PEOPLE HAVE PRIORITY

Instruction for use

CE
0051

lisa
fully automatic

UM009ENG LISA FULLY AUTOMATIC 201 10 Rev.2

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1. INTRODUCTION

1.1 SCOPE

The purpose of this user manual is to provide you with information about Lisa 517/522 sterilizers to ensure:

- proper installation and set-up.
- optimal use.
- safe and reliable operation.
- compliance with regular maintenance and servicing requirements.

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1.2 FOREWORD

There are two types of users who may operate the sterilizer and who shall read this manual carefully:

Administrator

The head of the clinic / practice, who is legally responsible for the efficiency of the hygiene protocol in place as well as the sterilization process. He/she is also responsible for the OPERATORS' training and the correct operation and maintenance of the equipment.

Operator

The person(s) who use(s) the sterilizer according to the ADMINISTRATOR'S instructions.

1.3 APPLICABLE EUROPEAN DIRECTIVES/NORMS

Lisa 517/522 sterilizers conform to the following European Directives:

- Medical Device Directive 93/42/CEE for devices class IIb, in accordance with rule 15 - Appendix IX of the above directive.
- Directive 97/23/CEE (Pressure Equipment Directive – PED) for every sterilization chamber designed and manufactured in conformity to Annex I and to the procedure described in form D1 annex III.
- Directive 2002/96/CEE (RAEE) for disposal of parts coming from electrical or electronic parts.
- The sterilizer has been developed, produced and tested in accordance with the European Norm relative to small water steam sterilizers EN13060, and with the applicable safety norms (see Appendix 1).

CE 0497

CE 0051

In the enclosed documents, you will find the Declaration of Conformity and a Warranty Card specific to your sterilizer.

1.4 INTENDED USE

Lisa 517/522 sterilizers are fully automated bench top steam sterilizers that generate steam using electrical heaters.
Lisa 517/522 sterilizers are used for medical purposes, e.g. in general medical practices, dental offices, facilities for personal hygiene and beauty care and veterinary practices. They are also used for materials and equipment that is likely to be exposed to blood or body fluids, e.g. instruments used by beauty therapists, tattooists, body piercers and hairdressers.
The types of loads that can be sterilized with Lisa sterilizers are described in Table 1 of the reference technical norm EN 13060. These loads include solid, porous, hollow loads type A and hollow loads type B, unwrapped, single wrapped and double wrapped.
Lisa sterilizers cannot be used to sterilize liquids or pharmaceutical products.

1.5 SYMBOLS DISPLAYED ON THE STERILIZER

Consult this table whenever one you see one of these symbols in this manual or on the sterilizer.

	ATTENTION **Where this symbol is displayed on the sterilizer, the user must refer to this document. When shown in the user manual this symbol means ATTENTION IMPORTANT NOTES. To disregard the instructions given in this manual, incorrect use, poor maintenance or servicing by unauthorized personnel, clears the manufacturer of any responsibility for warranty and any other claims.**

	HOT SURFACES **This symbol is displayed at the front of the sterilizer beneath the chamber door. It reminds the user to take special care to avoid burns when dealing with the sterilization load, the sterilization chamber, the chamber door and the area around the chamber door.**

	The material the sterilizer is composed of must be disposed according to the directive 2002/96/CEE.

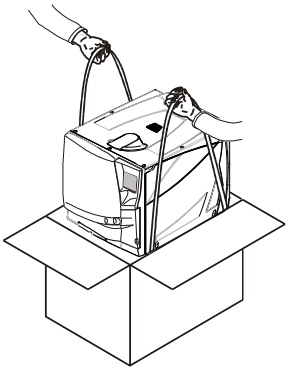
1.6 GENERAL AND SAFETY RECOMMENDATIONS

- The user is responsible for the proper installation, the correct use and maintenance of the sterilizer in accordance with the instructions listed in this manual. For further information call your local service provider.
- The sterilizer has not been designed for the sterilization of liquids.
- The sterilizer must not be used in the presence of gas or explosive vapours.
- The chamber is automatically heating to 120°C as soon as the sterilizer is switched on.
- The trays and the sterilization load will be hot at the end of each cycle. Use tray or cassette holders to empty the sterilization chamber.
- Do not exceed the maximum load weight limits as specified in this manual (see § 7.1)
- Do not remove the name plate or any label from the sterilizer.
- To avoid electrical short circuits, do not pour water or any other liquid over the sterilizer.
- Switch off the sterilizer and unplug the mains cable before inspecting, carrying out maintenance or servicing the sterilizer.
- Repairs, maintenance or service must be carried out by authorized W&H service technicians only with the use of original spare parts.
- In case of transport:
  - Drain both water tanks completely (§ 5.5).
  - Allow the sterilization chamber to cool down.
  - Use original or appropriate packaging.

	Not observing the instructions as specified in this manual can lead to unsafe operation for the user.

2. UNPACKING

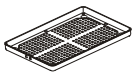
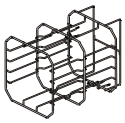
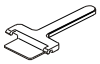
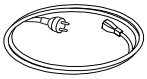
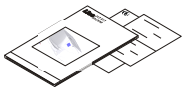
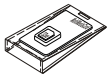
2.1 UNPACKING THE STERILIZER



⚠	If the sterilizer had been kept in a place with temperature and humidity different from the installation location, wait for an appropriate time before installing and switching ON the sterilizer. Sterilizers arriving from cold locations could contain moisture, affecting the electrical parts and it could lead to unsafe operation for the user if switched ON immediately.
⚠	The sterilizer must be removed from the box and transported by two people**.** **Total weight:** **Lisa 517 40 kg** **Lisa 522 50 kg**
NOTE:	Check the external condition of the box and the sterilizer. In case of any damages, immediately contact your dealer or the shipping agent that has carried out the transport.

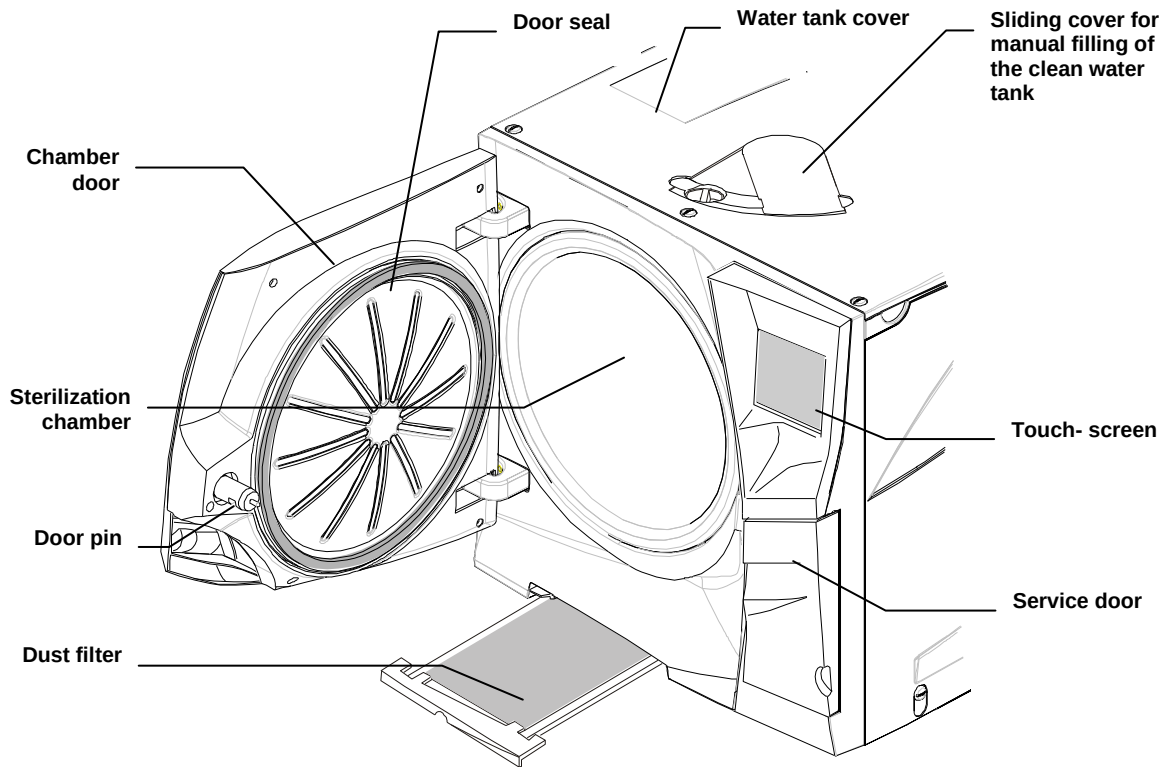
2.2 STANDARD ACCESSORIES

Following accessories are supplied together with the sterilizer:

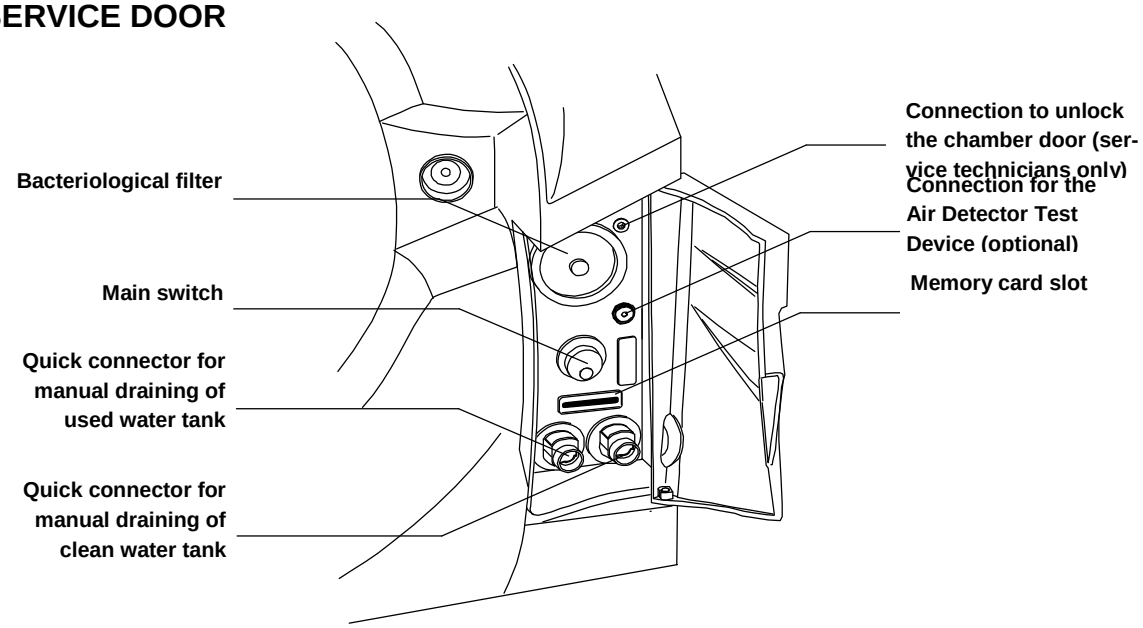
ACCESSORIES PLACED INSIDE THE STERILIZATION CHAMBER			
Accessory		**Description**	**Quantity**
Tray		Perforated anodized aluminum tray	5
Reversible rack		Stainless steel rack to accommodate 5 trays or 3 cassettes. Optional racks available (see Appendix 8). For more information contact your dealer.	1
Tray holder		Tray holder for removing trays from the sterilization chamber.	1
Drain tube		Transparent drain tube with quick connector	1
Mains cable		Length = 2 meters	1
Funnel		Funnel to fill the clean water tank.	1
Wall spacer		Spacer to keep distance between wall and steril.	2
DOCUMENTS PLACED INSIDE THE PACKAGE			
Declaration of conformity CE		Sterilization chamber: CE 0497	1
		Sterilizer: CE 0051	1
User manual		Current user manual	1
Warranty card		Warranty card	1
Works Test Report		Norm EN 13060: small steam sterilizers.	1
ACCESSORIES PLACED INSIDE THE PACKAGE			
Memory card USB reader		External memory card reader	1
Memory card		Reads and saves cycle data	1

3. UNIT DESCRIPTION

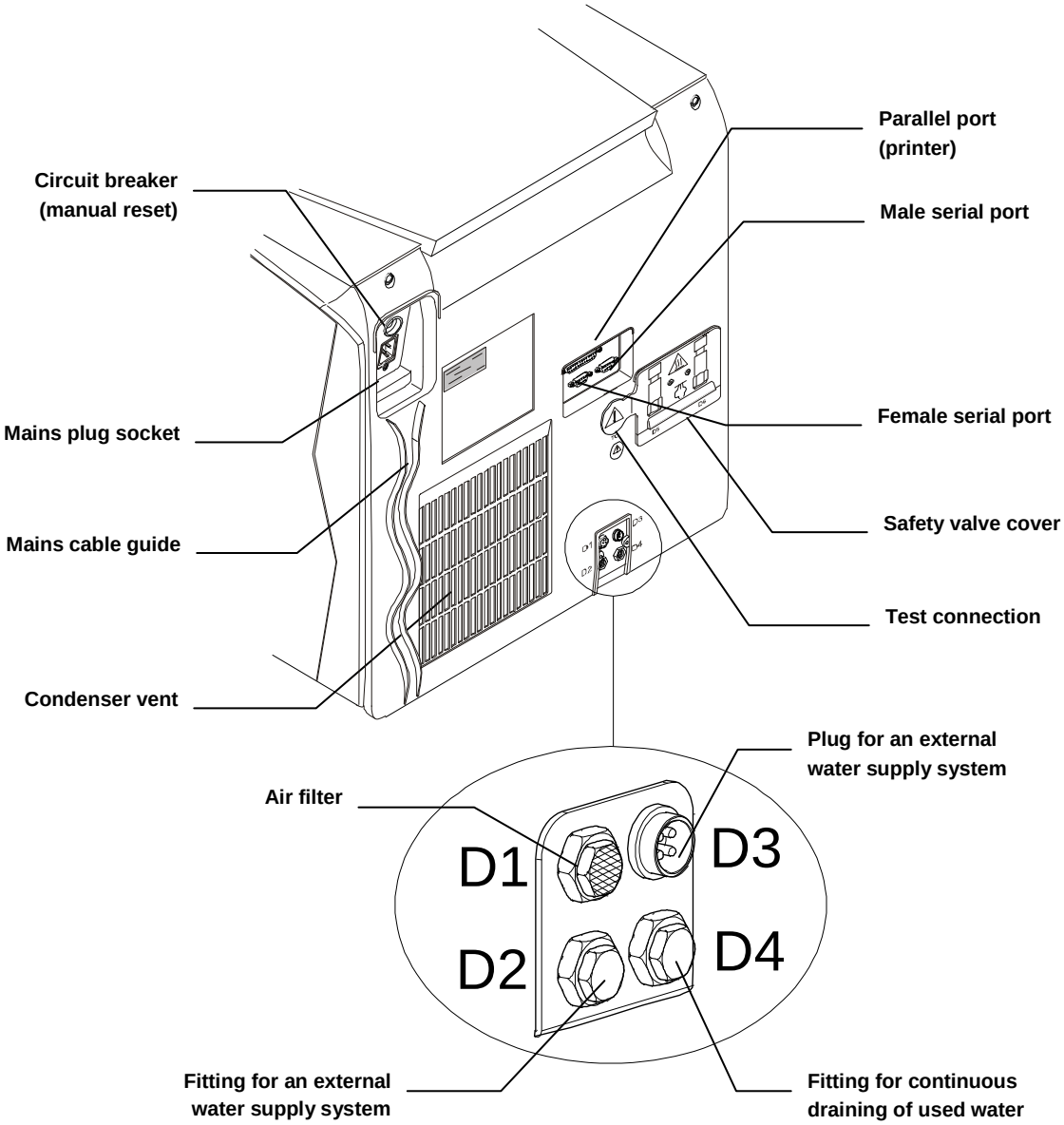
3.1 FRONT VIEW



3.2 SERVICE DOOR



3.3 REAR VIEW


Circuit breaker
(manual reset)
Mains plug socket
Mains cable guide
Condenser vent
Parallel port
(printer)
Male serial port
Female serial port
Safety valve cover
Test connection
Air filter
Plug for an external
water supply system
D1
D2
D3
D4
Fitting for an external
water supply system
Fitting for continuous
draining of used water

3.4 DESCRIPTION OF THE INTERNAL WATER TANKS

The sterilizer is equipped with two independent water tanks, one for clean water and one for used water (capacity of 3.5 litres each).

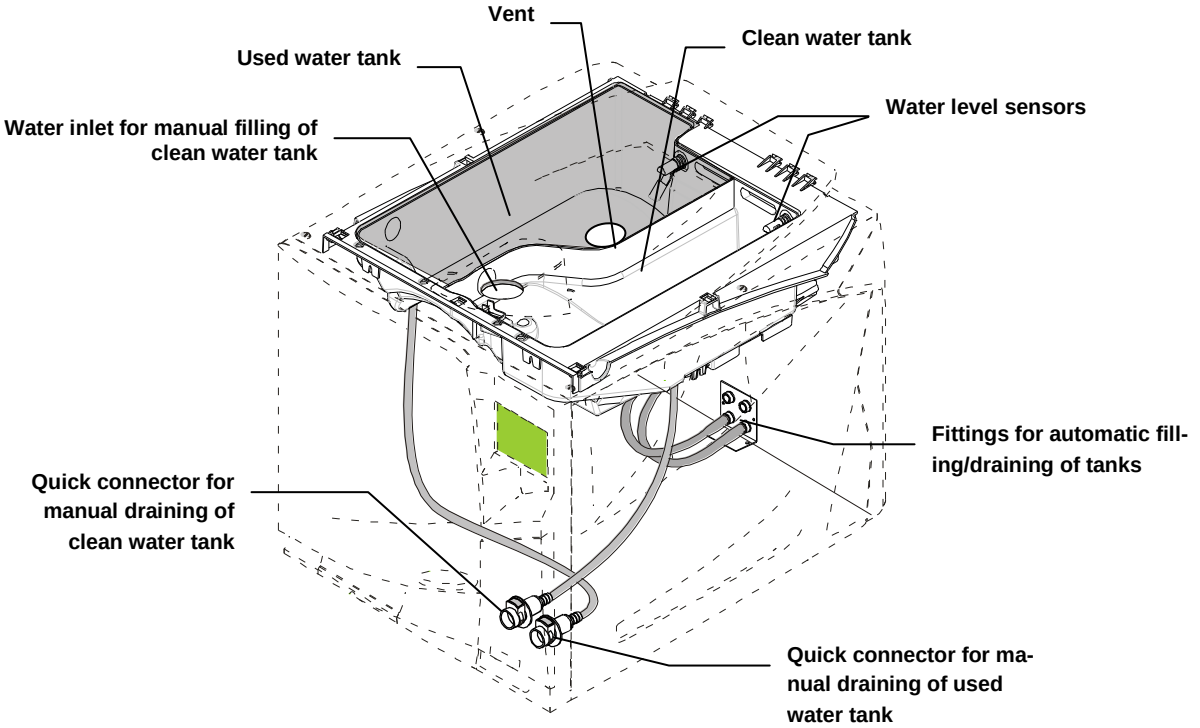
The tank on the right side is called "**clean water tank**" and has to be filled with distilled or demineralized water required for the sterilization process. It is fitted with a minimum (0.6l) and a maximum (3.5l) water level sensor. The tank can be filled manually through the tank hole on the top of the sterilizer or automatically with an external water supply system (*Dem 32* or *Osmo*) connected to point D2 at the back of the sterilizer (see § 4.5.1).

Use the quick connector behind the service door (left/blue) to drain the clean water tank for cleaning purposes (see chapter on maintenance).

The tank on the left side is called "**used water tank**" and contains the used water collected at the end of each sterilization cycle. It is fitted with a maximum water level sensor (3.5l).

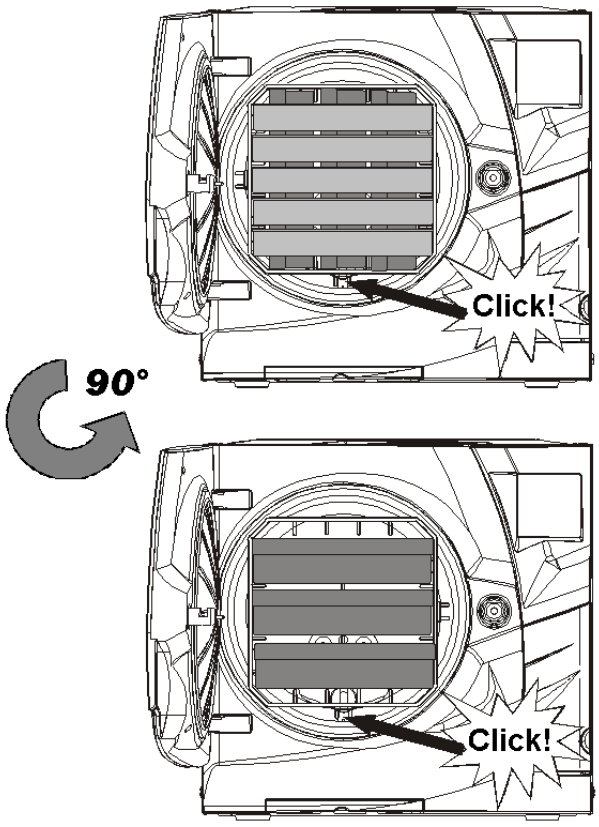
Use the quick connector behind the service door (right/grey) to drain the used water tank (see chapter on maintenance).

The used water tank can also be drained automatically by connecting a drain tube to the D4 fitting located at the back of the sterilizer (see § 4.6).



NOTE:	The water consumption per sterilization cycle varies depending on the type and weight of the sterilization load. The capacity of the clean water tank is sufficient to run 8 - 12 sterilization cycles.

3.5 CHAMBER RACK



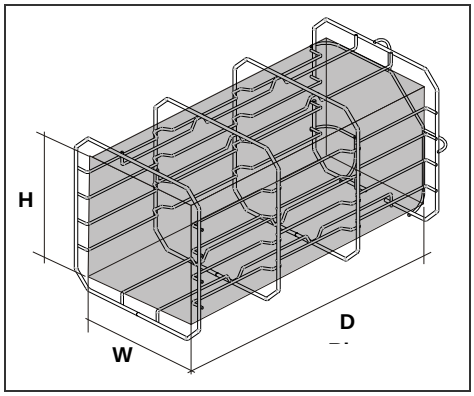
Insert the rack into the sterilization chamber, align it at the center/bottom of the chamber and push it gently into position until it clicks.
The chamber rack is reversible and can be used for:

5 trays horizontally or 3 cassettes vertically;

or, if inserted in a 90° degree rotated position,

3 trays or 3 cassettes horizontally.

3.6 USABLE SPACE IN THE CHAMBER



The chamber usable space is the maximum volume of the chamber for accommodating a sterilization load. This volume is equivalent to a pipe with the following dimensions:

Lisa 517
195 x 195 x 297mm (WxHxD); equal to the volume of 11.5 litres

Lisa 522
195 x 195 x 390mm (WxHxD); equal to the volume of 15 litres

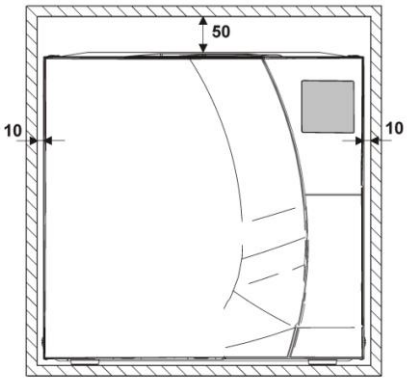
The capacity/volume is identical for all sterilization cycles and types of load.

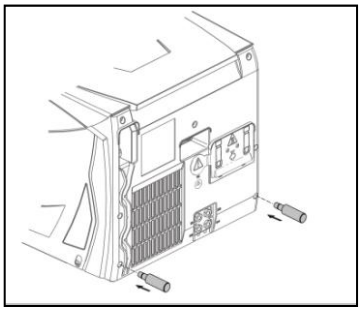
4. INSTALLATION

4.1 SETUP

The sterilizer has been calibrated and intensively tested in the factory prior to shipping. It does not require any calibration during installation.
Observe the following environmental conditions:

Working temperature range: from +5°C to +40°C / relative humidity: 0 - 90%
Storage temperature range: from -20°C to +60°C / relative humidity: 0 - 90% (empty tanks)





Install the sterilizer as outlined below:
Place the sterilizer on a flat and level surface.
Do not place the sterilizer so that it is difficult to open the service door and operate on the controls in it (main switch, microbiological filter, drains)

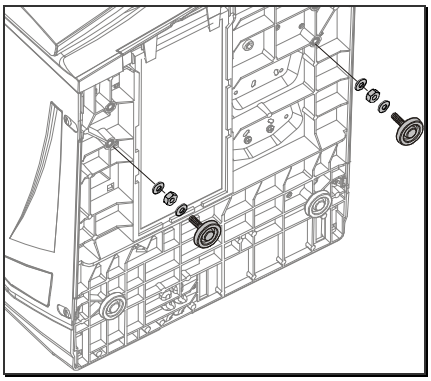
The maximum weight of the sterilizer with a full clean water tank and the chamber fully loaded is:
52 kg (*Lisa 517*)
63 kg (*Lisa 522*)

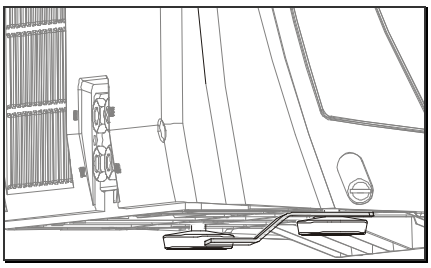
Leave a gap **of 50mm in the back** and 10mm on each side of the sterilizer to ensure adequate ventilation.
Mount the supplied wall spacers at the back of the sterilizer (see image to the right).

Do not place the sterilizer near a sink or in a location where it is likely to be splashed with water - **danger of electric short circuit!**

Install the sterilizer in a well-ventilated room.
Keep the sterilizer away from all sources of heat.

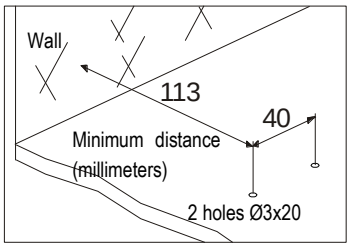
4.1.1 Securing the sterilizer with a safety bracket

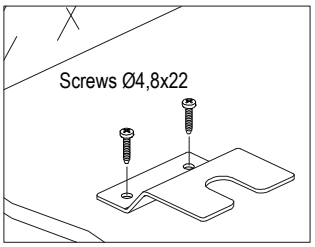




If the bench on which the sterilizer is installed is small, there is a risk of the sterilizer tilting when the chamber door is opened and leaned upon.
Use the safety bracket (optional; see Appendix 9) to avoid tilting.

- Move the two front feet in the rear position.
- Drill two holes on the installation surface and fix the bracket with the supplied screws.

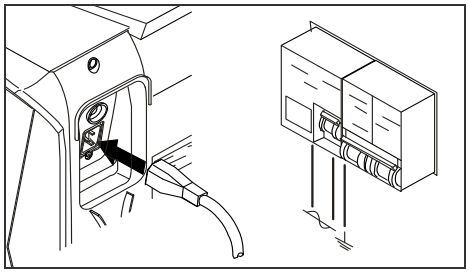




Refer to safety bracket installation procedures for further details.
Position the sterilizer on the bench with one of the rear feet inserted in the safety bracket.

4.2 ELECTRICAL POWER SUPPLY

The electrical power supply of the sterilizer must comply with all applicable standards in the country of use. The following characteristics are required:

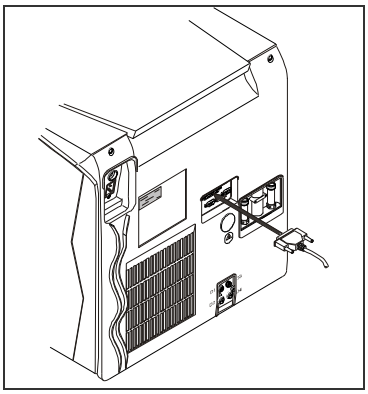


- Single - phase 200 - 240 VAC ±10%, 50/60 Hz, 10 A, on a **dedicated circuit.**
- Installation category / mains overload category = II
- 10 A differential circuit breaker with a sensitivity of 30 mA. The circuit breaker must be a certified type according to applicable norms.
- Maximum power consumption of the sterilizer is 2,000 - 2,400W (10 A)
- A grounded connection is essential.

⚠	**Check that the voltage specified on the name plate located on the backside of the sterilizer corresponds to the supplied mains voltage.** **The overall electrical safety of the sterilizer is guaranteed only if the mains voltage supply is properly grounded according to all applicable norms.** **If unclear, have the electrical installation checked by a qualified electrician.** **Do not plug other equipment into the same socket/circuit**. **Do not bend or twist the mains cable.** **Only use the original mains cable as supplied with the sterilizer.** **Do not use cable extensions.**

4.3 PRINTER (optional)

⚠	**We recommend the use of LisaPrint (conforms to the IEC 61010-1 norm) as it has been tested for compatibility with the sterilizer and its software.** **The use of printers other than the ones listed in the relevant printer setup menu (see 6.1.3) clears the manufacturer of any responsibility for warranty or any other claims.**



- Connect the printer cable to the 25-pin parallel port socket at the back of the sterilizer. Cable length should not exceed 2 meters.
- Connect the printer mains cable.
- Switch ON the printer.
- Select the printer type (§ 6.1.3). LisaPrint is the default setting (Print-p).

All necessary data to document sterilization cycles is automatically printed (for details see Appendix 8).

NOTE:	**Lisa 517/522 sterilizers offer the option to digitally save cycle data on removable memory cards.**

4.4 LISAWARE - CONNECTING THE STERILIZER TO A COMPUTER (optional)

Connect up to four Lisa 517/522 sterilizers to a computer or computer network with *Lisa*Ware, a computer software that allows automatic saving of cycle data on a computer and the remote monitoring of the cycle progress on the computer screen.
Sterilizers can be connected to a computer in two ways, either via a LAN connection using a MOXA ethernet to serial adaptor, or via a serial connection.

4.4.1 LAN connection

⚠	**W&H recommend using the MOXA NPort 5110 which has been tested and is compatible with the Lisa sterilizer and its software.** **The use of other ethernet to serial adaptors removes all responsibility from the manufacturer in regards to the correct functioning of the system, the warranty and any other claims.**

- Your sterilizer features two serial ports in the back: male and female; either port can be used for data transfer. Switch on the sterilizer, access the setup menu, enter the “RSDATA port selection” option and select one of the two available serial ports for data transfer (see 6.1.17).
- Scroll to the “Connection to PC/Log” option in the setup menu and select and confirm “yes” (see 6.1.16).
- Please refer to the MOXA configuration sheet for instructions on how to configure your MOXA NPort 5110 to your network.
- Once you have configured your MOXA, use one of the supplied serial cables (F-F and F-M) to connect the MOXA to the serial port you selected for data transfer.
- Connect the MOXA to the LAN using an ethernet cable (or if connecting directly to the computer use a cross-wire cable).
- Use the supplied cable to connect the MOXA to the mains power supply.

For further information, please refer to the “Connection Lisa to LAN or PC” quick-start guide.

⚠	**W&H does not accept any responsibility should the MOXA interfere with the normal functioning of your network.**

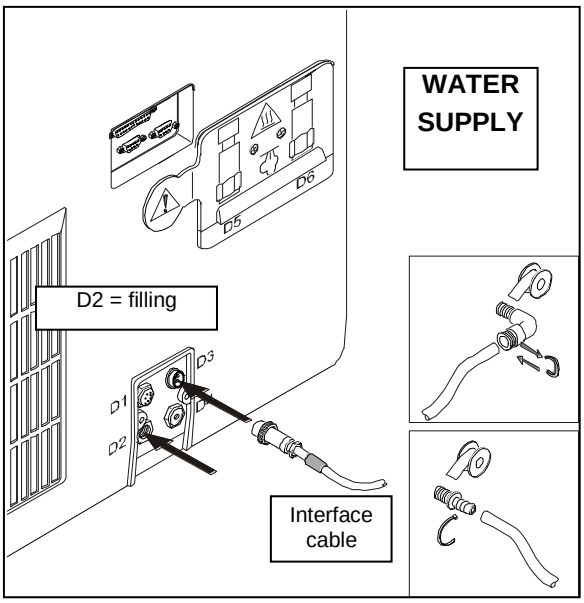
4.4.2 Serial connection

- Your sterilizer features two serial ports in the back: male and female; either port can be used for data transfer. Switch on the sterilizer, access the setup menu, enter the “RSDATA port selection” option and select one of the two available serial ports for data transfer (see 6.1.17).
- Scroll to the “Connection to PC/Log” option in the setup menu and select and confirm “yes” (see 6.1.16).
- Use one of the supplied serial cables (F-F and F-M) to connect the sterilizer (from the selected serial port) directly to the serial port on your computer.

For further information, please refer to the “Connection Lisa to LAN or PC” quick-start guide.

4.5 DEMINERALIZER (optional)

W&H Sterilization offers external water supply systems for automated supply of demineralized water to the sterilizer(s) (*Dem32 or Osmo).*



Once installed, the clean water tank no longer needs to be filled manually but will be filled automatically with demineralized water. The *Dem32/Osmo* features resin cartridges to remove minerals from city water to assure a constant supply of good quality water for the sterilization process.

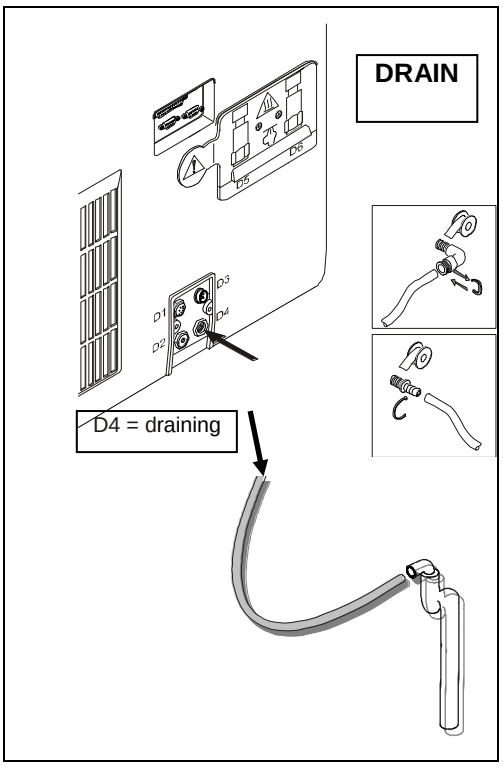
4.5.1 Connecting an external water supply system (demineralizer)

To install a *Dem32/Osmo* water supply system, an interface cable and the fittings D2 and D4 located at the back of the sterilizer are used.

For more information, refer to the *Dem32/Osmo* user manuals.

4.6 CONTINUOUS DRAINING (optional)

4.6.1 Connecting the drain tube



The sterilizer can be connected to a drain (or simply to a sink) for continuous draining of the used water tank.

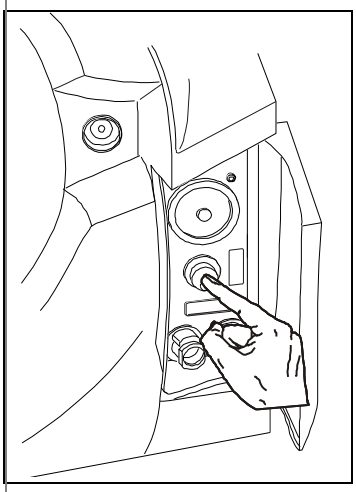
- Unscrew the plug from the D4 fitting at the back of the sterilizer.
- Install the 1/8” barb fitting and the drain tube from the kit and route the tube to a drain or sink (kit ordering number: G0053060). If unclear, have the installation checked by a qualified plumber.

⚠	**The drain tube must not be longer than 5 meters.** **The draining point must be at least 20cm below the surface on which the sterilizer is placed.**

For further information, refer to the *Dem32/Osmo* user manuals.

5. GETTING STARTED

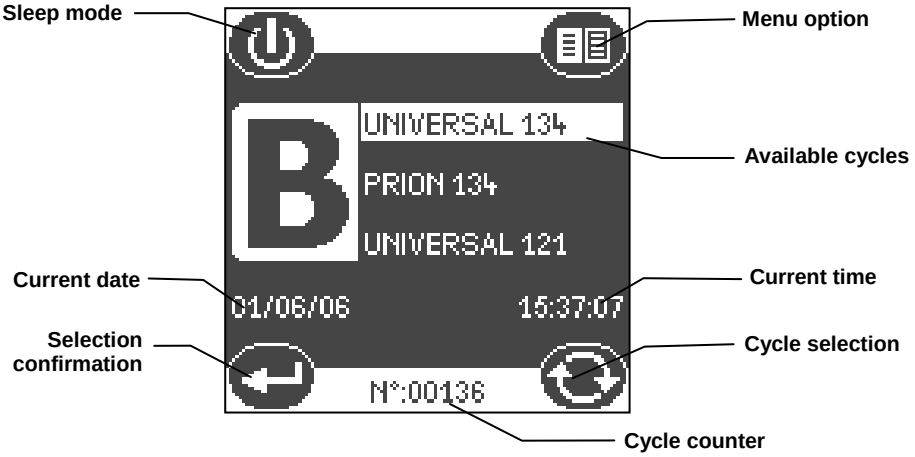
5.1 THE USER INTERFACE



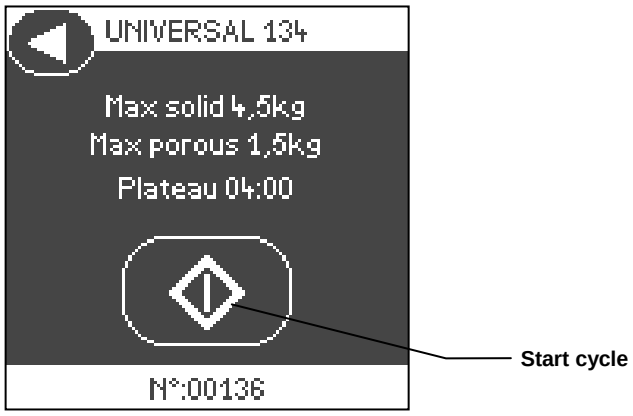
To power the sterilizer press the main switch located behind the service door (see image to the left).

	When the sterilizer is switched ON, the chamber automatically heats to 120°C. **This process (pre-heating) takes approximately 10 minutes.** **If a sterilization cycle is initiated during the pre-heating phase, it will start automatically once the pre-heating temperature is achieved.**

Once the sterilizer is switched on, the following screen appears:



To run a sterilization cycle, place the load in the sterilization chamber and close the chamber door. Select a cycle by pressing the “Cycle selection” icon and confirm the selection by pressing the “Selection confirmation” icon.



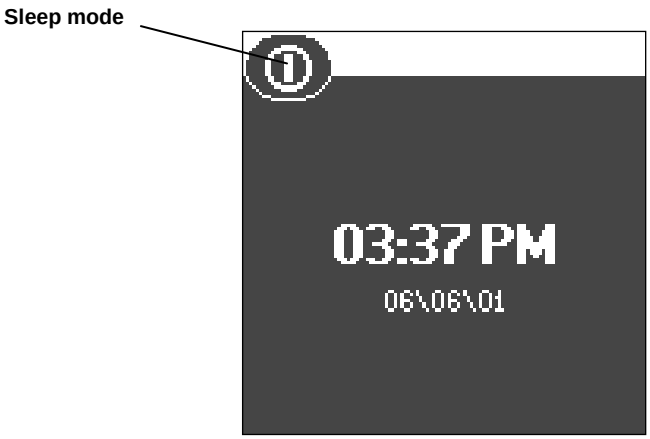
A screen will inform you about the maximum load weight limits for the cycle you selected. Initiate the cycle by pressing the “Start cycle” icon.

5.2 INITIAL WARNINGS AND SLEEP MODE

This message will appear if the sterilizer is switched on and the clean water tank is empty. Fill the clean water tank with distilled or demineralized water (see § 5.4).

NOTE:	**If this message is displayed it is not possible to initiate a sterilization cycle. The message disappears automatically once the clean water tank is filled.**

If the sterilizer is not used for a certain programmable time period, it will automatically switch to “Sleep mode” to conserve energy (programmable time-out; default 1 hour; see § 6.1.2). Press the “Sleep mode” icon to get back to the main menu.



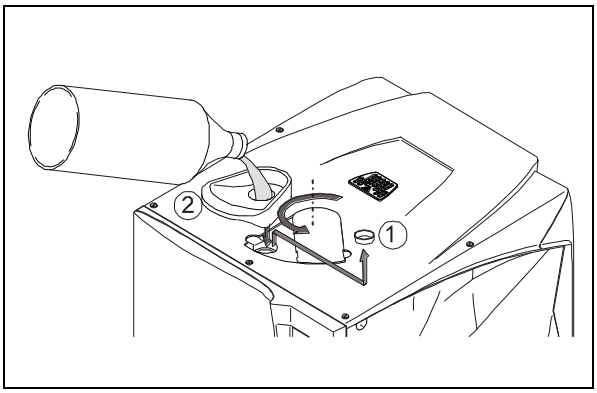
5.3 DATE-CLOCK SETTING

To properly save or print cycle data on a memory card or on a printout, the internal sterilizer time and date has to be set since these parameters are included in the sterilization cycle data report. Please refer to § 6.1.9 for details on how to properly set the sterilizer date and time.

5.4 FILLING THE CLEAN WATER TANK

5.4.1 Manual filling

⚠	**Use only high quality distilled or demineralized water (see Appendix 7)**.



- Slide the tank cover to the right to access the clean water tank inlet.
- Remove the cap (1) from the tank inlet.
- Insert the funnel and fill the clean water tank with app. 3.5 litres of distilled or demineralized water.
- Once the clean water tank is almost full, an audible tone will sound; stop filling.
- Place the cap (1) to close the tank.
- Slide the tank cover back into its original position.
- Drain the used water tank (see § 5.5).

The water level in the clean water tank decreases during every sterilization cycle, while the water level in the used water tank is rising. The sterilizer is equipped with an internal water conductivity sensor that constantly monitors the water quality in regards to mineral content. Should the mineral content go beyond a maximum threshold (conductivity >15µS/cm), a warning message is displayed on the screen.

⚠	**Every time you fill the clean water tank, drain the used water tank (see § 5.5).**

5.4.2 Automated water supply (optional)

If an automated water supply system is connected to the sterilizer (see § 4.5), the clean water tank automatically fills
once the water level drops below the minimum level.
An internal water conductivity sensor constantly monitors the water quality in regards to mineral content. Should the mineral content go beyond a maximum threshold (>15µS/cm conductivity as defined by the European Norm EN 13060), a warning message is displayed on the screen (see screenshot to the left).

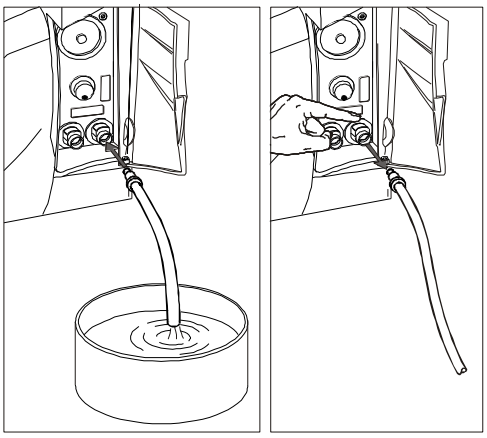
⚠	**Water of low quality with high mineral contents can impair the sterilization process and seriously damage the internal components of the sterilizer. Damages caused by water of poor quality will not be covered by the manufacturer's warranty. Once the non conform water message is displayed, check the water source (refer to the water supply system user manual; replace resin cartridges etc.). In case distilled or demineralized water is purchased, switch to a brand of better quality.**

5.5 DRAINING THE USED WATER TANK

When the waste water in the used water tank reaches the maximum level, the following message is displayed:

The message will disappear once the used water tank got drained. Keep draining the tank until it is completely empty.

5.5.1 Manual draining



- Open the service door at the front of the sterilizer.
- Insert the drain tube into the quick connector for the used water (grey connector / right).
- Drain the used water tank until it is completely empty.
- Press the push-button on top of the quick connector to dislodge the drain tube.

⚠	**Never reuse water from the used water tank!**

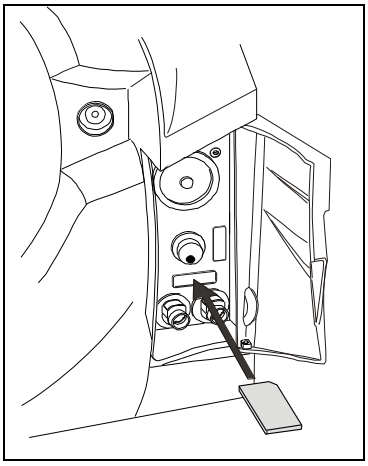
5.5.2 Continuous draining

If the permanent drain tube for automated draining of the used water is mounted, the used water tank gets drained automatically. For more information see § 4.6.

⚠	If the sterilizer is not used for more than 3 days, both water tanks should be completely drained in order to avoid algae growth or any other deposits.

5.6 MEMORY CARD

5.6.1 Inserting / removing the memory card



Lisa 517/522 sterilizers are equipped with a digital cycle data recording system. Cycle data are written and saved on removable/rewritable memory cards.

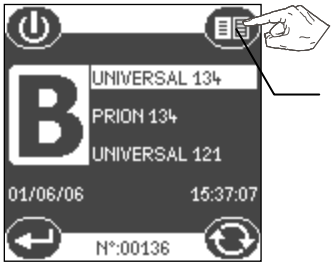
- Insert the memory card into the dedicated slot behind the service door until it clicks into its final position. Ensure that the flat corner of the card points to the top/right (see image to the right).
- Periodically remove the memory card to download cycle data to a computer.
- To remove the memory card, slighty push it in and pull it out gently.

For further instructions on the use of the memory card, see §12.

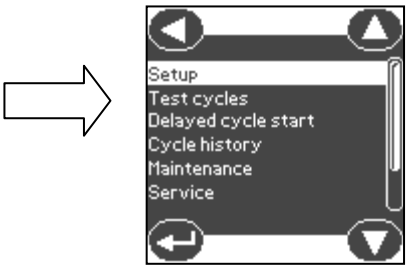
6. PROGRAMMING

Lisa 517/522 sterilizers allow the user to program a number of different features. The following section shows step by step how each of these features can be programmed.

Press the menu icon to view the list of available options.



The available menu options are shown below:

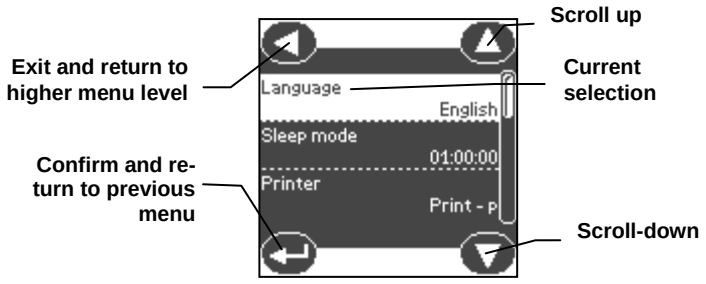


6.1 SETUP MENU

The **Setup menu** permits to set the following options:

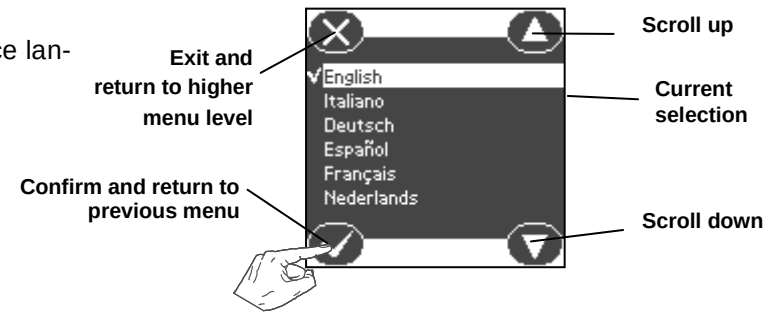
§ 6.1.1 – Language
§ 6.1.2 – Sleep mode
§ 6.1.3 – Printer
§ 6.1.4 – Label printer *
§ 6.1.5 – Automatic printing *
§ 6.1.6 – Manual printing *
§ 6.1.7 – Storage time *
§ 6.1.8 – User name
§ 6.1.9 – Date-Clock setting
§ 6.1.10 – Date format
§ 6.1.11 – Clock format
§ 6.1.12 – Display contrast
§ 6.1.13 – Display backlight
§ 6.1.14 – Acoustic tones
§ 6.1.15 – Night cycle shortcut
§ 6.1.16 – Connection to PC/Log
§ 6.1.17 – RSDATA port selection

* The sub-menus related to label printing are only available when the label printer *Lisa*Safe is connected.



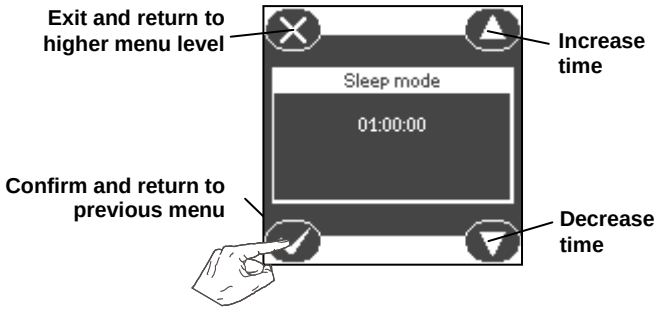
6.1.1 Language

Use this menu to select the user interface language.



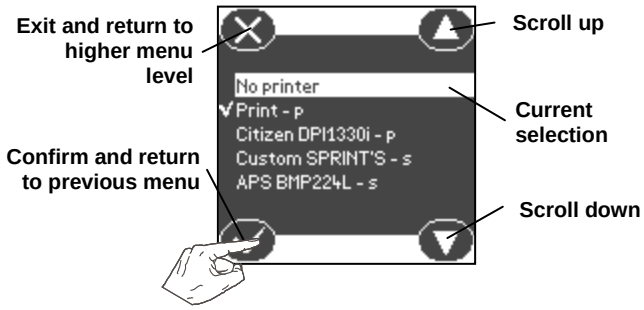
6.1.2 Sleep mode

In “Sleep mode” the sterilizer reduces the power consumption to a minimum. The sterilizer will switch to sleep mode whenever it is idling without being used. Use this menu to program the time before the sterilizer automatically switches to sleep mode.
The time range is from 0 (never in sleep mode) to 8 hours. The factory setting is 1 hour.The time can be set in fixed increments of 10 minutes.



6.1.3 Printer

Use this menu if you want to connect a printer for cycle data recording. Select the printer by using the scroll icons, press “Confirm” to save the configuration. For more information on connecting a printer to your sterilizer, see § 4.3.



6.1.4 Label printer (available only when a *Lisa*Safe label printer is connected)

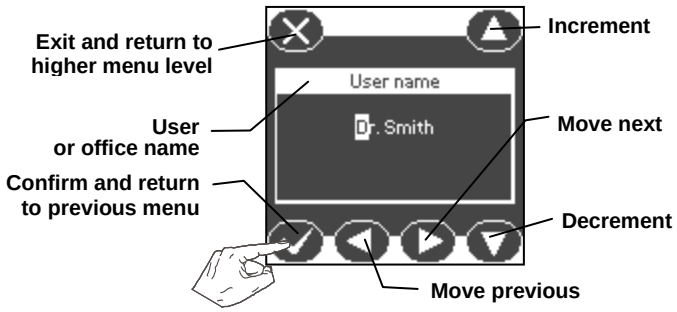
6.1.5 Automatic printing (available only when a *Lisa*Safe label printer is connected)

6.1.6 Manual printing (available only when a *Lisa*Safe label printer is connected)

6.1.7 Storage time/weeks (available only when a *Lisa*Safe label printer is connected)

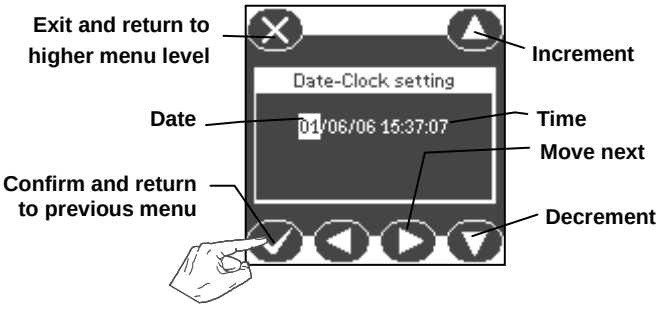
6.1.8 User name

Use this menu to program the user or the office name. The name will be included in the cycle data report. Select a character by pressing the ”Increment” or “Decrement” icons. Press the “Move next” icon to move to the next position. When the setting is completed, press the “Confirm” icon.



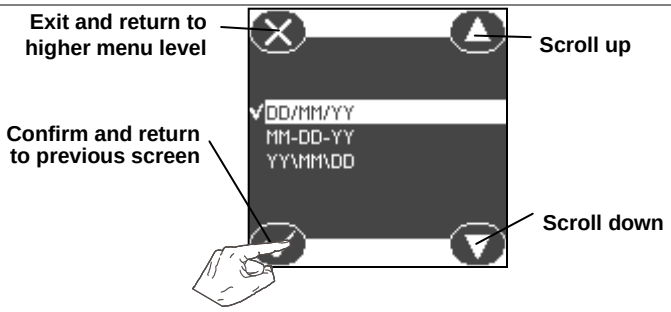
6.1.9 Date-Clock setting

Use this menu to set the internal time and date of the sterilizer. It is important to set these parameters as they are included in the cycle data report.
Select a character by pressing the ”Increment” or “Decrement” icons. Press the “Move next” icon to go to the next position. When the setting is completed, press the “Confirm” icon.



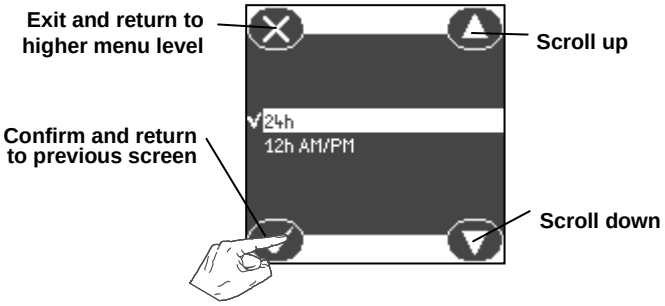
6.1.10 Date format

Use this menu to change the date format. Press the “Scroll up” and “Scroll down” icons to select the format. Press the “Confirm” icon to save the selection.



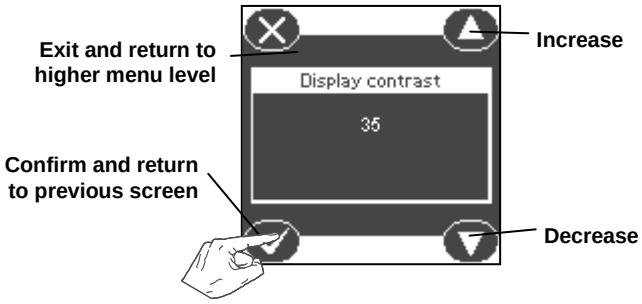
6.1.11 Clock format

Use this menu to change the clock format. Press the “Scroll up” and “Scroll down” icons to select the format. Press the “Confirm” icon to save the selection.



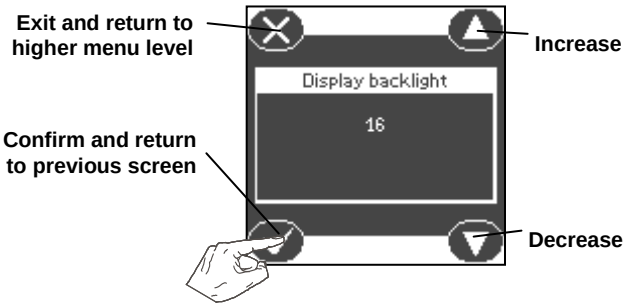
6.1.12 Display contrast

Use this menu to change the screen contrast for a better visualization in regards to the surrounding environment. Press the “Increase contrast” and “Decrease contrast” icons to adjust the contrast. Press the “Confirm” icon to save the selection.



6.1.13 Display backlight

Use this menu to adjust the screen backlight. Press the “Increment” and “Decrement” icons to change the setting. Press the “Confirm” icon to save the selection.

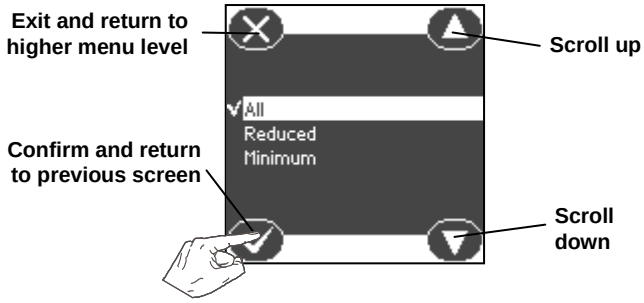


6.1.14 Acoustic tones

Use this menu to set the amount of audible tones the sterilizer is generating for various procedures:

- “All”: All actions come with audible tones.
- “Reduced”: Most actions come with audible tones.
- “Minimum”: Only critical actions come with audible tones (e.g., alarms, end of cycle, etc.).

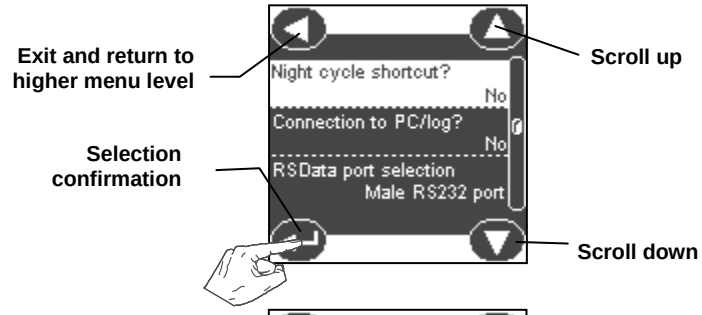
Press the “Scroll up” and “Scroll down” icons to select the setting. Press the “Confirm“ icon to save the setting.



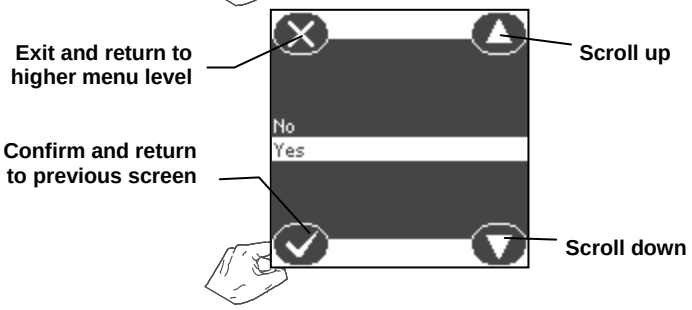
6.1.15 Night cycle shortcut

If you frequently use the delayed cycle start option (see § 6.2) you can activate an icon on the main screen (cycle selection screen) that will serve as a shortcut to the delayed cycle start submenu.

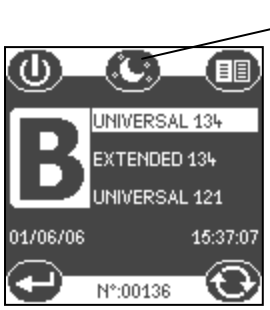
Select the “Night cycle shortcut” option by pressing ”Scroll up” and “Scroll down”. Press “Confirm” to enter the option.



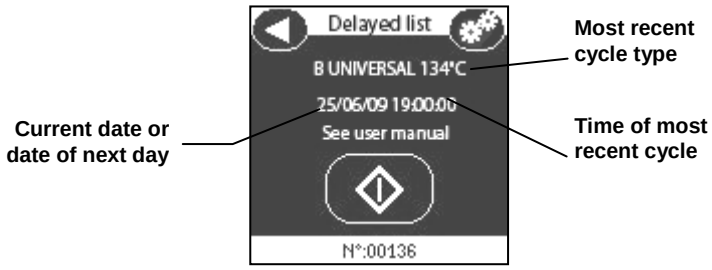
Select “Yes” using “Scroll up” and “Scroll down” and press “Confirm” to save the setting.



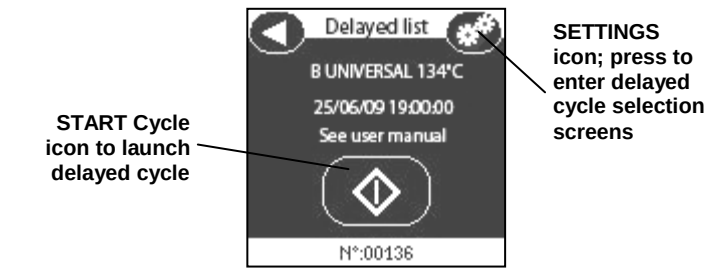
Once you have selected the shortcut option, a shortcut icon will appear on the main screen (cycle selection screen; see picture to the right).
Note: The shortcut icon will only appear if you have used the delayed cycle start function at least once in the past.



Whenever you wish to use the delayed cycle start function, press the shortcut to night cycle icon. You will access a screen showing your most recent settings for delayed cycle start cycle type and time/date.
Note: The suggested date will be set by default to either the current day or the next day, depending on your past programming pattern.



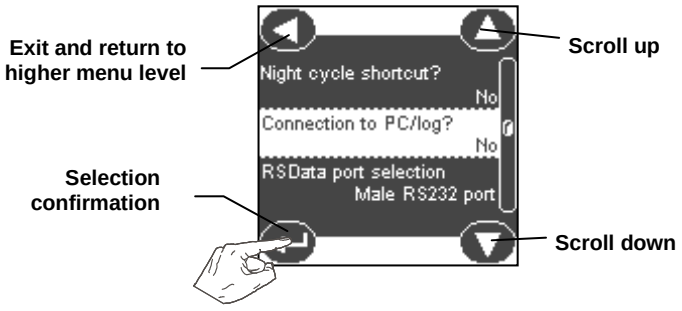
If you wish to modify any of the default settings, press the “Settings” icon. This will send you to the delayed cycle selection screens. Please refer to § 6.2 for further information.
To launch the delayed cycle, press the “start cycle” icon.



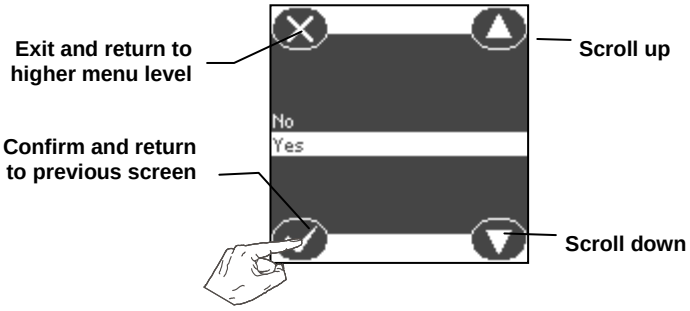
6.1.16 Connection to PC/Log

Use this menu if you want your sterilizer to communicate with a computer in conjunction with the LisaWare software package. For further details please see § 4.4.

Select the “Connection to PC/Log?” option by pressing the “Scroll up” and “Scroll down” icons. Press “Confirm” to enter the option.



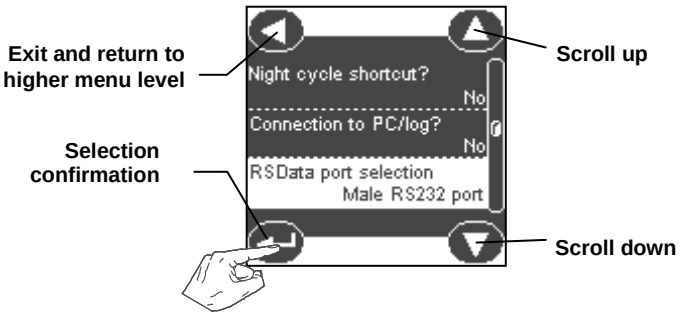
Select “Yes” using the “Scroll up” and “Scroll down” icons and press the “Confirm” icon to save the setting.



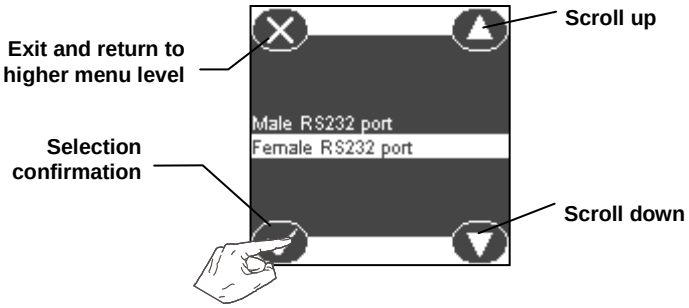
6.1.17 RSDATA port selection

Use this menu to allocate one of the rear serial ports for data transfer to your computer in conjunction with the *Lisa*Ware software package (see § 4.4).

Select the “RSDATA port selection” option by pressing the “Scroll up” and “Scroll down” icons. Press the “Selection confirmation” icon to enter the option.

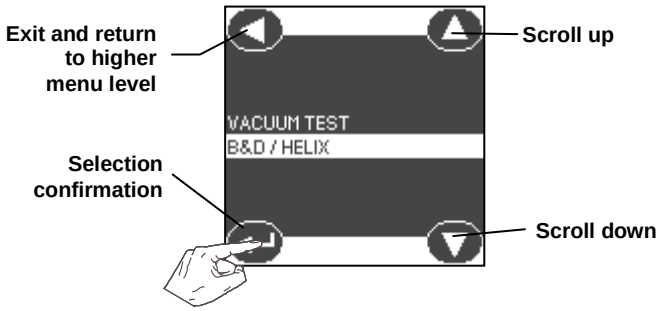


There are two serial ports for data transfer fitted in the back of the sterilizer. Looking at the sterilizer from the back, the serial port on the right side is of a female type (RS232), whereas the port on the left is of a male type (RS232). Any of the two ports can be used for data transfer; the LisaWare package includes both male and female cables. Select the serial port you wish to allocate for data transfer using the “Scroll up” and “Scroll down” icons and press the “Confirm” icon to save the setting.



6.2 TEST CYCLES

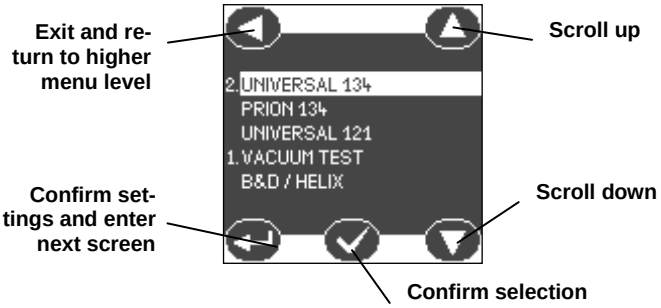
Use this menu to run a variety of test cycles that might be mandatory in your country. Press the "Menu" icon on the main screen and select "Test cycles" from the menu (see § 6).
Select the Test cycle by pressing the ”Scroll up” and “Scroll down” icons and initiate the cycle by pressing the "Selection confirmation" icon. For more information on test cycles see appendices 3-5.



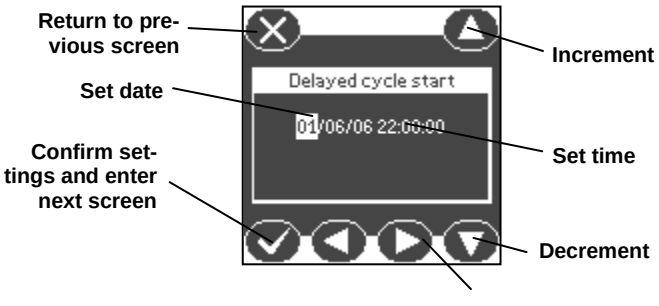
6.3 DELAYED CYCLE START

Use this menu to delay the start of one or up to three consecutive cycles (e.g., if you want to load the sterilizer in the evening and run a Vacuum Test followed by Bowie and Dick Test or a standard sterilization cycle early the next morning before office hours). It is possible to set both the date and the time in which the selected cycle(s) will start. Place the test or sterilization load in the chamber, close the chamber door, press the "Menu" icon on the main screen and select "Delayed cycle start" from the menu. If this option is frequently used, there is the possibility to add a shortcut icon on the main screen (cycle selection screen; see § 6.1.15).

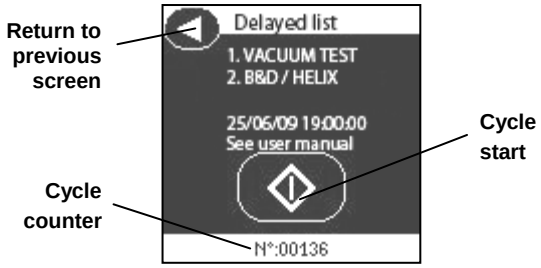
Once you entered the “Delayed cycle start” option, you will see a list of all available sterilization and test cycles. Select the cycle(s) you want to start delayed by pressing the “Scroll up” and “Scroll down” icons; use the “confirm selection” icon to select, de-select and sort the cycles of your choice.
Once set correctly, press the “confirm settings” icon to go to the next screen.



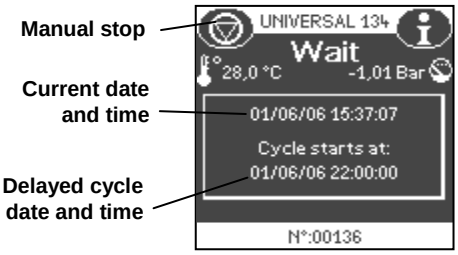
Set the date and time of the delayed cycle start by pressing the “Increment” or “Decrement” icons. Press the “Move next” icon to go to the next character. When the setting is completed, press the “Confirm” icon to go to the next screen.



On this screen the selected cycle(s) is/are shown. Press the "Cycle start" icon to launch the delayed cycle.

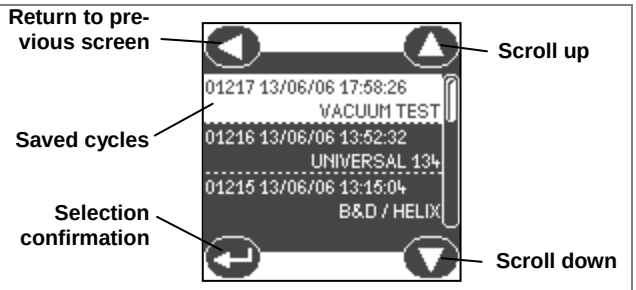


The current and the set delayed date and time appear on the screen indicating when the delayed cycle(s) will start.

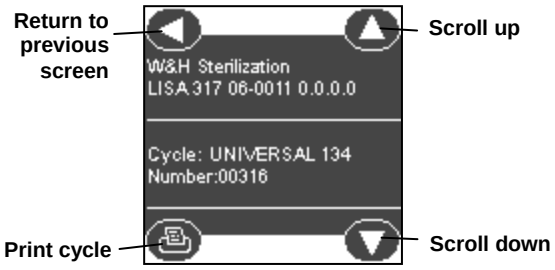


6.4 CYCLE HISTORY

Use this menu to view cycle data of the most recent 30 sterilization and/or test cycles. Cycle data is recorded on the main CPU board on a “first in – first out” basis.
Press the “Menu” icon on the main screen and select “Cycle history” from the menu (see § 6).



Use the “Scroll up” and ”Scroll down” icons to select a cycle you want to view. Press “Confirm” to view further details of the selected cycle:



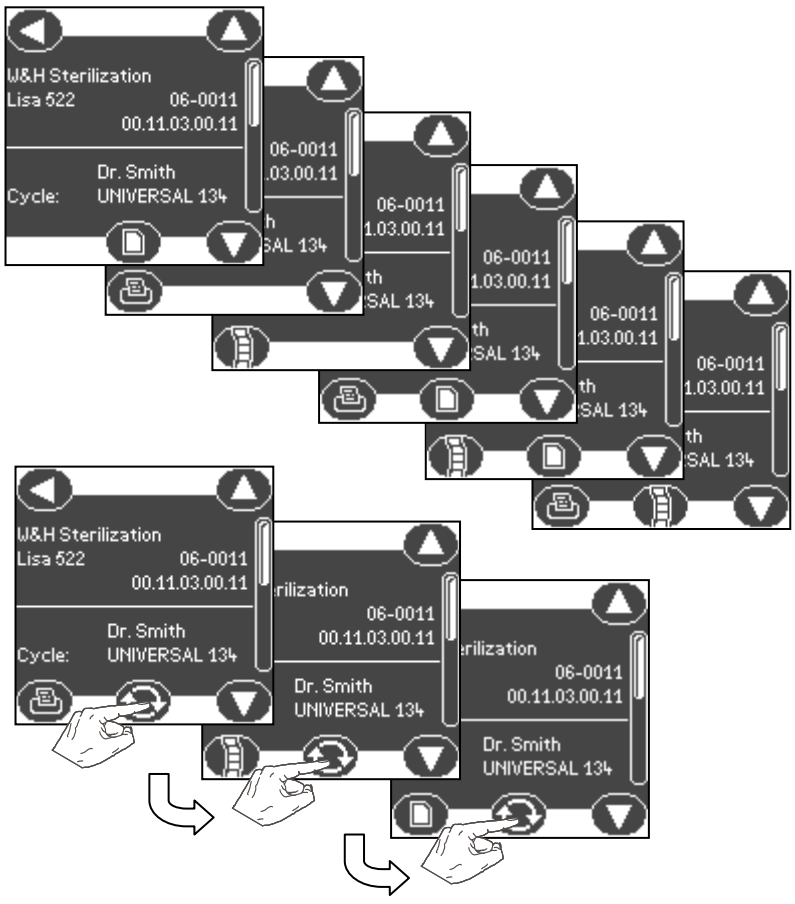
It is possible to print or save this data by selecting the appropriate icons:

prints the cycle report (only if a printer is connected to the sterilizer; see § 4.3 and 6.1.3)

saves the cycle report on the memory card

prints cycle labels (only if a *Lisa*Safe label printer is connected to the sterilizer; see § 6.1.4)

If you have several accessories connected to your sterilizer, more icons will be available (see aside).



If more than two options are active, a selection key appears to allow you to select the desired icon and action.

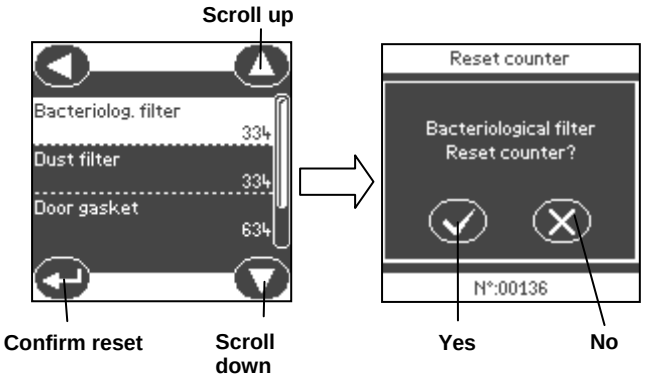
6.5 MAINTENANCE

Certain consumables have to be replaced periodically to guarantee a faultless operation of the sterilizer. Display messages will inform you whenever it is time to replace one of those components (see § 8).
Press the "Menu" icon on the main screen and select "Maintenance" from the submenu (see § 6). Use this menu to view the number of cycles remaining before it is time to replace the:

- bacteriological filter (every 400 cycles)
- dust filter (every 400 cycles)
- door seal (every 800 cycles)
- or perform a general service by a qualified technician (every 4000 cycles)

The 4 counters decrease in value after each cycle. When one of the counters reaches 0, the corresponding message appears on the touch-screen (see § 8).
In case a consumable gets replaced before the respective counter has reached 0, the counter has to be reset manually:

- Select the counter you wish to reset by pressing the ”Scroll up” and “Scroll down” icons.
- Reset the counter by pressing the “Confirm reset” icon.
- Confirm by selecting "Yes" or "No" from the maintenance screen shown aside.



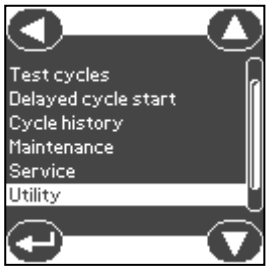
To guarantee an efficient sterilization process and the correct functioning of the sterilizer, we strongly recommend to follow the maintenance program (see § 11.1).

6.6 SERVICE

This menu is used for service and diagnostic operations. It can be accessed by authorized service technicians only.

6.7 UTILITY

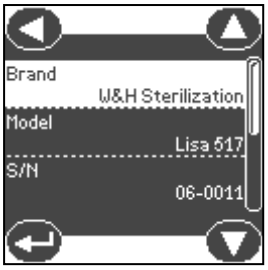
Use this menu to view the sterilizer system information and to format the memory card. Press the “Menu” icon on the main screen and select “Utility” from the menu (see § 6).



6.7.1 System info

Use this menu to view the sterilizer system information.

- Model
- Serial Number
- Firmware revision
- Loader revision
- Power FW revision



6.7.2 Formatting the memory card

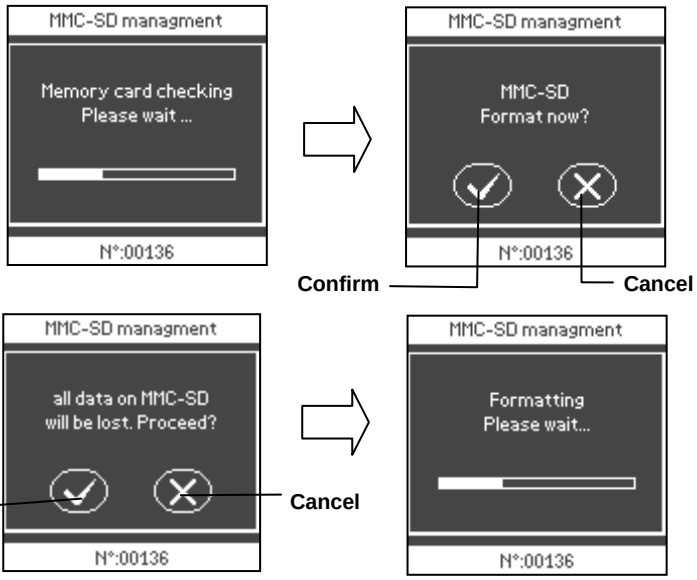
Use this menu to format your memory card in case you want to erase all the data on the card. Press the “Menu” icon on the main screen and select “Utility” from the menu (see § 6). Press “Format MMC” to initiate the formatting.

The system first verifies the card.

Next you will see this screen asking if you want to format the card. Press "Confirm" to proceed with the formatting or "Cancel" to exit the formatting menu.

If you confirm to proceed with formatting, all data will be lost on the card. Press “Cancel” to exit the formatting menu.

Once the formatting is completed, the card is ready to be used



6.8 USER AUTHENTICATION

W&H Lisa 517/522 sterilizers, in combination with the optional LisaSafe package for label printing, provide an ultra-safe traceability concept in an extremely user-friendly way.

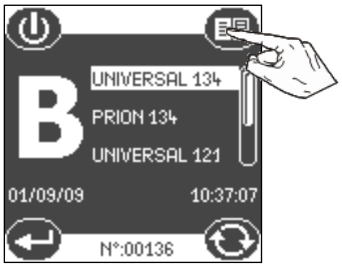
They provide the following options, all separately selectable:

- Management of multiple users by the Administrator (dentist)
- Identification via user name and saving of the user who has started the cycle
- Password-protected cycle start once the user has been identified
- Identification via user name and saving of the user who has released the load
- Password-protected load release once the user has been identified
- Printing of bar-code labels containing the name of the user who has released the load
- Inhibition of label printing if the cycle has not completed successfully (alarm, cycle interruption etc.) so as to avoid all human error
- Easy management and access to all traceability options directly from the sterilizer touch-screen.

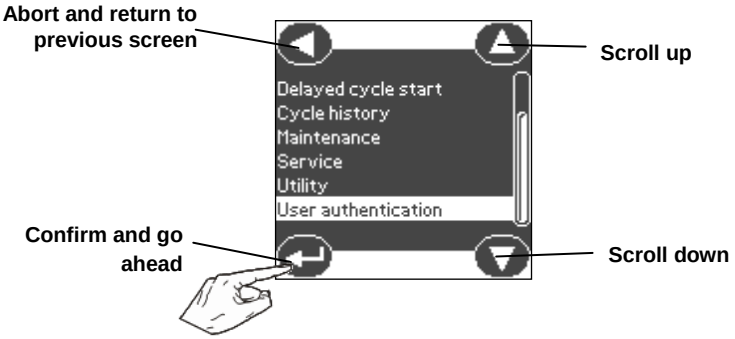
6.9 FUNCTIONS AVAILABLE FOR THE ADMINISTRATOR

6.9.1 Access the administrator functions

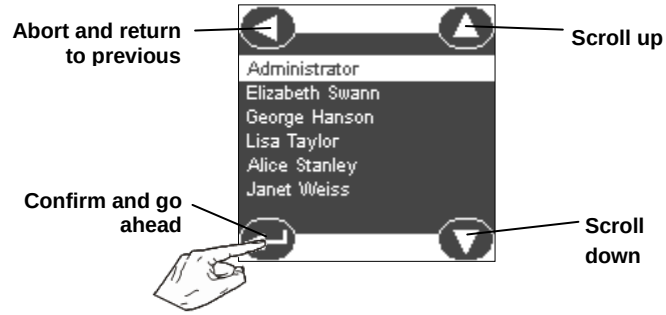
To access the ADMINISTRATOR functions:
1) Press the “Menu” icon on the main screen that appears when the unit is switched ON.



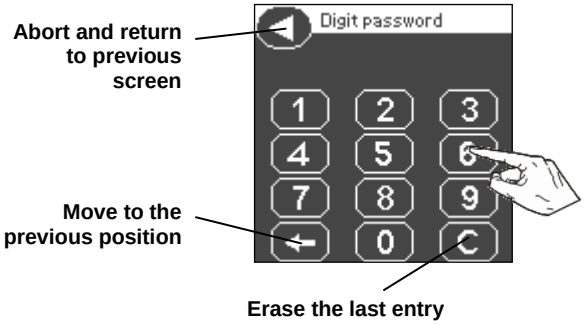
2) Scroll the options until the “User authentication" option is highlighted and confirm.



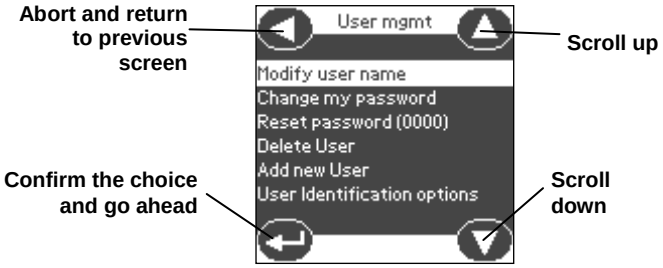
3) A list of users will be displayed: scroll the list until the ADMINISTRATOR is highlighted and confirm.



4) Enter the secret password to gain access to the ADMINISTRATOR functions.
(The default password for the Administrator (and for any new user) is 0000.)

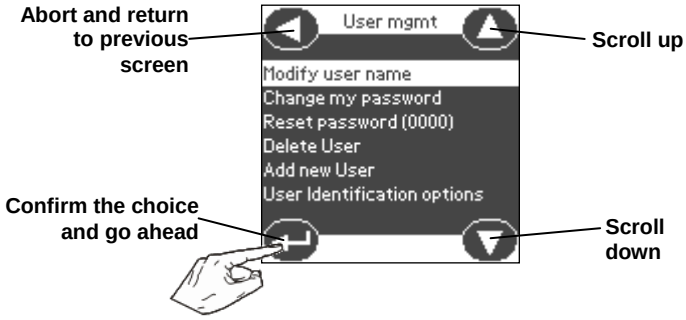


5) Select the desired option using the scroll buttons and confirm your selection:
You can choose the following options:
1) Modify a user name
2) Change my password
3) Reset a user's passwords to the default value (0000)
4) Delete a user
5) Add a new user
6) Define the user identification options

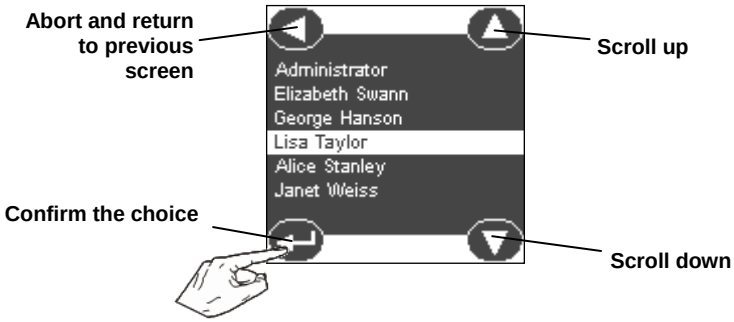


6.9.2 Modifying a user name

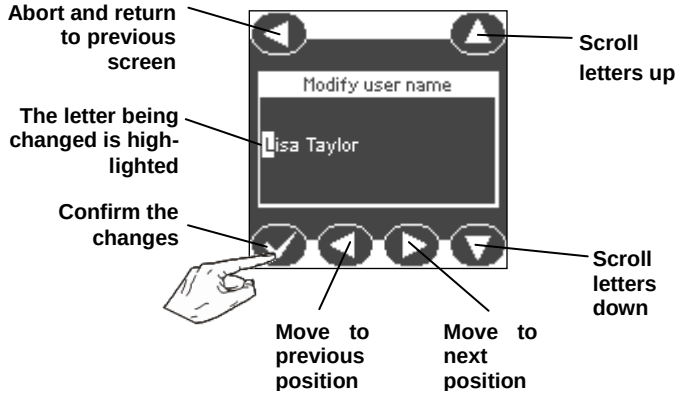
1) Scroll the menu options and select the "Modify user name" option.



2) Select the name of the user to be modified and confirm.



3) Select the letter(s) to be modified using the PREVIOUS and NEXT position buttons. Use the SCROLL UP and SCROLL DOWN buttons to select the correct letter.
Once finished, confirm the changes: this will save the changes and exit the menu.

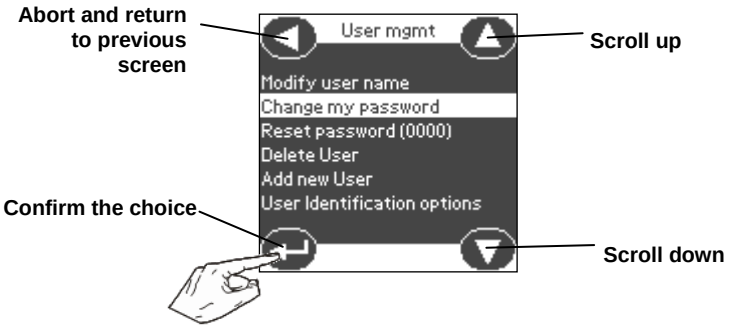


6.9.3 Changing the administrator's password

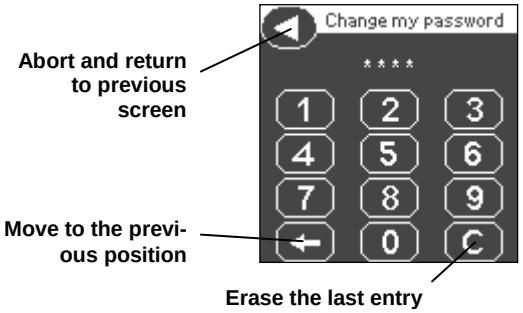
The default password for the Administrator (and for any new user) is 0000.

To change the Administrator's password proceed as follows:

1) Scroll through the menu options and select the "Change my password" option and confirm.



2) Enter the new four-digit password.

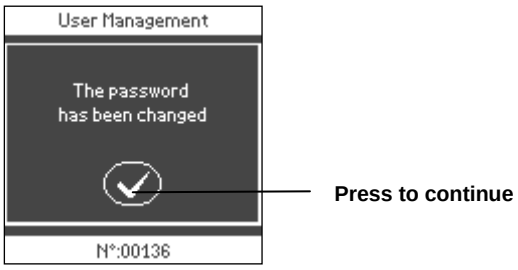


WARNING!

The password is saved as soon as the fourth digit has been entered.

If you are unsure of the sequence you have entered, DO NOT EXIT THE FUNCTION and repeat the procedure.

3) Press the confirmation button to save and exit the function.

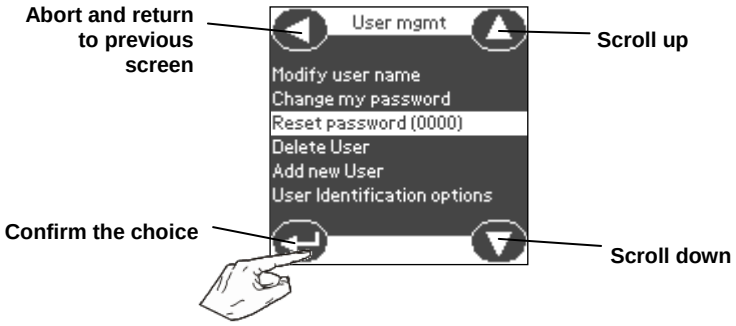


6.9.4 Resetting a user's password to the default value (0000)

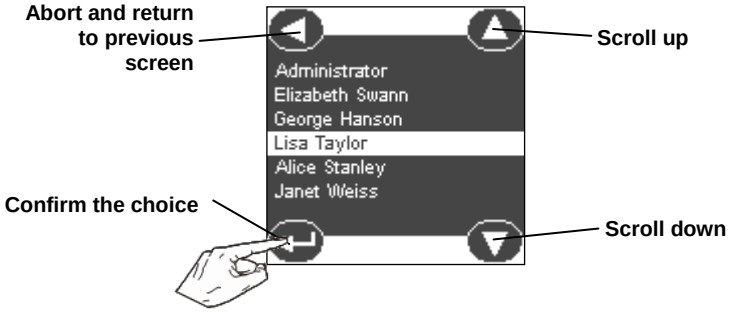
Use this function if a user has lost or forgotten his/her own password: it can be reset to "0000" so that the user can then enter with "0000" and save a new valid password.

To reset a user's password proceed as follows:

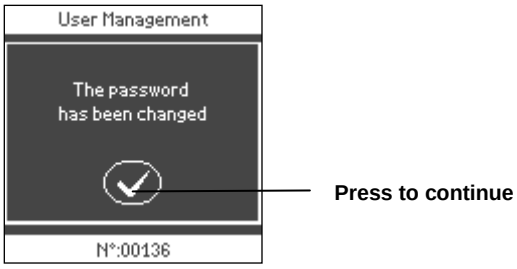
1) Scroll through the menu and select the "Reset password (0000)" option and confirm.



2) Select the name of the user who needs a new password and confirm.



3) The old password has been deleted and the new password is "0000". Press the confirmation button to exit the sub-menu.

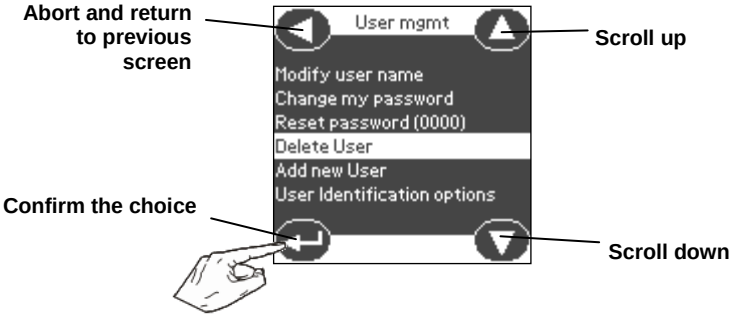


NOTE	**The user is now able to set a new password. See section 6.10**

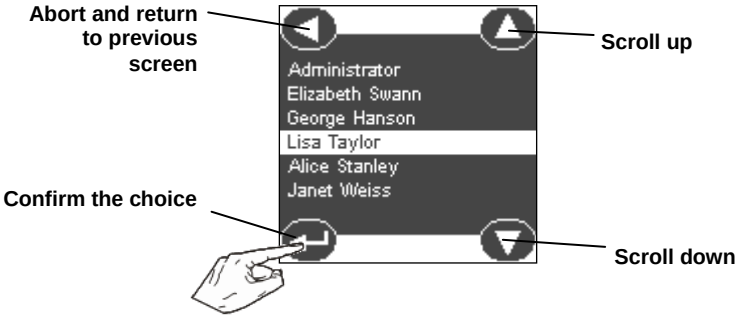
6.9.5 Deleting a user

To delete the name of a user who no longer uses the sterilizer, proceed as follows:

1) Scroll through the menu options and select the “Delete user” option.



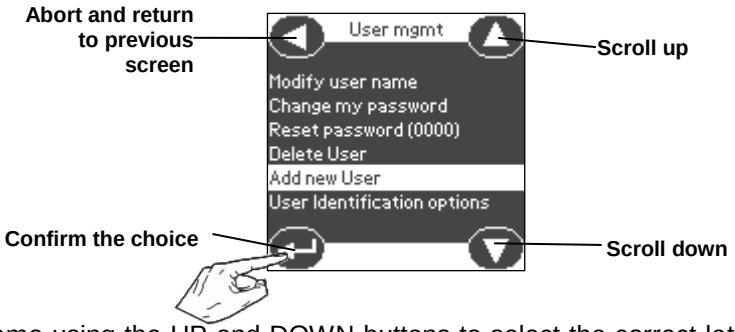
2) Select the user to be deleted and confirm



3) Confirm the operation

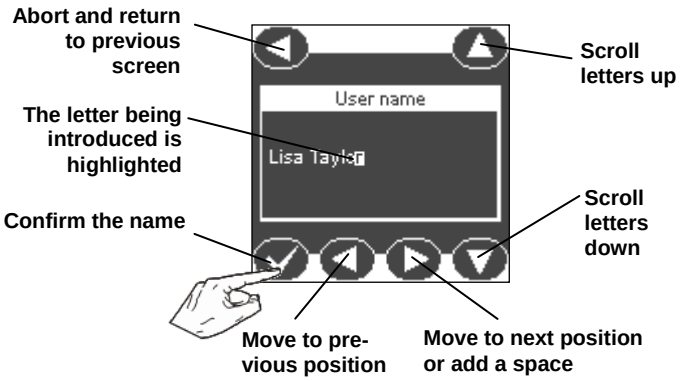
6.9.6 Adding a new user

This function allows to create a new user who is permitted to operate the sterilizer.
1) Scroll through the menu options, select the “Add new user” option and confirm.



2) Enter the user name using the UP and DOWN buttons to select the correct letter, and PREVIOUS and NEXT buttons to move along the character positions.
Once entered correctly, confirm the changes.

ATTENTION!
The new user will be created as soon as the confirmation button is pressed.

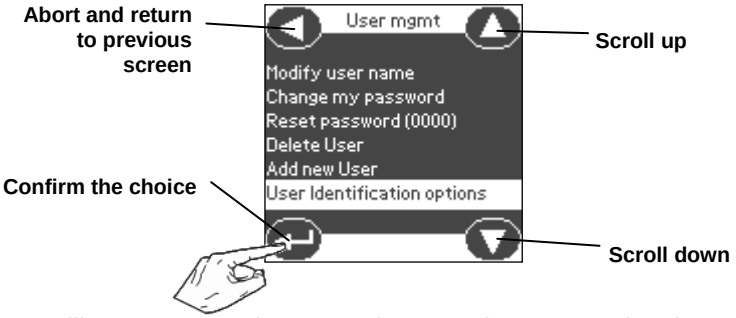


6.9.7 Setting the user identification options for all users

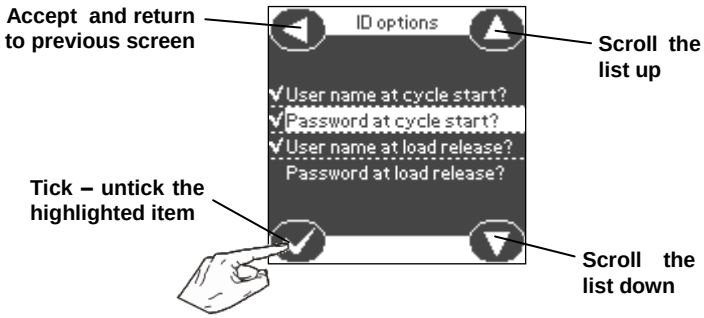
Depending on the organization of the practice and the traceability requirements, the ADMINISTRATOR can set the following options:

- - Identification and saving of the operator who has started the cycle;
- - Password-protected cycle start once the operator has been identified;
- - Identification and saving of the operator who has released the load;
- - Password-protected load release and label printing once the operator has been identified.

1) Scroll through the menu options and select “User Identification options”.



2) The following screen will appear. Use the UP and DOWN buttons, and activate / deactivate each option with the TICK button. The “✓” symbol confirms that the option has been activated.



The following options can be activated:

- **User name at cycle start**:

When the cycle has been selected and is started, the user will be asked to identify themselves. The operator’s name will be saved and included in the cycle report.

If this option has been activated and no operator is identified, it will not be possible to start the cycle.

- **Password at cycle start**:

Once the user has been identified, they will be asked to enter the secret password.

If the password is entered incorrectly, it will not be possible to start the cycle.

- **User name at load release**:

When the door is opened at the end of the cycle, the user will be asked to identify him/herself to release the load. The user name will be saved, included in the cycle report and printed on the load identification labels.

If this option has been activated and no user is identified, no labels will be printed.

- **Password at load release**:

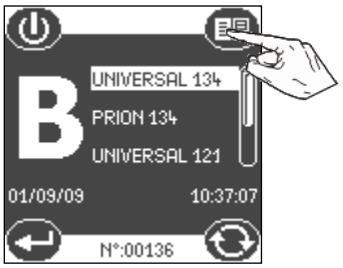
Once the user has been identified, they will be asked to enter the secret password

If the password is entered incorrectly, no labels will be printed.

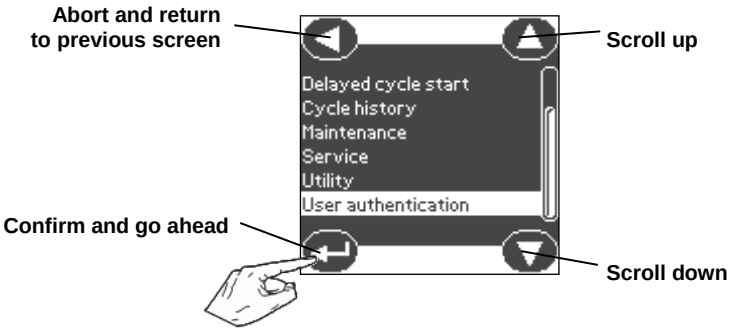
NOTES	**- The use of passwords can only be activated if the relevant identification option has been activated too.** **- The selected user identification options apply to all operators as well as to the administrator.**

6.10 FUNCTIONS AVAILABLE TO THE OPERATOR(S): PASSWORD MODIFICATION

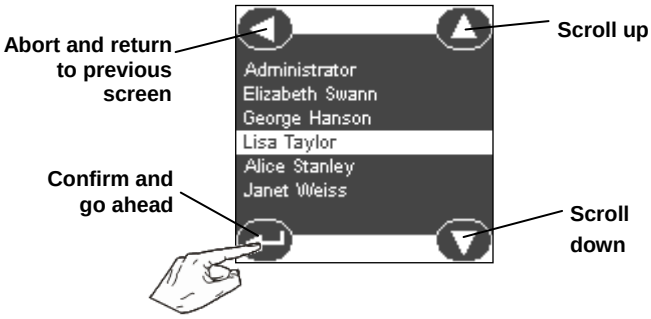
Proceed as follows:
1) Press the “Menu” icon on the main screen that appears when the unit is switched ON.



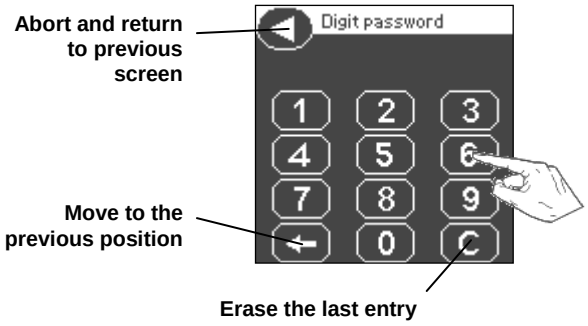
2) Scroll the menu options and select the “User authentication” option.



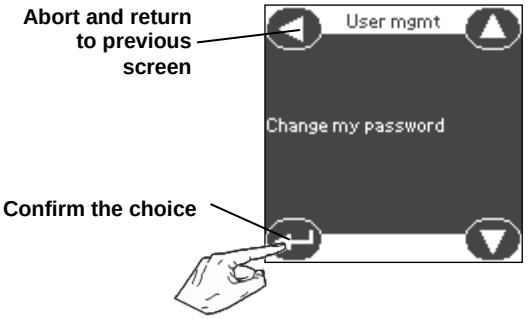
3) A list of users will be displayed: scroll through the list until your name is highlighted, then press the confirmation button.



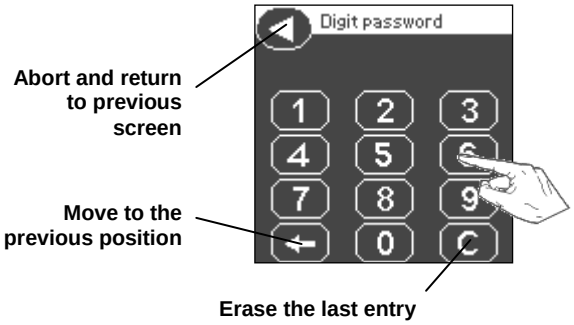
4) You will then be asked to enter your OLD password. If you are inserting a password for the first time, or after it has been reset to the default, the password is 0000



5) The “Change my password” function is now available: select it by pressing the confirmation button.



6) The password keypad appears. Enter your NEW four-digit password.

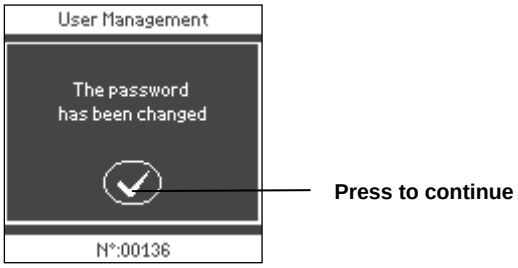


WARNING!

The password is saved as soon as the fourth digit has been entered.

If you are unsure of the sequence you have entered, DO NOT EXIT THE FUNCTION and repeat the procedure.

7) The following screen will appear: press the confirmation button to continue.



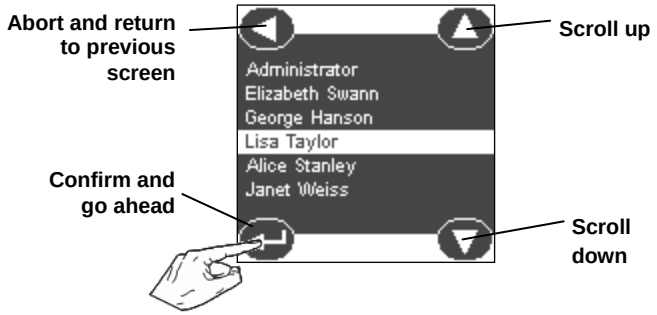
6.11 STARTING AND ENDING A STERILIZATION CYCLE WITH IDENTIFICATION OF THE USER

NOTE	**The instructions in this chapter are valid only if the "User Authentication" option is activated. See § 6.8**

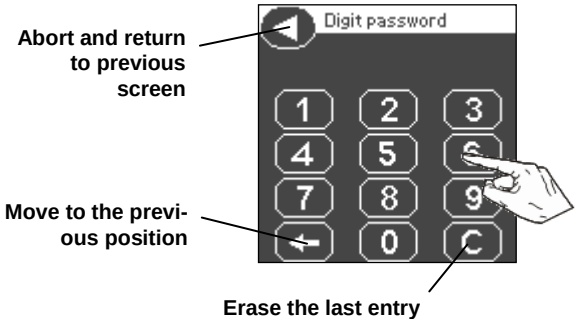
6.11.1 Starting a sterilization cycle

The steps required to start a sterilization cycle are basically the same as described in §7.1.1, with the following changes:

- After selecting and confirming the cycle, if the "Identification at cycle start" option has been activated, a list of all the authorized users will appear.
Scroll through the list until your name is highlighted and confirm.

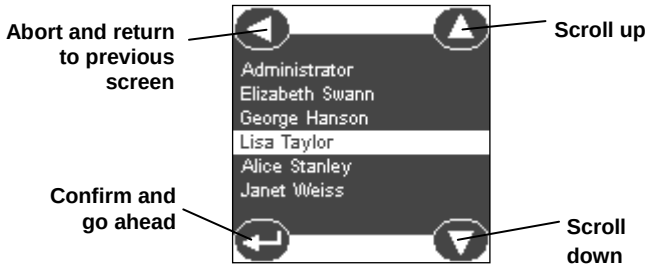


- If the "Password at cycle start" option has been activated, the password keypad will appear.
Enter your password to start the sterilization cycle.
The name of the user that launched the cycle will be saved.

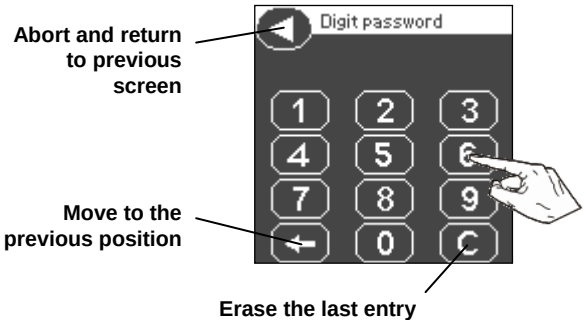


6.11.2 End of a sterilization cycle

At the end of a cycle when the door is opened, if the “User name at load release” option has been activated, a list of all authorized users will appear.
Scroll through the list until your name is highlighted and confirm.



- If the “Password at load release” option has been activated, the password keypad will appear. Enter your password.



The name of the user who released the load will be saved and printed on the cycle report.
If the LisaSafe (optional label printer) is connected and the label printing option is activated, the name of the user who released the load will be printed on the load identification labels

7. RUNNING A STERILIZATION CYCLE

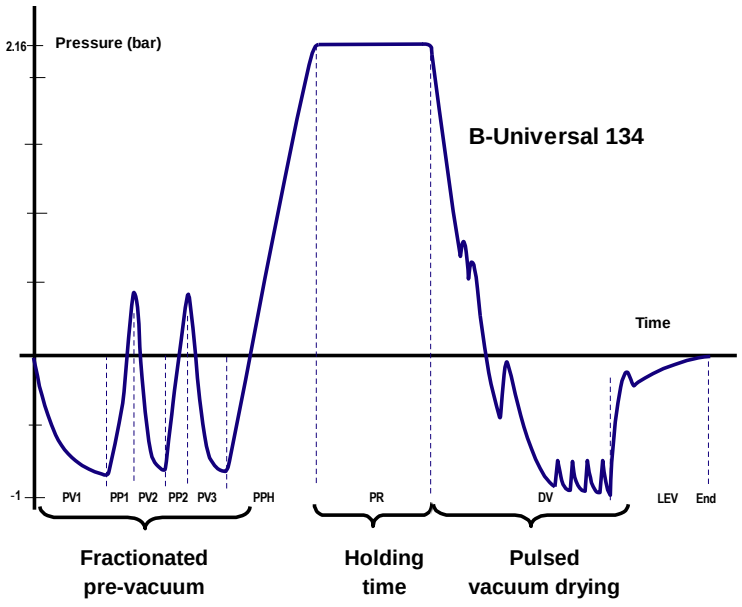
7.1 THE AVAILABLE STERILIZATION CYCLES

The following table shows the available sterilization cycles and the different type of loads that can be processed in the sterilizer. In total there are 3 type B sterilization cycles available; all offering the ECO-DRY feature (see below).

Note: Certain cycles may have been be de-activated in accordance with local requirements or guidelines

B UNIVERSAL 134 (with ECO-Dry)	This is the factory setting default sterilization cycle of the sterilizer (a different default cycle can be set by the user). The cycle is a type B sterilization cycle (suitable for all types of loads; solid, porous, hollow A and B; unwrapped, bagged, single or double wrapped) that features a pre-vacuum phase, a plateau time (sterilization or holding time) of 4 minutes at a temperature of 134°C and a pulsed vacuum drying phase. See the table on the following page for further details.
B PRION 134 (with ECO-Dry)	This is a special sterilization cycle in accordance with the WHO's recommendations on CJD (Creutzfeld Jakob Disease) for a longer sterilization plateau. The cycle is a type B sterilization cycle (suitable for all types of loads; solid, porous, hollow A and B; unwrapped, bagged, single or double wrapped) that features a pre-vacuum phase, a plateau time (sterilization or holding time) of 18 minutes at a temperature of 134°C and a pulsed vacuum drying phase. See the table on the following page for further details.
B UNIVERSAL 121	This is a low-temperature sterilization cycle (121°C) primarily designed to sterilize items that cannot withstand the temperature of 134°C (plastics, textiles). The cycle is a type B sterilization cycle (suitable for all types of loads; solid, porous, hollow A and B; unwrapped, bagged, single or double wrapped) that features a plateau time (sterilization or holding time) of 15 minutes at a temperature of 121°C and a pulsed vacuum drying phase. See the table on the following page for further details.

ECO-Dry FEATURE	**When selecting a "B-UNIVERSAL 134" or a "B-PRION 134" cycle, the sterilizer automatically adjusts the time of the drying phase to the amount of load placed, thus delivering the shortest cycle duration possible at all times. For further details see § 7.1.2.**



All available sterilization cycles feature the same pressure profile as shown in the graph aside. Only the duration of the sterilization time (or holding time), drying time and the sterilization temperature change.

Legend:

PV1 – PV3	Vacuum pulse (removal of air from the sterilization chamber/load)
PP1 - PP2	Pressure pulse (steam injection)
PPH	Pressure pulse and heating (steam injection and heating to sterilization temp.)
PR	Process (plateau/sterilization/holding time)
DV	Vacuum drying
SEP	Water separator draining phase
LEV	Leveling

		STERILIZATION CYCLES						**TEST CYCLES**	
		B UNIVERSAL 134		**B PRION 134**		**B UNIVERSAL 121**		Helix B&D	Air leakage Vacuum test
Sterilization temperature		134°C		134°C		121°C		134°C	--
Sterilization pressure		2.16 bar		2.16 bar		1.16 bar		2.16 bar	-0.87bar
Duration of the plateau phase		4'		18'		15'		3'30	10'
Duration of the drying phase		5-16'		5-16'		20'		4'	--
TOTAL CYCLE DURATION (including drying time)	Lisa 517	**Small load 22'**	**Full Load 48'**	**Small load 34'**	**Full Load 52'**	**Small load 41'**	**Full Load 56'**	**23'**	24'
	Lisa 522	**24'**	**56'**	**35'**	**62'**	**42'**	**62'**	**26'**	25'
LOAD TYPE	Full solid (probes, tweezers, burs,…)	**YES**		**YES**		**YES**		**Empty chamber or test pack** **See appendices 6 and 7**	
	Small porous items (gauze, cotton,…)	**YES**		**YES**		**YES**			
	Full porous (80% of the usable space).	**YES**		**YES**		**YES**			
	Hollow A (hand pieces, forceps, scissors,)	**YES**		**YES**		**YES**			
	Hollow B (vacuum tips,…)	**YES**		**YES**		**YES**			
	Unwrapped, bagged, single/double wrapped	**YES**		**YES**		**YES**			
MAXIMUM LOAD WEIGHT LIMITS:		Lisa 517: 4.5 kg solid items / 1.5 kg porous items Lisa 522: 6.0 kg solid items / 2.0 kg porous items							

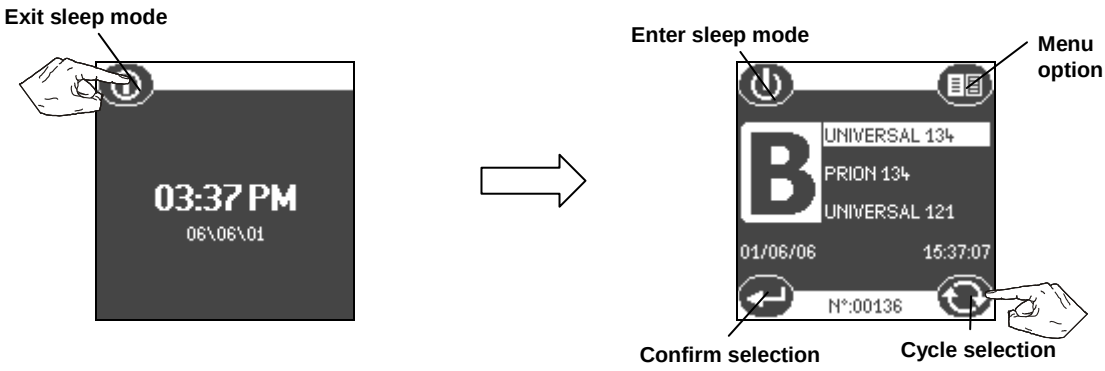
- **Total type-B concept: All available sterilization cycles can sterilize and dry all types of loads: full solid, porous, hollow A, hollow B, plastics, rubber, etc.; unwrapped, bagged, single or double wrapped, but :**
- **For preparation of the load, follow the instructions provided by the instrument manufacturer.**
- **For guaranteed sterilization, stay within the maximum load weight limits as specified in this table.**

Using the sterilizer with a load type different from the one given in the table above or bigger than specified in the table above could result in non-sterile conditions at the end of the cycle and expose people to the hazard of cross-infections.
The indication of sterile load given on the display at the end of the cycle is not valid if the type and quantity of the load are not complied.

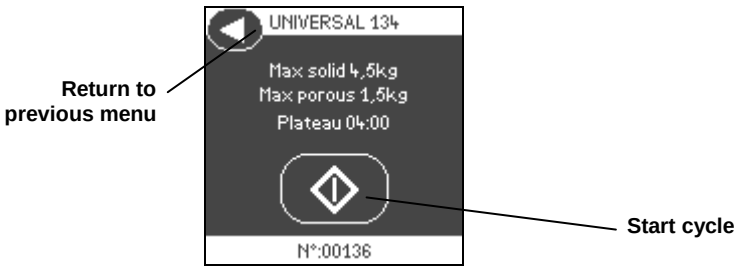
7.1.1 Starting a sterilization cycle

Exit from sleep mode by pressing the "Sleep mode" icon.

Select a cycle by pressing the "Cycle selection" icon and confirm the selection by pressing the "Selection confirmation" icon.



Once a cycle is selected and confirmed, the following screen informs about the maximum load weight limits that can be processed with the selected cycle (see cycle table § 7.1 for further information).
Press the "Start cycle" icon to initiate the selected cycle.



NOTE:	**If the "user authentication" option is activated, the user will be asked to identify themselves before starting the cycle.** **If the password protection is activated as well, a password will be requested.** **See §6.11 for further details.**

7.1.2 ECO-Dry feature

The ECO-Dry feature is active whenever you initiate a sterilization cycle. The feature is designed to always automatically provide you with the shortest possible cycle times always, while assuring that any load placed in the sterilizer will be perfectly dry at the end of the cycle. The on-board sterilizer computer is able to determine the amount of the load you placed in the sterilizer chamber and will automatically adjust the cycle drying time to that specific load. That means the smaller the load, the faster the cycle, thus eliminating the need for selecting a quick or a flash cycle. Place loads of 500 grams or less (e.g., up to 8 wrapped dental handpieces) to benefit from the shortest cycle time of just over 20 minutes. This feature helps you to save time, energy and money, and works fully automatic.

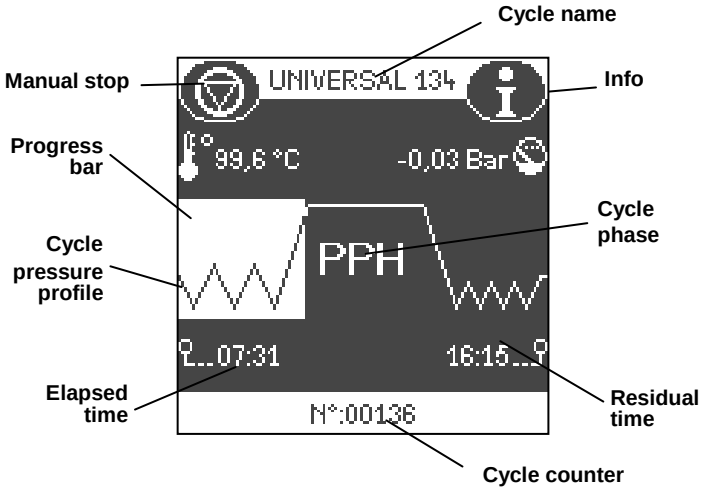
NOTE:	To enjoy the full benefit of short cycle times when placing small loads, always place the load on the upper tray of the chamber rack and remove all other trays from the chamber. Ensure that the paper side of sterilization bags faces up.

7.1.3 Cycle in-progress

While a cycle is in progress, the following parameters are displayed on the touch-screen:

- Sterilization temperature and pressure – measured inside the chamber.
- Elapsed time – time elapsed from the beginning of the sterilization cycle.
- Residual time - time remaining until cycle completion.
- Current cycle phase (e.g., PV1)
- Cycle counter
- Cycle name

In the central part of the screen, a simplified cycle pressure profile is shown. As the cycle proceeds, a progress bar overwrites the completed cycle pressure profile, showing in real time the actual phase the cycle is in.
If you press the "Info" icon, further technical parameters are displayed. The "Info" icon can be pressed at any time, also if there is no cycle in progress; it provides important information especially for service technicians.

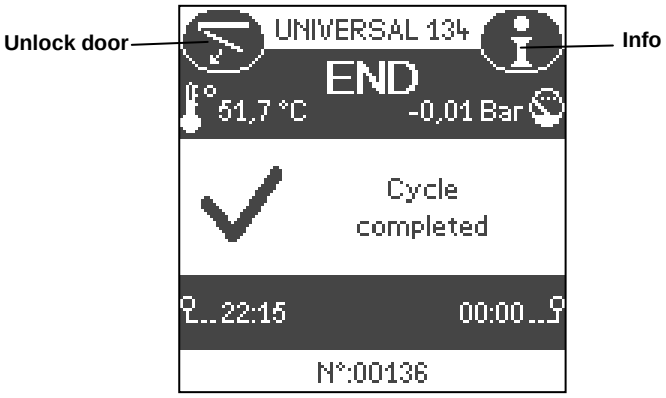


7.1.4 End of cycle

Once the cycle is complete, the screen appears as in the image aside.

To unlock the door press the “Unlock door” icon.

To view the parameters of the last cycle press the “Info” icon before unlocking the door.



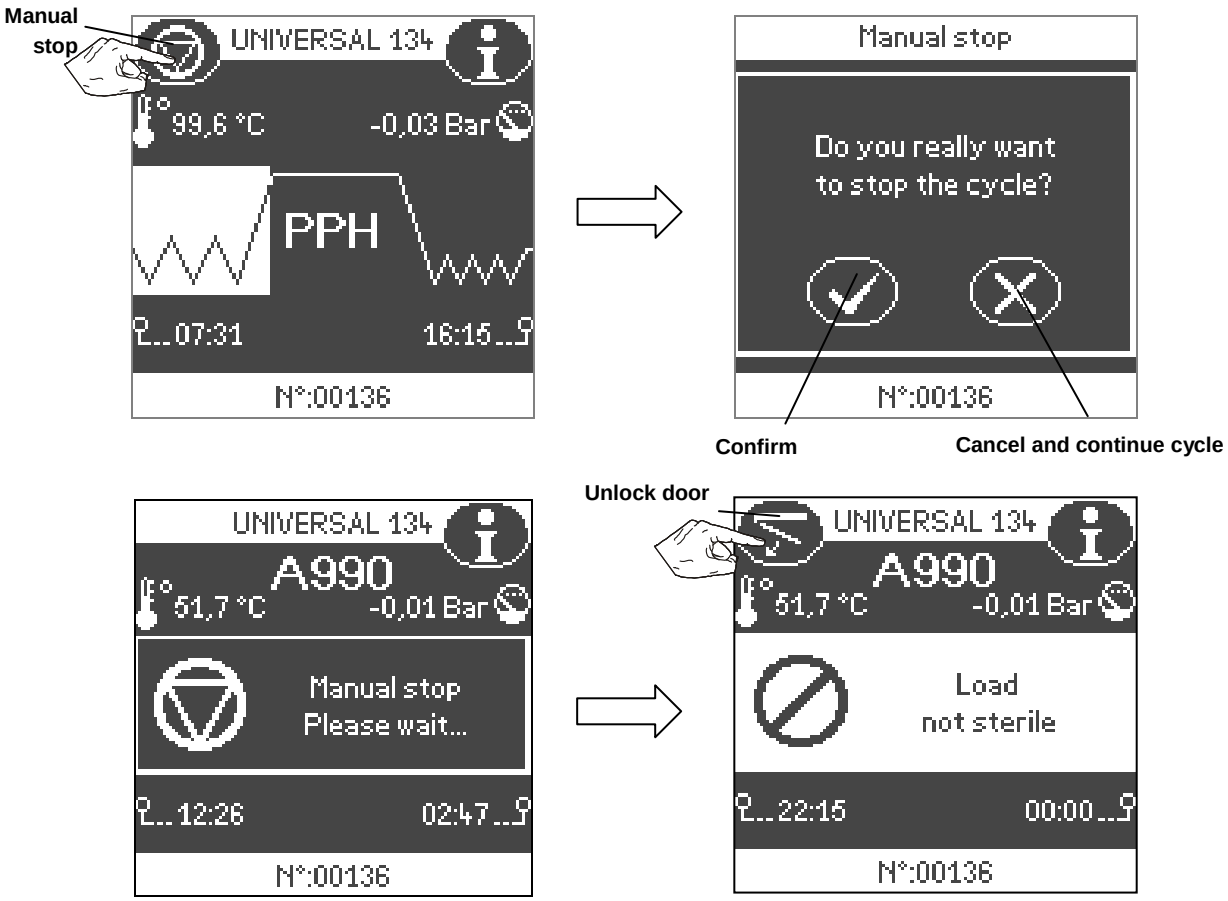
	ATTENTION! Load and trays will be hot at the end of the cycle! **Use tray or cassette holders to remove the load.**

NOTE:	If you do not open the chamber door at the end of the sterilization cycle (the sterilization load remains in the chamber), the sterilizer vacuum pump is activated for a few seconds every 10 minutes for a time period of 40-60 minutes to keep the load dry.

NOTE:	**If the “user authentication” option is activated, the user will be asked to identify themselves before releasing the load.** **If the password protection is activated as well, a password will be requested.** **See §6.11 for further details.** **The name of the user who released the load will be saved on the memory card and printed on the cycle report.**

7.2 MANUAL STOP

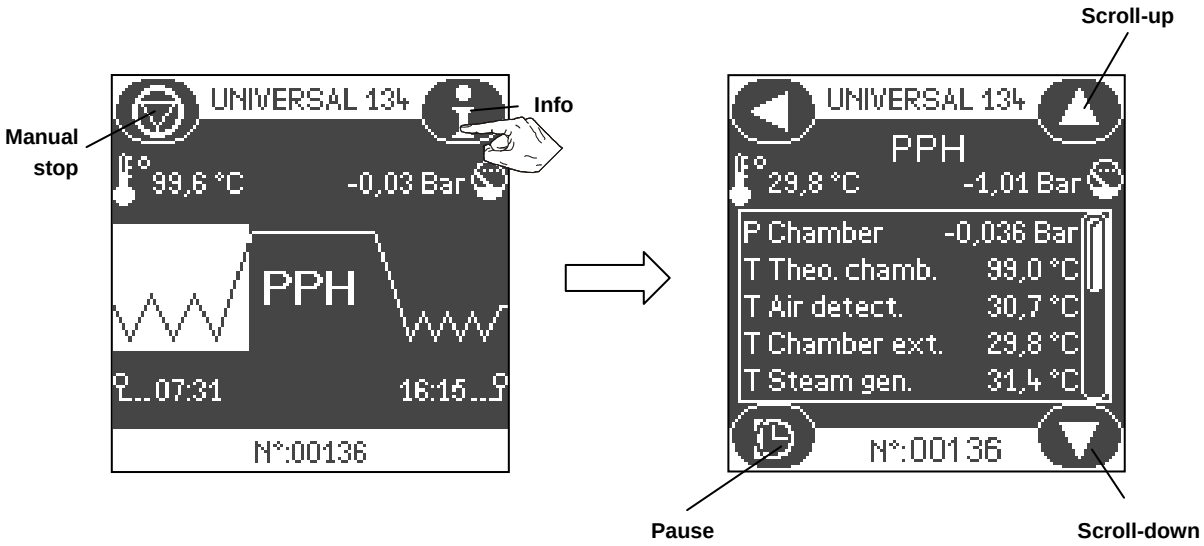
A sterilization cycle in progress can be aborted manually at any time by pressing the manual stop icon. Once pressed, a warning screen will appear asking for a confirmation (see image below, top right). If the manual stop is confirmed, the alarm code A990 (see picture below) is displayed, and a two-minute reset phase starts to drain the pneumatic circuits and to depressurize the chamber (see image below, bottom left). Do not switch off or unplug the sterilizer during this reset phase! At the end of this phase, the door can be unlocked by pressing the "Unlock door" icon (see image below, bottom right).



⚠	**If a cycle is interrupted before the sterilization/plateau phase (PR) of the sterilization cycle is completed, the following message will be displayed:** **!! Load not sterile !!** **If the cycle is interrupted after the sterilization/plateau phase of the sterilization cycle (e.g., during the drying phase), the following message will appear:** **!! Sterile conditions achieved, drying interrupted !!** **Both messages are printed or saved on the memory card.**

7.3 REAL-TIME CYCLE DATA INFORMATION

Press the “Info” icon at any time during the sterilization cycle or when the sterilizer is idling to view a list of the most important technical parameters of the unit (see screen below, right).



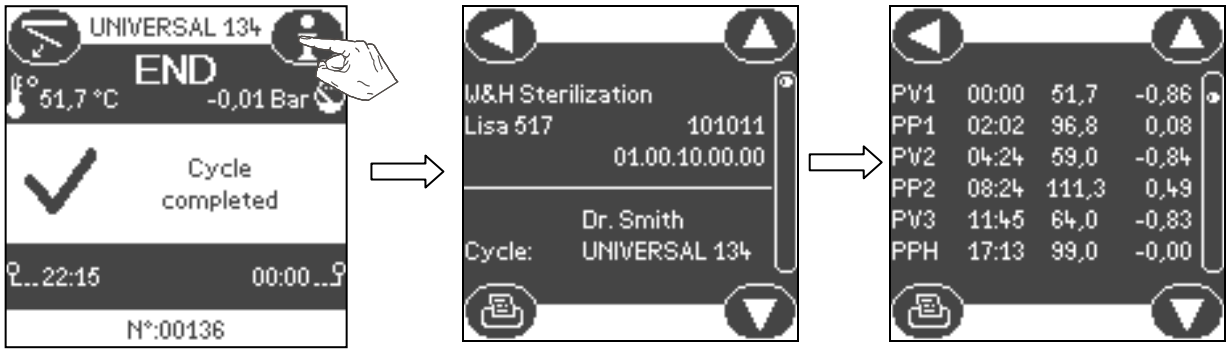
The INFO screen is controlled by an automatic timeout. Press the “Pause” icon to prevent the screen from automatically returning to the previous screen.
See the table below for a description of the displayed technical parameters:

Legend:

P Chamber	Pressure/vacuum inside the sterilization chamber
T Theo.	Theoretical temperature calculated from chamber pressure
T Chamber Heat	Temperature of the chamber heating element
T Steam gen.	Temperature of the steam generator heating element
T Condenser	Temperature of the heat exchanger (condenser)
Power Steam gen.	Power consumption of steam generator
Power Chamber heat.	Power consumption of the chamber jacket heater
Cond. H20	Water conductivity
H20	Water volume pumped inside the steam generator

7.4 CYCLE DATA SUMMARY

Press the "Info" icon at the end of a cycle before unlocking the chamber door (see image below, left) to view a summary of the cycle parameters (see images below, middle and right).



The information screen lists the following parameters:

- Cycle name
- Cycle counter
- Time/duration, pressure and temperature readings at the end of each cycle phase.
- Temperature and pressure readings of the actual sterilization/plateau phase.

Legend:

PV	Vacuum pulse (air removal)
PP	Pressure pulse (steam injection)
PPH	Pressure pulse and heating
PR	Process (sterilization/plateau phase)
DV	Vacuum drying

8. DISPLAY MESSAGES

Once the sterilizer is switched on, a variety of messages can appear on the touch-screen. Messages show the status of the sterilizer; an example is shown aside. A message counter indicates the number of messages pending (e.g., message 01/02).
Messages are divided into three main categories:

- Warning messages
- Information messages
- Maintenance messages

Check the table below for instructions on how to respond to the various messages

WARNING MESSAGES

Message	Cause	Action
Fill water tank	The clean water tank is empty.	Fill the clean water tank with distilled or demineralized water (see § 5.4).
Drain used water tank	The used water tank is full.	Drain the used water tank (see § 5.5).
Door locking system problem - Try again	The door could not be locked / unlocked properly.	Check (clean) the door seal and try again. Call for service if the message persists.

Note: When these messages appear on the screen, the cycle selection command is disabled. It is not possible to initiate a cycle until the necessary action is carried out.

INFORMATION MESSAGES

Non conform water replace water	According to the sterilizer water conductivity sensor, the water quality (in terms of µS) does not conform to the norm and it may damage the sterilizer (see Appendix 7).	Completely drain the clean water tank and refill it with water of good quality. If you use an automated water supply system, check and replace resin filters.
Unacceptable water DO NOT run cycle!	According to the sterilizer water conductivity sensor, the water quality (in terms of µS) does not conform to the norm and it may seriously damage the sterilizer (see Appendix 7).	Completely drain the clean water tank and refill it with water of good quality. If you use an automated water supply system, check and replace resin filters.
CPU battery flat	The CPU board battery is worn.	Call for service.
Lost connection with PC/Log	The sterilizer is unable to establish a connection with the computer.	Check that the cables between the sterilizer and the computer or between sterilizer, MOXA and LAN are inserted correctly. If problem persists, call for service.

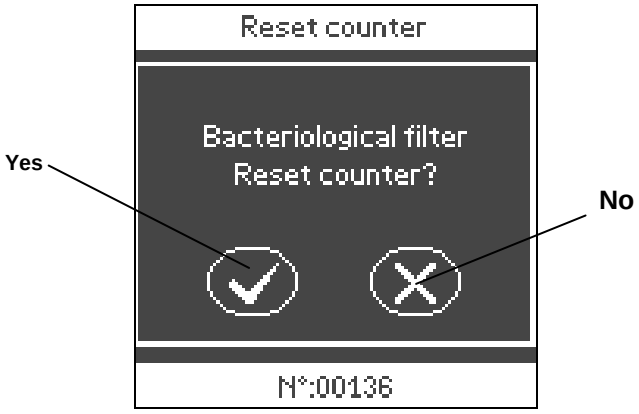
MAINTENANCE MESSAGES

Replace bacteriological filter	This message informs that the bacteriological filter needs to be replaced.	Replace the bacteriological filter (see § 11.6).
Replace dust filter	This message informs that the dust filter needs to be replaced.	Replace the dust filter (see § 11.7).
Replace door seal	This message informs that the door seal needs to be replaced.	Replace the door seal (see § 11.9).
Clean clear and used water tanks	This message informs that the water tanks need to be cleaned.	Clean the water tanks (see § 11.8).
4000 cycles reached Call for service	This message informs that a 4000 cycle overhaul needs to be performed.	Call for service.

Note: When these messages appear on the screen:

- It is not possible to initiate a cycle (the cycle selection icon will disappear).
- The message must be acknowledged by pressing the **"Confirm"** icon.
- The "Yes" or "No" option from the "Reset counter" screen must be selected.
- The necessary actions must be carried out as described above.

The "Reset counter" function allows the user to postpone the necessary action (e.g. when the consumable part to be replaced is not available).
If you press the "Yes" icon, the maintenance message will disappear and the maintenance counter will be reinitialized. If you press the "No" icon, the maintenance message will reappear after five cycles and the counter will keep counting up.

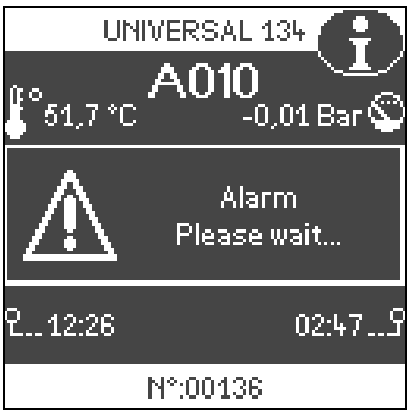


⚠	**Lisa sterilizers must be maintained according to the maintenance program (see § 11.1). Inadequate or inappropriate maintenance can lead to frequent malfunctions and expensive repairs and may void the manufacturer's warranty.**

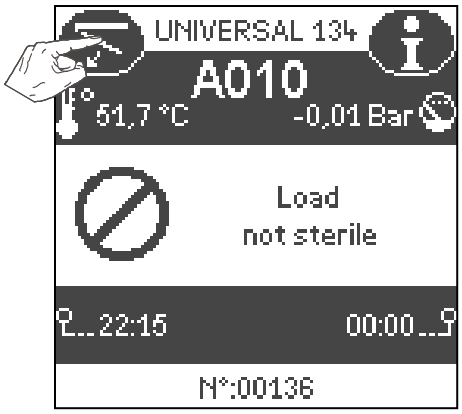
9. ALARMS

Lisa sterilizers constantly monitor a variety of parameters during the sterilization cycle to assure a proper sterilization of the load. In case any of the parameters are off, potentially affecting the sterilization efficiency, the cycle is immediately interrupted and an alarm message is displayed.

Once the sterilizer generates an alarm message, a two-minute reset phase starts to drain the pneumatic circuits and depressurizes the chamber. Do not switch off or unplug the sterilizer during this reset phase!



At the end of the reset phase, the door can be unlocked by pressing the “Unlock door” icon. The screen will display the type of alarm that was generated and indicate the condition of the sterilization load. Refer to § 10 for alarm-code troubleshooting.



⚠	**If an alarm message is generated before the sterilization/plateau phase (PR) of the sterilization cycle is completed, the following message will be displayed:** **!! Load not sterile !!** **If an alarm message is generated after the completion of the sterilization/plateau phase of the sterilization cycle (e.g., during the drying phase), the following message will be displayed:** **!! Sterile conditions achieved, drying interrupted !!** **Both messages are printed or saved on the memory card.**

10. ALARM CODE TABLE

Refer to the table below for troubleshooting assistance in case the sterilizer generates an alarm code.

Code	Description	Action
	Power supply	
A010	Power failure or significant drop in voltage occurred during the cycle.	The load cannot be considered sterile. The cycle must be repeated. Check building power supply to the sterilizer.
	Sterilization chamber	
A100	The time it took to reach the sterilization plateau is too long (overload, leaks, etc.).	Observe the maximum load weight limits, clean, check or replace the door seal and the face side of the chamber and repeat the cycle. If the problem persists ⇨ ☎ service.
A130	During the sterilization phase of the cycle, the pressure measured inside the sterilization chamber is above the maximum threshold.	Repeat the cycle. If the problem persists ⇨ ☎ service.
A140	During the sterilization phase of the cycle, the pressure measured inside the sterilization chamber is below the minimum threshold.	Clean, check or replace the door seal and the face side of the chamber and repeat the cycle. If the problem persists ⇨ ☎ service.
A150	During the sterilization phase of the cycle, the temperature of the steam is below the minimum threshold.	Clean, check or replace the door seal and the face side of the chamber and repeat the cycle. If the problem persists ⇨ ☎ service.
A160	During the sterilization phase of the cycle, the temperature of the steam is above the maximum threshold.	Repeat the cycle. If the problem persists ⇨ ☎ service.
A170	The temperature sensor of the chamber heating element is broken or disconnected.	⇨ ☎ service
A180	The internal temperature sensor of the chamber is broken or disconnected.	⇨ ☎ service
A190	Air detector alarm	Clean, check or replace the door seal and the face side of the chamber and repeat the cycle. If the problem persists ⇨ ☎ service.
	Steam generator	
A230	The temperature sensor of the steam generator is broken or disconnected.	⇨ ☎ service
A240	Fault of the steam generator heater.	⇨ ☎ service
A250	The internal temperature sensor of the air detector system is broken or disconnected.	⇨ ☎ service

Code	Description	Action
Vacuum pump		
A310	During a vacuum phase of the cycle, a vacuum of –0.20 bar or lower could not be achieved.	Clean, check or replace the door seal (§11.2) and the face side of the chamber; repeat the cycle. If the problem persists ⇨ ☎ service.
A320	During a vacuum phase of the cycle, a vacuum of –0.50 bar or lower could not be achieved.	
A330	Vacuum pump fault	⇨ ☎ service
A350	Vacuum pump fault	⇨ ☎ service
A380	Leak between the reading points P1 and P2 of the Vacuum Test	Clean, check or replace the door seal (see § 11.2) and the face side of the chamber; repeat the cycle. If the problem persists ⇨ ☎ service. Note: Ensure that the sterilizer chamber is cold and dry when initiating Vacuum Tests!
A390	Leak between the reading points P2 and P3 of the Vacuum Test	
Water pump		
A400	Water pump fault	⇨ ☎ service
A410	Water conductivity meter fault	⇨ ☎ service
A420	Flow meter fault	⇨ ☎ service
Door locking		
A520	The chamber door locking mechanism blocked during opening.	⇨ ☎ service
A530	The chamber door locking mechanism blocked during closing.	⇨ ☎ service
Electric valves		
A601…8	Electric valve fault	⇨ ☎ service
Condenser		
A720	Fan fault	⇨ ☎ service
Water tanks		
A810	Water level sensor fault	⇨ ☎ service
Manual stop		
A990	The “Manual stop” icon was pressed	Wait until the end of the reset phase (see § 7.2).

11. MAINTENANCE

There are two levels of maintenance:

- Maintenance performed regularly by the user.
- Maintenance carried out by authorized service technicians (see § 11.10).

⚠	**Before carrying out any maintenance on the unit, remove the mains cable.**

11.1 MAINTENANCE PROGRAM

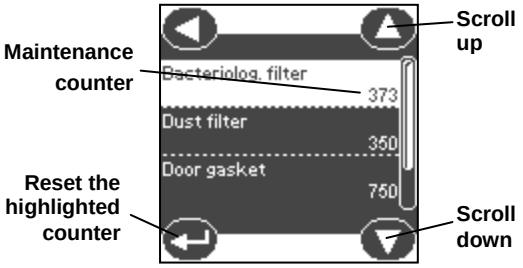
Certain consumables have to be replaced periodically to guarantee a faultless operation of the sterilizer. Display messages will inform you whenever it is time to replace one of these components. Check the table below for an overview of the various maintenance tasks and the frequency of replacement.

Frequency *	# of cycles*	Operation	Consumable part number	Description
Monthly	**50**	Clean the door seal and the chamber face side.		§ 11.2
		Clean the chamber, the trays and the rack.		§ 0
		Clean the chamber filter.		§ 11.4
		Clean the external sterilizer surfaces.		§ 11.5
Every 3 months	**400**	Replace the bacteriological filter.	see Appendix 9	§ 11.6
		Replace the dust filter.		§ 11.7
Every 6 months	**800**	Clean both water tanks.	-	§ 11.8
Every year	**800**	Replace the door seal.	see Appendix 9	§ 11.9
	4000	Have the sterilizer serviced by an authorized service technician.	-	§ 11.10

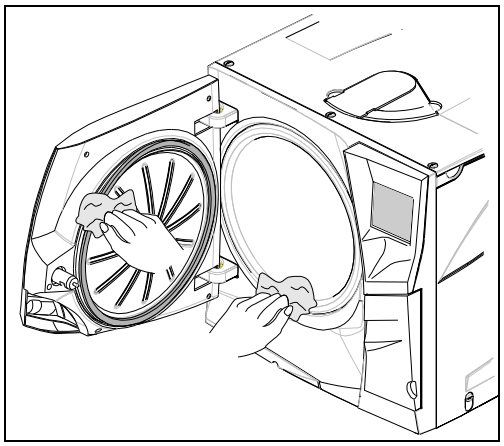
*** whichever comes first**

⚠	**In addition to the maintenance program above, local or national rules, guidelines and standards could mean that periodical checks, maintenance and calibration of the sterilizer are required.** **The sterilizer shall be checked, maintained and serviced in accordance with all rules in force in the Country of use.**

The Maintenance sub-menu (see § 6.5) indicates the number of cycles remaining before it is time to replace the various consumables or when general servicing is required. The maintenance counter decreases in value after each cycle. When one of the counters reaches 0, the corresponding message appears on the touch-screen (see § 8).



11.2 CLEANING THE DOOR SEAL



ATTENTION!
Operation to be carried out when the sterilization chamber is cold

Clean the door seal and the chamber face side with a non abrasive cloth and a mild detergent solution. Rinse with clean water.

11.3 CLEANING THE CHAMBER AND CHAMBER COMPONENTS

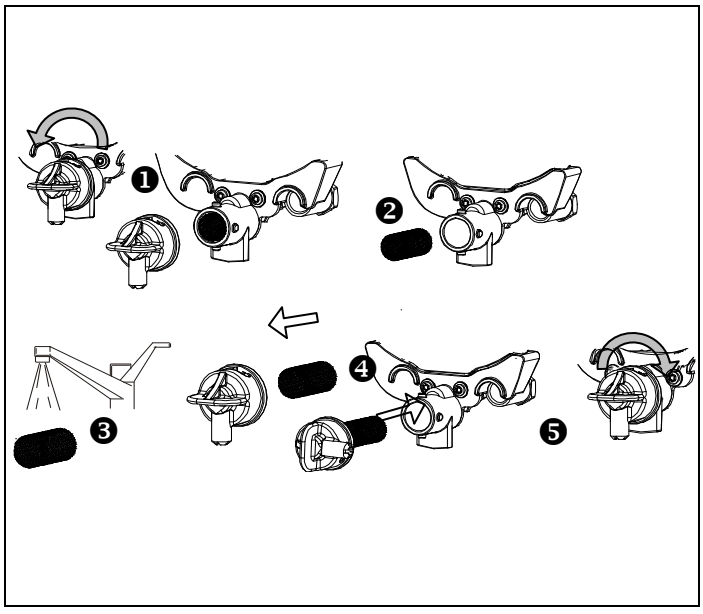
ATTENTION!
Operation to be carried out when the sterilization chamber is cold

- Remove the trays from the chamber.
- Remove the chamber rack.
- Clean the chamber with a damp sponge and a mild detergent solution.
- Rinse the chamber with a sponge and remove all traces of the cleaning agent.

Apply the same procedure for the rack, trays or cassettes.

- **Thoroughly clean all around the sterilization chamber and the internal chamber interface at the back of the chamber.**
- **Do not bend or damage the temperature sensor at the bottom/right of the chamber.**
- **Never use disinfectants or sharp objects to clean the chamber.**

11.4 CLEANING THE CHAMBER FILTER



ATTENTION!
Operation to be carried out when the sterilization chamber is cold

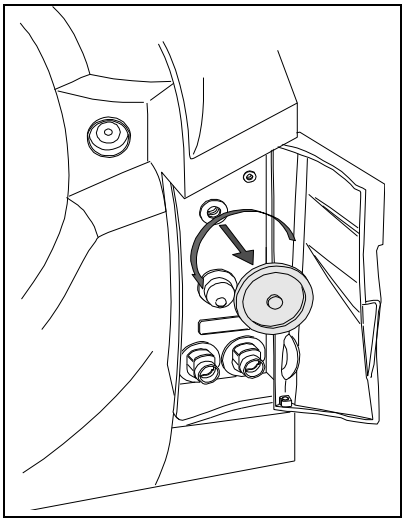
- Empty the sterilization chamber by removing the trays and rack.
- Remove the filter cap at the back of the chamber (bottom/center) by turning it counter-clockwise.
- Remove the cartridge filter and rinse it with tap water.
- Insert the filter on the cap, plug it in and lock it by turning clockwise.

11.5 CLEANING THE EXTERNAL STERILIZER SURFACES

- Disconnect the mains cable.
- Never use disinfectants or abrasive products.
- Clean all external covers with a damp cloth and a mild detergent solution.

⚠	• **Do not use excessive amounts of water to wash the sterilizer as this may damage the electrical components and safety mechanisms.** • **Take care not to scratch the plastic film in front of the touch-screen; avoid cleaning it with detergents or pointed objects.**

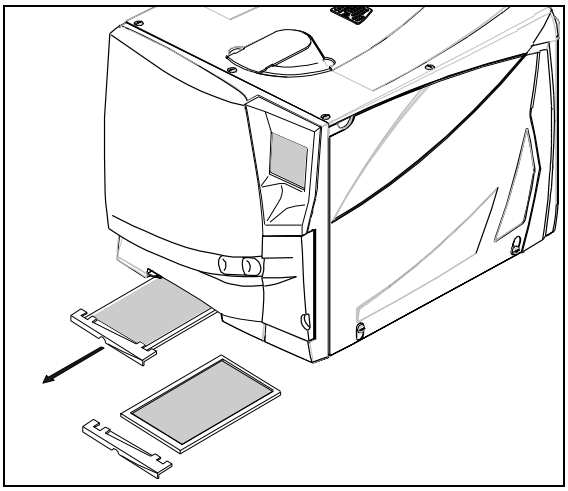
11.6 REPLACING THE BACTERIOLOGICAL FILTER



- Open the service door.
- Unscrew the bacteriological filter by hand (counter-clockwise).
- Screw on the new filter (clockwise) and tighten it snug.

⚠	**ATTENTION!** Disposal of used consumables shall be done in compliance with local laws and rules

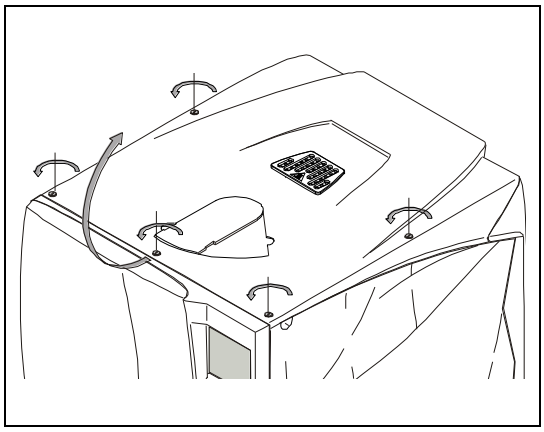
11.7 REPLACING THE DUST FILTER



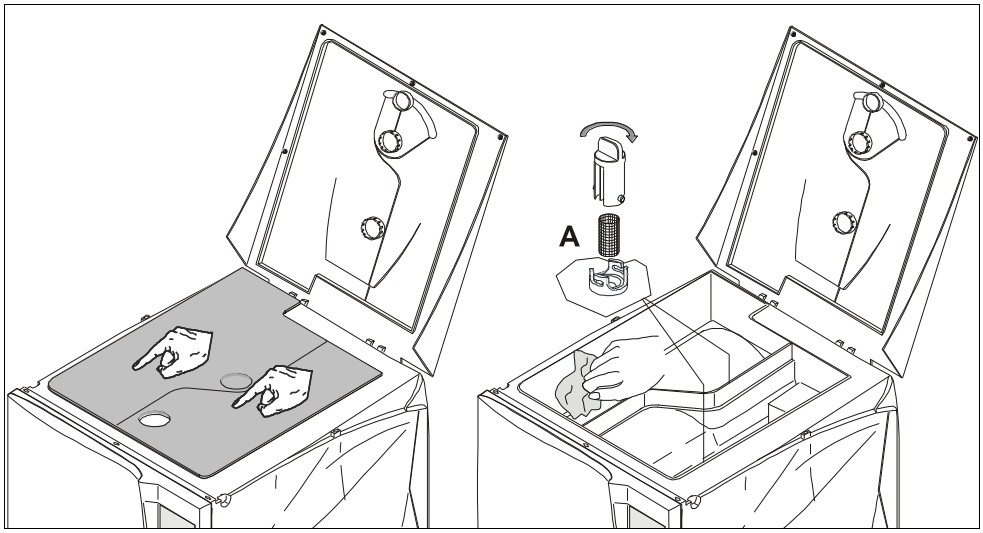
- Pull out the filter from the bottom/front of the sterilizer.
- Detach the used filter from the handle.
- Attach the new filter to the handle.
- Slide the filter back into its position.

⚠	**ATTENTION!** Disposal of used consumables shall be done in compliance with local laws and rules

11.8 CLEANING THE WATER TANKS



- Disconnect the mains cable.
- Completely drain both tanks (see § 5.5).
- Leave the drain tube attached to one of the drain quick connectors.
- Turn the 5 screws of the tank cover a ½ turn counter-clockwise with the use of a screwdriver (or coin; see image to the right) and lift the cover to gain access to the water tanks.
- Tap with your fingers on the rubber membrane to remove any condensation water (see image below/left).
- Remove the rubber membrane; clean and dry it. Do not yet remove the two internal tank filters (**A**) (see image below/right).
- Clean the internal tank surfaces with a soft sponge and a mild detergent solution, then rinse and dry them. Do not use abrasive or strong detergents or disinfectants. Use a small non-abrasive brush to clean areas that are difficult to reach. Repeat this procedure for both tanks; make sure the drain tube it attached to the drain quick connector of the tank you are cleaning (left tank = used water tank – gray colored connector; right tank = clean water tank – blue colored connector).
- Remove the two internal tank filters (**A**), clean them with tap water (mild detergent can also be used) and put them back into their positions.
- Reposition the rubber membrane by carefully inserting it into its outer seat and the tank dividing wall.
- Close the cover and tighten the 5 tank cover screws (clockwise).



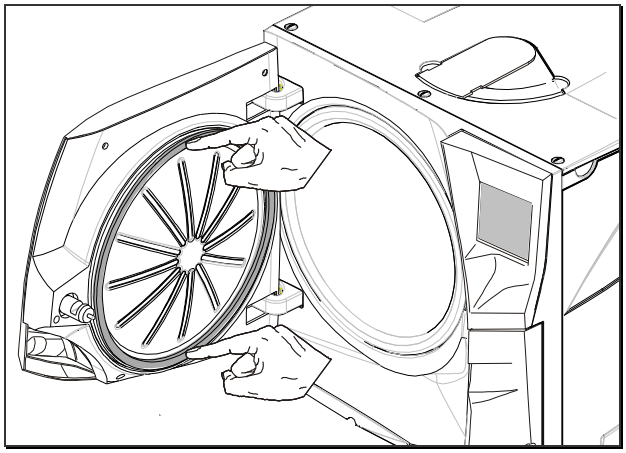
⚠	If the sterilizer is not used for more than 3 days, both water tanks should be completely drained in order to avoid algae growth or any other deposits.

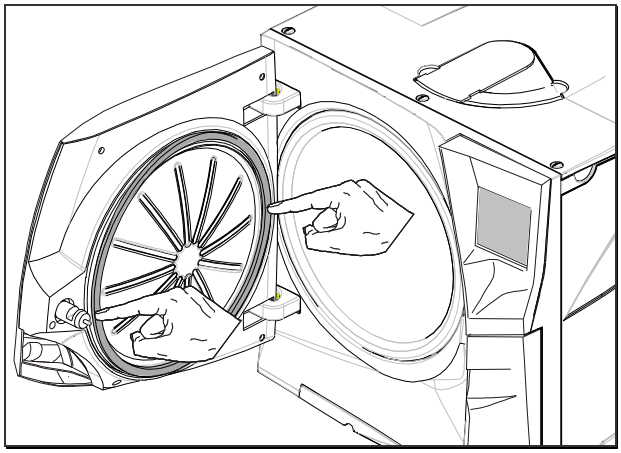
11.9 REPLACING THE DOOR SEAL

⚠	**ATTENTION!** **Operation to be carried out when the sterilization chamber is cold**

- Fully open the chamber door of the sterilizer.
- Pull out the used door seal by hand.
- Carefully clean the seal seat and the chamber face side with a cotton swab moistened with isopropyl alcohol.
- Moisten the new seal with water.
- Insert the seal in the sequence as illustrated in the following diagrams:

FIRST: top and bottom → THEN: left and right





Complete the operation by evenly inserting the seal on the entire circumference.

⚠	**Make sure that the door seal is properly placed to avoid air leaks. It must be evenly inserted on the entire circumference without any bumps or deformations.**

⚠	**ATTENTION!** Disposal of used consumables shall be done in compliance with local laws and rules

11.10 SERVICE CONDUCTED BY AN AUTHORIZED SERVICE TECHNICIAN

Regular service is imperative to ensure continuously effective sterilization. LISA 517/522 Sterilizers require servicing every **4000 cycles** by authorized service technicians. The service includes replacement of consumables and other important internal components, a safety and system check as well as thorough cleaning of areas that cannot be accessed by the user.

Replacement parts:

2 Metallic water filters
1 One way valve
2 Solenoid valves (EVE-EVF)
2 Metallic filters - (CH/SG)
2 Pressure safety valve 0-rings
1 Air detector O-ring
1 PT1000 Teflon compression bushing
1 Water separator one way valve
1 Interface one way valve (air)
1 EV A-B-C solenoid valves assembly
1 Vacuum Pump membrane kit

Cleaning:

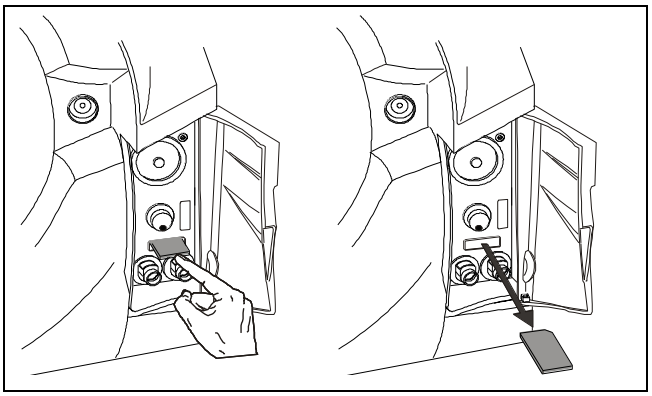
Cleaning of the sterilization chamber and external surfaces
Cleaning of the sterilization chamber filter
Vacuum-cleaning of the interior of the unit, paying particular attention to the condenser fins

Checks:

Check of the pneumatic connections.
Check of the electrical connections.
Check of the temperature and pressure calibration.
Check of the door locking system.
Check of the 2 pressure safety valves.
Check of the safety systems.
Check of the steam generator.

12. USE OF THE MEMORY CARD

Lisa 517/522 sterilizers come with a digital cycle data recording system. Cycle data is automatically saved on a removable/rewritable memory card. Data from memory cards can be managed with your PC or MAC. Memory cards are supplied with a USB cable and an external USB reader.
Insert the memory card into the dedicated slot behind the service door until it clicks into its final position. Ensure that the flat corner of the card points to the top/right (see image below). Once a card is inserted, the unit automatically verifies the condition of the card. The verification time of the memory card takes from a few seconds to some minutes. It is possible to reduce the verification time if the card is formatted directly on the sterilizer (see § 6.7.2).



NOTE 1 Periodically transfer cycle data from the card to your computer.

NOTE 2 The manufacturer does not take responsibility for any damages to the memory card or loss of data during or after the warranty period.

To remove the memory card, slighty push it in and gently pull it out.

12.1 TECHNICAL CHARACTERISTICS OF THE MEMORY CARD

Technology	MMC (Multi Media Card)
Tested brands that can be used with the Lisa sterilizer	*PQI-Sandisk-Lexar-Transcend-TwinMos-Toshiba
Tested capacity	between 16MB - 1GB

* Brands and products are trademarks of the manufacturers

The supplied memory cards have a storage capacity of not less than 128 MB.

12.2 READING OF MEMORY CARD DATA WITH A PC/MAC

Memory card data can be saved, viewed, copied and printed on a PC/MAC equipped with a USB port (USB 1.1 or above).

12.3 MINIMUM HARDWARE REQUIREMENTS FOR A PC/MAC

PC/MAC	1 free USB port (1.1 or above)
PC/MAC	CD-ROM reader
PC Operating System	*WINDOWS 98SE, 2000, ME, XP or above
MAC Operating System	*OS 9.1.x, OS X v10.1.2+

* Brands and products are trademarks of the manufacturers

12.4 CONNECTING THE EXTERNAL USB CARD READER TO YOUR PC/MAC

To connect the USB reader to your PC/MAC, follow these steps:

- Start the PC/MAC
- Connect the USB reader to a free USB port on your computer.

NOTE 1	Most operating systems recognize the USB reader and install the device automatically. In some cases the operating system asks for the installation disk. To complete the installation follow the messages on your computer screen. For further information refer to the instructions supplied with the USB reader.

NOTE 2	If the computer is connected to a network system it is possible that the USB reader drive is not visible on your computer even after correct installation. In this case consult your network administrator or assign a different drive letter to the USB reader.

Once the installation is completed and a memory card with cycle data is inserted into the external card reader, data can be saved, copied and organized on your PC/MAC.

12.5 SAVED FILE

The sterilization report is saved in a file with a HTM extension. It can be opened, viewed and printed with a HMTL viewer (e.g., *Microsoft Internet Explorer).
* Brands and products are trademarks of the manufacturers

12.6 CONTROL CODE

Saved files contain a control code for proper identification. Any manipulation of a file will change the code and compromise the integrity of the saved data. W&H Sterilization will not take responsibility for any manipulated cycle data.

12.7 FILE NAMES

Each cycle report is saved as a file in a HTM format. File names are generated automatically.
Example of a file name:

01898 28-01-06 08_41_22 B&D _ HELIX LISA 517 02-0005.htm

saving format depends on the Date-Clock setting (see § 6.1.10 and 6.1.11)

12.8 DIRECTORY NAME

Files are saved on the memory card in the following structure:

LISA 517 02-0005

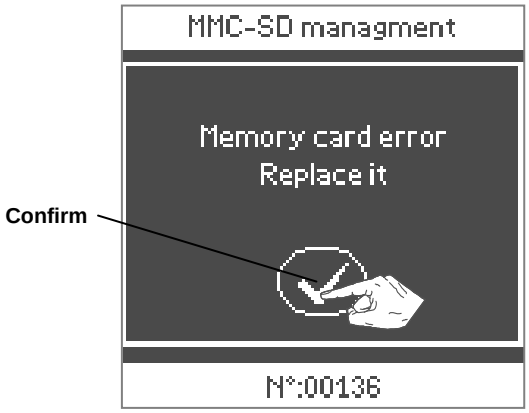
∟2006-01

∟01898 28-01-06 08_41_22 B&D _ HELIX LISA 517 02-0005.htm

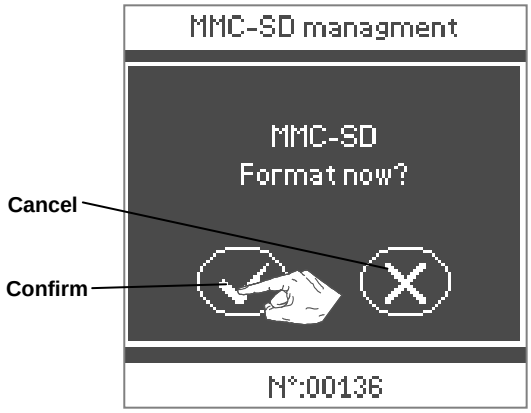
12.9 MEMORY CARD MANAGEMENT

As soon as a memory card is inserted the unit automatically checks the card.

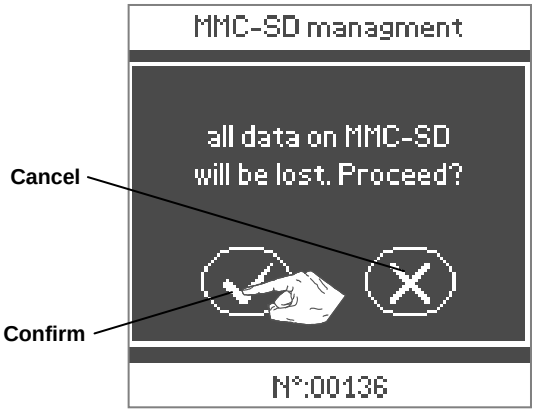
In case the recorder detects that the memory card is damaged or defective, the following screen is shown.
Press the “Confirm” icon and replace the card.



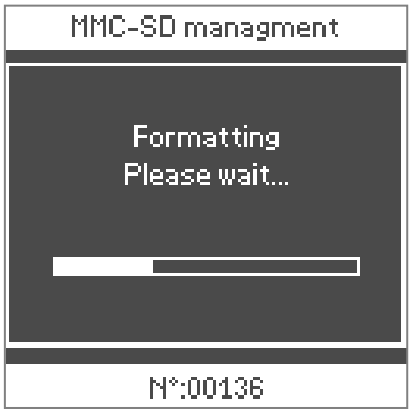
If the card is not formatted or if it is formatted with a different standard (e.g., FAT 12) the following screen is shown.
Press the “Confirm” icon to proceed with the formatting.



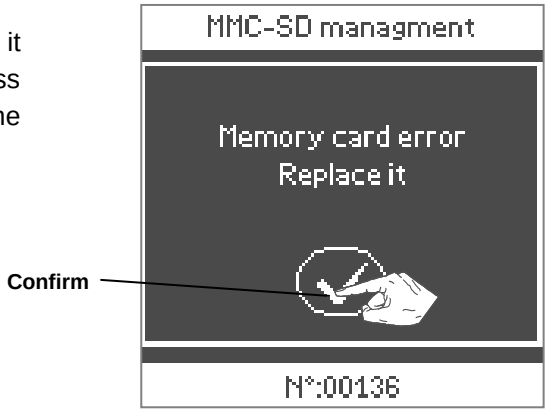
A confirmation screen will appear, warning you that all data will be lost if you proceed with the formatting. Press the “Confirm” icon to proceed or press “Cancel“ to return to the main menu.



If the “Confirm” icon is pressed the formatting begins.

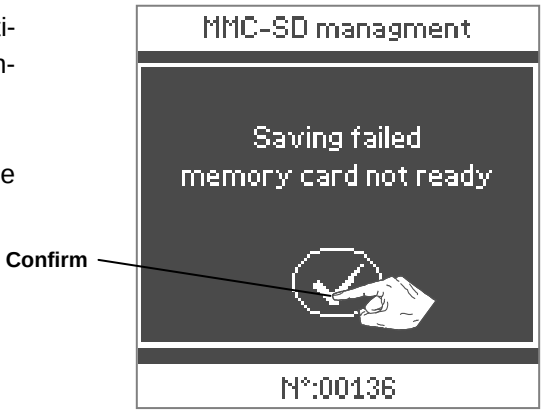


During formatting the system also checks for errors. If it detects any errors the following screen is displayed. Press the “Confirm” icon to return to main menu and replace the card.



12.10 SAVING A FILE

If a memory card is inserted, cycle data is saved automatically on the card at the end of every cycle. Is no card inserted, the following screen will be displayed.
Press the “Confirm” icon to get to the cycle end screen.
You always have the option to print or save data of the most recent cycle (see § 6.4).



NOTE	No activity will take place if a memory card is inserted while a cycle is in progress. At the end of the cycle, the memory card will be verified and cycle data will be saved.

13. TROUBLESHOOTING

Please find below a table of potential problems and easy solutions. For further troubleshooting information please also refer to § 8 (Display messages) and § 9 (Alarms).

PROBLEMS	POTENTIAL CAUSES	SOLUTIONS
The sterilizer remains switched OFF.	The main switch or network circuit breaker is OFF.	Activate the main switch or network circuit breaker (ON).
	No voltage at the socket.	Check the electrical power supply.
	The mains cable is not properly connected.	Plug in the mains cable.
Water is leaking at the front of the sterilizer.	Leaks through the chamber door seal.	Clean or replace the door seal (§ 11.2) and clean the chamber face side.
	Clean water tank got overfilled or sterilizer got tilted.	Stop filling the clean water tank as soon as you hear the audible beep tone. If you tilt the sterilizer some water may leak at the front.
At the end of the cycle, water remains inside the chamber and the load is not perfectly dry.	Countertop not properly leveled.	The sterilizer must be installed on a level surface.
	Overloaded chamber.	Comply with the maximum load weight limits for each type of load (§ 7.1). Always use the chamber rack for trays and cassettes.
	Chamber filter clogged.	Remove and clean the chamber filter (see § 11.4).
	Load incorrectly placed.	Follow the recommendations as listed in Appendix 2.
Oxidation or spots on instruments.	Tap water on instruments when placed in the sterilizer.	Ensure that instruments are dry before they are placed in the sterilizer.
	Use of water of poor quality or water containing chemical substances.	Drain both water tanks (§ 11.8). Use water of good quality (see Appendix 7).
	Organic or chemical residues on the instruments.	Clean, rinse and dry instruments before placing them in the sterilizer (see Appendix 2).
	Contact between instruments of different materials.	Ensure that instruments of different materials do not touch (aluminum, carbon or stainless steel, etc.); place them on different trays or cassettes or bag/wrap them.
	Scale deposits on the chamber.	Clean the chamber and use water of good quality (see Appendix 7).
Instruments are turning brown or black.	Incorrect temperature selected.	Select a sterilization cycle featuring a lower sterilization temperature. Follow the instructions of the instrument manufacturer.

Before sending the sterilizer to technical service, remove the mains cable, empty both water tanks and use the original or appropriate packing.

14. RECYCLING / DISPOSAL INSTRUCTIONS

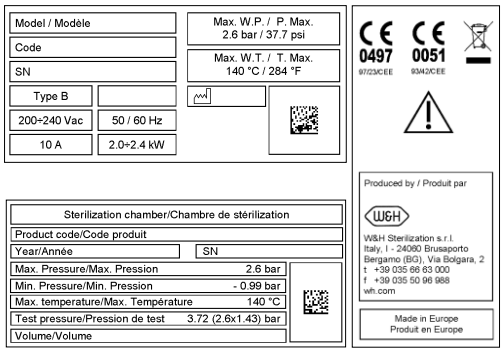
Lisa 517/522 sterilizers are mainly built from fiber-reinforced polymers, metals and electronic components. In case of disposal, separate the various components according to the materials they are made of. Drop the sterilizer with a company that specializes on recycling of related products. Do not abandon the sterilizer in unsecured places.
When disposing of the sterilizer, as well as of used consumables, always refer to current/applicable laws in the country of use.

APPENDIX 1 TECHNICAL CHARACTERISTICS

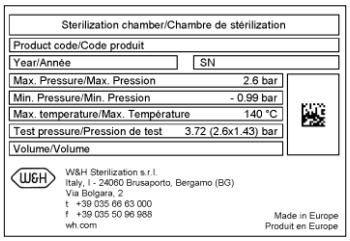
Electrical supply:	Single phase 200-240 VAC (±10%); 50/60 Hz; 10 A
Sterilizer:	
Working temperature	From +5°C to +40°C
Working relative humidity	Max. RH 80% up to 31°C, lineary decreasing to 50% at 40°C
Storage temperature / relative humidity	From -20°C to +60°C / 0-90% (empty tanks)
Max. altitude	3,000 m asl
Min. atmospheric pressure	0.65 barA
Nominal voltage	200 - 240 VAC
Max. absorbed power	2,000 – 2,400 W
Max. current	10 A
Overall dimensions	W 450 mm / H 435 mm / D 599 mm
Max. space required	W 470 mm / H 485 mm / D 650 mm
Size of the door movement	W 360 mm / H 410 mm / D 360 mm
Weight (empty / full loaded)	LISA 517: 40 / 52 kg LISA 522: 50 / 63 kg
Max. heat output	3,000 kJ/hour
Max. noise level	62 dB
Steam generator:	
Power / voltage	2,000 W / 200 VAC
Max. pressure / max. temperature	3 bar / 144°C
Safety overload valve	3 bar
Sterilization chamber:	
Power / voltage	1,000 W / 200 VAC (1,400 W / 240 VAC)
Max. pressure / max. temperature	2.6 bar / 140°C
Safety overload valve	2.6 bar
Total volume	17 l / Ø 250 mm x D 362 mm (LISA 517) 22 l / Ø 250 mm x D 440 mm (LISA 522)
Usable space (identical for all cycles)	12 l / L 195 mm x H 205 mm x D 300 mm (LISA 517) 15.5 l / L 195 mm x H 205 mm x D 385 mm (LISA 522)
Bacteriological filter	0.3 µm debris filter
Distilled or demineralized water:	
Water quality	Conform to EN 13060 Annex C (water conductivity < 15µS/cm)
Min. / max. water consumption per cycle	0.30 l / 0.55 l (full porous load - *LISA 517*) 0.40 l / 0.60 l (full porous load - *LISA 522)*
Tank volume	3.5 l (good for 8 to 12 cycles depending on load type and weight)
Communication:	1 parallel port - 2 serial ports on the back of sterilizer
Miscellaneous:	Fully micro-processor controlled / touch-screen Programmable sleep-mode

STERILIZER featuring type B sterilization cycles conform with following directives and norms :

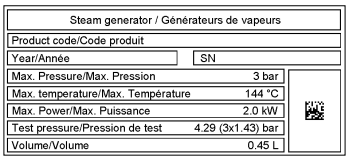
93/42/CEE	Medical Device Directive (MDD)
97/23/CEE	Pressure Equipment Directive (PED)
2002/96/CEE	Waste Electrical and Electronic Equipment (WEEE)
UNI EN 554	Sterilization of medical devices: validation and routine control of sterilization by most heat
EN 13060	Small steam sterilizers
IEC 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use: general requirements
IEC 1010-2-040	Safety requirements for electrical equipment for measurement, control and laboratory use; particular requirements for autoclaves using steam for the treatment of medical materials and for laboratory processes
EN 61326	Electrical equipment for measurement, control and laboratory use EMC requirements



Name plate on the back of the sterilizer



Name plate on the chamber



Name plate on the steam generator

APPENDIX 2 STERILIZATION LOAD PREPARATION

1. Cleaning the instruments

Thorough cleaning of all items prior to sterilization is imperative to ensure effective sterilization. If visible debris and bio-burden is not removed through cleaning prior to sterilization, it will interfere with microbial inactivation and compromise the sterilization process!

- If possible, clean instruments immediately after use; always follow instrument manufacturer instructions.
- Remove all traces of disinfectants from the instruments as this may cause corrosion during the sterilization process. Rinse and dry instruments thoroughly.
- Lubricate dental handpieces after cleaning, prior to sterilization, in accordance with the handpiece manufacturer's instructions.

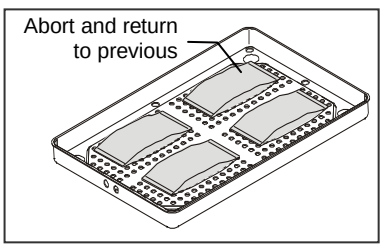
2. Preparing the trays

- Do not overload the chamber; adhere to the maximum load weight limits as listed in "The available sterilization cycles" in this manual.
- Always use the chamber rack to allow adequate steam circulation.
- **Place pouched items on trays with the paper side facing up.**
- Do not overload trays; spread single items on multiple trays.
- Place cassettes in the vertical position (if possible) to enhance drying.
- Place empty containers or non-perforated trays upside down to prevent accumulation of water.
- Items made from different materials (stainless steel, carbon steel, aluminium, etc.) must be placed on separate trays or wrapped/pouched.
- If instruments are manufactured from carbon steel, paper should be placed between them and the sterilizer tray.
- Sterilize hinged instruments (e.g., forceps, extraction pliers, etc.) in the opened position.
- Wrap items with porous wrapping materials to facilitate steam penetration and drying (e.g., sterilization bags for autoclaves).

3. Tubes

- Rinse, drain and dry after washing.
- Place tubes on a tray allowing the ends to remain open. Do not bend tubes.

4. Wrapped / bagged items



- Sterilization bags should be placed on trays allowing adequate space in-between bags.
- **Ensure that packs do not touch the sterilizer chamber walls.**
- **Place sterilization bags with the paper side facing up.**

APPENDIX 3 MAINTENANCE OF DENTAL HANDPIECES

1. External disinfection

This procedure reduces the risk of infection during cleaning and maintenance of the instrument.

- Wear protective gloves during disinfection.
- Refer to the instructions of the instrument manufacturer.
- Avoid using abrasive disinfectants (ph-value 2.5 – 9; no chlorine based disinfectants).
- We recommend the use of disinfectant wipes rather than spray disinfection.
- Do not immerse instruments in disinfectants.

Residual disinfectants on instruments can cause extensive damage to your instrumentation during sterilization (oxidation, alteration of technical characteristics of seals, rubbers, fiber optics, etc.).

2. External cleaning

This procedure involves the removal of residues (blood, dentine, etc.) that adhere to critical areas such as spray outlets, light ports, knurling etc.

- Wear protective gloves during cleaning.
- Refer to the instructions of the instrument manufacturer.
- Use a soft, damp brush and take care not to scratch the surface of the light ports.

3. Lubrication

Once the instrument has been disinfected, cleaned and dried (free from residues), it must be lubricated **prior to** sterilization.

Follow manufacturer's instructions for proper lubrication.

4. Packaging

In order to preserve sterility, rotating instruments should be wrapped prior to sterilization. Follow the manufacturer's packing instructions when using sterilization packaging (also see "Sterilization load preparation" in the appendix section of this manual).

APPENDIX 4 BOWIE AND DICK TEST

The Bowie & Dick (B&D) Test device, also called Steam Penetration Test device, is representative of the small porous type load. It comprises several sheets of paper wrapped in a small packet in the middle of which there is a chemical heat-sensitive indicator sheet.

This test is used to validate the sterilizer performance in terms of textile load sterilization, that is:

- Pre-vacuum efficiency and thus steam penetration
- Temperature and pressure parameters of saturated steam achieved during the plateau/holding time.

The Bowie & Dick test cycle profile is identical to the profile of the B UNIVERSAL 134 sterilization cycle, with the following differences:

- The plateau period (PR) is shorter (3 minutes 30 seconds instead of 4 minutes), assuring a 30 seconds security margin.
- The drying time is reduced to 4 min to not affect the chemical indicator through drying and to save time. It is therefore normal that the test pack will be wet at the end of the test cycle.

How to carry out the test:

- The test must be performed in an empty chamber (EN 13060) without load but with the standard chamber accessories (chamber rack and trays) mounted.
- Place the Bowie & Dick test pack in the center of a tray in the lowest rack position.
- Select and initiate the **Helix / B&D** test cycle from the **"Test cycles"** submenu.

- Once the cycle is finished, open the sterilizer door and remove the test pack.

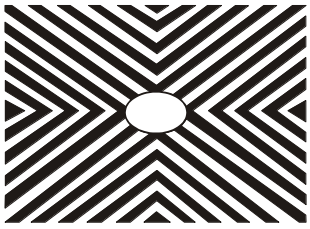
CAUTION: The packet will be hot!

For correct interpretation of the test results, refer to the instructions of the test pack manufacturer.

- Remove the indicator sheet from the center of the test pack and check the change in colour as explained below:

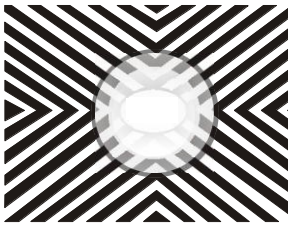
TEST PASSED

The entire surface of the indicator sheet has changed colour



TEST FAILED

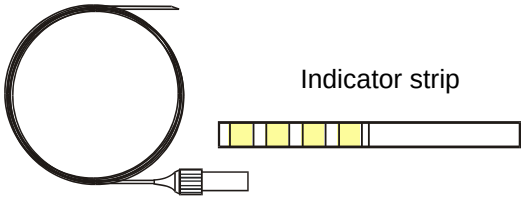
Certain areas of the indicator sheet have not changed colour, e.g., the central part has not turned dark due to an air pocket in the center of the test pack



Any unexpected colour change, such as the center of the indicator sheet being paler or of a different colour than the edges, indicates that there was an air pocket present during the cycle due to sterilizer malfunction. If the test fails repeatedly call technical service. Follow local/national guidelines on the frequency of testing.

APPENDIX 5 HELIX TEST

The Helix Test device is representative of the type A hollow load (EN 13060). It consists of a 1,500 mm long tube that is open on one side and closed with a capsule on the other side. An indicator strip is placed inside of the capsule.



This test is used to validate the sterilizer performance in terms of hollow A load sterilization, that is:

- Pre-vacuum efficiency; rapid and uniform steam penetration.
- Temperature and pressure of saturated steam achieved during the plateau/holding phase.

The Helix Test cycle profile is identical to the profile of the B UNIVERSAL 134 sterilization cycle with the following differences:

- The plateau period (PR) is shorter (3 minutes 30 seconds instead of 4 minutes), assuring a 30 seconds security margin.
- The drying time is reduced to 4 min to not affect the chemical indicator result through drying and to save time.

How to carry out the test:

- The test must be performed in an empty chamber (EN 13060) without load but with the standard chamber accessories (chamber rack and trays) mounted.
- Place an indicator strip inside the capsule. See the test manufacturer instructions.
- Close the capsule.

- Place the Helix Test in the center of a tray in the lowest rack position.
- Select and start the B&D / HELIX test cycle from the “Test cycles” submenu.

- Once the cycle is completed, open the sterilizer door and remove the test.

CAUTION: The test will be hot !
For correct interpretation of the test results, refer to the instructions of the test manufacturer.

- Remove the indicator strip from the capsule and check the change in colour as explained below:

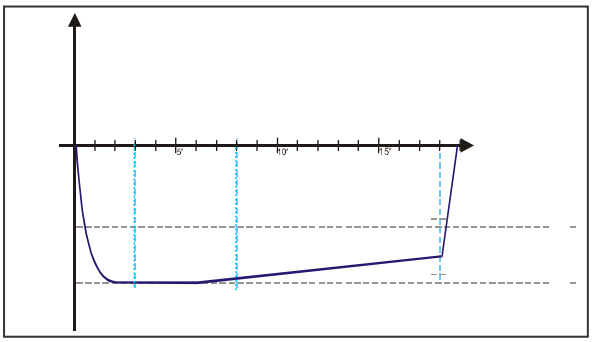
PASSED	FAILED
The chemical indicator has turned dark.	Part of the chemical indicator has not turned dark; e.g. due to residual air inside the capsule.

Insufficient colour change of the indicator strip indicates that there was an air pocket present during the cycle due to sterilizer malfunction. If the test fails repeatedly call technical service. Follow local/national guidelines on the frequency of testing.

APPENDIX 6 VACUUM TEST

Use this test to validate the performance of the sterilizer in terms of leakage. During the test the following is checked:

- Efficiency of the vacuum pump.
- Tightness of the pneumatic circuit.



The cycle profile specific for this test includes:

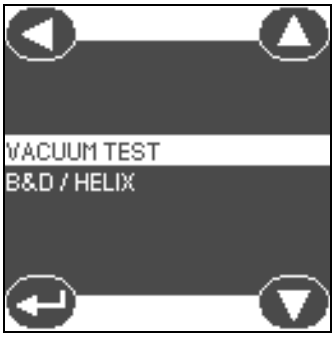
- A vacuum phase up to P1 (-0.87 bar).
- A stabilization period of 5 min.
  => T2. Reading of P2.
- A testing period of 10 min.
  => T3. Reading of P3.

The microprocessor makes the following calculation: P3 - P2. The result must be less than 0.013 bar.

⚠	**When performing a Vacuum Test, the sterilizer chamber must be completely dry and cold. By not following this instruction, the Vacuum Test might fail even if the sterilizer works properly.**

How to carry out the test:

Select and initiate the Vacuum Test cycle from the "Test cycles" submenu.



A display message will inform at the end of the test cycle if the test passed or failed. If the test failed, check, clean or replace the door gasket, clean the chamber face side and repeat the test. If the test fails repeatedly call technical service. Follow local/national guidelines on the frequency of testing.

APPENDIX 7 WATER QUALITY

W&H Lisa sterilizers use distilled or demineralized water to generate steam for the sterilization process. Water quality sensors constantly monitor the quality of the water used for sterilization as water of too high mineral content can seriously damage the sterilizer and impair the sterilization process.
The total mineral content of water used for sterilization has to be lower than 10 ppm (parts per million) or if a conductivity meter is used to check the water quality, the conductivity has to be lower than 15 µs/cm.
The table below lists the water quality to be used for steam sterilization (see EN 13060 APPENDIX C).

Contaminants of feed water

	Values
Evaporate residue	< 10 mg/l
Silicon oxide, SiO_2	< 1 mg/l
Iron	< 0,2 mg/l
Cadmium	< 0,005 mg/l
Lead	< 0,05 mg/l
Rest of heavy metals, excluding iron, cadmium, lead	< 0,1 mg/l
Chloride	< 2 mg/l
Phosphate	< 0,5 mg/l
Conductivity (at 20°C)	**< 15 µs/cm**
pH value	5 - 7
Appearance	colorless, clean, without sediment
Hardness	< 0,02 mmol/l

If the sterilizer generates a display message in regards to poor water quality, check the water source (refer to the water treatment system user manual; replace resin cartridge etc.). In case distilled or demineralized water is purchased from the market, switch to a brand of better quality.

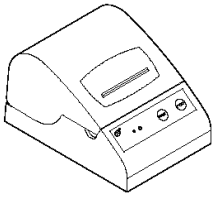
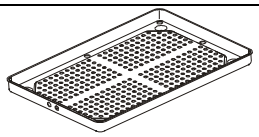
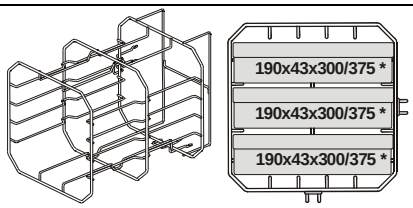
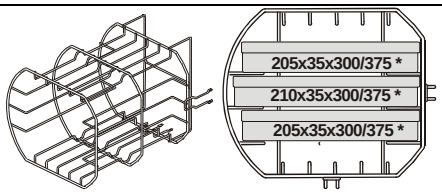
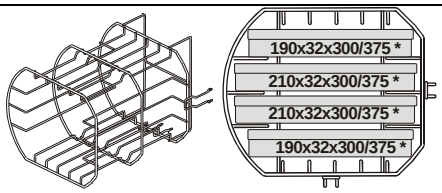
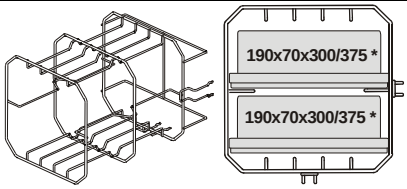
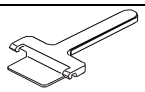
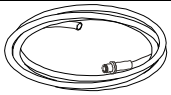
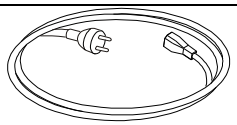
The use of water with a conductivity greater than 15µS/cm may affect the sterilization process and damage the sterilizer (EN 13060). A conductivity greater than 50µS/cm may strongly affect the sterilization process and seriously damage the sterilizer.
The use of water for steam generation with contaminants at levels exceeding those listed in the table above, can greatly shorten the working life of the sterilizer and void the manufacturer's warranty.

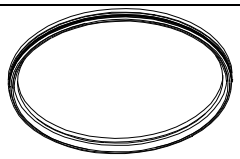
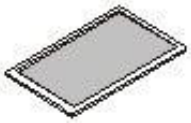
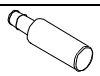
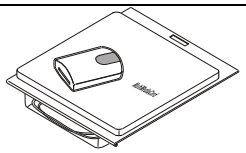
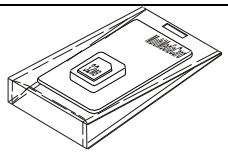
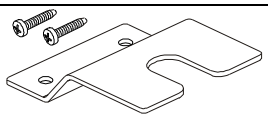
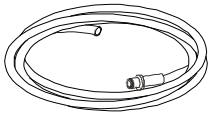
APPENDIX 8 EXAMPLE OF A CYCLE DATA REPORT

```
LISA 517  06-5790 0.0.0.0
-------------------------------------
        Dr. Smith
Cycle:    B UNIVERSAL 134
Number:   01898

Date:     02/05/06 10:12:30
Phase     Time  part.  T °C   P Bar
-------------------------------------
Start     00:00         050,   +0,00
PV1       04:25  04:25  056,2  -0,85
PP1       05:05  00:40  099,8  -0,05
PV2       06:41  01:36  073,0  -0,80
PP2       07:16  00:35  100,9  +0,06
PV3       08:35  01:19  082,5  -0,80
PP3       09:09  00:34  100,7   0,05
PV4       09:45  00:36  090,2  -0,51
PPH       15:25  05:40  135,1  +2,17
-------------------------------------
PRs       15:40  00:00  135,6  +2,15
          MIN    06:15  135,6  +2,15
          MAX    04:45  135,7   -.-
MIN       00:20  -.-    +2,08
MAX       06:01  -.-    +2,18
PRe       22:00  06:20  135,6  +2,17
-------------------------------------
DVs       22:00  00:00  135,6  +2,17
DO1       00:00  00:00  22,0   -0,02
DO2       00:00  00:00  22,0   -0,02
DO3       00:00  00:00  22,0   -0,02
DO4       00:00  00:00  22,0   -0,02
DO5       00:00  00:00  22,0   -0,02
DO6       00:00  00:00  22,0   -0,02
DVe       24:30  02:30  094,5  -0,71
SEP       25:20  00:50  095,9  -0,05
LEV       26:05  00:45  092,6  +0,00
-------------------------------------
END       26:05  0:00   092,6 +0,00
-------------------------------------
Date: 02/05/06 11:41:14
Cycle completed
```

APPENDIX 9 ACCESSORIES

DESCRIPTION	ORDERING NUMBER
LisaPrint 	A70010xx
Perforated anodized aluminium tray 	F523204x (*Lisa 517*) F523205x (*Lisa 522*)
Chamber racks: Chamber rack (Europe) 	F523008x (*Lisa 517*) F523009x (*Lisa 522*)
Chamber rack (USA) 	F523020x (*Lisa 517*) F523021x (*Lisa 522*)
Chamber rack (for 4 cassettes) 	F523012x (*Lisa 517*) F523015x (*Lisa 522*)
Chamber rack (for 2 implant cassettes) 	F523016x (*Lisa 517*) F523017x (*Lisa 522*)
Tray holder 	F523001x
Drain tube 	S230900x
Mains cable 	U38010xx
Funnel	F540903x
Bacteriological filter	W322400x

DESCRIPTION		ORDERING NUMBER
Door seal		F460504x
Dust filter		F364502x
Wall spacer		F190107x
Memory card USB reader		A801002x
Memory card		A801001x
Safety bracket +screws		X051019x
Used water tank continuous drain kit		G005306x

APPENDIX 10 HELIX TEST DOCUMENTATION FORM

Documentation

For the documentation of sterilization cycles

After the sterilization process the chemical indicator strip that was used in the “Helix Test” should be attached here (the strip comes with an adhesive part). The sterilization process was successful when the previously yellow marked spots turned to a consistent dark color.

Operator No. 1:_____ Operator No. 2:_____

Operator No. 3:_____ S/N of the sterilizer _____

Date	Cycle No.	Operator No.	Released Yes - No	Signature	Chemical indicator
			❒ ❒		
			❒ ❒		
			❒ ❒		
			❒ ❒		
			❒ ❒		
			❒ ❒		
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Authorized W&H service partners

Find your nearest W&H service partner at http://wh.com
Simply go to the menu option »Service« for full details. Alternatively please contact:

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Manufacturer

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wh.com

ISO 13485,
93/42/EEC – Annex II

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