61010-1 certificate and poses a potential risk.

The following has to be observed:

- ❑ The operator must only operate the device in a sound and operationally safe condition. The technical condition must always comply with the legal requirements and regulations.

- ❑ Prior to every use the device must be checked for damage and sound condition.
- ❑ Any changes in the device affecting its safety must be reported by the operating personnel to the operator without delay.

2.4 Requirements for the operating personnel

The Biometra TOne must only be operated by qualified specialist personnel instructed in the use of the device. The instructions also include imparting the contents of this manual.

In addition to the safety at work instructions in this operating manual the generally applicable safety and accident prevention regulations of the respective country of operation must be observed and adhered to. The operator must ascertain the latest version of these regulations.

The operating manual must be accessible to the operating and service personnel at all times.

2.5 Safety instructions: transport and installation

The following has to be observed:

- ❑ Drain the sample block before transporting the Biometra TOne. Make sure there are no sample tubes in the block.
- ❑ Only ship the Biometra TOne in its original packaging with the transport lock installed.
- ❑ Please verify that the delivery is complete on receipt of the Biometra TOne and check for possible transport damage. In case of claims please contact Biometra GmbH.

2.6 Safety instructions: during operation

2.6.1 General

The operator of the Biometra TOne must make sure before each commissioning that the condition of the device including the safety equipment is sound.

The following has to be observed:

- ❑ Free access to the power switch on the back of the enclosure has to be ensured during operation.
- ❑ The ventilation fittings at the rear of the device must be unobstructed and operational. Covered ventilation grilles or slits etc. may cause the device to break down or may cause damage to it.
- ❑ The use of oil between the samples and the sample block is not necessary to achieve an improved heat exchange. However, if you still want to use oil, you should use mineral oil. Do not use silicone oil.
- ❑ Be careful to avoid crushing or pinching injuries when closing the device.

The Biometra TOne may cause burns. The following has to be observed:

- ❑ The thermal block, the samples and the heated lid reach high temperatures. There is a risk of burns during contact.
- ❑ Ensure that the lid is securely closed before starting the program! Do not touch the heated lid!
- ❑ The rapid heating of the thermal block can cause liquids to boil explosively. Always wear safety goggles during operation!
- ❑ Do not touch hot sample tubes or plates and do not open them or boiling liquid may escape!
- ❑ Only use plates and tubes that are suitable for high temperatures (up to 100°C), fit well into the thermal block (no shaking) and whose lids seal tightly!

2.6.2 Safety instructions: protection against explosion and fire

The Biometra TOne must not be operated in an explosive environment.

The Biometra TOne must not be operated with flammable, explosive or volatile substances.

2.6.3 Safety instructions: electrical equipment

Work on the electrical components of the Biometra TOne may only be performed by a qualified electrical technician in accordance with the applicable electrical engineering rules. Life-threatening electrical voltages may occur in the interior of the Biometra TOne!

The following has to be observed:

- ❑ Any work on the interior of the device may only be carried out by the customer service of Biometra GmbH and specially authorized technicians.
- ❑ The electrical components must be checked regularly by a qualified electrician. Any defects, such as loose connections, faulty or damaged cables, must be repaired without delay.
- ❑ Before opening the device it must be switched off at the power switch and the mains plug must be disconnected from the mains outlet!
- ❑ The Biometra TOne must be switched off immediately using the power switch (on the equipment backplate) and the mains plug disconnected from the power supply if any faults occur in the electric components.
- ❑ Do not operate the device near sources of strong electromagnetic radiation (for example, an unshielded, deliberately operated high frequency source), as these may affect proper operation of the device.

2.6.4 Handling of samples, auxiliary and operating materials

The operator is responsible for the selection of substances used in the process as well as for their safe handling. This is particularly important for radioactive, pathogenic, infectious, poisonous, corrosive or otherwise dangerous substances. For details contact the safety officer responsible for your location. When handling dangerous substances local safety codes and guidelines must be observed. The following general notes do not replace the specific local regulations or the regulations in the EC safety data sheets of the manufacturers for the auxiliary and operating materials.

The following has to be observed:

- ❑ Protective goggles and rubber gloves have to be worn when handing reagents.
- ❑ If only a few samples are treated, an (empty) tube of the same height must additionally be placed at each corner position of the block. If the number of samples in the block is too low, there is a risk of the tubes being damaged and sample liquid leaking out.
- ❑ For your own safety, please observe the potential infectious qualities of the examined biological material.

2.7 Safety instructions: service and repair

The Biometra TOne is usually repaired by the service department of Biometra GmbH or its authorized and trained specialist personnel. Unauthorized repairs can damage the device. Therefore, the operator may generally only carry out the tasks listed in chapter "Maintenance and care" p. 91.

The following has to be observed:

- ❑ The exterior of the device may only be cleaned with a damp, not dripping, cloth after the device has been switched off.
- ❑ Do not use alcohol (e.g., methanol or ethanol), organic solvents or abrasives to clean the device.
- ❑ Any maintenance on the device may usually only be carried out in the switched-off condition (unless stated otherwise).

2.8 Behavior during emergencies

In case of danger or accidents, immediately switch off the Biometra TOne using the main switch on the equipment backplate. Disconnect the mains plug from the power supply!

3 Technical specifications

Order number		**846-x-070-311**	**846-x-070-301**
Name		**Biometra TOne 96**	**Biometra TOne 96G**
Capacity		96 x 0.2 ml tubes, 96 well micro plates or 8 well strips	
Block material		Aluminum	
Block coating		Special alloy	
Max. heating rate*		4.0 °C/sec	
Max. cooling rate*		3.3 °C/sec	
Avg. heating rate*		3.7 °C/sec	
Avg. cooling rate*		3.0 °C/sec	
Max./min gradient		-	20 °C/0.1 °C
Gradient temperature range[1]		-	20 °C to 99 °C
Temperature uniformity	95°C	+/- 0.60 °C after 15 s	
	72°C	+/- 0.30 °C after 15 s	
	55°C	+/- 0.20 °C after 15 s	
Temperature range		3 °C to 99 °C	
Control accuracy		+/- 0.1 °C	
Software		User-specific quick start option for the five most recent programs; program preview before start; option for toggling between programming table and graph programming mode; Linear Gradient Tool[1], service info file (SINF) generation; expanded self-test; adjustable ramp rates; gradient temperature diagram view; Ethernet-based PC control via PCR Control App and tablet/smartphone with Android/iOS	
Program memory		Total capacity of 350 programs in up to 90 user directories	
Language		English, German, Chinese	
Display		7" color touchscreen	
Automatic restart after power failure		Yes	
High Performance Smart Lid (HPSL) technology		Yes	
Lid temperature range		30 °C to 110 °C	

Power consumption	550 watt
Operating voltage	100, 115, 230 Volt, 50 - 60 Hz
Noise emissions	Very low, max. 45 dB
Interfaces[1]	USB A, Ethernet
Environmental conditions	15 °C to 35 °C, 70% air humidity, max. 2,000 m above sea level
Dimensions (WxDxH)	260 mm x 430 mm x 210 mm
Dimensions (WxDxH) with open lid	260 mm x 430 mm x 385 mm
Weight	11.5 kg

* measured inside the block

[1] The network cable must be at least performance class Cat 5e and the cable configuration has to be STP

x = 2 for 230 V, 4 for 115 V, 5 for 100 V

4 Function and setup

The Biometra TOne thermal cycler is available in the following models:

- Biometra TOne 96 with aluminum block
- Biometra TOne 96G with aluminum block and gradient function

The device is controlled by a 7" touchscreen display and an easy-to-use user interface. PCR protocols and run log files can be saved to a connected USB stick. By using the USB functions, PCR protocols can be exchanged easily between devices and run log files can be stored for documentation reasons on a PC.

Fig. 1 The Biometra TOne Thermal Cycler

The Biometra TOne thermal cycler features an automatic restart. If a power failure occurs during the run, the device will continue the run as soon as power is restored. In case of long-term power failure (longer than 30 minutes), the device will keep the sample block at 4°C (freeze step) and the user can decide to repeat the run with the same samples or to discard them.

The block with gradient function can optionally be used for the optimization of new primer pairs. The Linear Gradient Tool allows the programming of gradients with a defined temperature difference between the rows or columns of the sample block.

This manual provides information on how to use all models of the Biometra TOne Thermal Cycler most effectively. Functions that are only available for certain versions are indicated accordingly, for example, "This function is only available for gradient-enabled thermal cyclers".

4.1 High speed thermoblock

All blocks of the Biometra TOne thermal cycler are made of aluminum and offer high ramp rates for fast protocol run times. A rubber seal on the heated lid forms an encapsulated space around the sample block as soon as the lid is closed. The closed space serves to improve the temperature uniformity of the sample block and avoids the formation of condensed water at the final PCR cooling step. Furthermore all blocks are perfectly sealed to prevent condensed water from penetrating into the Peltier elements underneath the sample block and other parts of the electronics. The sealing protects the Peltier elements and prolongs the lifetime of the device.

4.2 High Performance Smart Lid

The Biometra TOne heated lid has been optimized to heat twice as fast as with older models and thus helps to shorten protocol run times. Moreover the heated lid fulfills two other important functions: It prevents the formation of condensation at the reaction tube portion located above the block surface level and it ensures reliable contact between the reaction tubes and the thermoblock by applying constant pressure. Thanks to the integrated clutch mechanism, the pressure applied to the reaction tubes is always the same, regardless of the plasticware height. The combination of the heated lid shape and the reliable contact pressure ensures even temperature distribution between samples, thus significantly improving temperature uniformity.

With one press on the front button, the heated lid gently swings open and locks in its end position. This mechanism ensures that the lid cannot fall down and the heated lid is out of the radius of action while the user inserts PCR tubes or plates. This prevents any risk of injury from crushing or hot surfaces.

4.3 Display

The Biometra TOne thermal cycler features a 7" state-of-the-art color touchscreen user interface. The touchscreen is built-in at a flat angle to ensure reflection-free viewing and ergonomic programming. For programming PCR protocols the software incorporates Biometra's proven spreadsheet philosophy and alternatively offers graphical programming. One touch of a button leads from the spreadsheet to the alternative graphical programming mode. This makes the creation of new programs or editing existing programs fast and easy.

4.4 User-specific quick start of programs

Many other thermal cyclers offer a so-called "List of latest programs used". In the list of latest programs used a certain number of PCR programs is collected and offered for quick start. The list is typically ordered only by date and the user has to search for the desired program. In contrast the Biometra TOne software creates a user-specific list and only the latest programs started by the currently logged-in user are offered for quick start. Even if a lab member does not use the device for a longer time, the information on the latest programs started by this user will not get lost.

For maximum convenience the Biometra TOne software additionally features a program preview. Before the start of a program the protocol steps are summarized in a clearly arranged table by the program preview tool. The preview therefore provides a comprehensive overview of the protocol structure without the need to access programming screens. The program preview is also available before the quick start of programs.

4.5 Easy programming

Creating new PCR programs takes a lot of time if for each single step all parameters have to be set manually. The Biometra TOne software offers several pre-installed program templates for different applications. The program templates provide a general protocol structure that can be easily adapted for the current experiment.

4.6 Linear Gradient Tool

For optimizing new primer pairs in a single run the Biometra TOne can optionally be equipped with a gradient function. Finding the best primer annealing temperature is crucial for the specificity and efficiency of PCR reactions. Often the optimization of experiments is conducted to a limited extent only leading to unspecific byproducts or reduced PCR sensitivity. By using the gradient function, new primer pairs with unknown annealing temperatures can be tested quickly and optimized in a very short time.

For maximum convenience the Biometra TOne offers the Linear Gradient Tool. For most other devices the temperature difference from row to row or from column to column in a gradient step varies across the sample block. The Biometra TOne Linear Gradient Tool enables the programming of gradient steps with a defined temperature increment between the columns or rows. The Linear Gradient Tool option allows the comfortable creation of gradient steps and thus the best annealing temperature can be easily transformed to a non-gradient protocol.

4.7 GLP compliance

The software can manage up to 30 user accounts. With each system start the Biometra TOne performs an initial self-test and additionally the software offers an extended self-test that can be initiated by the user. The results of the extended self-test are summarized in a protocol and stored by the device. In addition to the self-test functions, the device creates and stores log files for each single run. For long-term storage, the log files and extended self-test protocols can be exported as a proprietary file format.

4.8 Open system philosophy

The Biometra TOne is an open system regarding consumables and reagents. Depending on the sample block, the system can be used with single tubes, strips or plates. PCR plates can be standard profile or low profile and they can be skirted, half-skirted or non-skirted. The Biometra TOne can handle all kinds of plates and the plasticware be sealed with domed lids, flat lids, sealing foil or other technologies. Regardless of the sealing method used, thanks to the HPSL technology (see chapter 4.2) the same pressure is always applied to the consumables for absolutely reproducible conditions.

The Biometra TOne thermal cycler is not limited to reagents from a specific vendor and can be used with any kind of polymerase. Regardless of whether isothermal, hotstart or non-hotstart polymerases are used, the Biometra TOne will produce reliable results. By programming a pause step for the initial denaturation, for example, the system can be used for manual hotstart applications. After inserting the samples into the heating block, the PCR protocol can be started just by pressing "continue".

4.9 Order numbers

Instruments incl. block and base unit			
Model	**Block type**	**Gradient range**	**Order number**
TOne 96	Aluminum	-	846-x-070-311
TOne 96G	Aluminum	20°C	846-x-070-301

Abbreviations:

G = gradient

x = 2 for 230 V, 4 for 115 V, 5 for 100 V

5 Installation

5.1 Scope of delivery

1. Thermal cycler
2. Mains cable
3. Operating instructions
4. Quick reference guide

Please keep the original packaging in case the device needs to be returned. The shipping box for the Biometra TOne thermal cycler contains a specially developed foam system for the transport of high quality electronic devices.

5.2 Unpacking and inspection

Unpack and carefully check the device. Immediately report any damage to Biometra GmbH. Do not attempt to operate the device if there is any visible damage.

Keep the original packaging for possible return. The Biometra TOne must always be transported in its original packaging. If the packaging is no longer available, please contact Biometra GmbH.

5.3 Setting the operating voltage

WARNING

Danger of electric shock!

Before commissioning the device, make sure that the voltage selector setting on the underside of the device corresponds to the mains voltage in your laboratory.

The Biometra TOne can be operated at 100, 115 or 230 volts.

❑ Set the operating voltage by turning the dial on the underside of the Biometra TOne to the desired voltage. You can do so with a coin.

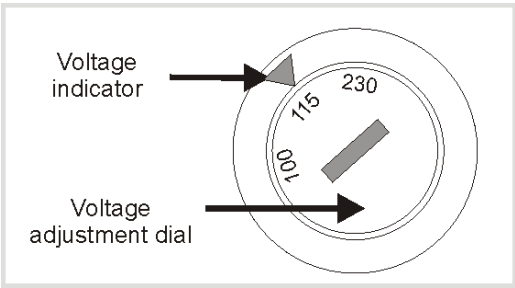


Image 1 Voltage selector switch on the underside of the device

5.4 Commissioning

WARNING

Danger of electric shock!

Prior to commissioning, please make sure that the operating voltage set on the device is the same as the mains voltage (see section "Setting the operating voltage" p. 17).

Attention

Do not cover the ventilation slits!

Ensure that the ventilation slits are clear. Insufficient ventilation may cause the device to overheat.

- Make sure that there are no objects underneath the device (e.g., paper) that may be sucked against the ventilation slot and thus interfere with ventilation.
- Place the device at a minimum distance of 10 cm between the rear of the device and the wall or other objects.
- In case of several cyclers side by side running simultaneously we would recommend to keep a distance of at least 10 cm between every thermal cycler.

❑ Place the Biometra TOne on a solid dry surface.

❑ If the Biometra TOne has been moved, allow the device to adjust to room temperature before switching it on for the first time (1 to 6 hours).

❑ Connect the Biometra TOne to a grounded mains outlet using the mains cable supplied. Make sure that the mains switch and the mains cable are easily accessible. This is important if the device needs to be disconnected from the mains voltage.

❑ The display contrast can be adjusted according to the respective lighting conditions (see section "Display brightness" p. 66).

6 Control elements

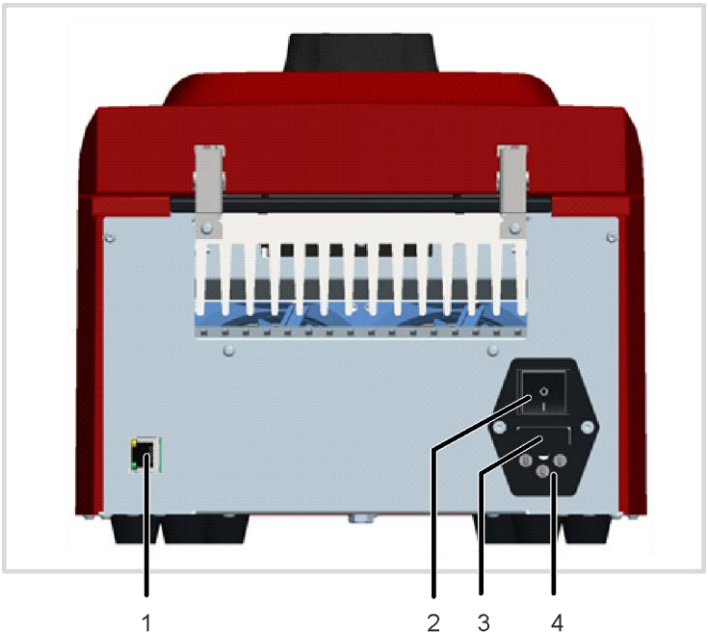
6.1 Biometra TOne front view

1 Dial for adjusting the contact pressure
2 Lid closing button
3 Display
4 USB port

Fig. 2 Front view of the Biometra TOne

6.2 Biometra TOne rear view

The Ethernet port, mains plug and mains switch are located at the rear of the Biometra TOne.



1 Ethernet port
2 Mains switch
3 Fuse holder
4 Mains plug

Fig. 3 Rear view of the Biometra TOne

6.3 High Performance Smart Lid (HPSL)

The Biometra TOne has a height-adjustable lid for optimal contact pressure on the samples.

6.3.1 Closing the lid

1. Place the samples in the block, then close the lid until you feel the button in the front click into position.
2. Turn the lid wheel clockwise until the clutch mechanism is activated (you will hear a clicking noise).

Attention

The strength of the lid contact pressure has been designed for a fully populated block. If only a few samples are to be used in the block, place an additional two (empty) tubes of the same height in the four corner positions of the block. Otherwise the sample tube may be damaged from excess contact pressure (see also Fig. 4).

Never attempt to close the heated lid with force! This may damage the device.

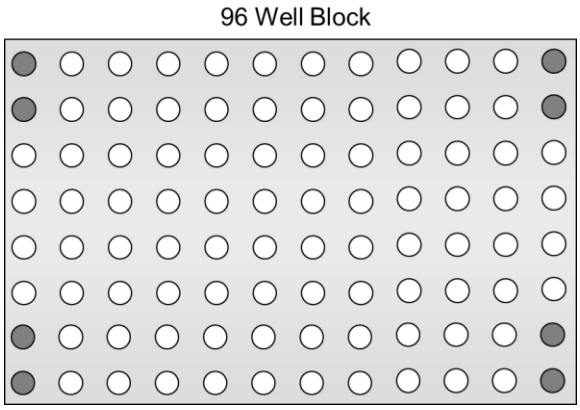


Fig. 4 Placement of sample tubes in the block

6.3.2 Opening the lid

Attention

Never open the lid under pressure!

Always follow the sequence below when opening the lid. If the lid is opened under pressure, the locking mechanism may be damaged.

1. Reduce the contact pressure of the lid completely by turning the lid wheel anticlockwise until there is no resistance.
2. Open the lid by pressing the button on the front of the lid.

   ✓ **The lid opens and locks in a defined end position.**

6.4 The Biometra TOne software

The Biometra TOne thermal cycler features a 7" color touchscreen and a completely new software for operation.

6.4.1 Keyboard

For some applications, names, addresses or passwords have to be defined. For this purpose, the Biometra TOne software offers a keyboard to enter characters, digits and special characters.

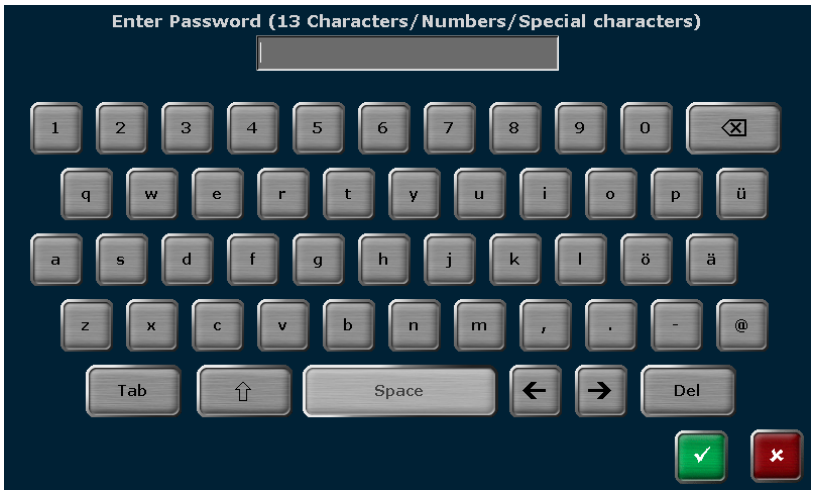


Fig. 5 Biometra TOne keyboard

The keyboard offers the following special keys:

Space	Space
Tab	Tab
Shift	⇧
Delete single character	⌫
Delete all characters	Del
Back	←
Forward	→

Note: For some functions the maximum number of characters is limited. Usernames, passwords and program names can have a maximum of 13 characters and user initials a maximum of 3 characters.

6.4.2 Keypad

In some screens of the Biometra TOne software digits have to be entered. For this purpose, the software features a keypad integrated in some screens:

Fig. 6 Biometra TOne keypad

The keypad can be used to enter digits, dots, minus signs and infinite. In addition the following special keys are available:

Delete single character	⌫
Delete all characters	Del
Tab	Tab
Infinite	∞

6.4.3 Cursor keys

The Biometra TOne software uses lists, tables or graphical representations. Whenever the number of entries becomes higher than the maximum number that can be displayed on a screen, the software will show cursor keys for navigation.

Scroll up	^^	**Scroll right**	>>
Scroll down	vv	**Scroll left**	<<

6.4.4 Confirm or Cancel

On many screens user entries have to be confirmed to avoid unintended operating errors. Press **Confirm** to accept entries or processes or **Cancel** to reject entries or processes.

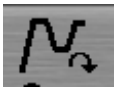
Confirm	✓

Cancel	

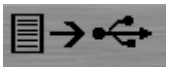
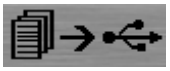
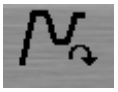
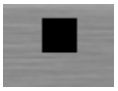
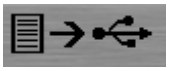
6.4.5 List of commands and icons used

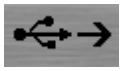
The Biometra TOne software uses the following icons:

Command			Icon
Home			
Back			
	Right		
	Left		
	Up		
	Down		
		Confirm	
		Cancel	
Login			
		User management	
		New user	
		Delete user	
		Edit user	
Incubation			
	Start incubation		

Programs			
	New program		
	Open template		
	Copy program/copy all programs		
	Delete program		
	Edit program		
	Start program		
	Quick select program or user		
	Stop program		
	Done		
	Save program		
	Pause program		
	Continue program		
	Skip step		
		Graphical view	
		Spreadsheet view	
		Gradient display	

		Edit step	
		Insert step	
		Delete step	
		Temperature increment	
		Time increment	
		Heating rate	
		Gradient	
		Linear Gradient Tool	
		Standard gradient programming	
		Preheating OFF	
		Preheating ON	
Tools			
	Settings		
		Date and time	
		Automatic user logout	
		Beeper	
		Network	

		Display brightness	
		Display darker	
		Display brighter	
		Touchscreen calibration	
		Factory settings	
	Documentation		
		Run log file	
		Run log file overview	
		Save run log file to USB	
		Save all run log files to USB	
		View run log file	
		View program	
		Log file self-test	
		Error log file	
	Extended self-test		
		Start extended self-test	
		Stop extended self-test	
	Backup file	Save backup file	

		Load backup file	
	Cycler information		

7 Operation

7.1 Power on self-test

After the Biometra TOne is switched on, the device performs an automatic self-test (power on self-test). During the test the device shows the following screen:

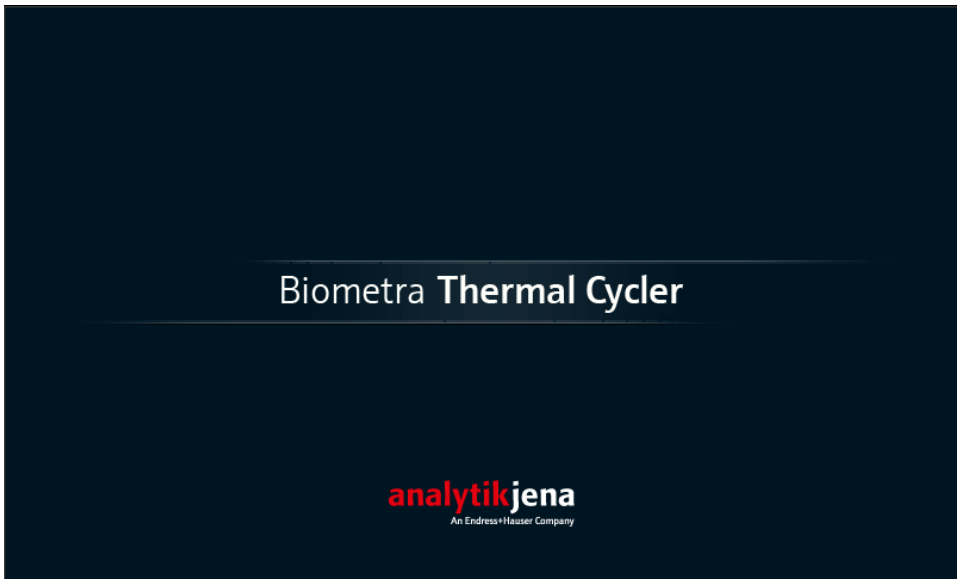


Fig. 7 Biometra TOne start screen

For the power on self-test a log file is created and stored in the thermal cycler memory (see chapter 11.3.2).

7.2 Login screen

After the Biometra TOne has performed the power on self-test, the login screen is displayed. The login screen offers the following functions:

Command	Function	Chapter
Login	Starts the login dialog.	See chapter 7.3
Block	Shows the current block status. If a block is free, a touch on the button leads to a list of previously used or changed programs for quick start (not user-specific in the login screen).	See chapter 0 and chapter 0
EN/DE	Changes the language setting for the login screen.	For user-specific software language settings see chapter 11.2.2

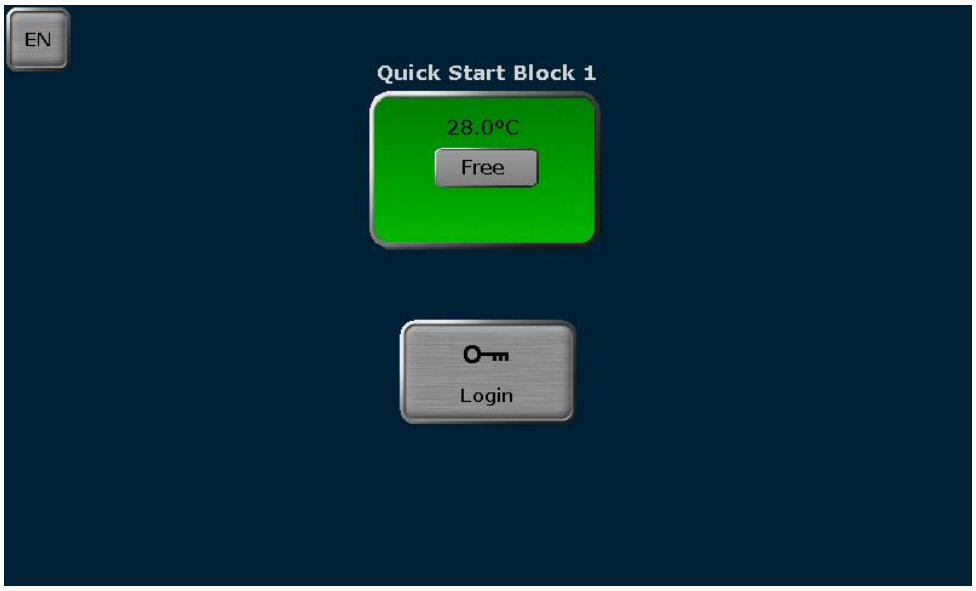


Fig. 8 Biometra TOne login screen

7.3 Login

After starting the Biometra TOne, the login screen is displayed. To log in as an existing user, press

Login 

In the next screen select a user by pressing the corresponding button.

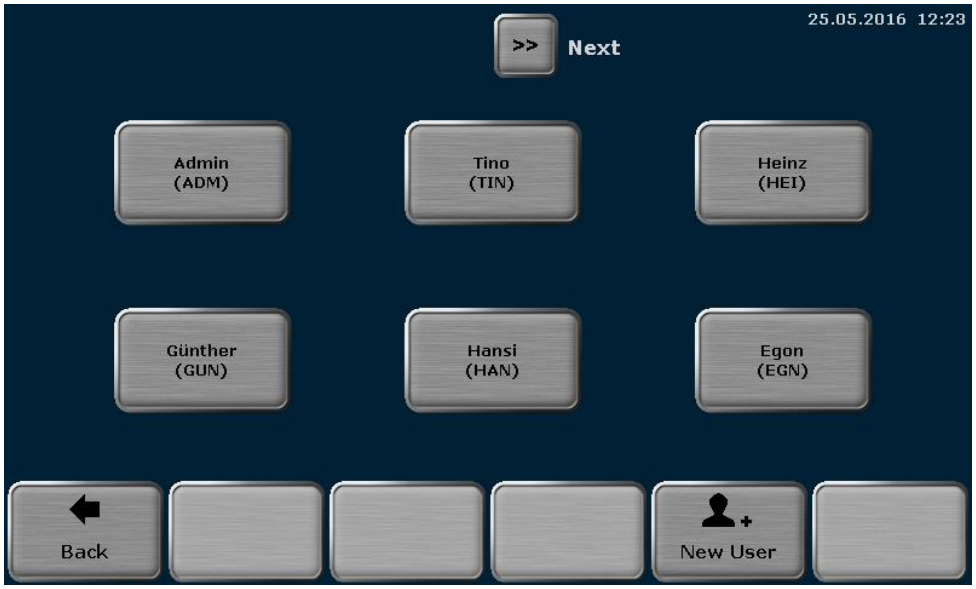


Fig. 9 Biometra TOne select user screen

Note: The position of the buttons can change. The button for the most recently logged in user is always shown in the first position at the top left of the screen. All the other buttons become arranged from top left to bottom right according to the date and time of the latest user login. If more than 6 user accounts are available, you might need to use the **Left** or **Right** cursor keys to turn the page. (See chapter 0).

Touch the **Password** input field and enter the password using the TOne keyboard (see chapter 6.4.1). The default password for the **Admin** administrator is "Admin". Please note that the password query is case sensitive.

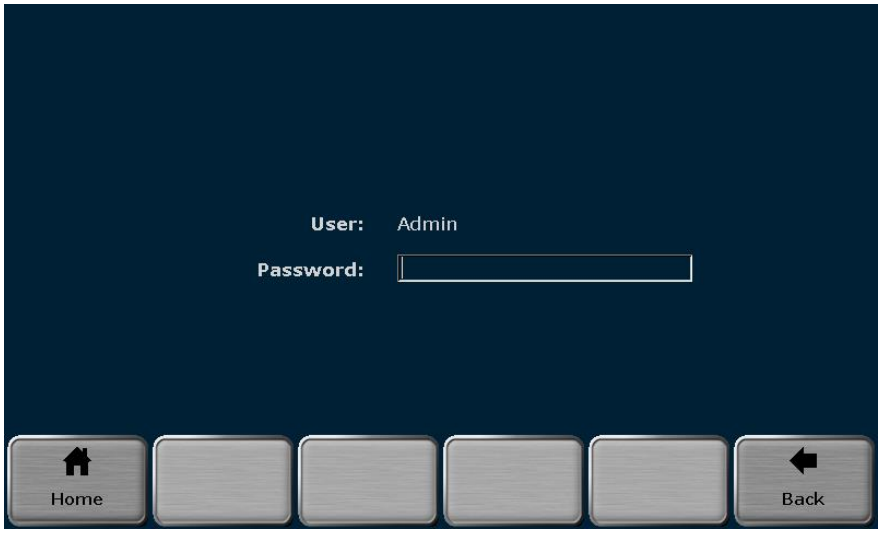


Fig. 10 Biometra TOne enter password screen

7.4 Home screen

After user login the Biometra TOne software shows the home screen. The home screen offers the following functions:

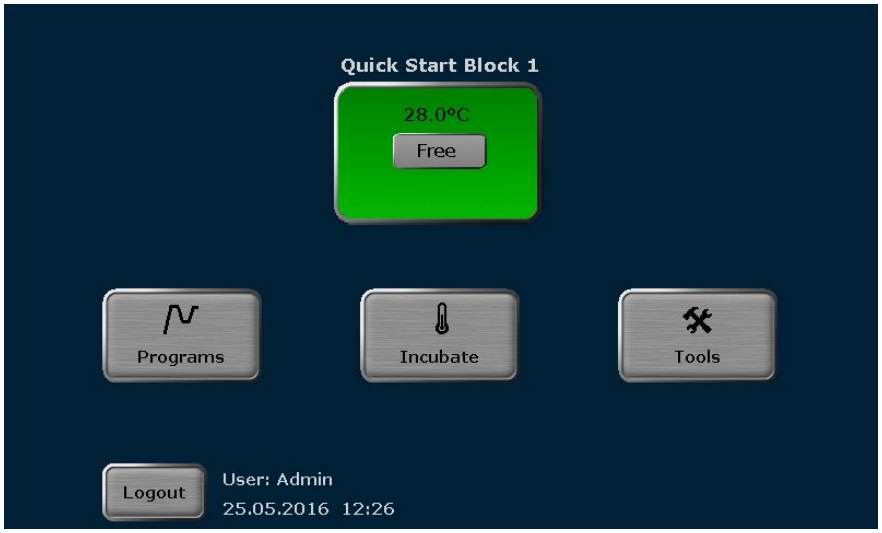


Fig. 11 Biometra TOne home screen

Command	Function	Chapter
Programs	Viewing, running and editing programs	See chapter 8
Block	Shows the current block status. If a block is free, a touch on the button leads to a list of previously used or changed programs for quick start	See chapter 0 and chapter 0
Incubate	For running a sample block at a constant temperature	See chapter 7.7
Tools	Settings, documentation, extended self-test, cycler information and diagnosis mode	See chapter 11
Logout	User logout	

7.5 Block status

In the login screen (see chapter 7.2) and in the home screen (see chapter 7.4) a special button with information on the current block status is shown. The sample block status can be **Free**, **Running** or **Pause** and is indicated by the color of the button and the textbox in the middle of the button ②. In the line above the textbox the current block temperature is shown ①. If the temperature is higher than 70°C, the characters are shown in red and the warning Hot plus the corresponding warning symbol are displayed. In the line below the textbox the remaining runtime is shown ③. The sample block number is shown above the button.

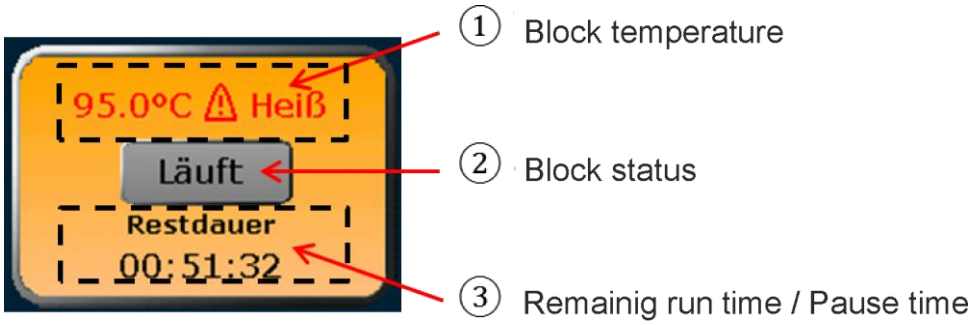


Fig. 12 Biometra TOne block status/quick start button

The following table summarizes the different button colors and sample block statuses. When the button is pressed, it depends on the sample block status which function is activated in the Biometra TOne software. If the status is **Running** or **Pause**, a touch of the button will lead to the program view (see chapter 10.1). If the status is **Free**, the quick start function is activated (see chapter 0).

Button	Block status	Color	Function
	Free	Green	Quick start function
	Running	Yellow	Program view
	Pause	Blue	Program view

7.6 Quick start function

The Biometra TOne software offers a quick start function for previously used programs. To use the quick start function, press the block status display button in the login screen (see chapter 7.2) or in the home screen (see chapter 7.4).

Note: The quick start function can only be activated if the current block status is **Free** (see chapter 0). If the status is **Running** or **Pause**, a touch of the button will lead to the program view screen instead.

If the block status button is used in the login screen before a user is logged in, a list of the programs most recently used on the thermal cycler are offered for quick start. If, on the other hand, the button is used in the home screen after user login, the software will show a user-specific list of the latest programs used for quick start.

Login screen	List containing the latest programs used
Home screen	User-specific list containing the latest programs used

The latest programs used are summarized in a table.

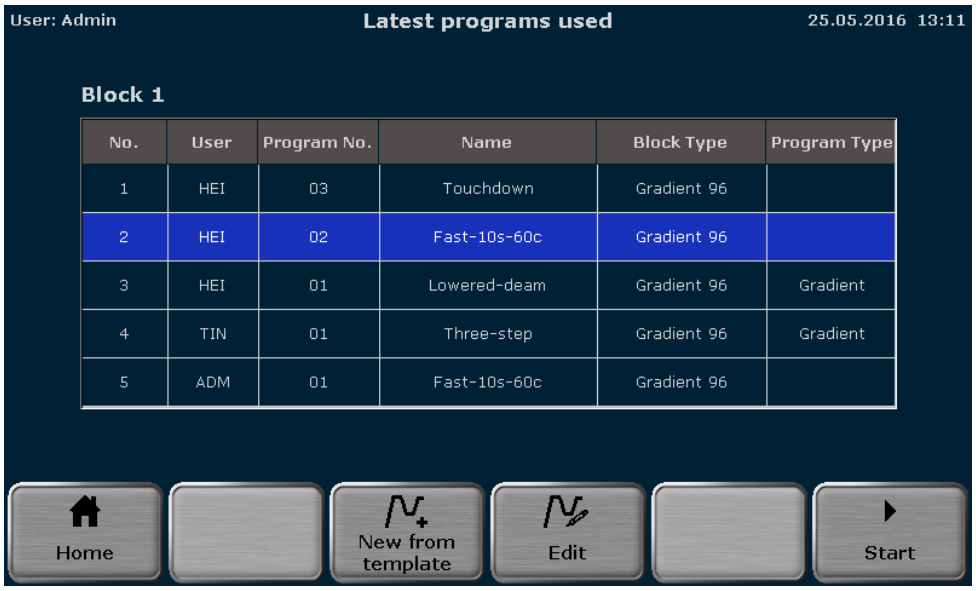


Fig. 13 Biometra TOne program quick start screen

Select the program for quick start in the table and press the Start button to start the selected program. If necessary, the program can be edited before the start or a new program can be created based on a template (see chapter 8.1).

Start 

Press the corresponding button to activate the programming mode or select a program from the list of templates:

Edit 

New from template 

7.7 Incubation mode

The incubation mode allows samples to be incubated at a constant temperature for an indefinite period of time. Press the **Incubate** button and in the next screen set the values for the block temperature and hold time using the keypad. Set whether the heated lid should be on or off and whether it should preheat or not using the corresponding buttons (see Fig. 14).

Incubate 

Note: To set the time to endless, use the  button.

To start incubation, press

Start 

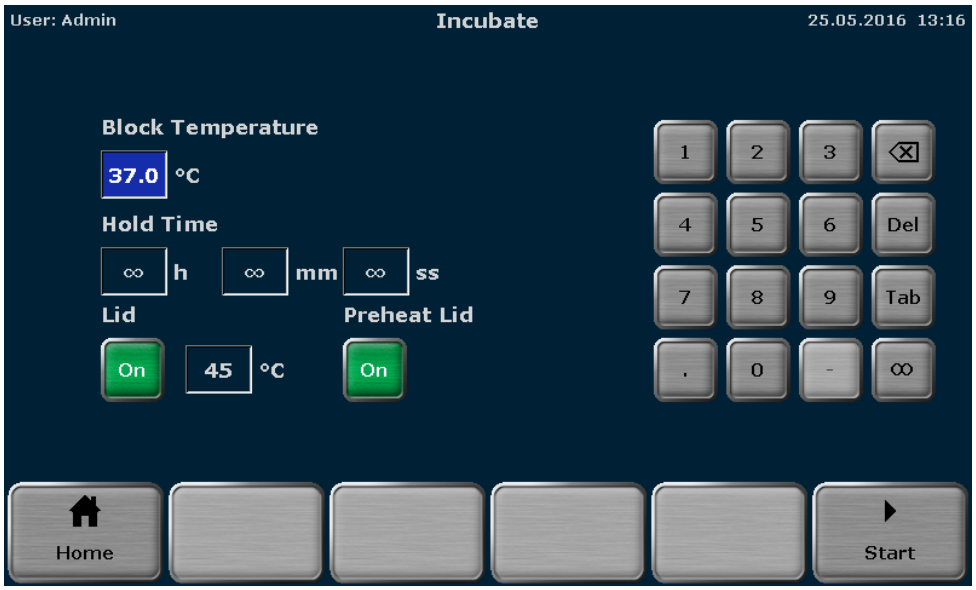


Fig. 14 Biometra TOne incubation mode screen

During incubation the following commands can be used:

Stop 

Pause 

Continue 

Skip 

Note: To stop the incubation, use the corresponding command. Do not switch off the device while the incubation is running. The device will react like after a power failure and will restart the incubation step when it is switched on next time.

8 Creating, editing and saving programs

8.1 Programming modes

The Biometra TOne software offers spreadsheet or graphical programming. Use the buttons to toggle between the two modes. The following screenshots show the spreadsheet and graphical programming mode.

Graphical view

Spreadsheet view

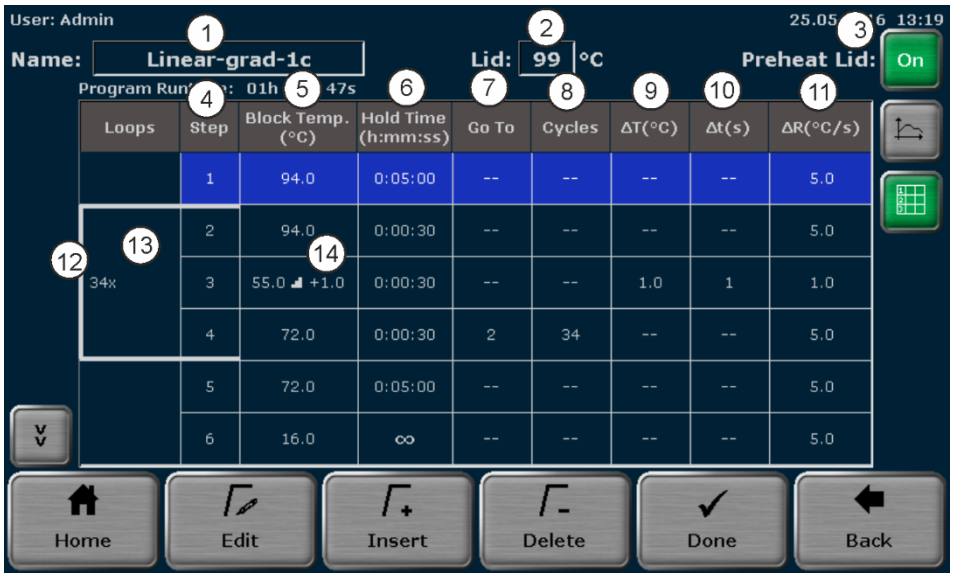


Fig. 15 Spreadsheet programming

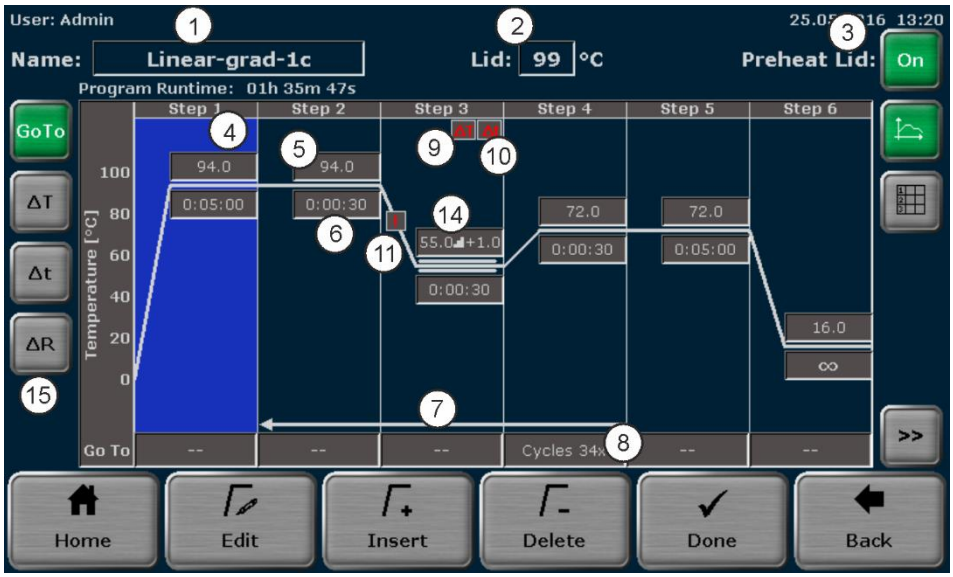


Fig. 16 Graphical programming

Both programming modes show the same information but in different ways. In the spreadsheet mode all parameters are summarized in a table. In the graphical mode symbols are displayed for some parameters (see the table below). Toggle to the spreadsheet mode to view the settings for these parameters.

Parameter	Spreadsheet mode	Graphical mode	Chapter
Program name	①	①	See chapter 8.3
Heated lid temperature [°C]	②	②	See chapter 8.4
Preheat lid mode	③	③	See chapter 8.5
Step number	④	④	See chapter 8.6
Temperature [°C]	⑤	⑤	See chapter 8.6
Hold time [h:mm:ss]	⑥	⑥	See chapter 8.6
Go to	⑦, ⑫	⑦	See chapter 8.6.1.1
Cycles	⑧, ⑬	⑧	See chapter 8.6.1.1
Temperature increment [ΔT (°C)]	⑨	⑨ 	See chapter 8.6.1.2
Time increment [Δt (s)]	⑩	⑩ 	See chapter 8.6.1.3
Heating rate ΔR (°C/s)]	⑪	⑪ 	See chapter 8.6.1.4
Gradient	⑭	⑭	See chapter 8.6.1.5
Step options (go to, temperature increment, time increment and heating rate)		⑮	

If a program has more than 6 steps, use the cursor keys to navigate in the spreadsheet or the graphical display (see chapter 0)

8.2 Creating a new program/using a program template

1. To create a new program or open a program template, first log in as an existing user (see chapter 7.1).
2. After login press the **Program** button in the home screen (see chapter 7.3).

Program 

The program overview screen opens:

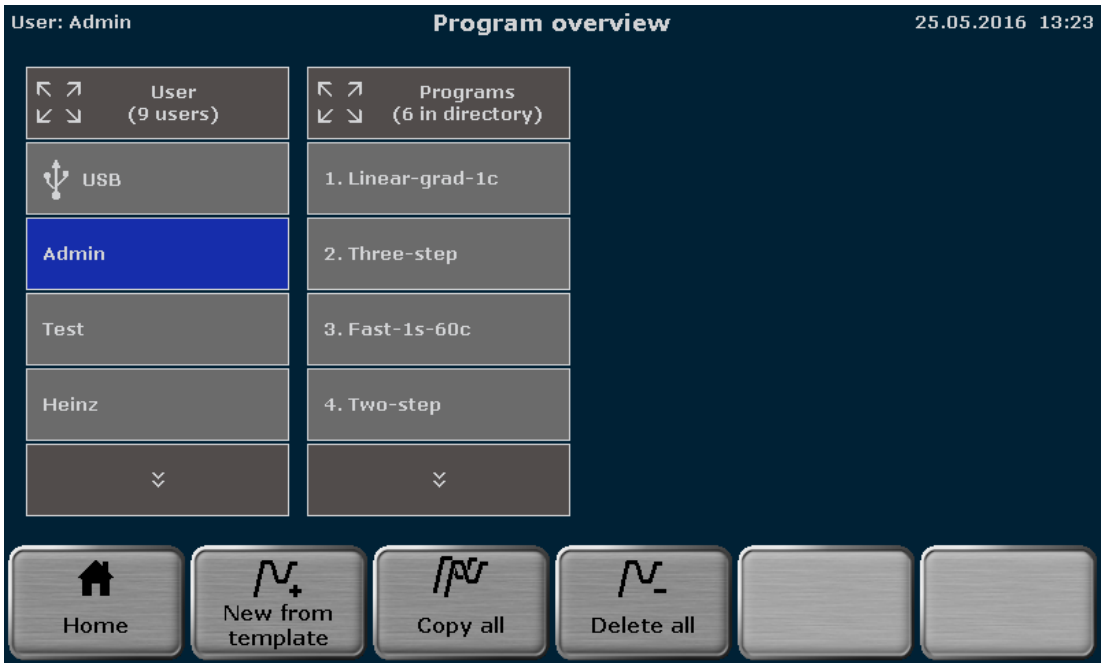
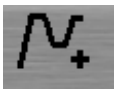


Fig. 17 **Biometra TOne program overview screen**

3. In the program overview screen, press the **New from template** button:

New from template 

4. The program template screen opens (see Fig. 19). Search for a program template using the cursor keys and press the corresponding button to select it.

Up 

Down 

Note: The Biometra TOne offers several program templates for different purposes. You can either use a template and modify it as desired or select "Blank". “Blank” is a program with no predefined steps (see Fig. 18).

Spreadsheet programming **Graphical programming**

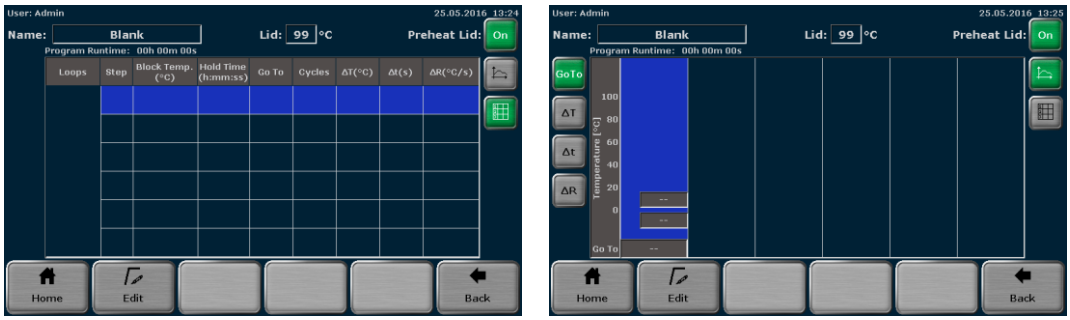
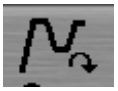


Fig. 18 **Biometra TOne "Blank" program template**

Select "Blank" whenever a new program should be created and select another template from the list whenever an existing program should be edited.

The program structure can be controlled in the program preview (see Fig. 19). If a template is selected, the program steps and some additional information are displayed in spreadsheet form. By using the program preview function, templates can be checked before they are opened.

5. To open a program template, press the **Open template** button.

Open template 

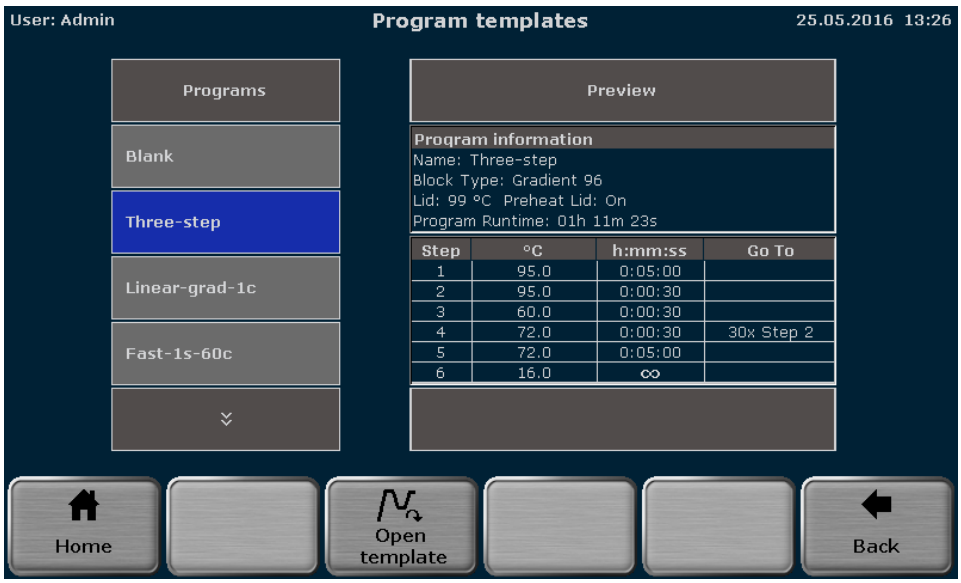


Fig. 19 Biometra TOne program template screen

8.3 Assigning program names

Each template has a specific name which is superimposed in the programming screen. To enter a name, touch the **Name** input field and enter a new name using the Biometra TOne keyboard (see chapter 6.4.1).

Note: If a character is pressed, the pre-displayed name will be deleted and a new program name can be set. If the program name should be modified, please first press another button like delete or space.

8.4 Setting the heated lid temperature

To set the heated lid temperature, touch the **Lid** input field. A small window opens in the middle of the screen with a keyboard (see Fig. 20). Enter a value between 30 and 110 using the TOne keyboard.

Use the corresponding buttons to switch the heated lid on or off.

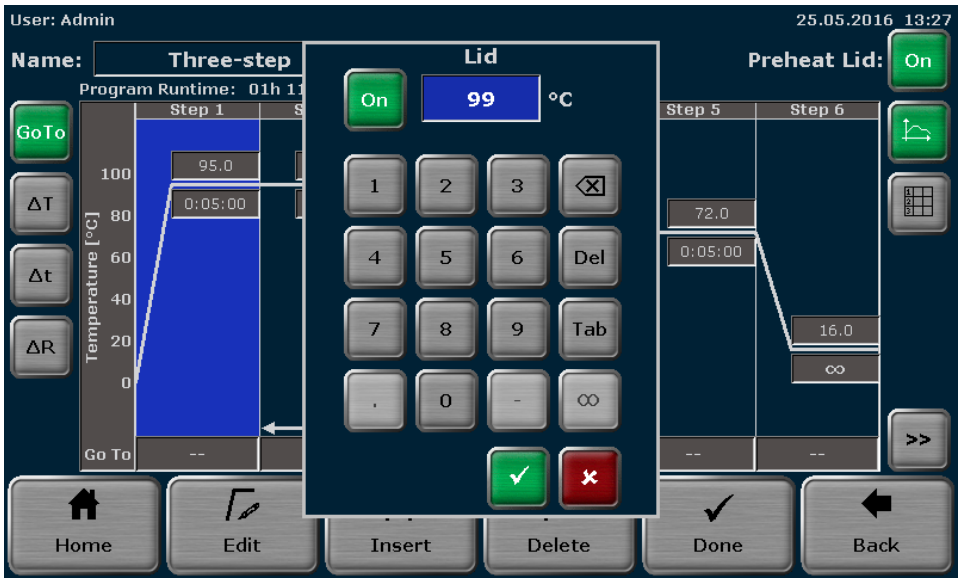


Fig. 20 **Biometra TOne heated lid temperature setting screen**

NOTICE

The heated lid automatically switches off at a temperature difference of >75 °C between the block and the heated lid. At these low block temperatures, sample condensation on the tube lid is no longer to be expected. In addition, it supports a longer service life of the Peltier elements in the block, since no unnecessary cooling against the heating cover is required.

8.5 Preheating the heated lid

The heated lid can be set to preheating ON or OFF using the corresponding buttons:

Preheat heated lid Off 

Preheat heated lid On 

If the preheating mode is activated, the heated lid is first heated up to the programmed temperature while the sample block is held constant at 25°C. After the heated lid reaches the target temperature, a 40 second equilibration phase follows. Then the sample block starts to heat up from 25°C to the first programmed target temperature.

Note: For most applications it is recommendable to set the preheating mode to "ON".

8.6 Editing steps

When editing program steps, the following parameters can be entered in the Biometra TOne software:

Parameter	Description and limits	Chapter
Temperature	Temperature for a step in °C. The target temperature can be set between 3.0°C and 99.0°C in tenths of a degree.	See chapter 8.6
Hold time	Hold time for a step in h:mm:ss. Values between 0 and 9 hours, 0 and 59 minutes and 0 to 59 seconds can be programmed. To program a pause and set the hold time to infinite, enter ∞ in one of the input fields for h:mm:ss.	See chapter 8.6
Go To	Defines the step number to which the program returns.	See chapter 8.6.1.1
Cycles	Defines the number of repetitions. The maximum number of repetitions is 999.	See chapter 8.6.1.1
	Temperature increment by which the target temperature is increased or decreased with each cycle. The temperature increment can be ± 20.0°C.	See chapter 8.6.1.2
	Time increment (e.g., for long range PCR) by which the time is increased with each cycle. The time increment can be between 0s and 240s.	See chapter 8.6.1.3
	Average heating and cooling rate between steps. The heating and cooling rate can be set from 0.1°C/s to max. in tenths of a degree. (The maximum ramp rate is sample bock specific). The ramp rate specifies the speed at which the selected step is reached with.	See chapter 8.6.1.4
	Establishes a temperature gradient across the sample block. The maximum gradient temperature range and the temperature range that can be used for the gradient will depend on the installed sample block.	See chapter 8.6.1.5

The Biometra TOne offers two options for editing a step in a PCR program:

1. Change all parameters for the step on a screen
2. Change individual parameters directly in the spreadsheet or graphical display

8.6.1 Editing all parameters of a step

Activate a step in the spreadsheet or graphical view (see chapter 8.1). To edit the activated step, press the **Edit** button.

Edit 

In the graphical view you can also access the screen for editing a program step by touching the currently activated step again.

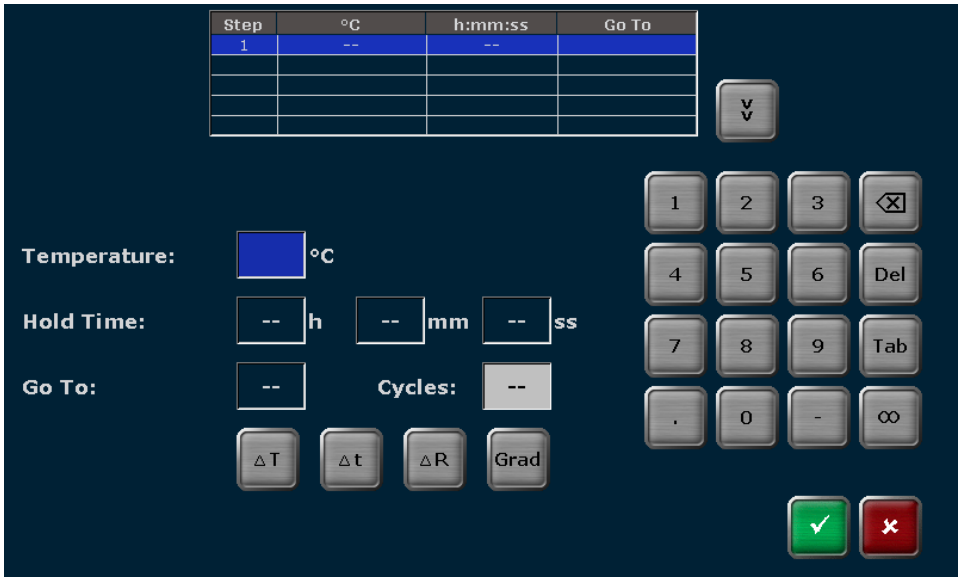


Fig. 21 Biometra TOne program step editing screen

Note: To program a step at least the temperature and the hold time must be defined.

To set the temperature, touch the corresponding input field and enter a value between 3.0°C and 99.0°C. Use the tab button or activate the next input field and enter a hold time in h:mm:ss.

The Biometra TOne software allows several program steps to be programmed subsequently (Multi Step Programming). Use the cursor keys to navigate between program steps.

Next step 

Previous step 

The currently activated step is highlighted in blue in the table above the input fields (see Fig. 21).

Note: By navigating between program steps it is not necessary to confirm the settings for each single parameter or step and to leave the screen for editing program steps. Instead, you can fill in the parameters for all steps subsequently and confirm your entries after all steps are programmed.

8.6.1.1 Programming loops

A typical PCR program consists of repetitive steps for denaturation, annealing and extension. For the repetition of steps the TOne software allows the programming of loops. For a loop two parameters have to be set:

1. The step number to which the program should return (**Go To**)

2. The number of repetitions (**Cycles**)

To program a loop, select the last step of the loop and enter the step number to which the program should return in the **Go To** input field (see Fig. 21). To define the number of repetitions, enter a number in the **Cycles** field (see Fig. 21).

For example, to program the loop for the following protocol, select step **4** and enter the value 2 in the **Go To** input field and the value 35 in the **Cycles** input field.

Step	Temp.	Time	Cycles
1	94 °C	05:00	
2	94 °C	01:00	
3	55 °C	01:00	35x
4	72 °C	01:00	
5	72 °C	05:00	
6	16 °C	Pause	

In this example, the device first executes steps 1 to 4, then repeats step 2 to step 4 for 34 times, performs the final extension at 72°C and holds the temperature indefinitely at 16°C in the last step.

8.6.1.2 Programming a temperature increment

For some applications, for example touch down PCR, temperature increments are used. The target temperature is increased or decreased in each cycle by the set value. To program a temperature increment, touch the ΔT button (see Fig. 21) and enter a value between +20°C and -20°C in the corresponding input field.

Temperature increment (ΔT) 

Note: Programmed temperature increments only become active if they are in loops. If a temperature increment has been programmed, the small symbol 

will be shown at the corresponding step in the graphical programming mode.

8.6.1.3 Programming a time increment

For some applications, for example long range PCR, time increments are used. The time is increased in each cycle by the set value. To program a time increment, touch the Δ t button (see Fig. 21) and enter a value between 0s and 240s in the corresponding input field.

Time increment (Δt) 

Note: Time increments only become active if they are in loops. If a time increment has been programmed, the small symbol  will be shown at the corresponding step in the graphical programming mode.

8.6.1.4 Adjusting the ramp rate

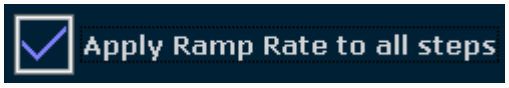
The average ramp rate can be adjusted for each step. This adjustment can be useful if PCR programs are transferred from slower devices to the Biometra TOne or for special PCR applications, for example, telomerase PCR. The average ramp rate specifies the speed at which the selected step is reached with.

To adjust the ramp, press

Ramp rate (ΔR) 

(see Fig. 21) and enter a value between 0.1°C/s and max. in tenths of degree Celsius.

It is also possible that the entered ramp rate is applied to all steps in the PCR program. For this the



checkbox to the right of the input field for the ramp rate must be activated.

Note: The maximum average ramp rate depends on the sample block installed in the Biometra TOne. If the ramp rate has been adjusted, the small symbol  will be shown at the corresponding step in the graphical programming mode.

8.6.1.5 Programming a gradient step

Note: To be able to use the gradient function, the sample block needs to be gradient enabled.

The gradient function is most often used to optimize new primer pairs. A temperature gradient is established across the sample block in the annealing step so that there are different temperatures from column to column:

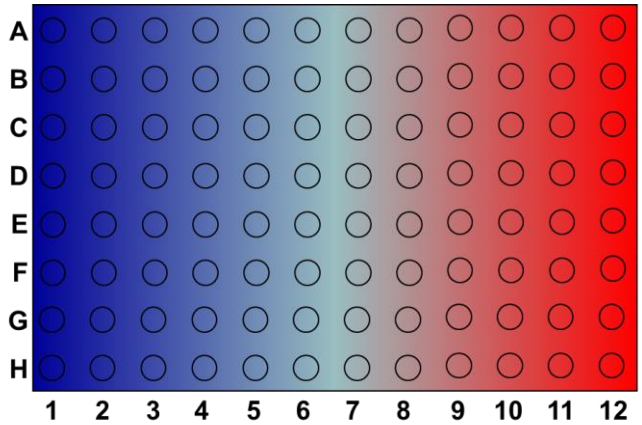


Fig. 22 **Temperature gradient on a 96 well sample block In a specific column all wells have the same temperature but the temperature differs from column to column. The temperature gradient can be applied in both directions; the highest temperature can be either in column 1 or column 12.**

Sample replicates are distributed across the columns of the sample block and tested for the temperature giving the optimal result. To program a gradient step press

Gradient 

(see Fig. 21). There are two options to program a gradient. To toggle between the two options, press the corresponding button on the Biometra TOne gradient programming screen (see Fig. 23):

Linear Gradient Tool 

Standard Gradient Programming 

To program a gradient using the Linear Gradient Tool, enter the desired annealing temperature (**Annealing Temp.**) and define a temperature increment (**Grad incr.**) between the individual columns of the sample block. The effective temperatures for all the other columns are automatically calculated and displayed as a bar chart (see Fig. 23).

Note: The annealing temperature is set for a specific column in the sample block. For example, the annealing temperature in a 96 well sample block corresponds to the temperature in column 6. The column number is indicated in parenthesis next to the corresponding input field (see Fig. 23). When setting a positive increment, the temperature in column 1 (left side of the sample block) is the lowest and the temperature in column 12 (right side of the sample block) is the highest. Use the minus button to enter a negative increment. When a negative value is used, the temperature in column 1 (left side of the sample block) is the highest and the temperature in column 12 (right side of the sample block) is the lowest.

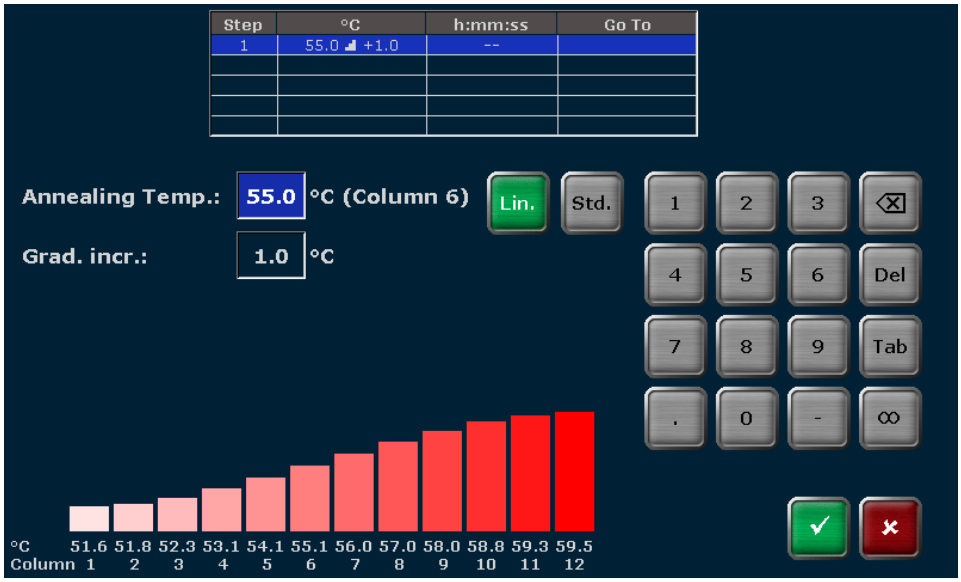


Fig. 23 **Biometra TOne Linear Gradient Tool screen**

To create a gradient using the standard gradient programming screen, enter a temperature for the first column and the last column in the sample block (see Fig. 24). The effective temperatures for all the other columns are automatically calculated and displayed as a bar chart.

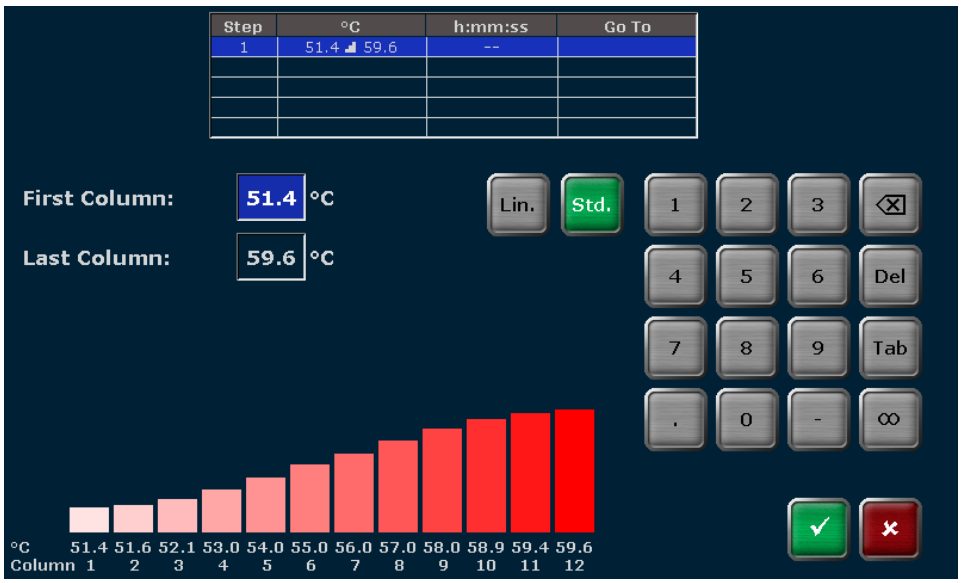


Fig. 24 Biometra TOne standard gradient programming screen

8.6.2 Direct programming of program parameters for a step

The Biometra TOne software allows individual parameters (temperature, hold time, loops, temperature and time increment, as well as the ramp rate) for a step to be edited directly in the graphical or spreadsheet view.

To edit a parameter for a step, press directly on the cell for the program parameter in the table (see Fig. 25).

Fig. 25 Biometra TOne spreadsheet program view

Parameter	Spreadsheet view
Temperature (gradient) [°C]	①
Hold time [h:mm:ss]	②
Loops	③
Number of cycles	④
Temperature increment [ΔT (°C)]	⑤
Time increment [Δt (s)]	⑥
Ramp rate [ΔR (°C/s)]	⑦

To edit program parameters in the graphical view, press the corresponding input field for the parameter that you want to edit for the step (see Fig. 26).

Program options (loops, temperature and time increment, as well as the ramp rate) must be activated using a button to the left of the graphical view (see Fig. 26). The loop setting is predefined.

The activated program option below the graphical view can then be edited by pressing the input field.

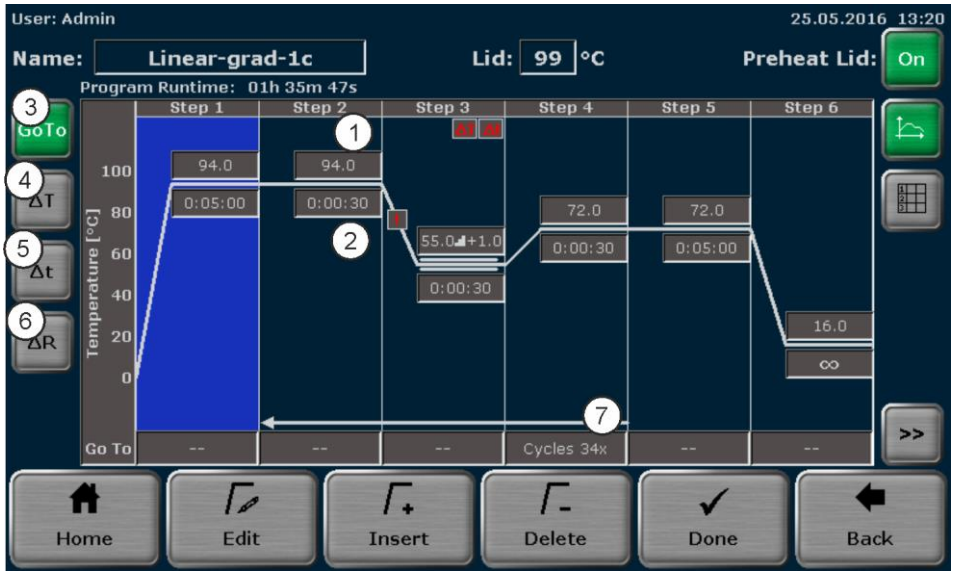


Fig. 26 Biometra TOne graphical program view

Parameter	Spreadsheet view
Temperature (gradient) [°C] input field	①
Hold time [h:mm:ss] input field	②
Loop counter option button	③
Temperature increment option button	④
Time increment option button	⑤

Ramp rate option button	⑥
Input field for program option (loop counter here)	⑦

When you press a cell in the spreadsheet view or an input field in the graphical view, a small window opens in the middle of the screen with a keyboard (see Fig. 27).

This window allows you to enter the desired value for the parameter using the keyboard.

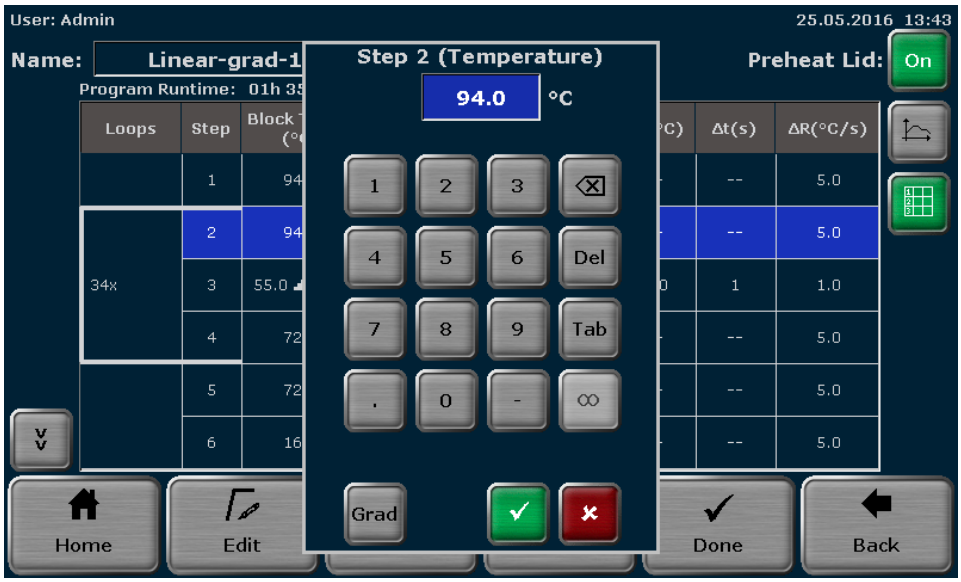


Fig. 27 Biometra TOne individual program parameter editing

If the sample block is gradient-enabled, you also have the option of programming a gradient step.

To do this, when editing the temperature, press the **Grad** button.

Gradient 

As already described in chapter 8.6.1.5, a gradient step can be programmed here (see Fig. 28).

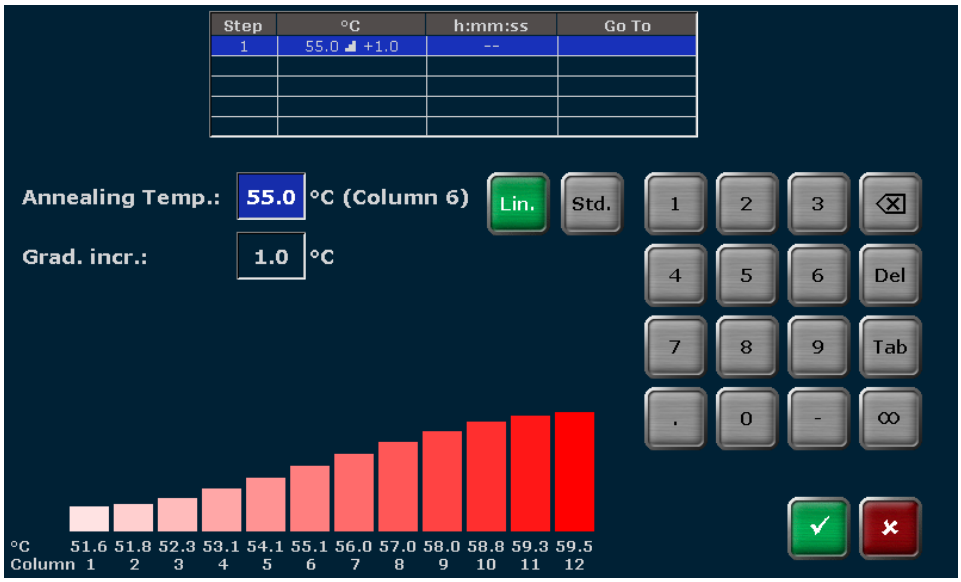


Fig. 28 **Biometra TOne gradient view**

8.7 Inserting a step

To insert a step, select a program step on the Biometra TOne spreadsheet or graphical programming screen and press the **Insert** button.

Insert 

When you press the **Insert** button, the screen for editing program steps opens (see chapter 8.6). Enter the desired parameters for the new step.

Note: The new step will be inserted at the selected program step. If, for example, step 3 is selected, the new step will be inserted at position 3. The existing step 3 is not overwritten; instead step 3 and all the following steps are moved one position higher. This means the existing step 3 becomes step 4, step 4 becomes step 5 and so on.

Note: If a new step is inserted in an existing loop, the number of steps within the loop increases, whereas the number of cycles remains the same.

8.8 Deleting a step

To delete a step, select a program step on the Biometra TOne spreadsheet or graphical programming screen and press the **Delete** button.

Delete 

Note: If a step is deleted, all the following steps will be moved one position lower. If, for example, step 3 is deleted, step 4 will become step 3, step 5 will become step 4 and so on.

Note: If a step is deleted in an existing loop, the number of steps within the loop decreases, whereas the number of cycles remains the same.

8.9 Saving the program

To save a program, press the **Done** button.

Done 

on the Biometra TOne spreadsheet or graphical programming screen. In the next program overview screen (see Fig. 29), touch the corresponding buttons to select a user directory and a program storage location.

If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the list can be used to scroll up and down.

Note: The user directory of the logged in user is automatically preselected.

Note: If a new program is to be saved, the first free storage location in the directory of the currently logged in user is automatically selected. However, the storage location can be changed using the cursor keys above and below the lists. If the selected storage location is already in use, the stored program will not be overwritten; instead this program and all other following programs will be moved one position higher. The storage location number for these programs will increase by +1 and the new program is saved at the selected location.

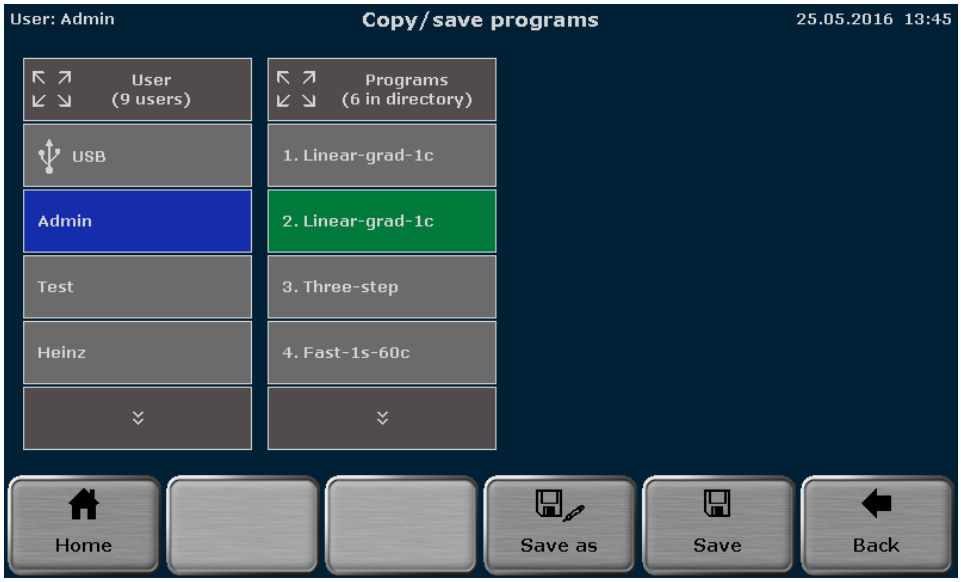


Fig. 29 Biometra TOne program overview screen

There is also the option of selecting a user directory or a program location using the quick select function.

Touch the icon above the user or program view (see Fig. 29).

Quick select function 

An overview screen opens in which a maximum of 30 users or 50 user programs are displayed. If a user has saved more than 50 programs, scroll through the user list using the cursor keys (see Fig. 30).

Right 

Left 

To select a user or program, press the corresponding button with the user or program name. The user or the program will be selected and the program overview screen (see Fig. 29) appears again.

Fig. 30 TOne quick select screen

Before saving the program there is still the possibility of changing the program name.

To do this, press the **Save as** button and enter the new program name using the Biometra TOne keyboard (see chapter 8.3).

Save as 

After selecting the user directory and the storage location and possibly changing the program name, press the **Save** button on the Biometra TOne program overview screen (see Fig. 29) to save the program.

Save 

9 Starting, coping and deleting programs

9.1 Starting a program

The Biometra TOne software offers a quick start function for previously started programs (see chapter 7.6).

This chapter describes the process of selecting and starting stored programs from a user account. To select a program to be started, press the **Programs** button on the Biometra TOne home screen (see chapter 7.4).

Programs 

The program overview screen opens with the directory of the logged in user preselected (see Fig. 31).

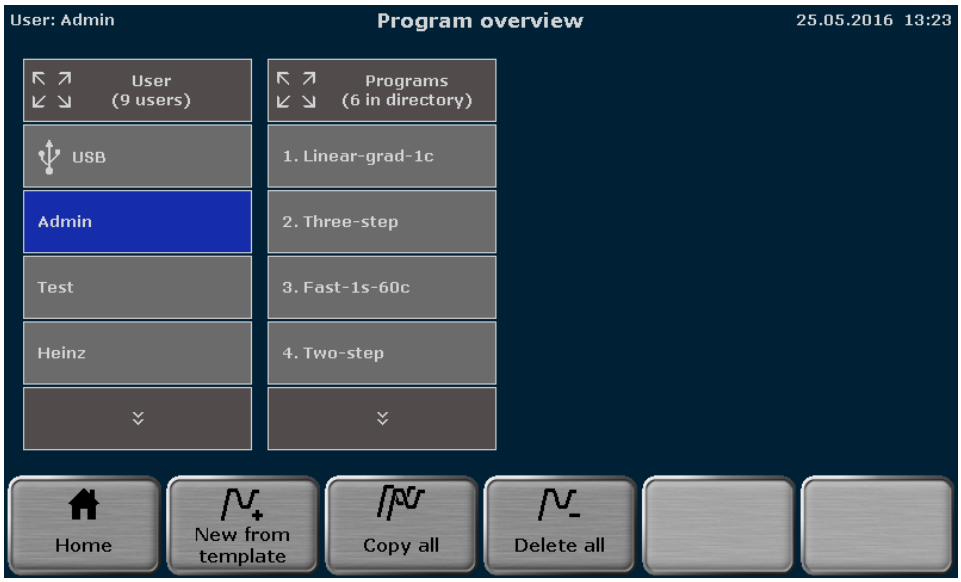


Fig. 31 Biometra TOne program overview screen

Touch the corresponding buttons to select a user directory and a stored program. If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down.

There is also the option of selecting a user directory or a program location using the quick select function (see chapter 8.9).

For the selected program a preview opens with general information on the program and the steps listed in a table (see Fig. 32). The program preview can be used to check the program before it is started. To start the selected program, press the **Start** button.

Start 

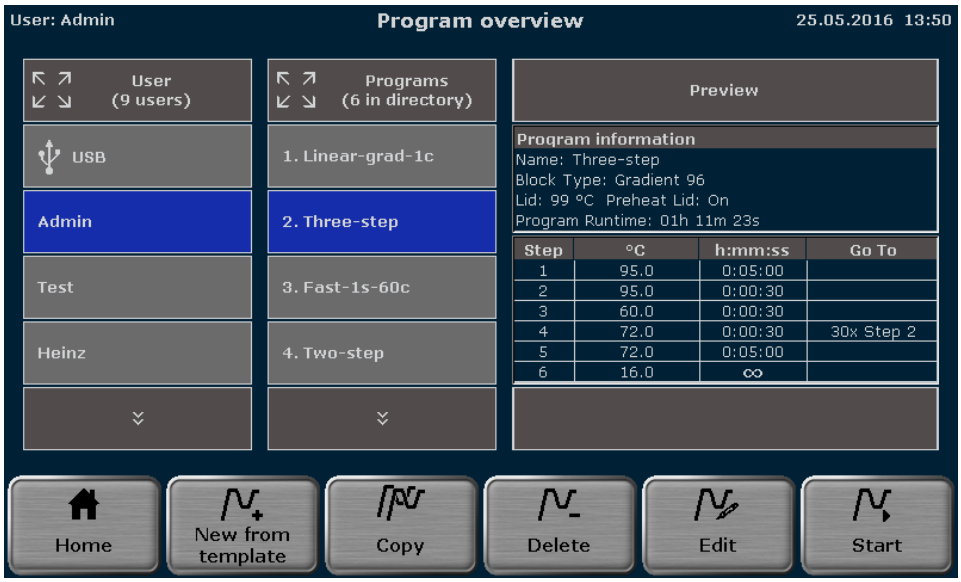


Fig. 32 Biometra TOne program overview screen with preview

9.2 Copying a program

To copy a program, touch the corresponding buttons to select a user directory and a program on the Biometra TOne program overview screen (see Fig. 31). If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down. To copy the selected program, press the **Copy** button.

Copy 

Touch the corresponding buttons to select a user directory and a storage location on the Biometra TOne program overview screen (see Fig. 33). The program to be copied is highlighted in green. If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down. To save the selected program, press the **Save** button.

Save 

Note: If the selected storage location is already in use, the stored program will not be overwritten; instead this program and all other following programs will be moved one position higher. The storage location number for these programs will increase by +1 and the new program is saved at the selected location.

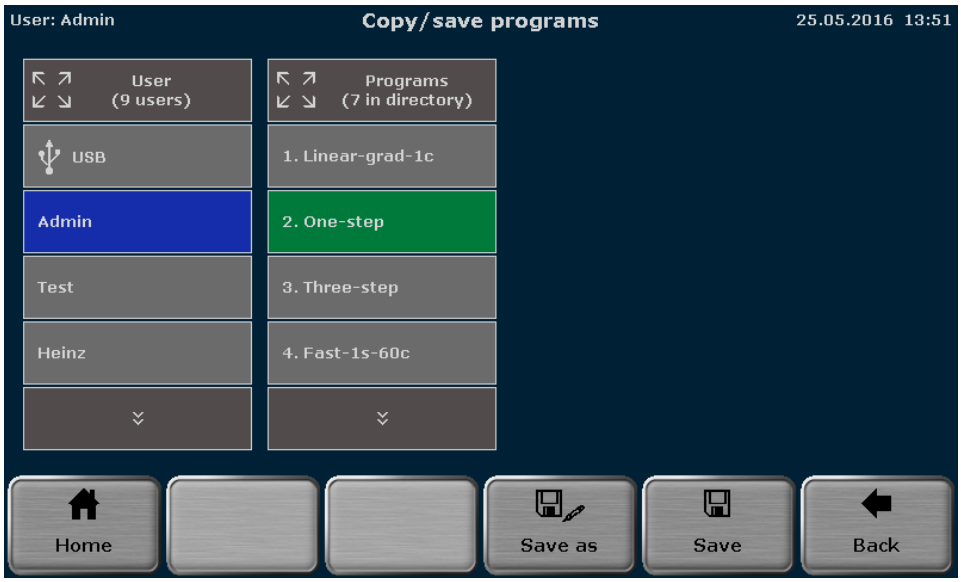


Fig. 33 Biometra TOne program overview screen

9.3 Copying all programs

To copy all programs, touch the corresponding button to select a user directory on the Biometra TOne program overview screen (see Fig. 31). If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down. To copy all the programs, press the **Copy all** button.

Copy all 

Touch the corresponding button to select a user directory on the Biometra TOne program overview screen (see Fig. 33). If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down. To save the programs, press the **Save** button.

Save 

Note: The programs will be copied into the selected user directory beginning at the first free storage location.

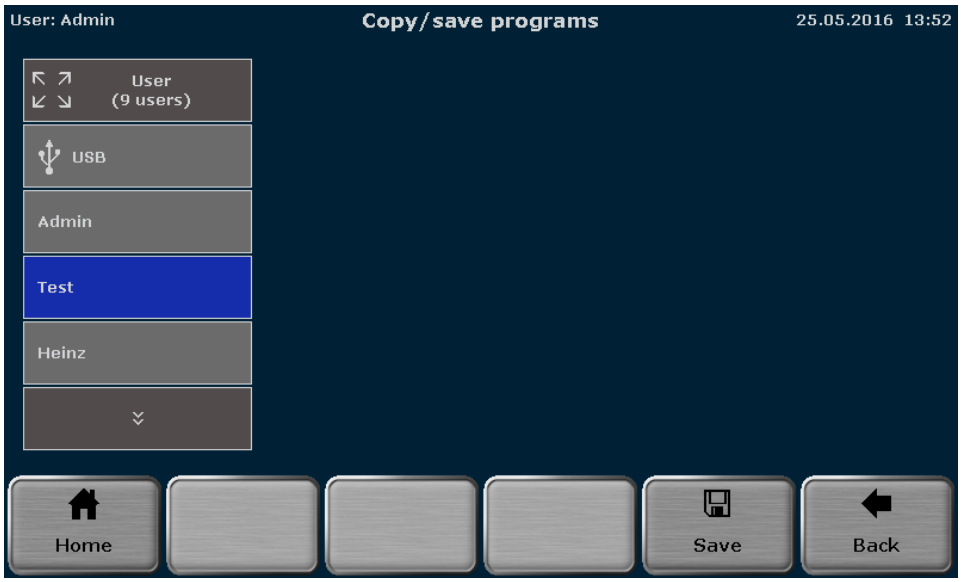


Fig. 34 Biometra TOne program overview screen

9.4 Deleting a program

To delete a program, touch the corresponding buttons to select a user directory and a program on the Biometra TOne program overview screen (see Fig. 31). If the number of user directories or programs is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down. To delete the selected program, press the **Delete** button.

Delete 

Confirm the confirmation prompt to delete the program

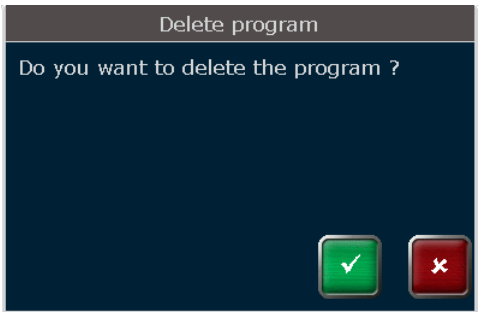


Fig. 35 TOne confirmation prompt

Note: If a program is deleted, all the following programs will be moved one storage location lower. The storage location number for these programs will decrease by -1.

9.5 Deleting all programs

To delete all programs, touch the corresponding buttons to select a user directory on the Biometra TOne program overview screen (see Fig. 31). If the number of user directories is higher than the maximum number that can be displayed in the list, the buttons above and below the lists can be used to scroll up and down. To delete the programs, press Delete all.

Delete all 

Confirm the confirmation prompt to delete the programs

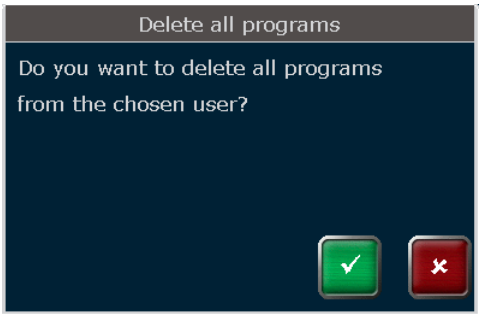


Fig. 36 Biometra TOne confirmation prompt

10 Running, pausing, continuing and stopping programs

10.1 Display during a run

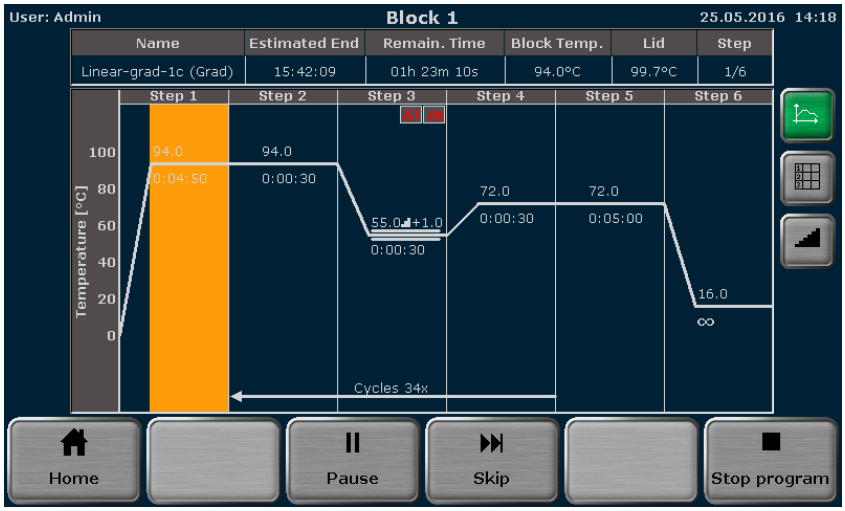
After a program has been started (see chapter 9.1) the Biometra TOne software can display the currently running program in a spreadsheet or graphical view. In addition, the curve of the gradient can be displayed in gradient steps. Use the following buttons to toggle between the different views.

Graphical view 

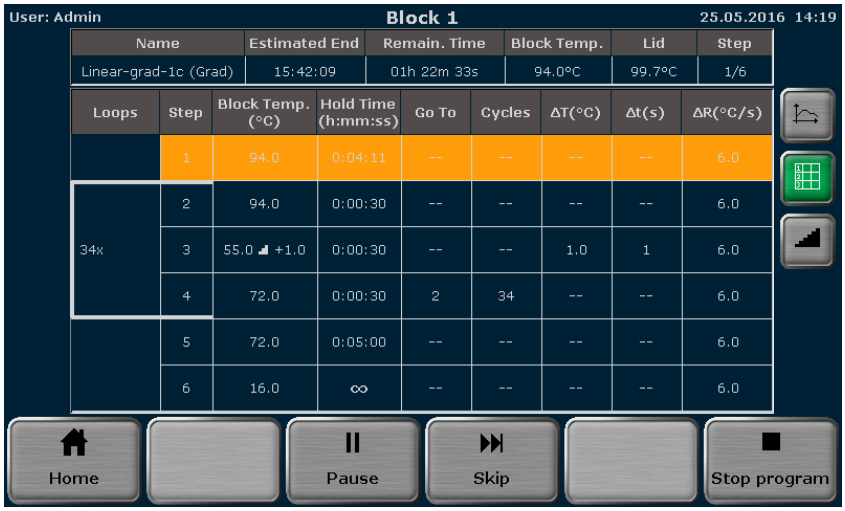
Spreadsheet view 

Gradient view 

Graphical view



Spreadsheet view



Gradient view

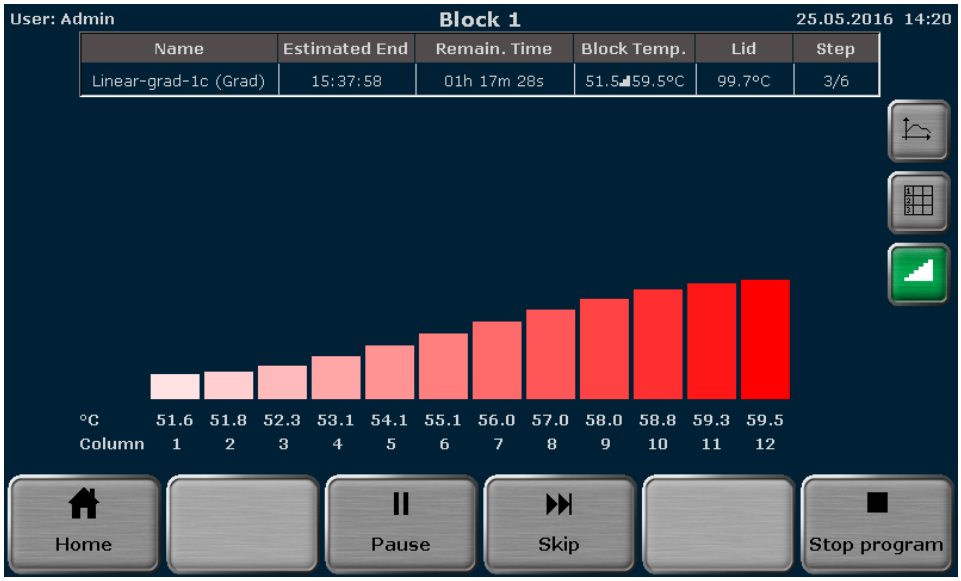


Fig. 37 Biometra TOne display during the run in a graphical, spreadsheet and gradient view

The following parameters are summarized in the headline in the table:

- Program name
- Sample block temperature
- Estimated end
- Heated lid temperature
- Remaining runtime
- Sequential number of working step

If the heated lid is set to preheating **On** (see chapter 8.5), during the preheating of the heated lid the word "Preheat" will be displayed in the **Step** field in the table. After the heated lid has reached the target temperature and the 40s equilibration phase has passed, the first program step starts. During the program run, the current step is highlighted in yellow in the graphical and spreadsheet view. In the graphical view, each step is divided into a heating phase and a hold time and both parts are highlighted separately. Time and temperature increments and ramp rate adjustments cannot be shown in the graphical view. Instead the symbols ΔT, Δt or ! are displayed (see chapter 8.1).

If it is a gradient program, "Grad" is also displayed in brackets in the **Name** field after the program name (see Fig. 37).

During a gradient step, the temperatures present in each individual column in the sample block can be checked in the gradient display.

10.2 Pausing a program

To pause a program, press the **Pause** button on the Biometra TOne run display screen (see Fig. 37).

Pause 

The word "Pause" is shown and the pause time is counted in the **Remain.Time** field.

Spreadsheet view

Graphical view

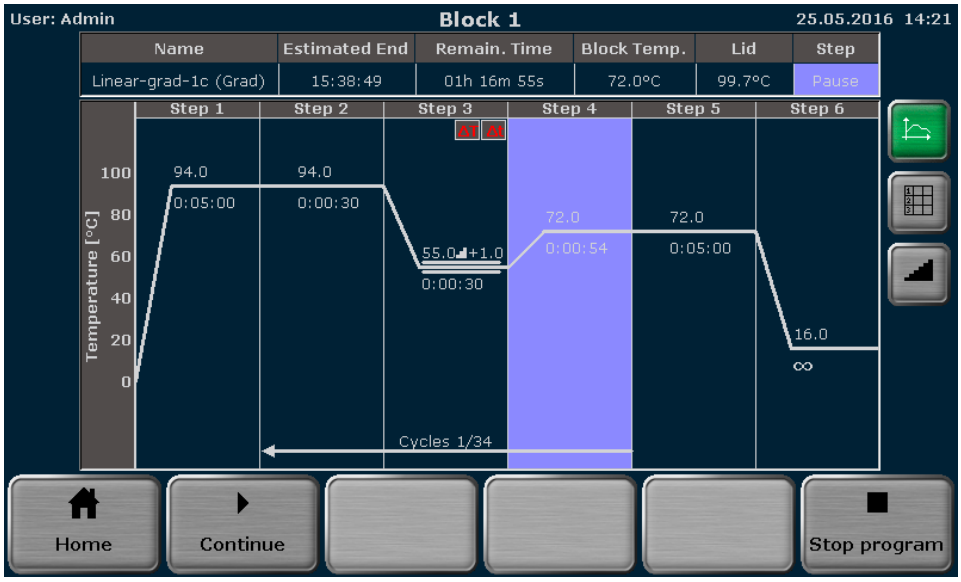


Fig. 38 Biometra TOne run display screen during a program pause

Note: Pressing the **Pause** button requires manual interaction. The Biometra TOne software also allows pauses to be programmed (see chapter 8.6), then the pause step is automatically started by the device.

Note: If the device is switched off during a pause step, this will be recognized as a power failure (a corresponding error message is written to the run log file). If, for example, the last

step in a program is a pause, the program has to be stopped by pressing the **Stop** button (see chapter 10.5), before switching off the Biometra TOne.

10.3 Continuing the program

To continue a paused program, press the **Continue** button on the TOne run display screen (see Fig. 38).

Continue 

The Biometra TOne will continue the program from exactly the point at which it was paused.

10.4 Skipping a step

To skip a program step, press the **Skip** button on the TOne run display screen (see Fig. 37).

Skip 

The Biometra TOne will continue with the next program step and skip the current step.

10.5 Stopping the program

To stop a program, press the **Stop program** button on the TOne run display screen (see Fig. 37).

Stop program 

Confirm the confirmation prompt to stop the current program:

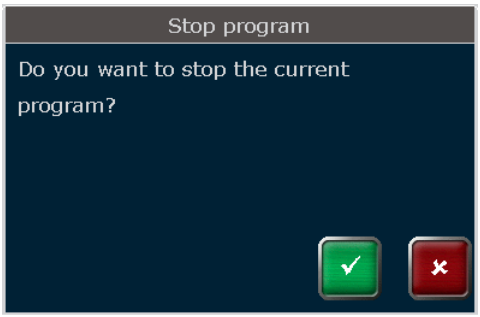


Fig. 39 Biometra TOne confirmation prompt

After confirmation of the confirmation prompt the Biometra TOne stops the current program.

11 Tools

The Biometra TOne software provides the following tools:

Settings	Defines basic device settings	See chapter 11.1
User Management	Tool for user management	See chapter 11.2
Documentation	Access to stored log files	See chapter 11.3
Self Test	Executes the extended self-test	See chapter 11.4
Service info file	Creates service info files (SINF)	See chapter 11.5
Backup	Saves all folders, programs, users and user rights to USB	See chapter 11.6
Cycler Info	General information on the device	See chapter 11.7
Contact	Biometra contact data	See chapter 11.8

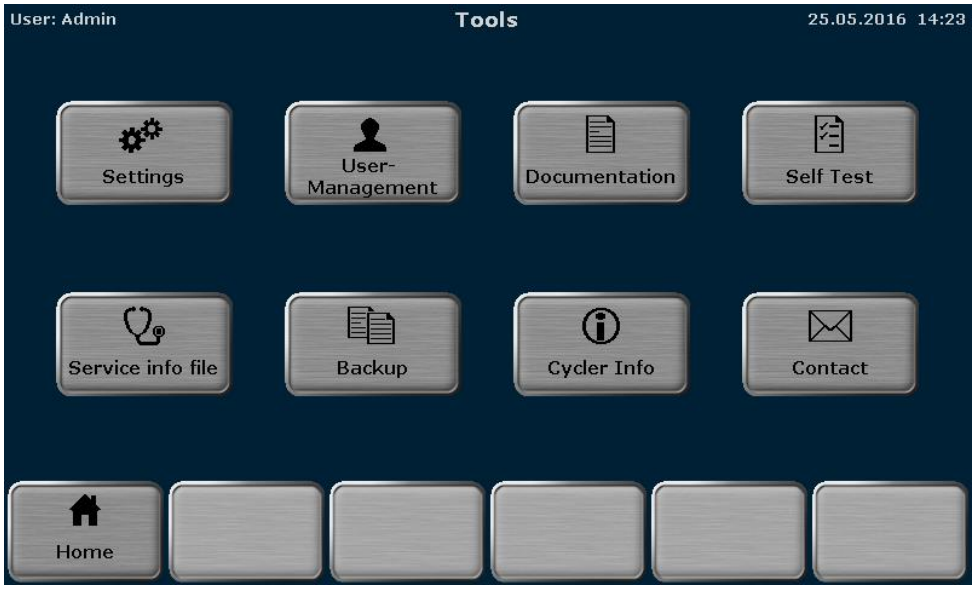


Fig. 40 Biometra TOne tools screen

Press the corresponding button to access the desired function.

11.1 Configuration

The Biometra TOne software offers the following setting options:

Date and time	Sets the date and time	See chapter 11.1.1
Automatic user logout	Switches automatic user logout on or off and time settings	See chapter 11.1.2
Beeper	Switches the beeper on or off	See chapter 11.1.3
Network	Defines network settings	See chapter 11.1.4
Display brightness	Adjusts the display brightness	See chapter 11.1.5
Touch screen calibration	Calibrates the touchscreen	See chapter 11.1.6
Factory settings	Resets all the settings	See chapter 11.1.7

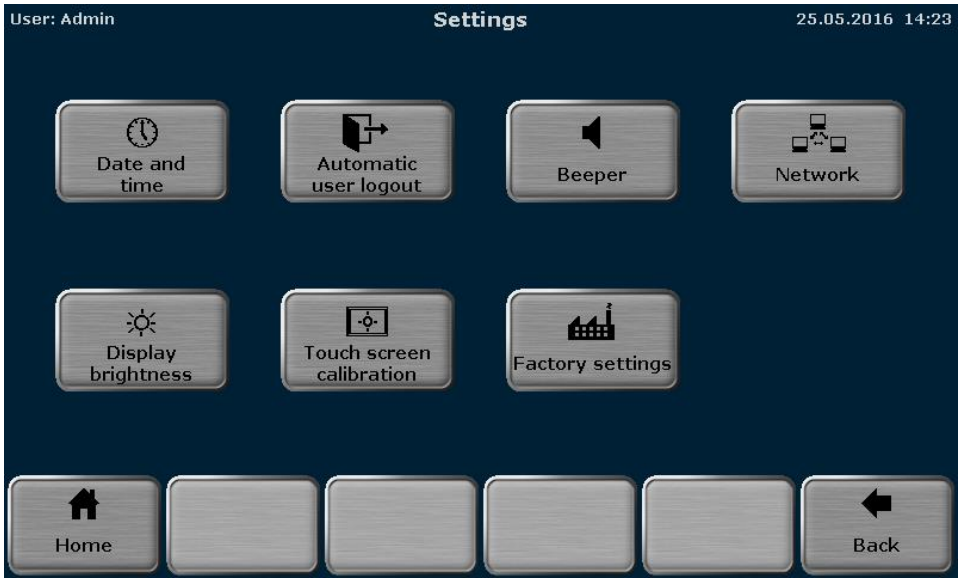


Fig. 41 Biometra TOne settings screen

Press the corresponding button to access the desired function.

11.1.1 Setting the date and time

The Biometra TOne software allows the user to set the date and time. The date has the format day:month:year and the time the format hours:minutes:seconds.

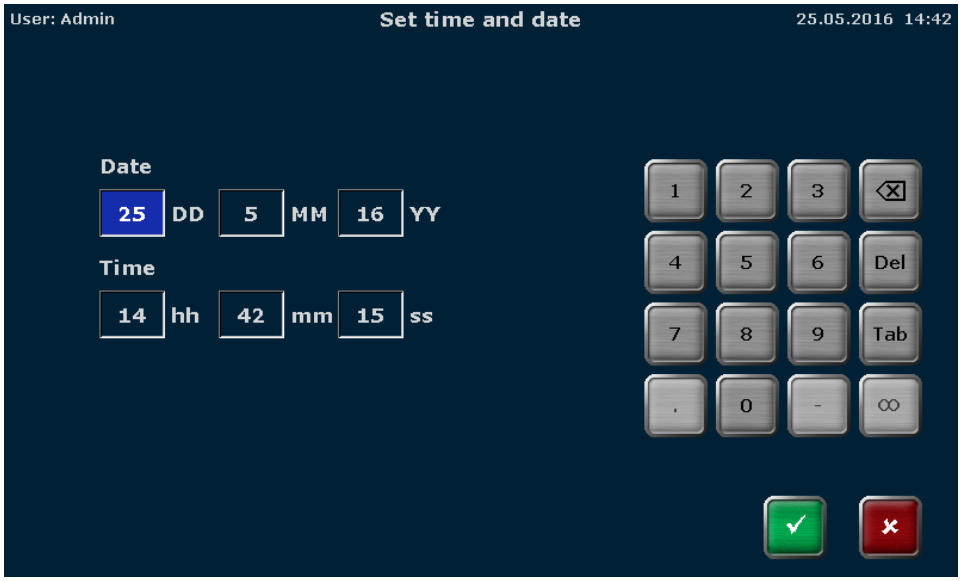


Fig. 42 Biometra TOne date and time entry screen

Activate the corresponding input field and use the keypad on the right side of the date and time entry screen to enter digits. The following buttons may also be helpful when completing the fields:

Delete single character	⌫
Delete all characters	Del
Go to the next input field	Tab

Note: The following buttons are inactive on the date and time entry screen and cannot be used:

. - ∞

11.1.2 Automatic user logout

The Biometra TOne features an automatic user logout function. The automatic user logout can be switched **On** or **Off** by using the corresponding button:

Automatic logout On 

Automatic logout Off 

If automatic user logout is switched on, the time after which the user is logged out from the system can be set. You can enter values between 30 and 60 minutes.

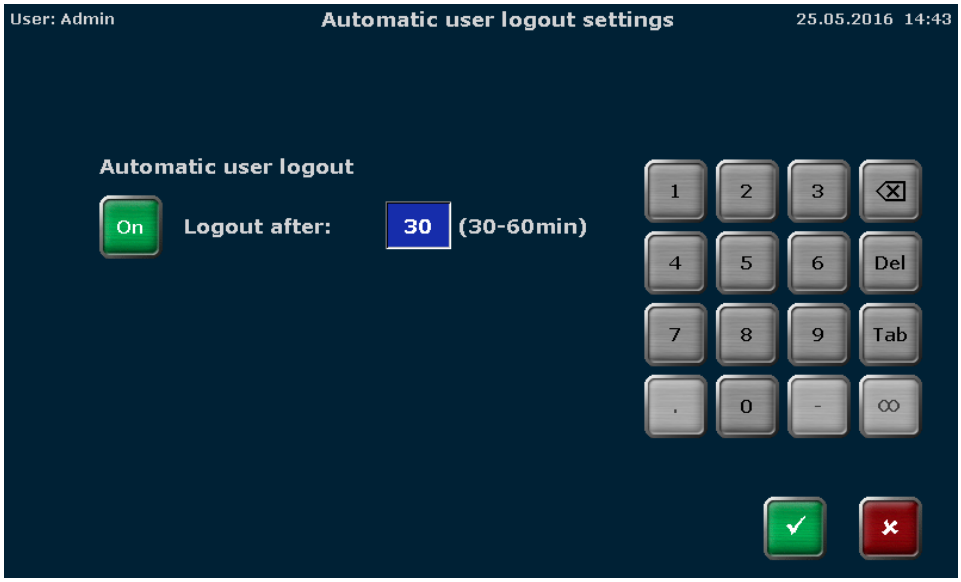


Fig. 43 Biometra TOne automatic user logout screen

Note: The standard setting is automatic user logout **Off**.

Note: The following buttons are inactive on the automatic user logout screen and cannot be used:

11.1.3 Configuring the beeper

The Biometra TOne has a beeper which, if switched on, will issue an acoustic signal when a PCR program is finished. The beeper can be switched ON or OFF by activating the corresponding checkbox.

Fig. 44 Biometra TOne beeper configuration screen

11.1.4 Network

The **Network** menu item can be used to configure basic settings or show a list of network users. Press the corresponding button

Network settings 

Network user 

11.1.4.1 Network settings

The Biometra TOne can handle static and dynamic IP addresses. Activate the corresponding checkbox to choose between dynamic (DHCP) and static IP address management. If DHCP is activated, the device automatically receives the network configuration settings. If the static checkbox is activated, you can enter the IP address, the subnet mask and the port number using the keypad on the right side of the screen.

The following buttons may be helpful when completing the fields:

Delete single character 

Delete all characters 

Go to the next input field 

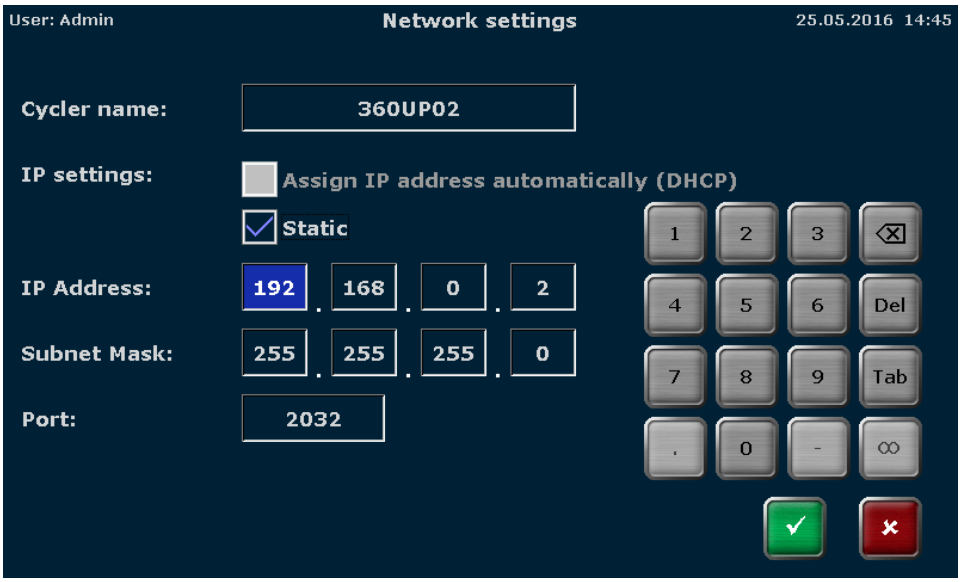


Fig. 45 Biometra TOne network settings screen

Note: The network cable must be at least performance class Cat 5e and the cable configuration has to be STP.

11.1.4.2 Network users

The software stores the users who access the Biometra TOne via the network and lists them in chronological order in a table. The function makes it possible to check if only authorized persons have network access to the device.

11.1.5 Display brightness

The display brightness can be adjusted to the local light conditions. To adjust the display brightness, use the corresponding buttons or the slider:

Darker 

Brighter 

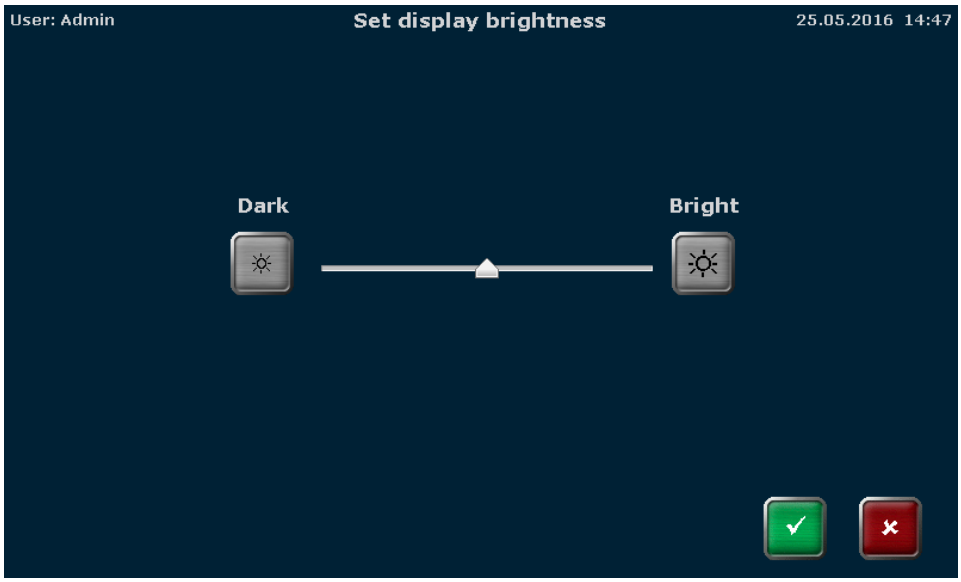


Fig. 46 **Biometra TOne display brightness adjustment screen**

11.1.6 Screen calibration

To calibrate the screen, follow the instructions and touch the screen at the center of the displayed circle. This procedure is repeated three times at different positions on the display. If, at the end of the procedure, a small cross is shown within the large circle, the calibration was successful.

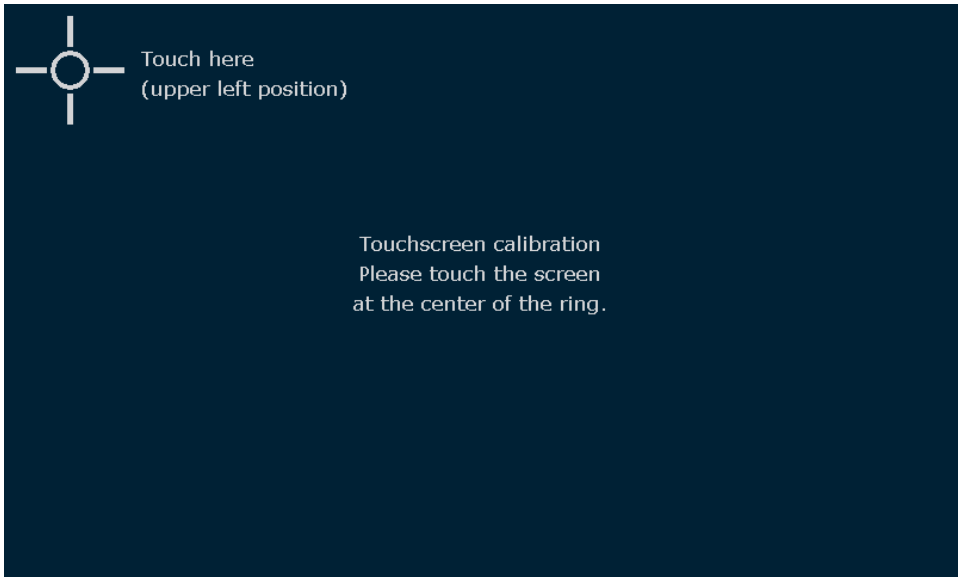


Fig. 47 **TOne calibration screen**

11.1.7 Factory settings

Press the **Factory settings** button and confirm the following confirmation prompt:

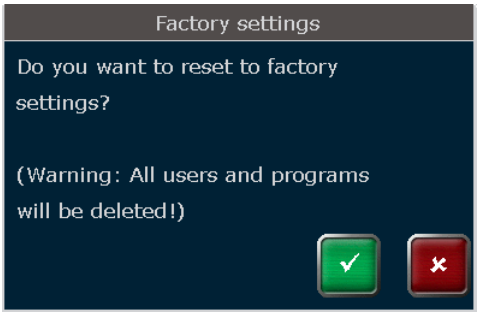


Fig. 48 Biometra TOne confirmation prompt

Using the factory settings tool will delete all users and programs! Use a backup file to restore the system (see chapter 11.6).

11.2 User management

The Biometra TOne can manage up to 90 user directories. User management allows new users to be created. Please observe the following recommendations:

1. The factory setting for the administrator password is "Admin". Please change the password after switching on user management to protect the system from unwanted modifications.
2. Use the backup function to create backup files. Backup files can be used to restore a system or to synchronize the memory contents of Biometra TOne thermal cyclers.

Fig. 49 Biometra TOne user management screen

Available users are listed on the Biometra TOne user management screen (see Fig. 49) sorted by the date and time of the last login and the username, the initials and the group assignment are shown. All users have the group assignment "Admin", that is, they have all the rights and access to all software functions.

There is no password protection for all users except the administrator "Admin".

If more than 8 users have been created, you can use the cursor keys to navigate through the table with the list of users (see Fig. 49).

Up 

Down 

To select a user, press on the corresponding row in the table.

11.2.1 Creating a user

To create a new user, press the **New User** button.

New user 

In the next screen enter the

- Username (up to 13 characters or numbers)
- Initials (2 to 3 characters)

using the Biometra TOne keyboard (see chapter 6.4.1) and set the language by activating the corresponding checkbox.

Fig. 50 Biometra TOne create new user screen

Note: The language setting is user specific. For each user the language setting is saved by the device. The language setting can be changed during operation and the device does not need to be switched off and rebooted.

11.2.2 Editing user settings

To edit the user settings, select a user on the Biometra TOne user management screen (see chapter 11.2) and press the **Edit** button.

Edit 

On the next screen the user name and the language setting can be changed.

Fig. 51 Biometra TOne user data screen

Note: For the administrator "Admin" the user name and the initials "ADM" cannot be modified. It is recommended to change the password for the administrator "Admin" after the first system start and to create a backup of the system. Folders, programs, users and rights settings can be restored from a backup file.

11.2.3 Delete user

To delete a user, select the user on the user management screen (see chapter 11.2) and press the **Delete User** button.

Delete User 

Note: The administrator "Admin" cannot be deleted because at least one user must be the administrator of the Biometra TOne.

Confirm the confirmation prompt to delete the user:

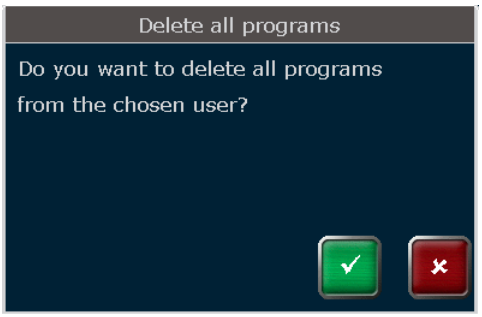


Fig. 52 TOne confirmation prompt

After confirmation of the confirmation prompt the user and all of his programs will be deleted.

11.3 Documentation

The Biometra TOne software provides the following documentation tools:

Run Log File	Documentation of PCR runs	See chapter 11.3.1
Power On Log File	Result of the latest initial self-test	See chapter 11.3.2
Self Test Log File	Result of the extended self-test	See chapter 11.3.3
Error Log File	List of all the error messages detected by the device	See chapter 11.3.4

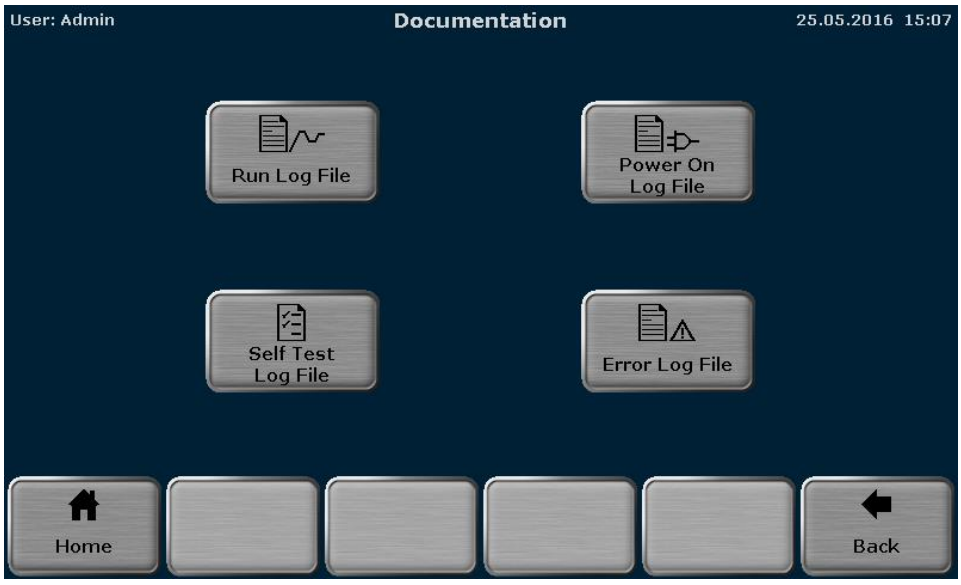


Fig. 53 Biometra TOne documentation screen

Press the corresponding button to access the desired function.

11.3.1 Run log file

The Biometra TOne lists up to 24 run log files for the programs that were last started.

Fig. 54 Biometra TOne run log file overview screen

The run log files are sorted by date and time. The run log file for the program that was last started is shown at the first position in the table. The initials of the user who started the program, the number of the sample block being used, the program name, the directory and the program number are also shown.

If more than 6 run log files have been created, you can use the cursor keys

Up 

Down 

to navigate through the table with the run log files (see Fig. 54).

To view the collected data, select a run log file by activating the corresponding row in the table and press the **View Run Log File** button.

View Run Log File 

In the run log file screen the following information is listed:

- Name of the run log file
- Login time and date
- Start and end time of the program run
- Date of the program run
- Name of the vendor
- Software version
- User initials
- Cycler type

- Serial number of the Biometra TOne thermal cycler
- Sample block type
- Block serial number
- Block number
- Messages

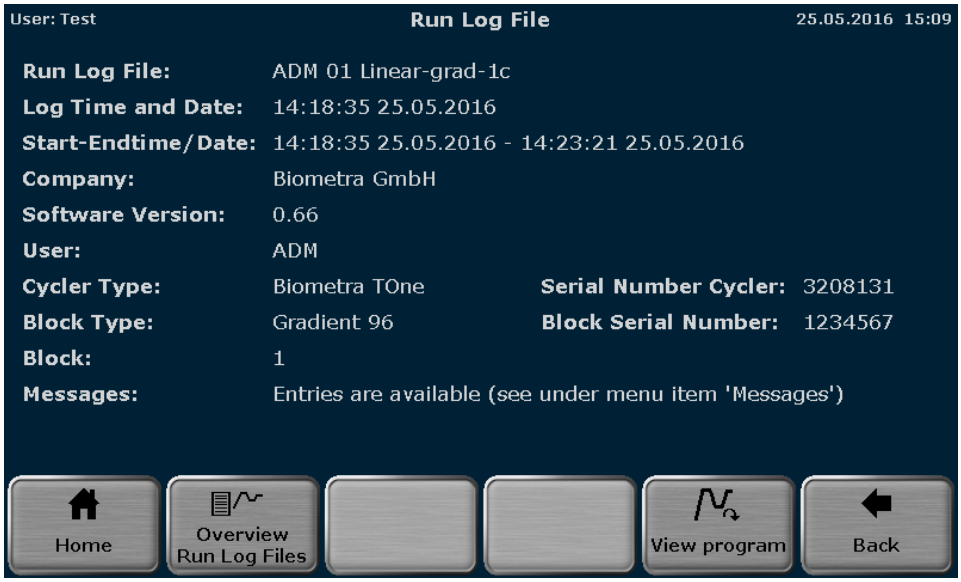
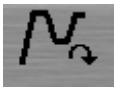


Fig. 55 Biometra TOne run log file screen

To view the corresponding program, press the **View Program** button.

View program 

The Biometra TOne offers the option to show the program in graphical from or as a spreadsheet (see chapter 8.1). To toggle between the graphical and spreadsheet view, use the buttons:

Graphical view 

Spreadsheet view 

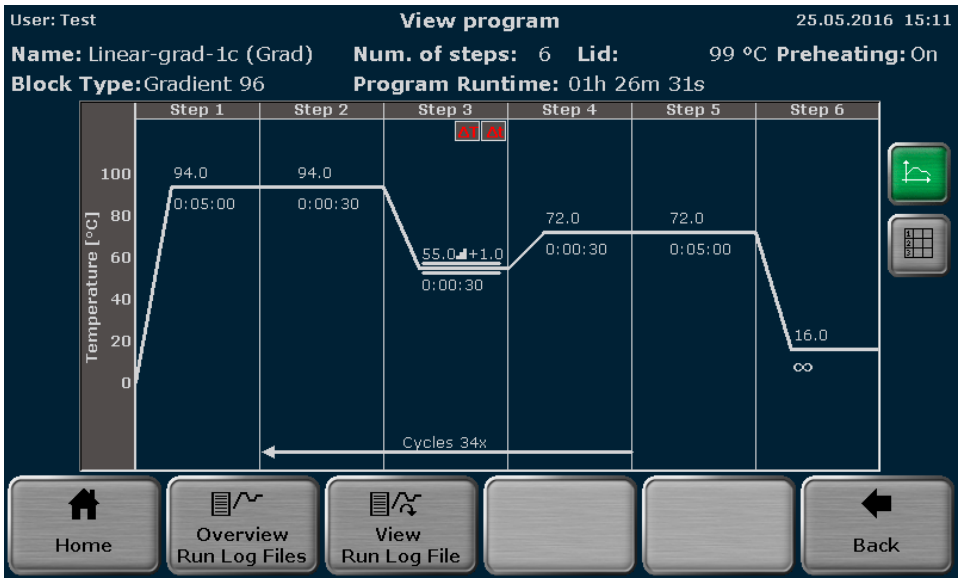


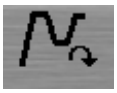
Fig. 56 Biometra TOne program view screen

Use the buttons to toggle between the overview screen, the run log file screen and the view program screen.

Overview Run Log Files

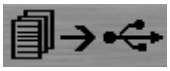
View Run Log File

Show Program

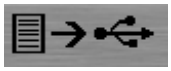


To export all the saved run log files on USB, press the **Save all Run Log Files on USB** button. To export a specific run log file, select a log file from the list on the run log file overview screen (see Fig. 54) and press the **Save Run Log File on USB** button.

Save all Run Log Files on USB



Save Run Log File on USB



11.3.2 Power On Logfile

With each system start, the Biometra TOne performs an initial self-test and stores the results in a power on logfile.

In the power on logfile screen the following information is listed:

- Power-on by date and time
- Last power-on by date and time
- Last power-down by date and time
- A table with a list of error messages by number, date, time, error code and message

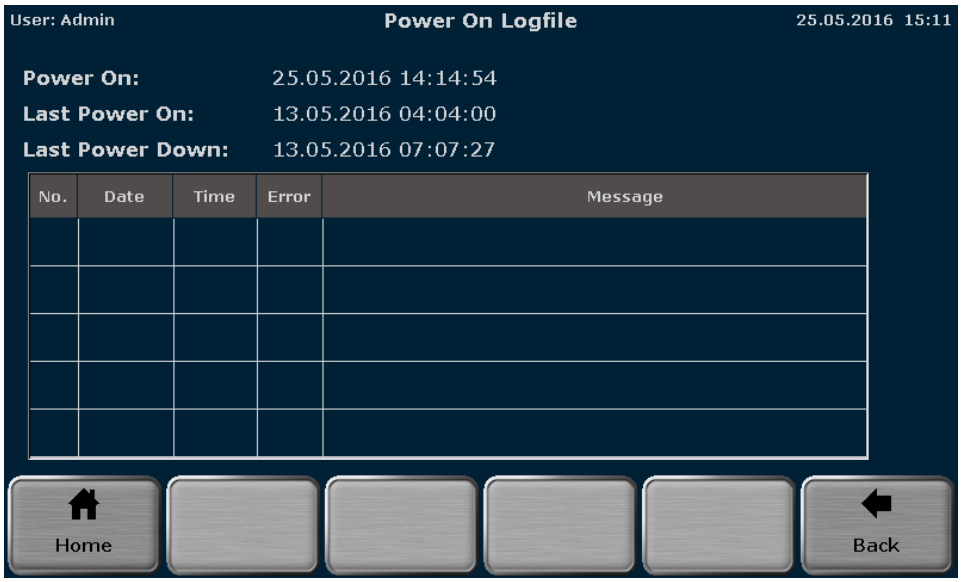


Fig. 57 Biometra TOne power on log file screen

11.3.3 Extended self-test log file

During the extended self-test the Biometra TOne checks several functions and components like cooler, thermal tracking, heating and cooling rate, refrigeration, gradient, heated lid and regulation (see chapter 11.4). Press on the corresponding button to see the results for a specific test summarized in spreadsheet form.

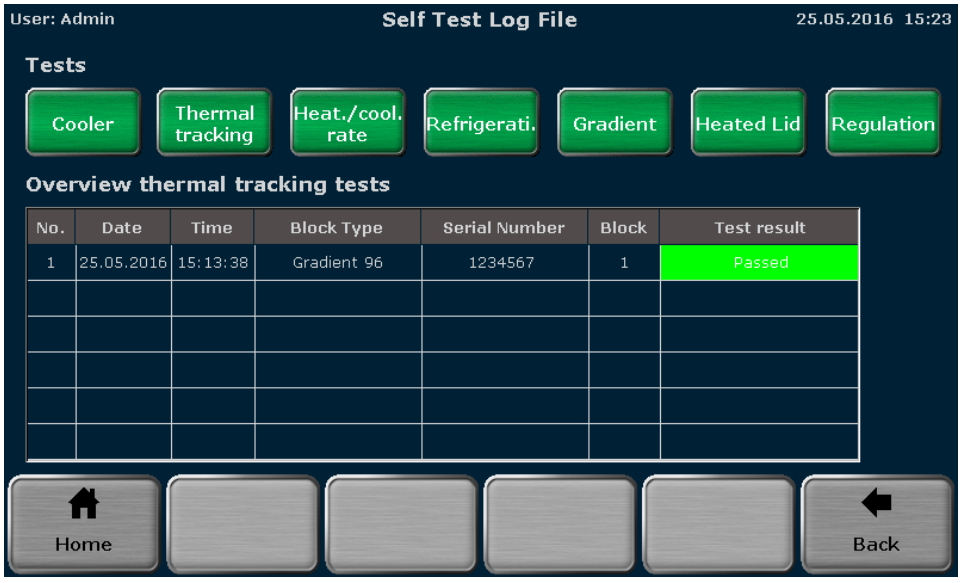


Fig. 58 Biometra TOne extended self-test log file screen

The test result can be "Passed" or "Failed" and is listed in the last row of the table for each test.

11.3.4 Error log file

The Biometra TOne records all errors by date and time. The latest error is shown at the first position in the error table. The error code and the message are also listed.

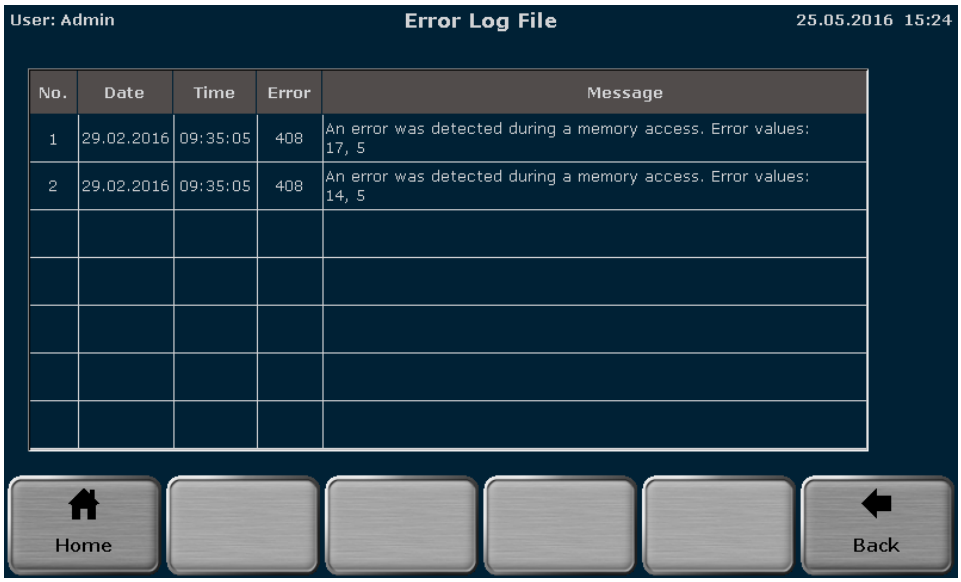


Fig. 59 Biometra TOne error log file screen

11.4 Extended self-test

NOTICE

The Extended Self-Test must be performed under the following conditions to achieve reproducible and meaningful results:

- Ambient temperature in the range 20 °C to 25 °C
- Mains voltage depending on the voltage type of the device: 100 V/115 V/230, ±10 % each
- The device must be cooled to the ambient temperature of 20 °C to 25 °C after the last application.

During the extended self-test the Biometra TOne checks several functions and components:

Test	Function
Cooler	Incubates the sample block to 4°C and checks if the temperature in the block is reached and can be held for a longer time.
Thermal tracking	Checks the synchronism of the control circuits and if they work together in a coordinated way.
Heating and cooling rate	Checks if the specified average heating and cooling rate is reached.
Refrigeration	Checks if the heat sink and the fans are working properly together.
Gradient[1]	Checks if the sample block reaches the set gradient temperatures.
Heated lid	Tests if the heated lid reaches the set temperature and can hold it for a longer time.
Regulation	Tests if the sample block is controlled properly.

[1] for gradient-capable models only

The Biometra TOne software will automatically recommend at regular intervals to carry out an extended self-test. Although it is not absolutely necessary to perform the test, it is highly recommendable to follow the prompt and to let the device check itself.

Before starting the extended self-test, insert a microplate or, if applicable, two strips or a row of tubes in the first and last row into the sample block (see Fig. 60). It is very important to load the sample block as described with plasticware because during the extended self-test the operation of the heated lid is tested and this test can only be carried out with a correctly loaded sample block. The position of the plasticware in the block is also very important to ensure optimal contact pressure and uniform horizontal alignment of the heated lid.

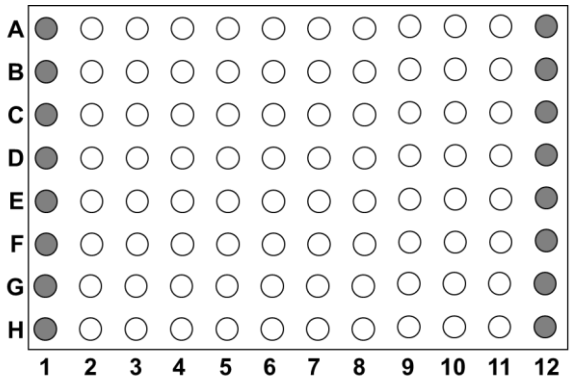


Fig. 60 How to load the sample block with plasticware for the extended self-test

When the plasticware has been properly inserted and the heated lid is closed, the extended self-test can be started. To start the extended self-test press:

Start Self Test 

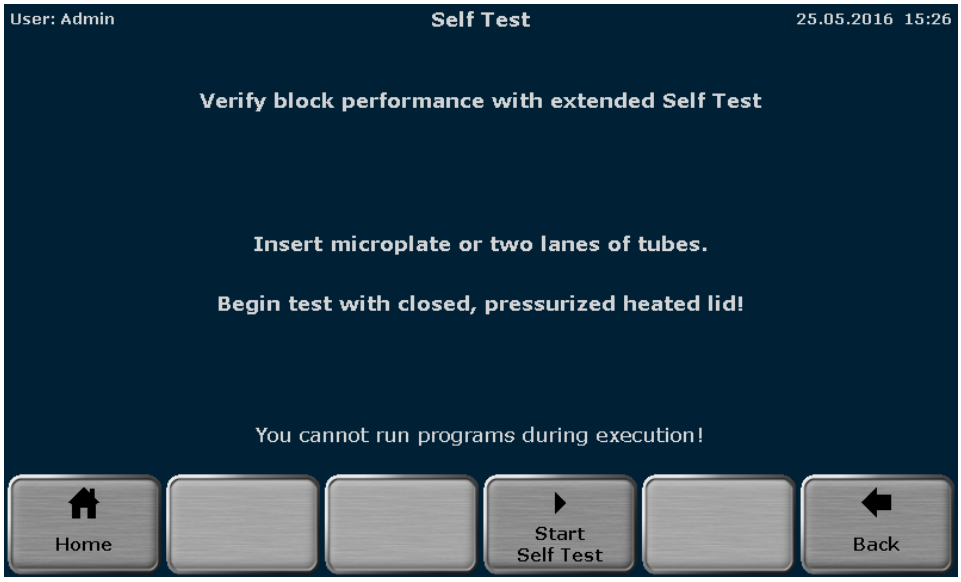


Fig. 61 Biometra TOne extended self-test screen

The software provides a progress overview during the extended self-test. When a test has finished, the result "Passed" or "Failed" is displayed. For the currently running test, the status "Running" is shown and all other tests for which no result is shown are not finished yet.

Note: The extended self-test will take approx. 30 minutes. The device is blocked while the test is running and no other program can be started. To stop the extended self-test, press the **Cancel Self Test** button.

Cancel Self Test 

If the extended self-test is canceled, either no log file or an incomplete log file will be created.

Fig. 62 Biometra TOne extended self-test overview screen

The results of the extended self-test are summarized in a log file, stored by the device and can be viewed by the user (see chapter 11.3.3).

11.5 Service info file (SINF)

The service info file is a helpful tool for remote fault diagnosis by the Biometra service department.

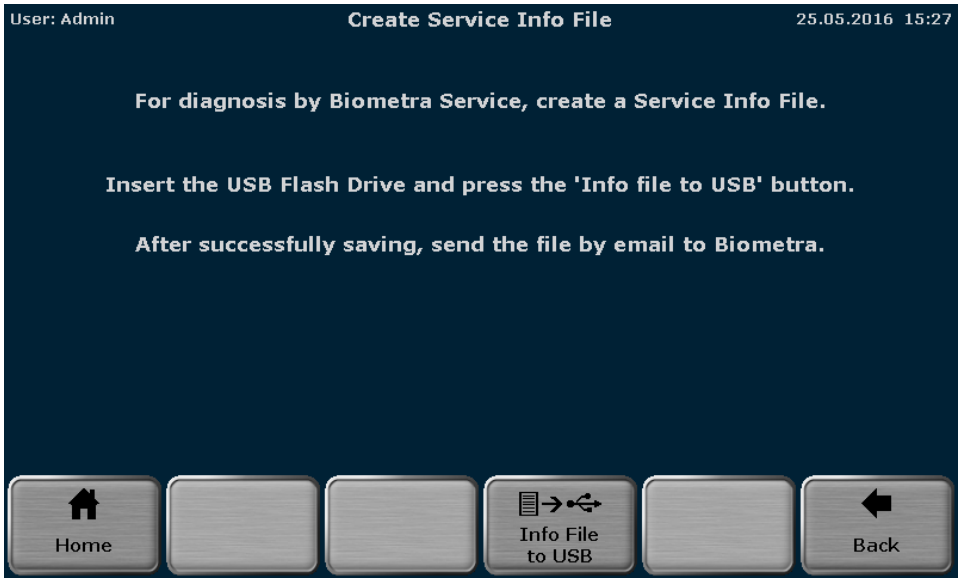


Fig. 63 Biometra TOne service info file creation screen

To create a service info file, connect a USB stick to the Biometra TOne and press the **Info File to USB** button.

Info File to USB 

The service info file can be sent by e-mail to the Biometra service department. For contact details, refer to the inside front cover.

11.6 Backup

The backup function is used to synchronize the memory contents between Biometra TOne thermal cyclers. With the backup all folders, programs, users and user settings can be stored to USB and transferred to another Biometra thermal cycler (TOne, Trio or TAdvanced).

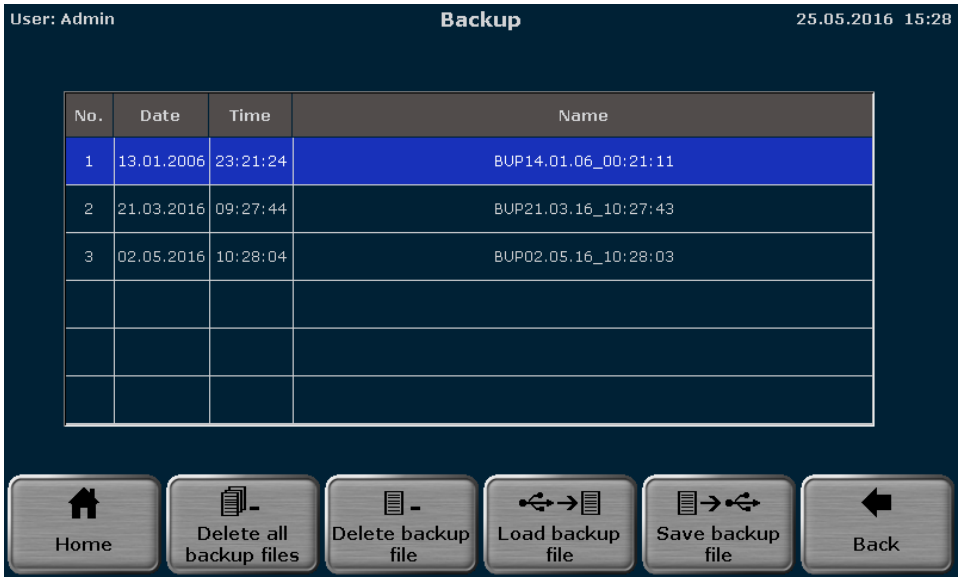
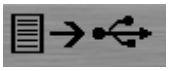
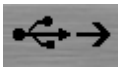


Fig. 64 Biometra TOne backup file screen

Connect a USB stick to the device and press the **Save backup file** button to create a backup file.

Save backup file 

To load a backup file, select it in the list and press the **Load backup file** button.

Load backup file 

Backup files that are no longer used can be deleted using the functions:

Delete all backup files 

Delete backup file 

11.7 Cycler Info

The Cycler Info screen provides general information about the device like:

- Cycler type
- Company
- Serial number cycler
- Block type
- Block serial number
- Software version
- Protocol version
- Revision number power board
- Software version power board
- Software version power board logic
- Revision number processor board
- Software version processor board
- Revision number IO
- Software version IO

The information is summarized in two screens. Press the **System/Cycler Info** button to toggle between the two screens.

System/Cycler Info 

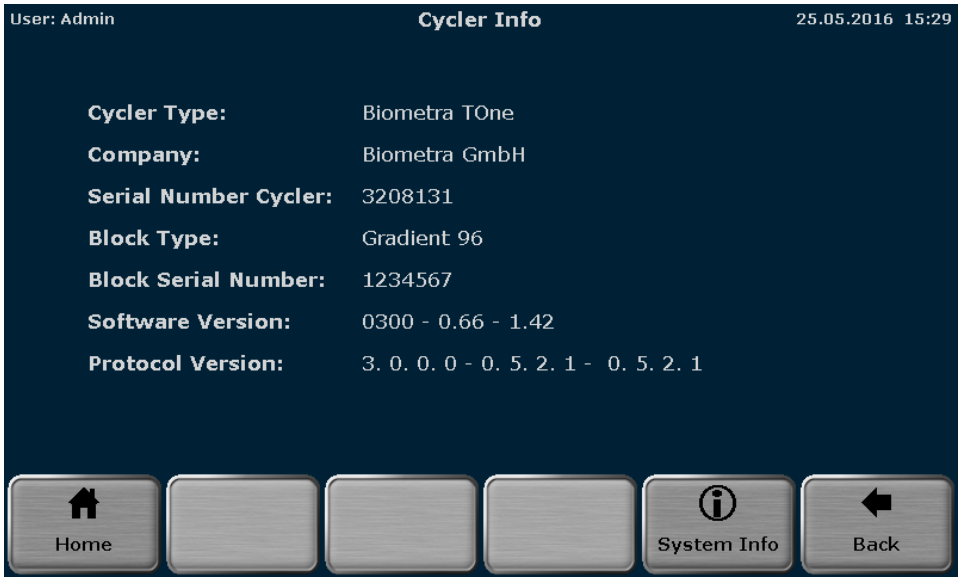


Fig. 65 Biometra TOne Cycler Info screen

11.8 Contact

Shows contact details for the Biometra service department.

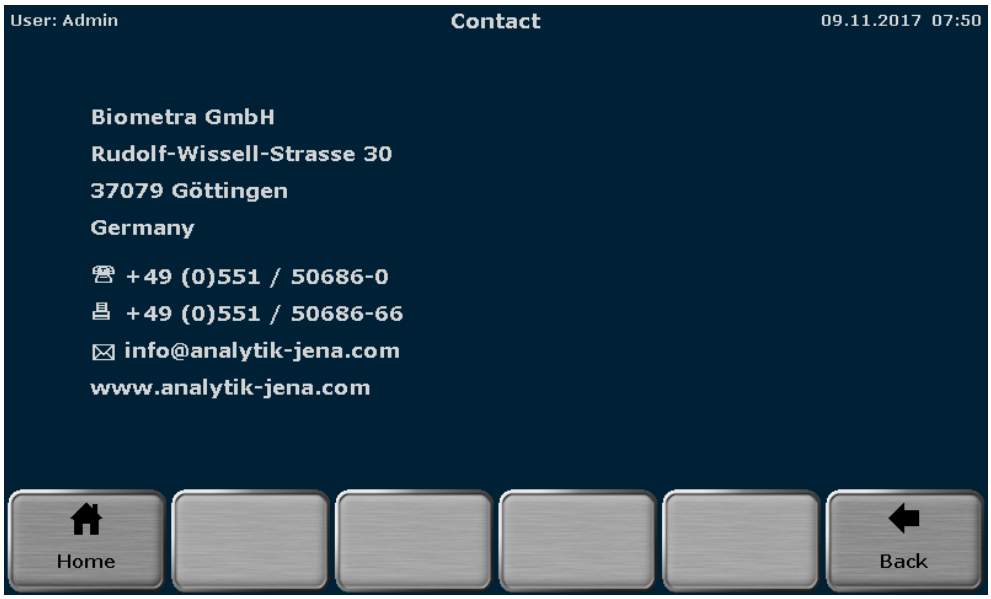


Fig. 66 Biometra TOne service department contact details screen

12 Adaptation of programs

If programs are exchanged between different thermal cycler models or the sample block is exchanged, programs might need to be adapted to the installed sample block type prior to the start or during editing. The following table provides an overview of possible program adaptations:

Cause	Example	Adaptation
The maximum gradient range is exceeded.	A program for the 96 well silver block with a programmed gradient range of >30°C is to be started on a 96 well aluminum block and exceeds the block's maximum permitted gradient range.	The temperature range of the gradient will be reduced based on the average temperature of the maximum permitted range. If, for example, the average temperature of the programmed gradient is 60°C and the gradient range is ± 20°C, the gradient will be reduced to 60°C ± 15°C.
A program with a gradient step is transferred to a non-gradient-enabled device.	The program with the gradient step is started on a sample block without gradient function.	The gradient will be deleted and the average temperature or annealing temperature will be used for this step. If the average temperature or annealing temperature of the programmed gradient is, for example, 60°C, this value will be used for the step.
The gradient is outside the permitted limit.	A program for the 96 well silver block with a gradient temperature below 20°C is to be started on a 96 well aluminum block and falls below the minimum permitted temperature.	The lower temperature is increased to the minimum permitted value. If, for example, a gradient is programmed from 5°C to 25°C, the gradient is changed to 20°C to 25°C.
A program with a temperature optimization step (TOS) is transferred to a device that does not offer this function.	A TOS program is transferred from the Biometra TRIO to another cycler type.	The average value of the temperatures programmed in the TOS step for the left and right sample block is used.
The heating and cooling rate is exceeded.	A program for a 96 well silver block is to be started on a 96 aluminum block.	The heating and cooling rate will be adjusted to the maximum possible value for the installed sample block type. If the programmed heating and cooling rate is, for example, 8°C/s, it will be reduced for the aluminum block to 6°C/s.

The heating and cooling rate is not reached.	A program for a 96 well aluminum block is to be started on a 96 silver block.	The heating and cooling rate will be increased to the maximum possible value for the installed sample block type. If the programmed heating and cooling rate is, for example, 6°C/s, it will be increased for the silver block to 8°C/s.
User-defined heating and cooling rate.	The heating and cooling rate is lower than the maximum value for a program step.	The user-defined value is maintained and not adjusted.

Note: If programs need to be adapted to the installed sample block, a message is always displayed prior to the start or during editing. The user can confirm or reject the adaptations. If a necessary adaptation is rejected during the attempt to start a program, the program cannot be started by the device.

13 Quick reference guide

WARNING

Before initial operation, check the correct operating voltage is set on the voltage selection switch on the underside of the device. Do not open the housing! Danger of electric shock!

CAUTION

The sample block and the heated lid can reach high temperatures during operation. Both the sample block and the heated lid can burn you. The samples are heated up quickly and may come to an explosive boil. Wear goggles when handling hot samples. Make sure that the lid is closed securely before starting the program!

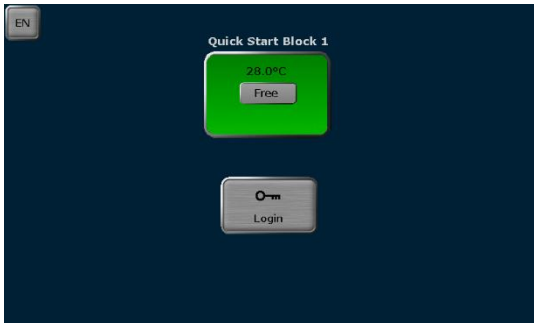
NOTICE

The use of oil between samples and sample block is not necessary. If you wish to use oil, never use silicone oil. Use mineral oil. Ensure that the ventilation slits are clear.

Important: Release the lid wheel before opening the lid! Adjust the lid wheel for every individual run!

Login

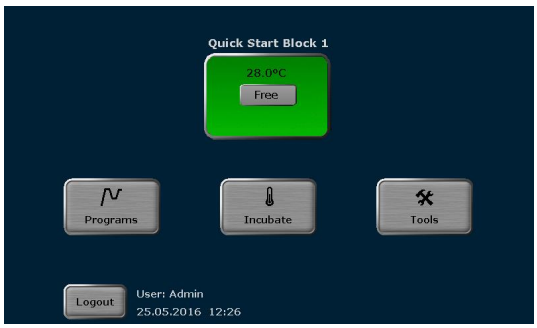
After the TOne has completed the initial self-test, the login screen is displayed:



- Press [**Login**] to log in as an existing user.
- Press [**Quick Start**] for the non-user-specific quick start of programs.
- Press [**EN/DE/CN**] to change the language setting of the login screen.

Home screen

After login the TOne home screen opens:

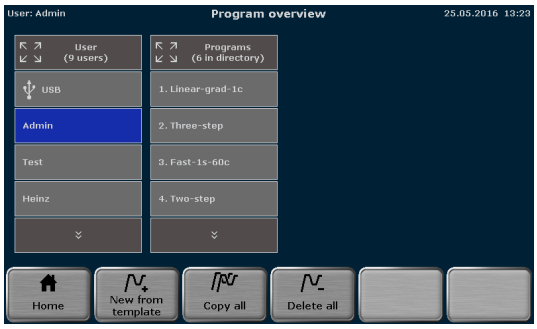


- Press [**Quick Start**] for the user-specific quick start of programs.
- Press [**Programs**] to edit, save, copy or run programs.
- Press [**Incubate**] to incubate the sample block at a constant temperature.

- Press [**Tools**] to access the system settings, user management, documentation, backup tool or self-test functions.
- Press **[Logout**] to log out.

Editing, saving and copying programs

- Press [**Programs**] on the TOne home screen The program overview screen opens:

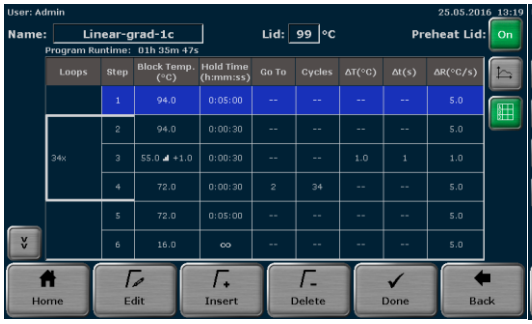


- To edit a template, press [**New from template**], select a template from the list and press [**Open template**].
- To edit a program, select a user directory and a program and then press [**Edit**].
- Alternatively, a user or a program can be selected via the quick selection .

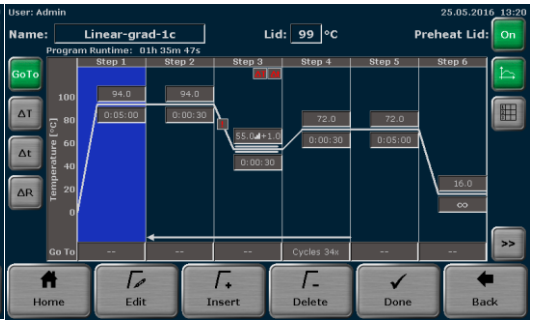
The TOne programming screen opens. Use the following buttons to toggle between the different programming modes:

Graphical mode Spreadsheet mode Gradient mode

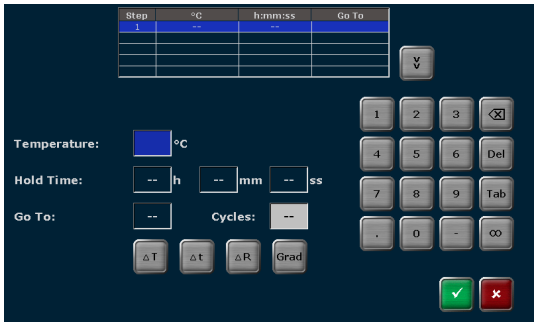
Spreadsheet programming screen



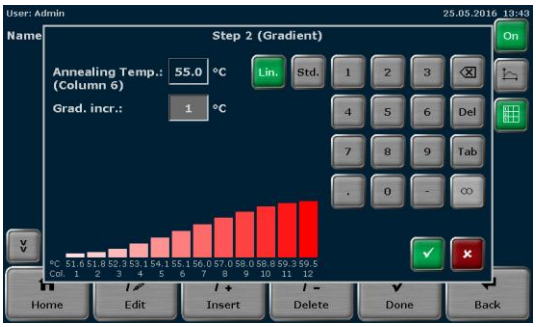
Graphical programming screen



- Enter a program name. To do this, touch the "**Name**" input field and enter a name using the TOne keyboard.
- Define the status and the temperature of the heated lid. Touch the "**Heated lid**" input field and switch the heated lid on or off. If the heated lid is switched on, enter a temperature between 30°C and 110°C.
- To switch the heated lid preheating on or off, press the corresponding button.
- Select a program step and press [**Edit**]. The screen for editing program steps opens:



- Use the cursor keys above the keyboard to switch between program steps. The number of the currently activated step is displayed on a blue background in the table at the top of the screen.
- Touch the "**Temperature**" input field and enter a temperature [**°C**].
- Touch the "**Hold time**" input field and enter a time [h:mm:ss]. To program a pause step press ∞.
- To program a loop, touch the "**Go To**" input field and enter the step number to which the program should return. Then touch the "**Cycles**" input field and enter how often the loop should be repeated.
- To reduce or increase the annealing temperature from step to step within a loop, press **ΔT** and set a negative or positive temperature increment.
- To reduce or increase the hold time from step to step within a loop, press **Δt** and set a time increment.
- To adjust the heating rate, press **ΔR** and enter a value between 0.1°C and max. You can accept the heating rate for all steps in the program by activating the [**Apply heating/cooling rate to all steps**] checkbox.
- (For gradient-capable devices only) To program a gradient, press Grad. On the next screen you can choose between standard [**Std.**] and linear gradient programming [**Lin.**]. For standard programming enter a temperature for both the first and last row in the sample block. For linear programming enter the primer annealing temperature and set a temperature increment. The gradient curve is displayed graphically. Press ✓ to confirm your entries.

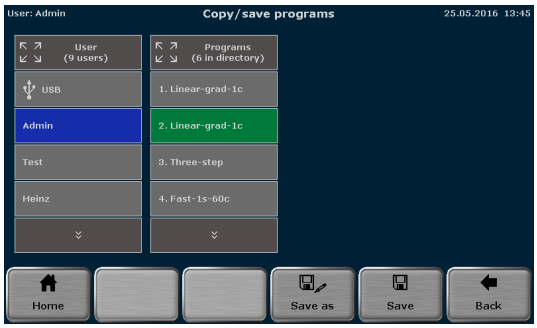


- Press ✓ on the screen for editing program steps to accept the settings. The software leaves the screen and opens the spreadsheet or graphical program display.
- Alternatively, individual program parameters for a step can also be edited. To do this, in the spreadsheet view press directly on the cell for the parameter in the program table which you want to edit. In the graphical view press on the desired parameter edit field. Program options (loops, temperature and time increment, as well as heating and cooling rate) must be activated using the button to the left of the graphical display.
- To insert a program step, select a step and press [**Insert**]. The screen for editing program steps opens. Enter the desired parameters and confirm the settings by pressing ✓.
- To delete a program step, select it and press [**Delete**].

Incubation at 15°C rather than 4°C at the end of a run increased the device's life time.

- When all the parameters for all steps have been entered, confirm the settings on the programming screen with [**Done**]. The software opens the screen for copying and storing programs.

- To save the program, select a user directory and a storage location. Then press [**Save**]. The program is now saved.



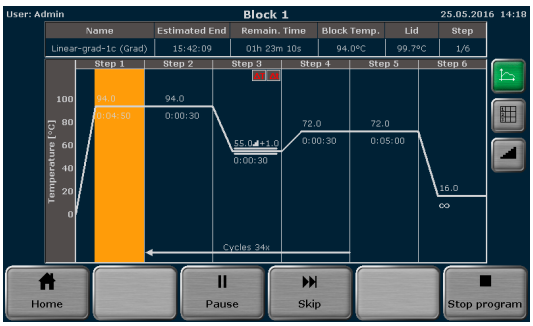
- To copy programs, press [**Programs**] on the TOne home screen.
- To copy all programs located in a directory, select a directory and press **[Copy all**]. Select a directory to which the programs should be copied and press [**Save**].
- To copy a single program, select a directory and a program and press [**Copy**]. Select a directory and a storage location and press [**Save**].
- To delete all programs located in a directory, select it and press [**Delete all**]. Confirm the confirmation prompt.
- To delete a single program, select a directory and a program and press [**Delete**]. Confirm the confirmation prompt.

Starting, stopping and pausing programs

- The Biometra TOne stores the latest 5 started or edited programs for each user. To quick start a program, press the [**Quick Start**] button on the TOne home screen. Select a program from the list and press [**Start**].
- To start a program from a user directory, press [**Programs**] on the TOne home screen. On the next screen select a directory and a program and press [**Start**].
- After the start, the current program is shown in a spreadsheet, graphical or gradient view. Use the same buttons as in the programming screen to switch between the different views. The active step is highlighted in yellow:

Spreadsheet view

Graphical view



- To pause an active program, press [**Pause**]. The color of the highlighted step changes to blue and the message Pause is shown in the "**Step**" field.
- To continue a paused program, press [**Continue**].
- To skip a step, press [**Skip**]. The program will continue with the next step.
- To stop an active program, press [**Stop program**] and confirm the confirmation prompt. Programs with a pause in the last step have to be stopped manually as well.

14 Troubleshooting

14.1 Administrator password forgotten

If the administrator has forgotten his password, use the "Factory settings" function (see chapter 11.1.7) to reset the system and download a backup file for recovery (see chapter 11.6).

14.2 Slow heating and cooling

The Biometra TOne is equipped with strong fans that remove the heat from the heat sink. The air supply to these fans is located on the underside of the device. Make sure that the inlet is not clogged by dust or other material (e.g., a piece of paper under the device may be sucked into the fan and restrict its functionality). Dirt should be frequently removed from the air supply of the fan with a vacuum cleaner or a brush.

14.3 Auto restart

The Biometra TOne features an auto restart function. If a power failure occurs during a run, the device will continue the run at the same point when the power returns. In case of long-term power failure (longer than 30 minutes) the device keeps the sample block at 4°C (freeze step) and the user can decide whether the device should continue the run or whether the samples should be discarded.

Note: After an auto restart the user has to log in again. In addition information can be displayed for a limited time.

14.4 Auto restart without an apparent cause

High voltage fluctuations may lead to a restart of the Biometra TOne. The device will then react similar to a power failure.

The following messages are displayed (see section "Auto restart" p. 89):

- A power failure occurred during the run.
- Time and step at which the program was restarted.

To avoid high voltage fluctuations, do not connect the Biometra to a socket shared by other, very strong power consumers (such as refrigerators or centrifuges).

Note: After an auto restart the user has to log in again. In addition information can be displayed for a limited time.

14.5 Adaptation of programs from other thermal cyclers

Since the Biometra TOne thermal cycler is a very fast device, it may be necessary to reduce the heating and cooling ramp when running protocols from other (slower) thermal cyclers (see section "Adjusting the ramp rate" p. 44). Alternatively, the hold times may be extended.

14.6 Loosening the lid wheel in case of blockage

When the heated lid is in the highest or lowest position, it may happen that the lid wheel is uncoupled. In this situation the clutch mechanism is active in both directions (there is a clicking noise in both directions).

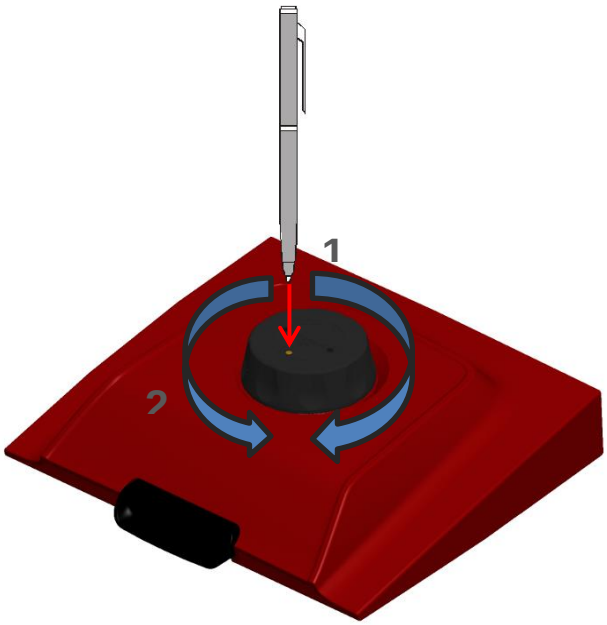
To unlock the lid wheel, press down the metal pin on the top of the lid wheel with a pen. This overrides the clutch mechanism. Take care not to apply excessive pressure.

Lid blocked in the top position:

1. Press down the metal pin.
2. Carefully turn the lid wheel **clockwise** until it moves again without resistance (no more clicking). Release the pin and turn the lid down until the clutch mechanism is activated (clicking noise, optimum contact pressure reached).

Lid blocked in the bottom position:

1. Press down the metal pin.
2. Carefully turn the lid wheel **counterclockwise** until it moves again without resistance (no more clicking). Release the pin and turn the lid wheel upward until the pressure is completely released. Open the lid.



Important: When the clutch mechanism is active (= optimal contact pressure reached) do not, under any circumstances, press the metal pin again to increase the contact pressure further. This will damage the samples and the device.

15 Maintenance and care

The Biometra TOne is mainly maintenance-free.

The care and maintenance tasks which can be performed by the customer are limited to the cleaning and disinfection of the housing and sample block.

All maintenance work and repairs beyond this scope must only be performed by Biometra GmbH customer service personnel or authorized and trained persons. Any unauthorized intervention limits warranty entitlements. If the device exhibits any faults or defects, please contact the Biometra GmbH customer service department immediately.

In order to guarantee sound and safe operation and to ensure laboratory certification, we recommend concluding a maintenance agreement with regular device validation.

15.1 Cleaning the housing

WARNING

Risk of electric shock!

Prior to commencing any maintenance or cleaning work, switch off the device and pull out the mains plug. After cleaning, wait until the Biometra TOne is completely dry before recommissioning it.

ATTENTION

The use of alcohol, organic solvents or abrasives can damage the paintwork. When cleaning, please also pay attention to the notes in chapter "Safety instructions: service and repair" p. 10.

- ❑ Only wipe the housing of the Biometra TOne with a soft clean cloth which may be slightly wetted with a commercial neutral detergent, if necessary.
- ❑ Clean the ventilation slits on the underside and at the rear of the device with a vacuum cleaner.

WARNING

Handling infectious and pathogenic materials

Observe the relevant safety regulations. Decontaminate the device in accordance with section "Disinfecting the device" p. 92.

Handling radioactive materials

The professional decontamination of radioactive contaminations depends on the type of substance used. Please contact your radiation protection officer on this matter and observe the relevant safety regulations!

15.2 Disinfecting the device

WARNING

Biological hazard!

Clean the Biometra TOne with particular care after analyzing potentially infectious material. Wear suitable protective equipment, e.g., protective gloves.

ATTENTION

The only suitable cleaning method for the housing is wipe disinfection.

When using spray disinfectants there is a risk that the liquid enters the sensitive electronic system through the ventilation slits. If the disinfectant has a spray nozzle, apply disinfectant to a suitable cloth before using it on the device.

- ❑ Avoid contamination by handling sample substances with care.
- ❑ Wipe spilled samples or reagents immediately with an absorbent cloth or piece of paper.
- ❑ If the Biometra TOne is used for the analysis of infectious material, great care must be taken because the Biometra TOne cannot be decontaminated as a whole device.
- ❑ Immediately remove visible contamination by suitable means. Do not allow solvents to enter the device.
- ❑ The sample block is also suitable for wipe and spray disinfection. The only suitable cleaning method for the housing is wipe disinfection.

Device part	Recommended disinfectants	Provider
Sample chamber	Descosept AF Meliseptol HBV (cloths)	Dr. Schuhmacher GmbH B. Braun company
Housing	Descosept Spezial	Dr. Schuhmacher GmbH

15.3 Firmware update

Please contact the Biometra customer service department or your local dealer for instructions on how to upgrade the TOne firmware.

16 Service

If you have any problems with the device, please contact our customer service department or your local Biometra dealer. For the address of the Biometra customer service department refer to the inside front cover of this operating manual.

Please observe the return information (see section "Device return information" p. 93) if you wish to return a device to Biometra.

16.1 Device return information

WARNING

Risk of damage to health due to improper decontamination!

Perform a professional decontamination before returning the device to Analytik Jena.

Attention

Biometra GmbH must refuse acceptance of contaminated devices. The sender may be liable for any damage caused by inadequate decontamination of the device.

- ❑ Please clean all device components from biologically hazardous, chemical or radioactive contamination (see also section "Disinfecting the device" p. 92).
- ❑ You can download the decontamination declaration as an editable PDF document in German or English from the Internet: https://www.analytik-jena.com/fileadmin/content/service/customer/Declaration_of_decontamination_en_01.pdf.

  Complete the form and attach the signed decontamination declaration to the outside of the shipment.
- ❑ Only use the original packaging for the shipment and insert the transport lock.
  If the original packaging is no longer available, please contact Biometra GmbH or your local dealer.
- ❑ Please attach the warning note
  "**CAUTION! SENSITIVE ELECTRONIC DEVICE!**" to the packaging.
- ❑ Please include a sheet containing the following data:
  - Name and address of the sender
  - Name and telephone number of a contact for inquiries
  - A detailed description of the fault, the precise conditions and situations under which the fault occurs

16.2 Packing the Biometra TOne

Biometra uses an extra designed packaging system with inserts of foamed material.

Important: The thermal cycler is only protected from transport damage if the original packaging is used and the packing instructions are followed. Biometra is not liable for transport damage due to incorrect packaging.

17 Disposal

The operator of the Biometra TOne must dispose of any waste materials that occur during measurements (sample materials) in accordance with statutory and local regulations.

At the end of its service life, the Biometra TOne and all its electronic components must be disposed of as electronic waste in accordance with valid regulations.

18 Declaration of conformity

analytikjena
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EU – Konformitätserklärung
EC - Declaration of Conformity

Göttingen, den 22.11.2018

Biometra erklärt als Hersteller in alleiniger Verantwortung, dass die Produkte
Biometra declares as manufacturer under sole responsibility that the products

Typen *Types:*	**Biometra TOne 96**	**Biometra TOne 96 G**
Best.-Nr. *Order No.:*	846-x-070-311	846-x-070-301

x = 2 für/*for* 230 V, 4 für/*for* 115 V, 5 für/*for* 100 V

den folgenden Europäischen Richtlinien und angewandten harmonisierten Normen entsprechen:
conform to the following European Directives and applied harmonized standards:

Richtlinie *Directive*	**Norm** *Standard*	**Ausgabejahr** *Year of Publication*
2014/35/EU **Niederspannungsrichtlinie/*LVD***	EN 61010-1 EN 61010-2-10	2010 2014
2014/30/EU **EMV/*EMC***	EN 61326-1 EN 55011 EN 61000-3-2 EN 61000-3-3	2013 2009 2014 2013
2011/65/EU **RoHS**	EN 50581	2012

Dr. Juergen Otte
Head of Quality Management

For and behalf of Biometra GmbH

19 Index