Tuttnauer
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Operation and Maintenance Manual

T-Lab Eco

Models T-Lab Eco V60 & V85

CE

Cat. No. MAN205-0503001EN Rev. C March 2023

Tuttnauer Europe b.v., Hoeksteen 11, 4815 PR Breda,
P.O. Box 7191, 4800 GD Breda, Netherlands. Tel: +31/76-5423510, Fax: +31/76-5423540

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1. General Information

1.1 Manufacturer and Authorized Representative Information

 T-Lab Eco Autoclave is manufactured by Tuttnauer Europe b.v., Hoeksteen 11, 4815 PR Breda, P.O. Box 7191, 4800 GD Breda, Netherlands. Tel: +31/76-5423510, Fax: +31/76-5423540

1.2 Introduction

 **Attention!**

This device is not a medical device and not intended for medical use.

The autoclave is a laboratory sterilizer designed especially for the sterilization of instruments, liquids, and other materials in laboratories, research institutes, food laboratories and pharmaceutical facilities.

The autoclave is fully automatic (a computerized control unit ensures a fully automatic sterilization cycle, control and monitoring of physical parameters and a clear documentation of the sterilization cycle).

This autoclave uses steam as a sterilizing agent. The steam is produced by warming up a controlled amount of water inside the chamber.

A touchscreen is used for monitoring and control purposes.

The printer is an optional addition to the autoclave. The printer prints the preset and actual parameters of the cycle (temperature and time).

The device features built-in memory to record up to 999 sterilization cycles. These can be exported to a USB device to be transferred to a PC.

The device has a built-in Network Port for use with optional Tuttnauer's R.P.C.R software when connected to your local network.

 **Only technical personnel having proper qualifications, holding technical documentation and adequate test instrumentation are authorized to undertake repair or service.**

1.3 Applicable Regulation and Quality Standards

Every autoclave meets the provisions of the following Directives and is in compliance with the following Standards:

ISO 9001:	Quality Management System
ISO 14001:	Environmental management system
2014/68/EU	Pressure Equipment Directive
ASME Section VIII Division 1	
IEC 61010-1 / UL 61010-1:	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements
IEC 61010-2-040:	Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 2-040: Requirements for sterilizers and washer-disinfectors used to treat medical materials
EN 61326-1:	EMC Requirements for Electrical Equipment
ETSI EN 301 489-1	Electromagnetic compatibility (EMC) standard for radio equipment and services - Part 1: Common technical requirements; Harmonized Standard for Electromagnetic Compatibility.
ETSI EN 301 489-17	Electromagnetic compatibility (EMC) standard for radio equipment and services - Part 17: Specific conditions for Broadband Data Transmission Systems, Harmonized Standard for Electromagnetic Compatibility.

1.4 Legend for Symbols appearing on the Labels and in this manual

	Manufacturer
	European Authorized Representative
	Year of Manufacturing
	Model Number
	Serial Number
	Consult the Operation and Maintenance Manual (User Manual) before use
CE1128	European compliance Mark of compliance with the European Pressure Equipment Directive (Number xxxx identifies the Notified Body that performed the examination)
	Keep away from sunlight and protect from heat.
	For Indoor Use Only
	Keep dry

	Disposal according to electronic scrap ordinance
	This side up (during transport and shipment)
	Fragile (during transport and shipment)
 OR 	A warning or precaution as detailed in the Operation and Maintenance Manual (User Manual)
 OR 	Caution! Hot Surface
	Protective conductor terminal

1.5 Incoming Inspection

Upon receiving your Tuttnauer Autoclave, carefully inspect the outside of the shipping carton for signs of damage. If any damage to the carton is found, note the location with respect to the autoclave and check that area of the autoclave carefully once it is fully unpacked. Observe packing method and retain packing materials until the unit has been inspected. Mechanical inspection involves checking for signs of physical damage such as: scratched panel surfaces, broken knobs, damaged gasket etc.

If any damage is found, contact your dealer as soon as possible so that they can file a claim with the shipping carrier and also notify Tuttnauer.

All Tuttnauer products are carefully inspected prior to shipment and all reasonable precautions are taken in preparing them for shipment to assure safe arrival at their destination.

1.6 Warranty Description

The warranty does not include and does not replace routine treatment and preventive maintenance to be performed according to the instructions in Preventive and Scheduled Maintenance.

This product is sold with a limited warranty and specific remedies are available to the original purchaser in the event that the product fails to conform to the limited warranty.

In general, and in a non-limited manner, Tuttnauer shall not be responsible for product damage caused by natural disasters, fire, static discharge, misuse, abuse, neglect, improper handling or installation, unauthorized repair, alteration, or accident.

Tuttnauer's obligation is limited to the repair or replacement of parts for the device. This warranty will be void if the unit is not purchased from an authorized Tuttnauer dealer. No other warranties or obligations are expressed or implied.

The Autoclave should not be used in a manner not described in this manual!

1.7 Warranty Statement

The warranty registration must be completed and returned to our service departments; within fourteen (14) days of purchase or the warranty will be void.

Our Technical Service Department can be reached at:

Tuttnauer Europe B.V., Hoeksteen 11 4815 PR P.O. Box 7191 4800 GD Breda, The Netherlands

✆ Tel: 31 (0) 765423510, 🖷 Fax: 31 (0) 765423540, Email: info@tuttnauer.nl

Note: If there is any difficulty with this autoclave, and the solution is not covered in this manual, contact our representative or us first. Do not attempt to service this autoclave yourself. Describe the difficulty as clearly as possible so we may be able to diagnose the problem and provide a prompt solution.

If replacement parts are needed, stipulate the model and serial number of the machine.

No autoclaves will be accepted for repair without proper authorization from us. All transportation charges must be paid both ways by the owner.

2. Safety Instructions

The autoclave has unique characteristics. Please read and understand the operation instructions before first operation of the autoclave. The following issues may require instructions provided by the manufacturer: how to operate the autoclave, the door safety mechanism, the dangers involved in circumventing safety means, how to ensure that the door is closed, and how to select a correct sterilization program.

Make sure that you know where the main power switch is located.

Autoclave maintenance is crucial for the correct and efficient function of the device. We enclose a log booklet that includes maintenance recommendations, with every device.

The weekly spore test is part of the preventive maintenance plan, along with the annual validation of the sterilization processes that ensures appropriate temperature dispersion within the chamber.

Never use the autoclave to sterilize corrosive products, such as: acids, bases and phenols, volatile compounds, or solutions such ethanol, methanol, or chloroform nor radioactive substances.

1. Never start using a new autoclave before the safety, licensing and authorization department has approved it for use.
2. All autoclave users must receive training in proper usage from an experienced employee. Every new employee must undergo a training period under an experienced employee.
3. A written procedure must be established for autoclave operation, including: daily safety tests, seal inspection and door hinge inspection, smooth action of the closing mechanism, chamber cleaning, prevention of clogging and preservation from corrosion, what is permitted and what is prohibited for sterilization and choosing a sterilization program.
4. Liquids may be sterilized only with the “liquids” programs. The container must be covered but not sealed. Sealed bottles may only be sterilized using a special program. The bottle must be either Pyrex or a Borosilicate glass bottle. Verify that the two temperature sensors are located inside two different bottles to assure that the liquid temperature is 10°C below boiling temperature for sealed bottles at the end of the cycle.
5. When sterilizing plastic materials, make sure that the item can withstand sterilization temperature. Plastic that melts in the chamber is liable to cause a great deal of damage.
6. Individual glass bottles may be placed in a basket. Never place glass bottles on the floor of the autoclave. Never fill more than the indicated bottle volume.
7. On closing the autoclave's door, make sure it is properly locked before activating.
8. Before withdrawing baskets, wear heat resistant gloves.
9. Before opening the door, verify that there is no pressure in the chamber (chamber pressure gauge is located on the autoclave's front panel).
10. Open the door slowly to allow steam to escape and wait 5 minutes before you remove the load. When sterilizing liquids, wait 10 minutes.
11. Once a month, ensure that the safety valves are functioning, and once a year a certified tester must conduct pressure chamber safety tests.
12. Once a year , or more frequently, effective tests must be performed, i.e., calibration and validation.

13. Examine the condition of assemblies on a regular basis. Make sure there are no leaks, breaks, blockages, whistles, or strange noises.
14. It is required to conduct maintenance operations as instructed.
15. Immediately notify the person in charge of any deviation or risk for the proper function of the device.

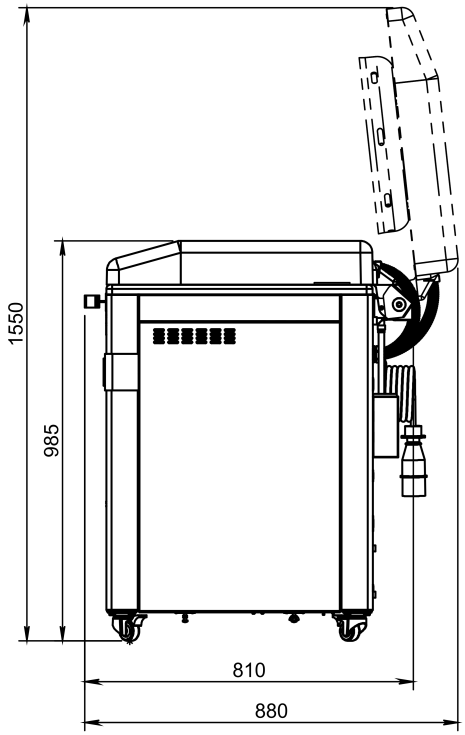
2.1 Safety Features

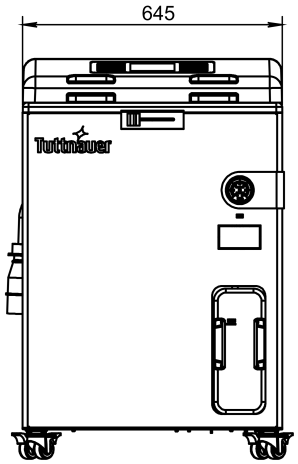
This autoclave includes built-in safety features such as:

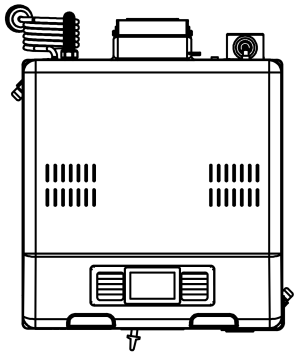
- Error message display
- Electronic temperature measurement
- Safety relief valve to avoid excessive pressure build-up
- Door switches enabling operating the device only when the door is closed and locked
- Water level safety device
- Excess temperature protection

3. Device Specifications

3.1 Device Overall Dimensions







3.2 Device Properties

Property		Dimension	
		V60	V85
Overall dimensions	Depth	810 mm	
	Width	645 mm	
	Height	985 mm	
Chamber	Diameter	390 mm	
	Height	505 mm	700 mm
Maximum dimensions (door open)	Depth	880 mm	
	Height	1550 mm	
Net weight		111 kg	120 kg
Shipping volume		0.92 m^3	
Shipping weight		141 kg	150 kg
Shipping dimensions	Depth	900 mm	
	Width	820 mm	
	Height	1250 mm	
Maximum allowable working pressure (MAWP)		2.9 bar	2.8 bar

3.3 Device Electrical Data

Property	Value	
	V85	V60
Total Power	5400W	3000W
Voltage	1Ph / 220-240VAC	
Amperage	22.3A	13.1A
Protection against electrical shock	IEC 61010-1	
Mains supply fluctuation	+/- 10%	
Frequency (Hz)	50/60Hz	

3.4 Utility Requirements

Property	Value	
	V85	V60
Mineral free water	See table in Water Quality	
Power supply	1 phase, 230VAC ±10%, 50/60Hz	
Recommended circuit breaker	32A	16A
Maximum altitude	Max. altitude - up to 3000 m above sea level	
Pollution degree	Pollution degree 2	
Over-voltage category	Category 2	

Caution!

In order to avoid any injury by electrical hazard, it is recommended that a ground fault protection device (GFCI) be installed in the electrical panel feeding the autoclave (local codes may make this mandatory).

The electrical network must comply with local rules and regulations.

Verify that there is an easy access to the main power switch and to the current leakage safety relay (GFCI). The voltage supplied to the device must comply with the label ± 10%.

3.5 Water Quality

The distilled or mineral-free water supply to the autoclave shall be according to the table below:

Suggested Maximum Limits of Contaminants in Water for Steam Sterilization per EN13060

Substance	Feed Water	Condensate
Evaporate residue	≤ 10 mg/l	≤ 1.0 mg/l
SiO_2	≤ 1 mg/l	≤ 0.1 mg/l
Iron	≤ 0.2mg/l	≤ 0.1mg/l
Cadmium	≤ 0.005 mg/l	≤ 0.005 mg/l
Lead	≤ 0.05 mg/l	≤ 0.05 mg/l
Rest of heavy metals except iron, cadmium, lead	≤ 0.1 mg/l	≤ 0.1 mg/l
Chloride (Cl)	≤ 2 mg/l	≤ 0.1 mg/l
Phosphate	≤ 0.5 mg/l	≤ 0.1 mg/l
Conductivity (at 20°C)	≤15 µs/cm	≤ 3 µs/cm
pH value	5 to 7.5	5 to 7
Hardness	≤ 0.02 mmol/l	≤ 0.02 mmol/l
Appearance	Colorless, clean, without sediments	

Compliance with the above data should be tested in accordance with acknowledged analytical methods, by an authorized laboratory.

Caution:

The use of water for autoclaves that do not comply with the table above may have severe impact on the working life of the sterilizer and can invalidate the manufacturer's warranty.

Use only deionized water, having a maximum conductivity of 15 µs/cm. Conductivity greater than 15 µs/cm may cause failures.

To detect the proper water level, the minimum conductivity of the mineral-free water should be above 1 µs/cm.

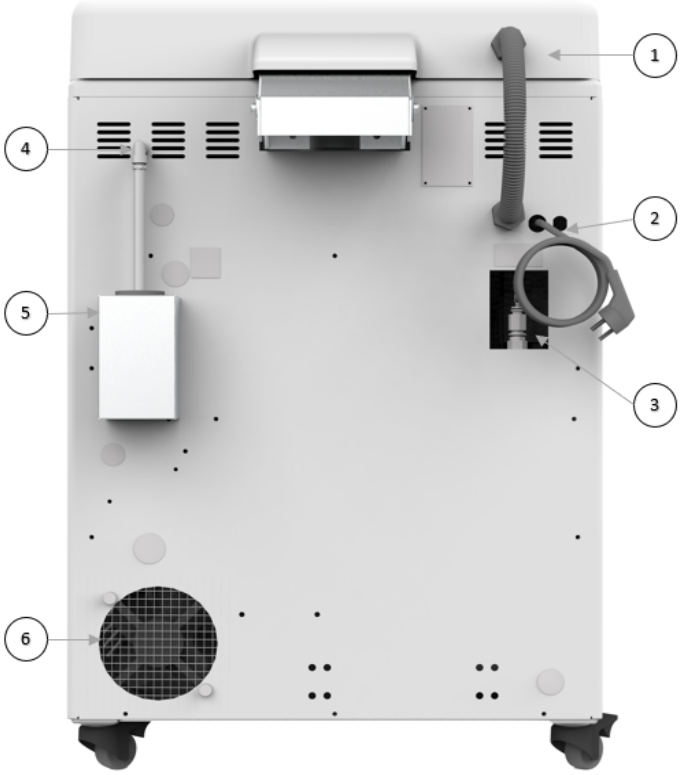
Note: We recommend testing the water quality once a month. The use of water for autoclaves that does not comply with the table above may have severe impact on the working life of the sterilizer and can invalidate the manufacturer's warranty.

4. Depiction of System Parts

4.1 Front View

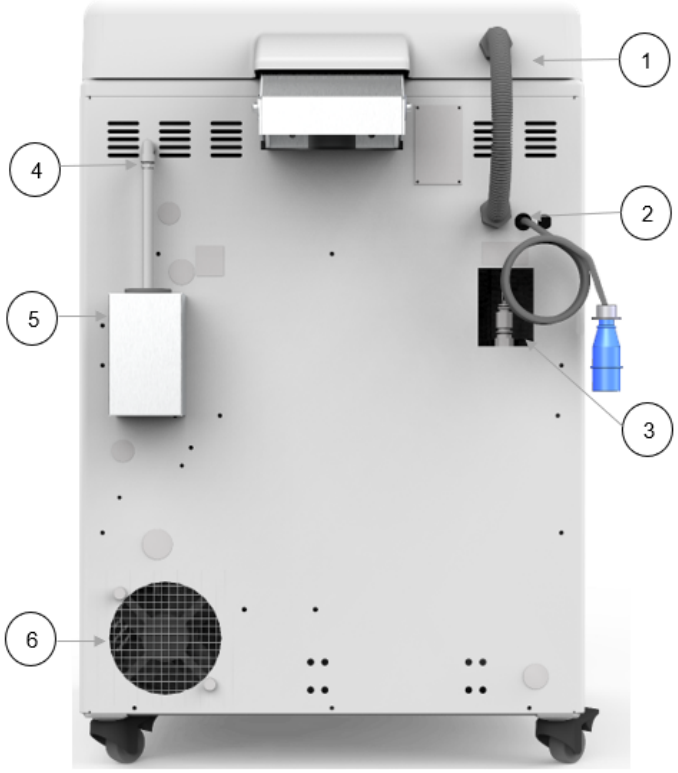
No.	Description	No.	Description
1	Control Panel - Touch Screen	5	USB Port
2	Chamber Lid	6	Drainage Water Tank
3	Lock Lever	7	Aeration Ventilation Opening
4	Pressure Gauge	8	ON/OFF Switch

4.2 Rear View - T-Lab Eco V60



No.	Description	No.	Description
1	Cable Routing	4	Exhaust Tube
2	Electrical Cord	5	Water Funnel Tank
3	Safety Valve	6	Cooling Fan

4.3 Rear View - T-Lab Eco V85



No.	Description	No.	Description
1	Cable Routing	4	Exhaust Tube
2	Electrical Cord	5	Water Funnel Tank
3	Safety Valve	6	Cooling Fan

5. Installation Instructions

5.1 Lifting and Carrying

Cautions!

Before moving the autoclave, make sure that the electric cord is disconnected from the power, and there is no pressure in the chamber.

Do not drop the device!

To avoid injuries, lifting and carrying should be done with at least two persons or by using a fork-lift or any other mechanical aid.

5.2 Device Placement and Operating Instructions

- The autoclave is intended to work in 'indoor' conditions only.
- Only autoclavable materials shall be used.
- The environment shall not exceed an ambient temperature range of 5ºC (41ºF)-40ºC (104ºF) and a relative humidity of 85% respectively.
- The autoclave shall not be used in a manner not specified in this manual!
- Do not use the autoclave in the presence of dangerous gases.
- The packed or unpacked device shall be stored in 'indoor' conditions.
- Operate the autoclave only in the manner specified in the manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Keep the autoclave at approx. 10 cm between the back and the wall and approx. 20 cm between the sides and the wall. This will enable ventilation and facilitate the device disconnection.

Caution! Insufficient space for ventilation may result in malfunction or damage due to overheating

5.3 Connection to Utility Supplies

1. Check and verify that the power supply is a 1 phase, 220-240V AC ±10%, 50/60Hz.
2. Check and verify that the electrical net is protected by a current leakage safety relay.
3. Applicable for T-Lab Eco V85 only - The industrial plug rated 220-240V AC, 50/60Hz, 32A is certified according to IEC60309 for Europe, and UL498 for the US, and should be used for the mains connection of the appliance.

   The mains disconnect device is 32A 2-pole circuit breaker, provided with the appliance.

5.4 Storage

After the removal of the autoclave from the package, we recommend the following:

Keep the device dry.

Keep the device away from sunlight and protect it from heat.

5.5 Initial Operation of the Device

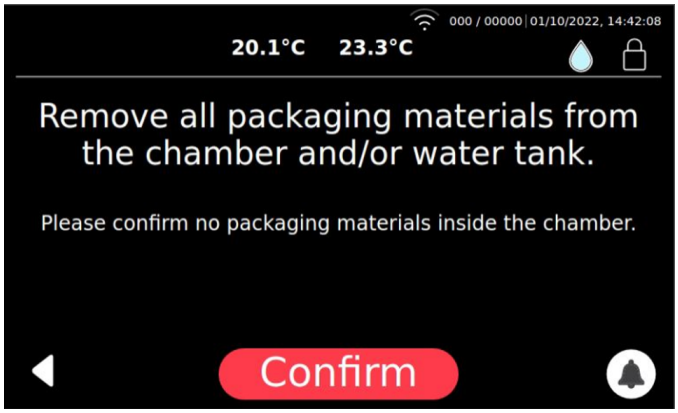
Note: Remove all packaging material before turning ON the device.

1. Plug the electrical cord into the wall outlet.
2. Turn ON the ON/OFF Switch located on the left side of the device.
3. Fill the Chamber with approx. 8 liters of mineral-free water.
4. Fill the Condensation tank, located inside the device, with approx. 6 liters of water.

5. Press  , to set the required language from the **Set language** screen below:

6. Press  .

7. Confirm from the screen below, the removal of all packaging materials from the chamber and water tank.

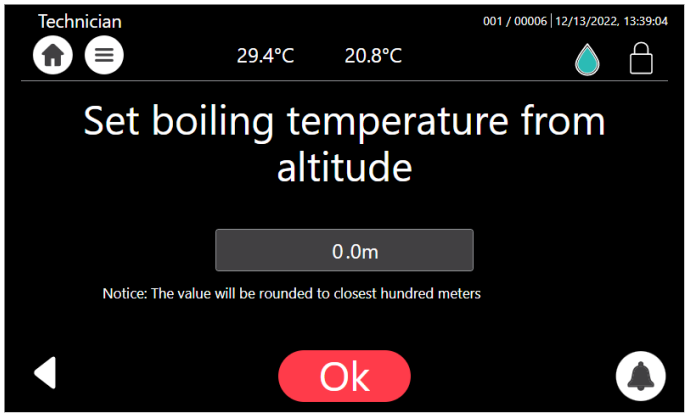


Important!

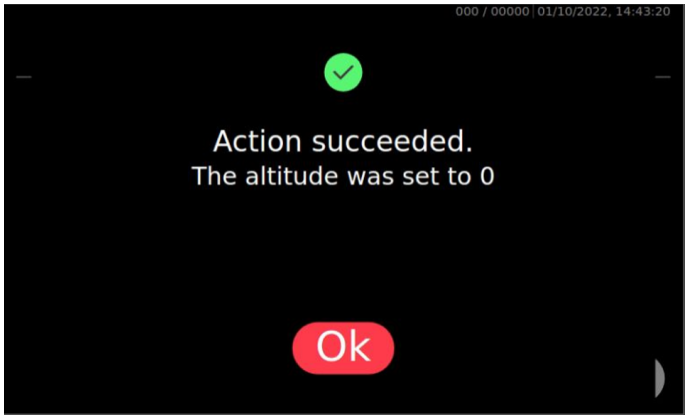
Reset the Local Altitude prior to operating the Autoclave for the first time.

To reset the Local Altitude:

1. Log in as technician from the **Quick option** screen and press **Settings**  .
2. Browse to **Maintenance**/**Set boiling temperature from altitude**.
3. The following screen is displayed.



4. Press Ok.



Wi-Fi Configuration

Prior to operating the autoclave for the first time, please connect the Wi-Fi and ensure it remains connected at all times.

The Wi-Fi connection is used for uploading all data from devices in the field, to the online company's server.

This data is used for:

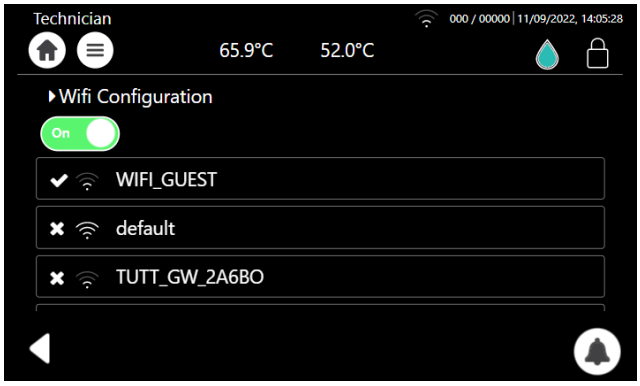
- Monitoring
- Viewing and downloading device history
- Software updates while validating the integrity of the update (applicable for users with Tuttnauer code)

The data is backed-up on the device main board.

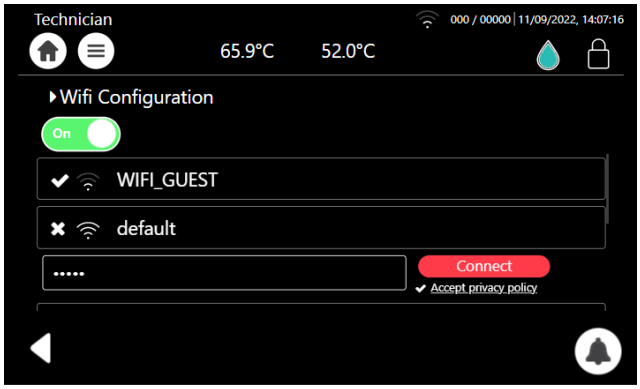
Note: In case of connection failure, the data may be exported manually.

To connect the Wi-Fi:

1. In the **Quick Option** screen, press the **Wifi Configuration** option .
2. To enable the connection, press .
3. The **Wifi Configuration** screen is displayed with the available networks.



4. Select your network, enter your **Password** and press the **Accept privacy policy**.

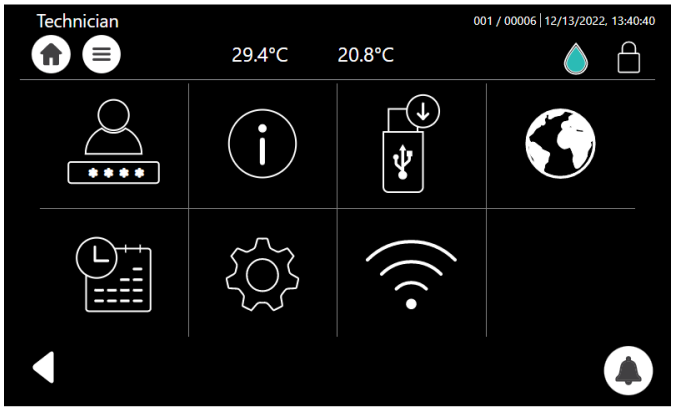


5. Press Connect.
6. The Wi-Fi is connected successfully. Press Ok.

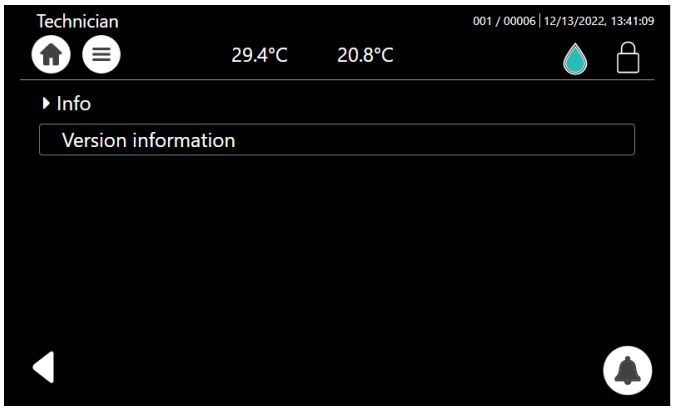
Version Information

Before starting the Autoclave, we recommend you check the **Version information**.

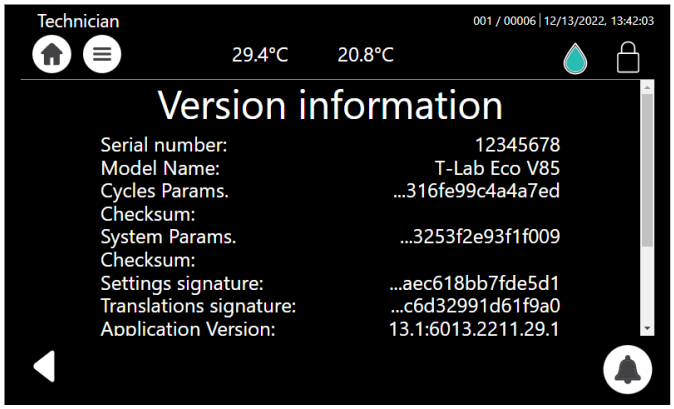
1. From the **Quick Option** screen, press **Info**  .



2. From the **Info** screen, select the **Version information**.



3. The **Version information** is displayed. For an example, see below:



4. Press  to return to the main screen.

6. Pre-sterilization Cleaning and Disinfection of Instruments and their Loading into the Device

 **Caution!**	**Never use the autoclave to sterilize corrosive products (acids, bases, or phenols) volatile compounds or solutions (ethanol, methanol or chloroform), or radioactive substances.**

The most important stage begins with removing debris by cleaning and rinsing. Effective cleaning is affected by several factors: water quality, type, concentration and quality of a cleaner, effective washing method, and adequate rinsing and drying.

The basic principle determining the size, mass and contents of instruments, is that the contents are sterile immediately on completion, and removal from the sterilizer chamber.

1. Follow the instrument manufacturer instructions.
2. After cleaning, rinse instruments for 30 seconds. (Follow manufacturer's instructions on the use of products for cleaning and lubricating instruments after using the ultrasonic cleaner).
3. If the unit is equipped with a printer, verify if a new roll of paper is necessary.

6.0.1 **Instruments**

1. Before placing an instrument onto the sterilizer baskets, ensure that instruments that are not constructed of the same metal (stainless steel, carbon steel, etc.) are separated and placed in a different place.
2. Place empty containers upside down to prevent accumulation of water.
3. In case carbon steel instruments are placed in stainless steel baskets, the baskets should be lined with a towel or paper wrap before placing the instruments on the baskets. There should be no direct contact between the carbon steel and the stainless-steel baskets.
4. All instruments must be sterilized in an open position.
5. Place a sterilization indicator strip in each basket.
6. Place instruments with ratchets opened and unlocked or clipped on the first ratchet position.
7. Disassemble or sufficiently loosen multiple-part instruments prior to packaging to permit the sterilizing agent to come into contact with all parts of the instrument.
8. Tilt on edge items prone to entrap air and moisture, e.g. hollowware, so that only minimal resistance to removal of air, the passage of steam and condensate will be met.
9. Make sure that all instruments remain apart during the sterilization cycle.
10. Load the basket loosely to capacity.

6.0.2 **Liquids**

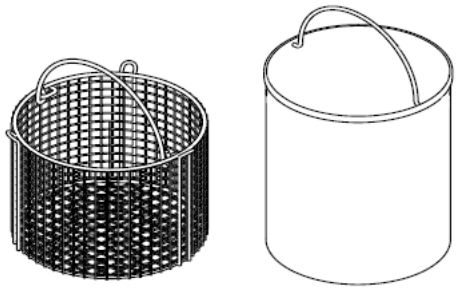
1. Use only heat- proof glass containers.
2. For Slow exhaust cooling (without air) the glass container should be covered but unsealed.
3. Place the two temperature sensors into two separate liquid containers. These are used to control the program temperature and ensure the safety of the operating cycle.

6.0.3 **Loading**

The loading of goods and instruments is done by means of two stacked baskets. The baskets are provided with handles for the convenience of the operator.

There are two types of baskets:

1. Baskets that are fully perforated.
2. Baskets that are not perforated. These baskets are recommended for waste cycles, to avoid clogging of the vessel's drainage pipe by overflowing liquids.



7. Operating Instructions

7.1 Turning on the Device

To avoid injuries, verify the pressure is 0 MPa before lifting the Chamber Lid.

1. Plug the electric cord into the power source.
2. Turn ON the power switch located on the left side of the device.

3. Open the sterilizer by sliding right the Lock Lever to the UNLOCK position, and lift the Chamber Lid.

Do not move the lock lever when the power is off!

4. Verify the water level in the drainage water tank is lower than the HIGH level. Drain regularly!

Warning!

Be careful the surfaces may be hot! Avoid placing your hand or any other part of your body in the location of the drainage water tank.

7.2 Filling Water

Cautions!

In the beginning of each day, check the water level in the chamber.

Note: The Improper Water level icon appears when the chamber needs to be filled.

A general alarm symbol will appear.

The Proper Water level icon appears when the chamber is properly filled.

1. Pour distilled water directly into the chamber. Verify the water level is below the bottom plate (approx. 8 liters).

   Note: Use only water having the characteristics stated in Water Quality. Using tap water will clog the system and invalidate the manufacturer's warranty.

2. Place the required sterilization articles inside the basket.

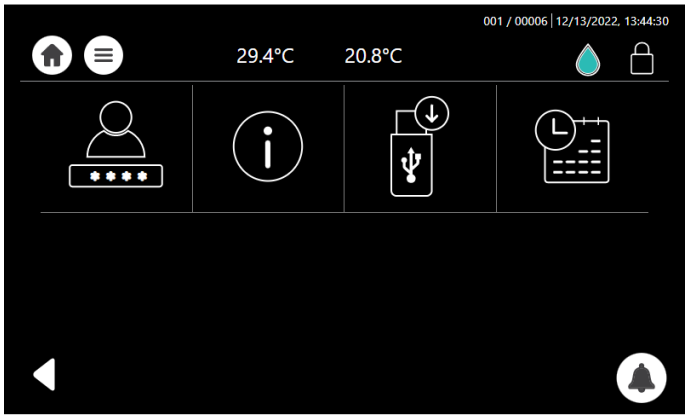
   Notes:
   - **Place the bottom plate in the chamber prior to the baskets.**
   - **Do not place the basket directly on the heater.**
   - **Do not overload! Please refer to Chapter 6.**

3. Select the appropriate required sterilization program.
4. Gently lower the Chamber Lid and slide left the Lock Lever to the LOCK position.

7.3 Setting Date and Time

From the main screen, press the **Quick option** icon .

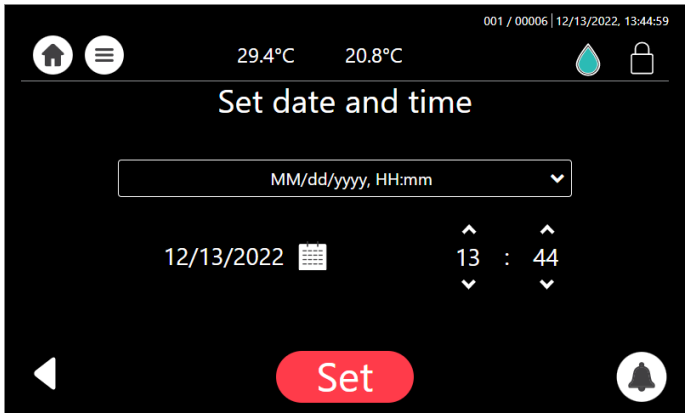
The Quick option screen is displayed below:



Select the **Set date and time** icon  .

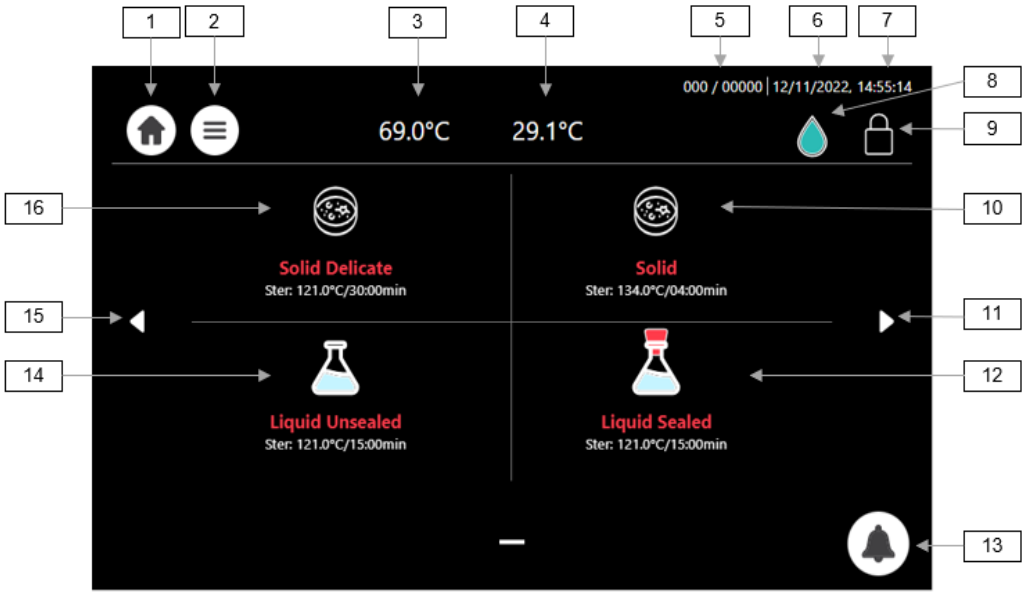
Note: The only functionality to be performed by the user (on a regular basis) is setting the date and time.

Select day, month and year, as depicted and press **Set** on completion:

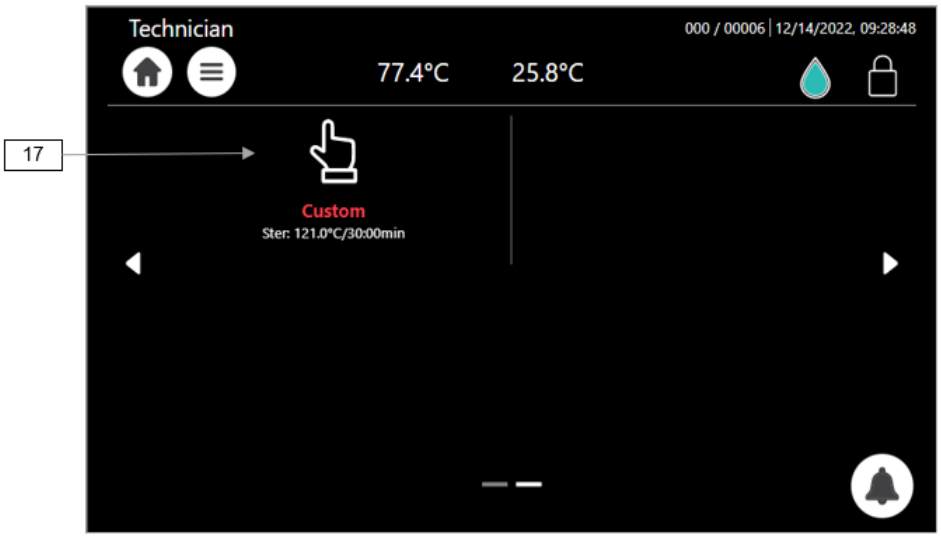


8. Control Panel

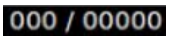
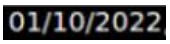
The display is a graphic LCD Touch Screen used to display the autoclave's current status, operational or error messages and for operating the device.



Additional programs are accessible by using the side arrows



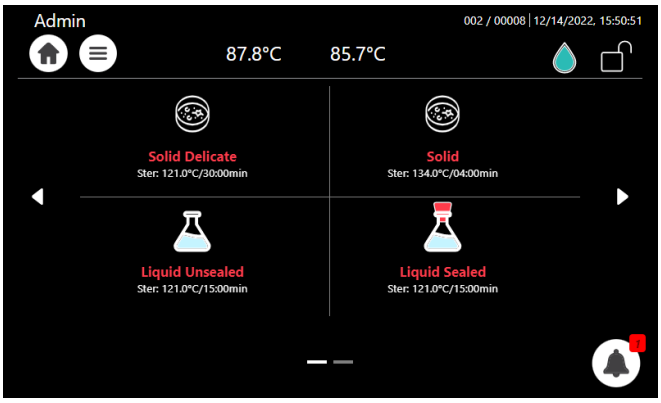
8.1 Home Screen Description and Functions

#	Icon	Name	Description
1		Home icon	Main screen selection icon
2		Quick option	Quick option selection icon
3		Chamber temperature	Momentary temperature in the chamber
4		REF. 1 temperature	Momentary temperature in the chamber
5		Counter No. ID	Daily / General cycle counter
6		Date	Indicates the date
7		Time	Indicates the time
8		Full water level	Proper water level in the chamber
9		Door closed	Door status
10		Solid	Solid 134°C Sterilization Program
11		Side arrow right	Paging forward to the next screen
12		Liquid Sealed	Liquid Sealed 121°C Sterilization Program
13		Warnings	Indicates the alarms / operational messages

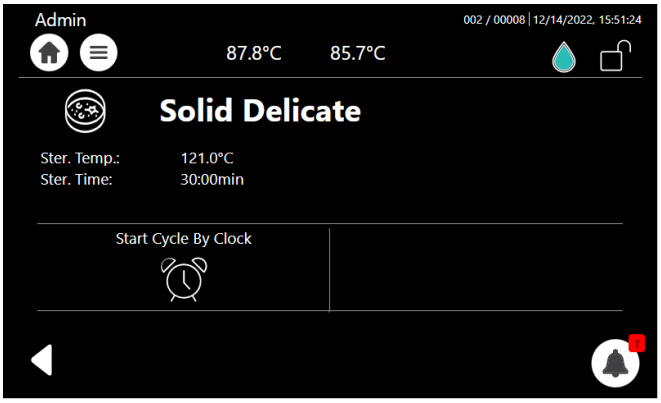
#	Icon	Name	Description
14		Liquid Unsealed	Liquid Unsealed 121°C Sterilization Program
15		Side arrow left	Paging backward to the previous screen
16		Solid Delicate	Solid Delicate 121°C Sterilization Program
17		Custom	Duplicates a sterilization program and enables modifying the settings. **Note: Requires validation by the user!**
18		Door opened	Door status
19		Door locked	Door status

8.2 Starting a Cycle

1. Before each cycle, check visually that the gasket is intact, not loose and clean.
2. Load the autoclave properly (see Chapter 6).
3. Choose the appropriate sterilization program from the screen below:



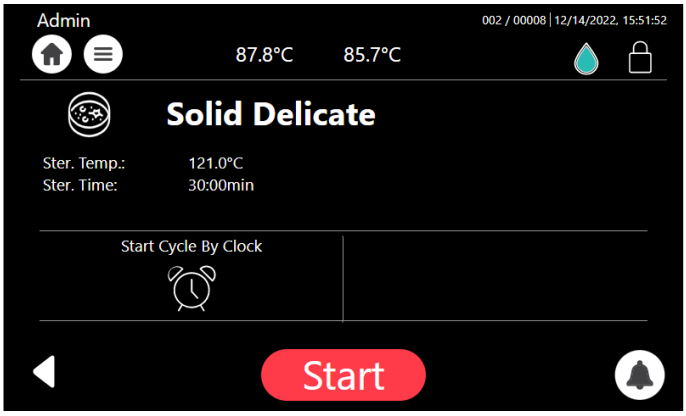
4. The selected program is displayed:



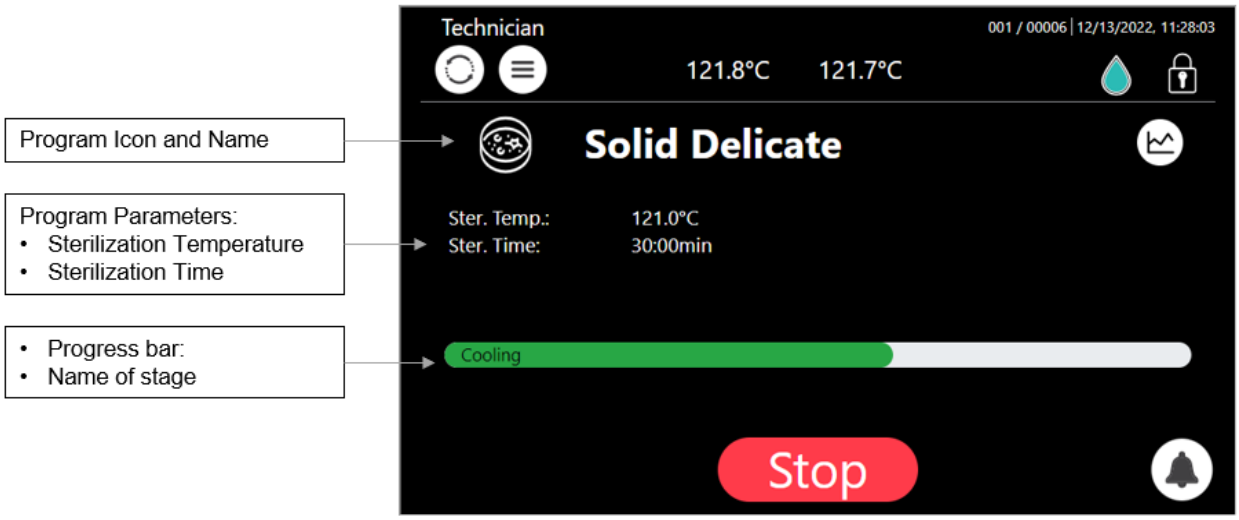
5. Close and lock the door by:

   - Gently lowering the Chamber Lid
   - Sliding the lock lever to the LOCK position

When the door is closed, the open-door symbol  is replaced by the closed-door symbol  , and by locking the door, the symbol is replaced by the locked-door symbol  .
The locking is activated as soon as the Start button is pressed.



1. Press Start to start the cycle.
2. The screen below displays the "Solid Delicate"program in progress:



8.3 Available Sterilization Programs

#	Icon	Name	Temp.	Sterilization time (minutes)	Load type	Type of use
1		Solid Delicate	121°C	30	Solid load	Immediate use only
2		Solid	134°C	4	Solid load	Immediate use only
3		Liquid Unsealed	121°C	15	Container with liquid	Immediate use only
4		Liquid Sealed	121°C	15	Container with liquid	For storage

Attention!

This device is not a medical device and not intended for medical use.

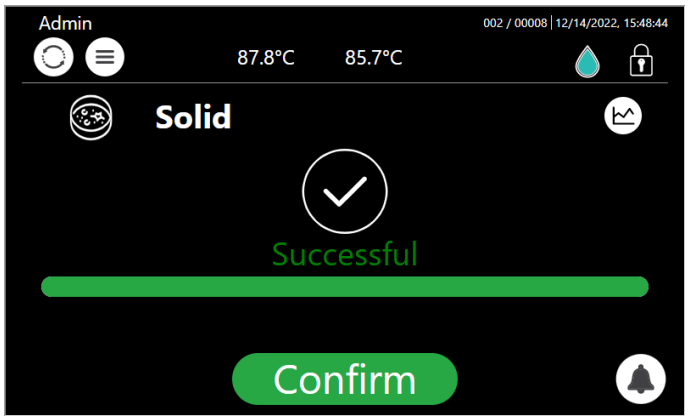
8.3.1 Description of the Sterilization Cycle Stages

- **Air-removal:** performed by the heating process from the chamber through the exhaust valve.
- **Heating:** temperature in the chamber is according to boiling temperature + 5°C.
- **Sterilization:** sterilization temperature is maintained constant during the sterilization time.
- **Cooling:** the cooling fan is operated and the exhaust valve opened, to cool the chamber and reach atmospheric pressure.
- **End:** determined when the temperature in the chamber or in the sterilized liquid, has reached the required end temperature.

8.4 Cycle Succeeded and Cycle Failed Notifications

8.4.1 Cycle Succeeded

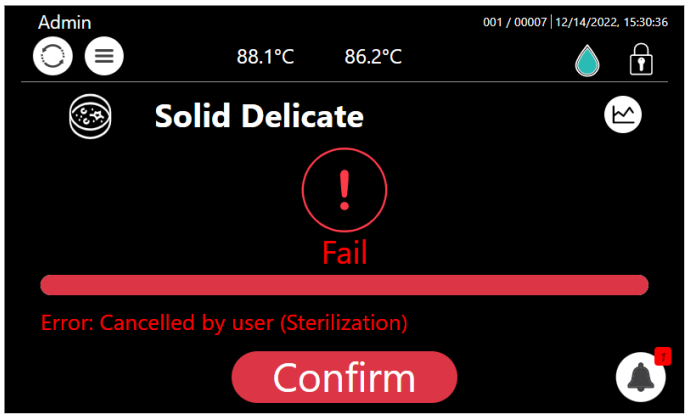
When a cycle has ended successfully, the following "Successful" message is displayed:



Press Confirm to confirm the successful cycle.

8.4.2 Cycle Failed

In the event of a failure at any stage, the exhaust valve will be opened to release pressure from the chamber, the message "Fail" and a relevant failure message will be displayed on the screen. An alternating buzzer signal will sound to notify the user.



Warning!

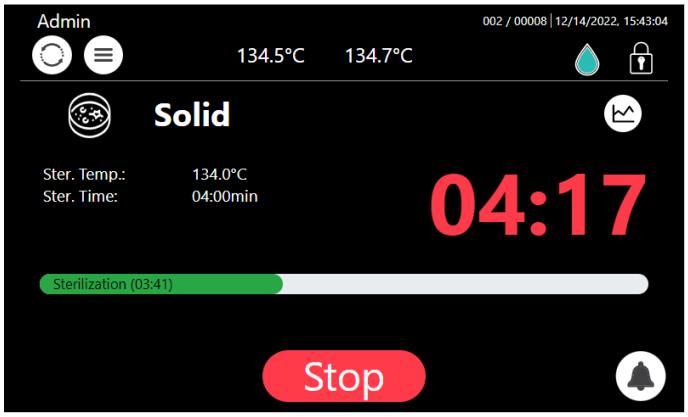
The load has not completed a sterilization cycle; therefore, it is not sterile. Handle it as a contaminated load.

Any failure means that the load is not sterile, except for failures that occur during the Cooling / Ending stage.

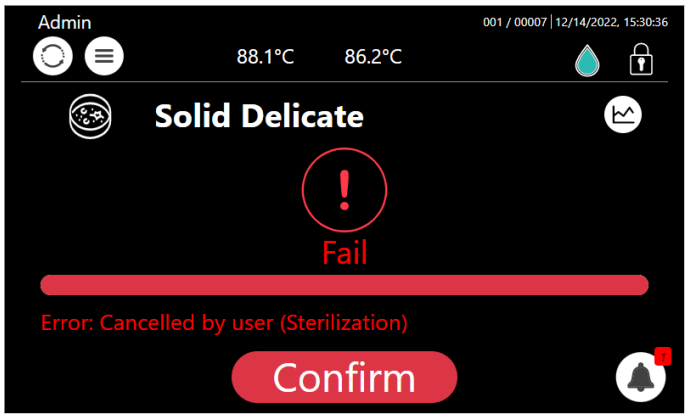
8.5 Aborting a Cycle

It is possible to stop the cycle while the autoclave is operating. Press the Stop button 

at any stage of the process to stop the operation.



If the cycle is aborted, the load is not sterile and a “fail” message will be displayed with an error message explaining the reason for the failure. An alternating buzzer signal will sound to notify the user.



Press 

to confirm the displayed Error message.

Warning!

The load has not completed the cycle; therefore, it is not sterile. Handle it as a contaminated load.

9. Preventive and Scheduled Maintenance

The maintenance operations described in this chapter need to be followed as indicated to keep the device in good working condition and to keep any breakdown time to a minimum.

The instructions that follow can easily be carried out by the operating personnel and do not require a service technician.

Should the need arise, technical assistance or a service technician can be requested by either calling your dealer or Tuttnauer Europe .

9.1 Daily Maintenance

Caution!

Make sure the autoclave is not hot before cleaning it.

- Clean door gasket with a mild detergent, water and a soft cloth. Check visually that the gasket is intact, not loose and clean.

9.2 Weekly Maintenance

Caution!

Make sure the autoclave is not hot before cleaning it.

- Clean the sterilization chamber with a soft cloth and wash with hot water. Do not use detergent!
- Clean the water level sensor with a soft cloth.
- Clean the outer parts of the autoclave with a soft cloth and mild detergent.
- Clean the sealing ring surface with a little detergent and wipe with a wet cloth.
- If the autoclave is only used occasionally, drain the water from the water tank once a week, and refill with fresh distilled water.

9.3 Monthly Maintenance

Caution!

Make sure the autoclave is not hot before cleaning it.

- Clean and descale the chamber.
- Remove the water plate and wash with a soft brush.
- Clean the outer parts of the autoclave with a soft cloth.
- Clean the Drain filter of the autoclave .

10. Error Messages & Troubleshooting

The troubleshooting section is provided in order to enable the user to solve minor malfunctions, prior to contacting our service department.

However, only technical personnel having proper qualifications and holding technical documentation (including a technician manual) and adequate information are authorized to serve the apparatus (See tables below).

10.1 Symbols

Symbol / Message	Symbol / Message Description	Required Action (if applicable)
	This symbol is displayed when the door is open.	Informative symbol
	This symbol is displayed when the door is closed.	Informative symbol
	This symbol is displayed when the door is locked.	Informative symbol
	Full water level	Informative symbol
	Low water level	Fill the Chamber with distilled water until this symbol changes to the proper water level symbol
	Alert	Press to watch the alert description

10.2 Troubleshooting

Message	Description
"Analog Input Error"	This message is displayed when any analog input such as Temperature sensor is disconnected or out of range during the cycle.
"Chamber temperature not in range"	This message is displayed if the temperature in the chamber is out of range.
"I/O card is not connected"	This message is displayed if the I/O card is disconnected (while the cycle is running or not).
"Chamber low temperature error"	This message is displayed if the temperature drops below the sterilization temperature limit.
"Chamber high temperature error"	This message is displayed if the temperature raises above the sterilization temperature limit.
"Time Error"	This message is displayed if the real-time clock is faulty.
“Door is Open”	This message is displayed when the door is open.
"Door lock Switch Error"	This message is displayed when the door is not locked after starting a cycle.
"Canceled By User"	This message is displayed after the STOP button is pressed and the cycle aborted.
"Routine cycle service is recommended. Please call your service provider."	This message is displayed if the number of cycles, since the last periodical maintenance, exceeded the "cycle service counter" parameter, or time elapsed exceeded the "time service counter" parameter.
"Power Down"	This message is displayed if power down has occurred during the cycle. The message will appear in the next power up (this message will be printed out in the printer after the autoclave is turned on).
"Unrecognized printer" (Optional with Printer)	This message is displayed if the printer is unrecognized.
Utility issue #2 – Please switch OFF and ON machine’s power switch	This message is displayed if the main application is not uploaded. Restart required.
"CfrPart11 – None	This message is displayed if authorization is required.

Message	Description
cycle can be started since no user is currently logged on"	Log in with your User.
"Settings don't match current application, Please try to load application first and only afterward load the settings"	This message is displayed if the Settings don't match the SW version.
"Start cycle by clock is active"	This message is displayed if the User decides to start the sterilization cycle by clock. The User should then select the required time.
"Door opened during the cycle"	This message is displayed if the door was opened during the cycle.
"Since no user is currently logged on – ' Guest ' user name will appear on result label"	This message is displayed if the label printer is configured but no user is logged in.
"System Control Ventilation Alert - please contact service"	This message is displayed when the CPU temperature is above the system parameter.
"Internal Error"	This message is displayed if software exception occurred.
"Utility Issue #3"	This message is displayed if the I/O card was disconnected during upload.
"Chamber Temperature Timeout - Air Removal"	This message is displayed if all temperature sensors have not reached the required temperature within the timeout parameter.
"Chamber Temperature Timeout - Heating"	This message is displayed if all temperature sensors have not reached the required temperature within the timeout parameter.
"Chamber Temperature Timeout - Cooling"	This message is displayed if all temperature sensors have not reached the required temperature within the timeout parameter.

Message	Description
"Chamber Temperature Timeout - Ending"	This message is displayed if all temperature sensors have not reached the required temperature within the timeout parameter.
"Chamber pressure not in range"	This message is displayed if pressostat is off.
"No Water in Chamber"	This message is displayed if the water level is low in the chamber. The message will appear in the error messages.

11. TSC Printer Installation (optional)

The sections below describe:

- General printer information.
- Setting printer definitions.

11.1 General printer information

The printer(s) are optional and can be purchased/ordered from Tuttnauer by the customer.

The printer can easily be installed and connected to the autoclave following the instructions below.

The options includes:

- One printer connected to the autoclave, loaded either with thermal paper roll, or with label roll. The user can direct the printer to switch between printing on thermal paper roll or label roll.
- Two printers connected to the autoclave - one printer loaded with thermal paper roll, and the second printer loaded with label roll.

11.1.1 **Printer Output:**

The autoclave is equipped with a character printer, which prints a detailed history of each cycle performed. (This can be used for the record or for subsequent consideration.)

The printing is on thermal paper with a defined set of characters per line and contains important information such as some of the main following details:

- Date:, Time: , Ser. Num:, Model:, Version:,
- Cycle Num:, Cycle Name:, Ster Temp:, Ster Time:, Dry Time:,End Temperature

When the sterilization cycle begins the printer starts printing the above data.

After the preliminary printing, the autoclave starts performing the sequence of operations of the cycle. The measured values of temperature and pressure are printed at time intervals, according to the phase of the process, as shown in the table on the next page.

The data is printed from the bottom up, beginning with the date and ending with "Cycle Ended". For an aborted cycle, "Cycle Failed" and the Error message are printed (refer to "Displayed Error Messages/Symbols").

The printer can also print labels when loaded with label roll and printer1 is selected.

Note: The software version number varies according to the released version,

11.2 Setting printer definitions

To enable setting the printer, the user is required to log-in.

1. From the main screen, press on the quick option icon  .
2. Press  to open the **Settings** screen.
3. Select **System parameters** to set the **Label Printer Type** or **Printer Type** option.
4. For paper roll printer, type 6 and press  .
5. For label roll printer, type 1 and press  .

12. Basket and Container

Model	Type	Dia. X Height (mm)	Capacity
T-Lab Eco V85	Stainless steel wire basket	362 x 280	2
	Stainless steel container for waste products	350 x 450	1
T-Lab Eco V60	Stainless steel wire basket	362 x 190	2
	Stainless steel container for waste products	350 x 320	1
	Tray	345 x 40	As required

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