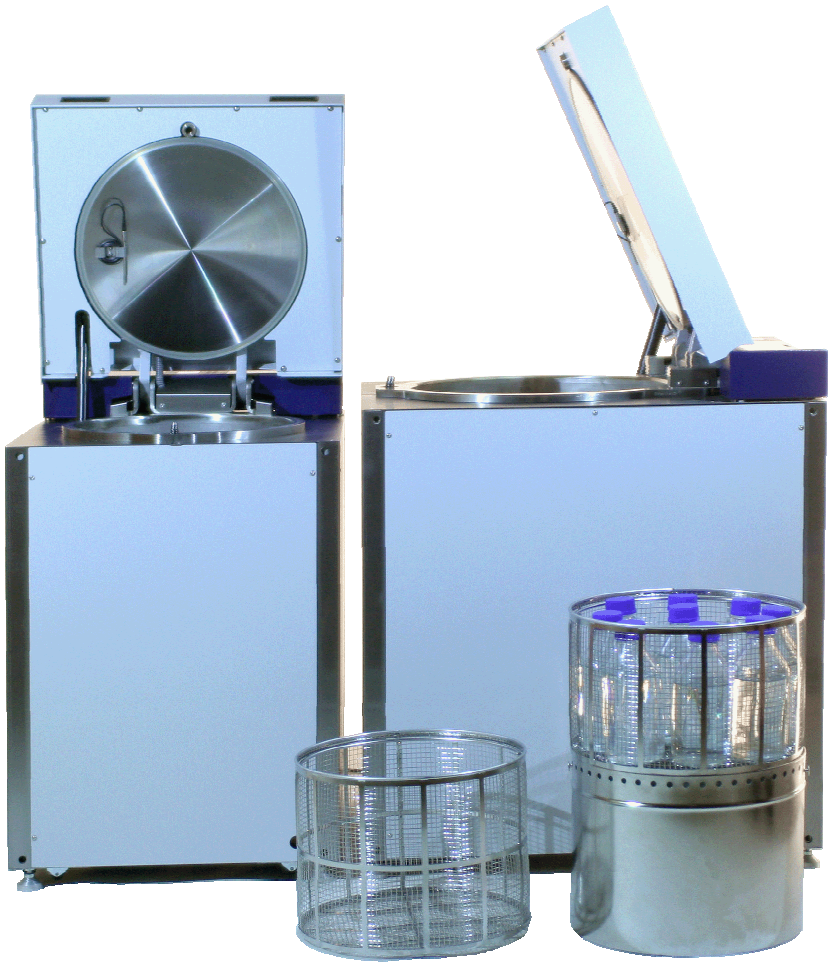
VWR Vapour Line Steam Sterilizer
Basic / with Forced Cooling

80 Litres, 135 Litres



User Manual

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481-0694	Vapour-Line 80 M	UK
481-0695	Vapour-Line 135 M	EU / CH
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CE **0036**

Legal Address of Manufacturer

United States
VWR International, LLC
100 Matsonford Rd
Radnor, PA 19087
800-932-5000
http://www.vwr.com

Europe
VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
B-3001 Leuven
+ 32 16 385011
http://be.vwr.com

Country of origin: Germany

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Introduction and definition of important symbols

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 and to draw 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

	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.

1. List of delivered parts

Device in ordered specification (options)
Connecting pipes for water supply steam / condensate remove
Bottom sheet
Documents including user manual, pressure vessel papers (conformity declaration), safety valve calculation, warranty declaration
Baskets acc. to order

2. Unpacking

⚠	**Unpacking, installation, instructing into the use of autoclave has to be done by certified / authorized stuff only. Lokal regulations acc. to PED 23/97/EU may regulate the installation process.**

While unpacking and installation the technician should have attention to the feet and rollers of the autoclave to protect the unit against damage! The feet in the front are used to fix the autoclave in a straight position.

3. Installation

Preparation of the unit

The floor in the room should be waterproof. The sterilizer require safe foundations, and it should be located in close distance to a floor drain, to allow draining of condensate and water. The room dimensions should ensure comfort in operation, while ensuring the minimal distances (min. 10 cm to the wall and next device in room).
Due to large amount of heat generated during the sterilizer operation, the room in which it is seated should be fitted with a mechanical intake and exhaust ventilation system, providing 6÷10 exchanges of air per hour. The ventilating hood should be installed above the sterilizer.
By using the turnable leeds the chamber of the device should be adjusted to remove the condensate from chaber easely.

Power supply

The steam sterilizer is equipped with a 2,5 m long net supply cable. The device is configured to be connected to an electrical system CEE 3P+N+GND with a voltage of 400V AC, 50 Hz, 16 A (Vapour Line 135) or 1N 230V 16A (Vapour Line 80). For commercial use we recommend to use an additional fault current protection switch. For fast switch off a central main power switch should be installed (see page 6).

⚠	**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 1x/3x16 A may cause an over load or heating up the power cable and can cause a fire!**

Water supply

The steam sterilizer needs demineralized or destilled water for feed water! Please refer to Appendix C EN 13060 about water quality. Normal tap water / drinking water is not for use as feed water! See the quality definition in chapter VII Additional Informations. The feed water is manually filled in the chamber until the height of bottom plate is reached. More water will be pressed out while dearation phase.

The device is prepared to be connected to a central cooling water supply for output cooling. This is made for protection of the house side installation of the drain. In case of this is given please use the connection. For that condensate cooling function drinking water is recommended. Pressure on water supply should be not less than 0.5 bar.

Attention! If the chamber is not filled with enough feed water before starting the process, the unit can not finish the program. Over heat protecting will break the program. In case of program break let the chamber cooling down to normal environmental temperature Do not fill cold water inside the chamber!

4. Intended use

The steam sterilizer Vapour Line 80 / 135 is equipped with a chamber by 80 Liter or 135 Liter chamber volume. It is constructed for the steam sterilization of instruments, materials for non medical use and liquids. Liquids should be water based solutions only! All versions contain a thermo lock acc. to IEC 61010-2-42. Different versions depending on the use of the sterilizers are available.

In Basic version (Vapour Line xxx) the sterilization of solid materials like instruments and glass ware, 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 to do not 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 (Vapour Line xxx 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 constructed 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 3 – 12 % depending of the pressure reduce speed (programmable by service).

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

⚠	**The steam sterilizer Vapour Line 80/135 is not prepared for the sterilization of acid, base or organic solutions. It is forbidden, to use the autoclave for handling of explosive materials.**

⚠	**Attention! All materials you bring inside the chamber come in contact with water / steam. It could happen that a chemical reaction will be initiated!**

⚠	**Sterilizing organic solution may damage the autoclave or reduce the life cycle or maintenance cycle! It may be dangerous for the user of the autoclave or local stuff being nearby the unit!**

5. Product specifications

Vapour Line 80

Overall dimension (free standing unit)(W x H x D).....		740 x 915 x 600 mm
Weight (net).....		ca. 165 kg
Maximum Load:	- Instruments	30 kg
	- Textiles ….....	10 kg
	- Liquids …..……..	21 Litre Total volume
Sterilizer chamber:		
Total volume ….		ca. 82 l
Chamber dimension (ϕ x D) …….....		ϕ 410 x 610 (+50-round.) mm
usable Volume ……..….		ca. 80 l
Maximum allowable pressure (PS)		2.8 bar
Maximum allowable temperature (TS)		143°C
Working pressure safety valve …….....		2.8 bar
Material number for chamber …….....		1.4404 (SS 316 L)
Surface roughness…….....….		≤ 1,5 µm
Pressure Equipment Directive 97/23/EG.....		CE 0036, Cat. III, Module B+C1
Power supply:		
Voltage …….....		1N 230V~ (±5%), 50 Hz, 16A
Working power.....		3 kW
Averaged power consumption per cycle		5 kWh
Protection class .....……..		**I**
Protection level. .....……..		IP24
Electromagnetic compatibility ……...		DIN EN 61326 / A1
Water supply:		
Destilled or demineralized Water		
(acc. to annex C EN 13060:2004)		
Averaged feed water consumption per cycle.....		ca. 0,5 l .. 2 l
Storing conditions:		
Temperature		5 ÷ 40°C
Humidity		max. 85%
Heat emission ……		Approx. 12 % of total power cons.

Programs:

5 predefined Programs in user level 1:

The program definition depends on the available options included in the model. The programs can be individually changed.

5 programs in user level 2 (Program P5 to P10) Code protected. Predefinition is like P1.

Computer interface:

- serial interface RS 485

Printer (optional)

Vapour Line 135

Overall dimension (free standing unit)(W x H x D).....		840 x 965 x 700 mm
Weight (net).....		ca. 205 kg
Maximum Load:	- Instruments	40 kg
	- Textiles ….....	25 kg
	- Liquids …..……..	30 Litre Total volume
Sterilizer chamber:		
Total volume ….		ca. 135 l
Chamber dimension (ϕ x D) …….....		ϕ 500 x 720 mm
usable Volume ……..….		ca. 130 l
Maximum allowable pressure (PS)		2.8 bar
Maximum allowable temperature (TS)		143°C
Working pressure safety valve …….....		2.8 bar
Material number for chamber …….....		1.4404 (SS 316 L)
Surface roughness…….....….		≤ 1,5 µm
Pressure Equipment Directive 97/23/EG		CE 0036, Kat. III, Module B+C1
Power supply:		
Voltage …….....		3N 400V~ (±5%), 50 Hz, 16A
Working power.....		6 kW
Averaged power consumption per cycle		6,5 kWh
Protection class .....……..		**I**
Protection level. .....……..		IP24
Electromagnetic compatibility ……...		DIN EN 61326 / A1
Water supply:		
Distilled or demineralised Water		
(acc. to annex C EN 13060:2004)		
Averaged feed water consumption per cycle.....		ca. 0,8 l .. 2,5 l
Storing conditions:		
Temperature		5 ÷ 40°C
Humidity		max. 85%
Heat emission ……		Approx. 12 % of total power cons.

Programs:

5 predefined Programs in user level 1:

The program definition depends on the available options included in the model. The programs can be individually changed.

5 programs in user level 2 (Program P6 to P10) Code protected. Predefinition is like P1.

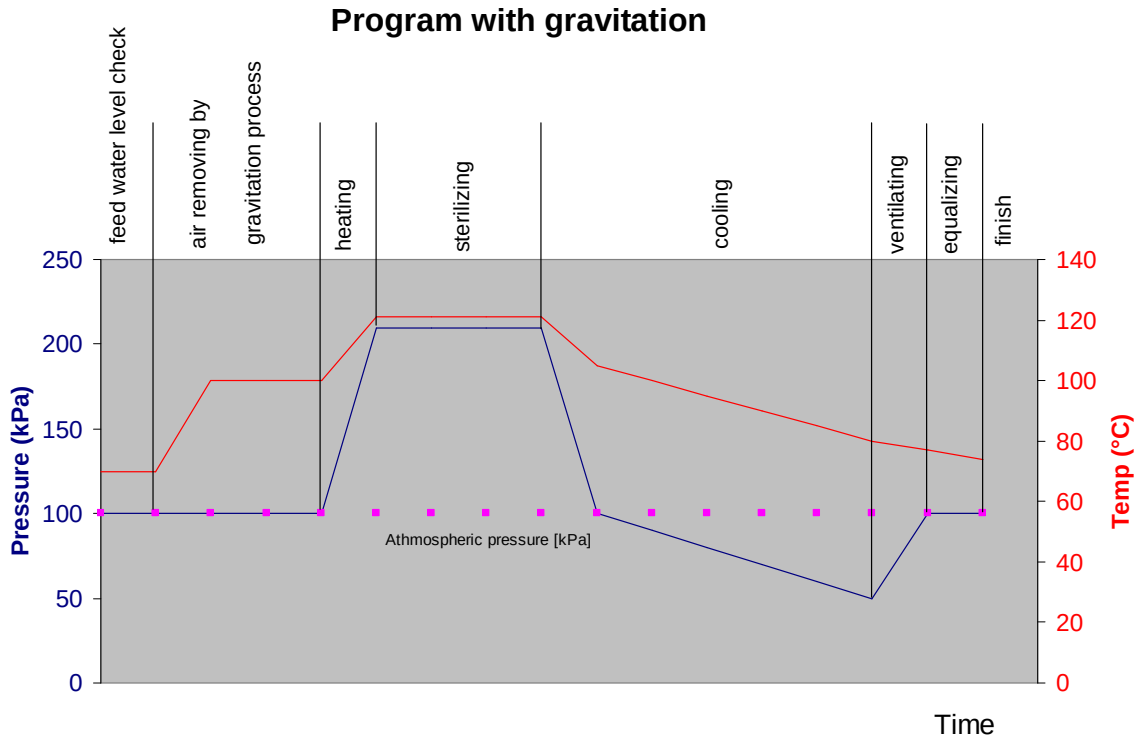
Computer interface:

- serial interface RS 485

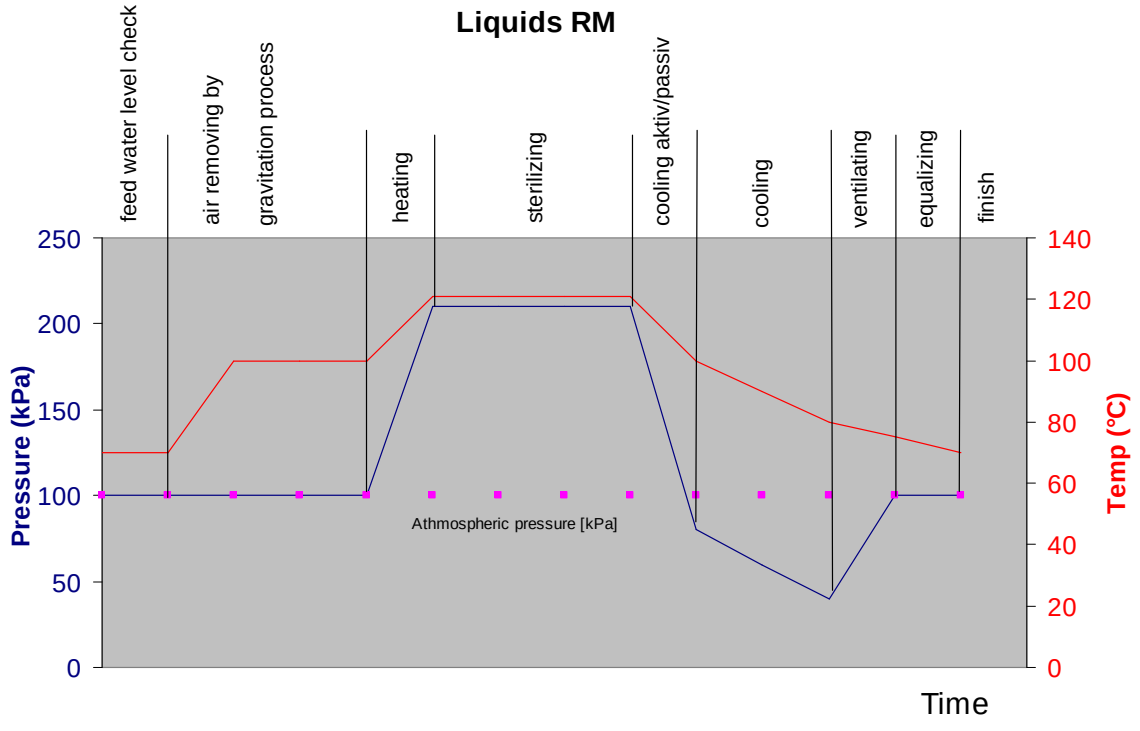
Printer (optional)

Programs available in steam sterilizer Vapour Line 80 / 135

- **standard program**



- **Programs with fast cooling**



Program Liquids RM in Vapour Line with option M only

Description of program steps

The sterilizing process in steam sterilizer line Vapour Line xxx (see drawings above) contains the following program steps:

- **feed water level check:**

Not implemented automatically! This step has to be done manually before each cycle by the user!

- **Deaeration**:

Chamber is heated up to 96°C, now the feed water is continuously heated while the dearatiion valve is continuously kept open over the dearation time.

- **Heating**

While heating feed water, the chamber is filled with steam up to the preset pressure and temperature. In heating phase a deaeration clock is working in most of the programs.

- **Sterilizing**

While sterilization phase the unit is keeping the settemperature over the sterilization time. In case of lower temperature than set temperature, the timer for the sterilization time is stopping.

- **pressure remove**

The steam is removing from chamber until reaching programmed pressure in chamber

- **cooling**

This is programmed for liquids only. Depending on the integrated fast cooling options different cooling versions are possible: passiv or active, in active cooling the chamber wall is cooled by air.

- **venting**

The program is using 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 the program the unit is waiting for quitting the program end by pressing the Stop-button. The unit is showing this situation with blinking display. Attention! With pressing the stop button the autoclave is automatically opening the lid. This may be noisy!

All sterilization cycles are running automatically. The duration of a single cycle depends on the load, kind of deaeration, the start conditions (warm or cold), kind of cooling etc. Even so the type of sterilization goods and kind of loading the good inside the chamber have an enormous effect on the cycle time. In case of a validation you can define the goods and loads. When ever the same good / load with same program and same parameters are started, the time depends mainly from start temperature. The control unit is automatically adding preheating and deaeration cycles if temperature was to low!

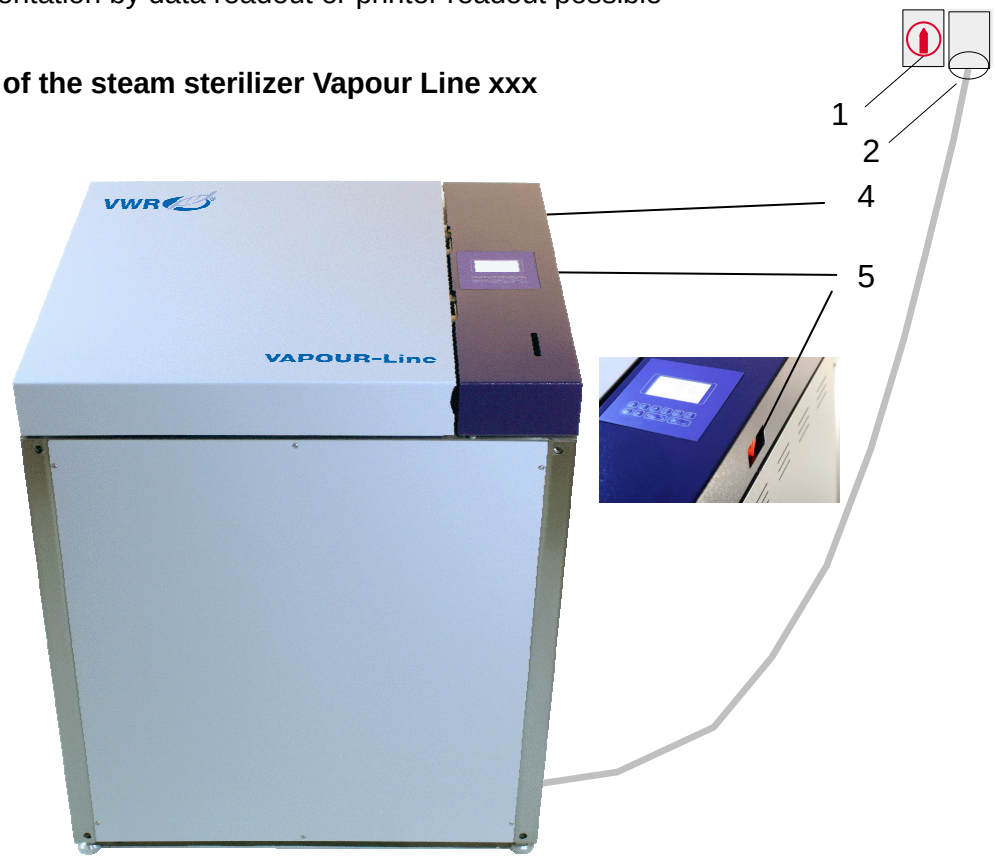
6. Use of the autoclave

The steam sterilizer line Vapour Line 80 / 135 allows a fully automatic process cycle. That includes deaeration, heating, sterilization, pressure remove and cooling. All steps for an automatic process are controlled by a microprocessor control board. The actual status is shown on a graphic display and includes all important information for the user to operate the device. The supported temperature range of the sterilization process is 103°C to 136°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 stuff.

The steam sterilizer line Vapour Line 80 / 135 includes the following additional advantages:

- Fully automatic deaeration of the sterilization goods by gravitation process.
- Simple and easy to use construction of the complete unit
- No contact of the heaters with feed water safes live cycle time
- Protection of the drain on house installation side by using normal tape water mixing to the steam outlet. That process works temperature controlled by PT 100 in the outlet installation. The Temperature is programmable for opening and closing the mixing valve.
- Enforced cooling option available (option M): cooling with air
- Timer controlled program start possible
- Microprocessor controlled process for fully automatic use
- Documentation by data readout or printer readout possible

Total view of the steam sterilizer Vapour Line xxx

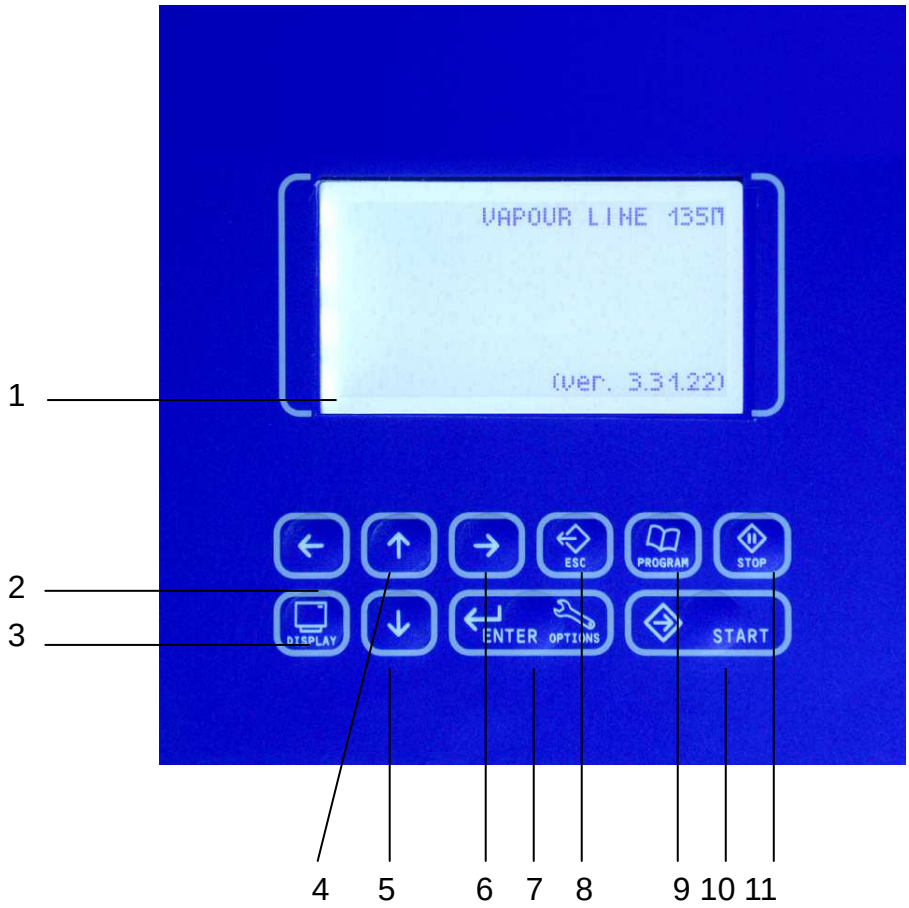


The Vapour Line should be operated while the normal laboratory working hours. If the device is not in use it should be switched off by the main power plug (5). Over night and on the weekends the central power plug (1) should be switched off. If that central power plug is missing please use the main breaker below the housing on the right side of the unit (4).

Emergency switch off

♦ In case of a fatal error switch off the device by turning the central main power switch (1) or disconnect the sterilizer from power supply by using the power plug (2).

Touch panel



1 Display	displays program parameter, cycle data and error messages
2 Cursor button to left	moves cursor left
3 Display button	changes display from normal program display to display of actual sensor values, information about statistic data and software version
4 Cursor button up	moves cursor up and changes value at actual cursor position, open door
5 Cursor button down	moves cursor down and changes value at actual cursor position, close door
6 Cursor button right	moves cursor right
7 Enter button	enters the input data or entry in a menu
8 Escape button	for leaving a menu position after or before changing is valid
9 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
10 Start button	starts the actual in display shown program
11 Stopp 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

Switching on

After regular installation and connecting to media / 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 key pad. Switching on the main switch the display shows the software version short time. When switched on the device is ready for use.

Do not manipulate the device! If the device is not going on please check the main breakers of the unit (4 – chap.1) and power supply. If no reason can be found please inform a trained service stuff to check the device internally.

Loading the device

We suggest to use the standard baskets and drums we optionally offer for the special use in Vapour Line steam sterilizers.

While loading and unloading the chamber please consider the chamber and surface of the device can be hot! Even so the loading goods and loading system parts like baskets! While loading and unloading you are in danger of burning!

Use adequate clothes to be protected against burning like temperature stable isolating gloves etc.

Check the water before putting baskets inside the chamber. Fill demineralized feed water up to the height of the bottom sheet inside the chamber manually.

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 pyrogenes!

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

Wrapped instruments can not be handled by gravitation dearation process. The sterilization would be not validable. Waste bags should be opened. 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!

Closed wrapped and porous material should be sterilized with vacuum program only! Waste bags are a kind of wrapping material, which can only be definetely deaerated in vacuum! Gravitation dearation process may be not enough for good deaeration. As there is no vacuum option available for Vapour Line autoclaves those goods cannot be sterilized successfully in units of Vapour Line!

Heavy good should lie 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 heaviest and most complicated load! A mixture of solid and liquid loads should be avoided.

The maximum loads are defined in chap. 1 technical data. Please refer to this chapter to see the maximum load of each type of load!

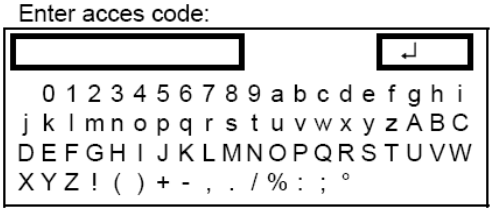
For the sterilization of liquids use the liquid programs only! In liquid programs the thermo locking system is activated and protects the user against burning. For the use of this mechanism correctly it is necessary to put the reference sensor into a reference flask that is equal in volume and form and filled with the same volume like the biggest single liquid volume inside your chamber!

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! 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!

Program change

Activating a Program is done by pressing program button (9). It opened the program menu and with the up (4) and down button (5) the right program is chosen by pressing the enter button (7). All programs which are marked with a key symbol needs entering a code before activation:



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 display shows the following sensors:

- Tk – chamber temperature,
- Tr – reference temperature,
- Pk – chamber pressure,
- To – temperature in the steam / condensate outlet,

Program start

After activation of a program press the start button 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.

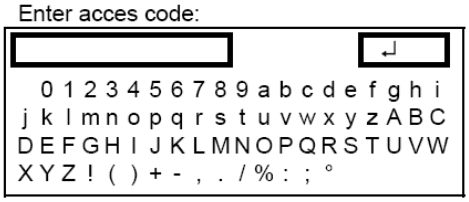
STOP button

Press the Stop button 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 the 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!

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!

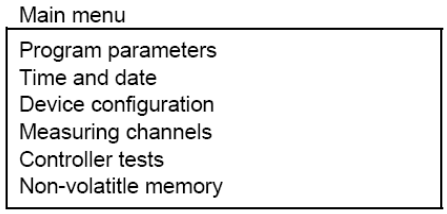
Changing program parameters

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.

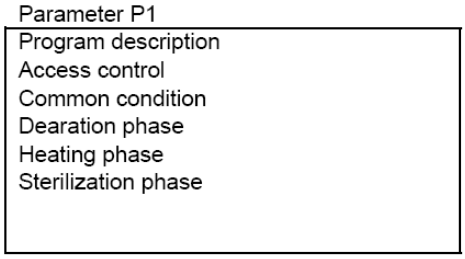


If the code was correct you reach the main menu. Depending on the access level defined by the code the main menu shows different submenus.

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.

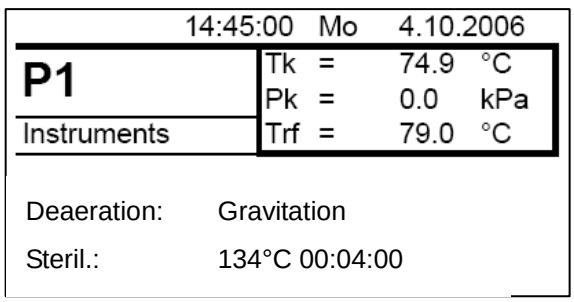
When all programs are configured you should run and test the program with empty chamber and full loaded chamber to be sure the program parameters do not make problems in normal cycle run. If there are doubts, you should make a full validation of the program.

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.

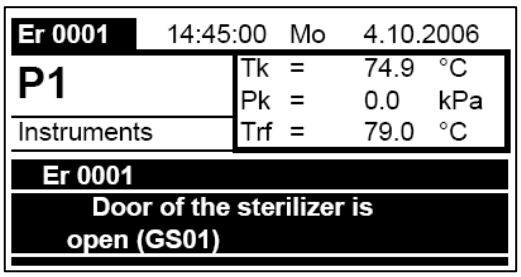
The successful finish of sterilization cycle will be displayed. In case of an incorrect cycle additionally sounds an acoustic signal.

In the following the typical display are described:

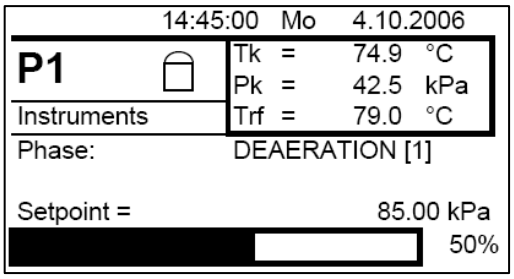


The steam sterilizer is switched on; program P1 is activated but not started. The device is ready for start. If the door is closed, the device is preheating the steam generator automatically.

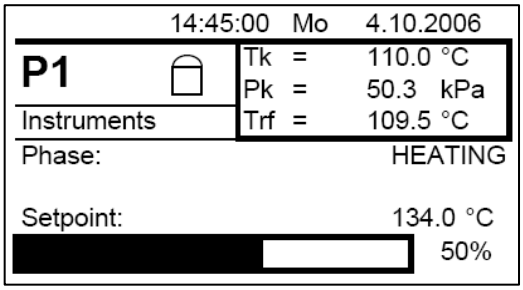
The display shows program no. P1. Here the program type is shown; if special program name was given it will replace the program type. The main program parameters are shown for fast identification of the program cycle. In this case you will find the deaeration and the relevant sterilizing parameters temperature and time. The most important sensor data of chamber temperature, chamber pressure and, if configured, reference sensor are displayed. Date and time are always indicated for documentation issues.



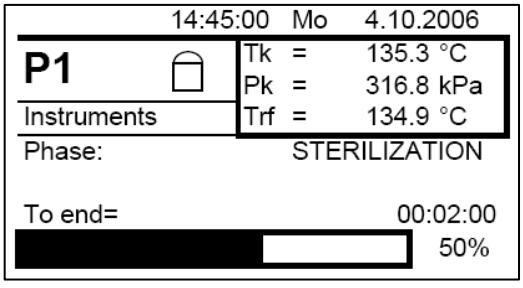
The program P1 was started but lid was not completely closed. So the device generates an error message. The error message can be cleared by pressing the Escape button if the cause of the error was cleared.



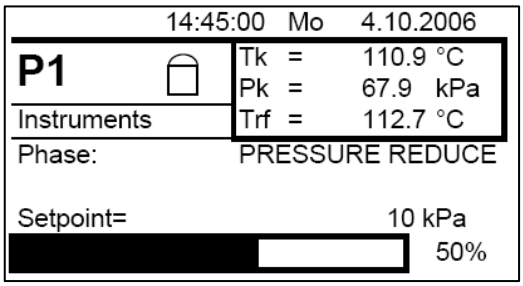
The program was started, the program has initialized the parameters regular and is now in deaeration phase step 1.



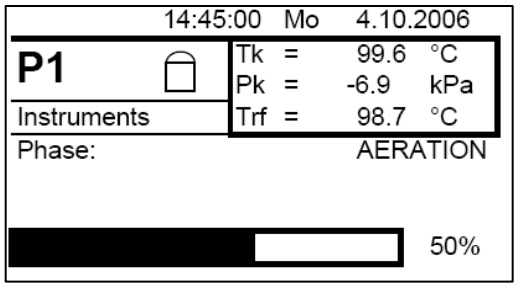
Deaeration has finished, the program is now in heating phase. Setpoint for finish of this phase is reaching the 134°C chamber temperature.



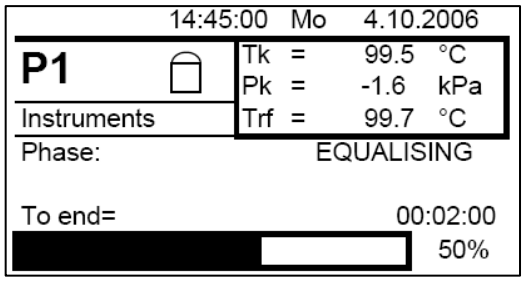
The sterilizer is in sterilization phase, 2 minutes before finish of this phase.



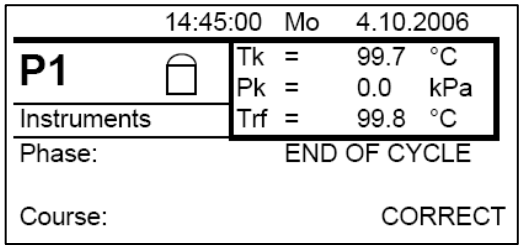
Sterilization phase has finished, now the chamber pressure will be reduced until reaching 10 kPa in chamber.



Pressure reduce is over, now the chamber is venting until reaching setpoint.

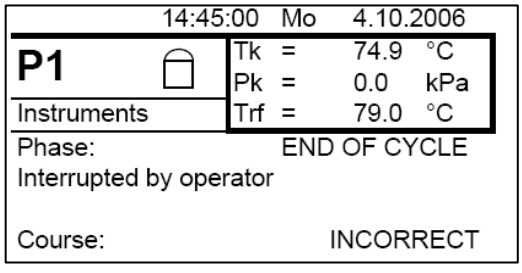


Venting the chamber finished. An additional time is running for safety.



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.

In case of a not successful or broken program the sterilizer shows the following message:



Before regular end of cycle a break was initialized maybe by hand or automatically. In case of automatic break an error message is additionally shown.

Cancellation of program cycle

Each program is able to be broken manually by operator by pressing the STOP button. The program asks if cancellation is really necessary before breaking. After breaking the program has different possibilities to react. The reaction depends on the situation and the program in that the break shall happen. Normally the program is going into the pressure reduce phase for solid goods

or into the cooling phase for liquids. The program is only using the parameters for standard programs of this sterilization good! Especially if liquids were chosen, the program break cause a very long waiting time until unlocking the lid! In or after the cooling phase of liquid programs a program cancellation is not possible!

In case of a liquid program the activated thermo lock can not disabled by using the program cancellation function!

> ⚠ **In case of a program cancellation before regular finish of sterilization phase the sterilization goods are not steril! The sterilization needs to be repeated!**

Closing the lid

Press the lid with your left hand down against the locking spindle. Push the “down button” with right hand and keep it pressed until the locking procedure has completely finished. The locking procedure has 3 steps: running first turn, sopping for 3 seconds, running 2nd turn. Breaking the procedure by let loose the button an error message for not correctly closed lid will be generated! You have to open again and repeat to close again.

Open the lid

If the chamber is closed and you want to open please press “Up button” once. Lid will be automatically open. After program has finished and you quit the program, the autoclave is automatically opening the lid.

Draining the air and steam

To remove the air and steam the unit is equipped with an outlet to connect to a drainage system. If the unit is connected with cold water supply the program is automatically protecting the condensate drain against over heating by direct draining with hot steam. If it is not possible to connect the unit with central drainage please use a condensate collector tank. If you do so please make sure the cooling water is not connected and is closed with a cap.

Documentation of sterilization cycle

The device is prepared for 2 different kinds of cycle documentation. The first is the connection to a standard IBM compatible PC via RS485 interface in the back of the unit. For read out of data a special interface transformer is necessary (RS 485 to USB adapter). Additionally you need to install documentation software DOKUMENTATOR
The second possibility is building in a standard needle printer for 40 characters per line with serial interface (CBM 910). The sterilizer has a built in memory with up to 4 MB and is automatically storing the data of each cycle until memory is full. Then start program over writing the oldest data. Data readout by one of the 2 possibilities is possible later on.
The parallel use of the 2 documentation possibilities is available under special conditions too.
The DOKUMENTATOR software has different levels of functionality. In basic module the following functions are available:

- Documentation of running cycle;
- Readout of data from memory;
- Display of different analog channels;

- Printout of the data as graphic and table;
- Display and printout of archive data;
- Protection of the data against changing;

In following picture you can see the main window of the DOKUMENTAR software.

The printer CBM-910II CITIZEN is a dot matrix printer. It is available as built in version. An interface for external connection is not available. With the printer it is possible to printout all relevant process data while the process is running. To a later time it is possible too.

☞	**The printer should be loaded with enough paper. If the paper role is at the end the printer stops automatically.**

7. Troubleshooting

✓ Er0001- Door of sterilizer opened during a cycle

- message: Door of sterilizer is open during a cycle
- description: error occurs if controller detects that cover is not closed (GS01 switch is not closed or K1 has no contact up from year 2008) during a cycle,

✓ **Er0004- Exceeded maximum available pressure in chamber**

- message: Exceeded max. available pressure in chamber
- description: error occurs if pressure in chamber is higher than 245,0kPa (relative scale): problems with deaeration / pressure sensor

✓ **Er0006- Exceeded maximum available temperature in chamber**

- message: Exceeded max. available temperature in chamber
- description: error occurs if temperature in chamber is higher than 145,0 ºC

✓ **Er0040- Disconnected steam generator thermal switch**

- message: Disconnected steam gen. thermal switch (THSZ01)
- description: error occurs if switch THSZ01 is disconnected,

✓ **Er0041- Disconnected chamber thermal switch**

- message: Disconnected chamber thermal switch (THZ11)
- description: error occurs if switch THZ11 is opened and switch THSZ01 is closed,

✓ **Er0042- Disconnected safety line**

- message: Disconnected safety line
- description: error occurs if switch THZ11 or switch THSZ01 is disconnected,

✓ **Er0051- Chamber temperature under available range**

- message: Chamber temperature is under available range
- description: error occurs if readout from TIC21 sensor is less than admissible minimum (Service check measuring channels, CH2: Tk)

✓ **Er0052- Chamber temperature over available range**

- message: Chamber temperature is over available range
- description: error occurs if readout from TIC21 sensor is more than admissible maximum (Service check measuring channels, CH2: Tk)

✓ **Er0053- Chamber pressure under available range**

- message: Chamber pressure is under available range
- description: error occurs if readout from PIS02 sensor is less than admissible minimum (Service check measuring channels, CH3: Pk)

✓ **Er0054- Chamber pressure over available range**

- message: Chamber pressure is over available range
- description: error occurs if readout from PIS02 sensor is more than admissible maximum (Service check measuring channels, CH3: Pk)

✓ **Er0055- Reference temperature under available range**

- message: Reference temperature is under available range
- description: error occurs if readout from TIC22 sensor is less than admissible minimum (Service check measuring channels, CH2: Tref)

✓ **Er0056- Reference temperature over available range**

- message: Reference temperature is over available range
- description: error occurs if readout from TIC22 sensor is more than admissible maximum (Service check measuring channels, CH2: Tref)

✓ **Er0101- Door of sterilizer opened at cycle start**

- message: Door of sterilizer is open (GS01)
- description: error occurs if controller detects that GS01 switch is not closed on cycle startup (see locking symbol in the display)

✓ **Er0106- Exceeded maximum available cycles number for filter counter**

- message: Filter counter: exceeded cycles number
- description: error occurs if counted filter cycles number is higher than admissible maximum – the filter elements needs to be changed and filter counter needs RESET (code 0911/Mainmenu/Statistical Data)

✓ **Er0108- Pressure in chamber outside atmospheric pressure range**

- message: Pressure in chamber not correct (PLS02)
- description: error occurs if chamber pressure is above 0,15 bar (relative) or zero pressure switch (PLS02) is disconnected (chamber pressure is outside atmospheric pressure range) and operator tries to open a door, check K11 if disconnected error is generated

✓ **Er0109- Door closing function: locking cycle was broken**

- message: Door locking cycle was broken. Please open again
- description: error occurs if locking operation was broken by the operator, it needs new opening operation and then closing again, or the unit can not see closed GS05 (motor position switch) or GS01 (door position switch) Maybe K1 is not correctly connected)

✓ **Er0201- Archiv data Error:**

- message: Archive data Error
- description: error occurs if new software was installed with reorganization of archive structure: delete the archive data (Service technician)

8. 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 stuff! 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 distributer 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 personnel 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!**

Regular cleaning, maintenance and service activities

Activity	Recommended time					notes
	dayly	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(s)				X	X	
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
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 stuff only!						

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 hat 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 house hold can be used.

Check of the safety valve

The safety valve(s) needs to be checked once per year. This should be done by specially trained service stuff. Other safety checks are necessary so we recommend making one safety check together with the yearly maintenance check by a trained service engineer. While testing the function of the safety valve steam is leaving the safety valve.

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!

Changing the venting air filter

Wear and tear of the venting air filter depends on the number of cycles and the quality of the environment. We recommend changing the filter after 100 cycles or once per month.

9. User replaceable accessories and spare parts

481-0705	Lid seal Vapour-Line 80	EU / UK / CH
481-0706	Lid seal Vapour-Line 135	EU / UK / CH
481-0707	Magnetic valve Vapour-Line	EU / UK / CH
	Filter 0,3µm / 99,5%	EU / UK / CH
	Waste bags for steam sterilization	EU / UK / CH
	Paper rolls for printer	EU / UK / CH
	Carbon stripe for printer	EU / UK / CH
481-0697	printer for Vapour-Line	EU / UK / CH
481-0698	basket Ø 39,5 cm x 30 cm	EU / UK / CH
481-0699	bucket Ø 39,5 cm x 30 cm	EU / UK / CH
481-0700	basket Ø 49,5 cm x 30 cm	EU / UK / CH
481-0701	bucket Ø 49,5 cm x30 cm	EU / UK / CH
481-0702	basket with closed bottom Ø 39,5 cm x 25cm	EU / UK / CH
481-0703	basket with closed bottom Ø 49,5 cm x 25cm	EU / UK / CH
481-0704	condensate collection canister	EU / UK / CH

10. Description of safety devices

The steam sterilizer is equipped with different safety devices. The safety devices protect the user against injury and safe the sterilization process. Mechanical and electronic safety devices are built 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 than 345 kPa absolute pressure (2,45 bar relative pressure) an alarm is generated (including error message) and the heating function is switched of and the unit breaks the program. With 2.8 bar relative pressure the safety valve is opening and chamber pressure is reduced mechanically! The steam is blowing into the housing 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 thermo 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 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 thermo 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.
- **Protection against over heating the steam generator** – The chamber is protected against over heating over temperature switch. The switch is self resetting when temperature is low again. While the temperature is high it is not possible to open the chamber! You have to wait until chamber cools down by them selves. Over temperature switch is breaking the program!

11. 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 do 7	5 do 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. Technical service

Web Resources

Visit the VWR's website at **www.vwr.com** for:

• Complete technical service contact information

• Access to VWR's Online Catalogue, and information about accessories and related products

• Additional product information and special offers

Contact us For information or technical assistance contact your local VWR representative or visit. **www.vwr.com**.

13. Warranty

VWR International warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

14. Compliance with local laws and regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorisations necessary to run or use the Product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorisation, unless any refusal is due to a defect of the product.

15. Equipment disposal

This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.
Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.
For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Thank you

16. APPENDIX

Please pay attention! The documents to fulfil the local regulations to
PED 23/97/EU and related regulations are separately enclosed in the document map. Please make sure that the complete set of documents will be available over the complete life cycle of the equipment!

Local VWR offices in Europe and Asia Pacific

Austria
VWR International GmbH
Graumanngasse 7
1150 Wien
Tel.: 01 97 002 0
Fax: 01 97 002 600
E-mail: info@at.vwr.com

Belgium
VWR International bvba
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: 016 385 011
Fax: 016 385 385
E-mail:
customerservice@be.vwr.com

China
VWR International China Co., Ltd
Suite 1802 - 1803,
Xing Ye Bank Mansion, No 168,
168 Jiangning Road
Shanghai 200041, China
Tel.: +86- 21 521 388 22
Fax: +86- 21 521 33 933
E-mail: sales_china@vwr.com

Czech Republic
VITRUM VWR s. r. o.
A VWR International Company
Pražská 442
CZ - 281 67 Stříbrná Skalice
Tel.: +420 321 570 321
Fax: +420 321 570 320
E-mail: info@vitrum.cz

Denmark
VWR - Bie & Berntsen
Transformervej 8
2730 Herlev
Tel.: 43 86 87 88
Fax: 43 86 87 90
E-mail: info@dk.vwr.com

Finland
VWR International Oy
Valimotie 9
00380 Helsinki
Tel.: +358 9 80 45 51
Fax: +358 9 80 45 52 00
E-mail: info@fi.vwr.com

France
VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Carnot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30 (0,15 EUR TTC/min)
Fax: 0 825 02 30 35 (0,15 EUR TTC/min)
E-mail: info@fr.vwr.com

Germany
VWR International GmbH
Hilpertstrasse 20a
D - 64295 Darmstadt
Tel.: 0180 570 20 00*
Fax: 0180 570 22 22*
E-mail: info@de.vwr.com
*0,14 €/Min. aus d. dt. Festnetz, Mobilfunk max. 0,42 €/Min.

Hungary
VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: (52) 521-130
Fax: (52) 470-069
E-mail: info@hu.vwr.com

India
VWR Lab Products Pvt Ltd
2nd Floor, Front Wing, 135/12,
Brigade Towers
Brigade Road
Bangaluru 560025 India
Tel: +91-2522-647911/922 (Mumbai)
Tel: +91-80-41117125/26 (Bangalore)
Fax +91-80-41117120
E-mail: vwr_india@vwr.com

Ireland / Northern Ireland
VWR International Ltd / VWR International (Northern Ireland) Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: 01 88 22 222
Fax: 01 88 22 333
E-mail sales@ie.vwr.com

Italy
VWR International PBI S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: 02-3320311/02-487791
Fax: 02-332031307/02-40090010
E-mail: info@it.vwr.com
info@internationalpbi.it

The Netherlands
VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: 020 4808 400
Fax: 020 4808 480
E-mail: info@nl.vwr.com

Norway
VWR International AS
Haavard Martinsens vei 30
0978 Oslo
Tel.: 02290
Fax: 815 00 940
E-mail: info@no.vwr.com

Poland
Labart Sp. z o.o.
A VWR International Company
Limbowa 5
80-175 Gdansk
Tel.: 058 32 38 200 do 204
Fax. 058 32 38 205
E-mail: labart@pl.vwr.com

Portugal
VWR International - Material de Laboratório, Lda
Edifício Neopark
Av. Tomás Ribeiro, 43- 3 D
2790-221 Carnaxide
Tel.: 21 3600 770
Fax: 21 3600 798/9
E-mail: info@pt.vwr.com

Singapore
VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel: +65 6505 0760
Fax: +65 6264 3780
E-mail: sales@sg.vwr.com

Spain
VWR International Eurolab S.L.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: 902 222 897
Fax: 902 430 657
E-mail: info@es.vwr.com

Sweden
VWR International AB
Fagerstagatan 18a
163 94 Stockholm
Tel.: 08 621 34 00
Fax: 08 621 34 66
E-mail: info@se.vwr.com

Switzerland
VWR International GmbH
Lerzenstrasse 16/18
8953 Dietikon
Tel.: 044 745 13 13
Fax: 044 745 13 10
E-mail: info@ch.vwr.com

UK
VWR International Ltd
Customer Service Centre
Hunter Boulevard
Magna Park
Lutterworth
Leicestershire