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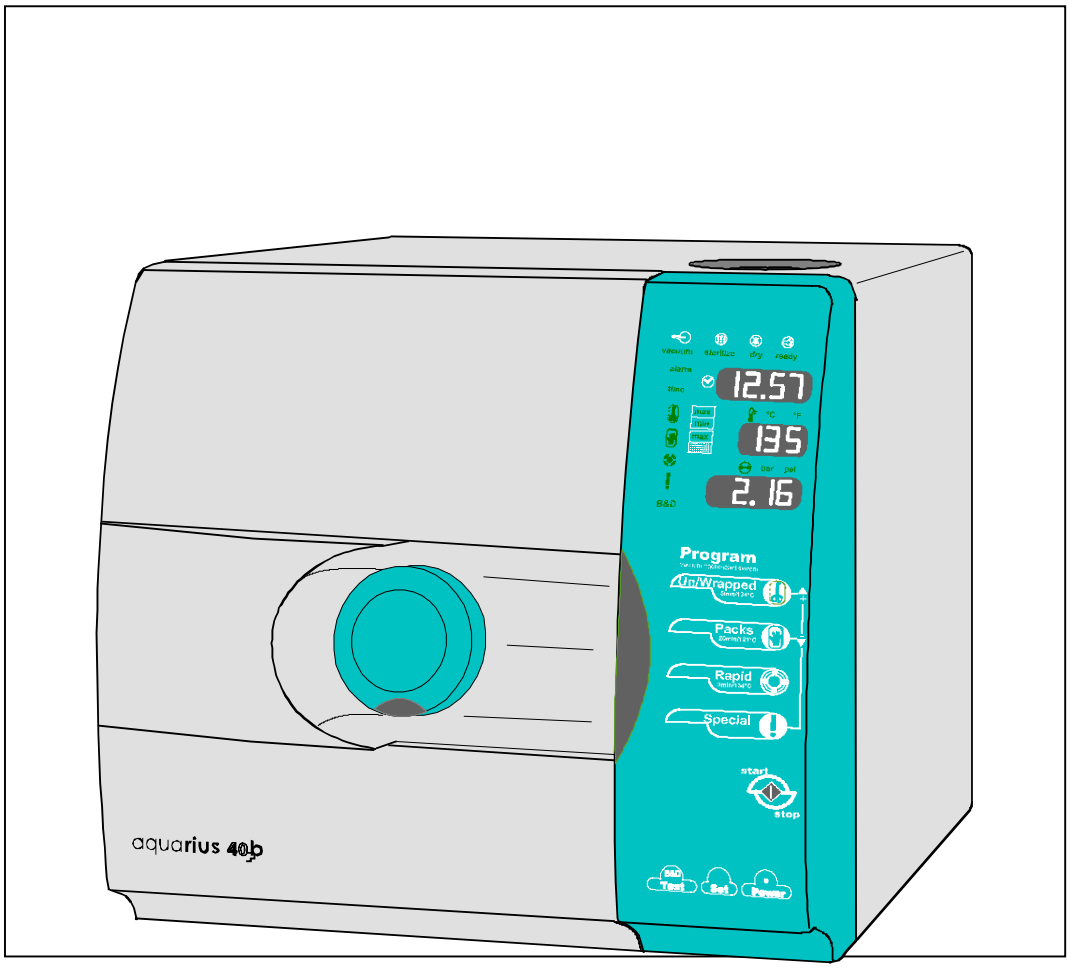
aquarius 40B

Steam sterilizer



OPERATING INSTRUCTIONS

Starting Serial Number 5580

Rev. 2
Date: January 2004

unident GENEVE

CE 1253

aquarius 40B

Operating Instructions

UNIDENT AQUARIUS 40B fulfills all the directions in force concerning the safety, and the built-in parameters has been properly set by the manufacturer in order to warranty effective sterilization if proper loading conditions are followed. Please, read carefully this manual before using the machine; an improper utilization of the sterilizer should carry on defective sterilization with unattended consequences.

In case of doubt or questions, please call the agent.

Thanks for the confidence given.

ENGLISH

UNIDENT SA is a company certified according with the standard ISO9001/13485. The certification has been issued by the notified authority SWISS TS.

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1. GENERAL

1.1 FOREWORD

Object of this manual is to supply the instructions for the operators in order to allow:

- the correct installation
- the right use
- the proper maintenance of the sterilizer

The machine must be installed and operated according to the procedures described in this manual.

The user is responsible for what concerns the fulfillment in the legal subject concerning the installation and the operation of the sterilizer.

If the machine is not correctly installed and operated or a not appropriate maintenance is carried out, the manufacturer cannot be considered responsible for any possible breaks and malfunctions.

Please, check for the packing integrity and no evident damages or missing parts (see delivery note).

※ IN CASE OF DAMAGES OR MISSING PARTS, PLEASE IMMEDIATELY INFORM AND IN DETAIL THE FORWARDER, UNIDENT SA AND ITS AREA AGENT.

1.2 CONFORMITY TO EUROPEAN DIRECTIVES

UNIDENT AQUARIUS 40B comply with the standards of electromagnetic compatibility in conformity with the 93/42/CEE for medical devices and with EN 13060/1 and 13060/2 for class B sterilizers.

CE
1253

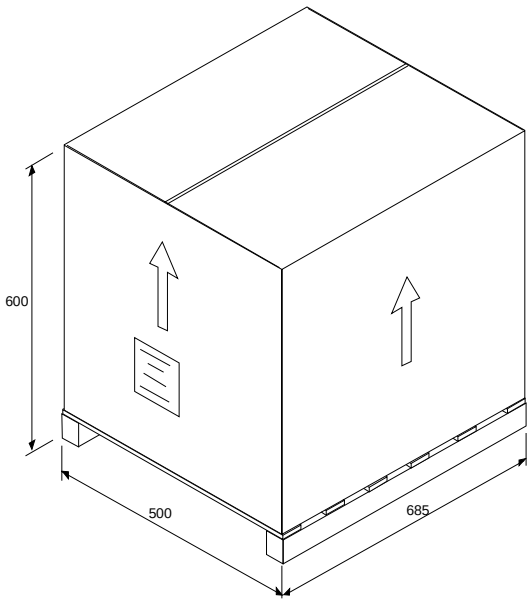
Mark CE 1253 applied on the rear panel point the conformity with the Directive 93/42/CEE and warrant the customer that the equipment is safe and according with the international standards

2. FAMILIARIZATION

2.1 PACKAGE DIMENSIONS AND WEIGHT

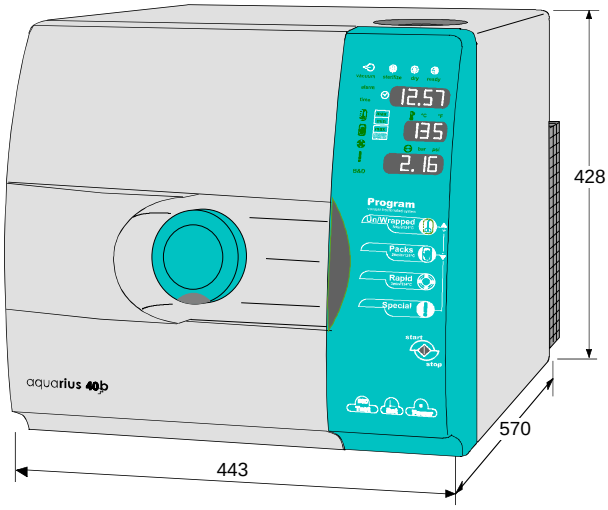
Package weight: 67 Kg

Store the package for future shipment.



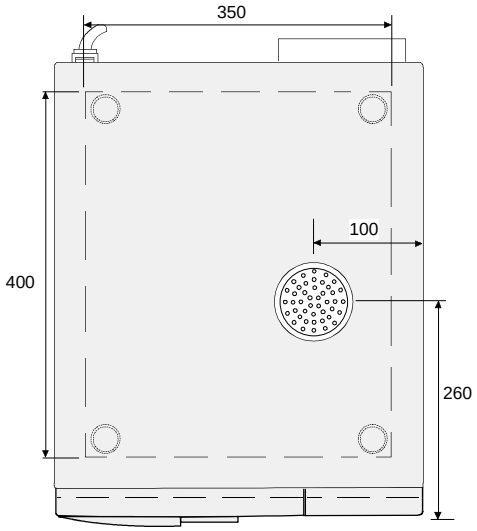
2.2 PHYSICAL CHARACTERISTICS

EXTERNAL DIMENSIONS AND WEIGHT



Net weigh:
55 Kg

USEFUL DIMENSIONS



Minimum dimensions for the support plane:
350x400mm

2.3 CHAMBER DIMENSIONS AND CAPACITY

Diameter:	240 mm
Depth	384 mm
Capacity	18 liters

2.4 SAFETY FEATURES

AQUARIUS 40B provides several safety features:

Double door lock mechanism

Chamber can be opened only when internal pressure is at atmospheric value.

Safety Valve/ Vent Valve

- **Safety valve** - The safety valve opens as backup protection to reduce chamber pressure in the event pressure exceeds 2,6 bar.
- **Vent valve** - If chamber pressure should exceed 2,4 bar the vent valve will open and the ALARM 10 will be displayed.

Overheat Protection

Chamber temperature is set so as not to exceed 142 °C and has an additional overheat protection if temperature reaches 150 °C.

Electrical Power Interruption “Black Out”

In case of an mains failure during the sterilization cycle, the pressure in the chamber is automatically vented up to the atmospheric value.

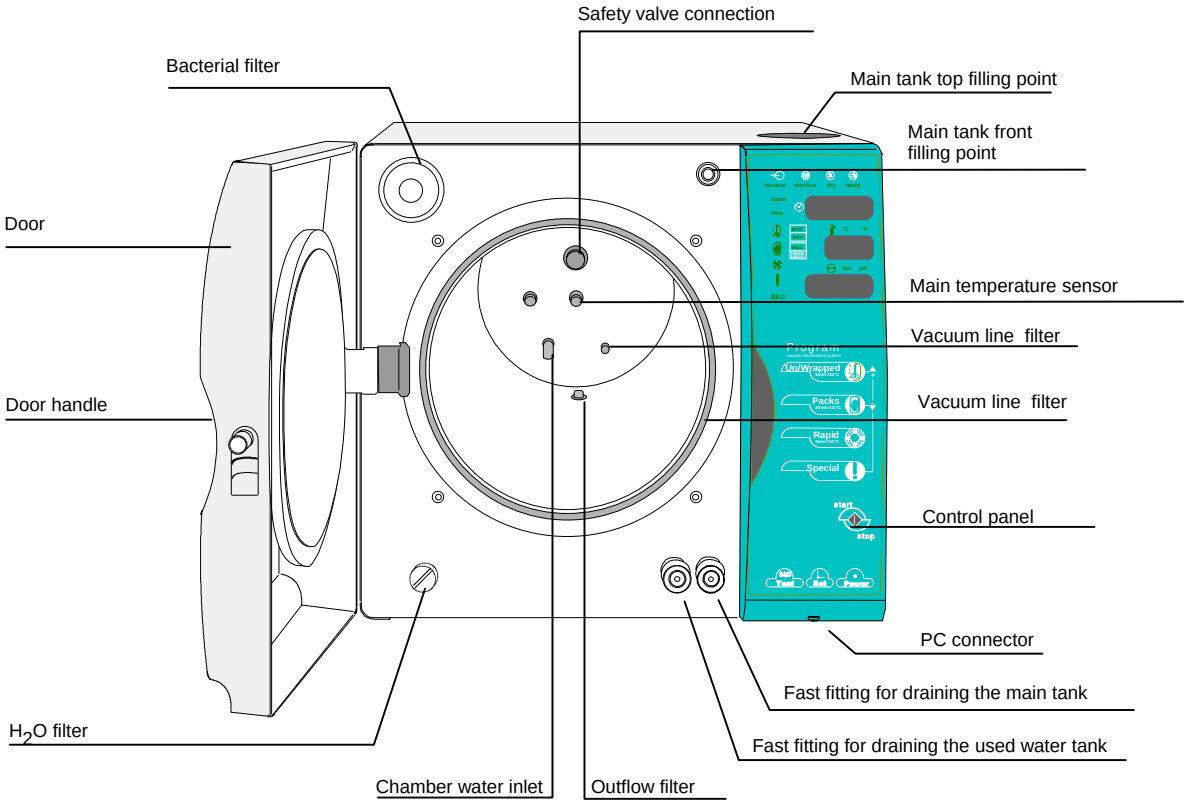
As the power returns, message **BLACK OUT** will be displayed.

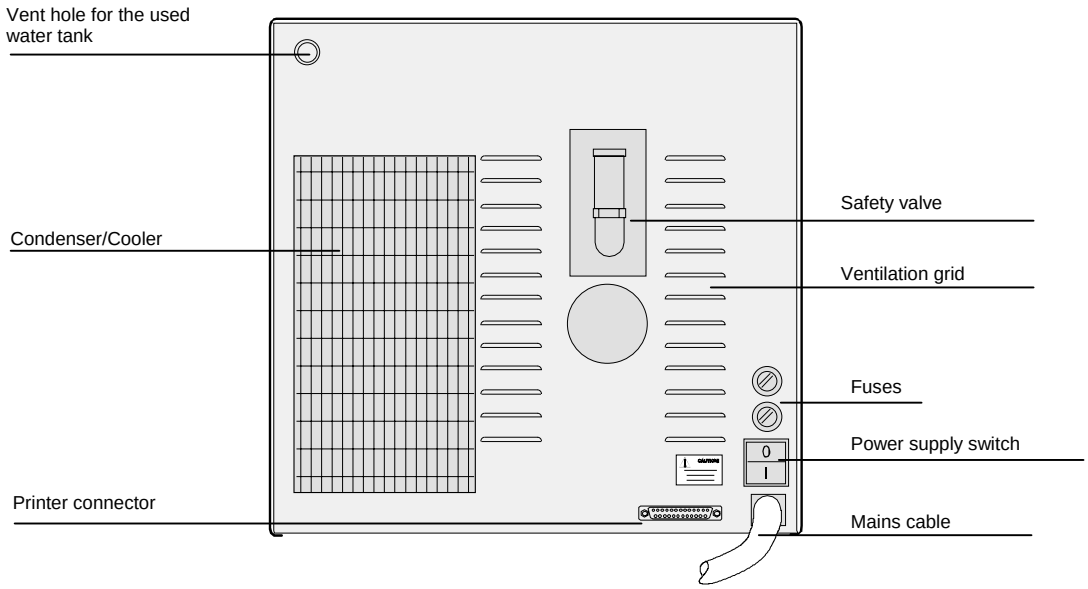
Automatic switch-off

At the end of a cycle the sterilizer turns off automatically after a period of 30 minutes if no program keys are activated or the door opened.

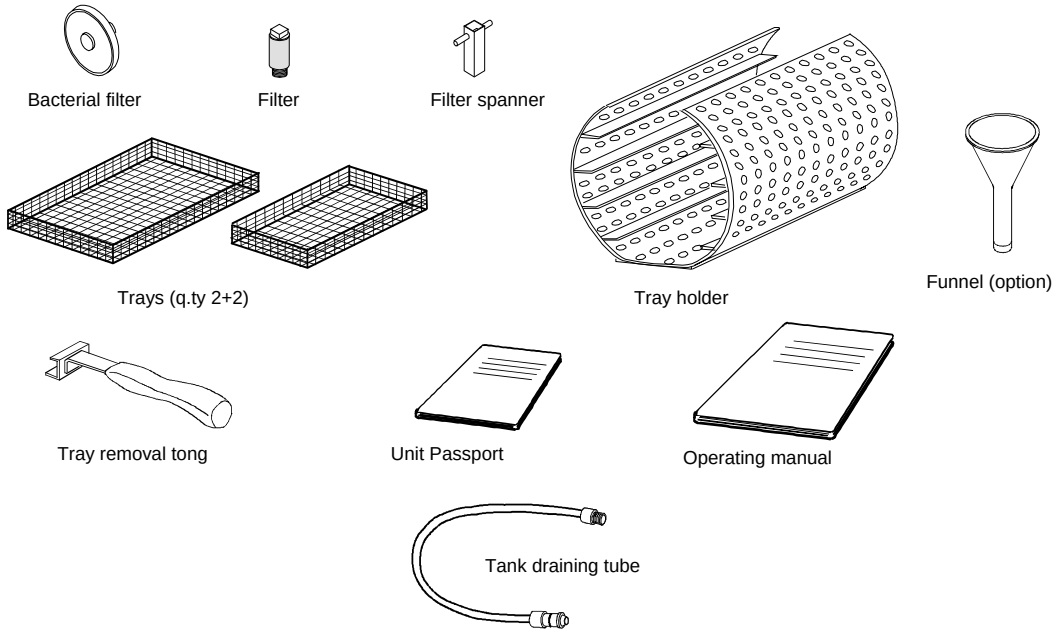
Class B EN13060-1/2

2.5 DEVICES OF THE STERILIZER





2.6 STANDARD ACCESSORIES



※ *Before installing the machine, verify all the accessories and that the Unit Passport is correctly signed. To make the warranty active it is necessary that a copy of the supplied Unit Passport is sent, through the agent, to the manufacturer; for want of this the warranty will decline.*

2.7 TECHNICAL SPECIFICATIONS

Chamber dimensions	Ø 240 mm, depth 384 mm
Chamber capacity	18 l
Maximum load	4 kg (solid instruments) 1,5 kg (porous instruments)
Warming-up time	20 min. starting from room temperature 10 min. starting from chamber pre-heated
Sterilization time	from 3 to 90 minutes, depending on the selected cycle
Drying time	from 3 to 14 minutes, depending on the selected cycle
External dimensions	443 x 590 x 428 mm (L x D x H)
Net weight	55 Kg
Power supply voltage	200 – 250 VAC
Frequency	50 Hz
Max consumption	2160 W
Average consumption	1000 W
Standby consumption	1 W
Fuses	2 x 10 AT (type 6.3 x 32 CT) - IEC 127

Auto-switching-off	The machine switches-off elapsed 30 min. after the end of a cycle
Dual water tank	4 liter each
Vacuum pump	20 l/ min. - 0.97 bar
Bacterial filter	0,3 µm at 99.97 % certification 21 (see 820 FDA) autoclavable
Differential heating system - SDR	
Class B – EN13060	
3 LCD displays and signaling LEDs	
Soft-touch diaphragm key	
10 different programs: - 2 for test - 6 for sterilization - 1 for disinfection - 1 adjustable	
Door with double insulating layers and safety lock	
Control of the water quality	

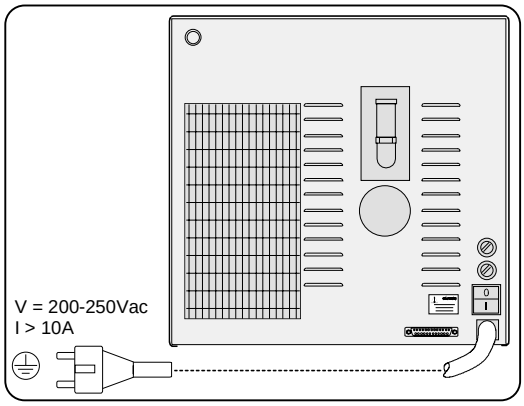
2.7.1 Operating environmental conditions

UNIDENT AQUARIUS 40B has been designed to operate with the environmental conditions of 3°C .... 45°C, H.R. lower than 95%, pressure from 750 mBar to 1050 mBar.

3. INSTALLATION

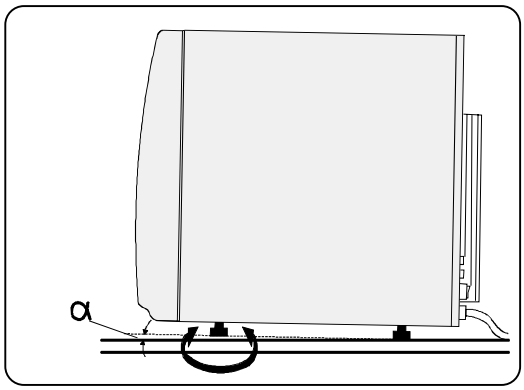
3.1 BASIC REQUIREMENTS

1. Make sure that the features of the electric plant is according with the requirements indicated on the rear plate, the power supply socket should provide at least 10 A and adequate earth connection.



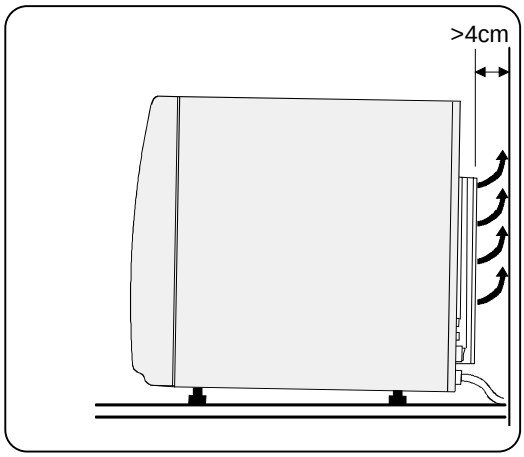
The manufacturer disclaims any responsibility for damage caused by inadequate or not earth-connected electrical plant.

2. The sterilizer should be slightly tilted to facilitate water outflow during the steam draining phase. If necessary adjust through the proper feet.

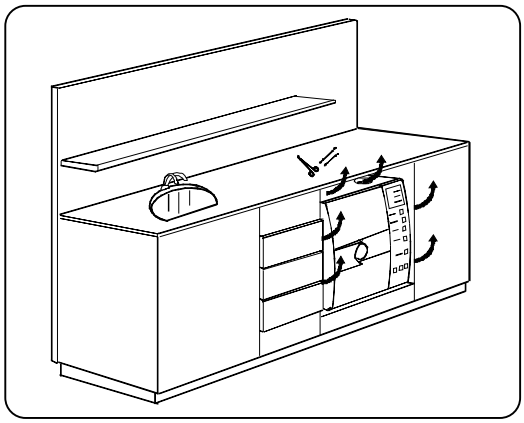


3. To warrant the correct working of the sterilizer it is imperative that the rear and lower panels are not clogged and that the unit is not installed in extremely moist environments or arranged close to inflammable gas sources.

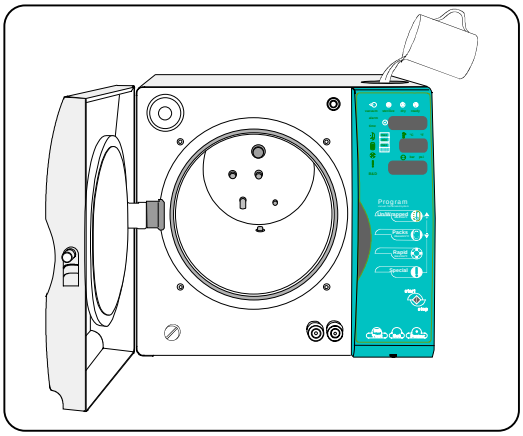
4. The distance from the rear wall should be at least 4 cm.



The sterilizer may be installed recessed, as long as adequate free space around the unit (> 10cm) is guaranteed.



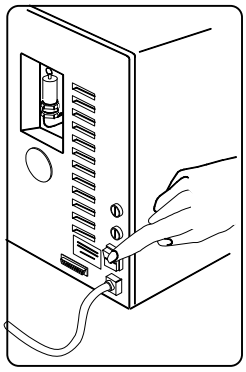
3.2 PRELIMINARY STEPS



※ *These operations should be carried out only by qualified service technicians. incorrect settings might effect the quality of sterilization.*

1. Verify that the electric plant meets the unit requirements, plug the power supply cable into an AC socket.
2. The sterilizer is delivered without water into the tank; before proceeding it is necessary to fill the tank with demineralized water.

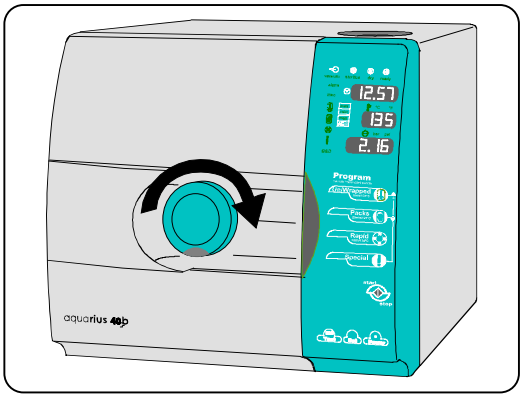
※ Poor-quality water may lead to the formation of calcareous deposits on the instruments, on the chamber inside walls and on the trays. Read the label carefully before pouring the fluid. Tap water must not be used under any circumstances, not even if conditioned through filters or softeners.



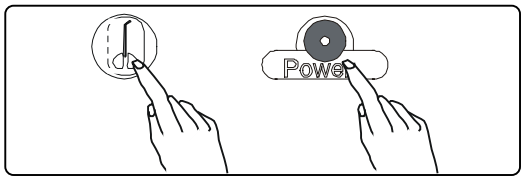
Distilled water bottles for batteries, supplemented with sulfuric acid, are available on the market. If used for the sterilizer may cause irreversible damage.

Fill completely the main tank.

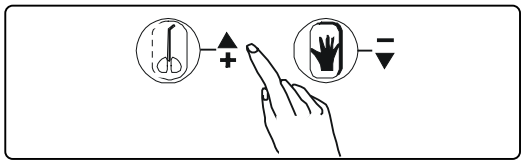
3. Switch-on the sterilizer by the rear power supply switch. This should preferably be kept in “on” position, as in stand-by mode the power consumption is very negligible.



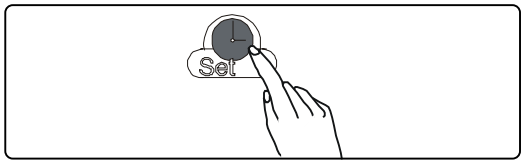
4. Take basket and trays out the chamber and close the door.



5. Hold pressed the key and select the key **POWER**; the display will show <*SET ALT 100 MT*> (100 is the factory-set standard altitude value).



Modify the value according to the current installation altitude (see next page) by operating on the keys or .



Then press the key **SET** to store the set value and to start the automatic procedure for the first water filling of the hydraulic circuit and the chamber itself.

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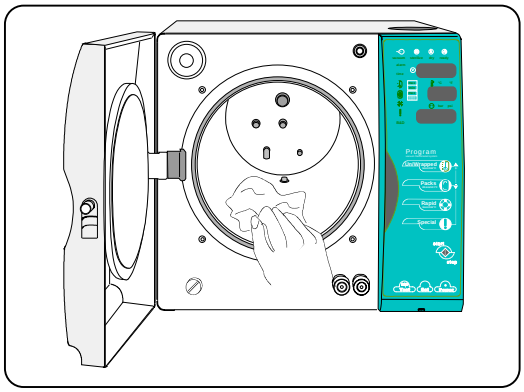
6. At the turning on of the signaling **READY**, open the door and wipe the chamber with a clean cloth.



In case of wrong procedure or incorrect condition, the display will show one of the following warnings:

DOOR OPEN: the door must be closed

ADD H2O: the tank must be filled

NEED INST: failed or missed installation procedure. Repeat the procedure from the step 5.

Now the sterilizer is ready for the first sterilization cycle.

Position the tray holder and the trays with the load to be sterilized in the chamber and select the first sterilization cycle.

The operating instructions are detailed on chapter 4 “OPERATION”.

3.3 ABOUT THE ALTITUDE COMPENSATION

To ensure the correct operation of the sterilizer’s pressure transducer the equipment must know the environment data in order to allow the necessary pressure compensation.

The correct altitude value (above sea level) must be set at the first installation and in case the sterilizer is moved at altitude differing from the set value.

The factory-set value is 100 meters. If the actual altitude is between 0 and 200 meters no adjustment is needed. Differences of ±100 meters do not affect the correct sterilizer operation.

To ensure the right sterilization verify that the altitude value set during the installation does not differ from over 200 meters from the current one. An incorrect altitude setting may result in a prolonged vacuum cycle and/or false or premature AL8 and AL5 error messages.

※ THESE ADJUSTMENTS SHOULD BE CARRIED OUT ONLY BY QUALIFIED SERVICE TECHNICIANS. INCORRECT SETTINGS MIGHT EFFECT THE QUALITY OF STERILIZATION.

4. OPERATION

4.1 FRONT PANEL

All controls and displays are on the front panel. The panel being slightly tilted, displays are clearly visible and controls can be readily operated.

The touch-sensitive keys enable and control all functions of the sterilizer.

Displays: Visualize the parameters of the different phases of the cycle and other useful information during the unit operation; the upper display shows time values or alarm codes – the middle display shows temperature values (°C or °F unit) – the lower display shows the the pressure values (bar or psi unit). The associated Led indicates the measurement unit.

Led of the current phase: VACUUM – STERILIZE – DRY – READY -: lights or flashes during the phases.

Led H2O max/min: lights for main tank full or empty condition.

Led H2O max : lights for used water recovery tank full.

Led of the cycle:  B&D - lights to signal the selected and running cycle.

Program selection keys : The first three recall different pre-set programs, the last recalls 4 special pre-set cycles, plus 1 programmable by the operator:

Sterilization - 134°C, 5 min. , 3 vacuum phases:
for all instruments (wrapped or unwrapped)

Sterilization -121°C, 20 min., 3 vacuum phases:
for porous instruments and textiles

Fast sterilization - 134°C, 3 min. 1 vacuum phase,
for solid unwrapped instruments

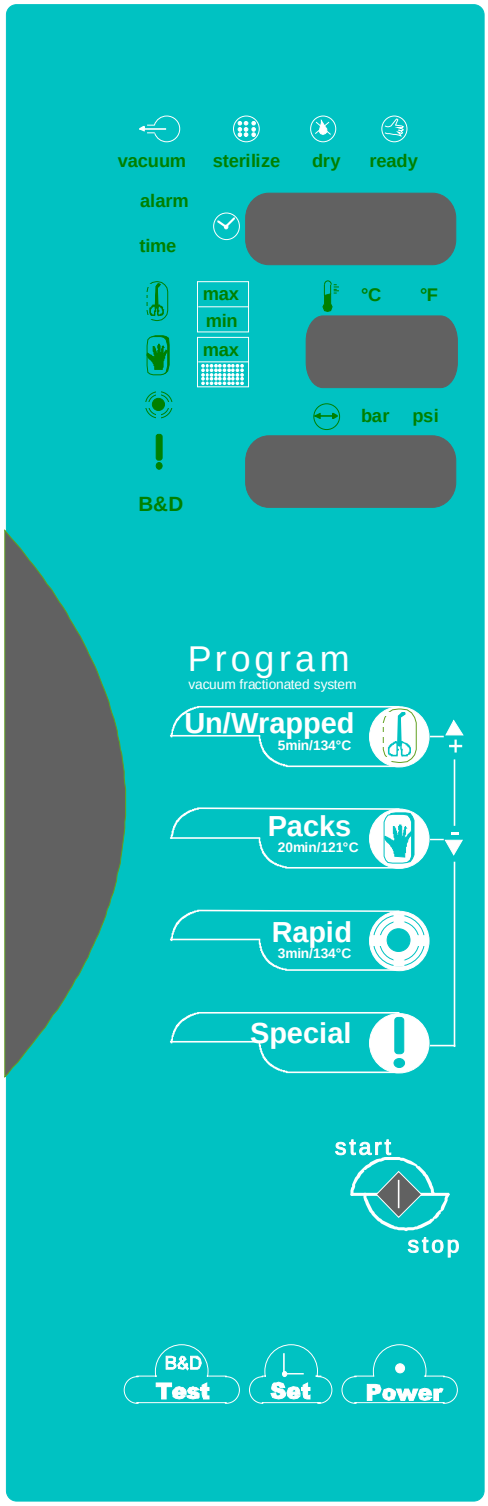
Special - Four special pre-set cycles (S1, S2, S3 and S4) + one special cycle (S5) programmable by the operator

Key **Start/Stop**: starts or stops the cycle after the starting.

Key **Power**: actives the control board and display panel, the switching-on auto test and the heaters for the pre-heating process.

Key **Set**: allows to set current date/time, measuring unit, printout language, and temperature/time/number of the vacuum phases for the programmable cycle.

Key **Test**: allows to carry out Bowie & Dick Test if the sterilizer is active, or Vacuum Test if the sterilizer is in stand-by and the chamber temperature lower than 35°C.



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4.2 CYCLE SEQUENCE

1. Push the switch on the rear panel to power the sterilizer.
   - "TIME" display shows the current date and time
   - "TEMP" display shows OFF
   - "PRESS" display shows day and month
2. Press key **POWER** on the front control panel and wait a few seconds for the automatic auto-test completion; during this auto-test the parameter set-points and the tested components will appear in a sequence on the display. As soon as the auto-test is over, the upper display "TIME" will show again the current time, display "PRESS" shows the pressure into the chamber, display "TEMP" shows the chamber temperature (if lower than 35° C "**Low**" will appear). The pre-heating process starts and the microprocessor drives the heaters at reduced power in order to set the chamber surface temperature up to about 100°C.

※ *During this phase the temperature reading on the display is inaccurate, because no steam being there.*

3. Arrange the material to be sterilized on the trays, load the tray into the chamber and close the door.
4. Verify that the red Led MIN of the main tank is off. If not fill up the main tank with demineralized water up to the lighting of Led MAX.

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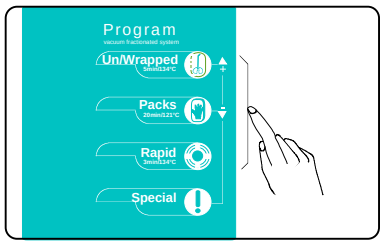
4.2.1 PROGRAM SELECTION

PROGRAMS AVAILABLE

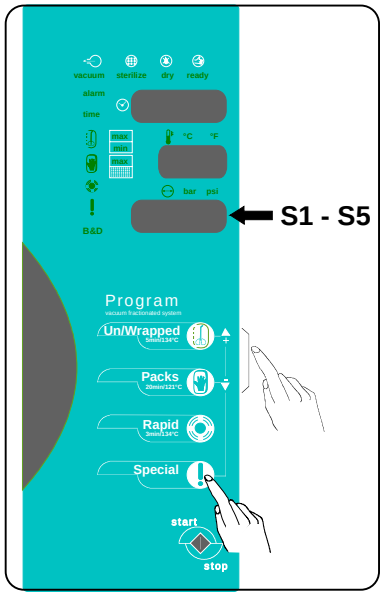
Key	Program	Parameters	Load type
	UN/WRAPPED	134°C 5 min. 3 pre-vacuum phases drying 10 min. (6 vacuum + 4 ventilation)	Every load type that could be treated at 134°C (Helix Test)
	PACKS	121°C 20 min. 3 pre-vacuum phases drying 11 min. (7 vacuum + 4 ventilation)	Every load type that could be treated at 121°C (Helix Test)
	RAPID	134°C 3 min. 1 pre-vacuum phase drying 3 min. (2 vacuum + 1 ventilation)	Solid unwrapped instruments
	SPECIAL		
	S1 disinfection	105°C, 8 min. 3 pre-vacuum phases, drying time 7 + 4 min.	Items which are only resistant up to 105°C
	S2 big load	134°C, 5 min. 4 pre-vacuum phases, drying time 8 + 5 min.	Critical instruments
	S3 big load	121°C, 20 min. 4 pre-vacuum phases, drying time 8 + 5 min.	Very critical instruments
	S4 Prions	135°C, 19 min. 3 pre-vacuum phases, drying time 6 + 4 min.	Creutzfeld-Jacob/mad cow disease
	S5 custom	Parameters set by the operator: Temperature: 105 ÷ 135°C Time: 3 ÷ 90 min. Pre-vacuum: 1, 3 or 4 phases Drying + Ventilation time: 3+2, 6+4 or 8+6 min.	It depends on the selected parameters
B&D Test	Bowie & Dick Test	134°C , 3.5 min. , 3 vacuum phases	B&D tests (3M™ COMPLY™ code 1300)
	Vacuum Test	Temperature under 35°C	No load

To select the program , or press the related key.



To select one of the **Special** programs hold down the key and select or (+ / -) to display the choice (S1,S2, S3, S4 or S5) on the lower display.

The displays will show for 5 seconds the parameters of the selected cycle o.



4.2.2 Running the cycle

Push key **START/STOP** to start the selected program.

※ Programs **Rapid**, **S1** and **S5** don't warrant the class B sterilization; to start these type of programs previously selected, hold down the key (or) and select the key **START/STOP**.

Pressing this key, the parameter values of the selected program are shown once again for 10 seconds, then the sterilizer starts and runs the cycle phases in automatic way. The various steps of the cycle are microprocessor controlled and sequentially shown on the display; in this way the operator can monitor the sterilization phases and times.

- Led VACUUM switches on
- Upper display TIME starts recording the cycle duration
- Display PRESS shows the pressure
- Display TEMP. shows the temperature
- The key's Led of the selected program starts to blink

VACUUM phase (chamber water filling and pre-vacuum phases)

In this first phase the microprocessor enables the vacuum pump and supplies a water dose into the chamber. The Led **VACUUM** flashes. This phase will be repeated more times and should require 10 to 20 minutes depending on the chamber conditions and on the type of material to be processed. Pump operation may be slightly noisy.

※ *For unwrapped solid instruments we recommend to use the cycle S. In this way the sterilization time will be faster, and power consumption reduced.*

STERILIZATION phase

Reached the pre-set parameter values, Led **VACUUM** turns OFF, and Led **STERILIZE** turns ON. The upper display starts the countdown marking the time remaining for the sterilization process, and the other displays show the temperature and pressure values of the steam.

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Ended the sterilization phase, starts the decompression phase, with the PRESS display showing the decreasing pressure values down to 0. Again, the display TIME will start the countdown of the decompression phase. Based on previous experiences, the decompression time has been slightly extended in order to minimize the thermal shock consequent to the steam changing its state.

DRYING phase

When decompression is through, Led **STERILIZE** starts to flash to signal the process has been completed. At the same time Led **DRYING** turns ON, signaling the start of the drying cycle. Throughout this phase, the heaters hold the chamber warm according to a microprocessor-controlled differentiated logic, the vacuum pump comes into operation again to suck in all residual steam. Display TIME shows the countdown of this phase.

Follows the forced ventilation through the bacterial filter; the countdown of this phase is signaled on the display TIME.

END – Led READY and STERILIZE turn ON

As soon as the drying is over, Led **DRYING** turns OFF, and Led **READY and STERILIZE** turn ON. A 10-second alert signal is generated to draw the attention by the operator. The heaters are switched to reduced power until the door is open. Display TIME shows the total time of the cycle, displays TEMP. and PRESS show the current temperature and pressure of the chamber.

※ At the end of the cycle **Rapid**, **S1** or **S5**, **only Led READY** will light (not the Led STERILIZE) to signal that the efficiency of the cycle selected by the operator has not been tested by the manufacturer.

The process is ended and the load can be removed from the chamber.

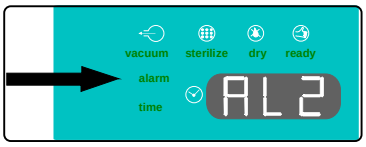
⚠ *Be careful !,*
both instruments and chamber are hot !

On opening the door, the displays will show again the current time, chamber temperature and pressure, and the sterilizer is ready for a new cycle.

If a printer is connected and ready, a report will be issued during the cycle phases with significant information, allowing a proof of the sterilization process.

The operator can arrange a new load and start a next sterilization cycle, taking the advantage of shorter warming-up time as the chamber is already warm, or press the key **POWER** to switch in stand-by status the unit (OFF state).

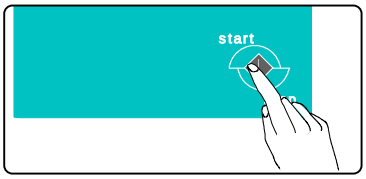
※ *If the door is not opened or no key is pressed within 30 minutes from the end of the cycle, the sterilizer will switch automatically in stand-by (OFF state).*



Should any failure or error occur during the cycle, Led **ALARM** turns ON and the upper display will show the alarm type and code (see chapter ALARM).

4.3 STOPPING THE CYCLE

To stop the sterilization cycle, press key **START/STOP**.



The upper display shows **MANU STOP**.

Before opening the door, make sure that the pressure value shown on display PRESS is equal to zero 0. A safety device will anyway prevent from opening the door if the chamber is over-pressurized.

Remove the instruments and check for the presence of water into the chamber. In case of wrapped instruments, we suggest to replace with new bags.

If water you find into the chamber, wait 10 minutes before loading the chamber again so as to allow the water to evaporate and be drained. Wipe the chamber with a cloth.

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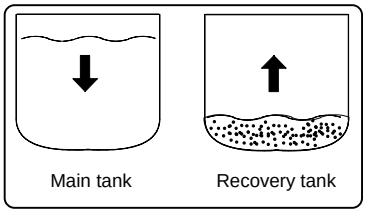
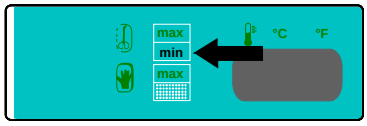
4.4 TOPPING UP THE MAIN TANK - DRAINING THE USED WATER TANK



The sterilizer is fitted with two 4-liters tanks: main tank for the demineralized water and recovery tank for the used water.
The hydraulic system does not reuse the steam generated during the sterilization process; this steam is collected in a recovery tank and periodically must be drained. This mode of operation involves the progressive emptying of the main tank and the filling of the recovery tank.

4.4.1 Topping up the main tank

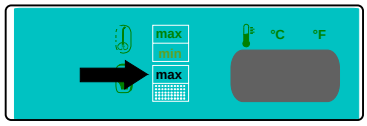


The average water consumption for each sterilization cycle is 520 cc, hence 7 cycles can be completed with a full tank loading.

The switching-on of Led **MIN** relating the main tank informs the operator the water level is insufficient to perform a new process.

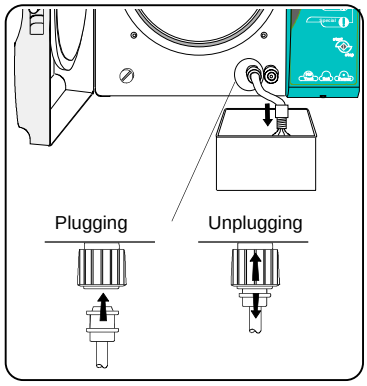
Provides for the topping up of the main tank, taking care to not exceed the grid limit of the hole. The lighting of Led **MAX** and a 7 beep warns that the tank is full.

4.4.2 Draining the recovery tank



Led **MAX** relating the recovery tank warns that the overflow limit has been reached. In this case:

- Get a bucket or a tank with a capacity of at least 4 liters,
- Fit the draining hose into the gray fast fitting (unthreaded side),
- Wait until the water has been completely drained,
- Unfit the hose pushing the ring nut against the machine and drawing the hose.



4.5 SOUND WARNING SIGNALS

In order to make AQUARIUS 40B operation even simpler and more user-friendly, some acoustic signals will draw the operator's attention on occurring the main steps of the sterilization cycle:

- Whenever a key is pressed, a short beep is generated.
- 3 beeps indicate the end of the switching-on autotest.
- 10 beeps indicate the end of the sterilization process.
- 1 intermittent beep indicates that the door has not been properly closed.
- 30-seconds beep warns the operator if an alarm occurs during the cycle.
- 7 beeps indicate that the main tank is full.

ENGLISH

5. PROGRAMMING

5.1 SETTING DATE AND TIME

Push key **SET** and use arrow keys **+** and **-** to fine adjust the values. Whenever key **SET** is pressed, a different function is controlled::

PUSH IN A SEQUENCE	ON DISPLAY "TIME"	ADJUSTED PARAMETER	USE KEY
SET	SET YEAR	YEAR	 to increase the value, or  to decrease the value
SET	SET MONTH	MONTH	
SET	SET DAY	DAY	
SET	SET HOUR	HOUR	
SET	SET MIN	MINUTES	
SET	Exit the programming mode		

Example: to adjust the current hour, press key SET four times and set the time using the arrow key (1 or 2).

5.2 SETTING MEASUREMENT UNIT AND OPTIONS

Push keys **SET** and **Rapid** sequentially to access the setting mode	display PRESS shows: *SET UNIT °C* or *SET UNIT °F* display TIME shows: *L1* *L2* *L3* *L4* *L5* *L6*	Use key  to set the desired temperature measurement unit Press more times key  L1 = Italian L2 = English L3 = Spanish L4 = French L5 = German } to set the language of the printing report L6 = saving the sterilization cycle data on PC (through a link with an external optional interface)
Push key **SET**	display PRESS shows: *SET UNIT BAR* or *SET UNIT PSI*	Use key  to set the desired pressure measurement unit
Push key **SET** to exit the programming mode		

The sterilizers are generally factory pre-set for the measurement unit and options used in the destination countries (°C, bar and L2).

5.3 SETTING THE SPECIAL CYCLE S5

The operator can set a special customized sterilization cycle as follows:

Push keys **SET** and **S** in a sequence	display PRESS shows: *SET TEMP*	Set the process temperature value between 105 and 135 °C through keys **+** and **-**
Push key **SET** once again	display PRESS shows: *SET TIME*	Set the process time between 3 and 90 minutes through keys **+** and **-**
Push key **SET** once again	display PRESS shows: *VAC* or *DRY*	Set the number of vacuum phases (1, 3 or 4) by key key  ; the value is shown close to message VAC. Set the duration of the drying phase (vacuum + ventilation = 3+2, 6+4 or 8+6 minutes) by key key  ; the value is shown close to message DRY.
Push key **SET** again to exit the programming mode. The parameter values of the **SPECIAL** cycle are automatically stored and maintained until new values are set through the same procedure.		

Depending on the selected time + temperature value combination, the processed cycle may differ from class B sterilization program. We recommend to test the sterilization performance by means of adequate procedures. At the end of the cycle **S5**, **only Led READY** will light (not Led STERILIZE) to signal that the efficiency of the cycle selected by the operator has not been tested by the manufacturer.

ENGLISH

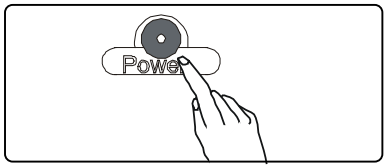
6. MAINTENANCE

6.1 PERIODIC CLEANING CYCLE

A proper maintenance program is an essential prerequisite for the smooth running of the sterilizer. To this regard, it is important to carry out the following cleaning cycle at least every fortnight or, in the case of heavy duty, every two tank fillings.

※ For more clarity, every 60 cycles without any intermediate maintenance, the sterilizer will display the warning <**NEED CLEANING** >.

1. Put in stand-by mode the sterilizer by pushing on the key **POWER** (**OFF** on the display).

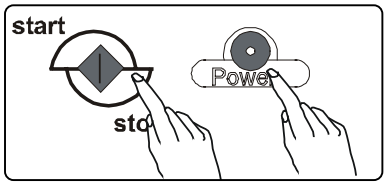


2. **IMPORTANT: Take the basket and the trays out of the chamber and wash them with an ordinary dish washing powder, then rinse with water and wipe them.**

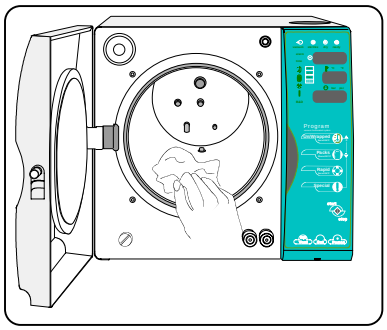
※ DO NOT USE ABRASIVE DETERGENTS

3. Put one cleaning tab into the chamber and close the door.

4. From standby state, hold down the key **START/STOP** and press the key **POWER** to start the automatic cleaning cycle. This cycle takes about 15 minutes.



5. Ended the cycle, the Led **READY** will turn on. Open the door and wipe the chamber with a clean cloth slightly soaked with demineralized water and pure alcohol. Do not use sponges, brushes, abrasive steel wool or paper.



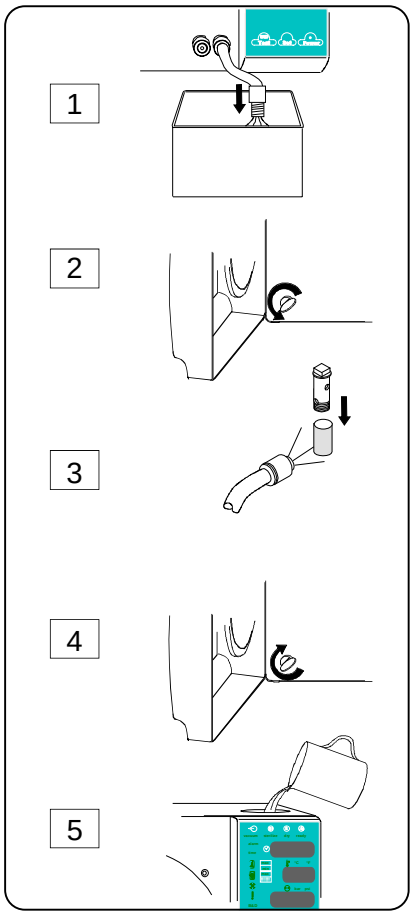
6.2 CLEAN THE INSTRUMENTS BEFORE THE STERILIZATION

In order to extend the sterilizer life, we recommend to carry out an accurate cleaning of instruments, as one of the main causes of an early wear of the unit is the settlement and accumulation of debris and fragments for inadequately instrument cleaning, and consequent stains, fouling and progressive clogging of filters, electrovalves and hydraulic circuits.

We remind you that the electronic control system can keep track the number of maintenance cycles actually performed. The lacking of appropriate and regular maintenance according to the above guidelines may require early repair and involve warranty lapse.

6.3 H_2O FILTER MAINTENANCE OR REPLACEMENT

To carry out the cleaning or replacement of the filter mounted left side of the stainless steel front panel, proceed as follows:



1. Empty the main tank by plugging the hose (unthreaded end) into the fast fitting right side of the front panel,

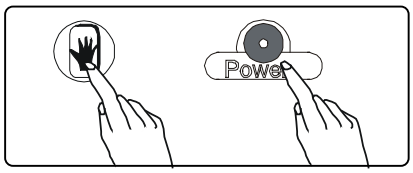
2. Use a coin to unscrew the cap closing the filter seat; pay attention for the overflow of the water that could be in the tank connecting tube. Unscrew the filter using the supply spanner,

3. Clean the filter with compressed air (or ultrasonic cleaner) or replace it if the filter is damaged,

4. Mount the filter into the seat then the cap by a coin without tightening both excessively,

5. Fill the main tank with demineralized water as for the standard operation of the machine.

6. With the unit in standby state (**OFF** on the display), hold down the key and select the key **POWER**. The equipment will provide for the automatic exhausting of the residual air from the filter. This procedure ends with the lighting of the signaling **READY**.



ENGLISH

6.4 REGULAR STERILITY CHECKS

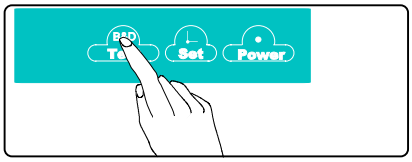
For a correct utilization of the sterilizer, it is advisable to carry out sterility tests regularly. In particular, we suggest to carry out the microbiologic tests, Bowie & Dick and Helix test that may be easily find on the market. For carrying out these tests, refer to the instructions and indications provided by the suppliers.

For the microbiologic tests, we recommend to place biological indicators at different points of the sterilization chamber in order to verify the homogeneity of the sterility conditions. For more information, please call your retailer or UNIDENT SA directly.

AQUARIUS 40B have been submitted to strict tests of sterility. According to the international standard, all sterilizers are moreover tested in factory with same tests.

6.4.1 Bowie & Dick Test

The test can be performed at any time with sterilizer turned on and operating.

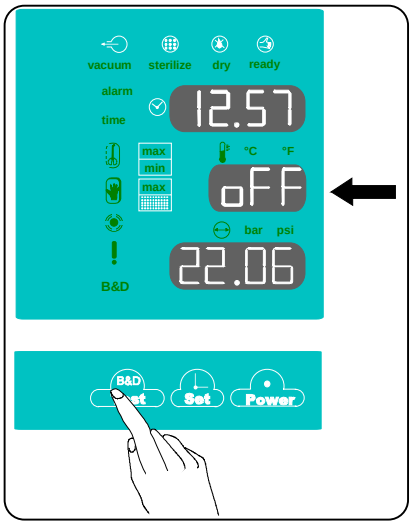


- Load the sterilizer with a B&D test (i.e. 3M^{TM} COMPLY^{TM} code 1300) according to the standards for the test procedure.
- With the unit switched-on, hold pressed the key **TEST** and press on the key **START/STOP**.

Test runs with cycle parameters of 134°C, sterilization time 3,5 min. and 3 pre-vacuum phases.

6.4.2 Vacuum Test

※ *We suggest to carry out the test at the beginning of the working day in order to check the leak-proof of the chamber and the vacuum system*.



The test can be enabled if the machine is in stand-by mode and internal temperature lower than 35°C (normal conditions at the beginning of the day, and with signaling **OFF** on the display).

- Press key **TEST**
- The test starts automatically and runs for about 15 minutes.
- Ended the test, the sterilizer re-enters into stand-by mode; press key POWER to set for a new cycle.

In case of negative result, alarm display will show the signaling **TEST FAIL** to warn for an insufficient condition of vacuum value into the chamber (see Chapter 8 - Alarms).

7. TROUBLESHOOTING

7.1 MANUAL DIAGNOSIS

The operator can perform at whenever time a test to verify the correct operation of the unit; proceed as follows:

Step 1

Actions	Displayed message
Push keys **SET** and **TEST** in a sequence	The displays show respectively: **TEST**, pressure and temperature values of the chamber
Push key 	Temperature measurement of the chamber upper wall
Push key 	Temperature measurement of the chamber lower wall
Push key 	Message **CICL**, and total number of the cycles
Push key 	Message **ABOR**, and number of the aborted cycles
Push key **Test**	Number of the cleaning cycles actually performed
Push key **Power**	Message **ALARM**, and codes of the last three alarms
Push key **SET**	Exit to normal mode

※ During manual troubleshooting the unit cannot be switched off by key **POWER**. The above procedures should be performed by skilled personnel.

Step 2

Actions	Displayed message/Result
Push keys **SET** and **POWER** in a sequence	Message **TEST OUT** shown on the display
Push key 	Electrovalve 1 energized (open)
Push key 	Electrovalve 2 energized (closed)
Push key 	Electrovalve 3 energized (open), electrovalve 5 energized (closed), vacuum pump and drain pump enabled
Push key 	Electrovalve 4 energized (open)
Push key **POWER**	Electrovalve 5 energized (closed)
Push key **TEST**	Fan of the condenser assembly enabled
Push key **SET**	Exit to normal mode

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7.2 AUTO-TEST AT THE SWITCHING-ON

An automatic test is started each time the unit is switched on (15-sec. duration).

During this test the main components are sequentially controlled. Three beeps are generated at the end of the auto-test.

If the test is positive, message ***Card Good*** will be shown. Whatever fault occurs, this is shown on the display and stored according to the alarm codes listed in table C (see chapter ALARM).

To skip the initial auto-test, press any key at the switching-on of the unit.

7.2.1 Water quality control

In order to prevent fail due to poor quality of the demineralized water, the new AQUARIUS 40B is equipped with a special water quality control.

The control, based on water conductivity measurement, is performed at the switching-on of the autoclave and only if the machine is cold and the water tank is full.

At the end of the self diagnosis the display will show "**H2O good**" if the conductivity is below 15 µS and "**H2O hard**" if it is above 15 µS.

ATTENTION

※ The negative result of the water quality control does not jam the operation of the sterilizer, but it is strictly recommended to replace the water.

8. ALARMS

8.1 GENERAL

The supervisory system of the sterilizer allows to monitor the cycle phases and the operation of the sterilizer's components. During the cycle, the monitoring system can identify and clearly report the trouble through a message on the alarm display and a sound warning signal. To make alarm interpretation and identification easier, the alarms have been divided into four classes, as shown in tables A, B, C and D.

8.2 WARNING MESSAGES

Table A lists the warning messages.

TABLE A

Message	Cause	Recommended action
OPEN DOOR	Door not opened at the end of the cycle. Start command entered with the door open.	Open the door. Close the door
FAIL	Failed cycle	See table C
DRY FAIL	Drying phase not completed due to manual interference (the load has been removed before the drying cycle completion). However the sterilization process has been achieved.	Press key STOP
ADD H2O	Insufficient water in the main tank (the message appears before starting a cycle)	Top up the main tank
FULL H2O	The recovery tank is full (the message appears before starting a cycle)	Empty the water recovery tank
MANU STOP	The cycle has been manually interrupted. The sterilization process has not been completed	Wipe the chamber, if wet, and start the cycle again
BLAC OUT	Power supply black-out during the cycle	Verify the AC plug and socket. Dry the chamber and repeat the cycle.
NEED CLEANING	60 cycles without any intermediate cleaning cycle	Perform the cleaning cycle (see Chapter 6.1)
NEED SERVICE	One year from the first installation or over 1500 cycles performed without the service check-up	The warning disappears as soon as a next cycle is selected, but will appear again at the next switching on. Call for a complete check by a qualified technical service; the message will be reset after the servicing.
NEED INST	Need for the installation procedure	Perform the installation procedure (see Chapter 3.2)
NEED TEST	Detected a pre-warning alarm	See table B
TEST FAIL	Negative result of the vacuum test	Clean the door gasket and repeat the test. Call for a technical service

8.3 WARNING ALARMS

The alarms shown on table B do not stop the sterilizer operation, but warn that a problem may interfere with the correct working of the sterilizer.

The trouble should be checked and the recommended action promptly performed.

In case of fault, the message **Need Test** will appear together with the code number of the detected alarm.

Example: Need Test cd 1.

TABLE B

Alarm code	Cause	Recommended solution
cd 1	Outflow filter dirty	Clean or replace the filter
cd 2	Slow heating of the upper surface of the chamber	Perform a cycle with reduced load. In case, call for a technical service. Verify the mains voltage.
cd 3	Slow heating of the lower surface of the chamber	Perform a cycle with reduced load. In case, call for a technical service. Verify the mains voltage.
cd 4	Water dose distributor blocked Front H_2O filter dirty	Impurities in the main tank. Carry out the H_2O filter maintenance. Carry out the standard maintenance routine!
cd 5	Water charge valve dirty	If the problem occurs more than 3 times, call for a technical service
cd 6	Bacterial filter clogged	Replace the filter
cd 7	Vacuum phase too slow	Wipe the chamber and perform a cleaning cycle

ENGLISH

8.4 ABORTED CYCLE ALARMS

The alarms shown on table C indicate that the sterilization process has not been completed.

Identify the fault and the recommended action on the table. The alarm condition is signaled on the red Led ALARM, and on the upper display the intermittent message FAIL will appear with the code number of the detected alarm. Example: **FAIL AL 6**

TABLE C

Alarm code	Cause	Recommended solution
AL 1	Fault of the electrovalve 1	Call for a technical service
AL 2	Fault of the electrovalve 2	Call for a technical service
AL 3	Fault of the electrovalve 3	Call for a technical service
AL 4	Fault of the electrovalve 4	Call for a technical service
AL 5	The pressure has not reached the set-point value within the preset time	Excess of load or pressure leakage. Carry out the cleaning cycle
AL 6	Too long time during the initial vacuum phase	Perform the cleaning cycle
AL 7	The door was opened after the start of the cycle	Make sure that the door is correctly closed.
AL 8	Air into the sterilization chamber	Verify the door tightness. Clean the gasket.
AL 9	Interruption of the countdown for over 60 sec. during the sterilization phase	Verify the door tightness. Perform the cleaning cycle, if needed, clean the door gasket. Perform the vacuum test
AL 10	Too high pressure	Call for a technical service.
AL 11	Too low pressure	Verify the door tightness. Perform the cleaning cycle, if needed. Perform the vacuum test
AL 12	Temperature out the normal range	Perform the cleaning cycle
AL 13	Fault of the chamber temperature sensor	Call for a technical service
AL 14	Fault of the temperature upper sensor	Call for a technical service
AL 15	Fault of the temperature lower sensor	Call for a technical service
AL 16	Fault of the pressure sensor	Call for a technical service

8.5 CLASS B ADDITIONAL ALARMS

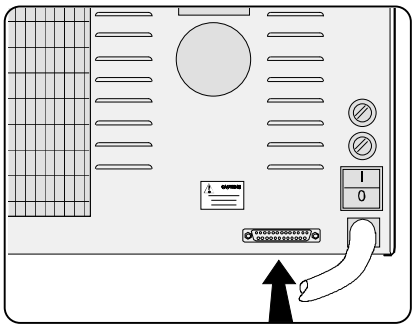
TABLE D

Alarm code	Phase involved	Cause	Recommended solution
18	Drying phase	Drying interrupted	Dry the instruments
31	Drying phase	Vacuum not sufficient	Excess of load

NOTE: The Class B alarms may occur in the programs **Un/Wrapped**, **Packs**, **S2**, **S3** and **S4 only**.

9. CONNECTIONS

9.1 PRINTER CONNECTION



AQUARIUS 40B is provided for the connection to an optional printer to allow a printout report of the sterilization process. The use of the printer, mandatory in some countries, goes to be more and more frequent as growing the need to certify, respect to the legal medical profile also, the effective sterilization of the instruments. The printer connector is mounted on the rear panel of the sterilizer.

※ *Use a standard cable with max. length of 3 m.*

It is possible to interface AQUARIUS 40B with any printer type (DOS, CENTRONIX Standards) provided with a parallel port. Most of the printer on the market can support this standard. Please contact UNIDENT SA for further information.

1. Switch-on the printer,
2. Switch-on the sterilizer.

The report will be printed during the process and with the following information:

date and time of the process - cycle number - selected program and parameters - cycle type: sterilization or disinfecting – start/end time of the sterilization phase - end time of the drying phase

In case of trouble or cycle interruption, the printout will report the message **ABORTED CYCLE - NOT STERIL** with the indication of the detected alarm type.

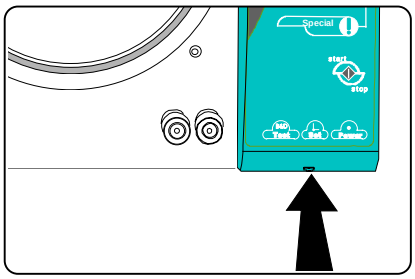
Remember to switch off the printer at the end of the working day.

※ *To set the language for the printed report, see chapter 5.*

The PRINTER port must be only used for connecting a printer device.

Moreover the printer port allows, via a dedicated interface, the connection to a computer for the storing of the sterilization cycle data. Please contact the retailer or directly UNIDENT SA for further information.

9.2 PC CONNECTION



AQUARIUS 40B is fully microprocessor controlled and may be connected to a standard PC. Trough a dedicated user interface, this feature allows both to perform more accurate tests and a new approach to service and certification aspect.

By a special SW tool used by the authorized service centers it is possible to know all the main data of the machine, and allow a fast troubleshooting and repairing at reduced cost.

Moreover, the system allows the connection via modem to an authorized service center performing a remote check-up and a periodic certification of effective operation of the sterilizer.

※ *Do not connect by yourself any device not provided and authorized by the manufacturer.*

Bestell-Nr.
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