

MediaClave

User Manual 3.4

Bedienungsanleitung 3.4

Mode d'emploi 3.4





Declaration of conformity

INTEGRA Biosciences AG - CH-7000 Chur, Switzerland

declares on its own responsibility that the product,

Description	Type, model
MEDIACLAVE	135020, 135025, 135030, 135035

in accordance with the EC directives

73/23/EEC	Low voltage equipment
89/336/EEC	Electromagnetic compatibility
97/23/EC	Pressure equipment
2002/95/EC	Restriction of Hazardous Substances
2002/96/EC	Waste Electrical and Electronic Equip- ment

is in compliance with the following standards or normative documents:

EN 61010-1:2001-02	Safety requirements for electrical equip- ment for measurement, control and lab- oratory use - General requirements.
EN 61010-2-041:1998	Particular requirements for autoclaves using steam for the treatment of medi- cal materials and for laboratory proc- esses.
EN 61326-1 +A1:1998+A2:2000	Electrical equipment for measurement, control and laboratory use - EMC requirements.

Standards for Canada and USA

CAN/CSA-C22.2 No.1010.1-92	Safety requirements for electrical equip- ment for measurement, control and lab- oratory use - General requirements.
UL Std. No. 3101-1	Safety requirements for electrical equip- ment for measurement, control and lab- oratory use - General requirements.
FCC, Part 15, Class A	Emission

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to both Part 15 of the FCC Rules and the radio interference regulations of the Canadian Department of Communications.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment gener-ates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful inter-ference to radio commu-nications.

Chur, Date

June 10, 2009

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This manual is identified by Art.No. 135900



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1 MediaClave overview

1.1 About the MediaClave

1.1.1 Introducing the MediaClave

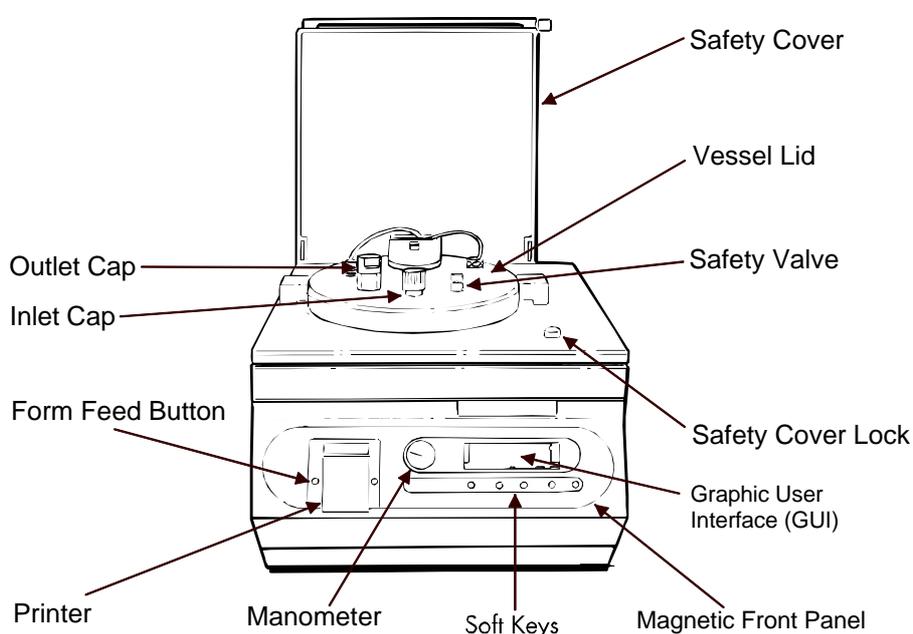


Figure 1.1: The MediaClave



NOTE: Consult section 7.2.1 for a list of all standard and optional MediaClave accessories.

1.1.2 Intended use

The MediaClave is a highly versatile piece of equipment. It operates as a stand-alone device used to program and control three integrated operation modes: MEDIACLAVE, AUTOCLAVE and WATERBATH. The MEDIACLAVE program is used to prepare culture media. Insertion of a stainless steel base plate and flexible PT100 temperature probe converts the MediaClave into the AUTOCLAVE. The AUTOCLAVE program is used as a bench-top autoclave for sterilisation of culture media in single containers. The WATER BATH program is used as a conventional water bath.



1.1.3 Basic concepts

The MediaClave offers many features to the user:

- Automatic initialisation and self-test execution
- Mode MEDIACLAVE – culture preparation of 1 to 9 L of agar containing medium or nutrient liquid
- Mode AUTOCLAVE – autoclave for sterilisation of culture media in single containers.
- Mode WATERBATH – fully running thermostatic water bath
- Preparation of highly sensitive culture media in a gentle and reproducible fashion
- Easy addition of growth additives, inhibitors and supplements
- Highly efficient intra-cooler – cool-down phase 60% faster than conventional jacket cooling; 60% less water consumption
- Easy to follow, user-friendly menu operation via four soft keys
- Low energy costs
- Up to 15(x3) individual programs can be stored
- Alarmed error messages
- 4-level security system regarding temperature and pressure control. Over pressure valve and over-heating sensor prevent danger to people and appliance.
- Full traceability of individual instrument functions and programmed processes – progress printouts via the integrated printer
- Adjustment of the graphic user interface (GUI) to suit the laboratory environment
- Easy maintenance
- Space-saving compact design
- Host PC connection
- Interface for external serial printer (from software version 1.9.1 and with additional cable installed)



ATTENTION: The MediaClave is not suitable for sterilisation of medical devices.

1.2 Using the manual

1.2.1 About the manual



NOTE: The MediaClave functionality, described in User manual version 3.4, is based on MediaClave software version 1.9.1 and higher. The interface for an external printer is only usable, if a special cable is installed into MediaClave additionally to the software 1.9.1. (cable order number: 135245). MediaClave instruments with serial number 13505601 and later have this cable installed by default.

The MediaClave User manual has been designed to allow general users access to required information. Any departure from the procedures outlined in the MediaClave User manual may lead to erroneous results or instrument malfunctions and may adversely affect the safety of the MediaClave.



The MediaClave User Manual is divided into 9 parts

Chapter	Name	Description
1	MediaClave overview	General information
2	Installation	Installation, moving
3	Operating controls	MediaClave preparation
4	Instructions for use	MEDIACLAVE, AUTOCLAVE, WATERBATH operation
5	Cleaning instructions	Cleaning procedures
6	Maintenance	Error- and Troubleshooting, Calibration, Paper-handling
7	Accessories and Technical specifications	Accessories, default values, ports, physical properties
8	Manufacturer and Customer service	Addresses
9	Glossary	Term definitions

Table 1.1: User manual overview

1.2.2 User manual symbols

The signal words **WARNING**, **ATTENTION** and **NOTE** are included in this manual to emphasise important instructions and alert the user to potential hazards. They have a special hazard alert symbol.

Symbol	Definition
	WARNING indicates a potentially hazardous situation that, if not avoided, could result in damage to the instrument or personal injury. This signal word is used only in extreme situations and, therefore, requires special attention.
	ATTENTION indicates special problems or important information. Read the accompanying text carefully as it is important for understanding the specific topic or command.
	NOTE indicates information that is useful, but not essential, to a task. Read the accompanying text carefully as it can help to clarify particular issues.

Table 1.2: Legend of symbols



1.3 General information

1.3.1 Safety precautions



ATTENTION: The MediaClave is subject to high thermal and compressive stress during the sterilisation cycle. It is therefore imperative to observe the safety notes of this User manual.



WARNING: For personal security, the MediaClave must be switched off and disconnected from power supply before any installation, repair or maintenance work is carried out.



WARNING: To prevent unintended damage to the appliance it is absolutely essential that you read and understand the operating instructions. Furthermore, the owner is responsible for ensuring that appropriate instructions are provided to users of the appliance.



WARNING: First carefully read these instructions before operating the MediaClave.



WARNING: No water must flow over the front panel!

1.3.1.1 General safety precautions

- The MediaClave User manual must be read in detail before operating the MediaClave
- In the event of a situation arising where safe operation of the MediaClave cannot be guaranteed, the instrument must be switched off and locked until qualified personnel can repair it. Such a situation may include one of the following scenarios:
 - The MediaClave is visibly damaged
 - The MediaClave stops working properly
 - The mains power switch automatically switches to position 0
 - Steam escapes through the lid
 - The safety cover or vessel lid does not close
- Repairs must only be carried out by authorised personnel, using genuine spare parts. In particular, only qualified personnel can connect and replace the mains plug.
- The appliance must only be operated by appropriately trained and instructed persons who are familiar with all aspects of safety relating to this appliance.
- Apart from the safety notes in these instructions, the specific requirements for the prevention of accidents as well as the generally applicable rules for work place safety must also be observed.
- These installation and operating instructions must at all times be readily available where the MediaClave is used.
- The MediaClave must not be used for any purpose apart from the outlined applications.
- Do not open the MediaClave. Do not carry out any conversions and alterations on the device.

1.3.1.2 Precautions during operation

- Do not leave the MediaClave unattended when running a program.
- Do not open the vessel lid when pressure is greater than 0.1 bar and temperature exceeds 80°C.
- Do not spill liquids on the MediaClave. If the MediaClave requires cleaning, consult chapter 5.



1.3.2 Safety regulations concerning service and maintenance

- It is mandatory that a service is carried out at least once a year by authorised personnel because the MediaClave is subject to high thermal and compressive stress during the sterilisation cycles. Ask your distributor for support!
- The sterile filter at the rear of the instrument must be replaced every 6 month.

1.3.3 Equipment disposal

The MediaClave is labelled with the "crossed-out wheeled bin" symbol to indicate that this equipment must not be disposed of with unsorted municipal waste. Instead, it is your responsibility to correctly dispose of your waste equipment by handing it over to an authorised facility for separate collection and recycling.

For more information about where you can drop off your waste equipment for recycling, please contact your local dealer from whom you originally purchased the product or your local council.

By doing so, you will help conserve natural resources and you will ensure that your waste equipment is recycled in a manner that protects human health and the environment. Thank you!



1.3.4 Warranty and liability



NOTE: MediaClave shall not be modified. Defective parts shall be exchanged only for original spare parts from INTEGRA Biosciences AG.



NOTE: MediaClave shall not be modified either as an equipment or with regard to the safety aspects. Any modification will result in exclusion of responsibility for consequential injury or damage on the part of INTEGRA Biosciences AG.



WARNING: MediaClave must not be opened! Repairs shall be carried out only by INTEGRA Biosciences AG or an authorized customer service organization.





2 Installation

2.1 Introduction



NOTE: Refer also to the Installation Qualification (IQ) which provides additional information. It should be consulted, if the MediaClave is installed first time or moved from one to another location.

The purpose of this chapter is to give a step-by-step guide to the installation procedures of the MediaClave. It is divided into the sections

- Operating environment
- MediaClave drawings
- Electricity and water
- Filter and tubing installation
- Moving the MediaClave

2.2 Operating environment

In choosing an appropriate operating environment for the instrument, several factors must be considered.



WARNING: Do not operate the instrument in an area that contains high concentrations of dust or humidity, if there is a danger of explosion or if toxic chemicals are being used or stored nearby.

- The operation of the MediaClave is allowed **inside buildings** only!
- The MediaClave must not be operated at places which are located **higher than 2000 metres** above sea level!
- The chosen area must not present a hostile environment to the instrument or its intended use and show **pollution degree I or II**.
- The ambient air temperature must be **within 0 and 40°C**. The maximum relative humidity for temperatures up to 31°C is 80% and then derates down to 50% at 40°C.
- The MediaClave must be placed on a clean, dry and horizontal surface which is capable of holding at least 50kg. For user convenience and ease of access to the soft keys, the front edge of the instrument must be positioned near the front of the bench. The instrument must be positioned in such a way that the On/Off and power switches are always accessible.
- In case of voltage fluctuations, the INSTALLATION CATEGORIES (Overvoltage Categories) I, II or III are authoritative! **For the mains supply, the minimum and normal category is II.**
- The instrument must be located within easy reach of electrical outlets, and provisions must be made to run the outlet tubes at the rear of the instrument into waste receptacles. **These must be positioned lower than the Mediaclave over its whole length.** (prevention of back pressure)
- Ensure all cables and tubes are positioned in a safe area to avoid people tripping over them.
- Do not place anything on the MediaClave safety cover. At the end of each cycle, or if a cycle is interrupted and terminated, the safety cover opens automatically.
- Consult the local regulations before connecting the MediaClave to the drinking-water supply.



ATTENTION: If water splatters to the front panel cannot be prevented, the provided printer cover must be installed.



2.3 MediaClave drawings

2.3.1 MediaClave vessel overview

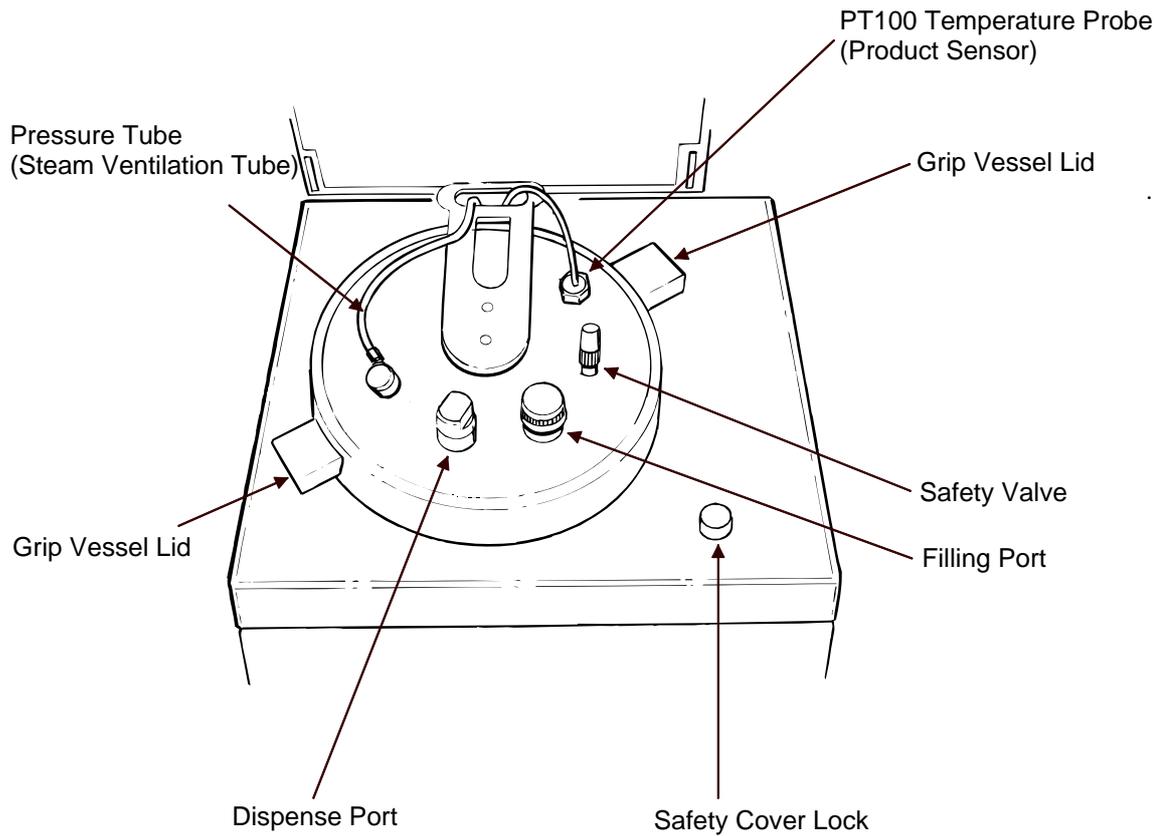


Figure 2.1: Vessel lid



2.3.2 MediaClave rear panel

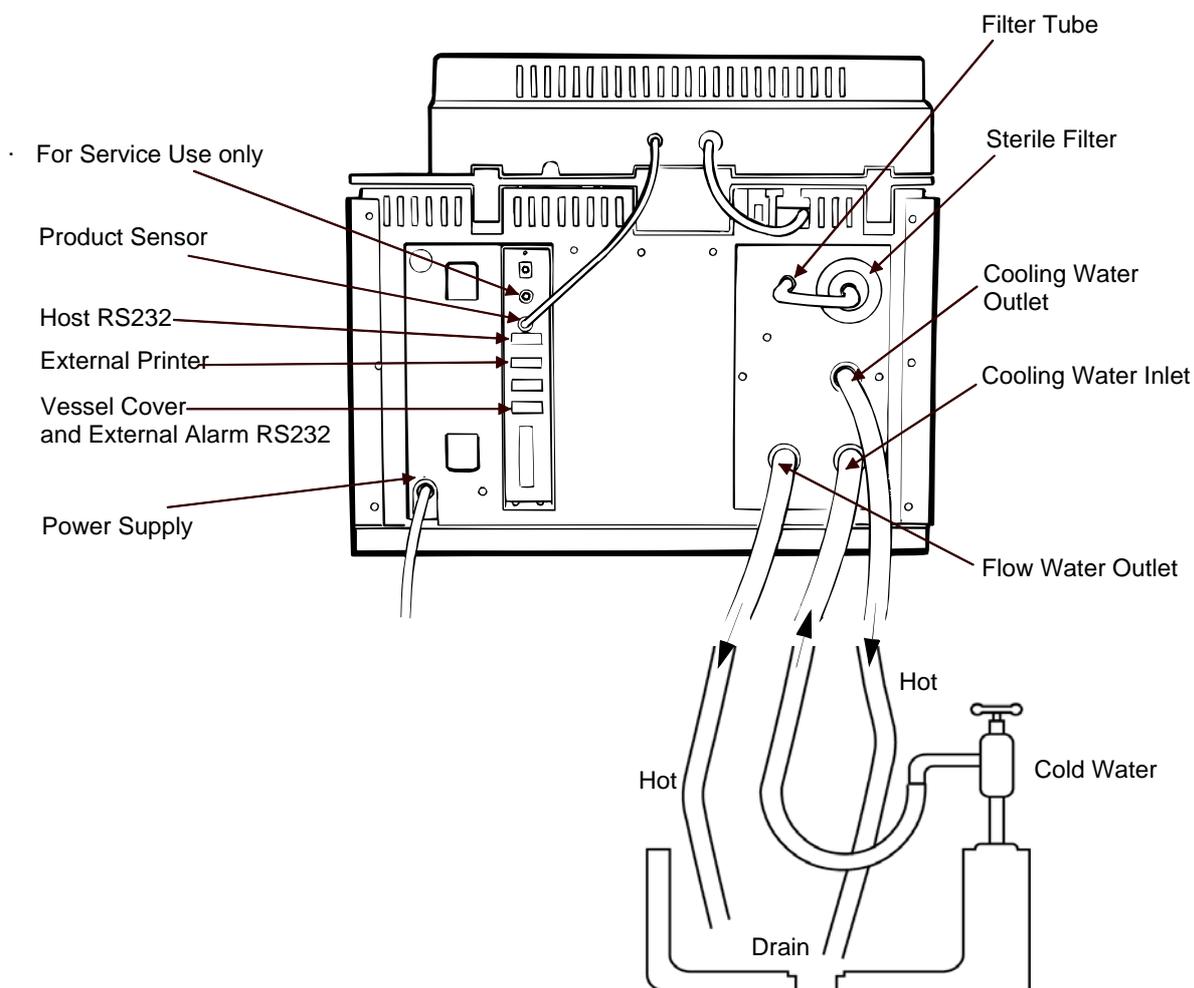


Figure 2.2: MediaClave rear panel

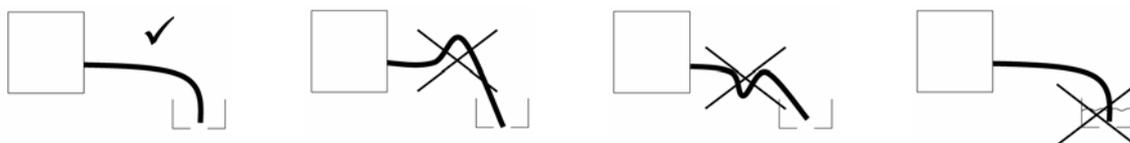


Figure 2.3: Waste tube of flow water outlet

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2.4 Electricity and water

2.4.1 Provision of electricity



WARNING: The MediaClave is an electrically heated pressure vessel and must only be operated by trained personnel.

- Before connecting the instrument to the power supply, ensure that the network voltage and fuse rating are compatible to that indicated on the instrument identification plate at the rear of the instrument. (consult Table 7.3.1).

Version EU: (1 x 230V)	16A
Version EU: (3 x 400V)	6A pro Phase
Version USA: (1 x 240V)	16A
Version Japan: (1 x 200V)	20A

- To prevent electric shock, plug the MediaClave power cables into fully grounded power sources. Do not use adapter plugs or remove grounding pins from a cable. If an extension cable must be used, use a cable suitable for the appliance version (system voltage according to type plate) with properly grounded plugs. Connect the MediaClave to the power socket from the building / laboratory.



WARNING: If condensation is visible on the MediaClave, do not switch on or operate the instrument for at least two hours.



WARNING: If the MediaClave is to be operated with 400 V, 3 phases, the voltage network must be isolated with a circuit breaker power switch or by a suitable isolation device.

2.4.2 Water supply

Three water connectors are situated on the MediaClave's rear panel. Two are for the cooling water inlet and outlet, one is the flow water outlet.

To connect the MediaClave to the water supply, proceed the following steps:

- Connect the cooling water inlet tube to the cooling water inlet.
- Connect the cooling water outlet tube to the cooling water outlet.
- Connect the waste tube for condensation and water vapour to the flow water outlet.



NOTE: A connection between the flow water outlet and cooling water outlet can only be made if a non-return valve is fitted to the water supply.



ATTENTION: For an error-free venting of the instrument, backpressure in the waste tube must be avoided. Therefore, the waste tube must be led straight downwards from the flow water outlet of the instrument - without any upward bending - into the lower lying water drain. Water must not accumulate within the tube and its end must not submerge into the water, but must freely hang over the water drain. See figure "Waste tube of flow water outlet" on page 9.



2.5 Filter and tubing installation

2.5.1 Sterile filter installation

The sterile filter prevents contaminated air from entering into the vessel during operation

- Screw the sterile filter into position (see figure 2.2). Orientation of the text on the filter: Text must be visible from the rear side.
- Using the milled screw, screw the support pressure tube into the sterile filter (see figure 2.2).
- Connect the end of the support pressure tube and secure it with a nut.



ATTENTION: Replace the sterile filter at least every six months.



INFO: Wetness or wearing out of the filter may provoke a pressure test failure!

2.6 Moving the MediaClave

2.6.1 Moving procedure



ATTENTION: Before moving the MediaClave, it must be cooled down, emptied and disconnected from the mains



NOTE: Two persons are required to lift the MediaClave.

- Remove any items from the top of the MediaClave
- Close vessel lid and safety cover
- Disconnect all cables and tubing



ATTENTION: Never lift the instrument by the cover handle. Carry the instrument, holding it steady and firmly at the base.



NOTE: After moving the MediaClave, the accomplishment of an Installation Qualification (IQ) procedure is strongly recommended!





3 Operating controls

3.1 Introduction

This chapter gives needed information to prepare the MediaClave for every operation mode.

3.2 Preparation for different operational modes

3.2.1 Mode MEDIACLAVE

3.2.1.1 Installing the Rigid Temperature Sensor

1. Unplug the flexible temperature sensor from the rear panel if installed
2. Unscrew the sensor from the vessel lid (using the fork wrench provided)
3. Insert the rigid temperature sensor and tighten it
4. Plug in to rear panel



ATTENTION: Ensure that there is a O-ring attached to the temperature sensor.

3.2.1.2 Installing the Decanting tube

1. Press the silicone decanting tube onto the dispense fitting nipple which is located on the underside of the vessel lid's dispense port (see figure 2.1)
2. Attach the tube to the vessel lid by rotating the stainless steel securing nut clockwise until it is finger-tight.

3.2.1.3 Installing the cuvette

1. Place the cuvette in the MediaClave vessel
2. Using both grips, turn the cuvette clockwise until it locks into position
3. **The stirrer magnet bar must be installed into the cuvette**



ATTENTION: It is essential that the stirrer magnet is installed properly. A stirrer magnet bar which is missing or not properly installed may lead to inhomogeneous temperatures during the sterilisation process!

3.2.1.4 Filling the cuvette

1. Place the stirring magnet bar inside the cuvette. Position it on the pivot of the cuvette base
2. Add the desired amount of liquid or agar to the cuvette



3.2.1.5 Filling the vessel

In mode MEDIACLAVE, the heating water (coupling medium) filling level depends on the amounts of product. Fill the vessel with **distilled or deionised water**. Ensure that the water does not contain chalk or minerals. The water level (with the cuvette inserted) must be approximately 7 cm below the upper edge of the vessel (approx. 2 litres).



NOTE: If insufficient water is added, an alarmed error message appears on the screen. Follow all on-screen instructions.

3.2.1.6 Closing the vessel lid



ATTENTION: The vessel lid must be closed at all times during MEDIACLAVE program operation!

1. Close the vessel lid by turning the grips clockwise around the attachment point. The grips of the vessel lid (1) must be aligned above the white stickers (2), as shown in the picture below. Otherwise the safety of the instrument is severely compromised.



Figure 3.1: Closing the vessel lid

2. Ensure the inlet and outlet caps are screwed finger-tight



NOTE: If the white stickers are not present on the instrument they can be ordered from your distribution partner as a retrofitting kit including instructions how to attach the stickers.

As long as the stickers are missing: The vessel lid is correctly closed if the 2 screws of the vessel lid holder and the filling port are in line as shown as dashed line in Fig. 3.1.

3.2.1.7 Removing the cuvette

1. Once the MEDIACLAVE cycle is finished press END
2. Using both grips, turn the vessel lid anticlockwise until it unlocks and is released
3. Open the vessel lid
4. Remove the cuvette (Take care about the product temperature sensor)



NOTE: If there is a difficulty in opening the vessel lid, slightly unscrew the adding port caps to release any residual pressure may help. This little residual pressure is mostly generated by the natural vaporisation of the hot media or water which is within the vessel. After releasing the residual pressure, the addition port must be closed again before opening the vessel lid.



3.2.2 Mode AUTOCLAVE



NOTE: The vessel lid must be closed at all times during operation of the AUTOCLAVE programs!

3.2.2.1 Installing the flexible temperature sensor

1. Unplug the rigid temperature sensor from the rear panel if installed
2. Using an Allen tool, unscrew the rigid temperature sensor from the vessel lid
3. Insert the flexible temperature sensor, and tighten with the Allen tool
4. Plug in to the rear panel



ATTENTION: Ensure that there is a seal attached to the temperature sensor.

3.2.2.2 Installing the steel base plate

1. Remove the cuvette
2. Place the steel base plate into the vessel, flat side facing up

3.2.2.3 Filling the vessel

In mode AUTOCLAVE, fill the vessel with distilled or deionised water to a height of 2 cm above the inserted base plate (this corresponds to a height of 3.5 cm without the inserted base plate).



NOTE: If insufficient water is added, an alarmed error message appears on the screen. Follow all on-screen instructions.



3.2.2.4 Specific configuration in program mode AUTOCLAVE



NOTE: The program mode AUTOCLAVE is suitable to sterilise small amounts of medium in single containers such as e.g. “Erlenmeyer flasks” or test-tubes.



ATTENTION: These containers must be placed as shown in the figure below to ensure an error-free operation.

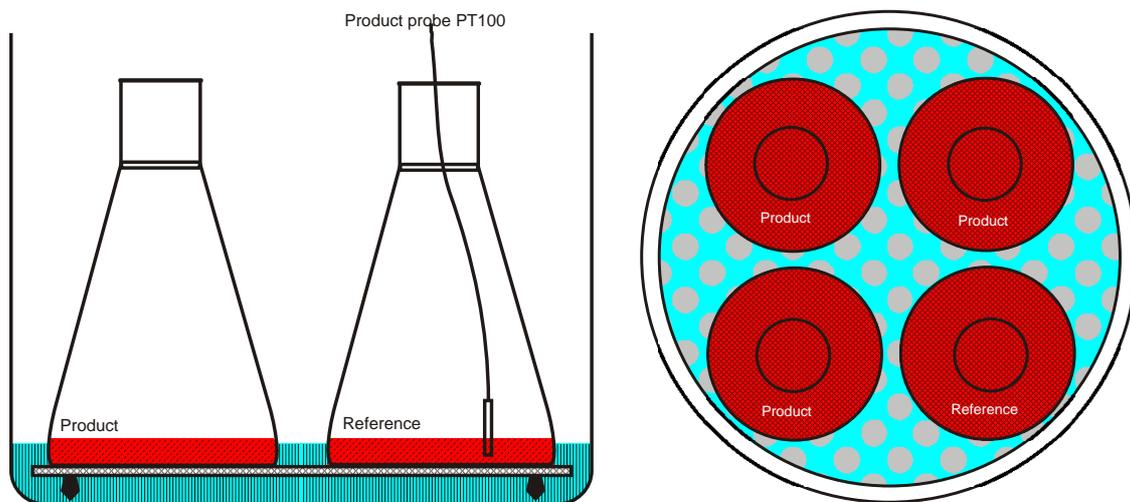


Figure 3.2: Positioning of containers in the vessel - example

When autoclaving liquids, the flexible temperature probe must be put into a reference container with the same amount of liquid as the one with the medium liquid. The heating water (coupling medium) must be higher than the steel base plate to ensure an optimal heat transfer to the product inside the container. Instead of flasks (as shown in the pictures) could be used test-tubes as well.

3.2.2.5 Closing the vessel lid

1. Turn the vessel lid clockwise until it locks into position (see figure 2.1)
2. Ensure the inlet and outlet caps on the access port and the filling ports are screwed finger-tight

3.2.2.6 Removing of autoclaved material

1. Once the AUTOCLAVE cycle is finished press END to open the safety cover
2. Using both grips, turn the vessel lid anticlockwise until it unlocks and is released
3. Open the vessel lid
4. Remove the autoclaved material from the vessel



NOTE: If there is a difficulty in opening the vessel lid, slightly unscrew the adding port caps to release any residual pressure may help. This little residual pressure is mostly generated by the natural vaporisation of the hot media or water which is within the vessel. After releasing the residual pressure, the addition port must be closed again before opening the vessel lid.



3.2.3 Mode WATERBATH

3.2.3.1 Opening the vessel lid



NOTE: The vessel lid must be left open at all times during operation of the WATERBATH programs. The same applies to the CLEANING program too.

1. Prior of opening the vessel, visually check the manometer to ensure that the pressure is below 1.2 bar
2. Turn the vessel lid anticlockwise until it is released

3.3 Switching On and Off the MediaClave

The MediaClave is switched on and off with the green power switch located on the right-hand side panel of the instrument. After switching on the instrument, it is automatically initialised and a self-test is performed. On successful completion of initialisation and the self-test, the safety cover automatically opens and the start screen appears (see figure 3.2).

3.3.1 MediaClave start display

The MediaClave is controlled and operated with one basic GUI (Graphical User Interface). This GUI is illustrated in figure 3.2. It consists of a graphic display and four soft keys below the display. There are six menu options available on the MediaClave start display:

- MEDIACLAVE
- AUTOCLAVE
- WATERBATH
- CLEANING
- LANGUAGE
- PARAMETER



Figure 3.3: MediaClave start display



3.3.2 Soft key menu options explained

3.3.2.1 Start display menu options

In the start display menu, the **MEDIACLAVE**, **AUTOCLAVE**, **WATER BATH**, **CLEANING**, **LANGUAGE** and **PARAMETER** programs can be selected.

- Press **MEDIACLAVE** to start, select and modify the MEDIACLAVE programs.
- Press **AUTOCLAVE** to start, select and modify the AUTOCLAVE programs.
- Press **WATERBATH** to start, select and modify the WATER BATH programs.
- Press → to access the next three menu options.
- Press **CLEANING** to start the EMPTY and CLEAN programs. (see chapter 5)
- Press **LANGUAGE** to start the language selection program.
- Press **PARAMETER** to start, select and modify the parameter selection programs.
- Press ← to return to the previous menu options

MEDIACLAVE	AUTOCLAVE	WATERBATH	→
CLEANING	LANGUAGE	PARAMETER	→

Figure 3.4: Start display menu options

3.3.2.2 MAIN menu options

In the Main menu, programs can be directly started or modified in the PROGRAM menu.

- Choose one of the three main operation modes or programs (**MEDIACLAVE**, **AUTOCLAVE** or **WATER BATH**). The MAIN menu appears
- Press **START** to start the modified or pre selected program
- Press **PROGRAM** to modify programs in the PROGRAM menu (see section 3.3.2.3)
- Press **MAIN MENU** to return to the start display

START	PROGRAM		MAIN MENU
--------------	----------------	--	------------------

Figure 3.5: MAIN menu options

3.3.2.3 PROGRAM menu options

In the PROGRAM menu, programs can be selected and modified.

- Press **PROGRAM** in the MAIN menu. The PROGRAM menu appears (see figure 3.4)
- Press **EDIT** to branch to a further sub menu in which the current program can be modified (see section 3.3.2.4)
- Press **PROG -** or **PROG +** to select one of the 15 available programs
- Press **BACK** to transfer the selected program to the MAIN menu

EDIT	PROG-	PROG+	BACK
-------------	--------------	--------------	-------------

Figure 3.6: PROGRAM menu options



3.3.2.4 EDIT menu options

In the EDIT menu, the current program can be modified or adapted to suit specific requirements.

- Press **EDIT** in the PROGRAM menu. The EDIT menu appears
- Press **CONTINUE** to modify program parameters using the - and + keys
- Press -> to access the next three menu options
- Press **START** to start the selected program
- Press **SAVE** to store all modifications and return to the PROGRAM menu
- Press **CANCEL** to reject all modifications and return to the PROGRAM menu
- Press <- to return to the previous menu options.

CONTINUE	-	+	->
START	SAVE	CANCEL	<-

Figure 3.7: EDIT menu options

3.3.3 LANGUAGE menu



NOTE: For the default values see section 7.4

3.3.3.1 LANGUAGE menu options

For selecting a language, carry out the following steps:

1. Press **LANGUAGE** on the start display (see figure 3.2 and figure 3.3)
2. The SELECT LANGUAGE menu appears displaying the six available languages:
 - German
 - French
 - English
 - Italian
 - Spanish
 - Portuguese
3. Press **CONTINUE** to scroll to and select the desired language
4. Press **MAIN MENU** to return to the start display



NOTE: The language choice is automatically saved!



3.3.4 PARAMETER menu

Instrument adjustments can be viewed or modified in the PARAMETER menu.



NOTE: All instrument data is stored in NVRAM (Non-Volatile Random Access Memory). NVRAM retains all memory even when the power to the instrument is switched off. A battery automatically takes over and all modifications and instrument data are saved. For the default values see section 7.4

3.3.4.1 Accessing the PARAMETER menu

1. Press **PARAMETER** on the start display. The PARAMETER ENTRY menu appears and displays 11 menu options:
 - PRINTER
 - COMMUNICATION
 - UNITS OF MEASUREMENT
 - CONTRAST
 - STERILISATION
 - VENTILATION
 - COOLING
 - CLEANING
 - DATE
 - TIME
 - INFO
2. Press **CONTINUE** to scroll to and select the desired menu option
3. Press **EDIT** to modify the required option
4. Press **MAIN MENU** to return to the start display

3.3.4.2 Adjusting parameters

PRINTER

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select PRINTER
2. Press **EDIT**. The SET UP PRINTER menu displays three options:
 - PROGRESS PRINTOUT
 - PRINT CYCLE
 - SELF TEST
3. Press **CONTINUE** to scroll to and select PROGRESS PRINTOUT
4. Press – or + to select one of the following:
 - TABLE
 - OFF



NOTE: TABLE results in a progress printout every x minutes; when the progress printout is switched off by selecting OFF, there is no printout.

5. Press **CONTINUE** to select PRINT CYCLE. (10,20..50s; 1,2..10min; default: 1min)
6. Press – or + to adjust the print cycle duration



NOTE: The print cycle duration can be adjusted between 10 seconds and 10 minutes. A two-minute print cycle is recommended. This means that during a program cycle, a progress printout is printed every two minutes. See section 7.7 for a detailed analysis of progress printouts.

7. Press **CONTINUE** to select SELF TEST



8. Press – or + to perform the self-test



NOTE: A self-test is executed to check the functionality of the printer. When the self-test is initiated, a test print is performed to check the functionality of the printer (see section 7.7).

9. Press **SAVE** to return to the PARAMETER ENTRY menu

COMMUNICATION



NOTE: A MediaClave device address can be selected from positions 1 to 16.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select COMMUNICATION.
2. Press **EDIT**
3. The SET HOST ADDRESS menu displays two options:
 - DEVICE ADDRESS: [1–16]
 - HOST-PORT: 9600B, 1S, 8D, NP, 1S
4. Press – or + to select the desired device address
5. Press **SAVE** to return to the PARAMETER ENTRY menu

UNITS OF MEASUREMENT

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select UNITS OF MEASUREMENT
2. Press **EDIT**
3. The SET UNITS OF MEASUREMENT menu displays the following:
 - UNITS OF MEASUREMENT: [DEGREES CELSIUS / DEGREES FAHRENHEIT]
4. Press – or + to select the desired unit of measurement
5. Press **SAVE** to return to the PARAMETER ENTRY menu

CONTRAST



NOTE: The contrast of the LCD can be adjusted between 0% and 100% to allow viewing in different lighting conditions.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select CONTRAST
2. Press **EDIT**
3. The SET CONTRAST menu appears
4. Press – or + to adjust the contrast to suit the working environment
5. Press **SAVE** to return to the PARAMETER ENTRY menu

STERILISATION



NOTE: The sterilisation tolerance can be adjusted between $\pm 0.5^{\circ}\text{C}$ and $\pm 3.0^{\circ}\text{C}$. (default: $\pm 1.5^{\circ}\text{C}$.)

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select STERILISATION
2. Press **EDIT**. The STERILISATION PARAMETER menu appears
3. Press **CONTINUE** to choose MEDIACLAVE TOLERANCE or AUTOCLAVE TOLERANCE
4. Press – or + to adjust the sterilisation tolerance
5. Press **SAVE** to return to the PARAMETER ENTRY menu



VENTILATION



NOTE: The ventilation end temperature can be adjusted between 90°C and 110°C. This value sets the temperature at which the exhaust valve closes during a heating phase.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select VENTILATION
2. Press **EDIT**
3. The VENTILATION PARAMETER menu displays two options:
 - MEDIACLAVE (Default: 100°C)
 - AUTOCLAVE (Default: 105°C)
4. Choose either MEDIACLAVE or AUTOCLAVE
5. Press – or + to adjust the ventilation end temperature
6. Press **SAVE** to return to the PARAMETER ENTRY menu

COOLING



NOTE: The minimum heating water (coupling medium) temperature can be adjusted between 5°C and 45°C. The cooling water temperature cannot be adjusted below 5°C. This prevents gel formation.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select COOLING
2. Press **EDIT**
3. The COOLING PARAMETER menu appears
4. Press – or + to adjust the minimum cooling water temperature
5. Press **SAVE** to return to the PARAMETER ENTRY menu

CLEANING



NOTE: The cleaning temperature can be adjusted between 40°C and 80°C. (default: 80°C) This temperature must be reached during the cleaning cycle to allow the cycle to proceed (see section 5.3).

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select CLEANING
2. Press **EDIT**
3. The CLEANING PARAMETER menu appears
4. Press – or + to adjust the cleaning temperature
5. Press **SAVE** to return to the PARAMETER ENTRY menu

DATE



NOTE: The date style used is dd.mm.yyyy.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select DATE
2. Press **EDIT**
3. The SET DATE menu displays three options:
 - DAY
 - MONTH
 - YEAR
4. Press **CONTINUE** to select each option individually
5. Press – or + to adjust the day, month and year
6. Press **SAVE** to return to the PARAMETER ENTRY menu



TIME

i

NOTE: The system clock is a 24-hour clock. The time style used is hh:mm.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select TIME
2. Press **EDIT**
3. The SET TIME menu displays two options:
 - HOURS
 - MINUTES
4. Press **CONTINUE** to select each option individually
5. Press – or + to adjust the hour and minutes
6. Press **SAVE** to return to the PARAMETER ENTRY menu

INFO

i

NOTE: The INFORMATION menu is read-only. The user cannot adjust any displayed parameters.

1. From the PARAMETER ENTRY menu, press **CONTINUE** to scroll to and select INFO
2. Press **EDIT**
3. The INFORMATION menu displays the following information:
 - VERSION: [software version]
 - SN: [device serial number]
 - DATE, TIME: [current date (dd: mm: yyyy) - current time (hh.mm.ss)]
 - WORKHOURS, CYCLES: [Workhours, number of cycles]
4. Press **BACK**
5. Press **MAIN MENU** to return to the start display





4 Instructions for use

4.1 Introduction

The MediaClave is a device used for the production of culture media containing agar or culture nutrient fluids. Additionally, the MediaClave can be used as an autoclave or a water bath.

This section of the manual is divided into three main parts:

- **MEDIACLAVE** program operation
- **AUTOCLAVE** program operation
- **WATERBATH** program operation



ATTENTION: For Limit values consult section 7.5.

4.2 Safety precautions and specifications

4.2.1 MEDIACLAVE and AUTOCLAVE sterilisation



WARNING: There must be sufficient inner heating medium of distilled or deionized water in the vessel at all times. The level must be approximately 7 cm below the upper edge of the vessel.



ATTENTION: Prior to each run, remove the rubber lid seal, wet the seal well and insert it again. The appropriate temperature sensor must be installed for sterilisation (see section 3.2)



ATTENTION: The safety cover and vessel lid must remain closed throughout the sterilisation cycle. Failure to close the safety cover and vessel lid will result in an alarmed error message.



ATTENTION: During MediaClave sterilisation, the cuvette must be installed and filled with product (see sections 3.2.1). The magnetic stirrer bar must be inserted.



ATTENTION: During autoclave sterilisation, the cuvette must be removed and the steel base plate installed in the vessel (see section 3.2.2).

4.2.2 WATERBATH



WARNING: The inner circulation medium must be distilled or deionized water.



ATTENTION: The safety cover and vessel lid must remain open throughout a water bath operation. Failure to open the safety cover and vessel lid will result in an alarmed error message.



4.3 Program operation

4.3.1 MEDIACLAVE program operation

4.3.1.1 Overview

The flow of the MEDIACLAVE sterilisation cycle is as follows:

System check → Pressure test (excluding MEDIACLAVE program 14) → Heating → Sterilisation → Cooling → (MEDIACLAVE program 15 only: Heating) → Boiling → Cooling → Dispensing → End of cycle

4.3.1.2 System check

All instrument functions and corresponding sensors are initialised and checked during a system check.

4.3.1.3 Pressure test

During a pressure test, the vent valve closes and the compressor operates for a maximum of 90 seconds. When the target pressure of 0.1 bar is reached, the compressor stops and the vent valve re-opens.



ATTENTION: If the pressure test fails, remove the rubber lid seal, wet it well and insert it again.

4.3.1.4 Heating

The heating phase brings the product temperature to the programmed target value. To ensure the sterilisation of the heat space inside the vessel, the vent valve remains open until the air vent parameter has been reached. This allows water vapour to escape from the system, thus all non sterile air is removed. If the target value is below 100°C, the vent valve closes at target value minus 3°C.

4.3.1.5 Sterilisation

The product is maintained at the programmed target value for the specified duration of the sterilisation phase. The maximum sterilisation temperature is 122°C and the corresponding maximum pressure is approximately 1.2 bar. **The sterilisation time runs if the temperature is within the defined tolerance band.**

4.3.1.6 Cooling

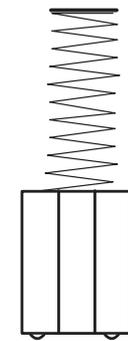
The cooling phase reduces the temperature and pressure to the programmed target values. External cooling water is flowing through the heat exchanger. The coupling medium is pumped through the inner ring of the heat exchanger and is cooled down to the required target value. There is only a thermal connection between coupling medium and tap water, therefore no contamination is possible. In order to prevent gel formation, a minimum cooling temperature can be defined as an option.



4.3.1.7 Dispensing the product

During the dispensing phase, the product will be dispensed through the sterile dispensing tube by an external pump.

1. Unscrew the media outlet cap from the dispensing ports (see figure 2.1)
2. Connect the sterile dispensing tube. When using a rigid dispensing tube, flame briefly with a bunsen burner before inserting
3. Secure the tube with the securing nuts
4. Place the tube in the external pump
5. When the cuvette is empty, press END
6. Remove the dispensing tube from the dispensing nipple
7. Clean the media outlet
8. Close the outlet by covering with the cleaned cap
9. Open the sterilisation compartment
10. Clean the rubber seal and insert again
11. Remove the cuvette (see section 3.2)
12. Clean the cuvette (see section 5.2)
13. Disconnect and clean the outlet tube immediately (see section 5.2).



Securing nut

ENGLISH



ATTENTION: MEDIACLAVE programs 14 and 15 differ from the other 13 programs:

- PROGRAM 14 (Without pressure test) results in pressure free steam disinfection of growth media. As the name suggests, a pressure test is not performed at the beginning of the cycle (true sterilisation is not performed).
- PROGRAM 15 (Chocolate Agar) is used for the production of chocolate agar. It runs in two cycles (sterilisation and boiling).

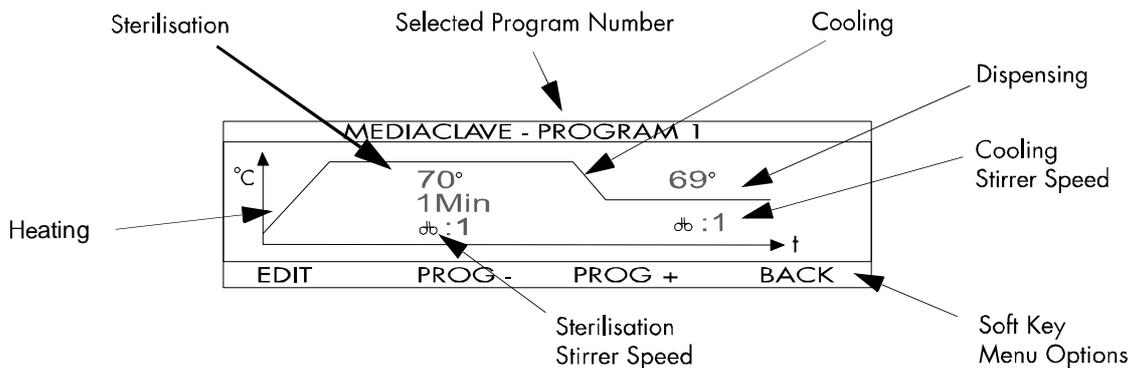


Figure 4.1: The MEDIACLAVE PROGRAM [#] Screen

Figure 4.1 illustrates the progress of the sterilisation cycle as displayed on the MEDIACLAVE PROGRAM [#] screen.

4.3.1.8 Selecting programs

1. Press **MEDIACLAVE** on the start display (see section 3.4.1). The MEDIACLAVE PROGRAM [#] screen appears (see figure 4.1)
2. Press **PROGRAM**. The PROGRAM menu appears (see figure 3.4)
3. Press **PROG -** or **PROG +** to select the desired program
4. Press **BACK** to transfer the selected program to the MEDIACLAVE PROGRAM [#] screen
5. Press **START** to start the selected program (see section 4.3.1.10)



4.3.1.9 Modifying programs



ATTENTION: Read section 7.4 before modifying programs.

Program 1 to 14

1. Follow steps 1–4 in section 4.3.1.8
2. Press **EDIT** to branch into the EDIT menu where the program can be modified (see section 3.4.2.4)
3. Press **CONTINUE** to scroll to and select the sterilisation temperature
4. Press – or + to adjust the sterilisation temperature



NOTE: For program 1–13 and 15, the temperature can be adjusted between 70°C and 122°C. For program 14, the temperature can be adjusted between 70°C and 105°C.

5. Press **CONTINUE** to select the sterilisation time
6. Press – or + to adjust the sterilisation time.



NOTE: For program 1–15, the duration can be adjusted between 1 and 99 minutes.

7. Press **CONTINUE** to select the stirrer speed for sterilisation
8. Press – or + to adjust the stirrer speed.



NOTE: For programs 1–15, the stirrer speed can be adjusted between 1 and 2. A speed of 2 is recommended when heating to the sterilisation temperature.

9. Press **CONTINUE** to select the cooling temperature
10. Press – or + to adjust the cooling temperature



NOTE: For programs 1–15, the cooling temperature can be adjusted between 30°C and 80°C.

11. Press **CONTINUE** to select the stirrer speed for cooling
12. Press – or + to adjust the stirrer speed
13. Press →
14. Press **SAVE** to save all modifications and return to the **PROGRAM** menu
OR
Press **CANCEL** to reject all modifications and return to the **PROGRAM** menu
15. Press **START** to start the selected program (see Section 4.3.1.10)

PROGRAM 15 - Chocolate Agar

1. Follow steps 1–12 in section 4.3.1.9 [PROGRAM 1 to 14]
2. Press **CONTINUE** to scroll to and select the boiling temperature
3. Press – or + to adjust the boiling temperature



NOTE: The temperature can be adjusted between 70°C and 122°C.

4. Press **CONTINUE** to select the boiling time
5. Press – or + to adjust the boiling time



NOTE: The time can be adjusted between 1 and 99 minutes.



6. Press **CONTINUE** to select the stirrer speed for boiling
7. Press – or + to adjust the stirrer speed
8. Press **CONTINUE** to select the cooling temperature
9. Press – or + to adjust the cooling temperature



NOTE: The temperature can be adjusted between 30°C and 80°C.

10. Press **CONTINUE** to select the stirrer speed for cooling
11. Press – or + to adjust the stirrer speed
12. Press →
13. Press **SAVE** to save all modifications and return to the **PROGRAM** menu
OR
Press **CANCEL** to reject all modifications and return to the **PROGRAM** menu
14. Press **START** to start the selected program (see Section 4.3.1.10)

4.3.1.10 Starting and running programs



ATTENTION: Ensure there is sufficient heating water in the vessel. If there is insufficient heating water in the vessel, the following alarmed message appears – **TOO LITTLE HEATING WATER IN VESSEL**. Press **END** to confirm this error. The cycle is terminated.



ATTENTION: Pressing **END** results in the alarmed message **CYCLE IS BEING CONCLUDED**. The **MAIN** menu appears.

1. Open the safety cover and vessel lid (see section 3.2)
2. Press **MEDIACLAVE** on the start display. The **MEDIACLAVE PROGRAM [#]** screen appears
3. Press **START**
4. Fill the cuvette with the medium to be prepared and enter the stirrer bar
5. Install the cuvette in the vessel (see section 3.2)
6. Install the rigid temperature sensor (see section 3.2)
7. When dispensing with the dispensing tube (not with the rigid tube) connect this to the inner side of the media outlet
8. Close the vessel lid (see section 3.2)
9. Press **OK** to continue the cycle
OR
Press **END** to terminate the cycle
10. Close the safety cover



NOTE: The safety cover lock ensures that the safety cover is securely closed.

- **PREPARE COOLING** appears on the GUI



NOTE: The heat exchanger is filled with water to prevent overheating. The actual and target temperatures are displayed in the upper right corner of the screen.

- All sensors are checked to ensure that they measure within the permitted temperature ranges. Sensors are also checked for short-circuit, interruption and ice formation (< 2°C)
- The pump runs for approximately five seconds to remove any trapped air
- **WATER CONTROL** appears. The water level is checked
- **PRESSURE TEST** appears for PROGRAMS 1–13 and 15. A pressure test is performed
- The sterilisation cycle is started



4.3.1.11 Flow of the MEDIACLAVE sterilisation cycle



ATTENTION: Press **STEP** to interrupt the cycle and proceed to the next cycle step. The program cannot be interrupted during cooling.



NOTE: A progress printout is printed every x seconds / minutes during the sterilisation cycle (x refers to the selected print cycle, see section 3.4.4.2).



NOTE: The cycle progress is monitored and periodically updated on the GUI.

A series of messages appears:

- **HEATING UP**



NOTE: The actual and target temperatures are displayed in the upper right of the screen. The target temperature must be reached in order for the cycle to progress. (phase change)

- **STERILISING** (The set sterilisation time begins when the PT100 probe registers the set temperature.)



NOTE: The actual sterilisation temperature and countdown timer are displayed in the upper right of the screen. The sterilisation time is counted down in minutes and seconds.

- **COOLING** (The cooling phase begins immediately on completion of the sterilisation phase and continues until the dispensing temperature is reached.)



ATTENTION: For programs 1–14, proceed to **DISPENSE**, for PROGRAM 15, proceed to **ADD PRODUCT!**



NOTE: The safety cover opens automatically.

- **ADD PRODUCT**

- Unscrew the cap on the access port and add blood to the cuvette
- Close the cap
- Press **END** when the entire product has been added
- Close the cover

A series of messages appears:

- **HEATING UP**



NOTE: The actual and target cooling temperatures are displayed in the upper right of the screen.

- **BOILING**



NOTE: The actual and target cooling temperatures are displayed in the upper right of the screen.

- **COOLING**



NOTE: The actual and target cooling temperatures are displayed in the upper right of the screen.

- **DISPENSING**



The safety cover opens automatically



NOTE: The actual and target dispensing times are displayed in the upper right of the screen.

11. Dispense the product (see section 4.3.1.7)
12. When the cuvette is empty, press **END**. The cycle ends

4.3.2 AUTOCLAVE program operation



ATTENTION: Read section 7.4 before operating the AUTOCLAVE program.

4.3.2.1 Overview

The flow of the AUTOCLAVE cycle is as follows:

System check → Pressure test → Heating → Sterilisation → Cooling → End of cycle

4.3.2.2 System check

All instrument functions and corresponding sensors are initialised and checked during a system check.

4.3.2.3 Pressure test

During a pressure test, the vent valve closes and the compressor operates for a maximum of 90 seconds. When the target pressure of 0.1 bar is reached, the compressor stops and the vent valve re-opens.

4.3.2.4 Heating

The heating phase brings the product temperature to the programmed target value. To ensure the sterilisation of the head space inside the vessel, the vent valve remains open until the air vent parameter has been reached. This allows water vapour to escape from the system, thus all non sterile air is removed. If the target value is below 100°C, the vent valve closes at target value minus 3°C.

4.3.2.5 Sterilisation

The product is maintained at the programmed target value for the specified duration of the sterilisation phase. The maximum sterilisation temperature is 122°C and the corresponding maximum pressure is approximately 1.2 bar. The sterilisation temperature runs within the defined tolerance band.

4.3.2.6 Cooling

The cooling phase reduces the temperature and pressure to the programmed target values. External cooling water is flowing through the heat exchanger. The coupling medium also passes through the heat exchanger. The pump volume of 10 litres/minute and cooling performance of approximately 30 kW cools the product to the required target value.



Figure 4.2 illustrates the AUTOCLAVE cycle progress as displayed on the AUTOCLAVE PROG [#]



ATTENTION: All AUTOCLAVE programs are similar. Unlike the MediaClave, there are no programs with special functions.

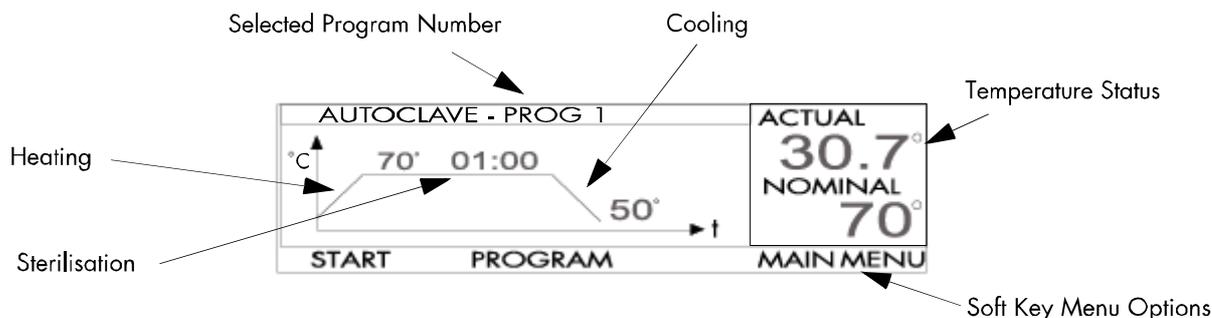


Figure 4.2: The AUTOCLAVE PROG [#] Screen

4.3.2.7 Selecting programs

1. Press **AUTOCLAVE** on the start display (see section 3.4.1). The AUTOCLAVE PROG [#] screen appears (see figure 4.2)
2. Press **PROGRAM**. The **PROGRAM** menu appears (see figure 3.4)
3. Press **PROG -** or **PROG +** to select the desired program
4. Press **BACK** to return to the AUTOCLAVE PROG [#] screen
5. Press **START** to start the selected program (see section 4.3.2.9)

4.3.2.8 Modifying programs



ATTENTION: Read section 7.4 before modifying programs.

1. Follow steps 1–2 in section 4.3.2.7
2. Press **EDIT** to return to the EDIT menu where the program can be modified (see section 3.4.2.4)
3. Press **CONTINUE** to scroll to and select the sterilisation temperature
4. Press **-** or **+** to adjust the sterilisation temperature.



NOTE: The temperature can be adjusted between 70°C and 122°C.

5. Press **CONTINUE** to select the sterilisation time
6. Press **-** or **+** to adjust the sterilisation time



NOTE: The duration can be adjusted between 1 and 99 minutes.

7. Press **CONTINUE** to select the cooling temperature
8. Press **-** or **+** to adjust the cooling temperature



NOTE: The cooling temperature can be adjusted between 30°C and 90°C.

9. Press **→**
10. Press **SAVE** to save all modifications and return to the **PROGRAM** menu



OR

Press **CANCEL** to reject all modifications and return to the **PROGRAM** menu

11. Press **START** to start the selected program (see section 4.3.2.9)

4.3.2.9 Starting and running programs



ATTENTION: Ensure there is sufficient heating water in the vessel. If there is insufficient heating water in the vessel, the following alarmed message appears – **TOO LITTLE HEATING WATER IN VESSEL**. Press **END** to confirm this error. The cycle is terminated.



ATTENTION: Pressing **END** results in the alarmed message **CYCLE IS BEING CONCLUDED**. The **MAIN** menu appears.

1. Open the safety cover and vessel lid
2. Press **AUTOCLAVE** on the start display. The AUTOCLAVE PROG [#] screen appears
3. Press **START**
4. Remove the cuvette from the vessel (see section 3.2)
5. Insert the steel base plate (see section 3.2.2.3)
6. Install the flexible temperature sensor (see section 3.2.2.2) and submerge it in the product
7. Close the vessel lid
8. Press **OK** to continue the cycle
OR
Press **END** to terminate the cycle
9. Close the safety cover. The message **PREPARE COOLING** appears



NOTE: The safety cover lock ensures the safety cover is securely closed.



NOTE: The heat exchanger is filled with water to prevent overheating. The actual and target temperatures are displayed in the upper right of the screen.

- All sensors are checked to ensure that they measure within the permitted temperature ranges. Sensors are also checked for short-circuit, interruption and ice formation (< 2°C)
- The pump runs for approximately five seconds to remove any trapped air
- **WATER CONTROL** appears on the screen. The water level is checked
- **PRESSURE TEST** appears on the screen
- The sterilisation cycle is started

4.3.2.10 Flow of the AUTOCLAVE sterilisation cycle



ATTENTION: Press **STEP** to interrupt the cycle and proceed to the next step. The cycle cannot be interrupted during cooling



NOTE: A progress printout is printed every x minutes during the cycle (x refers to the selected print cycle, see section 3.4.4.2).



NOTE: The cycle progress is monitored and periodically updated on the GUI.

A series of messages appears:



- **HEATING UP**



NOTE: The actual and target temperatures are displayed in the upper right of the screen. The target temperature must be reached in order for the cycle to progress.

- **STERILISING**



NOTE: The actual sterilisation temperature and countdown timer are displayed in the upper right of the screen. The sterilisation time is counted down in minutes and seconds.

- **COOLING**



NOTE: The actual and target cooling temperatures are displayed in the upper right of the screen.

- **STERILISATION CONCLUDED**



NOTE: The safety cover opens after pressing the END button. The cycle ends.

4.3.3 WATERBATH program operation

4.3.3.1 Overview

The flow of the WATER BATH cycle is as follows:

System Check → Heating → WATER BATH

4.3.3.2 System check

All instrument functions and corresponding sensors are initialised and checked during a system check.

4.3.3.3 Heating

The heating phase brings the water bath temperature to the programmed target value.

Figure 4.3 illustrates the progress of the WATER BATH cycle as displayed on the WATER BATH PROG [#] screen

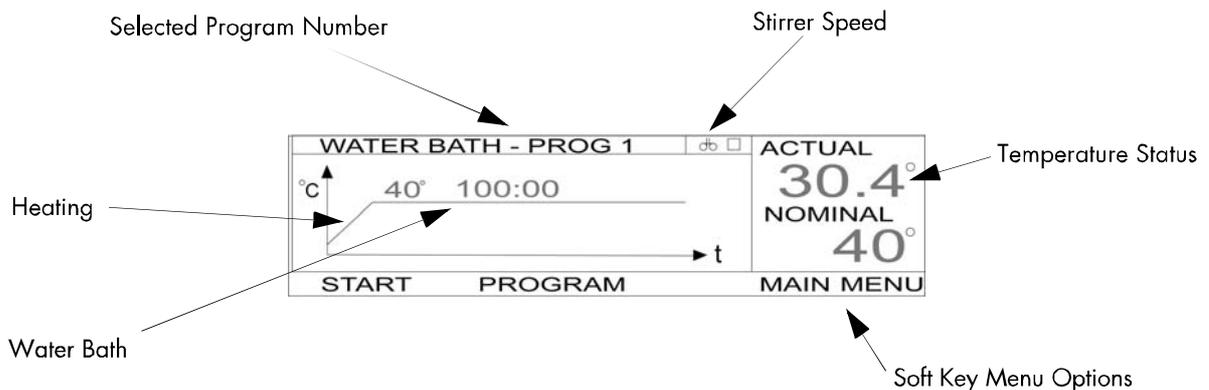


Figure 4.3: The WATER BATH PROG [#] screen



ATTENTION: The vessel lid must remain open throughout the WATER BATH cycle. If the vessel lid is closed, the cycle is terminated and cooled to the heating safety temperature of 80°C



ATTENTION: All 15 WATER BATH programs are similar. Unlike the MediaClave, there are no programs with special functions.

4.3.3.4 Selecting Programs

1. Press **WATERBATH** on the Start Display (see section 3.4.1). The WATER BATH PROG [#] screen appears (see figure 4.3)
2. Press **PROGRAM**. The PROGRAM menu appears (see figure 3.4)
3. Press **PROG -** or **PROG +** to select the desired program



NOTE: There are 15 programs to choose from.

4. Press **BACK** to return to the WATER BATH PROG [#] screen
5. Press **START** to start the selected program

4.3.3.5 Modifying programs

1. Follow steps 1–2 in section 4.3.3.4
2. Press **EDIT** to branch into the EDIT menu where the program can be modified (see section 3.4.2.4)
3. Press **CONTINUE** to scroll to and select the temperature
4. Press **-** or **+** to adjust the temperature



NOTE: The temperature can be adjusted between 37°C and 80°C.

5. Press **CONTINUE** to scroll to and select the stirrer speed
6. Press **-** or **+** to adjust the stirrer speed



NOTE: The stirring speed can be adjusted between 1 and 2.

7. Press **→**
8. Press **SAVE** to save all modifications and return to the PROGRAM menu
OR
Press **CANCEL** to reject all modifications and return to the PROGRAM menu
9. Press **START** to start the selected program (see section 4.3.3.6)



4.3.3.6 Starting and running programs



ATTENTION: Ensure there is sufficient heating water in the vessel.



ATTENTION: Pressing **END** results in the following alarmed screen message – **CYCLE IS BEING CONCLUDED**. The **MAIN** menu appears.



ATTENTION: Install the cuvette (see section 3.2), and fill with approximately 2 L of water.

1. Press **WATERBATH** on the start display. The WATER BATH PROG [#] screen appears
2. Press **START**
3. Open the safety cover and vessel lid
4. Press **OK** to continue the cycle
OR
Press **END** to terminate the cycle

4.3.3.7 Flow of the WATERBATH cycle



ATTENTION: Press **STEP** to interrupt the cycle and proceed to the next step. The cycle **cannot** be interrupted during cooling.



NOTE: A progress printout is printed every x minutes during the sterilisation cycle (x refers to the selected print cycle, see section 3.4.4.2).



NOTE: The cycle progress is monitored and periodically updated on the screen.

The message **PREPARE COOLING** appears



NOTE: The heat exchanger is filled with water to prevent overheating. The actual and target temperatures are displayed in the upper right of the screen.

All sensors are checked to ensure that they measure within the permitted temperature ranges. Sensors are also checked for short-circuit, interruption and ice formation (< 2°C).

The pump runs for approximately five seconds to remove any trapped air.

Certain messages appear:

- **WATER CONTROL** (The water level is checked)
- **HEAT UP**
- **WATERBATH ACTIVE**



NOTE: The actual temperature is displayed in the upper right of the screen. The duration is also displayed in minutes and seconds. The product is held at the target temperature for the specified time.



5 Cleaning instructions

5.1 Introduction

Periodic cleaning procedures must be performed to ensure optimal performance and safety of the MediaClave. Some parts can be made automatically, others manually.

The section describes the two parts

- Manually controlled Cleaning routines
- MediaClave **CLEANING** menu

5.2 Manually controlled cleaning routines

5.2.1 General cleaning routine

This cleaning routine is a mandatory procedure. It is a guide to facilitate the optimal and safe operation of the MediaClave.

5.2.1.1 Materials required

The following materials are required:

- Liquid dish washing detergent – use a mixture of one-part liquid dishwasher detergent and three-parts water
- Deionised water
- Soft, lint-free cleaning cloth
- Paper towels

5.2.1.2 Cleaning procedure



WARNING: Before starting the cleaning procedure, ensure the MediaClave is switched off and disconnected from the mains.

1. Clean and empty the vessel
2. Switch off the MediaClave and disconnect it from the power source
3. Visually check the instrument for obvious spills, paying particular attention to the following areas:
 - Media outlet port
 - Vessel
 - Safety cover
 - Vessel lid
 - Lid seal
 - Clear protection cover
 - Cuvette



4. Moisten a cleaning cloth with the liquid dishwasher detergent



ATTENTION: Do not soak the cloth in the solution. Do not let the solution drip inside the MediaClave.

5. Use the moistened cloth to clean all affected areas including vessel, cuvette and temperature sensor
6. Dry all areas with a clean, dry paper towel
7. Take out tubing and O-ring if necessary
8. Change the vessel lid seal as required



ATTENTION: It is recommended to change the lid seal after every 100 runs.

9. Check the cuvette holder and magnetic stirrer bar holder. Clean as required
10. Check the printer and, if necessary, replace the printer paper as per section 6.2
11. Switch on the MediaClave
12. Execute a self-test to check the function of all sensors and so on

5.2.2 Removing residual dirt

Visually check the instrument for encrusted dirt and brown spots. Clean the instrument as follows.

5.2.2.1 Materials required

The following materials are required:

- Passivating paste
- Soft, non-abrasive brush
- Liquid dish washing detergent – use a mixture of one-part liquid dish washing detergent and three-parts water
- Deionised water
- Soft, lint-free cleaning cloth

5.2.2.2 Safety Precautions



WARNING: The passivating paste contains a mixture of nitric acid and phosphoric acid. It generates toxic vapors. Ensure the area is well ventilated and always wear personal protective equipment such as disposable gloves, eye protection, breathing mask and a laboratory coat when handling this chemical.



WARNING: Ensure that all traces of the passivating paste are removed during the cleaning procedure. Failure to remove all traces will result in instrument corrosion.

5.2.2.3 Cleaning procedure

1. Moisten a cleaning cloth with the liquid dish washing detergent
2. Use the moistened cloth to clean the vessel
3. Apply the passivating paste to all affected areas
4. Leave for 10 minutes to 12 hours, depending on the intensity of the dirt
5. Using warm water and a non-abrasive brush, remove all traces of the passivating paste



5.3 MediaClave Cleaning menu

5.3.1 Cleaning procedure

To access the **CLEANING** menu, press **CLEANING** on the start display. The **CLEANING** menu appears as illustrated in figure 5.1.

5.3.2 Overview

The **CLEANING** menu is illustrated in figure 2.8. In the **CLEANING** menu, the MediaClave can be emptied or cleaned by pressing the **EMPTY** or **CLEAN** soft keys. The **MAIN MENU** soft key is used to return to the Start Display.

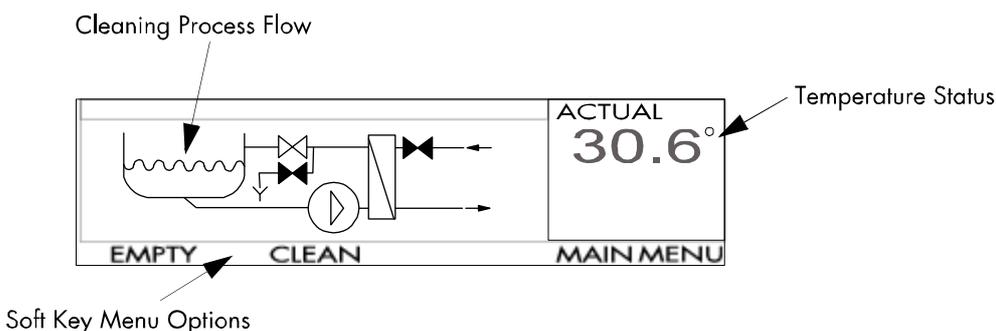


Figure 5.1: The **CLEANING** Menu

- !** **ATTENTION:** The safety cover and vessel lid must remain open throughout the **EMPTY** and **CLEAN** programs.
- i** **NOTE:** The actual temperature and the preassigned target temperature are displayed in the upper right of the screen throughout the **CLEAN** cycle. The target temperature must be reached to allow the program to progress. The actual temperature is displayed in the upper right of the screen throughout the **EMPTY** cycle.
- i** **NOTE:** It is mandatory to clean the vessel monthly or when the heating water is visibly dirty.

5.3.3 EMPTY menu

5.3.3.1 Overview

When emptying the vessel, the inner contents are pumped out until the water level falls below the empty level sensor. After the sensor switches off the pump, the pump pauses for approximately 10 seconds. The pump restarts repeatedly and pumps out the residual water for approximately 10 seconds.



5.3.3.2 Emptying the MediaClave



NOTE: The emptying duration depends on the volume of the vessel content.

1. Open the safety cover and vessel lid
2. Press **EMPTY** on the **CLEANING** menu. The **EMPTY** menu appears and certain messages progressively appear:
 - **VESSEL IS BEING EMPTIED**
 - **PAUSE**
 - **VESSEL IS BEING EMPTIED**



NOTE: The actual temperature is displayed in the upper right of the screen.

- **VESSEL EMPTIED**
 - **WATER DRAIN MANUAL** (The residual water can be expelled manually)
3. Press and hold **MANUAL** to manually expel residual water using the pump
 4. Press **END** to finish the emptying program and return to the **CLEANING** menu
 5. Press **MAIN MENU** to return to the start display

5.3.4 CLEAN menu

5.3.4.1 Overview

When cleaning, the enclosed heating water is first heated to 40–80°C (see section 3.4.4.2), held for 100 seconds and then expelled. Emptying occurs in the same manner as in the **EMPTY** Menu (see section 5.3.3).



ATTENTION: Ensure that there is sufficient heating water in the vessel throughout the **CLEAN** program.



NOTE: The approximate cleaning duration is 10 minutes (this includes emptying). This may vary according to temperature and the volume of the vessel contents.



NOTE: Press **END** to cancel cleaning. The **CLEANING** menu appears.

5.3.4.2 Cleaning the MediaClave

1. Open the safety cover and vessel lid
2. Press **CLEAN** on the **CLEANING** menu. Certain messages progressively appear:
 - **VESSEL IS BEING CLEANED**



NOTE: The actual temperature is displayed in the upper right of the screen.

- **PREPARE COOLING**
- **WATER CONTROL** (The heating water level is checked)



NOTE: If there is insufficient water in the vessel, the following alarmed message appears – **TOO LITTLE HEATING WATER IN VESSEL**. Press **END** to confirm this error.

- **VESSEL IS BEING HEATED**



NOTE: The actual and target temperatures are displayed in the upper right of the screen. The pre-programmed target temperature (see Section 3.4.4.2) must be achieved in order for the cleaning cycle to progress.

- **VESSEL IS BEING CLEANED**



NOTE: The countdown timer is displayed in the upper right of the screen. The temperature is held at the target value for 100 seconds. The timer counts back from 100 to 0 seconds.

- **VESSEL IS BEING EMPTIED** (The actual temperature also appears)

3. Clean and empty the vessel as outlined in section 5.3.3.2, steps 2–5





6 Maintenance

6.1 Introduction

The Maintenance Section consists of four parts:

- Paper handling
- Temperature calibration
- Troubleshooting
- Frequently asked questions FAQ's

6.2 Paper handling

6.2.1 Replacing the Printer paper roll



ATTENTION: Refer to Figure 6.1 and Figure 6.2 when replacing the printer paper roll.



NOTE: The appearance of a red strip at the edge of the paper indicates the need of a paper-replacement.

1. Ensure that the MediaClave is switched on
2. Remove the printer protection plexiglass and the magnetic front cover
3. Press the form feed button to expel the last piece of paper
4. Remove the empty bobbin and replace with a new paper roll
5. Insert the end of the paper into the paper slit
6. The paper is automatically fed into the printer
7. Press the form feed button
8. Replace the printer protection plexiglass and the magnetic front cover
9. Perform a print self-test (see section 3.4.4.2 - PRINTER)

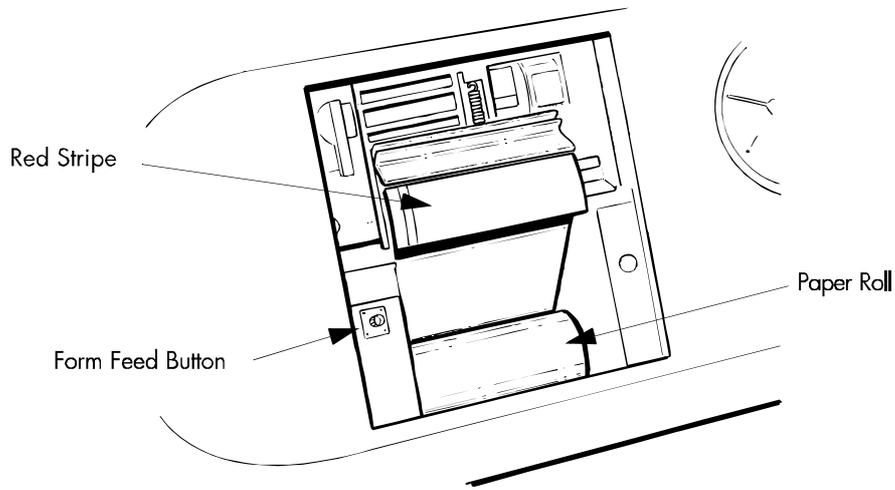


Figure 6.1: The MediaClave printer

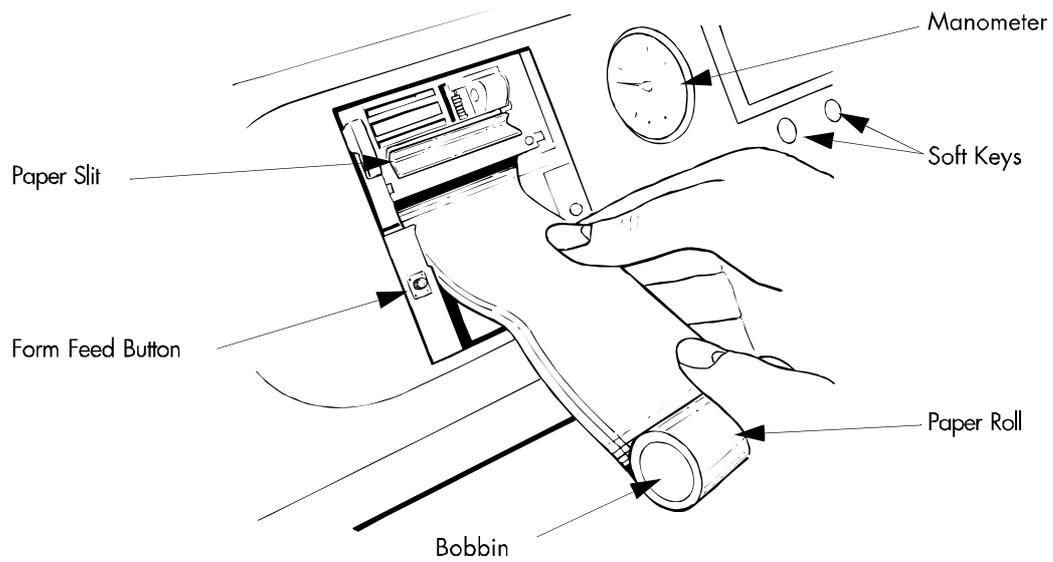


Figure 6.2: Inserting the Printer paper roll



6.3 Temperature calibration

6.3.1 Overview

Company directives require all companies working under a quality assurance management to periodically calibrate their equipment. The calibration must guarantee that the instrument fulfils the defined specifications.

6.3.2 When to perform calibration

INTEGRA Biosciences recommends the following:

- Calibration must be performed at least once a year, preferably in combination with a service
- Calibration must be performed after each instrument adjustment or repair

6.3.3 Temperature calibration routine

For temperature calibration, an external temperature measuring system is required. Instrument and sensor must be calibrated together. To ensure an high accuracy, a good temperature instrument and a high-class sensor is needed. INTEGRA Biosciences provides an appropriate system including a temperature-measuring instrument and a double Pt100 temperature sensor 1/10 DIN with a calibration protocol for the entire system. (Order number: 135800)

6.3.3.1 Using the INTEGRA temperature calibration set (Order Nr. 135800)

- Connect the double Pt100 sensor to the temperature sensor inlet. There are two connector cables. One is connected to the MediaClave rear panel, the other one to the external instrument.
- Compare the true temperature reading with the temperature reading on the display. If the displayed reading differs from the true reading more than defined by internal company directives, the temperature measurement must be adjusted. Contact a Service Technician (see chapter 8).

6.3.3.2 Using another temperature measurement system for calibration

- An external temperature measuring system, consisting of a measuring instrument and a Pt100 temperature sensor, is required.



ATTENTION: Reference temperature instrument and sensor must be calibrated together as a system.

- Connect this system to the dispense port



ATTENTION: To make sure that there is a homogeneous temperature inside the MediaClave, the stirrer must be switched on.

- Compare the reference temperature reading with the temperature reading on the display. If the displayed reading differs from the reading, contact a Service Technician (see chapter 8 for addresses).



6.4 Troubleshooting + Error handling

6.4.1 Possible solutions for problems

Tables 6.1 and 6.2 can help to remedy certain problems that may be encountered when operating the MediaClave. These tables contain the symptom, possible cause and corrective action related to the particular problem.

Symptom	Possible Cause	Corrective Action
Instrument does not start up	<ul style="list-style-type: none"> • Plug is not connected to mains. • Incorrect voltage set • Fuse has blown in main switch or electronics 	<p>Check connection to power</p> <p>Call your local INTEGRA Biosciences Technical Support Department</p>

Table 6.1: Start-up Problems

Symptom	Possible Cause	Corrective Action
The instrument does not work properly after starting a program	<ul style="list-style-type: none"> • Settings are incorrect • Safety cover is open • Vessel lid is open • Media inlet/outlet caps are not sufficiently tight 	<p>Check all settings</p> <p>Close safety cover</p> <p>Close vessel lid</p> <p>Manually tighten caps</p>
Insufficient or no pressure buildup during the cooling phase	<ul style="list-style-type: none"> • Support pressure tube at the rear of the instrument is leaking • Sterile filter is blocked or wet 	<p>Ensure that the tube between the compressor outlet and filter inlet is correctly installed</p> <p>Install a new sterile filter</p>
Pressure test fails	<ul style="list-style-type: none"> • Vessel is not sufficiently tight 	<p>Remove the rubber lid seal. Wet well and replace again or replace seal</p>
Safety cover does not open at the end of a programmed run	<ul style="list-style-type: none"> • The temperature of the medium is greater than the heating safety temperature (80°C) • The pressure in the system is greater than 0.1 bar 	<p>Allow the instrument and media to cool to below 80°C. A cooling phase may need to be started</p> <p>Allow the pressure to drop to below 0.1 bar. A dispensing phase may need to be started</p>

Table 6.2: General operation problems



6.4.2 Error handling

6.4.2.1 Overview

The MediaClave software contains error-handling procedures that enable certain problems to be rectified without service intervention. If the MediaClave encounters a problem, it tries to rectify the problem by issuing instructions to the user via the GUI. If the on-screen instructions are followed, the error can usually be rectified without service intervention. Typically, the alarmed error messages contain an error description.



ATTENTION: All alarmed errors are accompanied by an acoustic alarm. This alarm can be switched off by pressing the **END** soft key.

6.4.2.2 Start-up errors messages

Displayed Text	Description/Action
DEVICE SAFETY! PLEASE CALL CUSTOMER SERVICE!	Description: The safety overtemperature switch reports a malfunction. The MediaClave is blocked. Reaction: Call customer service!
ERROR! SYSTEM (BATTERY, SAFETY,...) PLEASE CALL CUSTOMER SERVICE!	Description: The internal memory is energised with a Lithium battery. At start-up, the memory image is checked. Reaction: Call customer service!
NOTE OLD CYCLE NOT TERMINATED YET! TERMINATION BEFORE 00:07 MM:SS	Description: This message is indicated, if a power loss occurs during a sterilisation cycle. Reaction: Choose between Start/End

Table 6.3: MediaClave Start-up Error messages



6.4.2.3 Error messages during operation

Displayed Text	Description/Action
WARNING: PLEASE CLOSE COVER!	Description: Before starting operation, the MediaClave verifies the sealing of the safety cover. If the cover is opened, the user is informed. Reaction: Close the cover.
WARNING! PLEASE OPEN BOILER!	Description: In mode Water bath, the MediaClave verifies the sealing of the vessel. If the vessel is closed, the user is informed. Reaction: Open vessel.
SENSOR SHORT!	Description: The MediaClave verifies before and during operation the functionality of product and coupling medium temperature sensors. The 'SHORT-WARNING' is issued when the measured temperature is below -20°C. Reaction: Check sensor wiring and connector.
WARNING! SENSOR SHORT! PLEASE CHECK SENSORS!	
ICE IN THE SYSTEM!	Description: The MediaClave verifies before and during operation the functionality of both temperature sensors. The 'ICE IN THE SYSTEM-WARNING' is issued when the temperature is below 2°C. Reaction: Check sensor and access wire, use MediaClave only within the specified environment conditions.
WARNING! ICE IN THE SYSTEM! PLEASE CHECK SENSORS!	
INTERRUPTION TEMPERATURE SENSOR!	Description: The MediaClave verifies before and during operation the functionality of product and coupling medium temperature sensors. The 'INTERRUPTION TEMPERATURE SENSOR-WARNING' is issued, when temperature is over 300°C. Reaction: Check sensor and access wire.
WARNING! INTERRUPTION TEMPERATURE SENSOR! PLEASE CHECK SENSORS!	
TOO LITTLE HEATING WATER IN BOILER!	Description: The MediaClave verifies before and during operation the water level of the coupling medium. If the level of the coupling media falls below the minimum, the user is informed. Reaction: Terminate the program and refill. The current program is blocked until the MediaClave has cooled down.
WARNING! WATER BELOW MINIMUM LEVEL! WAIT UNTIL MACHINE HAS COOLED DOWN	
PRESSURE TEST NOT SUCCESSFUL!	Description: At start-up, a pressure test is enforced. Reaction: Terminate program and check lid seal and sterile filter.
ERROR! SAFETY TEMPERATURE HEATER! PLEASE CALL CUSTOMER SERVICE!	Description: The MediaClave verifies before and during operation the functionality of the overtemperature switch. Reaction: Call customer service

Table 6.4: Operational Error Messages



6.5 Frequently Asked Questions

Question	Answer
Can the print cycle time settings for the heating and sterilisation cycles be different (e.g. 1 minute and 5 minutes, respectively)?	No, these intervals must be the same for the program.
What happens in the event of a power failure?	When the power supply is cut, the instrument remains in the safety mode. The safety cover cannot be opened. When power resumes, the user has the option of continuing with the interrupted program or stopping the program. Stopping the program leads to a cooling to 80°C. The agar must be discarded. Continuing the program causes resumption at the beginning of the interrupted cycle. The MediaClave will take 30 seconds to restart.
What causes an excess of agar to remain at the bottom of the cuvette at the end of a process (circa 2 cm high)?	The length of the internal tube connected to the dispensing port may be too short. The length of silicone tubing must be at least 215–218 mm.
Why does the safety cover lock become warm during normal operation?	The bolt is magnetically operated and releases only if the cover is closed. The magnet runs when the cover is open, and so produces heat. Thus, this is a normal phenomenon.
What can be done when the paper does not feed correctly from the printer?	Ensure that paper is removed after each run.
What can be done when the pressure test fails?	Remove rubber lid seal. Wet and replace it.
Are all the processes reported in the printout?	No. For example, the transition from the sterilisation cycle to the cooling cycle takes approximately 1 minute. This process time is not documented
What is the average consumption of cooling water?	1.5 - 2.5 litre per minute during cooling down sequence. It also depends on the distribution pressure and on valve settings.
Is the PT100 GLP compatible? Can this be calibrated independently?	The MediaClave is CE marked. For GLP purposes, it is possible to build in a galvanically separated double PT100.
What does the user do when STEP is pressed in error?	The process which has been selected by pressing STEP is executed immediately. Keep pressing STEP until the end of the program of the desired cycle is reached.

Table 6.5: Frequently Asked Questions





7 Accessories and Technical specifications

7.1 Introduction

The Technical Reference information provides additional information to the MediaClave

- MediaClave accessories
- Country versions
- Software default values
- Limitations and general notes
- Port connector definitions
- Progress printouts
- Physical properties

7.2 MediaClave accessories

7.2.1 MediaClave accessories list

Accessory	Code	Recommended
Lid seal silicone	135860	x
Decanting tube, complete	132175	
Tubing securing nut for filling tube	132165	
Magnetic stirrer beam, complete	132130	
Stainless steel cuvette, complete	132125	
Paper roll for thermo printer	135155	x
Sterile filter 0.45um	132140	x
Double PT-100 temperature probe 1/4" flexible	135486	
Double PT-100 temperature probe 1/4" rigid	135481	
Media outlet tube rigid	135176	
Base plate and flexible PT-100 temperature sensor (autoclave kit)	135110	
Cooling water filter	135690	
Retainer for cooling water filter	135691	
Reference measurement set, consisting of temperature measure instrument, double Pt100 temperature sensor 1/10 DIN, SCS calibration protocol, round stirrer magnet and pressure adapter cap.	135800	x

Table 7.1: MediaClave accessories



7.3 Country versions

7.3.1 Electrical ratings



WARNING: For all countries worldwide, a protective earth (PE) wire is required



NOTE: Mains voltage tolerance: +/- 10%.

Region	Mains voltage (VAC)	Phases	min. current (A)	Wattage (kW)	Frequency (Hz)	Article Number
Europe	3 x 400	3L,N,PE	6A per Ph.	3.5	50–60	135030
Australia, Europe, Africa	1 x 230	L,N,PE	16A	3.5	50–60	135020
USA	1 x 240 (2x120)	2L,PE,180°	16A	3.5	50–60	135025
Japan	1 x 200	L,N,PE	20A	3.5	50–60	135035

Table 7.2: Fixed voltage

7.4 Software default values

7.4.1 Overview

This section informs about the different default program settings which comes with a new MediaClave. Furthermore, the default general values, which can be changed in the **PARAMETER** Menu, are listed.

7.4.2 MEDIACLAVE programs 1–13 (1–9 L of medium)

PROGRAMS 1–13	Range	Default
Sterilisation temperature:	70 - 122°C	121°C
Sterilisation time:	1 - 99 min.	20 minutes
Stirrer speed:	1,2	2 (150 rpm)
Dispensing temperature:	30 - 80°C	50°C
Stirrer speed:	1,2	1 (75 rpm)

Table 7.3: MEDIACLAVE programs 1 - 13



7.4.3 MEDIACLAVE program 14 (Without pressure test)



NOTE: This program is capable of preparing 1–9 L of liquid. This program performs steam disinfection but no sterilisation.

PROGRAMS 14	Range	Default
Sterilisation temperature:	70 - 105°C	105°C
Sterilisation time:	1 - 99 min.	20 minutes
Stirrer speed:	1,2	2 (150 rpm)
Dispensing temperature:	30 - 80°C	50°C
Stirrer speed:	1,2	1 (75 rpm)

Table 7.4: MEDIACLAVE program 14

7.4.4 MEDIACLAVE program 15 (Chocolate Agar)



NOTE: Blood is added to the sterilised medium and held for 10 minutes at 100°C (there is no sterilisation of the added blood).

PROGRAMS 15	Range	Default
Sterilisation temperature:	70 - 122°C	121°C
Sterilisation time:	1 - 99 min.	20 minutes
Stirrer speed:	1,2	2 (150 rpm)
Cooling temperature:	30 - 80°C	50°C
Stirrer speed:	1,2	2 (150 rpm)
Boiling temperature:	70 - 122°C	100°C
Boiling time:	1 - 99 min.	10 minutes
Stirrer speed:	1,2	2 (150 rpm)
Dispensing temperature:	30 - 80°C	50°C
Stirrer speed:	1,2	1 (75 rpm)

Table 7.5: MEDIACLAVE program 15



7.4.5 General default values

Language:		English
Printer:	Progress print: Print cycle: Self-test:	Table 1 minute off
Communication:	Device address: Host Port	1 9600 Bd - 1S - 8D - NP - 1S
Unit of measure:		Degrees Celsius
Contrast:		77%
Sterilisation:	Mediaclave tolerance: Autoclave tolerance:	+/- 1.5°C +/- 1.5°C
Ventilation: (Vent valve closing temperature - it is open below)	MediaClave ventilation temp: Autoclave ventilation temp:	100°C 105°C
Cooling:	1. Cooling temperature at MediaClave program 15: min. temp. of coupling medium:	45°C 35°C
Cleaning:	Cleaning temperature:	80°C
Date:	Day, Month, Year:	Current date
Time:	Hour, Minute:	Current time
Info:		- Software version - Serial number - Date, time - Operating hours, Cycle
Dispensing time		240 minutes

Table 7.6: General default values

7.5 Limitations and general notes

7.5.1 Overview

- When operating the MediaClave in the MEDIACLAVE program mode, always follow the recommendations of the medium suppliers. Using non-specified values may influence the quality of the prepared medium.
- To operate the MediaClave in the AUTOCLAVE program mode, special equipment (AUTOCLAVE kit) must be ordered (see section 7.2.1).



WARNING: Do not use MediaClave to sterilise medical devices or laboratory instruments.



WARNING: Modification of the pre-installed programs (see section 7.4) may influence the efficiency of the sterilisation/steam disinfection. Perform validation of altered programs before using as standard.

7.5.2 Limit values within mode MEDIACLAVE

Program number	Step in cycle	Range
Programs 1–13	Sterilisation temperature: Sterilisation duration: Dispensing temperature:	70–122°C 1–99 minutes 30–80°C
Program 14 (Without pressure test)	Heat treatment temperature: Heat treatment duration: Dispensing temperature:	70–105°C 1–99 minutes 30–80°C
Program 15 (Chocolate Agar)	Sterilisation temperature: Sterilisation duration: Addition temperature: Boiling temperature: Boiling duration: Dispensing temperature: Dispensing duration:	70–122°C 1–99 minutes 30–80°C 70–122°C 1–99 minutes 30–80°C 30–240 minutes or endless

Table 7.7: MEDIACLAVE limit values

7.5.3 Limit values within mode AUTOCLAVE

Program Number	Step in cycle	Range
Programs 1–15	Sterilisation temperature Sterilisation duration Termination temperature	70–122°C 1–99 minutes 30–80°C

Table 7.8: AUTOCLAVE limit values

7.5.4 Limit values within mode WATERBATH

Program Number	Step in cycle	Range
Programs 1–15	Temperature duration	40–80°C 1–99 minutes

Table 7.9: WATERBATH limit values



7.6 Input / Output connectors

7.6.1 Overview

The MediaClave has three external ports which use 9-pin D-sub miniature connectors. The first serial RS232 port supports devices such as an external PC or the MEDIAJET. The second serial interface is intended for an external printer. (supported from software version 1.9.1) The third port provides status information (safety cover lock, alarms).

Figure 7.1 illustrates the pin numbers for the serial port connector. Table 7.10 details the RS232 serial interface for communication with a PC. Table 7.11 lists the presettings for the RS232 serial interface and table 7.12 details the interface for the external safety cover lock switch and buzzer alarm status.

7.6.2 First serial port RS232

7.6.2.1 RS232 pin numbers and connector allocation

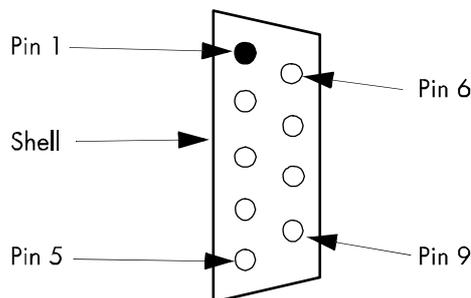


Figure 7.1: Pin numbers for 9-pin D-sub miniature connector - view to socket at rear panel!

Connection	Plug type	Allocation	Meaning	Comment
RS232	9-pin D-sub miniature	Pin 1: n.c. Pin 2: TxD Pin 3: RxD Pin 4: n.c. Pin 5: n.c. Pin 6: n.c. Pin 7: GND Pin 8: n.c. Pin 9: VCC	Not occupied Transmitted data Received data Not occupied Not occupied Not occupied Not occupied Not occupied	Standard interface

Table 7.10: RS232 Serial interface for communication with PC



7.6.2.2 RS232 interface presets

Serial interface	9600 Baud	Standard adjustment
RS232	9600 Baud	1Start - 8Data - NoParity - 1Stop

Table 7.11: RS232 interface presets

7.6.3 Second serial port RS232

7.6.3.1 Pin numbers

Connection	Plug Type	Allocation	Meaning	Comment
RS232	9-pin D-subminiature male	Pin 1: n.c. Pin 2: TxD Pin 3: RxD Pin 4: n.c. Pin 5: GND Pin 6: n.c. Pin 7: n.c. Pin 8: n.c. Pin 9: n.c.	Not Connected Transmitted Data Received Data Not Connected Ground Not Connected Not Connected Not Connected Not Connected	Standard Schnittstelle

Tabelle 7.12: RS232 serial interface for communication with external printer

7.6.3.2 Specifications for an external printer

The serial printer interface is active continually. In contrast to the thermal printer, the external printer interface cannot be switched off. The print-outs are identical.

An external printer must understand the following protocol:

Serial Interface	Speed	Standard settings
RS232	9600 Baud	1Start - 8Daten - NoParity - 1Stop Xon /Xoff

Tabelle 7.13: Pre settings RS232 interface

INTEGRA Biosciences has successfully tested the **TM-U220B** printer from **Epson** together with the MediaClave. The interface for an external printer is active, if additionally to the software version 1.9.1 a special cable (Order number 135245) is installed in the MediaClave. MediaClave instruments which are purchased after January 2006 have this cable built in by default! The **Epson TM-U220B** is a matrix protocol printer.



7.6.4 Interface for external safety cover lock switch and alarm

7.6.4.1 Pin numbers

Connection	Plug type	Allocation	Meaning	Comment
24 V max.	9-pin D-sub minia- ture	Pin 1: S1	Buzzer No. 1	External alarm
		Pin 2: n.c.	Not occupied	
		Pin 3: n.c.	Not occupied	
		Pin 4: n.c.	GND	Battery link cover External alarm
		Pin 5: DG	Ext. safety cover unlock 0 V	
		Pin 6: S2	Buzzer No. 2	
		Pin 7: n.c.	Not occupied	Battery link cover
		Pin 8: n.c.	Not occupied	
		Pin 9: DS	Ext. safety cover unlock 24 V	

Table 7.14: Interface for external safety cover lock and alarm



ATTENTION: The buzzer built-in voltage may amount to 24 V DC. The contact is in an open state of rest and is separated galvanically. (That is, there is no electronic contact between the MediaClave and external power supply. This is realised by relays or opto-electronic parts.) The forced opening cover only operates with a battery and a maximum 24 V DC voltage.



ATTENTION: Never open the vessel lid when operating the instrument.



ATTENTION: The forced opening of the safety cover is not galvanically separated and must only be operated with a battery.



7.7 Progress printouts

7.7.1 Overview

There are two kind of printouts, the test print for test of internal and external printer and the detailed protocol of the single program processes (MEDIACLAVE, AUTOCLAVE, WATER BATH)

7.7.2 Test print

Item printed	Description
Title:	Test print
Time:	Current time (hh:mm)
Date:	Current date (dd.mm.yyyy)
Software version:	Software version and date
Reset Code 1:	E:O, P:6, S:O
Reset Code 2:	H:O, L:O, Y:O

Table 7.15: Test print

7.7.2.1 Test print sample

```

*****
TEST PRINT
*****

RES 2 : H:0, L:0, Y:0
RES 1 : E:0, P:0, S:0
SWV   : 1.8.3
Date  : 15.03.2004
Time  : 12:38

*****
*****
*****
    
```

ENGLISH



7.7.3 Progress print

Item printed	Description
Date:	Date (hh:mm) of the cycle
Start time:	Start time of cycle (hh:mm)
Cycle:	Number of the actual cycle
Program number:	Actual program number (1–15)
Program parameters: <ul style="list-style-type: none"> • Sterilisation temperature • Sterilisation time • Stirrer speed • Cooling temperature • Additions dispensing temperature • Boiling temperature • Boiling time • Cooling 	Actual program parameters
System test: <ul style="list-style-type: none"> • SN • SW • Sensors OK • Vessel lid closed OK • Safety cover closed OK • Cooling system OK • Lack of water check OK • Pressure test OK 	Serial number Software version All sensors are ok Vessel lid is closed Safety cover is closed Cooling system is checked Sufficient coupling medium available Pressure test passed
Program Phases: <ul style="list-style-type: none"> • Heating • Temperature held (WATERBATH) • Sterilisation • Cooling • Addition (MEDIACLAVE program 15 only) • Heating (MEDIACLAVE program 15 only) • Boiling (MEDIACLAVE program 15 only) • Cooling (MEDIACLAVE program 15 only) • Dispensing 	The actual program phases are printed
STEP Button:	When pressing the STEP button, the program is interrupted and the next section of the cycle is performed.
STERILISATION OK Time: 20:00 Min	This message is printed if the medium has been within the sterilisation temperature tolerances the hole sterilisation time.
Cycle end:	Cycle is finished

Table 7.16: Progress print



7.8 MediaClave physical properties

7.8.1 MediaClave data

Height:	437 mm
Depth:	570 mm
Width:	490 mm
Volume:	12 L
Net weight:	49 kg
Water connection:	3/4 inches
Water bath capacity:	5 L
Accuracy of sterilisation temperature displayed:	0.1°C
Sterilisation duration display:	Digital display in increments of 1 minute
Sterilisation / cooling temperature display:	Digital display in increments of 0.1°C
Quality of steel used:	1.4301 / 1.4305
Feed tube dimensions:	Internal diameter: 6 mm Thickness: 2 mm
Product live span:	Max. 10'000 sterilization cycles or max. 10 years

Table 7.17: MediaClave physical properties

7.8.2 Installation data

Water tubing:	1.5 m, 3/4" with standard thread
Maximum pressure of cooling water	4 bar
Water quality (for coupling medium, water bath):	Distilled or deionised water
Cooling water quality:	Water hardness <12 (German) or 20 (French)
Cooling water temperature:	5–25°C (adjust settings for software and hardware)

Table 7.18: MediaClave installation data





8 Manufacturer and Customer Service

8.1 Manufacturer:

INTEGRA Biosciences AG
Tardisstrasse 201
CH-7205 Zizers
Switzerland
www.integra-biosciences.com
info@integra-biosciences.com

8.2 Customer Service:

Please contact your local INTEGRA Biosciences AG distributor. You will find their name and address on our web-site www.integra-biosciences.com.





9 Glossary

ACTIVE CORRECTIVE COOLING	Safety procedure that is activated to cool the product when a target temperature within a program phase is reached prematurely.
ACTUAL TEMPERATURE	The temperature status at a given moment during a program phase.
ALARMED ERROR MESSAGES	Error messages that are accompanied by sound.
AUTOCLAVE	Program suite used for operation of MediaClave as a bench-top autoclave. The user has a choice of 15 possible programs.
CLEANING	Programs associated with the cleaning and emptying of the MediaClave.
COMMUNICATION	Program parameter that specifies the host device address and host port for the MediaClave.
CONTRAST	Program parameter that controls the contrast on the monitor of the GUI.
COUNTDOWN TIMER	Displayed on the GUI, this displays the time remaining for completion of a particular cycle phase.
CUVETTE	Pot in which culture media are prepared when using the MEDIA-CLAVE programs. This also functions as a water bath when using the WATERBATH programs. For operation, the cuvette has to be placed into the vessel.
DEIONIZED WATER	Water free of calcium and magnesium ions
DISTILLED WATER	Water free of calcium and magnesium ions
EDIT MENU	This function is used to modify the parameters of a selected program.
EMPTY LEVEL SENSOR	This device monitors the contents level within the vessel.
FEED INLET	Port on the vessel lid used for introducing additives to the medium (for example, blood for MEDIACLAVE PROGRAM 15).
FORM FEED	Button on MediaClave printer used for scrolling printer paper.
GRAPHIC USER INTERFACE (GUI)	This consists of a graphic display (240 x 64 pixels) and four soft keys below the display.
HEATING WATER	Coupling medium
INFO	Read-only screen detailing serial device number and date. This information is used for servicing purposes only.
INTRA-COOLER	Cooling mechanism used in the MediaClave.
KLIXON (OVERTEMPERATURE SWITCH)	This is a temperature safety device used in temperature control circuit. It is located at the base of the MediaClave.



LANGUAGE MENU	Users may choose one of six languages for navigation through all MEDIACLAVE programs.
MAGNETIC STIRRER BAR	Bar magnet to be entered into the cuvette. Necessary to reach homogeneous temperature.
MAINS VOLTAGES	The network voltage at particular locations that are compatible with the MediaClave.
LIMIT VALUES	The range of parameter values available to users for program cycles.
MANOMETER	Pressure-measuring device for MediaClave vessel.
MEDIA OUTLET	Dispense port with outlet cap.
MEDIACLAVE PROGRAM	Program suite used for the preparation of culture media. The user has a choice of 15 possible programs.
NOMINAL TEMPERATURE	The target temperature to be reached for a particular program cycle.
NON-VOLATILE RAM (NVRAM)	Random access memory that is maintained by an auxiliary power source when power to the MediaClave is switched off.
OPERATING ENVIRONMENT	Recommended conditions (such as temperature and humidity) under which the MediaClave is to be operated and transported.
OVERTEMPERATURE SWITCH (KLIXON)	This is a temperature safety device used in temperature control circuit. It is located at the base of the MediaClave.
PARAMETER MENU	Screen at which users may view or modify 11 instrument parameters for each program cycle.
PASSIVATING PASTE	Cleaning agent containing a mixture of phosphoric and nitric acids, which must be handled with care.
PERISTALTIC PUMP	Device used to dispense product from the MediaClave.
PRESSURE CHECK	External method for calibrating the manometer (performed by an IBS service technician).
PRESSURE TEST	Built in safety function at the begin of a MEDIACLAVE cycle.
PRINT CYCLE	Program parameter that determines the frequency of progress print-outs during a program cycle (10 seconds – 10 minutes range).
PRODUCT SAFETY TEMPERATURE	The product temperature above which cooling is automatically activated and the program cycle is concluded. This is 80°C for the MediaClave.
PROGRAM CYCLE	A description of all program phases during a particular operation.
PROGRAM PHASE	Refers to periods during a program cycle. These include heating-up, sterilising, cooling down, dispensing and so on.
PROPORTIONAL INTEGRAL DIFFERENTIAL (PID)	A control filter that is used to reach a goal set point as quickly as possible without overshoot.
PT100 TEMP. PROBE	Temperature sensor for product.



SAFETY COVER	Hood to protect the operator against access to vessel lid during some process phases. Above 80°C. vessel temperature, it is always closed and locked. Open/Close status is monitored by a safety cover closed sensor.
SAFETY COVER LOCK	Box in which the safety cover sensor is placed in.
SAFETY COVER SENSOR	Magnetic sensor that determines if the safety cover is open or closed.
SAFETY SLITS	These limit the pressure in the vessel to 1.75 bar and are located at the edge of the vessel lid. Covered by support plates.
SAFETY VALVE	This device limits pressure within the vessel to 1.75 bar (+10% tolerance) and is located on the vessel lid.
SERIAL PORT CONNECTORS	Support internal and external devices that require serial data transmission (for example, RS232).
SOFT KEYS	These keys are situated below the GUI and used to select screen options.
SOFT KEYS PROTECTION COVER	Magnetic front cover. Protects the electronics beneath the soft keys from moisture.
START DISPLAY	Screen that appears when the instrument is switched on. This allows the user to select the six main options used by MediaClave (MEDIA-CLAVE, AUTOCLAVE, WATERBATH, CLEANING, LANGUAGE and PARAMETER).
STEP	This program function enables the operator to interrupt a cycle phase manually and proceed to the next phase in the program cycle. This cannot be used during a cooling phase.
STERILISATION TOLERANCE	Specifies the range of temperatures at which the vent valve closes during the sterilisation phase of a program cycle.
STIRRING SPEED	A program parameter specifying the speed at which the product is stirred. Possible values are 1 and 2.
TEMPERATURE CALIBRATION	External method for calibrating the MediaClave (performed by an IBS service technician).
TEST PRINT	A performance test that checks the functionality of the printer.
TYPE PLATE	Located to the rear of the instrument, this specifies compatibility with network voltage and fuse ratings as well as type and serial number.
VESSEL	Container (Pressure vessel) in which the cuvette can be entered
VESSEL LID	Stainless steel lid with ports for filling, dispense, temperature sensor and safety valve. It is connected to the vessel by a bajonet coupling. Open/close status is monitored by a safety cover closed sensor.
WATER BATH	Program suite used for operation of MediaClave as a water bath.
WATER CONTROL	Step in the AUTOCLAVE program to check the heating water level.
VESSEL LID GRIPS WHITE	Located on the MediaClave vessel lid, these are turned anticlockwise to open the vessel lid.

