

CleanTec **CB18/CB23**

C20-0033
2402EN

autoclave (steam sterilizer)
- Instruction for use -



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CE 0044

 **Ritter**®
[THE DENTAL EXPERTS]

Dear user,
the autoclave is a device designed for water steam sterilization of small sized tools and professional equipment.

CleanTec CB18/CB23 are autoclaves - steam sterilizer, table model. Type of Cycle: **B type**.

If you face technical problems, our service
hotline +49 (0) 7351/52925-37 is available for you.
And now a lot of joy with your Ritter equipment.



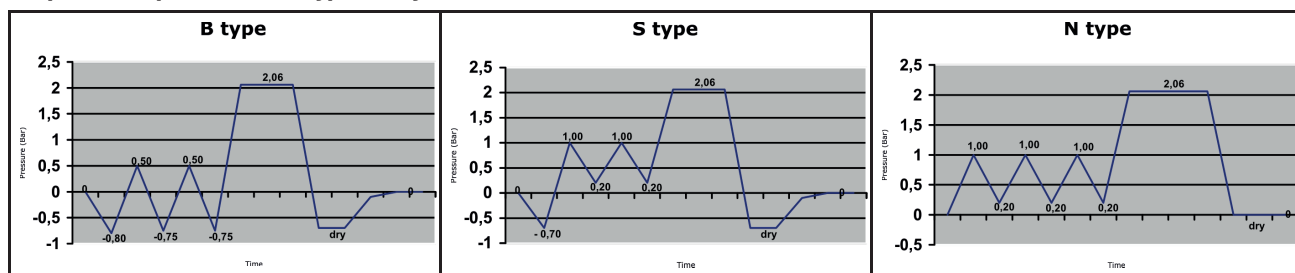
It is of fundamental importance for the sterilizer and the respective equipment to be used solely for the type of product for which they were designed. We therefore request you to consult the Declaration of Conformity of this appliance: the Class to which the appliance belongs is indicated in the "Category" box. The "Program table" (page 11) gives all the information necessary for establishing the type of cycle to be used for sterilizing the various instruments.

INFORMATION TABLE (Annex D - EN13060)

Requirements	B	S	N
Dynamic steriliser chamber pressure	X	X	X
Air outlet	X	X	
Empty chamber	X	X	X
Solid load	X	X	X
Small porous objects	X		
Small porous loads	X		
Full porous load	X		
B type hollow load	X		
A type hollow load	X		
Multiple wrap	X		
Drying, solid load	X	X	X
Drying, porous load	X	X	
Residual air			X















X= available

Graphic example of various types of cycle



Our equipment complies to the safety standards for medical products (MPDG) according to Annex VII, Section 3 of Directive 93/42/EEC for Medical Devices, revised by EU-Directive 2007/47/EG from 21.03.2010.

Intended use

	Intended purpose: The Autoclave is intended for sterilising medical devices. Intended users: healthcare professionals.
	This unit is not explosion proof.
	This autoclave must not be modified without permission of the manufacturer.
	We can only accept responsibility for the safety properties of our equipment, if installation, maintenance, repair and modifications are carried out by our workshop or by a person explicitly authorized by us. Further, the equipment has to be correctly handled according to our operating manual.
	In case of failure, structural parts that can effecting the security of the device are to be replaced by original parts only.
	In case of repair, the technician must issue a certificate as to the kind and extent of work performed and, if applicable, indicate any changes of nominal data and operating range. The certificate must contain the date of repair, the name of the executing company and a signature (according to MPDG, DIN VDE 0750 / DIN VDE 0751).
	Close to the equipment do not operate any devices producing electro-magnetic emissions (such as wireless phones, micro-wave therapeutics devices,...).
	Please don't use other voltage power than specified at the name plate. Don't touch plug or socket with wet hands. Be sure it is connected to the ground wire.
	Don't put autoclave on unstable place. Don't block autoclave's ventilate radiation. Don't put anything on the autoclave.
	If you smell or hear any abnormal (it doesn't include the noise of pump) then switch power off and contact with sellers or manufacturer. Please disconnect power if you don't use the autoclave for a long time.
	Position the autoclave in a place where it is not accessible to children.
	Do not carry out maintenance with the autoclave running or if it is plugged into the power socket.
	Do not use the appliance for purposes other than those mentioned in this Instruction manual. Read the paragraph concerning the technical features carefully before starting up the appliance.
	ATTENTION! It is strictly forbidden the use of the autoclave under the effect of medicinals, drugs or alcohol.

According to law, electric equipment is to be disposed by authorized disposal firms only.
 The safety standards for medical products and all legal obligations are to be fully observed by the user.
 Scope and schedules of safety-relevant inspections are as follows:
 Every two years the following safety-relevant inspections according to DIN EN ISO 62353 have to be performed:
 see Form "Safety inspection".
 We recommend to keep an equipment control log for documenting the results of the safety-relevant inspections.

Guarantee

Please do not forget to return us the guarantee card within 15 days after installation of the unit.
 Under the premise of abiding by the regulations on transportation, storage and use, the user is entitled to one -year free after-sale service from the date of purchasing this unit. Terms of Guarantee: see "Duplicate of Guarantee".

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Safety symbols

Attention:
Read carefully the instructions of the user manual.



Voltage.



Attention high temperature.



Earth connection.

The packaging material used for transporting this autoclave is NOT STERILE.

The autoclave is fragile and should therefore be transported with extreme care.
DO NOT TURN UPSIDE DOWN.

The autoclave is packed with all accessories lying in the sterilizer chamber. It is placed in a protective polyethylene bag in the shipping package. To protect it from any impacts, it is surrounded with polystyrene moldings.

The user is recommended to retain the packaging for the period of the warranty: if the equipment is returned for repair without the original packaging, the user will be charged for a new packaging at time of reshipment.

Unpacking and setting up the autoclave

At least two people are required to remove the equipment from the box, following the instructions given below:


- Open the shipping packaging and bend the metal clips upwards so as not to scratch or cut yourself while lifting out the autoclave.
- Carefully read the instructions for use.
- Remove the autoclave from the shipping packaging by lifting it out using the carrying straps attached to the device.
- Place the machine on a perfectly horizontal level surface with a load capacity of **at least 70 kg**.
- Connect the plug to a safety plug with safety ground.
- Do not replace the original plug with other types.
- Do not make additional connections.
- Do not connect to multiple plugs or similar: ensure that the installation to which the sterilizer is connected complies with all relevant legislation and can sustain the specified load (see chapter „Technical data“).
- To open the door, pull out the handle on the front.
- Remove the holder with trays and incl. accessory pack.
- Carefully read chapter „first installation“ before starting normal operation.

Disposal and/or scraping

for the disposal and/or scraping of any component (packaging, water, complete machine...) strictly refer to the norms in force in the country where the operation is carried out.



Warnings

- This sterilizer is only suitable to sterilize moisture- and heat-resistant medical devices, it is not suitable for oils and powders, such as petroleum jelly and agar.
- This sterilizer cannot be used for sterilization of liquids or liquids sealed within closed containers (especially glassware), which may cause the containers to burst, endangering the safety of persons and equipment.
- Chloride ion is an important factor causing corrosion of stainless steel. If you use this sterilizer to sterilize items which contains chloride ions, you must rinse the sterilization chamber with clean water after each cycle to prevent the deposited chloride ions from corroding the chamber and shortening the service life of the equipment.
- When you see this symbol anywhere on the device,  it means that the surface temperature is high, avoid touching to avoid burns.
- This equipment complies with the emission and immunity requirements of Class A equipment specified in EN61326-1. It may cause interference when used in home or similar environment, and protective measures are required.
- It is recommended to evaluate the electromagnetic environment before using the equipment. It is forbidden to use this device near strong radiation sources (such as unshielded radio frequency sources), otherwise it may interfere with the normal operation of the device.
- When an unexpected situation occurs during the use of the product, if the device alarms or other abnormal conditions occur, please immediately cut off the power supply to the device and check and correct according to the „Error Codes“ and „Maintenance“ chapter of the manual.
- Necessary monitoring shall be carried out in accordance with relevant national and regional regulations. After putting the monitoring substance (such as chemical indicator or biological indicator) into the equipment, run the corresponding program to monitor the sterilization effect and judge according to the result. If it fails, find the cause or contact the manufacturer or trained personell.
- A three-hole socket (230±23VAC / 10A / 50Hz) must be used to ensure that the socket is reliably grounded. Do not place the device where it is difficult to disconnect the power.
- Do not use other power supplies with different voltages or frequencies.
- Do not touch the plug or socket with wet hands.
- Do not damage, modify, pull, excessively bend or twist the power cord and do not place heavy objects on the power cord.
- Do not place the sterilizer on an unstable workbench, such as a shaking table, a sloping surface or a place where it will vibrate.
- Do not block or cover the sterilizer door, vents or heat dissipation windows.
- Do not place anything on top of the sterilizer.
- If the sterilizer is not used for a long time due to various reasons, the power cord should be disconnected from the power supply and placed in a dry and cool place.
- Air break switch is a device for electrical disconnection, please do not put this machine in a place where is difficult to operate the air break switch to cut off the power.
- Keep away from all external sources of heat.
- Do not install the device in a closed cabinet.
- Make sure flat and level surface is strong enough to put the device on. The surface must be flameproof.
- Do not put the device in a place where inflammable and explosive materials are present.
- Do not place the sterilizer near a sink or in a location where it is likely to be splashed with any kind of liquid.
- It is strictly forbidden to lift the door during transportation to avoid damage to the device.
- Do not place the device on its side or upside down during transport.
- Make sure that the equipment is reliably grounded.
- After the device has been transported and stored in an environment below 2°C, the equipment must be placed in an environment with a temperature not lower than 5°C for at least 2 hours before normal operation. This kind of situation usually occurs in winter, and the freezing of water in the equipment pipeline may cause equipment failure.
- We suggest that users do a vacuum test every month.
- The file format of the flash disk must be FAT32. Otherwise, records may fail to be stored.
- We advised to back up data every three months and clear the USB flash drive. Otherwise, records may be lost or device startup may be affected.
- Do not touch the wall of the sterilization chamber after a completed cycle to avoid burns.
- The operator should use the configured instrument tray handle or wear insulated gloves or other tools to remove the sterilized items to avoid burns.
- When opening the door under special circumstances, please ensure that the sterilizer is powered off and the pressure in the sterilization chamber has been completely released.
- Do not use acidic or alkaline cleaning agents to clean the sterilization chamber.
- Before cleaning the sterilization chamber, please confirm that the sterilization chamber has been cooled to avoid burns.
- Do not remove the filter of the water storage tank when cleaning the water tank to prevent dirt from entering the pipeline, causing the pump to fail and alarm.

Mechanical specifications

Type:	CleanTec CB18 CleanTec CB23
Overall dimensions (L x H x D)	CleanTec CB18 505 x 400 x 610 mm CleanTec CB23 505 x 400 x 650 mm
Weight (with empty tanks)	CleanTec CB18 45 kg CleanTec CB23 50 kg
Weight (with full tanks)	CleanTec CB18 50 kg CleanTec CB23 55 kg
Weight per unit area of support:	max. 32.46 N/cm ²
Colour:	RAL9002
Material:	SUS304 Steel FeP01 Steel (Cover)
Noise level at 1 m distance:	54 dBA
Noise level in front of the display:	63 dBA
Max. transmitted heat	6.3 MJ/h (1506 kcal/h)

Electrical specifications

Rated voltage:	230 V ~ 50/60 Hz
Rated input:	1950 W
Supply cable (L 1.5m)	2+1 x 1.5mm ²
Fuses	T10 A
Insulation class	I

Chamber specifications

Max. working pressure:	0.21 MPa (relative)
Max. working vacuum:	-82 kPa (relative)
Max. vacuum (drying process):	-94 kPa (relative)
Max. working temperature:	137°C
Material:	Stainless steel SUS 304
Dimensions: ØxP	CleanTec CB18 250 x 350 mm CleanTec CB23 250 x 450 mm

Clean water tank + Dirty water tank specifications

Max. capacity:	4.5l
Cycles per tankful	CleanTec CB18 ~4 CleanTec CB23 ~4
Material:	Stainless steel

Bacterial filter data

maximum diameter	56mm
max. allowed filtering capacity	0.3µm
No. of cycles before replacement	~150

Tray holder specifications

Material:	SUS 304 Stainless steel
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Tray specifications










Material:	SUS 304 Stainless steel
No. of trays packaged with unit	3

Life time cycle

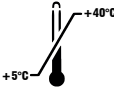





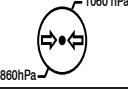

8 years

Technical modifications reserved!

Name plate

Icon	Explanations to type plates
	<u>CE-Approval</u> according to standard 93/42/EEC for medical products
	There are specific warnings or precautions related to this product.
	Follow the instruction for use
	The symbol of the crossed waste container on wheels indicates, that Ritter products are electrical equipment according to the EC Directive 2002/96/EC. Within the EU-Countries these products have to be separately disposed. Ritter wants to encourage you, to minimize possible effects of waste to environment and health outside of the EU, too. Please follow to the local directives for disposal of waste and make use of the separate collection of electrical equipment.
	Type B applied part
	Serial number
	Manufacturer/Date of manufacturing (according ISO 15223-1)
	Date of manufacturing
	Medical device

Shipping label

Icon	Explanations to Shipping label
	Permissible temperature range
	Permissible range of humidity
	This way up
	Don't roll
	Fragile, Handle with care
	Keep dry
	Permissible range of pressure
	Stacking limit

Working conditions

Temperature: +5°C up to +40°C
 rel. humidity: ≤80%
 Barometric pressure: 860 hPa to 1060 hPa

Transport and storage conditions

(original packing)

Temperature: 5°C up to +40°C
 rel. humidity: ≤80%
 Barometric pressure: 860 hPa to 1060 hPa

Installation

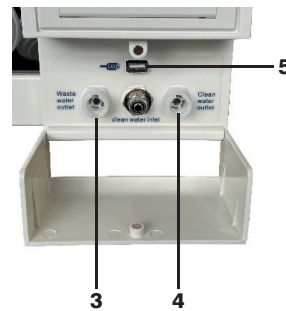
At least 10 cm of space should be left between the wall and the back of the autoclave. The top cover of the autoclave must be freely accessible. Place the autoclave in a well-ventilated area. Place the autoclave on a level and horizontal surface.

Electrical connection



1	Power inlet
2	Circuit breaker

Water connection



3	Waste water outlet
4	Water storage outlet
5	USB port

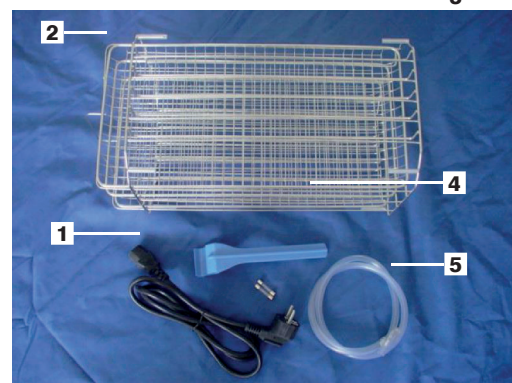
Preparation before using

Please connect the device to the mains for starting. To do so, first plug the power plug into the appropriate socket on the back of the device. Then connect it to the power supply.

Press the main switch on the right side of the device. The signal light indicates the start-up of the device.

	<p>ATTENTION! Please be sure the power is connected to the supply mains with protective earthing!</p>
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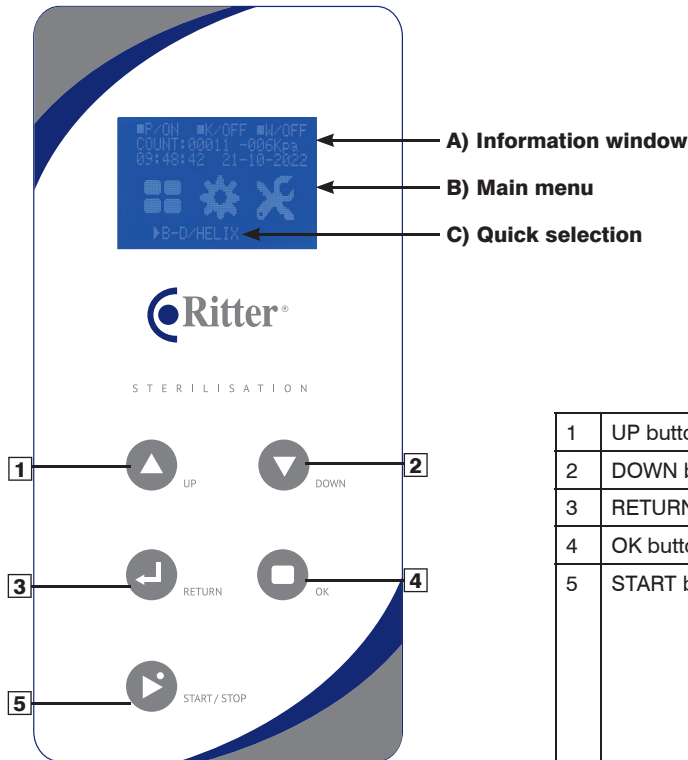
Accessories



1.	Mains plug	1
2.	Equipment tray	3
3.	Tray shelf	1
4.	Tray-hand-holder	1
5.	Drainage pipe	1

Process	Vacuum times	Sterilizing time	Sterilizing temperature	Sterilizing pressure	Vacuum persist time	Dry time	Materials and instruments to be sterilized
121°C/SOLID	1 time*	20 min*	121°C	110 kPa		5 min*	Unwrapped solid
121°C/POROUS	3 times*	20 min*	121°C	110 kPa		10 min*	Solid material in single package Solid material in double package Unpackaged porous material Porous material in single package Porous material in double package
121°C/HOLLOW	3 times*	20 min*	121°C	110 kPa		15 min*	Unpackaged Hollow Material/handpieces Hollow material/handpieces Packaged by sterile pouch
134°C/SOLID	1 time*	4 min*	134°C	210 kPa		5 min*	Unwrapped solid
134°C/POROUS	3 times*	4 min*	134°C	210 kPa		10 min*	Solid material in single package Solid material in double package Unpackaged porous material Porous material in single package Porous material in double package
134°C/HOLLOW	3 times*	4 min*	134°C	210 kPa		15 min*	Unpackaged Hollow material/handpieces Hollow material/handpieces Packaged by sterile pouch
USER DEFINED	*	*	*	*		*	Adjust the values to the desired load and check the sterilization result
PRIONEN	3 times	19 min	135°C	210 kPa		10 min	Viruses that are only made up of proteins. (e.g., prion)
B-D/Helix test	3 times	4 min	134°C	210 kPa		7 min	Only Bowie-dick/helix test material
Vacuum TEST				-80 kPa	15 min		Empty chamber test
CLEAN PROCESS	3 times	5 min	105°C	20 kPa			Empty chamber test

* The values can be adjusted



1	UP button	Move up or left
2	DOWN button	Move down or right
3	RETURN button	Return to menu of the upper level
4	OK button	Confirm or enter menu of the next level
5	START button	After selecting and confirming the program, "please push the start key to start..." appears in the display, press START button to run the program. After the program run, press the START button more than 5 s can stop the program.

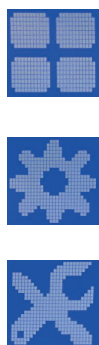
LCD screen

A) Information window



printer status (set up in ADV menu)
 keep temperature (set up in ADV menu)
 Pre-heat setting (set up in ADV menu)
 times of sterilization procedure already running (B&D/helix test and vacuum test can not counted).
 indicates the air pressure value of sterilization chamber (It indicates that the air pressure value in the sterilization chamber is 1 kPa; when the sterilization door is open, this air pressure value is the local air pressure value)
 Local time and date

B) Main menu

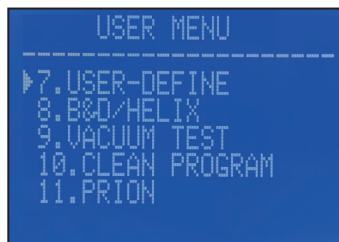


User process menu
 To set the data with the sterilizer (for user)
 For technicians only!
 The technicians can enter it with password.

C) Quick selection



quick selection to start the last selected program

> User menu**>> SOLID**

program for sterilization of solid appliance without packaging, only having vacuum for once

>> POROUS

program for sterilization of solid and porous penetration appliance

>> HOLLOW

program sterilization of all kinds of appliances except for the appliances that can't have ultra high temperature sterilization, such as: solid appliance, hollow appliance, porous penetration appliance, spiral appliance and cotton fabric.

>> USER DEFINED

user-defined program, in which the sterilization temperature, time, vacuum times and drying time can be set under **ADVANCED_SET** menu. Before using this program, it shall check the sterilization effect of this program first, so as to judge whether the parameter is set correct.

>> B-D TEST/HELIX TEST

description of B-D and Helix test → see page 22

>> VACUUM TEST

program to judge whether there is seal leakage in the sterilizer.




>> CLEAN PROCESS

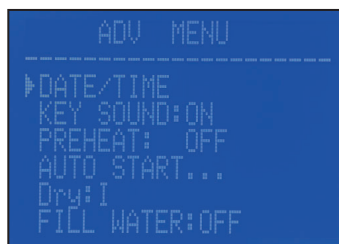
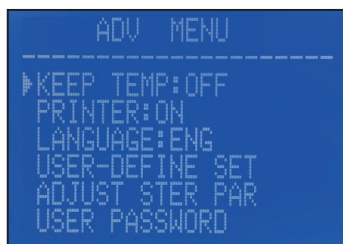
For cleaning the internal lines of the autoclave. When the sterilizer displays the prompt of "NEED CLEAN", it shall run this program to clean it.


>> PRIONEN:

Viruses that are only made up of proteins. (e.g. prion)


Starting a program

- select a program: press button  or 
- start the selected program: press button 

> ADV Menu**>> KEEP TEMP**

Keep temperature option: it can be switched ON/OFF by pressing the button 


>> PRINTER

Printer option: it can be switched ON/OFF by pressing the button 




>> LANGUAGE: ENG

Language option: it can be switched between ENG/GER by pressing the button .




>> USER-DEFINED SET:

The user defined settings can be selected by pressing the key .




**>>> VACUUM TIMES:**

Setting of vacuum times, the number of vacuum times can be set between 1~10 times. To select the desired number press the  /  buttons and confirm by pressing the key .

>>> STER TEMP:

Setting of sterilization temperature, the specific sterilization temperature can be set between 105°C-134°C by pressing  /  and confirm by pressing the key .

>>> STER TIME:

Setting of sterilization time, the specific sterilization time can be set between 4 min-60 min by pressing  /  and confirming it by pressing the key .

>>> DRY TIME:

Setting a user defined drying time. (Standard drying time values for each program are shown in the „Program table“ on page 11.)

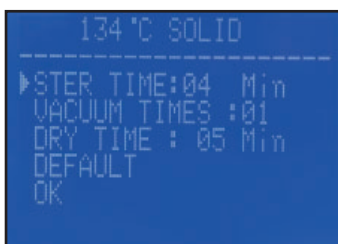
>>> OK:







Confirmation of the settings. Return to the previous menu.

>> ADJUST STER PAR





Adjustment of sterilization parameter. The settings can be changed by pressing the key .

There are six programs up for selection:



In order to reach the desired program item, the  /  The selected setting can be confirmed by pressing the key  (as shown in the figure: 134°C SOLID program has been selected). The three parameters for STER TIME, VACUUM TIMES and DRY TIME can be changed. The other settings can also be confirmed by pressing the  key or to select the settings by pressing the  /  keys.

>>> LOAD DEFAULT:

Select DEFAULT by using the  or  buttons once. To define other settings, confirm the selection by pressing the  key and press the  key again to load default settings and exit the settings.

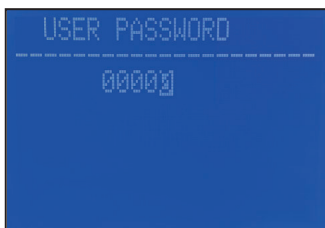
Note:

Select DEFAULT by pressing the  key and confirm your selection without using the  or  keys.






>>> USER PASSWORD SET:





The user password is set by pressing the  key and pressing the  key for the selection of the respective option.



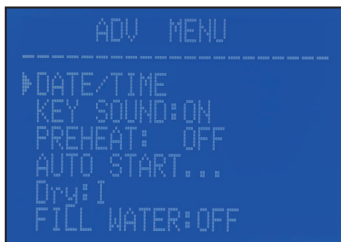
User password set:


Select USER PASSWORD SET, press the  key and enter password setting page, press the / keys to create the desired password in numerical form and  to shift between the columns. After setting the numerical password, press the  key to save the setting and return to the previous menu.

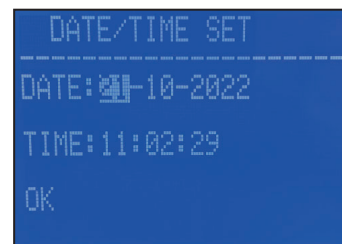
ENABLED: To activate the user password (ON/OFF) press the  key.
When ENABLED is in ON status, sterilizer can only be used by inputting the password.
After finish the setting, pressing the button  to next setting option.






OK: Save the settings and return to the previous menu.


>>> DATE/TIME



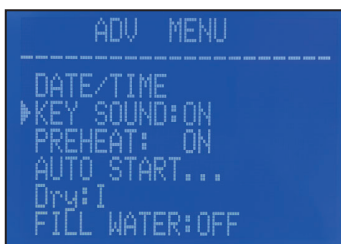
press key  to go into Date/Time menu:



- increase the selected value: press key 
- reduce the selected value: press key 
- go to next value: press key 
- save Date/Time: go to OK and press key 
- don't save and go to previous menu level: press key 

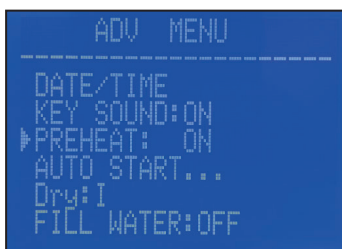
At first change the date then the time. If you change the time only accept the actual values for date by pressing the key .

>>> KEY SOUND



- set key sound ON/OFF by pressing button 

>>> PREHEAT:



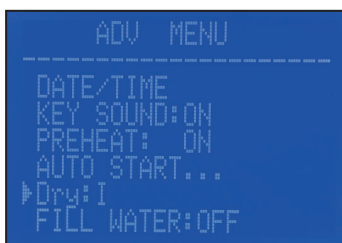
- set PREHEAT ON/OFF by pressing button



The preheating status is displayed in information window (see page 12)



>>> DRYING



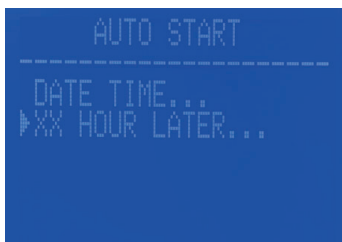
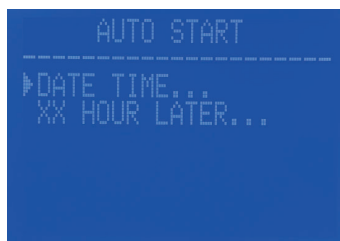
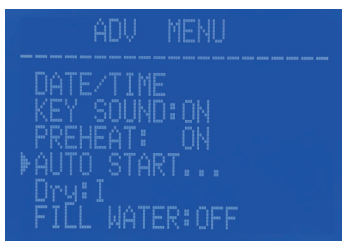
Adjust the drying intensity level:

- change to next intensity level: press button

There are three different intensity levels for you to choose from.

>>>AUTO START


It is possible to have the device switch on automatically at a certain time. To do this, go to AUTO START and confirm the selection by pressing the key. Under AUTO START the desired time can be set analogous to the regular setting of the date/time. To do this, select the date/time and confirm with . Additionally a time-delayed switch-on can be set. To do this, select XX hours later and set the desired delay.




Operation

Before starting up the autoclave, connect it to the power supply and press the main switch (1) on the right side of the front plastic panel. If the indicator lamp of the switch lights up and the LCD screen also lights up, this means that the autoclave is switched on.



At this time, the program of the autoclave is in the initial state and the autoclave is not heating up. You can now select the program that you wish to use and then perform the sterilization by pressing the key .

Water filling

If the message „Please fill with water“ is displayed on the LCD screen after switching on the autoclave, the water level in the fresh water tank is too low. At this point, the selected program cannot be started by pressing the  key. A program cannot be started until the water has been added.

This autoclave series is filled manually or automatically. For manual filling, remove the cover cap on the top of the autoclave and pour in distilled water. If the water level in the water tank exceeds the alarm water level (minimum water quantity), the low water indicator on the LCD display disappears and a signal tone sounds. Fill with water until you hear another acoustic signal indicating that the tank is full.

Note:

If a low water alarm occurs during the program run, fill with water in good time to avoid a possible alarm and to prevent an abortion of the sterilization process.

Water quality

To ensure that only water of the appropriate quality is used for the process, a sensor is installed in the fresh water tank of the autoclave to constantly monitor the water quality. The installed sensor continuously measures the electrical conductivity of the water in the fresh water tank and issues a warning as soon as the specified limit values are exceeded.

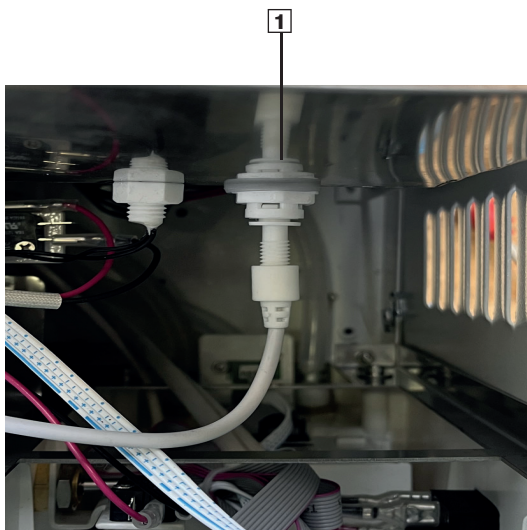


Fig.: Water quality sensor (1) connection to the water tank

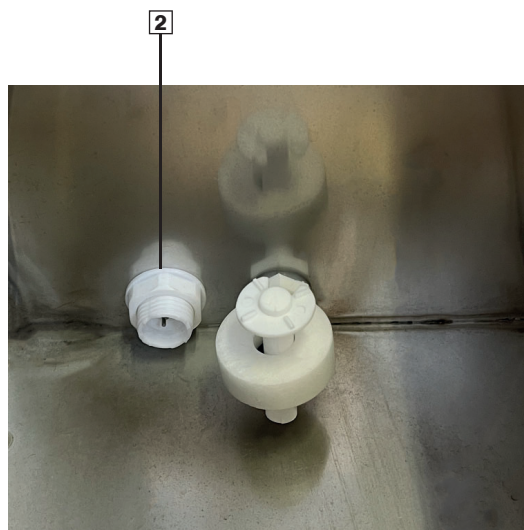




Fig.: Water quality sensor (2) inside the water tank

	<p>ATTENTION! Only use distilled water. In case of non-observance, the user bears all consequences!</p>
	<p>1. Before water can be refilled, the autoclave must be switched on and ready for operation. 2. Do not refill water when the second signal tone has sounded. If you continue to add water, this can lead to an overflow and damage to the device. 3. Please do not put the sterilizer up side down when tank is full. 4. If the device is not used for 3 days please change the water in the fresh water tank.</p>

Water quality table (UNI EN 13060)

UNI EN 13060 – annex C	Maximum value
Evaporation residue	10 mg/l
Silicon oxide (SiO ₂)	1 mg/l
Iron	0.2 mg/l
Cadmium	0.005 mg/l
Lead	0.05 mg/l
Heavy metal residues (except iron, cadmium and lead)	0.1 mg/l
Chloride	2 mg/l
Phosphate	0.5 mg/l
Conductivity (at 20°C)	15 µs/cm
pH value	5 to 7
Look	colourless, clean, without sediment
Hardness	0.02 mmol/l

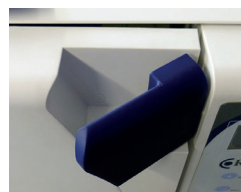
 **NOTE: The use of water containing impurities in concentrations exceeding the values specified in the table may significantly shorten the service life of the device, seriously damage its components and invalidate the manufacturer's warranty!**

Testing/Setting

1. Before daily operation of the autoclave, a **B&D and Helix test program** must be performed to assess whether the sterilization effect of the autoclave is given. If the sterilization effect is not given, please stop and contact qualified personnel for maintenance.
2. At least one **VACUUM TEST** program per month must be carried out in order to be able to assess whether the autoclave is tight. This program must be run when the autoclave is cold and without a sterilization load. In case of leakage, please stop and contact qualified personnel for maintenance.
3. **Setting before the operation of the program:**
 Whether KEEP TEMP option is on;
 Whether the printer is on;
 The Printer On must meet the following two points at the same time
 1) PRINTER option under ADVANCED_SET menu is ON
 2) The light on the printer is on when pressed and the paper feed works.

Sterilization

1. Put the equipments that you want to sterilize into the autoclave.



Door handle - open position

Door handle - close position

	ATTENTION!
1.	Don't use more than 70% of the volume of the chamber or more than 6 kg at once to sterilize.
2.	The equipments should not stick to the inside-wall, especially should not block the ventilation of the autoclave. There should be some space around the sterilization load.
3.	When loading the autoclave, we recommend using the tray handle to avoid scalding.

After loading the autoclave, press the door firmly shut and move the door handle to the closed position.

	ATTENTION! You must close the door handle, otherwise the control electronics will prevent the selected sterilization program from starting. If the start key is pressed and the door handle is not closed, an acoustic signal is emitted and the error code E6 is displayed.
--	---

- Close the door.
- Select the desired program in the program list of the user menu or select the program in the quick selection (see page 13).
- Press the button and the prompt "please push the start key to start" occurs.
- Insert an USB stick to store the printout data in an TXT file. Otherwise the autoclave will create a printout only (Any USB stick can be used. USB port → see page 10. If a program is running, don't remove the USB stick!).

Note: USB stick must be formatted with FAT32 filesystem.

- Press the button to start the program.

After the program starts running, the sterilizer will automatically finish the processes such as heating, pulsation vacuum, sterilization

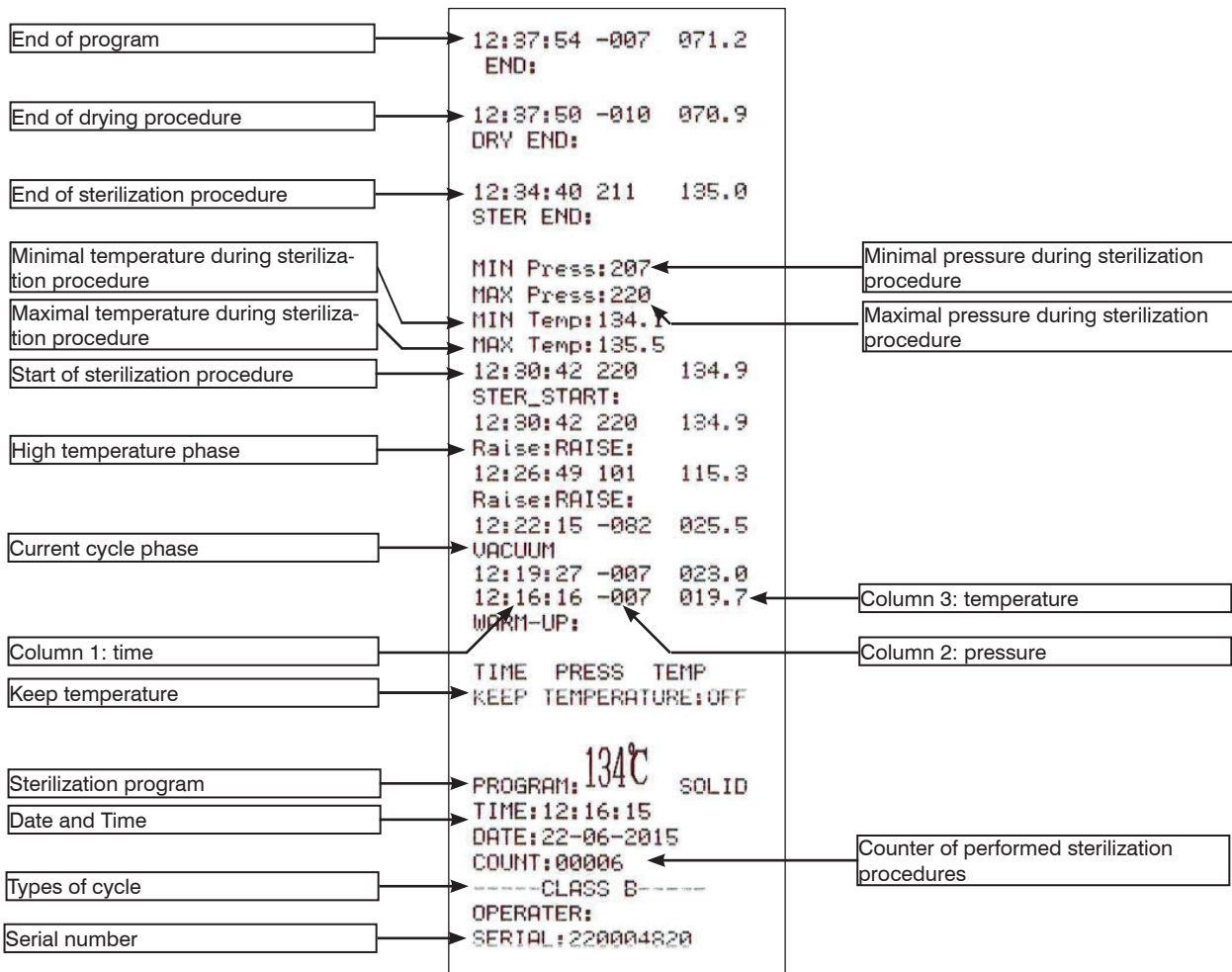
and drying, etc. Working time is mainly determined by the initial temperature of the sterilizer and the selected sterilization program and sterilized articles.

- After the sterilization finishes, LCD screen will display “END” and there will be 3 prompt sounds.
You can open the door of the sterilizer and get the sterilized appliance.

If you finished sterilizing, please turn off the power switch (be sure the power lamp is off). If you won't use the sterilizer for a long time, please disconnect the power.

Printouts

How to read and interpret the information provided in the printouts.



Abnormal Situations

The autoclave sounds an alarm, releases the pressure and stops preheating if unusual situations occur during operation. This protects the user and the items to be sterilized. The autoclave displays the respective error code (see table „Error codes and resolutions“).

If you do not find the solution in this table, contact the dealer or our service department, we will help you shortly.

Error Codes and Resolutions

Code	Alarm	Reason	Resolution
E2	beep	The sterilization pressure over preset pressure +0.4 bar (134°C process over 3.5 bar (absolute pressure)/121°C process over 2.5 bar; vacuum unusually, have many air remain in chamber.	Ask professional to check vacuum pump
E5	beep	In vacuum period, after air relief 3 min, the pressure in chamber still over 20 kPa, or after sterilization finished air relief 10 min the pressure in chamber still over 0.5 bar; air relief instability.	Ask professional to check water drain valve
E6	beep	The door opened in sterilization period; the door detector switch damaged.	Ask professional to check door detector switch
E7	beep	The local air pressure value <70 kPa; sea level elevation too high.	Can't be used in these areas
E8	beep	In temperature rise period, every 5 min temperature rise <3°C	Ask professional to check admission passage, water pump, heating rod, control board
E9	beep	In sterilization period, the sterilization pressure below the preset pressure -0,3 bar.	Whether the water tank is empty
E10	beep	The electromagnet in wrong condition (power on, the electromagnet at close condition; process start, the electromagnet at open condition; process finished, the electromagnet at close condition).	Ask professional to check electromagnet, control board
E11	beep	The electromagnet at open condition in sterilization period; the port on control board which use to control electromagnet damaged.	Ask professional to check control board
E12	beep	The degree of vacuum does not reach -70 kPa 2 times in the cycle of pre-fractionated vacuum.	Ask professional to check vacuum pump
E13	beep	The fault of automatic water filling.	Check the water source if there's enough water or the tape is not opened. If the water source is OK, check the water pump and the relevant solenoid valves.
E16	beep	After drying, the pressure in the chamber can't be balanced with the external air pressure.	Change the bacterial filter or, ask a professional to check air inlet valve
E31	beep	Inner temperature >150°C Inner temperature sensor open circuit.	Ask professional to check inner temperature sensor
E32	beep	External temperature >280°C; external temperature sensor open circuit.	Ask professional to check external temperature sensor
E41	beep	In preheat period, after 8 min external temperature <100°C; heating circle damaged.	Ask professional to check heating circle
E42	beep	In preheat period, after 8 min steam generator temperature <110°C; heating rod damaged.	Ask professional to check heating rod
E51	beep	Inner temperature ≤0°C; Inner temperature sensor short circuit.	Ask professional to check inner temperature sensor
E52	beep	External temperature ≤ 0°C; External temperature sensor short circuit.	Ask professional to check external temperature sensor

Code	Alarm	Reason	Resolution
E61	beep	134°C process: inner temperature >140°C or 121°C process: inner temperature >127°C; temperature control instability.	Ask professional check inner temperature sensor, control board.
E62	beep	External temperature >155°C; temperature control instability, control board damaged.	Ask professional check external temperature sensor, control board
E63	beep	1. steam generator temperature ≤0; steam generator temperature sensor open circuit. 2. steam generator temperature >230°C; temperature control instability, over 230 °C; general the control board damaged or the steam generator heat delivers abnormal, steam generator temperature sensor damaged.	Ask professional check steam generator, temperature sensor, control board, steam generator
E99	beep	The communication between CPU is wrong.	Ask professional check control board data line, and CPU install

B-D test („BOWIE & DICK“ test)

The Bowie & Dick cycle verifies that the steam penetrates properly inside a porous load. Carry out the test cycle after removing all trays from the autoclave chamber but the central one: place the test pack without any other instrument on this tray. Start the cycle (→ see chapter „User menu“ on page 13). The cycle result is confirmed by the test-pack result.

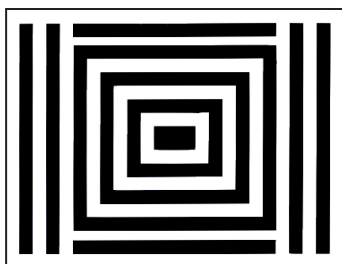


Fig.: Bowie & Dick Test

HELIX TEST

This test should be performed to check steam penetration into a hollow load. Carry out the test cycle after removing all trays from the autoclave chamber but the central one: place the „Helix-Indicator System“ on this tray (without any other instrument). Start the HELIX TEST cycle (→ see chapter „User menu“ on page 13) The cycle result is confirmed by the test paper included in the test material (see figure below).

Important: the cycle must be started when the autoclave is warm (immediately after having performed a cycle of work).

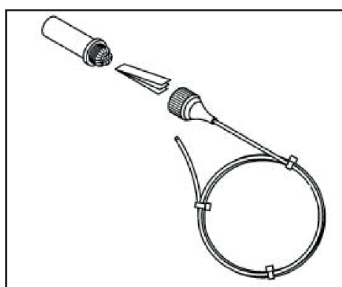


Fig.: Helix test

VACUUM TEST

The Vacuum Test cycle is used to detect any pressure losses in the sterilization chamber. This test should be carried out on an empty autoclave, prior to starting other sterilization cycles. The autoclave reaches the selected vacuum degree and will hold it for 15 minutes.

Start the vacuum test (→ see chapter „User menu“ on page 13).

The test result is shown in the corresponding protocol printout at the end of the cycle.

If the autoclave failed the test, the door seal should be checked, cleaned or, if necessary, replaced (see chapter „Maintenance“). Similarly, the sterilisation chamber rim should be checked also. Finally, the test should be repeated. A failed vacuum test does not bar the use of the autoclave in the near future. However, it is recommended that you contact a technical support centre as sterilisation cycles may be affected in the long term.



After each test cycle, the door of the auoclave must be opened once before a new test or work cycle can be started.

Printer maintenance

Paper change and paper feed of printer

Printer paper change:

1. Pull the printer's toggle lever (1) to open the paper tray.



2. change the paper as shown in figure 1.



Fig. 1

2. Cover the paper with the flap as shown in figure 2.



Fig. 2

3. Check through the paper feed (2) whether the paper change has been completed correctly.

Printer paper feed check:

After turning on the printer, press the paper feed button (2) on the printer to determine if the paper feed is is being performed correctly. If the paper feed stops working, the paper has jammed. Change the paper and feed it again.

If the printer paper feed is working correctly, but there is no data on the paper, install the printer paper the other way around.



Note:
The printer paper can only be printed from one side.

Adjusting the door

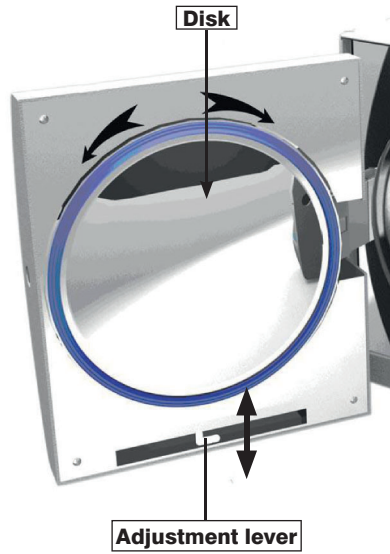
Turning the disc clockwise:

First pull the adjustment lever down to release the lock of the of the disk.

Now turn the disk clockwise.

Increases the distance between door and the chamber.

The door is looser and you need less force to close it.



Turning the disc counterclockwise:

First pull the adjustment lever down to release the lock of the of the disk.

Now turn the disk counterclockwise.


Decreases the distance between door and the chamber.

The door is tightened and you need more force to close it.

- After completing the adjustment, push the adjustment lever back up to lock the disc again.
- After Adjusting the door it is necessary to perform a vacuum test. If there are leakages, the adjustment has to be performed again.

	<p>ATTENTION! Do not adjust the door too loosely, as this may endanger the user during the high-pressure phase. If the door adjustment is too loose, the sealing ring may pop out. The adjustment of the door must be carried out with the utmost care!</p>
---	---

	<p>ATTENTION! After adjusting the door, check the autoclave and perform a vacuum test.</p>
---	--

	<p>ATTENTION! The device should be serviced according the maintenance plan in document C32-0125 in order to ensure the functionality and safety for your daily work.</p> <p>Document C32-0125 is part of the delivered documentation and contains the order numbers of the needed maintenance kits, as well as the space for notes and the carried out services.</p> <p>With regard to any warranty processing, we strongly recommend documenting all maintenance work with notes in this Maintenance plan document C32-0125.</p>
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Daily maintenance

Check for contamination, damage or other performance-relevant abnormalities.

Carry out Helix test and B&D test. Use the autoclave in everyday clinical practice only after successful testing.

If required

Cleaning of the housing and operating parts:

- Clean the housing parts only with neutral liquid cleaners
- Apply cleaning agent with a lint-free cloth, allow to soak in sufficiently and allow to evaporate
- Wipe down with fresh lint-free cloth and distilled water to remove cleaning residues, repeat if necessary
- Wipe-disinfection only with alcohol-based agents (e.g. ethanol) to prevent damage to the housing and the operating parts
- Do **not** carry out spray disinfection!

Weekly maintenance

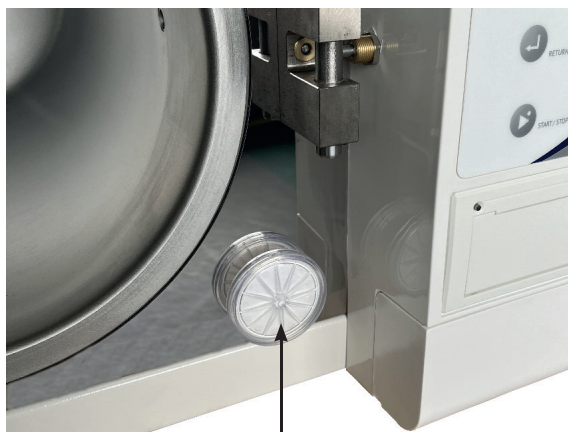
Weekly maintenance requires visual inspection and cleaning of the interior of the sterilization chamber. Remove the trays and the holder from the chamber before cleaning.

- CHAMBER INTERIOR: Use the fine part of a sponge to remove minor impurities from the bottom of the chamber. If increased deposits remain, it is advisable to check the quality of the water used.

Every three months

Quarterly maintenance requires lubrication of the door hinges and replacement of the bacteria filter.

- HINGE LUBRICATION: spray the two door hinges with small quantities of silicone oil.
- REPLACE THE BACTERIAL FILTER: replace the filter approximately every 150 cycles (Note: bacterial filter life largely depends on usage rather than time. Notwithstanding this fact, it is recommended that the filter should be changed at least every three months, so as not to reduce the autoclave drying performance). A clogged bacterial filter may lead to some difficulties in opening the door on completion of the sterilization cycle.



Bacterial filter:
replace after approx. 150 cycles
or
every three months

Every two years

The autoclave is fundamental to the protection of patient and operator alike: even though the electronic controls of these machines are increasingly reliable, it is good practice to carry out a functional check of the equipment at least once a year. This check should be carried out by authorised service centres only, with calibrated and certified instruments, in order to guarantee the equipment a long life and reliable operation (validation). To establish the proper check procedures, refer to the instructions issued by the relevant health authority.

- VALIDATION: validation requires the use of instruments calibrated by specialist centres to check the sterilisation cycle parameters. This check includes inspections of pressure and temperature probes and the timer. On request, the manufacturer issues a yearly test certificate for machines returned to its premises for maintenance and checks.

Cleaning the sealing ring

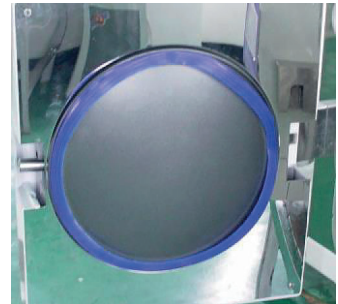
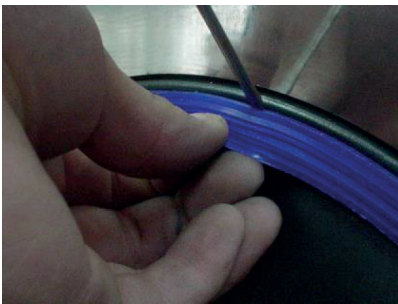
To maintain good sealing ability, you should clean the sealing ring regularly. Clean the sealing ring with distilled water. If leakage still occurs after cleaning, you may have to replace the sealing ring.

Replacing the sealing ring

Tools: you need a blunt screwdriver or similar tool.

- a) Hold the sealing ring with one hand and carefully lift it with a screwdriver to the center of the disc and the door. Slowly remove the sealing ring.
- b) After removing the sealing ring, clean it and check if it is damaged. If this is the case you must replace it.
- c) After cleaning the sealing ring, put it back in place.
- d) Attention:

If you find that it is difficult to reinsert the sealing ring, carefully press it with a screwdriver into the correct position.



To avoid scalding, be sure to turn off the unit and let it cool down.

	Repairs to the autoclave must be carried out by qualified personnel of the manufacturer with the power supply switched off.
--	--

Transport and Storage

Preparation

Allow the autoclave to cool down and switch it off.

Drainage

Empty all tanks:



Insert the side of the hose with connector into the corresponding valve:

- (1) Waste water outlet
- (2) Water storage outlet

	Attention! Be careful emptying the waste water tank! The waste water can get to a maximum temperature of 60°C. The waste water can drain with a flow rate of 4 L/min.
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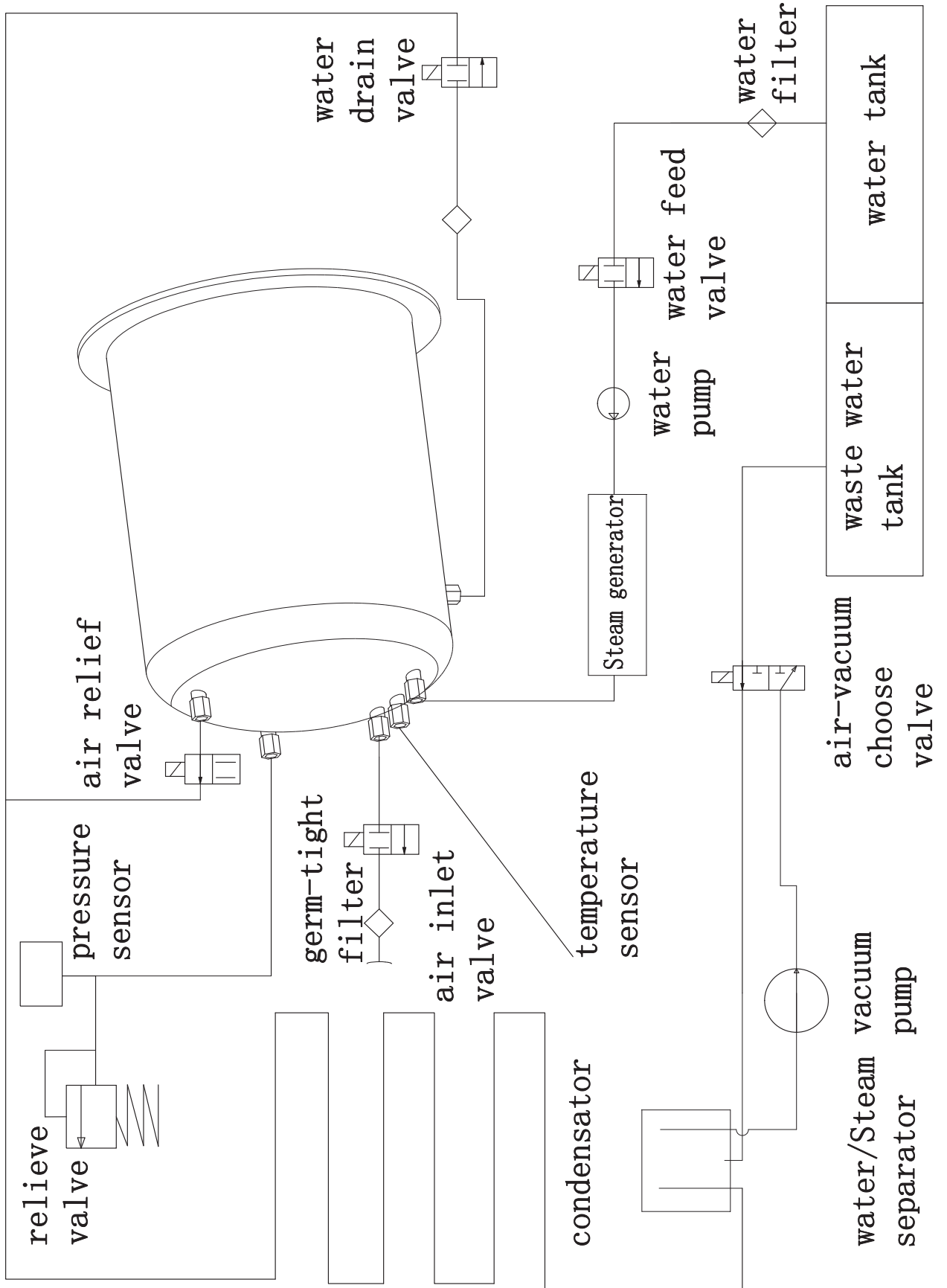
Terms of transportation

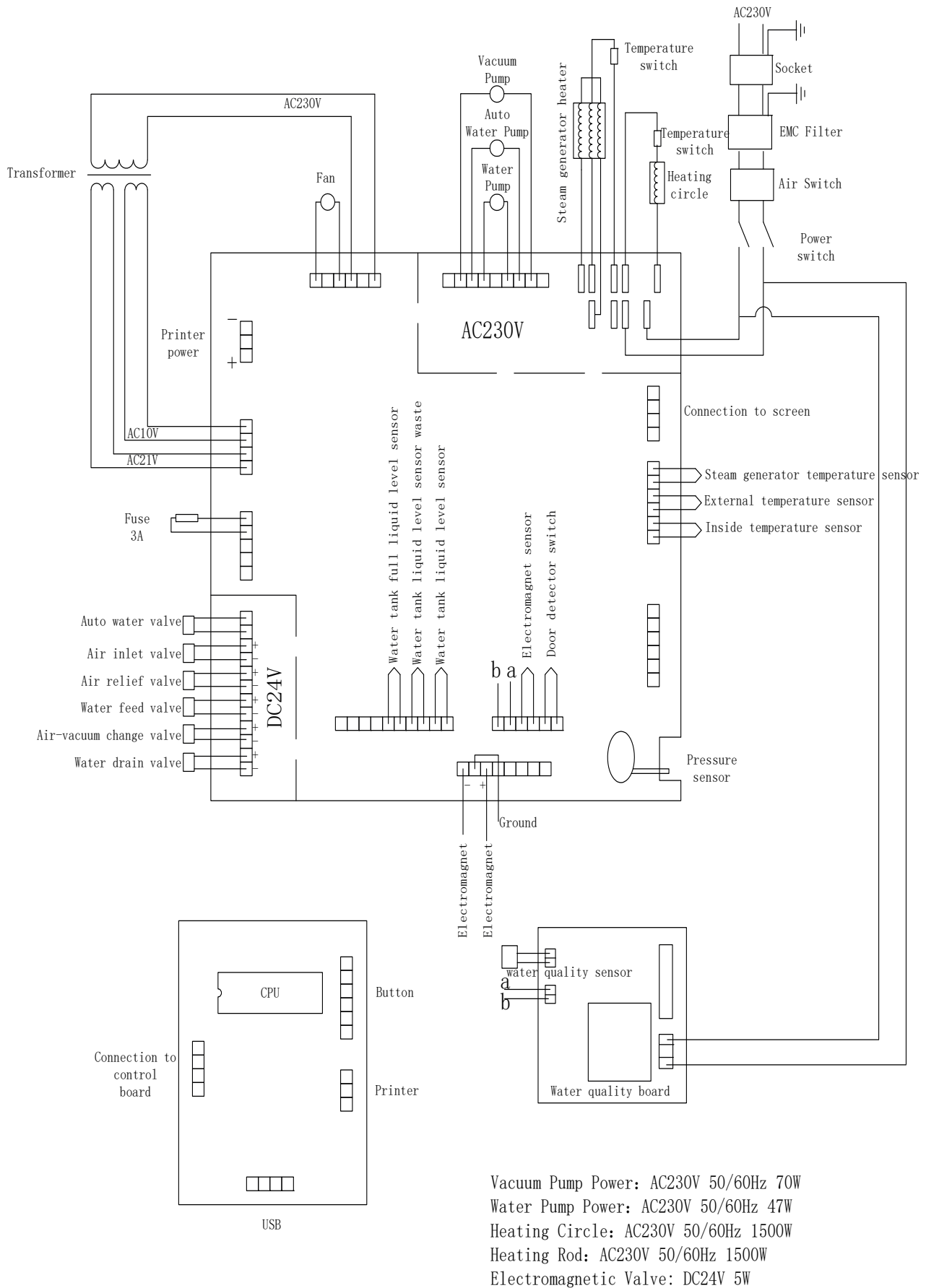
see page 9 in this manual.

Storage conditions

After packing, the autoclave should be stored in a clean interior room, the temperature of which is 5°C-40°C, whose relative humidity does not exceed 80%, has no corrosive gases and is well ventilated.

	Attention! Don't drag during moving.
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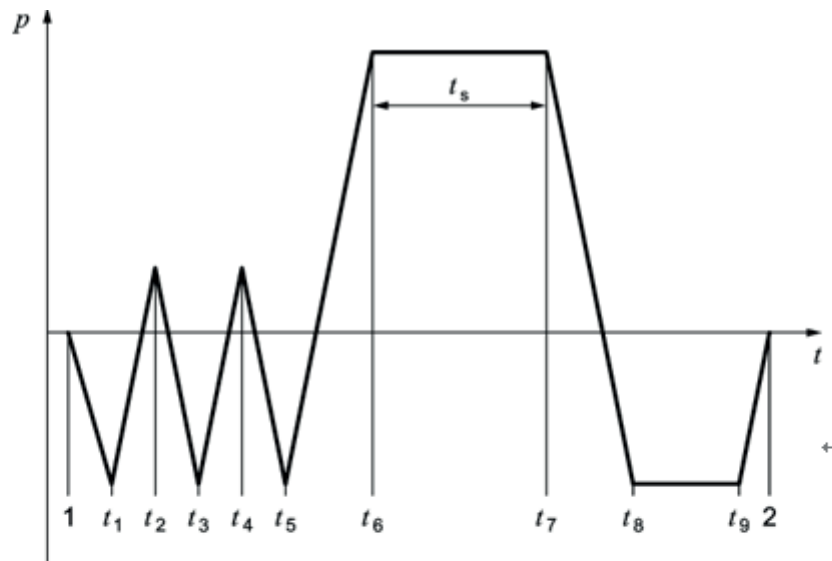


Information on maximum load weight and load configuration:

Cycle	Load configuration	Model	max. weight per tray (kg)	total max. weight (kg)
SOLID	solid instruments without packaging	CleanTec CB23	2.5	7.5
SOLID	solid instruments without packaging	CleanTec CB18	2	6
POROUS	solid instruments without packaging, porous load	CleanTec CB23	2.5	7.5
POROUS	solid instruments without packaging, porous load	CleanTec CB18	2	6
HOLLOW	solid instruments without packaging, porous load, hollow A load, hollow B load	CleanTec CB23	2.5	7.5
HOLLOW	solid instruments without packaging, porous load, hollow A load, hollow B load	CleanTec CB18	2	6

Total cycle time and used water volume

	121°C SOLID	121°C POROUS	121°C HOLLOW	134°C SOLID	134°C POROUS	134°C HOLLOW
max. time (min)	46	61	66	38	52	58
max. volume of water used (ml)	320	410	520	280	360	450

**Key**

- 1 START - start of the operating cycle
- $t_{1, 3, 5}$ time for vacuum pulse
- $t_{2, 4}$ time for pressure pulse
- t_6 sterilization start time
- t_s holding time
- t_7 sterilization end time
- t_8 drying start time
- t_9 drying end time
- 2 END - end of operating cycle

diagram of pressure vs time and temperature during the cycle

The limit of t_1, t_3, t_5 is -82kPa ;

The limit of t_2, t_4 is 50kPa ;

The limit of the t_6, t_7 is: pressure $> 210\text{kPa}$ and temperature $> 135^\circ\text{C}$ or pressure $> 110\text{kPa}$ and temperature $> 122^\circ\text{C}$

The limit of t_8, t_9 is $\leq -85\text{kPa}$

CleanTec **CB18/CB23**

C20-0033
24012402EN

Automatic water supply function



The user who operates and maintains this device must be sufficiently trained for these tasks.

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[THE DENTAL EXPERTS]

Introduction of Function

With the automatic water supply function, you no longer need to worry about whether there is enough fresh water in the tank. The device independently checks whether there is enough water and automatically fills it from an external source if necessary.

Connection And Operation

Connection

Connectors as below:



1	Waste water outlet
2	Clean water inlet
3	Clean water outlet

Waste water outlet:

Connecting a hose - connect the other end of the hose to an external tank or the waste water.

Clean water inlet:


Connecting a hose - connect the other end of the hose to an external tank (unpressurized) or a water supply (under pressure).

Clean water outlet:

When the fresh water is to be drained, connect a hose to this port and the tank will be drained.

Please note:

Before shipping or storing, the water tanks must be emptied.

	<p>The pressure of clean water tap shall not exceed 0.4 MPa. If the water pressure is more than 0.4 MPa, a pressure relief valve shall be installed between the autoclave and clean water tap.</p>
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Operation Instruction

After installation of autoclaves switch the power on.
The LCD screen will show: "PLEASE FILL WATER".



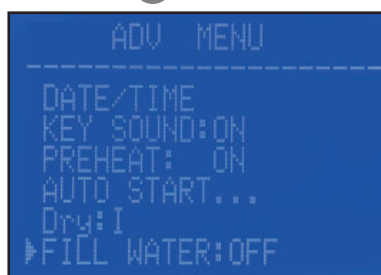
If you need to enable the Automatic Water Supply Function, please do as below:

Enter ADV menu

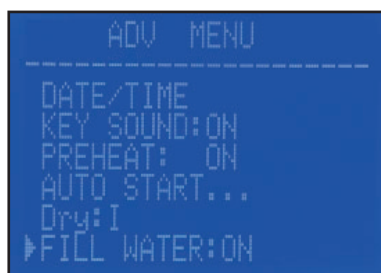
- press button ▲ or ▼ to select „ADV“ menu.



- press button ◻ to enter "ADV" Menu.



- press button ▼ to select „FILL WATER: OFF“
- press button ◻
 - It will show „FILL WATER: ON“. At this time, the function is running.
 - The clean water will be automatically filled into clean water tank until the tank is full.



If you need to pause the water-filling, you can press button ◻ to close this function. The menu prompt will show „FILL WATER: OFF“ again.

When the Automatic Water Supply Function is enabled, once there's not enough water inside clean water tank, the function will automatically run and clean water will be filled until the clean water tank is full.

Error

After the clean water has been filling for 2 minutes, if the clean water inside tank is still not enough, "ERROR 13" will be shown.

Code	Reason	Resolution
E13	Fault of automatic water filling.	Check the water source if there's enough water or the tap is not opened. If the water source is OK, check the water pump and the relevant solenoid valves.