Laboklav

SHP Steriltechnik AG

Dampfsterilisatoren
Steam sterilizers

Type 25 Liter

User manual

edition 08/2023 – V6

SHP Steriltechnik AG

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Please read these user instructions before starting the use of the steam sterilizer! It is necessary to keep this user manual over the complete life cycle of the sterilizer nearby the unit.

Indications included in this manual and labeled **warning**, **important** and **attention** are very important to pay attention to them. They are marked with the following graphical symbols.

Warning

Failing to observe these warnings can cause injury and even death. This symbol also means that an operator must acquaint with a suitable passage in the manual.

Important

This symbol denotes important indications for example to prevent sterilizer or load damage.

Attention

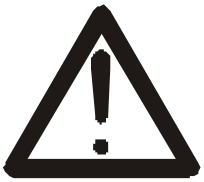
Observing the texts marked with this symbol facilitates operation of the sterilizer.

General Warnings:

Access to sterilizer operations manual should be restricted only to persons authorized to operate a sterilizer.
The device may only be operated by authorized personnel. Personnel who have not been trained in its operation or who are unable to read the safety instructions are not authorized to operate the device.

During an installation of a sterilizer, after maintenance performed by technical staff and during power outlet exchange, the verification of null electric potential of the elements being touched by users should absolutely be performed by authorized staff.

General safety instructions:



Observe the following safety instructions for the operation of the autoclave!

Determination

- Only use the autoclave for the purpose defined in the operating instructions.

Power cord and power plug

- Never damage or change the power cord or power plug.
- Never operate the autoclave if the power cord or plug is damaged.
- Never pull on the power cord to remove the power plug from the outlet. Always touch the power plug directly.

Installation

- Follow the instructions in this manual to install and operate the unit. We recommend that the first commissioning is carried out by authorised specialist of SHP Steriltechnik AG.
- Do not operate the autoclave in potentially explosive atmospheres.
- Only have the electrical connection set up by a specialist.

Program termination

- Note, that hot water steam can leave the chamber when the door is opened immediately after a program has been stopped manually.
- Depending on the time of program termination, the load may be not sterile. Observe the instructions on the display of the autoclave. You may need to sterilize the item again.
- Never open the door with force.

Removal of sterile goods

- Use gloves to remove the trays or bottom plate and wait until it has cooled down. Never touch the sterile goods with unprotected hands. The parts can be hot.
- Check the packaging of the items to be sterilized for removal from the autoclave.

Maintenance

- Have the service carried out by authorized persons only.

Malfunctions

- If you get repeated error messages when operating the autoclave, put the autoclave out of service and, if necessary, inform your specialist or authorized service.
- Have the autoclave repaired only by authorized persons.

Content

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1. General application, construction and use of steam sterilizer line Laboklav 25

The steam sterilizer type Laboklav 25 is equipped with a chamber by 25-Liter usable chamber volume. It is constructed for the steam sterilization of instruments, materials for **non-medical use** and liquids (based on water or aqueous solutions with equivalent properties). All versions contain a norm conform thermo lock. Different versions depending on the use of the sterilizers are available.

In Basic version (Laboklav 25 B), the sterilization of solid materials like instruments and glassware, waste and liquids is possible. Instruments should be sterilized in unwrapped form. Please be sure that the materials to sterilize are allowed to be sterilized by steam sterilization in the correct temperature range you want to sterilize them. We suggest not to sterilize wrapped, porous and hollow materials with basic units. The result is not defined and not possible to validate.

The version with fast liquid cooling option (Laboklav 25 M) is equipped to make the cooling process of liquids faster than self-cooling process can be. The use of the active cooling process is designed for the use of not tightly closed flasks! Reduce of process time of cooling process is about 40 % compared with basic version! In consequence of the active cooling process happens a loss of liquids by 6 – 12 % depending of the pressure reduce speed (programmable by service).

The vacuum version (Laboklav 25 V) includes a membrane vacuum pump. This makes the steam sterilization process safe for wrapped, porous and hollow materials. Additionally this version includes the possibility of drying of the materials.

The different options are possible to combine in one unit (Laboklav 25 MV).

⚠	**The manufacturer is not liable or responsible for defects or indefinitely results if the sterilizer is not under intended use.**

The steam sterilizer type Laboklav 25 allows a fully automatic process cycle. That includes deaeration, heating, sterilization, pressure remove and cooling or drying function (optional if included in the actual version).

The basic function of the Laboklav 25 steam sterilizer includes venting the sterilization chamber and the items to be sterilized, generating and feeding steam into the sterilization chamber, heating the chamber according to the selected program under saturated steam conditions (mainly 121°C or 134°C with overpressure up to 1, 1 bar or 2.1 bar according to the saturated steam table) and maintaining the corresponding conditions for a defined period of time (at least 15 minutes at 121°C and 3 minutes at 134°C) as well as cooling the chamber and loading and, if necessary, drying the items to be sterilized.

All steps for an automatic process are controlled by a microprocessor control board. The actual status is shown on a graphic display and includes important information for the user to operate the device. The supported temperature range of the sterilization process is 50°C to 135°C. The typical temperatures of 121°C and 134°C are programmed for different sterilizing situations and different materials. All program positions can be reprogrammed by special trained engineers / service staff.

The steam sterilizer type Laboklav 25 includes the following additional advantages:

- Automatic preheating to reach defined condition in the start situation in each program separately to define. This function is especially developed for fractionated pre-vacuum process to reduce the condensate in the chamber and on the sterilization goods

- Fully automatic deaeration of the sterilization goods by fractionated pre-vacuum (in vacuum option only) or pressure purge process for solids and gravity process for liquid goods.

- Use of the principle of hot stone for the steam production reduces the use of water and decreases the heating time of the device. That make the process much more economic than the typical steam generation process in a classic steam generator

- Cooling process using normal air driven by a fan. That reduces the need of expensive demineralized water.

- Protection of the drain on house installation side by using internal condensate tank.

- Microprocessor controlled process for fully automatic use.

Total view of the steam sterilizer Laboklav 25

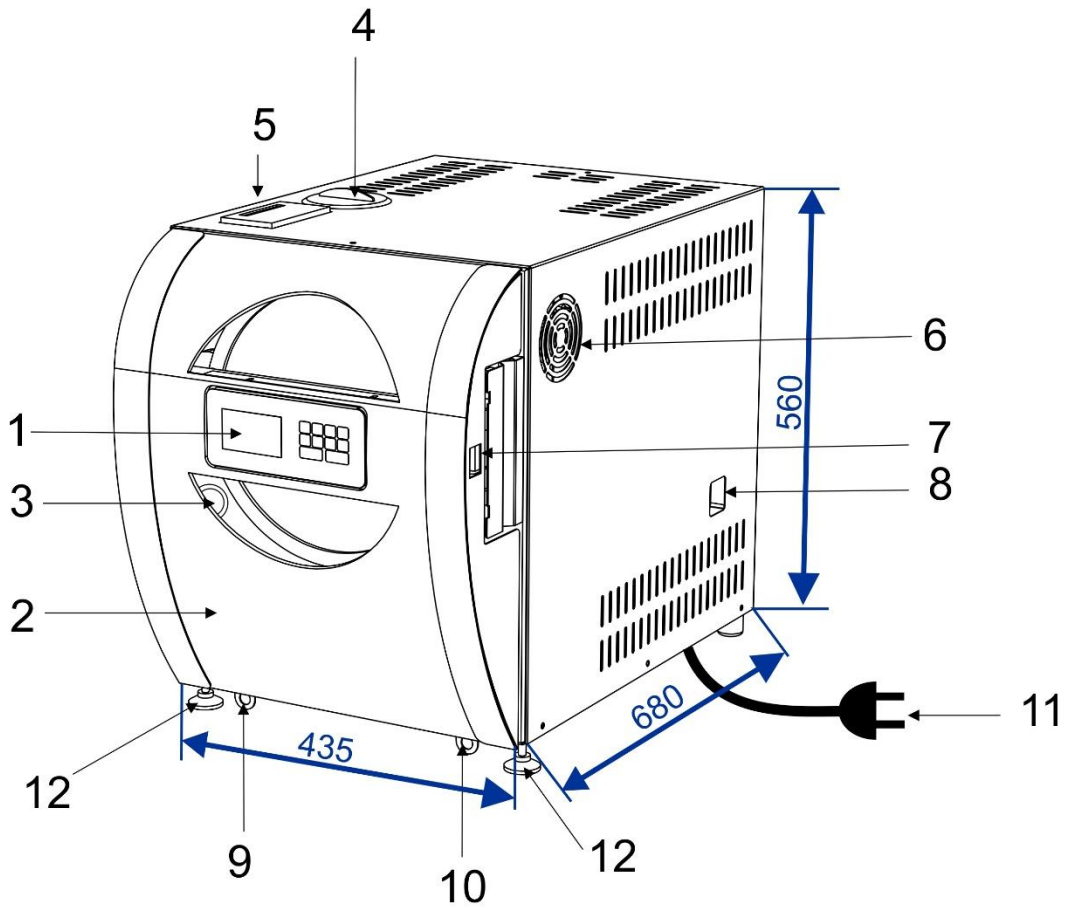


Figure : Total view of Laboklav 25

1 Control panel
- key functions →**see 4.3.1. Control panel and key functions**

2 Door

3 Venting air filter

4 Water inlet feed water (demineralized water only)

5 Printer (optional)

6 Air inlet for the cooling fan (optional)

7 Power switch (on/ off)

8 Central mains

9 Outlet feed water

10 Outlet condensate

11 Power cable with power plug

12 Front feet (height-adjustable)
- for correct adjustment of the inclination of the chamber

2. Steam sterilizer Laboklav 25 technical data

Overall dimension (free standing unit)(W x H x D).....	435 x 560 x 680 mm
Footprint (Bench top unit)(W x D)……..	500 x 570 mm
Weight (netto).....	about 65 kg
Volume Feed water tank.....	about 3 l
Volume Condensate tank.....	about 3 l
Maximum Load:	
- Instruments	5 kg
- Textiles ….....	2 kg
- Liquids …..……..	5 Liter Total volume
Sterilizer chamber:	
Total volume ….	about 25 l
Chamber dimension (ϕ x D) …….....	ϕ 265 x 450 mm
usable Volume ……..….	about 25 l
usable chamber dimension.....	about 200 x 200 x 430 mm
Maximum allowable pressure (PS)	2.8 bar
Maximum allowable temperature (TS)	138°C
Working pressure safety valve …….....	2.8 bar
Power supply:	
Voltage …….....	230V~ (±10%), 50 Hz, 16A
Working power.....	2,5 kW
Averaged power consumption per cycle	0,75 kWh
Protection class .....……..	**I**
Water supply:	
Destilled or demineralized Water	
(acc. to annex C EN 13060)	
Averaged feed water consumption per cycle.....	about 0,7 l
Storing conditions:	
Temperature	5 ÷ 40°C
Humidity	max. 85%

Computer interface:
- serial interface RS 485

Printer (optional)

Programs:

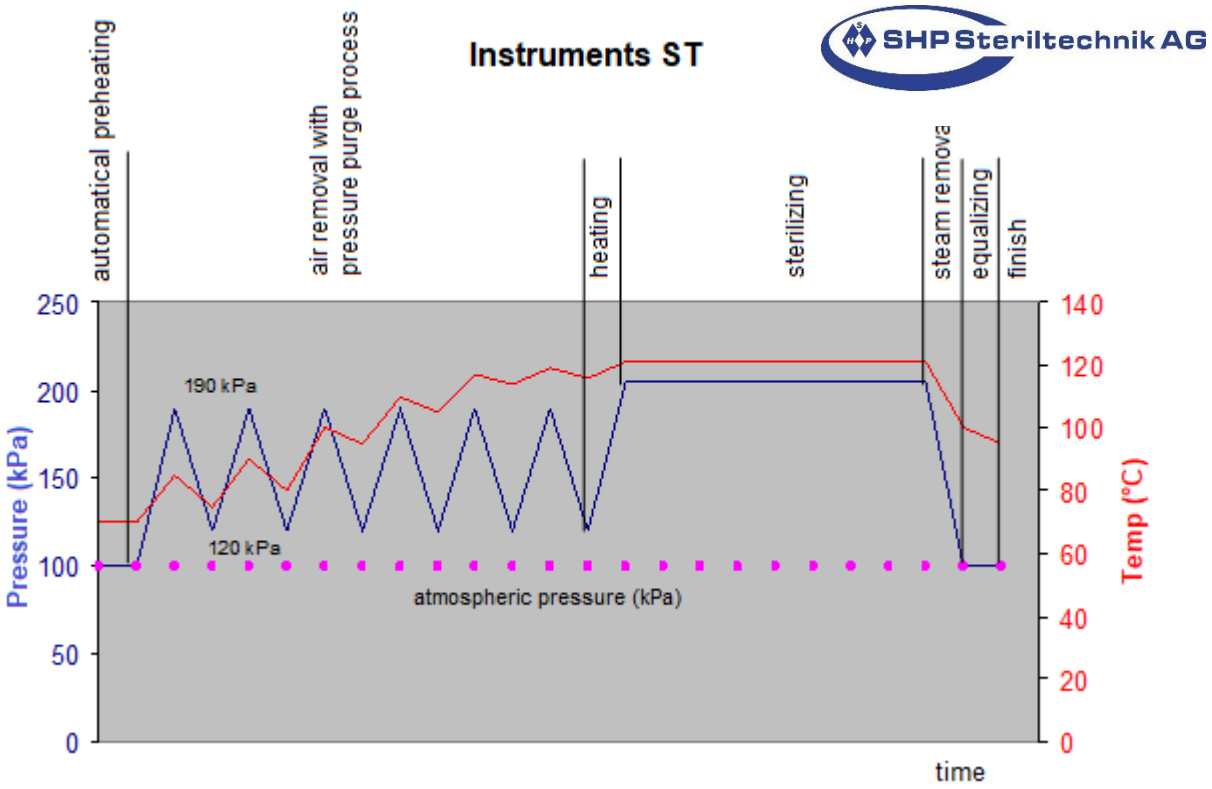
5 predefined programs not code protected:
- P1: Instruments 134°C, 15 min, Drying - in Version V and MV
- P2: Instruments 121°C, 20 min, Drying - in Version V and MV
- P3: Waste 134°C, 15 min
- P4: Liquids 121°C, 20 min, active cooling – in Version M and MV
- P5: Liquids 121°C, 20 min, passive cooling

4 further programs (P6 – P9) predefined like P1, code protected,.

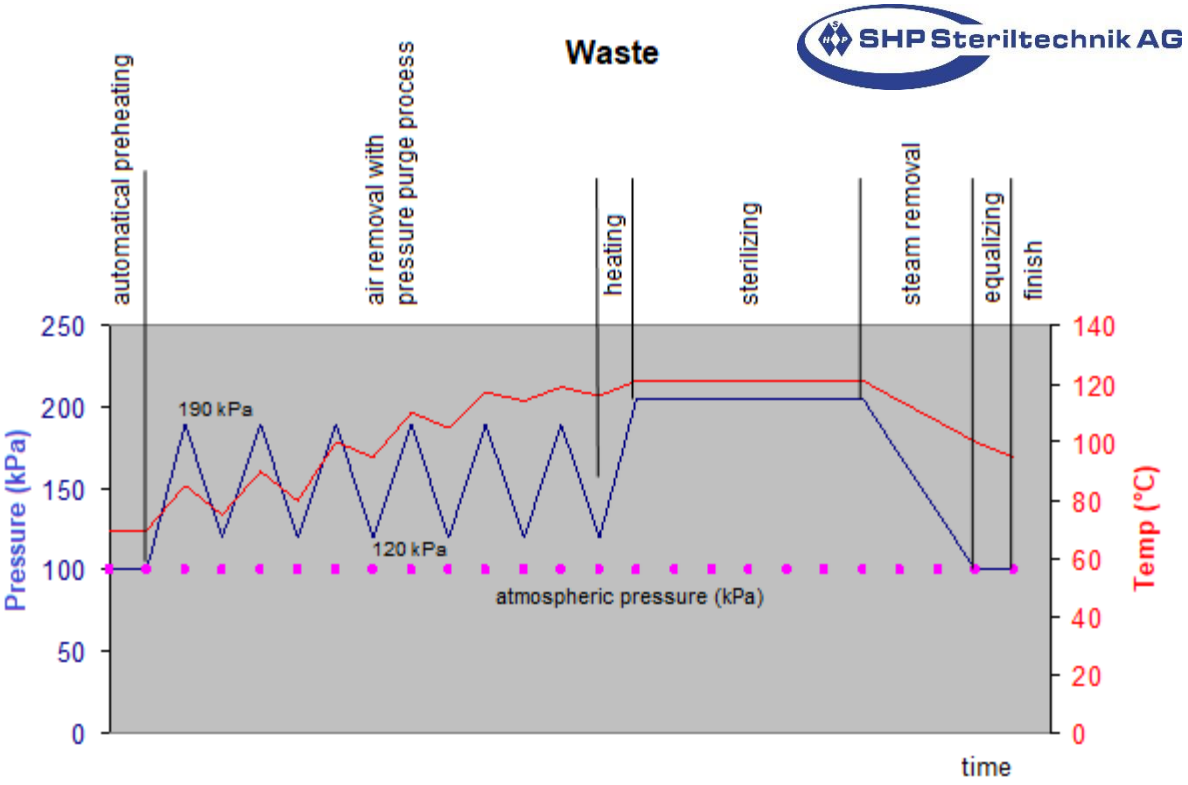
3 Testprograms (Durham, P10, Bowie & Dick-Test, P11, Vacuumtest, P12) - in Version V and MV

3. Programs available in steam sterilizer line Laboklav 25

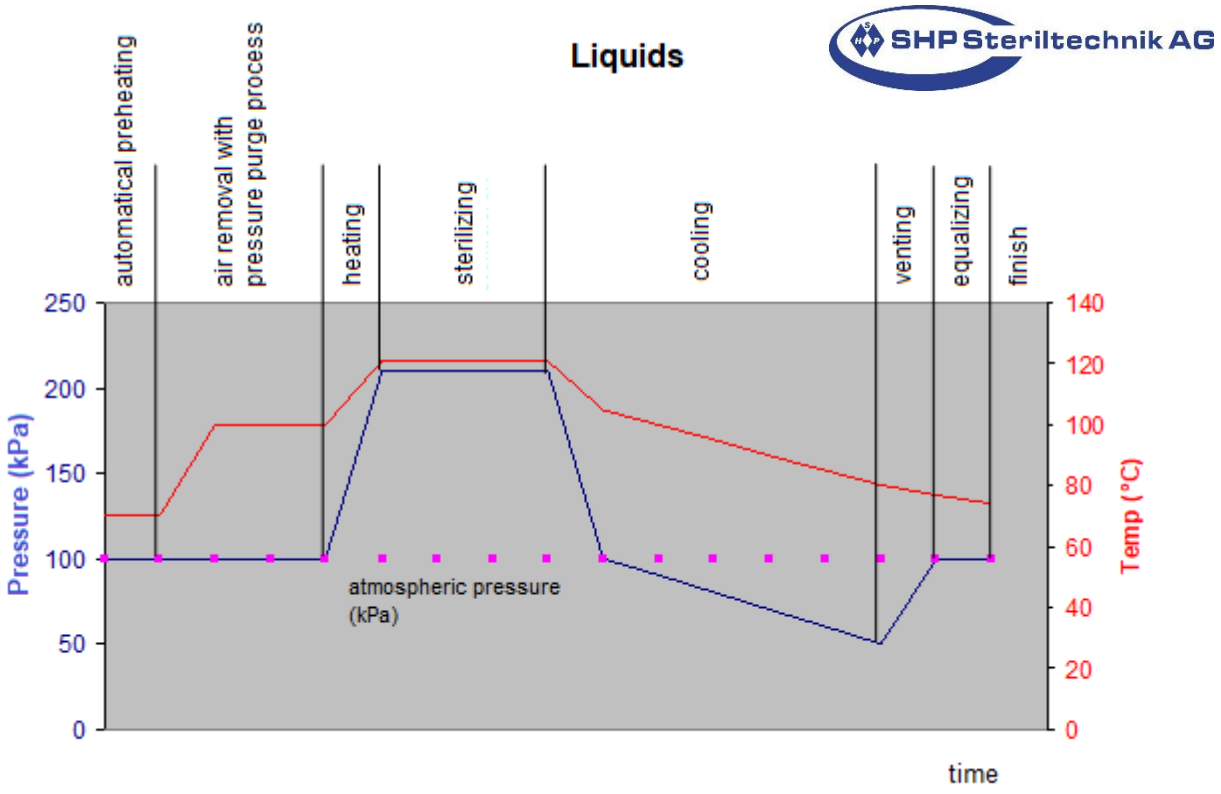
3.1. Standard programs



Program Instruments ST available in version Laboklav 25 B and M

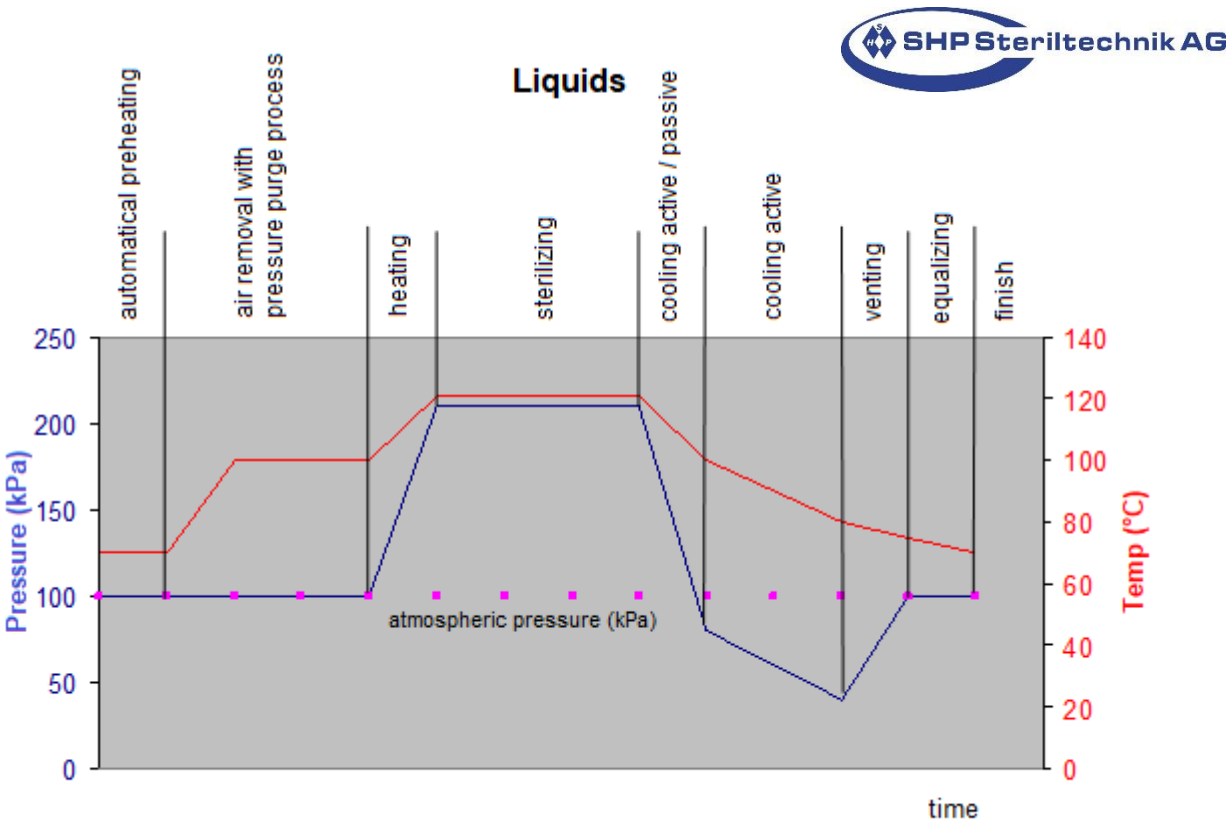


Program Waste available in version Laboklav 25 B and M



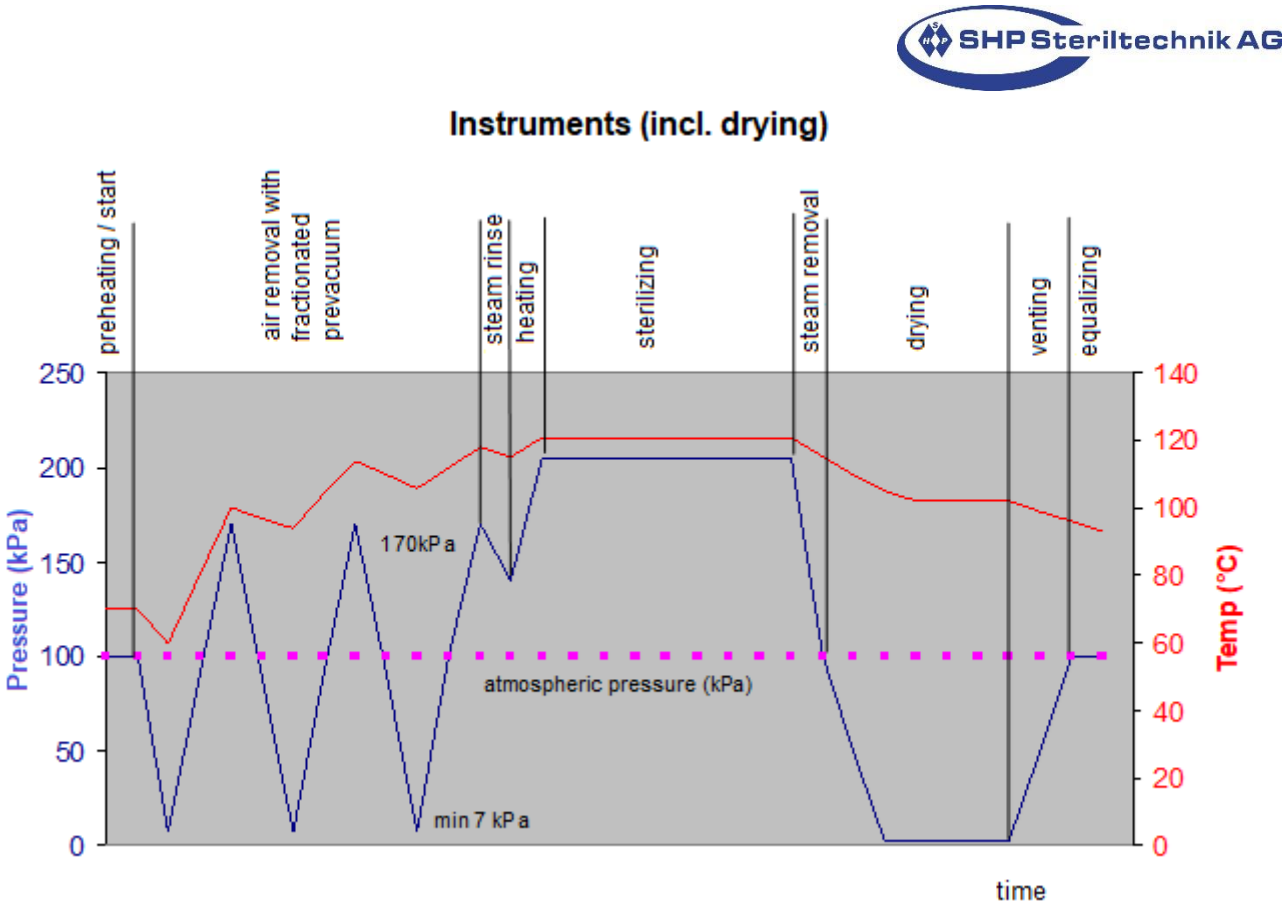
Program Liquids in all Laboklav 25 cooling time differs in version M in P4 / P5

3.2. Programs with forced recooling



Programm Liquids in version Laboklav 25 M and MV (P4)

3.3. Programs with vacuum (version V and MV)



Program Instruments FV in version Laboklav 25 V and MV

3.4. Description of program steps

The sterilizing process in steam sterilizer type Laboklav 25 contains the following program steps:

- **Preheating**
The steam generator and if programmed the chamber is preheated until reaching a specified temperature. It takes ca. 5 to 10 minutes. If the chamber temperature is high enough, it decreases the preheating time or preheating is switched off.

- **Deaeration**
In all programs for liquids, a gravity deaeration is preselected automatically.
In versions B and M (no vacuum available), the deaeration for instruments and waste is preselected as a pressure purge cycle. It works with 3 to 5 pressure purges between 190 and 120 kPa absolute pressure (number of pressure purges depends on program type).
In versions V and MV the deaeration for instruments and waste programs works with fractionated pre-vacuum- an alternation between overpressure (through the flow of steam into the chamber) and vacuum (air/steam mixture is evacuated) using the vacuum pump . Which step to start with is programmable.

- **Heating**
The chamber and the items to be sterilized are heated to the preselected temperature using steam; extra steam rinsing is usually not used.

- **Sterilizing**
While sterilization phase the unit is keeping the set temperature over the sterilization time. In case over lower temperature that set temperature, the timer for the sterilization time is stopping.

- **Pressure remove**
The steam is removing from chamber until reaching the programmed pressure in the chamber through the steam condenser into the condensate tank. Depending on the program, this step occurs quickly (instruments) or slowly (liquids).

- **Cooling**
This is programmed for liquids only. Depending on the integrated fast cooling options, different cooling versions are possible: passive or active, in active cooling slow, fast or forced is possible.
Is passive in all variants in program P5, in the variants M and MV cooling is active on program slot P4 (rapid cooling).

- **Drying (for versions V and MV only)**
Program is drying with vacuum with a programmed drying time. Alternate an intermitting venting and vacuum cycle is possible. The venting function is automatically using the venting air filter.

- **Venting**
The program used for the venting function the integrated venting air filter automatically. The function works until reaching the programmed air pressure.

- **Equalizing**
For additional safety, the device is waiting a few seconds after reaching the program finish to make sure that no measurement mistake has set the program to finish. Equalizing time depends on program and sterilization goods and can be different.

- **End of program**
After the end of a program, the controller waits for the program to be confirmed by the operator! This condition is indicated by a flashing green display and a short acoustic sound. Acknowledgment is done by pressing the STOP button. After another 3 seconds, the door is unlocked.

3.5. Programs for testing

The **Bowie&Dick-Test** proofs the process for steam penetration of the sterilization good (mainly for textiles or paper wrap). This test is implemented in vacuum option only. The test is normally for medical use only! The test body for this test should be a one usable test package only.

The **vacuum test** is implemented in vacuum option only. It can be used for testing the leakage rate of the unit. For the normal use it is not necessary to run this test (implemented for service/maintenance). The test should run if the chamber is cold! The chamber temperature should not be higher than 40°C (than it is impossible to start the test).

If the test result is "Incorrect" the unit should get a service / maintenance! In that case you should not use the device until qualified service stuff has checked the device!

All sterilization cycles are running automatically. The duration of a single cycle depends on the load, kind of deaeration, number of vacuum fractions in fractionated pre-vacuum and the start conditions (warm or cold), drying time, kind of cooling etc. Even the type of sterilization goods, and kind of loading inside the chamber have an enormous effect on the cycle time. In case of a validation, you can define the goods and loads. **Basically, the higher the load and the colder the items to be sterilized and the sterilization chamber, the longer the time per cycle.**

Whenever the same good / load with same program and same parameters is started, the time depends mainly from start temperature. The control unit is automatically adding preheating and deaeration cycles if temperature was to low!

3.6. Overview about predefined programs

The following table provides an overview of the program parameters selected in the various pre-assigned programs and the average duration of the program with a medium load and a chamber that has already been preheated.

Program	Materials	Deaeration	Sterilisier -time	Sterilization temp.	Drying / cooling	Time
P1 (B/M)	Instruments	Pressure purge: 4x 170 kPa /120 kPa	15 min	134°C	nein	41 min
P1 (V/MV)	Instruments	Vacuum and Steam: 4x 30-50 kPa /170 kPa	15 min	134°C	5 min	45 min
P2 (B/M)	Instruments	Pressure purge: 4x 170 kPa /120 kPa	20 min	121°C	nein	45 min
P2 (V/MV)	Instruments	Vacuum and Steam: 3x 30-50kPa / 170 kPa	20 min	121°C	5 min	55 min
P3 (B/M)	Waste	Pressure Purge: 5x 170 kPa /120 kPa	15 min	134°C	nein	50 min
P3 (V/MV)	Waste	Vacuum and Steam: 3x 30-50kPa /170 kPa	15 min	134°C	nein	55 min
P4 (M/MV)	Liquids	Gravitation	20 min	121°C	cooling aktiv	1:20 h
P4 (B/V)	Liquids	Gravitation	20 min	121°C	cooling passiv	1:50 h
P5 (M)	Liquids	Gravitation	20 min	121°C	cooling passiv	1:50 h
P5 (B/V)	Liquids	Gravitation	20 min	121 °C	self cooling	1:50 h
P6 – P9	Like P1	Like P1	Like P1	Like P1	Like P1	Like P1
P10	Durham	Gravitation	20 min	121°C	cooling passiv	
P11 (V,MV)	Bowie&Dick-Test	Vacuum and Steam: 3x 20-40kPa /170 kPa	3:30 min	134°C	3 min	60 min
P12 (V,MV)	Vacuum test					20 min

4. Operation of the steam sterilizer Laboklav 25

4.1. List of delivered parts

- Sterilizer Laboklav 25 - 1 pc.

  Inclusive of following equipment:

  Bottom sheet - 1 pc.
  Documents including user manual, pressure vessel papers (conformity declaration), safety valve calculation, warranty declaration - 1 pc.
  Connecting pipe for water supply steam / condensate remove - 1 pc.

The following accessories can be ordered separately:

- printer: CBM-920
- Insert frame for trays
- trays (up to 4 pieces possible)
- documentation (1 pc.)

Figure: Laboklav 25 with frame for trays

4.2. Installation

4.2.1. Power supply

The steam sterilizer is equipped with a 2,5m long net supply cable. The device is configured to be connected to an electrical system of 230V AC, 50 Hz, 16 A. For commercial use, we recommend to use an additional fault current protection switch.

If the device is connected to a power supply with wrong or without correct ground connection, it may endanger the operator of the device by dangerous electrical voltage.

Connecting the device to a power supply with lower capacity than 16 A may cause an over load or heating up the power cable and can cause a fire!

4.2.2. Water supply

The steam sterilizer needs demineralized or distilled water only! Please refer to Appendix C EN 13060 about water quality. **Normal tape water / drinking water is not for use as feed water!** (quality definition **see → 12: additional information**). The device is equipped with a build in tank that needs to be filled with approx. 3 Liter distilled / demineralized water. Refilling the tank should be done in the beginning of each working day. The volume of the tank is enough for up to 3-4 cycles.

Attention! Do not overfill the tank! If the maximum level is reached, the control unit gives an alarm (if alarm is activated) and the funnel lights up in red color!

We recommend always to refill the storage tank freshly before each start of the program and to empty the condensate tank.

The quick-release closures underneath the device are used for emptying **the storage tank (left)** and **condensate tank (right)** using the supplied drain hose. The level of both tanks is monitored. If a tank is full or empty, this is indicated in an error message and signaled acoustically, without immediate interruption of the current program.

In the case of an empty storage tank, the tank must be refilled immediately or after each program run. If the error message does not react within 10 minutes (refill with water), water will no longer be injected from the pump into the tank (protects the pump from running dry). If the fault is not remedied in the next 10 minutes (20 minutes after error message), the program is interrupted automatically.

When the maximum condensate level has been reached, you can connect the supplied drain hose to empty the condensate tank (discontinuous drainage) or leave it permanently connected (continuous drainage). In order to avoid an overflow of the condensate tank, you should always react to an error message and promptly emptying via the condensate drain.

When draining continuously, you must ensure that the condensate is disposed of without contamination (eg collecting tank, floor drain).

4.3. General information for operation

4.3.1. Control panel and key functions

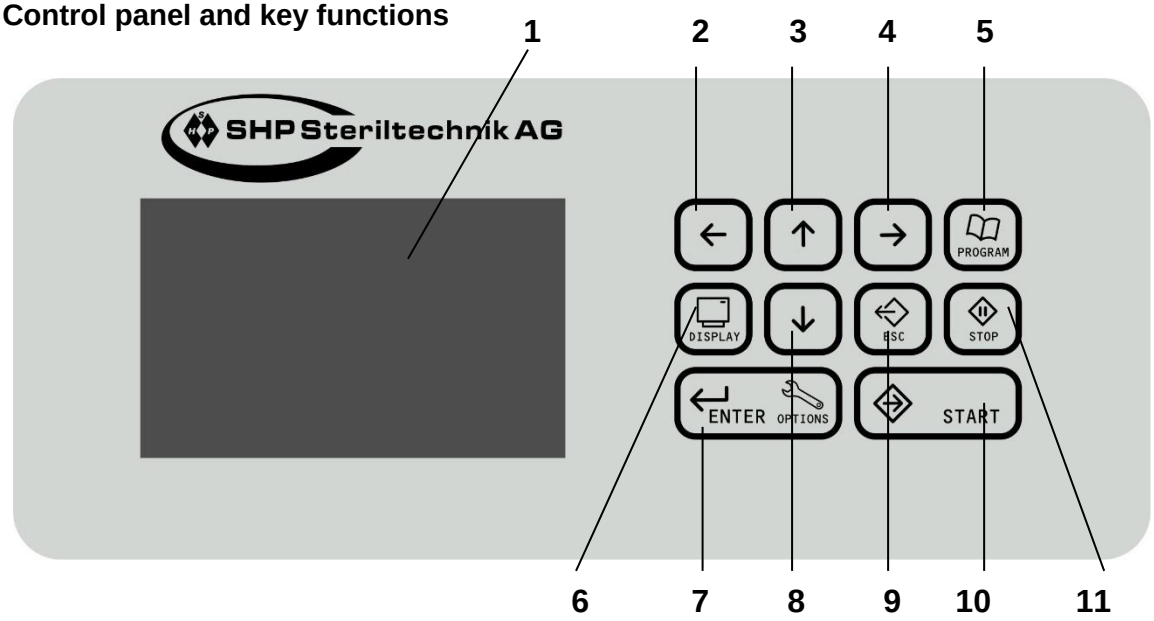


Figure: Control panel Laboklav 25

1 Display	displays program parameter, cycle data and error messages
2 Cursor button to left	moves cursor left
3 Cursor button up	moves cursor up and changes value at actual cursor position, open door
4 Cursor button right	moves cursor right
5 Program button	for entering the program menu to change the program, by using up and down button the program is chosen and activated by pressing the enter button
6 Display button	changes display from normal program display to display of actual sensor values, information about statistic data and software version
7 Enter button	enters the input data or entry in a menu
8 Cursor button down	moves cursor down and changes value at actual cursor position, close door
9 Escape button	for leaving a menu position after or before changing is valid
10 Start button	starts the actual in display shown program
11 Stop button	breaks a running program and quits the final signal after finishing a program regular or by manual break Opening of the lid is possible after quitting the program only

4.3.2. Optional Touchscreen

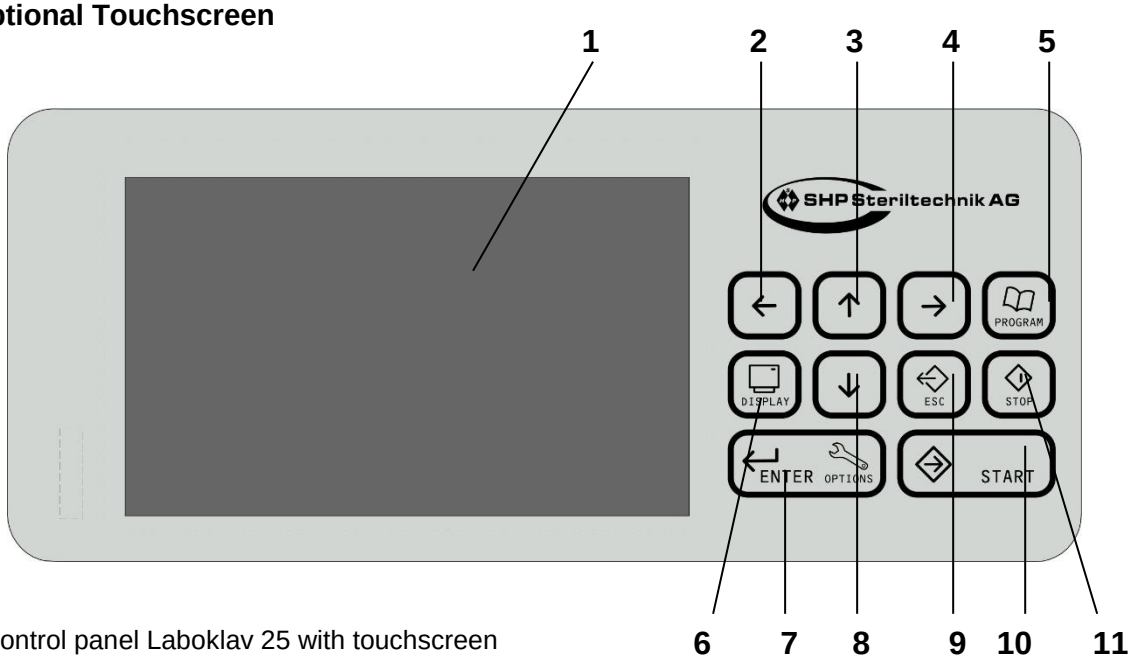


Figure: Control panel Laboklav 25 with touchscreen

The device is optionally equipped with an additional touch function. Due to the larger, coloured display and the possibility to operate it directly, working with the device is much more comfortable. In addition, it offers extended options such as

- Network connection to retrieve the device status and archive data at any time via internet browser (static IP is recommended)
- USB port for reading out the device archive via USB stick (FAT32 format)
- Output of the archive runs as PDF file incl. history diagram

All important user functions can be operated both via the control panel and via the touch screen. The control panel has the same key functions as described in
→ **4.3.1. control panel and key functions** described.

4.3.3. Operation modes of the Laboklav 25

The operating mode, in which the device works actually, is shown by the illumination on the display.

Figure: Lights of the different operating modes of the Laboklav 25

Light	Operation mode	Description
BLUE	READY - standby mode	Device is ready for operation.
RED	ATTENTION! - operation mode	Device is in a running program. (red colour indicates danger from hot parts and hot steam).
	ERROR! - error mode	Device reports an error/ a fault in the current program. (Error message is also shown on the display)
GREEN	FINISHED - finish mode	Device has finished program successfully

Operation mode	Description	Signals of the device
Turning on	After switching on the device at the power switch on the door	lights up permanently blue short signal sounds once
Program start	After pressing the start button	lightning changes from blue to red short signal sounds several times
Program run	Device is in an operation mode	light is constantly red
Programm interruption	By pressing the STOP-button twice	flashes red after warning signal sounds 3 times, a short signal sounds every 3 seconds
Error message	- with the door open	short signal sounds several times error message occurs in the display
	- with the door closed + out of the program	flashes red short signal sounds several times error message occurs in the display
	- with the door closed + in the program	light is constantly red short signal sounds several times error message occurs in the display
End of program	Device displays the cycle correctly	light is constantly green signal sounds every 3 seconds after the completion signal

4.4. Initial commissioning

Follow these steps one after the other to get the device started and running for the first time:

4.4.1. Setting up the device

You can set up the device yourself and put it into operation. It is essential to observe the following notes on setting up, installation and commissioning in this operating manual! It is recommended that the autoclave is set up, installed and commissioned by specialist personnel who have been authorized by SHP Steriltechnik AG for the first commissioning.

The sterilizer should be placed on a straight, horizontal surface. The best is a stable table. The required area is: 50 cm (width) and 60 cm (depth), the height should be about 85 cm. The table should have a load capacity of at least 80 kg. **Please leave 10 cm space between the back of the device and the wall.** The room should be well ventilated, the heat dissipation of the device to the environment should not be hindered.

When setting up the unit, make sure that the chamber is tilted slightly to the rear, so that during the program run the condensate collects in the rear area of the chamber and is removed from the chamber during the after-venting process.

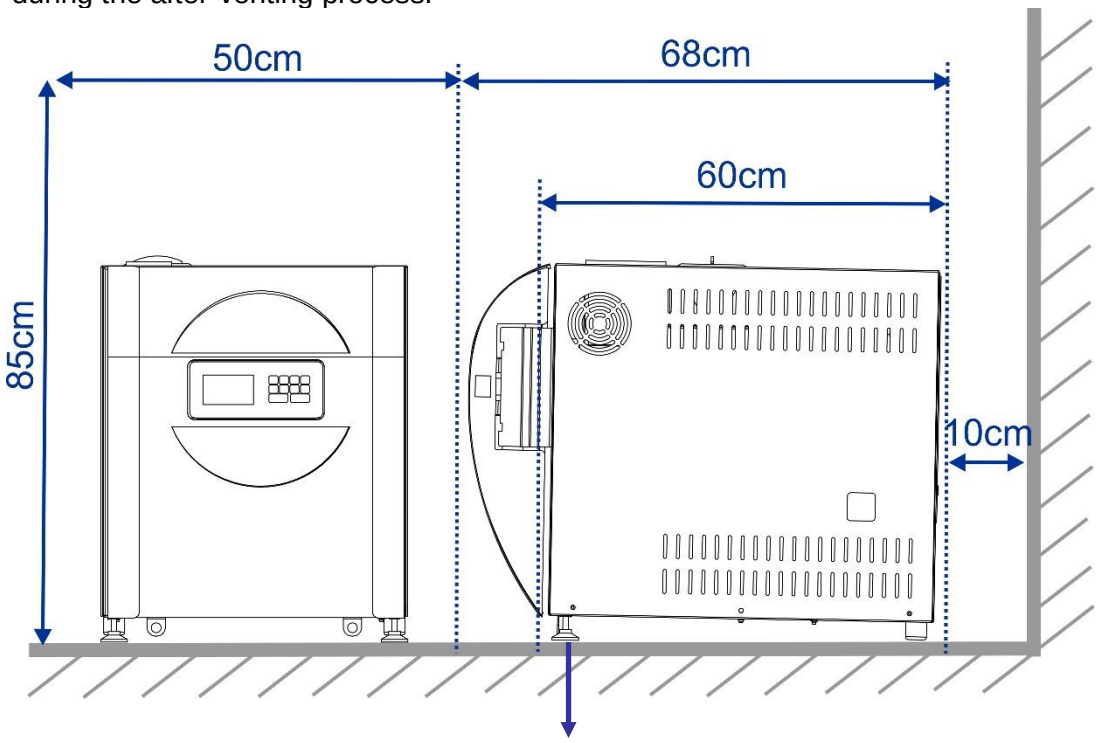


Figure: Dimensions for setting up the Laboklav 25

☞	**Do not place the device immediately under a smoke detector! Otherwise, depending on the type of the detector, it may trigger a false alarm due to rising water steam. The device should therefore always be set up at least 3 meters away from the smoke detector. If necessary, the smoke detector should be replaced by a temperature-dependent fire alarm.**

4.4.2. Switching on

After regular installation and connecting to the power supply, the device is ready for use. Standing in front of the device you will find the main switch at the right side of the door. By switching on the main switch, the display lights up and shows the software version and the SHP Logo short time.
Now, the device is ready for use.

The device goes into standby mode and lights up blue. If you do not see any change on the display after switching on, check the fuse on the display.

If the device does not turn on, turn the device off at the power switch and then again on. If switching on is still not possible, contact the service.

⚠	**Do not manipulate the device! If the device is not going on please check the main breakers of the unit and of power supply. If no reason can be found, please inform a trained service stuff to check the device.**

4.4.3. Open the door

Opening the chamber door is only possible when the device is ready for operation, after the device has been switched on successfully!

- The door is opened automatically by briefly pressing the **Up arrow key (3)** on the control panel of the device once. The door can then be opened further by hand.
- Remove all supplied accessories (bottom sheet, hose with quick coupling) from inside of the chamber. The hose with quick coupling is used for connection to the tank's drain couplings (left side for feed water tank/ right side for condensate tank) and can be used for both connections (**see →7.3. Emptying the tanks**)

⚠	**The opening of the chamber can only be done when there is no pressure in the chamber. In this case (for example, the door is closed when the chamber is hot, the air heats up, a chamber pressure > 120 kPa), the door opening is not possible and an error message appears. The device waits until the pressure is released again. Only then can the door be opened.**

⚠	**Attention at negative pressure in the chamber! In this case it is not possible to open the door immediately after switching on the device! This happens, e.g. if the device is switched off in the evening after the end of the program without acknowledgment (door remains closed), as it cools overnight, and a vacuum is created in the chamber. Only when the negative pressure of the device in the still active program is compensated by ventilation, after a short waiting, the door can be opened again.**

4.4.4. Fill in feed water

Fill the internal storage tank with feed water of appropriate quality
(→**see 12.1. Definition Feed water quality**).

Remove the cap on the top of the device and fill in approx. 3 litres of feed water. If the storage tank is full, the device reports this by a corresponding error message in the display. In this case the funnel for feed water fill in lights up in red colour.

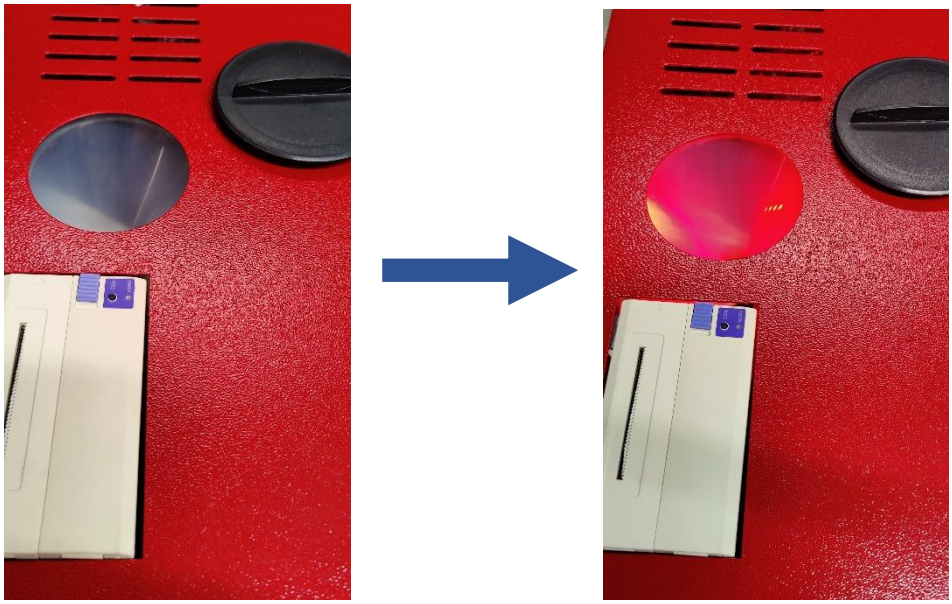


Figure: water fill in lights up in red colour

☞	**Make sure that the storage tank does not overflow when filling!**

After filling the storage tank, connect the supplied drain hose to the feed water drain at the bottom on the left side of the autoclave. Drain the feed water until it emerges from the hose without air bubbles. Then remove the drain hose from the device.

4.4.5. Loading the device

We recommend the use of the optional chamber insert system and the trays. At least a bottom sheet should be used to avoid contact of the sterilized material with accumulating condensate on the bottom of the chamber.

When loading or unloading the device, it must be ensured that the surfaces of the device, the chamber, the slide-in systems or the items to be sterilized can be very hot.
There is a risk of severe burns.

Use suitable protective equipment, e.g. heat- insulating gloves.

4.4.6. Close the door

When closing the device, proceed as follows:
Hold the door slightly pressed against the locking spindle. Then press the **Arrow- Down key (8)** and keep it pressed until the closing process is completed.
The closing process is done step by step:

Step 1- 3s Close,
Step 2- 2s Break,
Step 3- Door is completely closing

An acoustic signal sounds until the door is completely closed.
Release of the key leads to the interruption of the closing process.

Keep the **Arrow-Down key (8)** pressed until the closing process is finished and the acoustic signal stops. If you interrupt the keystroke, the door must first be opened with the **Arrow- Up key (3)** before you can start the closing process again.

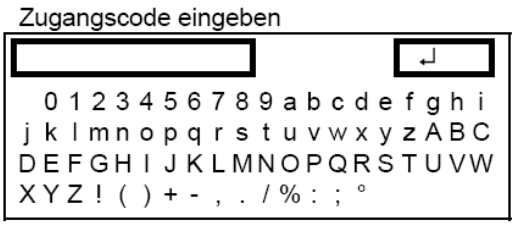
When closing, make sure that no parts are trapped between the door and the seal!

Do not open and close the door by force, as this may damage the door mechanism!
If damaged, safe operation cannot be guaranteed.

4.4.7. Select a program

program selection

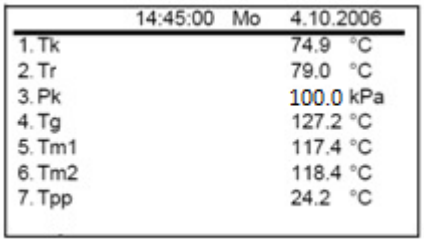
To select a program, press the **program selection button (5).** The program selection menu opens. By means of the cursor **keys "up" (3) and "down" (8)** the desired program is selected and by pressing the **enter key (7)** the program selection is confirmed and the program selection menu is closed. Please note that the programs marked with a key can only be selected after confirming a code key. This is done in the following automatically opening menu:



The cursor buttons navigate the cursor, up and down button changes the value, enter button must be pressed to confirm the code

2. Display level

In second display level the actual value of all installed sensors is shown.



The symbols shows the following sensors:

- Tk – chamber temperature,
- Tr – reference temperature,
- Pk – chamber pressure,
- Tg – temperature steam generator,
- Tm1, Tm2 – temperature in the outlet of heating / cooling jacket (not in all options)
- Tpp – temperature in vacuum pump

for touch operation:

A program is selected by pressing the **program selection keys (9).** The program selection menu opens. Use the cursor keys **"up" (4)** and **"down" (5)** or the touch screen (scroll) to select the desired program and confirm the program selection by pressing the **Enter key (7)** or by tapping on the respective program, and close the program selection menu again:

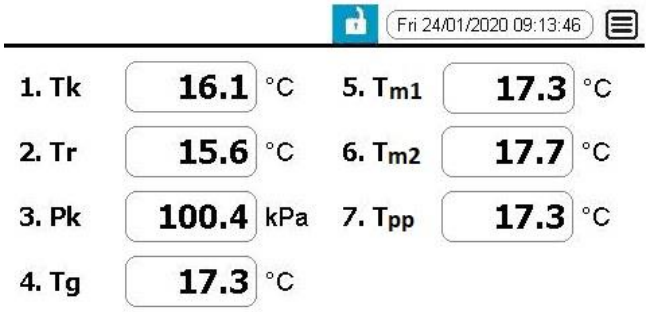
Startup screen

Program selection menu

Please note that programs marked with a key can only be selected after confirmation of a code key:

enter code key

The **display button (3)** can be used to change to a **second display level**. The values of further sensors are displayed here:



4.4.8. Program start

After selection of a program press the **start button (10)** and program starts. Depending on the program and the temperature in chamber the device starts directly or starts with preheating to realize standard start conditions **(→see 3.4. Description of program steps)**

4.4.9. Program termination (STOP Taste)

Press the **Stop button (11)** to break a program or to quit the finish signal. While a program is running you can break a program, the program is asking if you really want to break the program so have to confirm this. The program is going to the next possible program phase without coming in danger for user or sterilization goods. Breaking a program is a special situation for the device. The device goes automatically in a standard program phase! For liquids does it mean that the unit is switching off the fast cooling function and waits until reaching the removal temperature and removal pressure! So that can mean the program needs longer for finish like without the program break!

After program stop, the device flashes red and a short beep sounds continuously.

After a program interruption there are different possibilities, what the program does then. The different options depend on the type of program selected and the state in which the device is located at the time the program was stopped.

Particular attention is paid to the state of the thermal barrier when using a fluid program. The thermal lock is activated if the temperature for safe removal, defined in the parameters of the compensation phase, has been exceeded at the reference point. Then an immediate opening of the chamber after abort is not possible! Only then must the condition for safe removal be reached. In general, this is done by self-cooling

⚠	**In the case of a program termination before the end of the sterilization phase, the sterilized material is to be regarded as "non-sterile" and accordingly declared and treated!**

If a program termination is initialized in an instrument program with final drying, the sterilized material and the chamber are then wet! The sterilized material cannot be stored in this condition for more than 2 hours even if sterilization has taken place correctly! If possible, the chamber should be dried before re-starting the program.

✋	**Use the program break for emergency break only! The device will try to finish the program regular even it finds an error! So breaking a program is not necessary in each case of error message. Try Escape before breaking the program!**

4.4.10. End of program

Upon successful completion of the selected program, it will be finished. After the end of a program, the controller waits for the program to be acknowledged by the operator!

This condition is indicated by a flashing green display and a short acoustic signal.
The acknowledgment is done by pressing the **STOP button (11).** After another 3 seconds the door will be unlocked automatically.

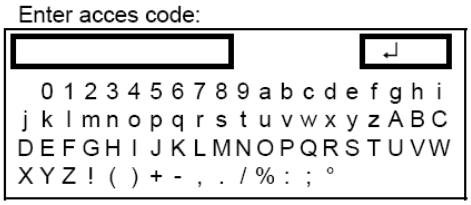
⚠	**When opening the chamber, hot steam can be released! Wait until the steam has completely drained and the chamber cools before removing the sterilized material.**

After completing the program, please note the following when removing the sterilized items:

- Never open the door by force. The autoclave could be damaged and hot steam could be released.
- Do not touch the sterile goods, the chamber or the door with unprotected hand. The parts can be hot.

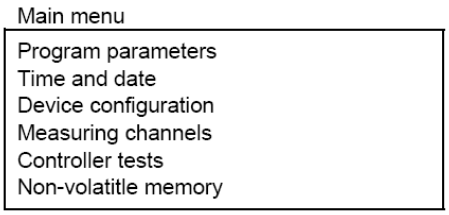
4.4.11. Changing program parameters

To change program parameters press the Enter button. You reach the code menu.
Give the **code 2000** to the menu and confirm with Enter button. To navigate trough the menu use the cursor buttons.

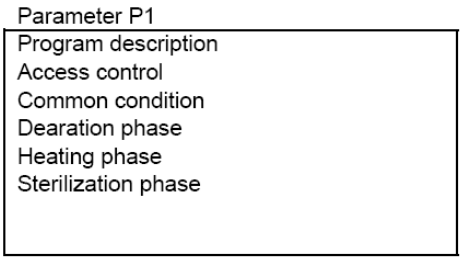


If the code was correct you reach the main menu. Depending on the access level defined by the code the main menu shows different submenus.

In the picture you find the maximum main menu, by giving the code 2000 you find the program parameter point only.



Enter the point program parameters. Inside the submenu go to the program you want to change.



Inside this submenu you can choose the program phase that should be changed directly.

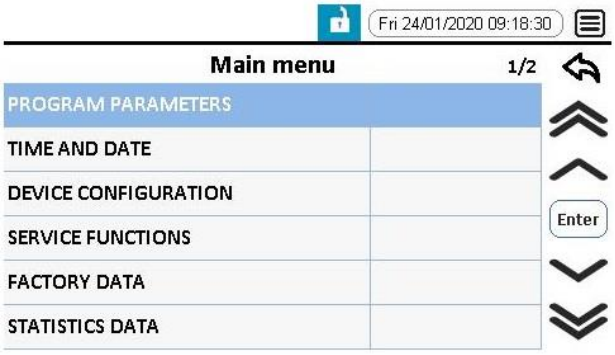
Change Program parameters only if the result gives real advantage! The preprogrammed sterilization cycles are validated for empty chamber and full loaded chamber. For the normal use the 10 preprogrammed cycles should be enough.

When all programs are configured you should run and test the program with empty chamber and full loaded chamber to be sure the program parameters do not make problems in normal cycle run. If there are doubts, you should make a full validation of the program.

for touch operation changing program parameters:

If you enter your access code correctly, you will enter the main menu. Different menu items are displayed depending on the access level. Special menus are reserved exclusively for authorised technicians. On the level "responsible operator" you will find the entries Program parameters to Device configuration. At the "user level" **(Code 2000)**, only the menu items “Program parameters” and “Time and Date” are displayed:

enter code key

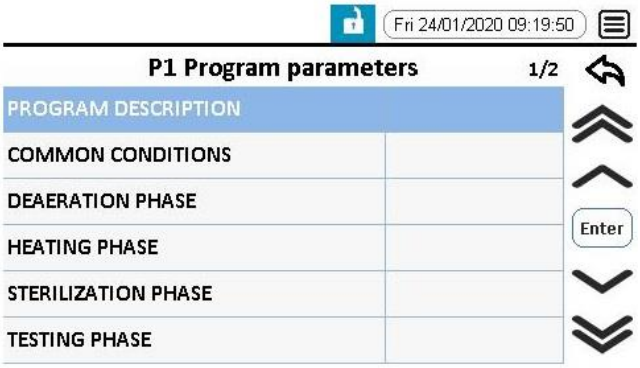


main menu

For example, to change the program parameters for touch operation press "Program parameters" in the main menu.

A list of the available programs appears. Select the one you wish to change. Depending on the access level selected, the corresponding available parameters for changing the program will appear:

In this menu you can directly select the program phase to be changed:

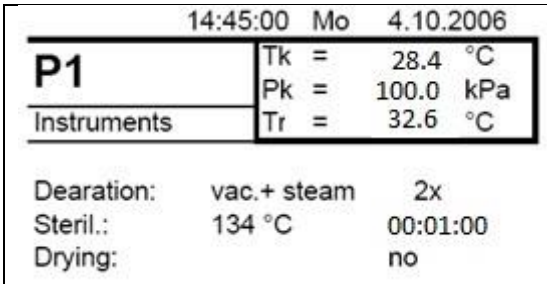


5. Sterilzation cycle progress

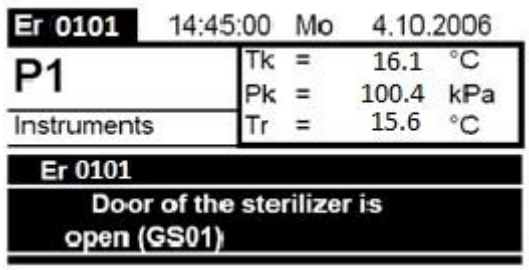
The program cycle is running fully automatically. The display shows the actual program cycle and gives information what is the actual situation in the running program phase.

The successful finish of sterilization cycle will be displayed. In case of an incorrect cycle additionally sounds an acoustic signal.

In the following the typical display are described:

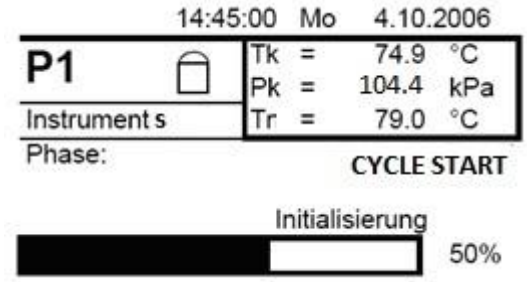
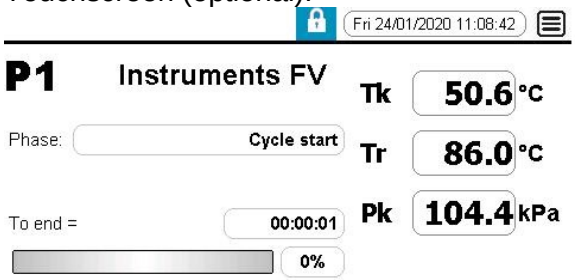
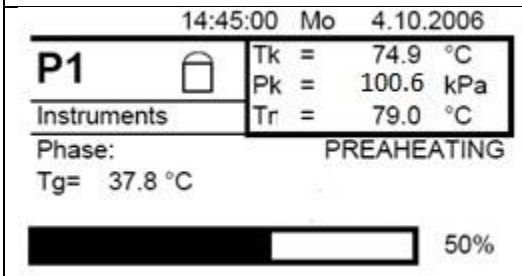
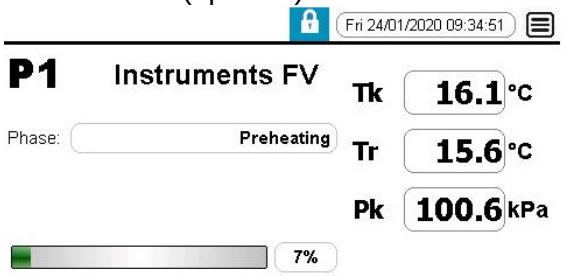
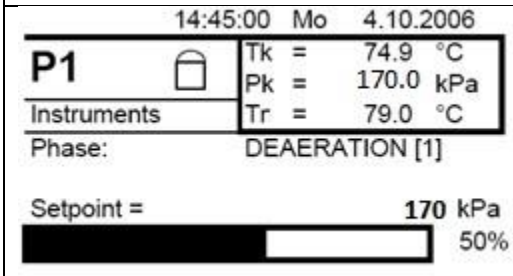
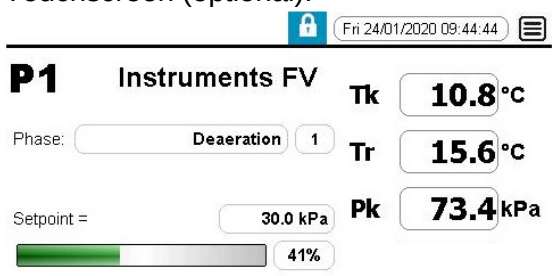
<table>
<tr>
<td>


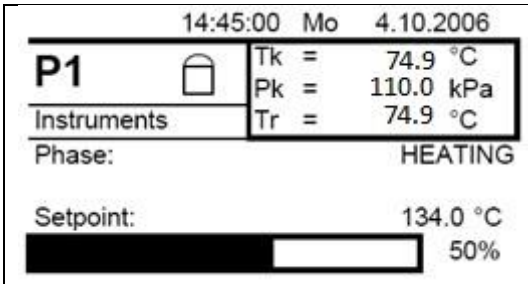
Touchscreen (optional):


</td>
<td>The steam sterilizer is switched on, program P1 is activated but not started. The device is ready for start. If the door is closed, the device is preheating the steam generator automatically.
The display shows program no. P1. Here the program type is shown, if special program name was given it will replace the program type. The main program parameters are shown for fast identification of the program cycle. In the picture the display shows Program type Instruments, with deaeration fractionated prevacuum starting with vacuum followed by steam injection 2 times. Sterilization is programmed for 134°C, 4 min. sterilization time. Drying function is not programmed. In the sensor window the main sensor values are shown.</td>
</tr>
<tr>
<td>


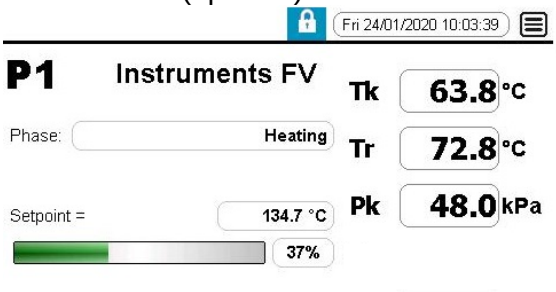
Touchscreen (optional)


</td>
<td>Example for an error: The program P1 was started but lid was not completely closed. So the device generates an error message. The error message can be cleared by pressing the Escape button if the cause of the error was cleared.</td>
</tr>
</table>

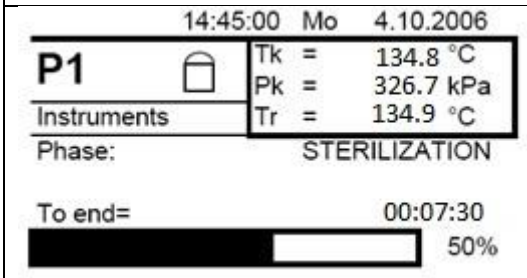
 Touchscreen (optional): 	The device was started up properly and a program was started.
 Touchscreen (optional): 	The cycle was started regularly, the temperature was low so unit starts with preheating. Instead of Tm1 / Tm2 the jacket temperature Tm is shown (only for option with vacuum and / or fast cooling)
 Touchscreen (optional): 	The program was started regularly and is now in deaeration phase step 1.



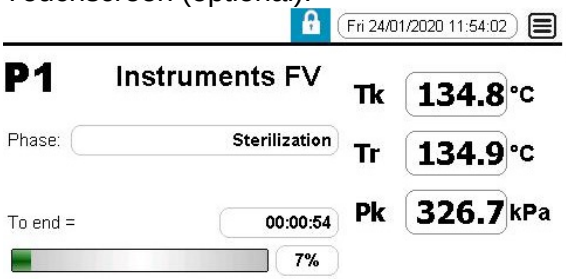
Touchscreen (optional):



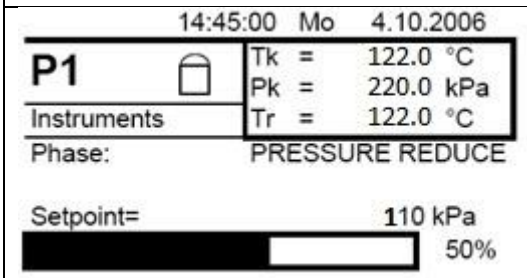
Deaeration has finished, the program is now in the heating phase. Set point for finish of this phase is reaching the 134°C chamber temperature.



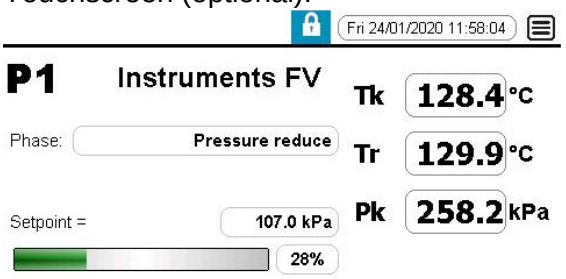
Touchscreen (optional):



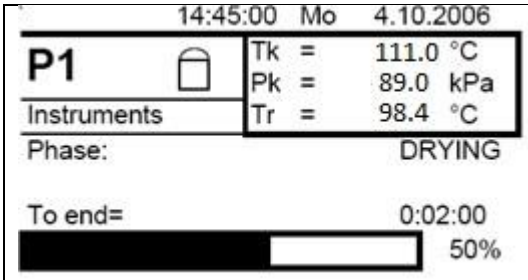
The sterilizer is in sterilization phase, 2 minutes before finish of this phase.



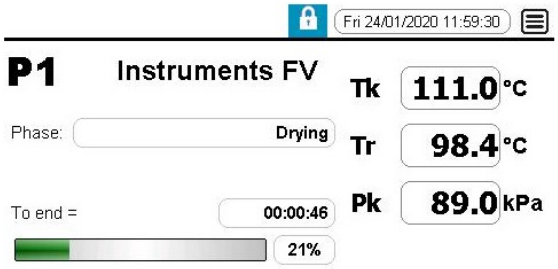
Touchscreen (optional):



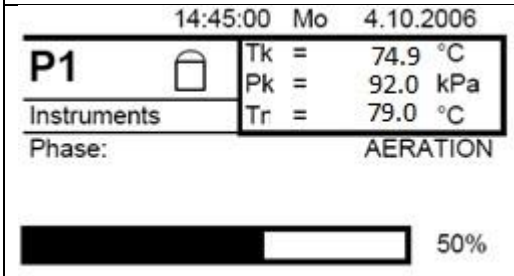
Sterilization phase has finished, now the chamber pressure will be reduced until reaching 110 kPa in chamber.



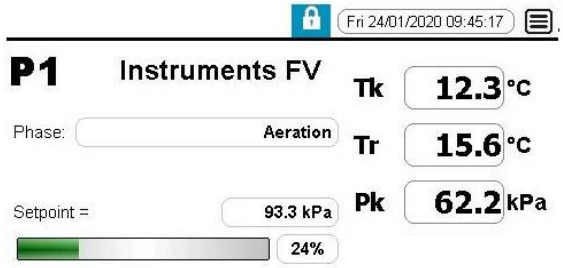
Touchscreen (optional):



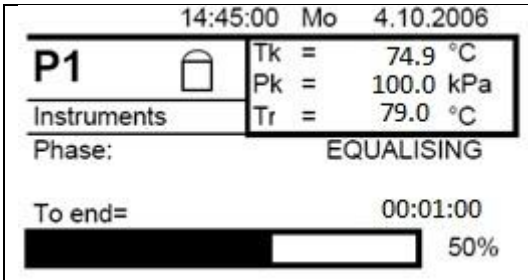
Chamber pressure was reduced lower than 10 kPa, pressure reduce phase has finished, now the device is in drying phase (vacuum pump is running). Drying is not available in units without vacuum pump!



Touchscreen (optional):

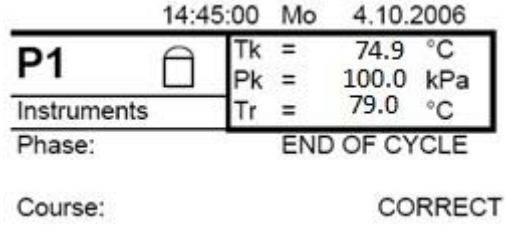


Drying time is over, now the chamber is venting until reaching set point.

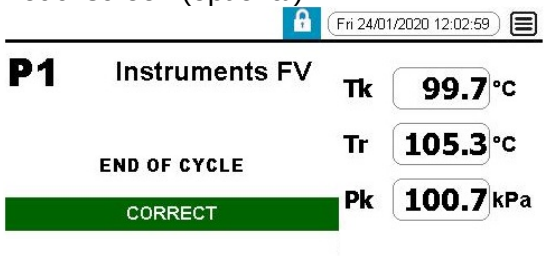


Touchscreen (optional):

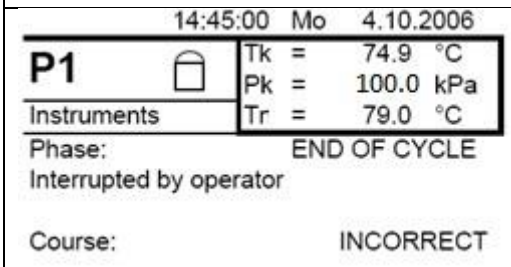
Venting the chamber has finished. An additional time is running for safety.



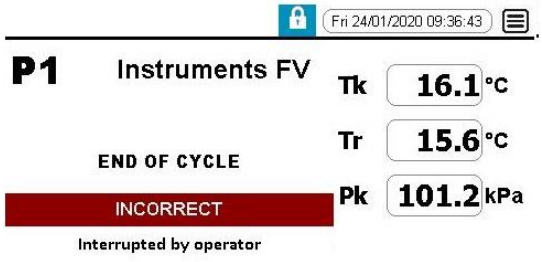
Touchscreen (optional):



The program cycle has finished successfully. The sterilizer gives the result as correct cycle. Now the program needs to be quit by pressing the **Stop** button. Then the lid can be opened and the sterilization good can be removed from chamber.



Touchscreen (optional):

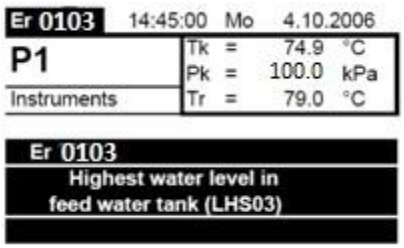


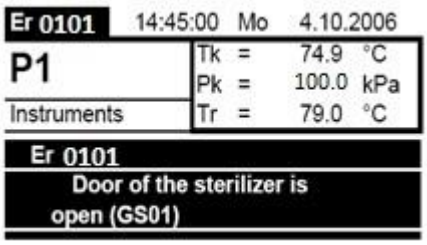
In case of a not successful or broken program the sterilizer shows the following message:
Before regular end of cycle a break was initialized. May be by hand or automatically. In case of automatic break an error message is additionally shown.

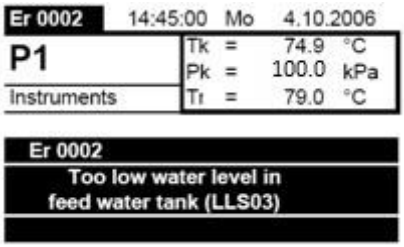
6. Error handling

The following errors can occur, which the device does not classify as serious, since they definitely represent normal operating states. Since the conditions can mean that a program may no longer be able to be terminated or lead to serious faults, it is no longer possible to start the program in this situation. If they occur while a program is running, these errors do not lead to the program to be aborted but only to inform the operator.

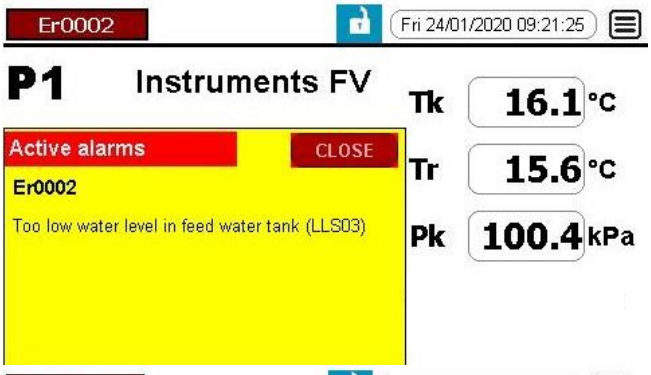
The following simple errors will not influence a program by breaking and are not real mistakes in process control. The errors make it impossible to start a program, the reason why it was generated needs to be removed before next start.







for touch operation:



An error list is included in the documentation folder of the device. In the event of a fault, a corresponding error message is shown on the display. If the error cannot be remedied independently, contact the customer service.

7. Operating the sterilizer- general information

7.1. Preheating the chamber

After switching on the device, the device enters a waiting mode. If a program is selected, the device goes into standby mode. If the door of the device is now closed, the device is automatically pre-heated. The steam generator and the pressure vessel are pre-heated to a set in the starting conditions for the selected program temperature. The automatic preheat function is active in all programs except in the vacuum test program. It cannot be deactivated. Only by changing the programming for the starting conditions can the general pre-heating be deactivated.

If the door is open, there is no automatic preheating possible!

Pre-heating is necessary to ensure uniform process conditions. This is the only way to validate processes and only then can it be ensured that the other ambient conditions do not adversely affect the sterilization process!
If the program is started during preheating, preheating will continue until the programmed start conditions are reached. Then automatically follows the program start, which is signaled by a 3-time signal.

After the device is ready for operation and the desired program has been activated (with the exception of the P12 vacuum test), the steam generator and the chamber jacket are electrically pre-heated when the door is closed!

7.2. Preparation of sterilization goods

Solid sterilization goods should be cleaned before sterilizing. Cleaning is a basic part of sterilization process. It reduces the numbers of microorganism on the surface. The sterilization is not a cleaning process! Microorganism will be killed or deactivated but the rest of material that the microorganism consists of will be on the surface after the sterilization has finished! Often these particles act as pyrogens!

Solid sterilization goods should be cleaned before sterilization! Only this gives warranty of a high quality sterilization cycle!

For wrapping the sterilization goods the wrapping material should be convenient to use as wrapping material! The wrapping should be closed over the complete cycle to protect the goods against recontamination after sterilization has finished. For waste material in a waste bag the opposite is valid. Waste bags should be opened or should open under vacuum! This is necessary to make sure the steam comes in direct contact with sterilization good. If there are doubts that the sterilization process runs without complications it should be validated!

Wrapped and porous material should be sterilized with vacuum program only! Waste bags are a kind of wrapping material! To sterilized waste in a waste bag a vacuum program is the best deaeration process. Pressure purge process may be not enough for good deaeration.

Especially when sterilizing wrapped goods it is necessary to keep the load in the same kind it was validated. The single packages should not lay inside to close to the next. Deaeration and drying function

depend on the kind of loading! If the steam can not reach the good evenly spread, the heating power will create temperature differences!

Heavy good should lay on the ground of the chamber, lighter goods should lay upstairs. In each program cycle the loads should be from the same type. The deaeration type should respect the most heavy and complicate load! A mixture of solid and liquid loads should be avoided.

The maximum loads are defined in chapter: **technical data**. Please refer to this chapter to see the maximum load of each type of load!

⚠	**Attention please while using hot liquids! While contact with hot liquids with temperature of more than 60°C it can burn the skin!**

⚠	**Attention please while handling closed waste bags! If the unit is not equipped with vacuum the waste needs to be opened while loaded into the chamber. While opening the waste bag bio aerosols will come free and may infect the operator! Operate the device in the right protection clothes only! Protect your skin, your face especially eyes, nose, mouth!**

7.3. Emptying the tanks

The tanks should be emptied when decommissioning **(see → 9. Decommissioning)**.
For the storage tank a complete draining of the feed water is recommended once a month.
Empty the storage tank (left) and the condensate tank (right) using the drain hose supplied with a fluid quick connector. Insert the coupling piece of the hose into the counterpart on the device until it snaps into place. Hold the other end in a container to catch the feed water or condensate. If no more water runs out of the tank, it is emptied. To release the connection of the quick coupling push the ring located on the device piece backwards, the coupling piece on the hose is automatically ejected.
The drain hose can be used for both tank drains.

☞	**In the condition of the connected coupler you have created a system of communicating tubes! If the free end of the hose is in a liquid and it is raised above the height of the hose coupling, there is a risk that liquid from your receptacle will run back into the tank and overflow it!**

☞	**Make sure there are no air bubbles in the drain hose. If so, gently shake the hose.**

⚠	**Never put the drain hose in your mouth!**

8. Documentation of sterilization cycle

The device is prepared for various types of process documentation. On the one hand, each process can record the relevant process data directly on paper using a built-in printer. At the same time, the device contains a memory that stores between 30 and 50 cycles depending on the number of analog channels defined for documentation and the number of values to be saved per time unit. This data can also be subsequently printed out with the printer. If the memory is full, the implementations on the data in memory are automatically overwritten. In addition, the process data can be directly read out and archived using electronic documentation software called **SegoSoft** and a special data cable.

The cycles can be assigned accordingly using the date and time. You can obtain separate instructions for **SegoSoft** from customer service on request or you can find them in the customer center on the website: www.shp-steriltechnik.de

Parallel use of both types of documentation is also possible.

When equipped with a **touch display**, it is no longer possible to use a printer and the **SegoSoft** software. Instead, data of up to 999 cycles is stored on an internal MicroSD card and can be accessed at any time (when the device is in switched-on standby mode) via network or USB stick (please use a FAT32 formatted stick, then it will start the data is automatically backed up on it; **do not leave the stick plugged in, it is only read out immediately after plugging it in or plugging it out and plugging it in again!)**.

After reaching 999 cycles, the archive must be deleted in order to be able to save new cycles again.

The printer is available as an integrated device, which is connected to the device via a serial RS 232 interface. The printer allows all relevant process parameters to be printed out during the cycle run or afterwards.

☞	**The printer enables process data to be printed out directly from the memory afterwards. To do this, select the submenu archive function in the main menu.**

☞	**The printer should have enough paper.** **When the paper roll is used up, the printer switches off automatically.**

9. Decommissioning

If you wish to put the device out of operation for a longer period of time (for example due to a holiday or a planned transport), proceed as follows:

- The chamber door should not be completely closed, but only lean against the lock spindle to allow the interior of the chamber to dry.
- Switch off the device at the mains switch on the appliance door and switch off the main fuse on the right rear side of the appliance.
- Disconnect the power plug from the socket.
- Empty the storage tank and condensate tank **(→ see 7.3. Emptying the tanks)**

10. Maintenance

The sterilizer should get regular cleaning, maintenance and service. Some parts are regular to be changed completely to protect the device against damage or mistakes in sterilization cycle. The simple cleaning and maintenance activities can be done by the operator without problems.

Special services can be done by specially trained service stuff only! All inspection activities acc. to pressure vessel regulations / local regulations for pressure vessels and electrical installations need special trained service staff!

We recommend to order one regular safety inspection per year and to connect this with a regular maintenance for the vessel, pressure parts and electrical installations. Your distributor is authorized to tell recommend a trained service partner.

☞	**We recommend to use a device book that helps to document all cleaning, maintenance and service repair activities at the device.**

⚠	**Maintenance or repair activities that need to open the housing are not allowed to be done by untrained personal stuff!**

⚠	**For maintenance or repair activities that need to open the housing the electrical power supply must be disconnected! Inside the housing dangerous electrical voltage can kill or hurt!**

⚠	**After work at electrical installations some electrical test are necessary to do. Please respect the local rules and regulations!**

10.1. Regular cleaning, maintenance and service activities

activity	Recommended time					notes
	daily	weekly	Monthly	Half year	yearly	
Cleaning the surface of chamber ring	X	X	X	X	X	
Cleaning chamber inside	X	X	X	X	X	Especially after over boiling of sugar or agar solution
Cleaning baskets		X	X	X	X	
Cleaning trays and bottom sheets		X	X	X	X	
Cleaning lid seal and check for damages	X	X	X	X	X	Change lid seal if damaged (SERVICE)
Cleaning the device outside			X			
Check the safety valve				X		SERVICE
Check the in/out connections			X	X	X	
Change the venting air filter			X	X	X	
Function test for the valves					X	SERVICE
Cleaning the tank					X	SERVICE
Functional test of vacuum pump					X	SERVICE
Check program parameters				X	X	
Check for lid / door adjustment					X	SERVICE
Electrical test (BGVA 2/4)					X	SERVICE
Attention please! Opening the unit is allowed for authorized and trained service staff only! **If other intervals are prescribed at the place of use according to national law, then these inspection periods and periods must be observed!**						

The vessel has to undergo regular inspections and tests according to the current laws and regulations. We advice you to have an inspection of the vessel jacket regularly to check any corrosion. Such inspection has to be done by an authorized person of our company.

Attention: Please pay attention when the lowest stress cycle has reached the half amount you have to inspect the pressure vessel. The inspection has to be done in Germany due to BetrSichV not later than 10 years.
Out of Germany local regulations have to be obeyed.

10.2. Cleaning

⚠	**Before starting with cleaning the device please disconnect the unit from power supply completely! Cleaning should be done if the unit was cooling down only! Danger if the chamber is hot!**

- **cleaning the surface of chamber ring** – Clean that area regular! That area is necessary for closing and sealing the chamber completely. Use a wet towel or textile cotton material for cleaning. In case of hard waste in the surface you can use the hard side of house hold eraser. Do not use aggressive chemicals or organic solutions like alcohol, benzine or acetone.

	**Do not use aggressive chemicals or rough cleaning materials for cleaning the metal surface!**

- **Cleaning the chamber inside** – for cleaning the chamber use a wet and soft towel from cotton material. Special cleaning material or chemicals are not necessary. Do not use aggressive or organic chemical for cleaning! Chemicals can damage the sealing or sensors!

	**The rest of chemicals or cleaning materials will be brought forward to the sterilization goods of next sterilization cycle! Do not use aggressive or organic chemicals for cleaning!**

- Cleaning the accessories – Clean the baskets etc. with wet towel or under running water.

- Cleaning the housing – The housing needs to be cleaned by wet towel or light oil. Special cleaning chemicals like used in household can be used.

- Emptying the feed water tank – Empty the feed water tank regularly by plugging the drain hose on the right drain plug (quick release)

10.3. Check of the safety valve

The safety valve should be checked for function at least once every six months and as part of the annual maintenance. This should be done by an authorized service technician! After a longer standstill of the device, it should be restarted by a qualified person. In this context, a check of the safety valve is to be carried out. Check the safety valve by turning the thumbscrew on the top of the safety valve until the valve opens. Then the valve is closed again. In order to let the valve blow off, there must be an overpressure in the chamber, so it is a program to start, the test takes place in the heating phase of the program, the program is then canceled.

⚠	**Attention please! While steam is leaving the safety valve the valve is getting very hot in a very short time! Make sure that your human skin is not coming in contact with the steam! Contact with the steam can burn your skin!**

⚠	**If the valve is not closing completely after testing it needs to be changed! If there are doubts about the regular functionality of the tested valve it needs to be changed!**

To check the safety valve, do the following:

- Remove the cover plate on the back of the device. To do this, unscrew the screw with which the cover plate is fastened. Then lift the lid sheet out of the holder and set it aside.

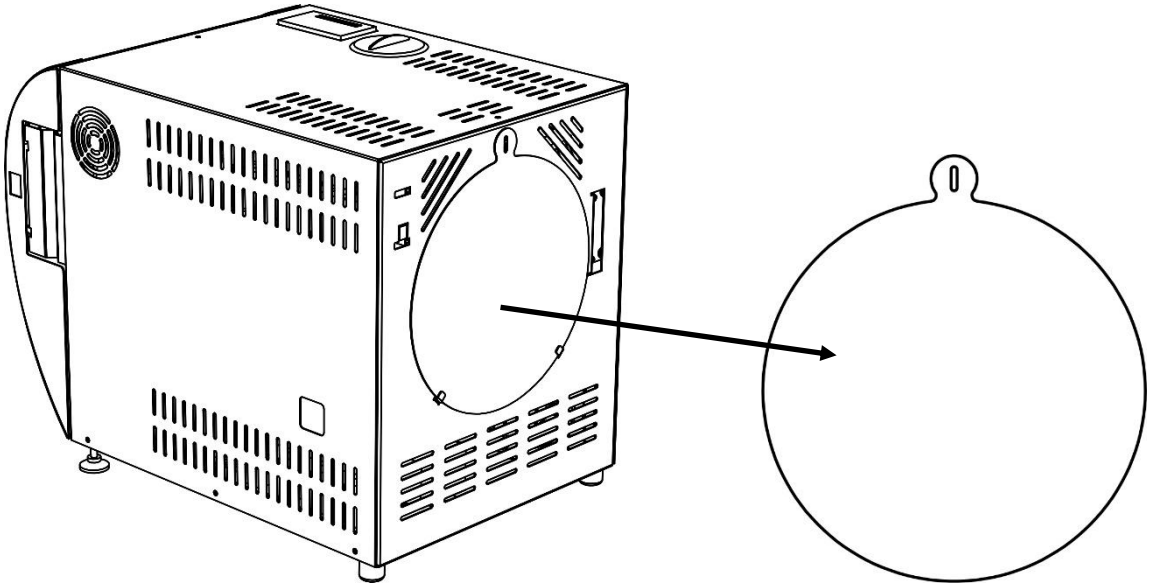


Figure: remove the lid sheet on the back

- The safety valve is located directly in the middle at the rear of the chamber.
- Turn the knurled screw on the upper end of the safety valve until the valve opens and can blow off.
- Then the safety valve is closed again.

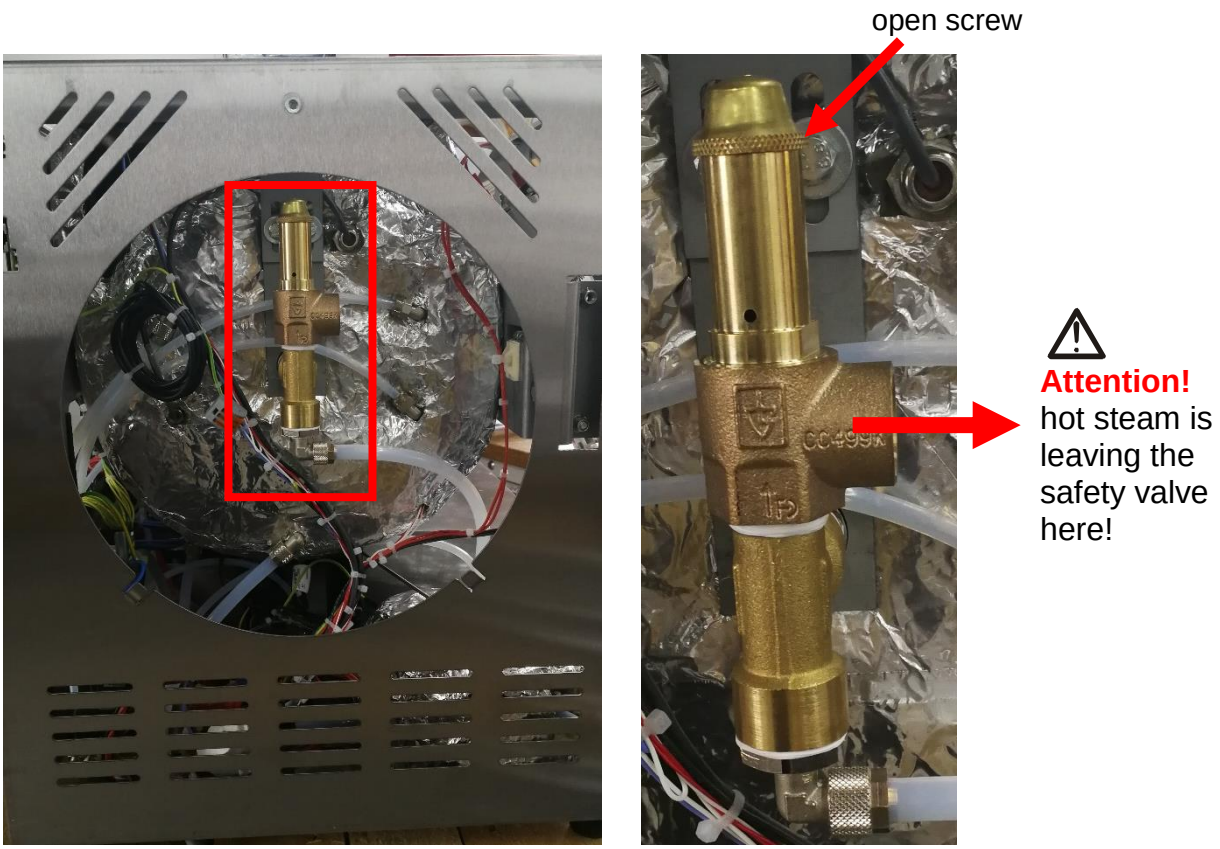


Figure: Safety valve of the Laboklav 25

⚠	**A check of the safety valve should be done by an authorized service technician! After a longer standstill of the device, it should be restarted by a qualified person.**

10.4. Changing venting air filter

The wear of the air filter is largely dependent on the quality of the ambient air. Particularly particle-laden air sets the filter faster. This can vary over the year for seasonal reasons. High humidity shortens the life of the air filter. We recommend to change the filter in winter after 450 cycles, in summer after 300 cycles or to define a regular cycle, which corresponds to the individual frequency according to our suggestion.

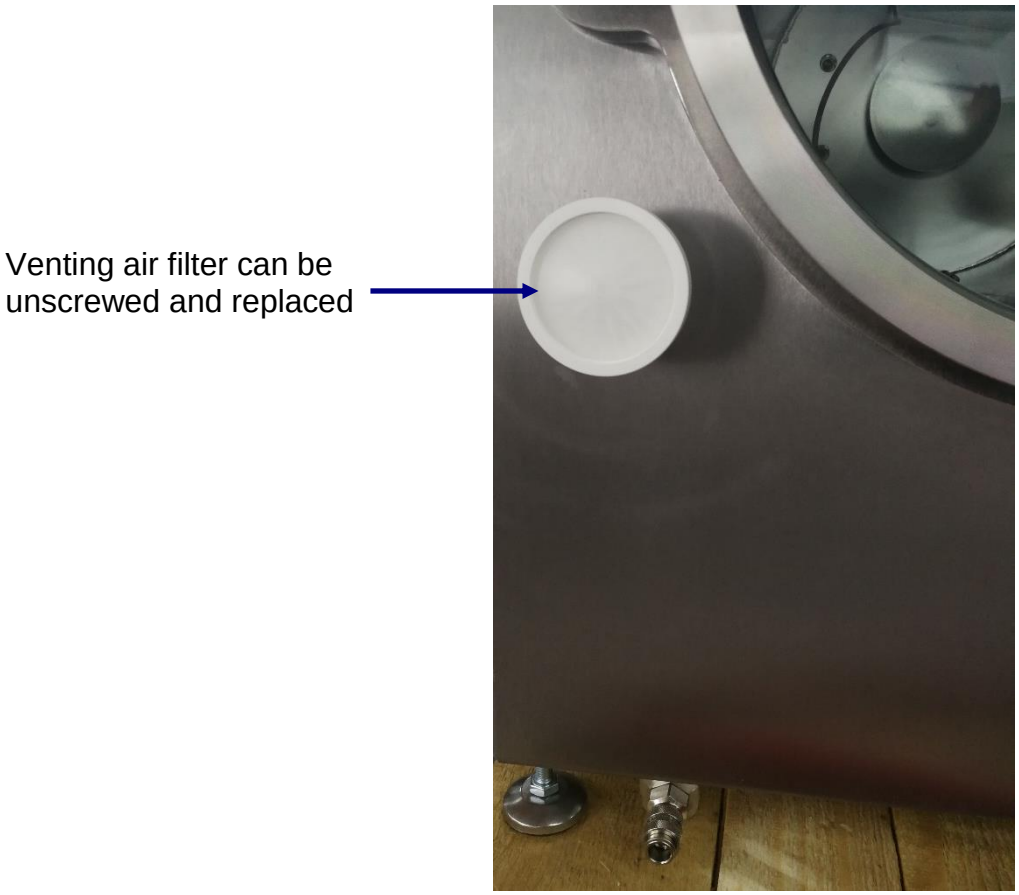


Figure : Venting air filter of Laboklav 25

10.5. Changing door seal

It is recommended to check the door seal annually and replace it if necessary. The replacement of the door seal should only be carried out properly by authorized personnel.
In this case, please contact the customer service.

10.6. Changing printer paper and ribbon cassette

The CBM-920 CITIZEN printer is a dot-matrix printer. It is available as an optionally integrated device which is connected to the device via a serial interface RS 232.

For more information, please read the detailed operating instructions of the printer from the manufacturer.

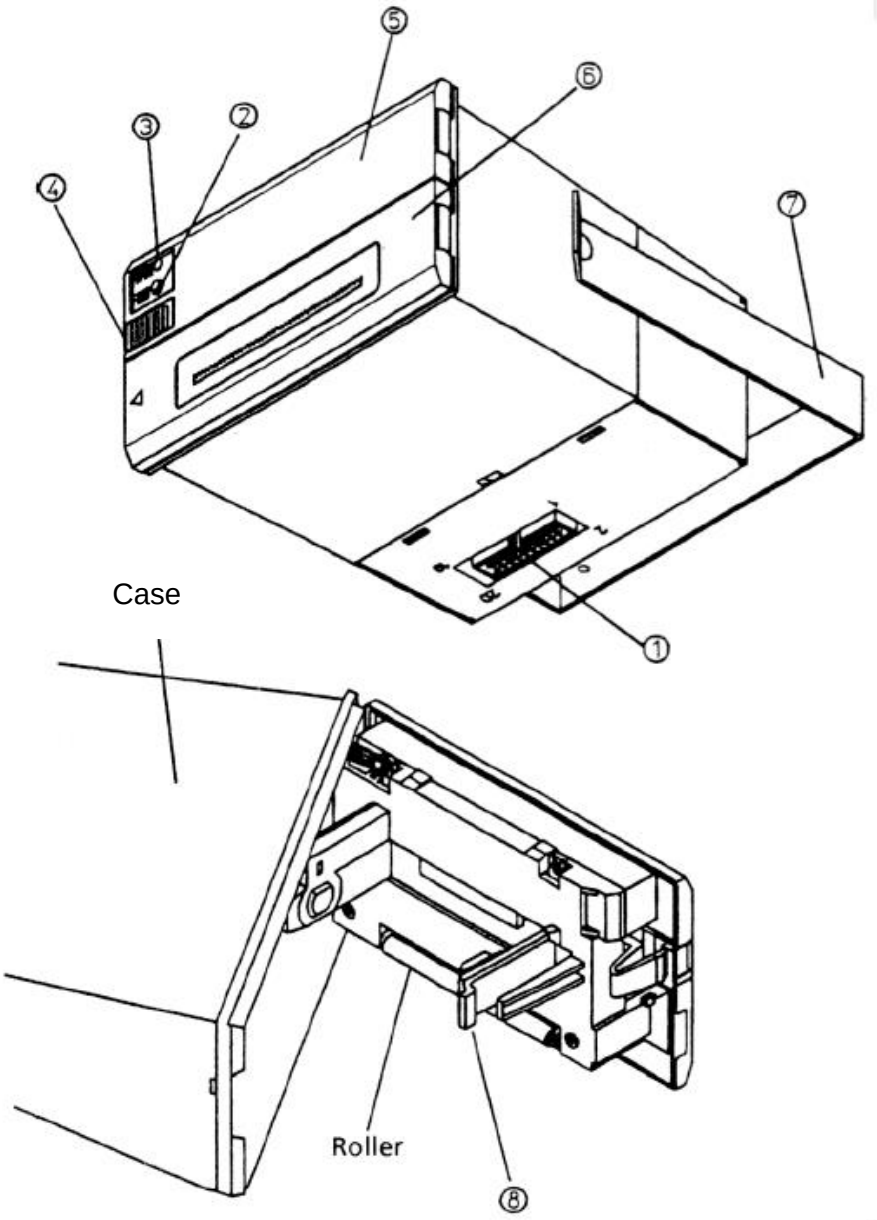


Figure: Printer CBM 920 RS 232

1- Interface Connector
2- Feed Switch
3- Paper Lamp
4- Knob
5- Front Cover
6- Ribbon Cover
7- Mounting bracket
8- Paper Holder

1.) Setting printing paper:

- Open the front cover of the printer.
- Cut the edge of Printing Paper as the following drawing:

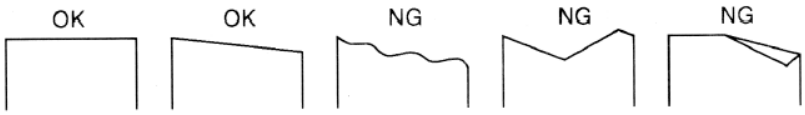


Figure: Cut the edge of the Printing Paper

- Insert the paper into the paper insertion of the printer mechanism. When auto loading function is specified, paper is loaded automatically. Otherwise push the LF switch until paper enters the printer mechanism.
- By holding the paper holder in the arrowed direction, insert paper roll and make sure paper holder hold the core.
- Eliminating slack on the printing paper, close the front panel.
- To change paper, as holding the paper holder in the arrowed direction, re-move the core. Remove, at this time, excessive paper by using the LF switch. After setting paper, press the LF switch once. Then, printer goes to data input printing mode.

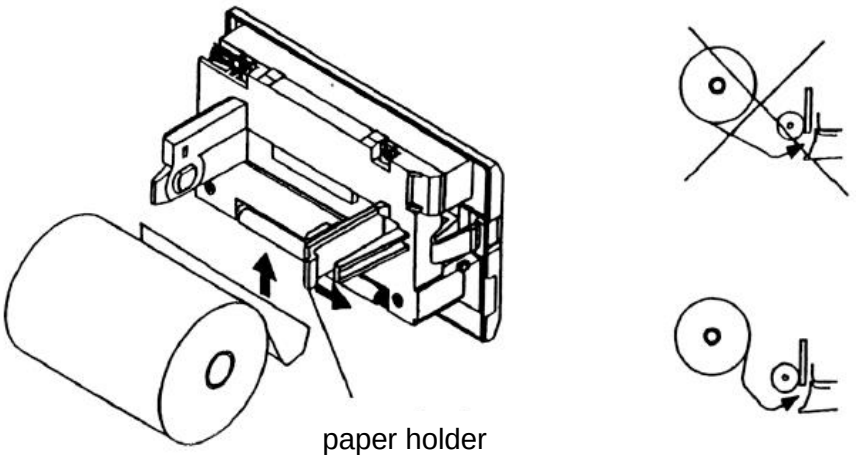


Figure: Setting Printing Paper

2.) Setting paper roll:

- Remove the empty roll by holding the paper holder to the side.
- Remove the empty roll core.
- Remove excess paper by pressing the feed switch.
- After loading the paper, press the feed switch again. This will put the printer in print mode

3.) Setting ribbon cassette:

- Press on the eject button. Cassette is ejected.
- A new ribbon cartridge can be inserted in the printer.

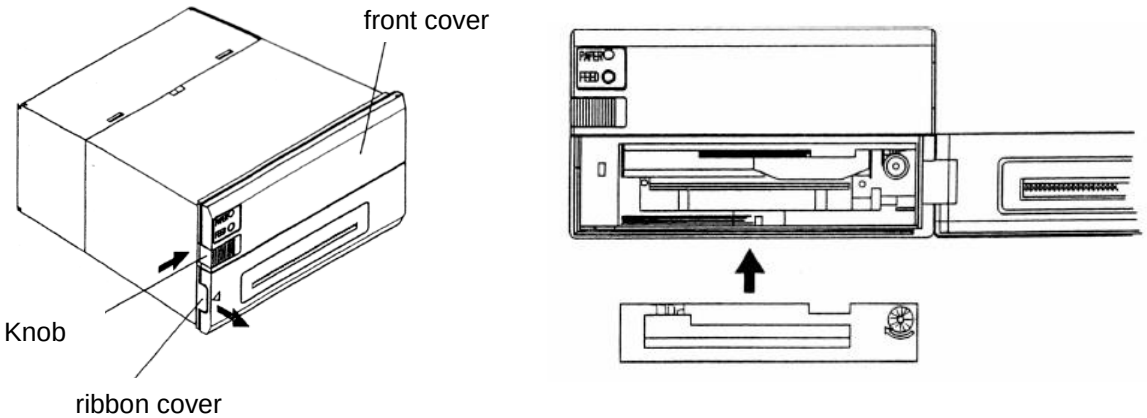


Figure: Setting ribbon cassette

10.7. List of consumables

The following consumables are available on request from Customer Service:

Spare part	Drawing number	Article number
Venting air filter; 0.3 μm / 99.5% – ϕ 50 (1/8" NPT)		40-0719-142-014
Door seal	Laboklav 25	50.05.00000.014
Printing paper		50.05.30001.199
Ribbon cassette		50.05.30001.183
Sterile filter cartridge		50.05.00000.032

11. Description of safety devices

The steam sterilizer is equipped with different safety devices. The safety devices protect the user against injury and keep the sterilization process safe. Mechanical and electronic safety devices are build in and realize in sum a safety concept with different safety functions.

- **protection against over pressure** – If control board is measuring a chamber pressure of more that 345 kPa absolute pressure (2,45 bar relative pressure) an alarm is generated (including error message) and the heating function is switched off. The heating function can be switched on manually again by pressing escape button, so that the program is not broken. With 360 kPa absolute pressure another error message is generated that is breaking the program automatically. With 2.8 bar relative pressure the safety valve is opening and chamber pressure is reduced mechanically! The steam is blowing into the housing. In this case, contact with the steam is not very dangerous because it is saturated after blowing out.

  Attention: To check the safety valve a special program can be implemented that is bridging the safety functions of over-pressure protection. This program will be implemented on special order by the customer only! Blowing off the safety valve in the condition that the housing I not opened can damage the electronic board!

- **Protection against opening the chamber while over pressure is inside** – the device has a built in thermos-locking function. The device opens the thermo lock when pressure is low only. The pressure is checked by pressure sensor and an additional pressure switch that detects normal pressure. The opening mechanism is calculated to open when chamber if pressure is low. These 3 safety functions give good protection against opening while pressure in chamber is high.

- **Protection against opening the chamber while temperature of liquids is too high** – One part of the thermos-locking system is the measurement of the temperature inside liquids by the reference sensor. The device is unlocking the lid in liquid programs when temperature is lower than programmed removing temperature is reached only. The flask where the reference sensor is positioned should be from the same size, form and filled with same volume of the largest single volume of the sterilization goods.

- **Protection against steam out coming from chamber** – steam production is switched off immediately if the lid is opened. After program finish, the pre-heating of steam generator is switched off so steam out coming from steam inlet should be not possible. Pre-heating is switched on again after new program change or entering the same program again.

- **Protection against overheating the steam generator** – the steam generator is protected against over heating by an over temperature switch. If this switch is activated, the device must cool down. The device reacts to overheating by aborting the program and displaying an error message. Before using the device again, it should be checked by an authorized service.

- **Protection against overheating the chamber** – The chamber is not directly heated so it can reach maximum the steam temperature that is limited by the pressure.

12. Additional Information

12.1. Definition of feed water quality

Acc. to **EN 285** – “Steam sterilizers”, app. B / EN 13060 – small size steam sterilizers App. C

	Feed water	Condensate
Residual dry matter	≤ 10 mg/l	≤ 1.0 mg/kg
Silica oxide, SiO_2	≤ 1 mg/l	≤ 0.1 mg/kg
Iron	≤ 0.2 mg/l	≤ 0.1 mg/kg
Cadmium	≤ 0.005 mg/l	≤ 0.005 mg/kg
Lead	≤ 0.05 mg/l	≤ 0.05 mg/kg
Other heavy metals, except for iron, cadmium, lead	≤ 0.1 mg/l	≤ 0.1 mg/kg
Chlorines	≤ 2 mg/l	≤ 0.1 mg/kg
Phosphates	≤ 0.5 mg/l	≤ 0.1 mg/kg
Conductivity (at 20°C)	≤ 15 µS/cm	≤ 3 µS/cm
pH	5 to 7	5 to 7
Colour	Colourless, clean, no deposit	Colourless, clean, no deposit
Hardness	≤ 0.02 mmol/l	≤ 0.02 mmol/l
NOTE 1: Using water of contamination greater than specified above for steam generation, can considerably reduce the sterilizer life and void the manufacturer’s warranty. NOTE 2: The condensate should be derived out of the steam collected during sterilizing cycle with the chamber empty.		

Tests for conformance are performed with commonly used analytic methods.

12.2. Disposal

By labeling a device with this symbol, SHP Steriltechnik AG declares that it complies with all requirements arising from the Act concerning the Placing on the Market, Return and the Environmentally Disposal of Electrical and Electronic Equipment. (WEEE Reg. No.: DE43170688)
The device must not be disposed of as household waste or industrial waste due to contaminated parts. Please contact the SHP Steriltechnik AG, so that the final destination of the device can be decided.
You can find documents (form "return of electronic devices") for the take-back of used devices and the proof of decontamination in the enclosed device folder. These can also be obtained from the homepage of SHP Steriltechnik AG.

13. Service and maintenance

If there are any problems in operating the sterilizer please contact your distributer first. The distributer knows the address of the next authorized service company or is able to solve your problem directly.

Manufacturer Germany	SHP Steriltechnik AG, Schloss Detzel 1 39345 Detzel Schloss / Satuelle	
Fax	+49 39058 97 62- 22	08:00 to 17:00 Mo. – Fr.
Phone	+49 39058 97 62- 0	08:00 to 17:00 Mo. – Fr.
Mobile	+49 177 6269880	24 h
Email	info@shp-steriltechnik.de	08:00 to 17:00 Mo. – Fr.

You can also contact the local importer/distributor as per your invoice or mentioned on the sticker on the instrument.