Tuttnauer
Your Sterilization & Infection Control Partners

OPERATION
&
MAINTENANCE
MANUAL

Laboratory Vertical Steam Sterilizers
models 5050, 5075

ELV – Standard Autoclave

ELVC – Including Fast Cooling System

Cat. No. MAN205-0451001EN Rev A

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1. GENERAL

1.1 Incoming Inspection

The autoclave should be unpacked and inspected for mechanical damage upon receipt. Observe packing method and retain packing materials until the unit has been inspected. Mechanical inspection involves checking for signs of physical damage such as: scratched panel surfaces, broken knobs, etc.
If damage is apparent, contact your dealer or point of purchase, so that they may notify the manufacturer and file a claim with the appropriate carrier.
All **Tuttnauer** products are carefully inspected prior to shipment and all reasonable precautions are taken in preparing them for shipment to assure safe arrival at their destination.

1.2 Warranty

We certify that this instrument is guaranteed to be free from defects in material and workmanship for one year against faulty components and assembly with the exception of glassware, lamps and heaters.
The warranty does not include and does not replace routine treatment and preventive maintenance to be performed according to instructions in sec. 12.1 (Preventive Maintenance).

Our obligation is limited to replacing the instrument or parts, after our examination, if within one year after the date of shipment they prove to be defective. This warranty does not apply to any instrument that has been subjected to misuse, neglect, accident or improper installation or application, nor shall it extend to products that have been repaired or altered outside the factory without prior authorization from us.
The Autoclave should not be used in a manner not described in this manual!

1.3 Warranty Statement

The warranty registration must be completed and returned to our service departments; within fourteen (14) days of purchase or the warranty will be void.
Our Technical Service Depts can be reached at:

Tuttnauer Europe b.v., Paardeweide 36, 4824 EH, Breda, P.O. Box 7191, 4800 GD Breda, Netherlands. ✆+31/76-5423510, Fax: +31/76-5423540, E-mail: info@tuttnauer.nl

Tuttnauer USA Co., Ltd., 25 Power Drive Hauppauge, NY 11788, USA ✆: (800) 624 5836, (631) 737 4850, Fax: (631) 737 0720
e-mail:info@tuttnauerUSA.com.

Note:
If there is any difficulty with this instrument, and the solution is not covered in this manual, contact our representative or us first. Do not attempt to service this instrument yourself. Describe the difficulty as clearly as possible so we may be able to diagnose the problem and provide a prompt solution.
If the autoclave is equipped with a printer, send along a copy of the last printout for our inspection. If replacement parts are needed, stipulate the model and serial number of the machine.
No products will be accepted for repair without proper authorization from us. All transportation charges must be paid both ways by the owner. This warranty will be void if the unit is not purchased from an authorized full service **Tuttnauer** dealer.

1.4 Accessories

Basket accessories: A set of two baskets is available for the unit. The baskets are made of stainless steel wire and have a handle. The basket allows the operator to load a large quantity of materials into the chamber.
The pressure scale, printer option and cooling method can be set up at any time by a technician.

Stainless steel containers: A stainless steel container, for waste products, is available. This container has vent holes on its upper part

2. SAFETY INSTRUCTIONS

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

Make sure that you know where the main power switch is, where the water cut-off valve is and where the compressed air disconnection valves (if applicable) are located.

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

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

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

1. Never start using a new autoclave before the safety, licensing and authorization department has approved it for use.
2. All autoclave users must receive training in proper usage from an experienced employee. Every new employee must undergo a training period under an experienced employee.
3. A written procedure must be established for autoclave operation, including: daily safety tests, seal inspection and door hinge inspection, smooth action of the closing mechanism, chamber cleaning, prevention of clogging and preservation from corrosion, what is permitted and what is prohibited for sterilization and choosing a sterilization program.
4. Liquids may be sterilized only with the “liquids” programs. The container must be covered but not sealed. Sealed bottles may only be sterilized using a special program. The bottle must be either Pyrex or a Borosilicate glass bottle. Verify that the two temperature sensors are located inside two different bottles to assure that the liquid temperature is 20°C below boiling temperature for sealed bottles at the end of the cycle.
5. When sterilizing plastic materials, make sure that the item can withstand sterilization temperature. Plastic that melts in the chamber is liable to cause a great deal of damage.
6. Individual glass bottles may be placed within an appropriate container that will be placed in a basket. Never place glass bottles on the floor of the autoclave. Never fill more than 2/3 of the bottle volume.
7. On closing the autoclave's door, make sure it is properly locked before activating.
8. Before withdrawing baskets, wear heat resistant gloves.
9. Before opening the door, verify that there is no pressure in the chamber (chamber pressure gauge is located on the autoclave's front panel or door, depends on model).

10. Open the door slowly to allow steam to escape and wait 5 minutes before you remove the load. When sterilizing liquids, wait 10 minutes.
11. Once a month, ensure that the safety valves are functioning, and once annually a certified tester must conduct pressure chamber safety tests.
12. Once annually, or more frequently, effective tests must be performed, i.e., calibration and validation.
13. Examine the condition of assemblies on a regular basis. Make sure there are no leaks, breaks, blockages, whistles or strange noises.
14. It is required to conduct maintenance operations as instructed.
15. Immediately notify the person in charge of any deviation or risk for the proper function of the device.

3. TECHNICAL DATA

3.1 Introduction

Models 5050 and 5075 ELV/ELVC are vertical sterilizers designed especially for sterilization of instruments, liquids and other materials in hospital laboratories, medical laboratories, research institutes, food laboratories and pharmaceutical facilities.

A special feature of this sterilizer is the fast cooling operation, provided as an option for the liquids sterilization cycle.

The sterilizer is fully automatic with a choice of ten programs (including two custom programs), eliminating any need for operator intervention during a cycle. The custom programs are programs that may be changed by an authorized technician. A computerized control unit enables precise control and monitoring of physical parameters and clear documentation of the sterilization cycles.

The autoclave is equipped with a safety valve, which blows off at 280 kPa (40 psi) (max. working pressure). The safety valve is located on the rear of the autoclave. The control system provides adequate protection, to ensure the safety of personnel and reliable operation with a minimum of down time.

On both models, a printer is an optional addition to the autoclave. The printer prints the preset and actual parameters of the cycle (temperature, time and pressure/vacuum).

The autoclave is equipped with an analog pressure gauge designed for reference only. In case that there is any problem with electricity supply during a sterilization cycle the pressure gauge will be used to verify that there is pressure in the chamber.

This manual provides information for the following models:

- ELV – this is the basic model of the vertical laboratory autoclave.
- ELVC – this model includes a cooling system that enables cycles with fast cooling.

This manual is intended to give the user a general understanding of how the autoclave works and indicates best ways to operate and maintain it in order to obtain optimum results and a trouble free operation.
After reading this manual, operating the autoclave should be straight forward. However, since the autoclave is built using high technology sensitive components, no attempt should be made by the user or any other unauthorized person to repair or re-calibrate it.

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

3.2 Operating Conditions

- The autoclave is intended to work in 'indoor' conditions only.
- Only autoclavable materials shall be used.
- The environment shall not exceed an ambient temperature range of 5ºC (41ºF)-40ºC (104ºF) and a relative humidity of 85% respectively.
- The operation altitude shall not be over 2000 meters (6561 feet) (ambient pressure shall not be lower than 80 kPa (11.6 psi)).
- The autoclave shall not be used in a manner not specified in this manual!
- Do not use the autoclave in the presence of dangerous gases.
- The packed or unpacked device shall be stored in 'indoor' conditions.
- Operate the autoclave only in the manner specified in the manual. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Caution!
Waste water should be brought into the public net in accordance with the local rules or requirements i.e. only non-hazardous liquids shall be disposed in public sewage!

3.3 Directives and Standards

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

3.3.1 Technical Standards

1. AAMI/ANSI ST 8.
2. ASME Code Sec. VIII for Pressure Vessels.
3. Pressure Equipment Directive 97/23/EEC.
4. EN 285:2006 — Sterilization , Steam sterilizers , Large sterilizers
5. IEC/UL 61010A-1 — electrical equipment for laboratory use; general requirements.
6. IEC 61010-2-040 — particular requirements for sterilizers and washer disinfectors used to treat medical materials.
7. ISO 17665 — 1:2006 Sterilization of health care products moist heat.

3.3.2 Quality standards

The manufacturing plant meets the following quality standards:

1. EN ISO 9001:2008– Quality System
2. ISO 13485:2003 – Quality systems – Medical devices.

3.4 Environment Emission Information

A. Peak sound level generated by the sterilizer is « 70 / dBA with a back sound level of 60 dBA.

B. Total heat transmitted by the sterilizer is < 100 W/h

3.5 Electrical Data

PROPERTIES	208V version	230V version
Ampere (A) at 3Ph	22A	13A
Voltage (V)	208V/3ph	230V/3ph
Hertz (Hz)	50/60 Hz	50/60 Hz
Heaters power (W)	9000	9000
Protection against electrical shock	Class I	Class I
Degree of protection by enclosure	IP31	IP31

3.6 Specifications

PROPERTIES		**MODEL**	
		5050	**5075**
Chamber diameter in mm		500	500
Chamber depth in mm		520	750
Effective Chamber volume		102 lit. 27 US gal	160 lit. 42.3 US gal
Overall dimensions	Height (mm)	950	1100
	Width (mm)	866	866
	Length (mm)	715	715
Maximum dimensions (door open)	Width (mm)	960	960
	Height (mm)	1538	1688
Net weight (kg)		171	190
Shipping volume (m^3)		1.35	1.35
Shipping weight (kg)		204	223
Max. Allowable Working pressure (MAWP)		2.8 bar (40 psi)	

3.7 Construction

Chamber and door material	Stainless steel
Outer Cabinet	Stainless Steel
Chamber insulation	Fiberglass with reinforced material

3.8 Loading Capacities

3.8.1 solid load

Maximum solid load: 7 kg (15.5 lb)

3.8.2 Erlenmeyer Flasks

Size		250 ml	500 ml	1000 ml
Qty	**5050**	2 x 21	2 x 14	2 x 8
	5075	3 x 21	3 x 14	3 x 8

3.8.3 Medium Flasks (Schott)

Size		250 ml.	500 ml	1000 ml
Qty	**5050**	2 x 32	2 x 21	2 x 15
	5075	3 x 32	3 x 21	3 x 15

3.9 Utilities

3.9.1 Electrical utility

Power	Switch box	Recommended Circuit Breaker
208-220V (3 Ph + Earthing)	No	32A
380-400V(3 Ph + Neutral + Earthing)	No	16A
230V 1ph	yes	50A
Frequency		50/60Hz

3.9.2 Other utilities

Compressed Air (ELVC only)	1/2" 3-4 Bar (44-58 psi)
Tap water	1/2", 2-3 Bar (29-44 psi)
Mineral free water	1/2", 2-3 Bar (29-44 psi)
Drain	2" Minimum Withstanding temp. of 80°C (176°F)

Attention:

- A switch or circuit-breaker must be included in the building installation. This switch or circuit-breaker shall be in close proximity to the equipment, within easy reach of the operator; and marked as the disconnecting device for the equipment.
- The electrical net must be protected with a current leakage safety relay.
- The electrical network must comply with local rules or regulations.
- Verify that there is an easy access to the main power switch, to the water cut-off valve and to the current leakage safety relay.
- Make sure while placing the autoclave, to leave space around the machine, to give the technician access to service the machine.
- All water connections to autoclave must be performed through "BACK FLOW PREVENTION SYSTEM" only, as per IEC 61770.

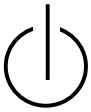
3.10 Symbol Description

Caution! Consult accompanying documents

Caution! Hot surface.

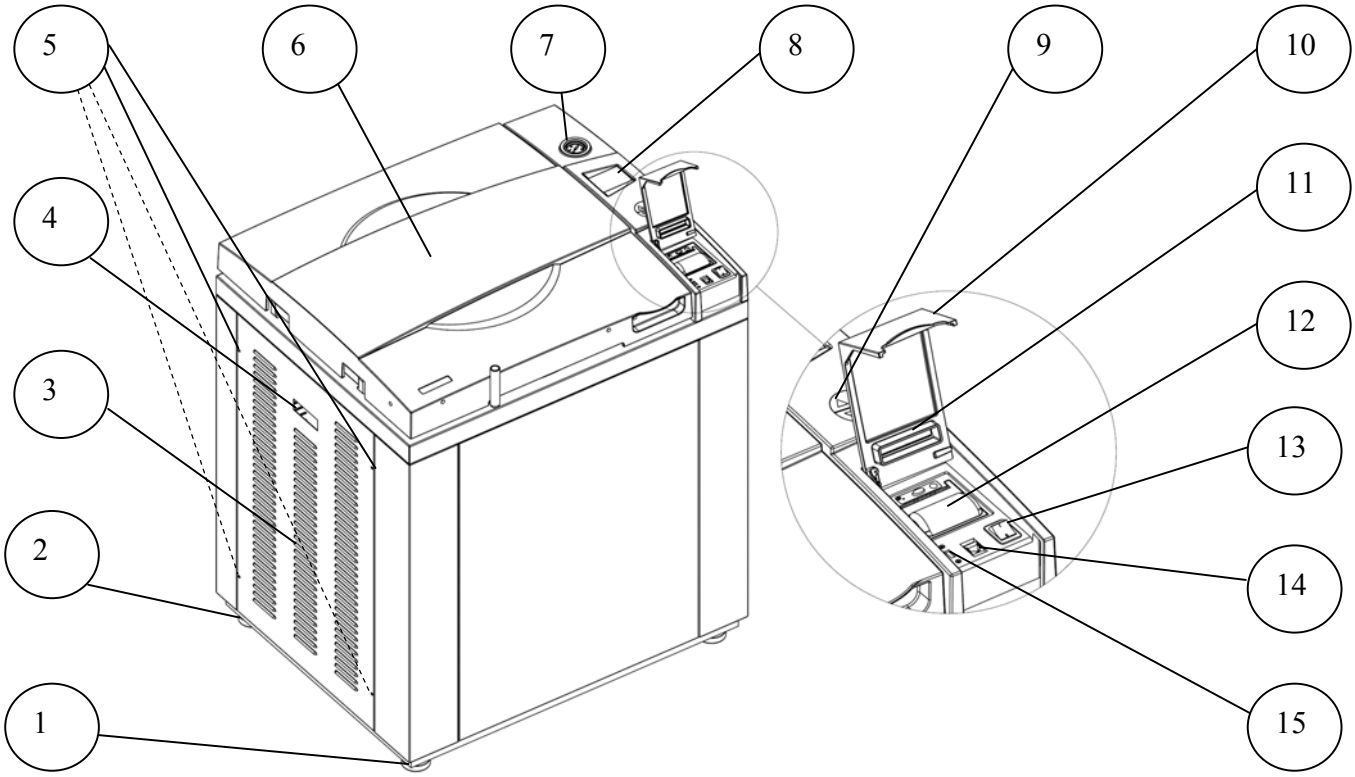
Caution! Hot steam.

Protective earth (Ground)



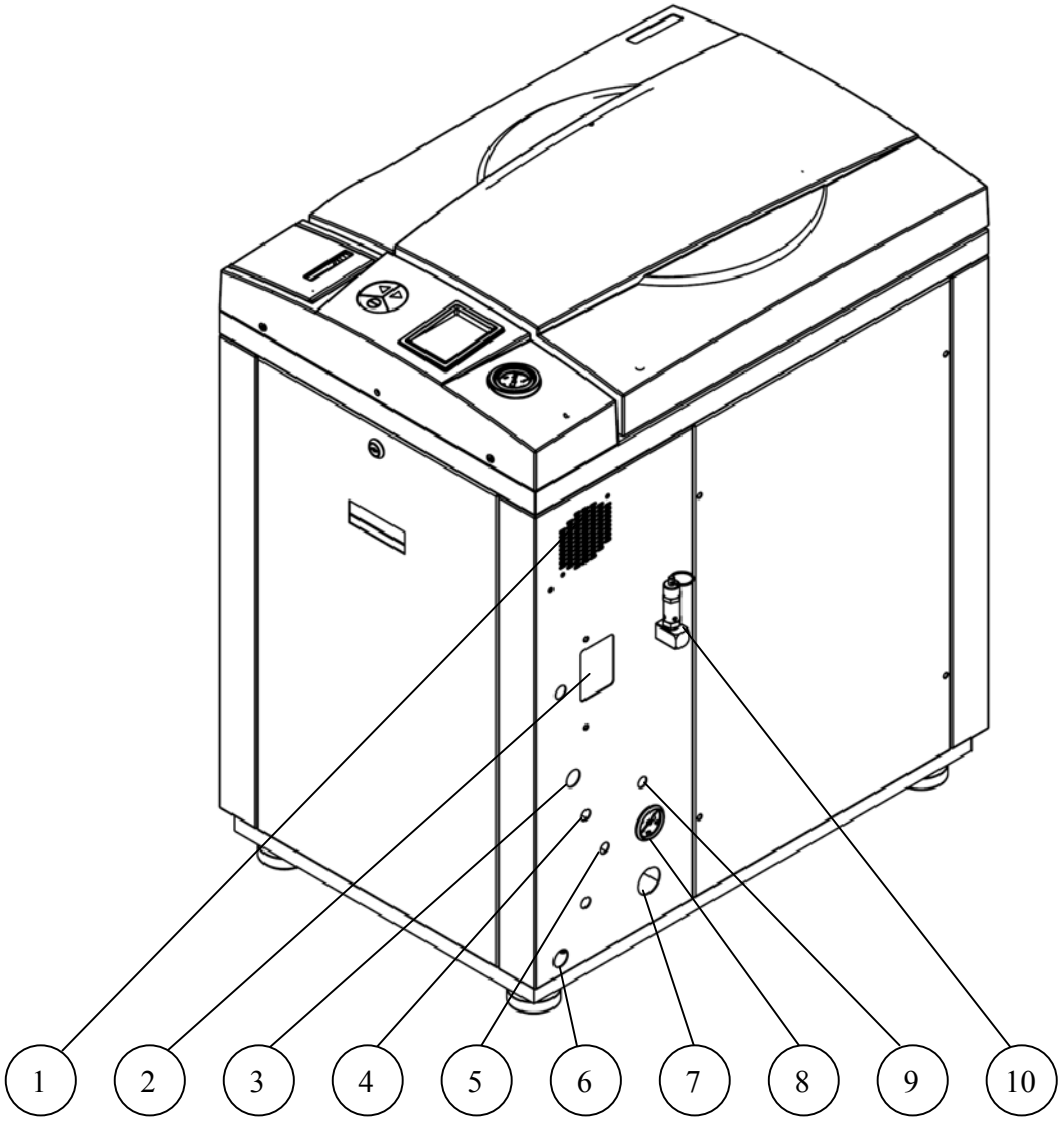
On-Off

FRONT VIEW



No.	Description
1	Front leg
2	Rear leg
3	Left service door
4	Left service door grip
5	Service door lock screws
6	Door cover
7	Pressure gauge
8	Display
9	Keyboard
10	Printer cover
11	Paper slot and paper cutter
12	Printer
13	Main switch
14	RJ45 connector
15	USB socket

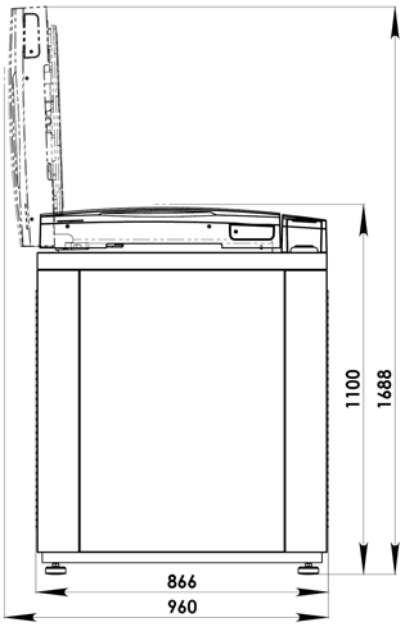
REAR VIEW



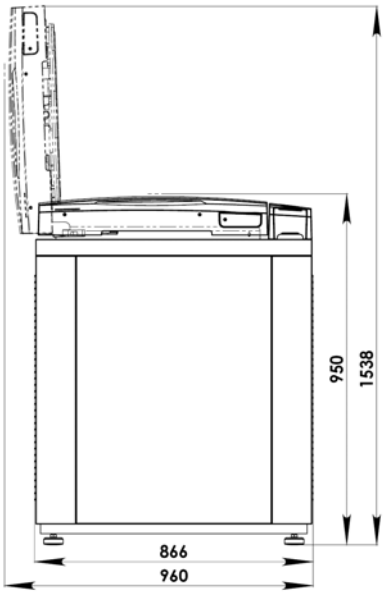
No.	Description
1	Fan grill
2	Circuit breaker
3	Electrical cord
4	City (tap) water inlet
5	Compressed air inlet
6	Drain outlet
7	Air pressure regulator
8	Air pressure gauge
9	Mineral free water inlet
10	Safety relief valve

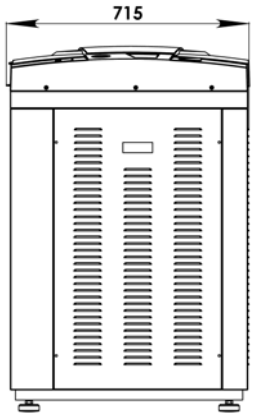
OVERALL DIMENSIONS DRAWING (mm)

5075ELV



5050ELV





3.11 Water Quality

3.11.1 Water for Steam Generation

The distilled or mineral – free water supplied to the autoclave should have the physical characteristics and maximum acceptable level of contaminants indicated in the table below:

Physical Characteristics and Maximum acceptable contaminants levels in steam for sterilizers (According to EN 13060:2004).

Element	Condensate – allowable content
Silicium oxide. SiO_2	≤0.1 mg/kg
Iron	≤0.1 mg/kg
Cadmium	≤0.005 mg/kg
Lead	≤ 0.05 mg/kg
Rest of metals except iron, cadmium, lead	≤0.1 mg/kg
Chloride (Cl)	≤0.1 mg/kg
Phosphate (P_2O_5)	≤0.1 mg/kg
Conductivity (at 20°C)	≤3 µs/cm
pH value (degree of acidity)	5 to 7
Appearance	Colourless clean without sediment
Hardness (Σ Ions of alkaline earth)	≤0.02 mmol/l

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

Attention:

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

3.11.2 Drain Cooling

The feed water supplied to the drain cooling must meet the following requirements:

- Hardness: 0.7 - 0.2 mmol/l.
- Water temperature shall not exceed 15°C (59°F).

3.11.3 Reverse Osmosis

A Reverse Osmosis (RO) system may be used to improve the quality of the water used to generate steam in the autoclave chamber.

In RO, the water is forced through a semi-penetrable membrane, which filters out contaminants to a high degree of efficiency. In deionisation (DI) ions and charged particles are removed either by electric fields or by ion exchange in resin beds.

Although the RO cannot normally attain the degree of purity possible with the DI methods, it is more than adequate for the feed water intended for clean-steam generators.

Moreover the RO has several advantages:

1. RO is cheaper to install and to run than DI.
2. RO removes particulate matter, organic molecules and pyrogens that DI cannot remove
3. RO water is less corrosive to steel and copper than DI water.
4. RO maintenance requirements are less demanding than those of the DI units.

Therefore the use of mineral free water will contribute to better performance and longer life of the autoclave.

3.12 Safety Features

This autoclave includes built-in safety features such as:

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

3.13 Description of Operation

3.13.1 Heat

The ELV vertical autoclaves are equipped with immersion type, heating elements. After water has been introduced to the chamber and the unit has been activated, the heating elements begin to heat. The temperature and pressure in the chamber increase until appropriate levels are reached. Sensors located inside the chamber control the temperature and pressure levels.

3.13.2 Sterilization

The sterilization temperature is factory set at 134°C (273°F) for instruments and at 121°C (250°F) for liquids and other materials for which this temperature is appropriate. These settings may be modified before each cycle. When sterilization temperature is reached, the timed sterilization cycle begins.

3.13.3 Cooling

The autoclave is designed to operate two liquid cooling cycles, as follows:

3.13.3.1 Sealed bottles (cooling with compressed air)

On completion of the sterilization stage, feed water starts flowing through the cooling coil mounted around the outer side of the chamber.

Compressed air is injected inside the chamber and keeps a constant air pressure to balance the internal pressure of the liquids inside the bottles. Compressed air is passed through a 0.2µ microbiological filter. When temperature of the liquids reaches the final set temperature, the cooling stage is completed, flowing water and compressed air is stopped, pressure in the chamber goes down to atmospheric pressure.

At this stage, the door of the autoclave can be opened and the sterilized materials can be taken out of the chamber.

3.13.3.2 Unsealed bottles (cooling without compressed air)

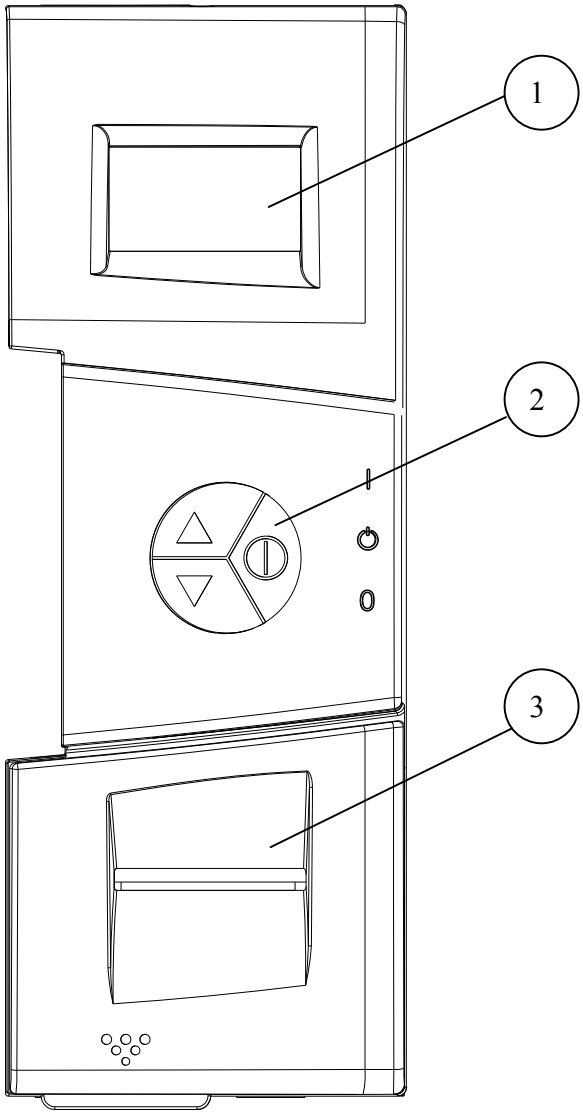
On completion of sterilization, steam is exhausted from the chamber at a slow rate. When chamber pressure goes down to atmospheric pressure, water starts flowing through the cooling coil mounted around the outer side of the chamber. On conclusion of the cycle the water flow is stopped automatically, process is completed and it is possible to open the door and take out the sterilized goods from the chamber.

3.13.4 Exhaust

When the timed sterilization cycle is complete, the unit enters into the exhaust stage, provided that a program other than the liquid program was selected. The steam is exhausted from the chamber, bringing the internal pressure down to atmospheric pressure.

4. CONTROL PANEL

CONTROL PANEL DRAWING



No.	Description
1	Display
2	Keypad
3	Printer

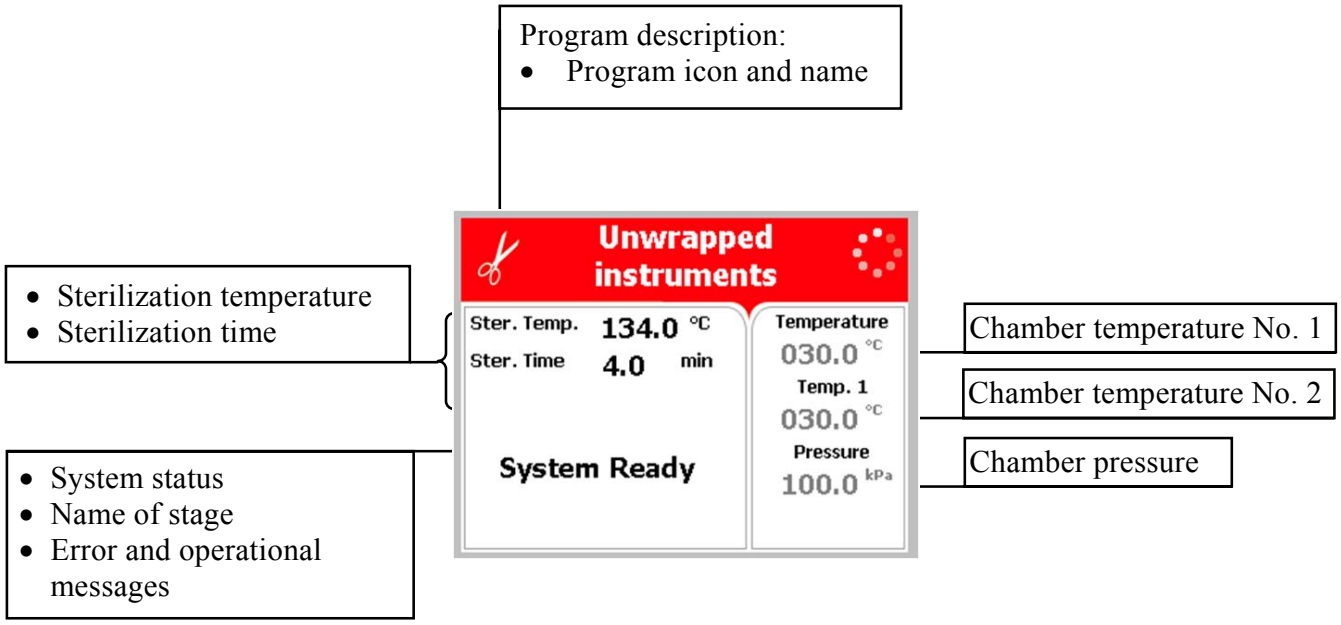
4.1 Description and Functions of the Front Panel Keyboard

The front panel is composed of 3 sections:

1. Display screen.
2. Keypad.
3. Printer

4.1.1 Display screen

The display is a LCD panel used to display the current status of the autoclave while using Operational Messages and Error Messages.



4.1.2 Keypad

The keypad consists of three keys as described below:

	**UP key** This key has the following functions: • In the menu directories: o This key enables the operator to browse through the cycles. • In the directories available: o When the cursor is blinking on a number, the **UP ▲** key increases its value. o When the cursor is blinking on a menu selection, the **UP ▲** key allows browsing backward through the menu. o When adjusting a parameter and the cursor is blinking on "SET" or "EXIT" the **UP ▲** key activates that procedure."
	**DOWN key** This key has the following functions: • In the menu directories: o This key enables the operator to browse through the cycles. • In the directories available: o When the cursor is blinking on a number, the **DOWN ▼** key decreases its value. o When the cursor is blinking on menu selection, the **DOWN ▼** key allows browsing forward through the menu. o When adjusting a parameter and the cursor is blinking on "SET" or "EXIT" the **DOWN ▼** key activates that procedure.
	**START/STOP key** This key has the following functions: • In the main screen: o Starts the process when the required program was chosen. o Stops the current process. o Cancels the ERROR message displayed on the screen and opens the electric door lock. • In the menu directories: o When the cursor is blinking on a number, the **START/STOP** ⏻ key enables moving to the next position. o When the cursor is blinking on a menu selection, the **START/STOP** ⏻ key activates that selection.

4.1.3 Printer

The printer is an optional device.

It prints the detailed history of each cycle performed by the autoclave. The printing is on thermal paper with 24 characters per line and records the sterilization cycle information for subsequent consideration.

4.2 Displayed Error Messages / Symbols

The failures are divided into two categories.

a. Failure that occur before completing the sterilization stage, which in this case will leave the load unsterilized
b. Failure that occur after completing the sterilization stage, which in this case will leave the load sterilized

For the list of *Displayed Error Messages / Symbols*
see sec. 13. ***TROUBLESHOOTING***

4.3 Displayed operational messages / Symbols

Message / Symbol Name	Message / Symbol Description	Required Action
	This symbol is displayed when the door is open.	Close the door.
Door is open (during stand by)	This message is displayed when the door is opened: In standby - if **START/STOP** is preset.	Close the door to perform a new cycle.
Cycle Ended	This message is displayed when the cycle ended successfully.	Press **START/STOP** in order to perform a new cycle.
Test Ended	This message is displayed when the test ended.	Press **START/STOP** in order to perform a new test
	This symbol is displayed when Cycle by Clock mode is performed.	Enter the Admin menu as described in this manual to change the time or to cancel this option.
Cycle by clock	This message is displayed if the user presses **START/STOP** key while the "cycle by clock" mode is active.	Enter the Admin menu as described in this manual to change the time or to cancel this option.
Atmospheric pressure not set	This message id displayed in order to set the atmosphere pressure by opening the door for 5 minutes.	Open the door for 5 minutes in order to set the Atmospheric pressure.
Critical settings have been updated, Please restart machine in order for changes to be updated	If a change of the autoclave setting was made, a restart operation is required.	Restart the autoclave in order for changes to be updated.
	This message is displayed if the electrode in the chamber senses water.	Perform a new cycle to drain the chamber.

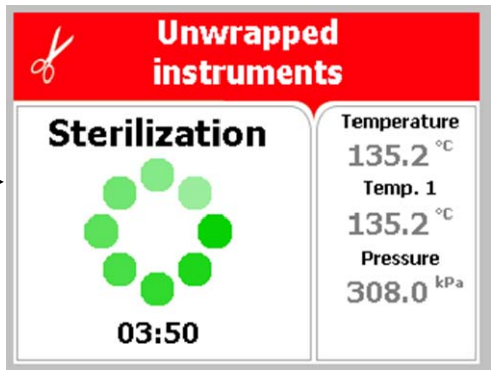
5. *STERILIZATION PROGRAMS*

The autoclave offers six sterilization programs as follows:

Sterilization Programs		Temp	Sterilization time (minutes)
Program	**Description**		
1	Unwrapped instruments	134°C	4
2	Wrapped instruments	134°C	7
3	Unwrapped pouches	134°C	7
4	Wrapped pouches	134°C	7
5	Unwrapped delicate instruments	121°C	20
6	Wrapped delicate instruments	121°C	20
7	Custom 1	134°C	4
8	Custom 2	121°C	20
9	Liquid A	121°C	20
10	Liquid B	121°C	30

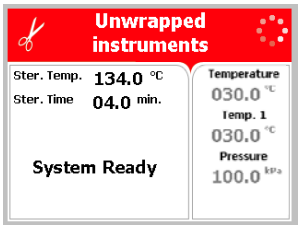
During the process, the stages of the cycle will be displayed on the screen:

The stages names are as follows:
Start
Insert water
Steam flush
Pulse H
Pulse L
Keep Heat (*option)
Heating
Sterilization
Cooling (Only in liquid programs)
Exhaust
Ending



* Display can be activated only by an authorized person.

5.1 Program 1: Unwrapped instruments



For unwrapped instruments and materials, when the manufacturer recommends autoclaving at temperatures of 134°C (273°F).

Nominal parameters default settings

- Sterilization temperature: 134°C (273°F)
- Sterilization time: 4 minutes.

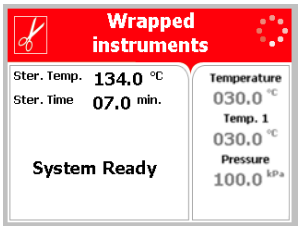
Operations Sequence

- Insert water into the chamber and heat by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant during the sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

Note:

The sterility of instruments processed in unwrapped cycles cannot be maintained if exposed to non-sterile environment.

5.2 Program 2: Wrapped instruments



For wrapped instruments, when the manufacturer recommends autoclaving at temperatures of 134°C (273°F).

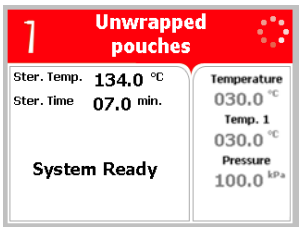
Nominal parameters default settings

- Sterilization temperature: 134°C (273°F)
- Sterilization time : 7 minutes

Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant during the sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.3 Program 3: Unwrapped pouches



For Unwrapped pouches, when the manufacturer recommends autoclaving at temperatures of 134°C (273°F).

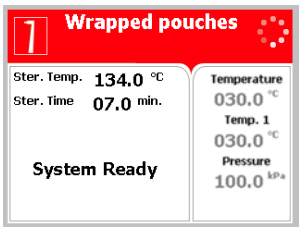
Nominal parameters default settings

- Sterilization temperature: 134°C (273°F)
- Sterilization time : 7 minutes

Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant during the sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.4 Program 4: Wrapped pouches



For Wrapped pouches, when the manufacturer recommends autoclaving at temperatures of 134°C (273°F).

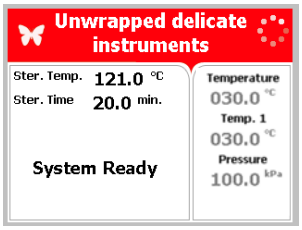
Nominal parameters default settings

- Sterilization temperature: 134°C (273°F)
- Sterilization time : 7 minutes

Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant during the sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.5 Program 5: Unwrapped delicate instruments



For unwrapped delicate instruments, when the manufacturer recommends autoclaving at temperatures of 121°C (250°F).

Nominal parameters default settings

- Sterilization temperature: 121°C (250°F)
- Sterilization time : 20 minutes

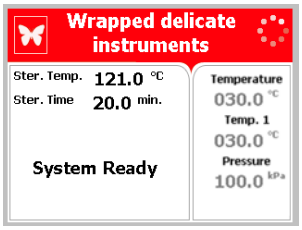
Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant during the sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

Note:

The sterility of instruments processed in unwrapped cycles cannot be maintained if exposed to non-sterile environment.

5.6 Program 6: Wrapped delicate instruments



For Wrapped delicate instruments, when the manufacturer recommends autoclaving at temperatures of 121°C (250°F).

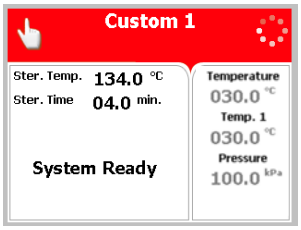
Nominal parameters default settings

- Sterilization temperature: 121°C (250°F)
- Sterilization time : 20 minutes

Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant during the sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.7 Program 7: Custom 1



Sterilization parameters are adjustable for items that cannot be sterilized in any of the preceding default programs. **Validation of the sterility when using this program is the responsibility of the user.**

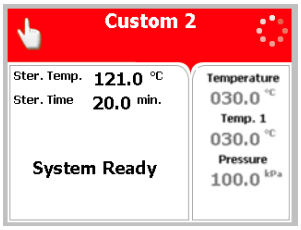
Nominal parameters default settings

- Sterilization temperature: 134°C (273°F).
- Sterilization time: 4 minutes.

Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant for the preset sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.8 Program 8: Custom 2



Sterilization parameters are adjustable for items that cannot be sterilized in any of the preceding default programs. **Validation of the sterility when using this program is the responsibility of the user.**

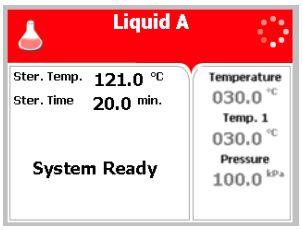
Nominal parameters default settings

- Sterilization temperature: 121°C (250°F).
- Sterilization time: Default 20 minutes.

Operations sequence:

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant for the preset sterilization time.
- Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.9 Program 9: Liquid A



For liquids in **unsealed bottles** when the manufacturer recommends autoclaving at temperatures of 121ºC (250°F) with no drying.

Nominal parameters default settings

- Sterilization temperature: 121°C (250°F).
- Sterilization time: 20 minutes.

Operations Sequence

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant for the preset sterilization time.

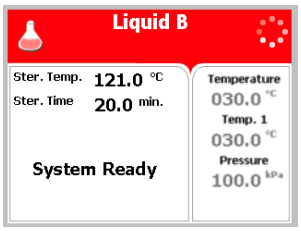
ELV models

- ♦ Slow exhaust; steam is slowly exhausted from the chamber, until it reaches the required end temperature (approx. 95ºC) and the pressure equals the atmospheric pressure.

ELVC models

- ♦ Forced cooling to the required end temperature (approx. 95ºC), while the pressure in the chamber remains the same as the sterilization pressure, by supplying compressed air into the chamber. The forced cooling shortens the cooling stage significantly.
- ♦ Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

5.10 Program 10: Liquid B



For liquids in **sealed bottles** when the manufacturer recommends autoclaving at temperatures of 121ºC (250°F) with no drying.

Nominal parameters default settings

- Sterilization temperature: 121°C (250°F).
- Sterilization time: 30 minutes.

Operations Sequence

- Insert water to chamber and heating by actuation of electrical heaters until reaching the high preset air pulse.
- Heating by actuation of electrical heaters until the sterilization temperature is reached.
- Sterilization temperature is maintained constant for the preset sterilization time.

ELV models

- ♦ Slow exhaust; steam is slowly exhausted from the chamber, until it reaches the required end temperature (approx. 85ºC) and the pressure equals the atmospheric pressure.

ELVC models

- ♦ Forced cooling to the required end temperature (approx. 85ºC), while the pressure in the chamber remains the same as the sterilization pressure, by supplying compressed air into the chamber. The forced cooling shortens the cooling stage significantly.
- ♦ Fast exhaust, steam is exhausted out of the chamber at a fast rate until pressure decreases to ambient pressure.

6. CHECKING AND CHANGING PARAMETERS AND OTHER DATA

The control system prevents changing programs if the door is closed. This protection is intended to avoid program changes if the autoclave is loaded. If the operator for example inserts the load into the chamber, closes the door and leaves the room and another operator/user tries to change the program, the operator/user will not be able to do this unless the door is opened and the load inside the chamber can be seen.

6.1 Directories and subdirectories

The operator (Admin) may perform the following:

DIRECTORY	SUBDIRECTORY
Cycle Parameters – applicable only for Custom 1 and Custom 2 programs	See sec. 6.4 “Cycle Parameters (Custom 1)”
System Parameters	Print Rate All
	Print Rate Sterilization
	Screen Saver
History	View old cycle history
	Export history to USB
Maintenance	Set date and time
	Export gain offset to USB
	Printer test
	Print all gain and offset
Advanced options	Start cycle by clock
	Export all settings to USB device
Version information	View current version information
	View factory default version information
	View previous version information

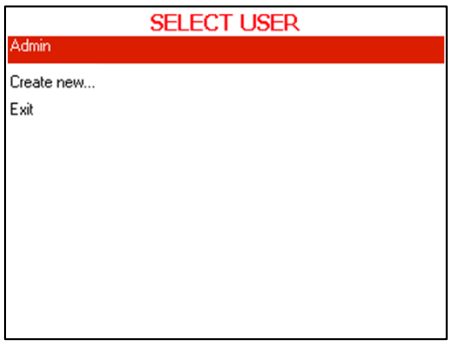
6.2 Table of parameters

The parameter default depends on the selected program. The following table is an example to Custom 1 program

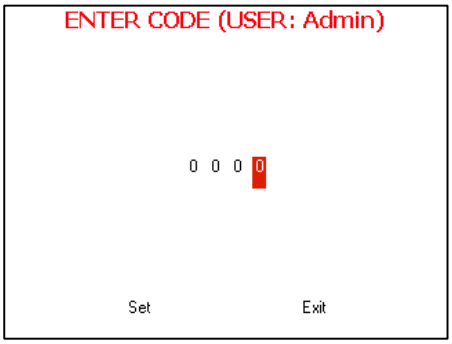
Parameters	Description	Default	Unit	Range	Resolution
Pulse A Count	Define the number of pulses in the first pulses group	3	#	0-10	1
Pulse A Stay Time	Define the additional time that the vacuum pump will continue to operate or slow/top exhaust valve will remain open after reaching the preset pressure in the first pulses group	10	Second	1-100	1
Pulse A Low Pressure	Define the minimum vacuum/pressure level in the first pulses group	130.0	kPa	5-200	1
Pulse A High Pressure	Define the maximum vacuum/pressure level in the first pulses group	180.0	kPa	5-200	1
Pulses B Count	Define the number of pulses in the second pulses group	0	#	0-10	1
Pulse B Stay Time	Define the additional time that the vacuum pump will continue to operate or slow/top exhaust valve will remain open after reaching the preset pressure in the second pulses group	2	Second	1-100	1
Pulse B Low Pressure	Define the minimum vacuum/pressure level in the second pulses group	160.0	kPa	5-200	1
Pulse B High Pressure	Define the maximum vacuum/pressure level in the second pulses group	180.0	kPa	5-200	1
Sterilization Temperature	Define the sterilization temperature	134.0	°C/°F	80-137	0.5°
Sterilization Time	Define the sterilization time	4.0	Minute	0-9999	0.5
F0Mode	This parameter calculates the time that the load is exposed to temperature according to F0 table. The printer prints out the values before sterilization and at the end of this cycle	0	#	0-1	1
Cool Mode	Defines whether to perform the cooling stage or not. There are 4 options: 0 = no cooling. 1 = forced cooling. 2 = N.A for this model. 3 = N.A for this model.	0	#	0-3	1
Cool End Temperature	Define the temperature at the end of the cooling stage	80.0	°C/°F	30-120	1
Cool Exhaust Rate	Defines exhaust rate at the end of cooling stage	5.0	kPa/sec	1-100	1
exhaust Mode	This parameter enables to choose between FAST EXHAUST=1 to SLOW EXHAUST=2	1	#	1-2	1
Dry heat On 1	Defines the time that the heaters operate during the first drying period	4	Second	0-120	1
Dry Heat Off 1	Defines the time that the heaters do not operate during the first drying period	12	Second	0-120	1
Dry First Stage Time	If steam is produced by heating water in the chamber, it is possible to define two heating periods during the drying stage. This parameter defines the first heating period. The second heating period will begin at the end of the first heating period and will last until the end of the drying stage.	5	Minute	0-120	1
Dry heat On 2	Defines the time that the heaters operate during the second drying period	2	Second	0-120	1
Dry Heat Off 2	Defines the time that the heaters do not operate during the second drying period	20	Second	0-120	1
End Temperature	Define the temperature at the end of the cycle , the cycle will not end before reaching the preset temperature	120	°C/°F	30-120	1
Multiple Cycles	Define the number of times the cycle repeated	1	#	1-50	1
Multiple Cycles Gap	Define the interval between repeated cycles in case that Multiple Cycles parameter is defined	2	Minute	1-60	1
Print Rate All	Defines the printing rate during the cycle except sterilization stage	3	Minute	1-30	1
Print Rate Sterilization	Defines the printing rate during the sterilization stage	1	Minute	1-30	1
Screen Saver	Defines the interval from the last use of the Keypad until activating the screen saver	90	Minute	0-600	1

6.3 Entering the main menu

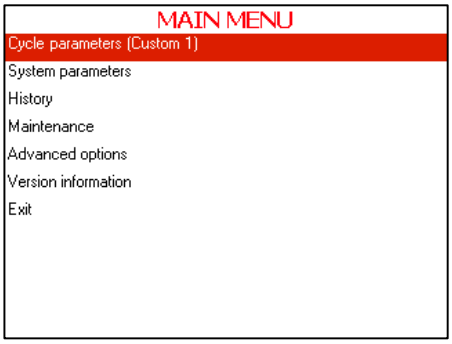
1. Enter the **SELECT USER** screen by pressing the **UP** and **DOWN** keys simultaneously.
   To exit the **SELECT USER** screen move the cursor to **Exit** by pressing **UP** or **DOWN** keys and then press **START/STOP** key.



   SELECT USER screen will be displayed.
2. Move the cursor to **Admin** and press **START/STOP** key. The following screen will be displayed:



3. 0000 is displayed on the screen with the cursor blinking on the right digit.
4. To increase or decrease the digits, press the **UP** or **DOWN** keys.
5. After changing the code to 0001 move the cursor to **Set** by pressing the **START/STOP** key.
6. When **Set** is blinking, press the **UP** or **DOWN** keys to enter the **MAIN MENU** of the autoclave.
   The following screen will be displayed:



In order to exit the **ENTER CODE** screen move the cursor to **Exit** by pressing **START/STOP** Key. when **Exit** is blinking press **UP** or **DOWN** keys.

7. To browse through the directories, use the **UP** or **DOWN** keys.
8. When the required directory is blinking, press the **START/STOP** key. The required screen will be displayed.
9. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

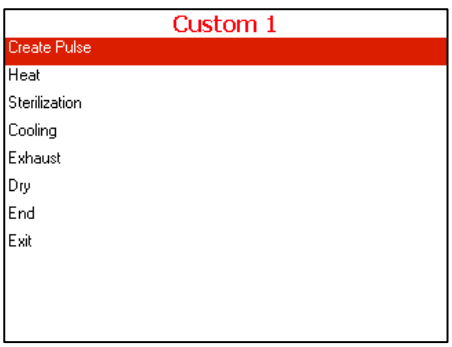
6.4 Cycle Parameters (Custom 1)

This directory applicable only for custom 1 and custom 2 programs

Subdirectory	Property
Create Pulse	Pulse A Count
	Pulse A Stay Time
	Pulse A Low Pressure
	Pulse A High Pressure
	Pulse B Count
	Pulse B Stay Time
	Pulse B Low Pressure
	Pulse B High Pressure
Heat	Sterilization Temperature
Sterilization	Sterilization Temperature
	Sterilization Time
	F0 Mode
Cooling	Cool mode
	Cool End Temperature
	Cool Exhaust Rate
Exhaust	Exhaust Mode
Dry	Dry Heat On 1
	Dry Heat Off 1
	Dry first stage time
	Dry Heat On 2
	Dry Heat Off 2
End	End Temperature
	Multiple Cycles
	Multiple Cycles Gap

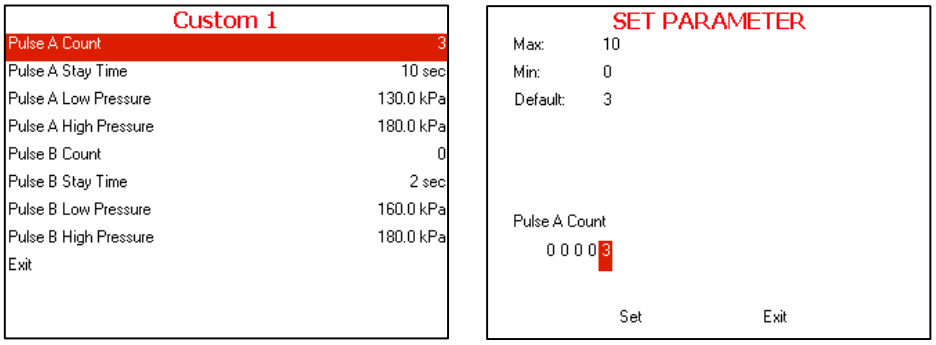
This directory includes seven subdirectories
These subdirectories enable to see and change the cycle parameters. Therefore it is necessary to choose the required cycle before entering the "**MAIN MENU**".

For seeing or changing the parameters proceed as follows:
Choose and enter **cycle parameters**
The following screen will display:



6.4.1 Create Pulse

6.4.1.1 Pulse A Count



Typical display for **Create Pulse** subdirectory

Choose and enter **Pulse A Count**
SET PARAMETER screen will be displayed
Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.
In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

6.4.1.2 Pulse A Stay Time

Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.1.3 Pulse A Low Pressure

Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.1.4 Pulse A High Pressure

Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.1.5 Pulse B Count

Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.1.6 Pulse B Stay Time

Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.1.7 Pulse B Low Pressure

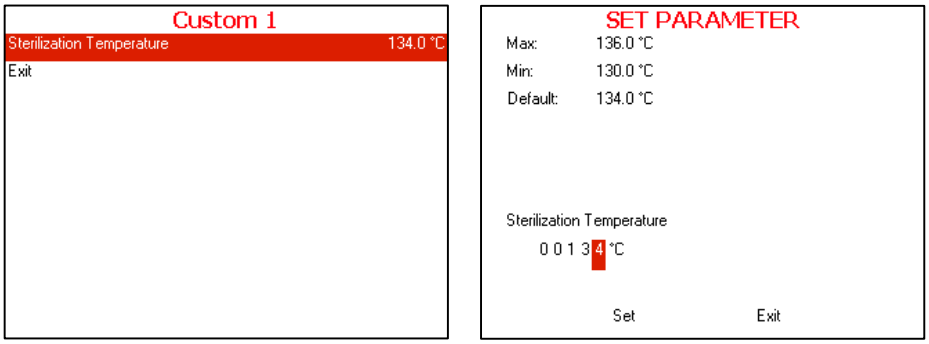
Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.1.8 Pulse B High Pressure

Repeat the action mention in 6.2.1.1 Pulse A Count

6.4.2 Heat

6.4.2.1 Sterilization Temperature



Typical display for **Sterilization Temperature** subdirectory

Choose and enter **Sterilization Temperature**
SET PARAMETER screen will be displayed
Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.
In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

6.4.3 Sterilization

6.4.3.1 Sterilization Temperature

See 6.2.2.1 Sterilization Temperature

6.4.3.2 Sterilization Time

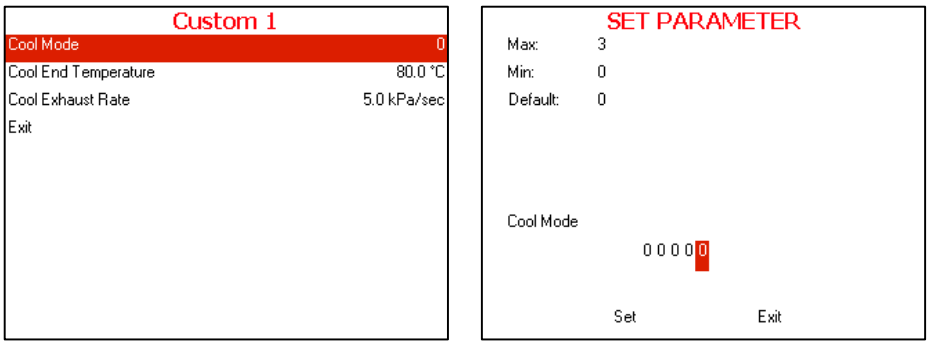
Repeat the action mention in 6.2.2.1 Sterilization Temperature

6.4.3.3 F0 Mode

Repeat the action mention in 6.2.2.1 Sterilization Temperature

6.4.4 Cooling

6.4.4.1 Cool Mode



Typical display for **Cool Mode** subdirectory

Choose and enter **Cool Mode**
SET PARAMETER screen will be displayed
Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.
In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

6.4.4.2 Cool End Temperature

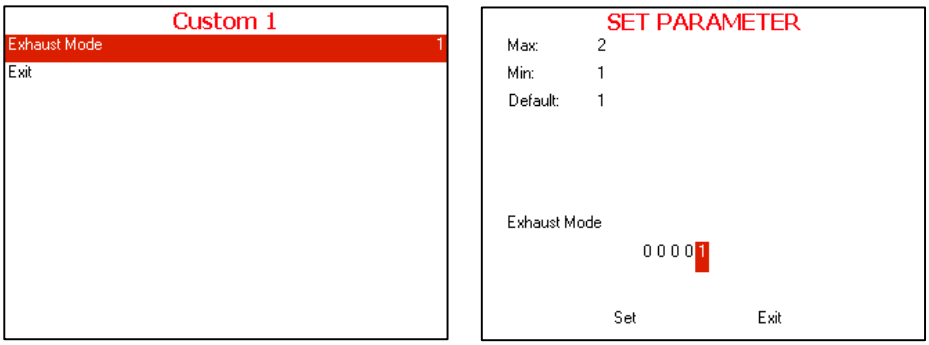
Repeat the action mention in 6.2.4.1 **Cool Mode**

6.4.4.3 Cool Exhaust Rate

Repeat the action mention in 6.2.4.1 **Cool Mode**

6.4.5 Exhaust

6.4.5.1 Exhaust Mode

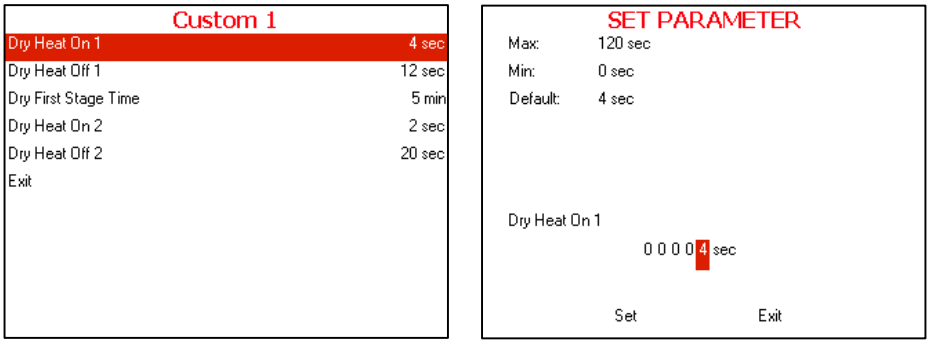


Typical display for **Exhaust Mode** subdirectory

Choose and enter **Exhaust Mode**
SET PARAMETER screen will be displayed
Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.
In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

6.4.6 Dry

6.4.6.1 Dry Heat On 1



Typical display for **Dry Heat On 1** subdirectory

Choose and enter **Dry Heat On 1**
SET PARAMETER screen will be displayed
Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.
In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

6.4.6.2 Dry Heat Off 1

Repeat the action mention in 6.2.6.1 Dry Heat On 1

6.4.6.3 Dry first stage time

Repeat the action mention in 6.2.6.1 Dry Heat On 1

6.4.6.4 Dry Heat On 2

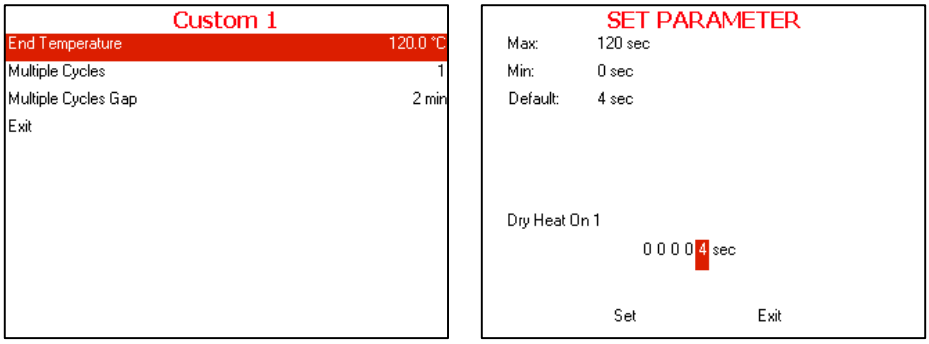
Repeat the action mention in 6.2.6.1 Dry Heat On 1

6.4.6.5 Dry Heat Off 2

Repeat the action mention in 6.2.6.1 Dry Heat On 1

6.4.7 End

6.4.7.1 End Temperature



Typical display for **End Temperature** subdirectory

Choose and enter **End Temperature**
SET PARAMETER screen will be displayed
Set the required value, move to **Set** and press **UP** or **DOWN** keys to confirm the parameter value.
In order to exit move the cursor to **Exit** and press **UP** or **DOWN** keys

6.4.7.2 Multiple Cycles

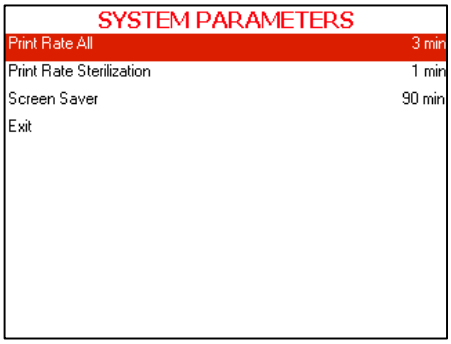
Repeat the action mention in 6.2.7.1 **End Temperature**

6.4.7.3 Multiple Cycles Gap

Repeat the action mention in 6.2.7.1 **End Temperature**

6.5 System Parameters

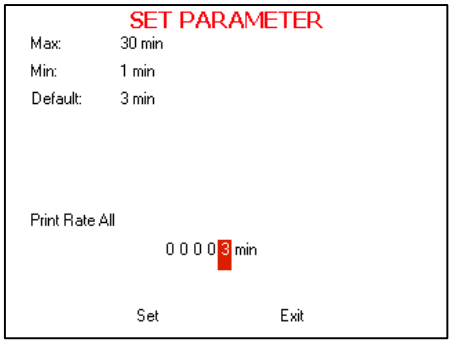
This directory includes three subdirectories
The following screen will be displayed when entering **SYSTEM PARAMETERS** directory:



1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.5.1 Print Rate All

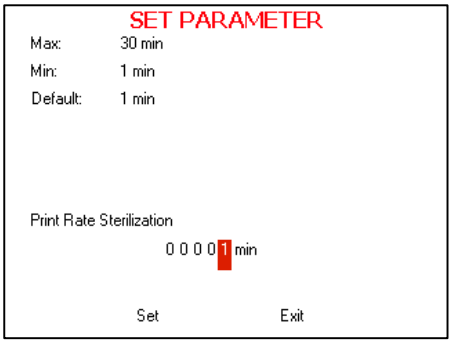
This subdirectory enables to change the printing rate during the whole cycle except sterilization stage



1. To increase or decrease the digits, press the **UP** or **DOWN** keys.
2. After changing the value move the cursor to **Set** by pressing the **START/STOP** key.
3. When **Set** is blinking, press the **UP** or **DOWN** keys in order to confirm changes and return to the previous screen.
4. In order to exit this screen follows one of the next:
   - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
   - Press the **UP** and **DOWN** keys simultaneously.

6.5.2 Print Rate Sterilization

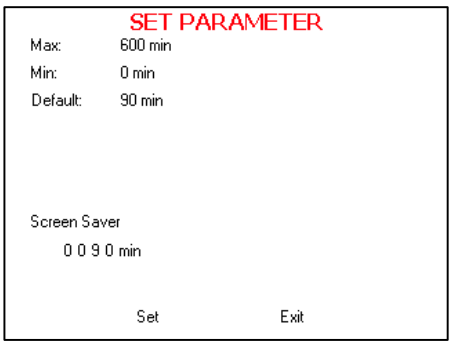
This subdirectory enables to change the printing rate during sterilization stage



1. To increase or decrease the digits, press the **UP** or **DOWN** keys.
2. After changing the value move the cursor to **Set** by pressing the **START/STOP**.
3. When **Set** is blinking, press the **UP** or **DOWN** keys in order to confirm changes and return to the previous screen.
4. In order to exit this screen follows one of the next:
   - In order to exit this screen move the cursor to **Exit** with the **START/STOP** key and select it by pressing the **UP** or **DOWN** keys.
   - Press the **UP** and **DOWN** keys simultaneously.

6.5.3 Screen Saver

This subdirectory enables the operator to set the screen saver time.
The default time value is 90 minutes. It is possible to increase or decrease the time value up to a maximum of 600 minutes or down to a minimum 0 minutes.

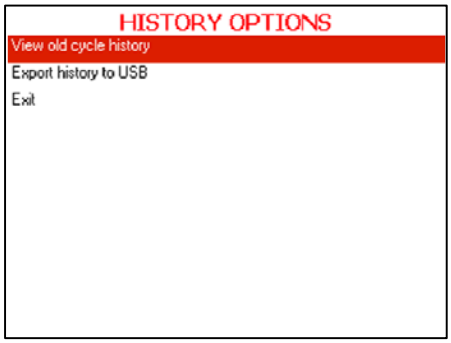


When entering the **Screen Saver** screen, the time will be displayed. The cursor is blinking on the "minute" digit.
The time is displayed in the form “0000” min.

1. To increase or decrease the digits, press the **UP** or **DOWN** keys.
2. After changing the value move the cursor to **Set** by pressing the **START/STOP**.
3. When **Set** is blinking, press the **UP** or **DOWN** keys in order to confirm changes and return to the previous screen.
4. In order to exit this screen follows one of the next:
   - In order to exit this screen move the cursor to Exit with the START/STOP key and select it by pressing the UP or DOWN keys.
   - Press the **UP** and **DOWN** keys simultaneously.

6.6 History

This directory includes two subdirectories
The following screen will be displayed when entering **HISTORY** directory:



1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.6.1 View old cycle history

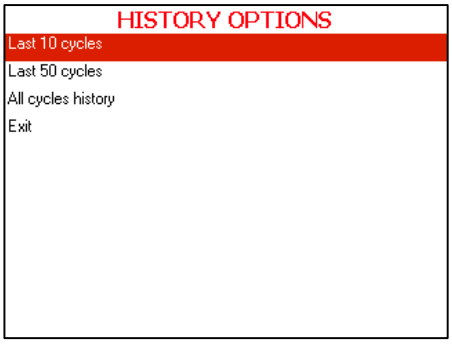
This subdirectory enables to print the 100 previous cycles.
The following screen will be displayed when entering **View old cycle history** subdirectory:

1. Choose the required cycle according to cycle number, date and time with the **UP** or **DOWN** keys
2. Press the **START/STOP** key. The printer will print the printout of the required cycle
3. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.6.2 Export history to USB

This subdirectory enables to Export history to USB device.

1. Insert the USB device into the USB Socket
2. Move the cursor to **Export history to USB**
3. Press the **START/STOP** key.
4. The following screen will be displayed:

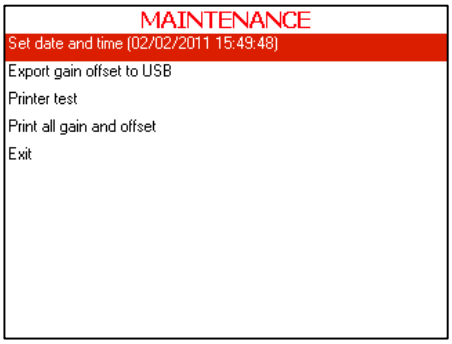


5. Move the cursor to the required item and press **START/STOP** key
6. The following screen will be displayed:

7. Remove the USB device from the USB Socket
8. In order to exit this screen and return to **HISTORY OPTIONS** screen press **START/STOP** key.
9. In order to exit the **HISTORY OPTIONS** screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.7 Maintenance

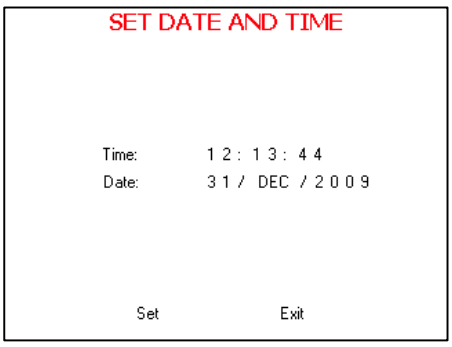
This directory includes four subdirectories
The following screen will be displayed when entering **MAINTENANCE** directory:



1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.7.1 Set date and time

This subdirectory enables the operator to set the date and time.
This **SET DATE AND TIME** screen will be displayed when entering the subdirectory:



When entering the **SET DATE AND TIME** screen, the time and date are displayed. The cursor is blinking on the "second" digit.
The time is displayed in the upper row in the form "HH:MM:SS". The hour range is 24 hour (i.e. from "0" to "24")
The date is displayed in the lower row in the form "DD:MMM:YYYY".

1. To increase or decrease the time or the date use the **UP** or **DOWN** keys.
2. To move the cursor from one digit to another press the **START/STOP** key.
3. After changing the time and the date move the cursor to **Set.**
4. Confirm the new time and date by pressing **UP** or **DOWN** keys.

After saving is completed, **SET DATE AND TIME** screen is still displayed, move the cursor to **Exit** and press **UP** or **DOWN** keys to return to **MAINTENANCE** screen.

6.7.2 Export gain offset to USB

This subdirectory enables to Export gain offset to USB device.

1. Insert the USB device into the USB Socket
2. Move the cursor to **Export gain offset to USB**
3. Press the **START/STOP** key
4. The following screen will be displayed:

5. Remove the USB device from the USB Socket
6. In order to exit this screen and return to **MAINTENANCE** directory press **START/STOP** key.

7. In order to exit the **MAINTENANCE** directory follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.7.3 Print Test

This subdirectory enables the operator to test the printer.

When pressing **START/STOP** key on the **Printer Test** item the printer will print out the following print out:

Cycle errors:
None
Canceled By User
Door is open
Analog Input Error
I/O Card Failed
Power Down
Invalid Parameter Value
No Water
Heat Time Error
Vacuum Time Error
Pressure Time Error
Heat Time Error (Keep)
Heat Time Error
Low Pressure
High Pressure
Low Temp
High Temp
Time Error
Low Pressure (Cooling)
High Temp. (Cooling)
High Pressure (Exhaust)
High Pressure (Dry)
High Pressure (Ending)
Air Error
High Temp. (Ending)
Error Open Door
Error Close Door
Accessory Timeout

And the following screen will be displayed.

In order to exit this screen and return to **MAINTENANCE** directory press **START/STOP** key.

In order to exit the **MAINTENANCE** directory follows one of the next:

- Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
- Press the **UP** and **DOWN** keys simultaneously

6.7.4 Print All Gain and Offset

This subdirectory enables the operator to print all the gain and offset values.
When pressing **START/STOP** key on the **Print all gain and offset** item the printer will print out the following:

Drain Temperature
G:000.0400;O:-004.0000
Chamber Temperature
G:000.0400;O:-004.0000
Ref Temperature 1
G:000.0400;O:-004.0000
Chamber Pressure
G:000.1250;O:-100.0000

And the following screen will be displayed.

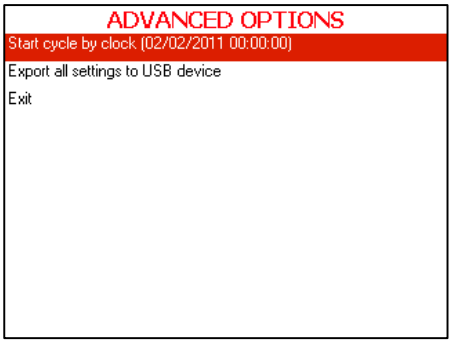
In order to exit this screen and return to **MAINTENANCE** directory press **START/STOP** key.

In order to exit the **MAINTENANCE** directory follows one of the next:

- Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
- Press the **UP** and **DOWN** keys simultaneously

6.8 Advanced Options

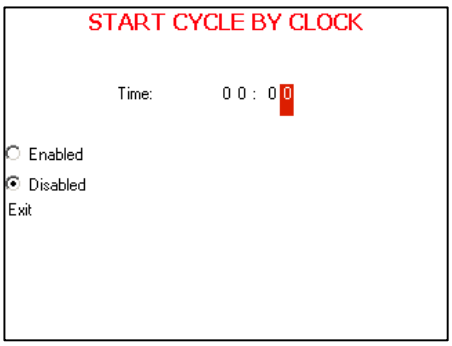
This directory includes two subdirectories
The following screen will be displayed when entering **ADVANCED OPTIONS** directory:



1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.8.1 Start Cycle by Clock

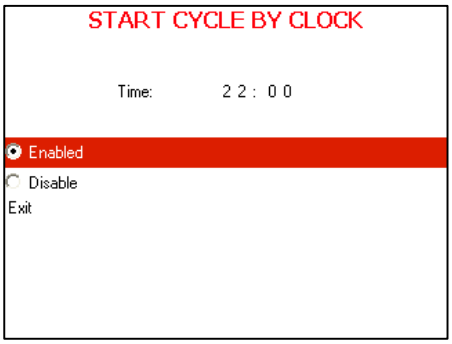
This subdirectory enables the operator to postpone the operation by a pre-set time.
This **Start cycle by clock** screen will be displayed when entering the **START CYCLE BY CLOCK** subdirectory:



When entering the **START CYCLE BY CLOCK** screen, the time is displayed. The cursor is blinking on the "minute" digit.
The time is displayed in the form “HH:MM”. The hour range is 24 hours (i.e. from "0" to "24").

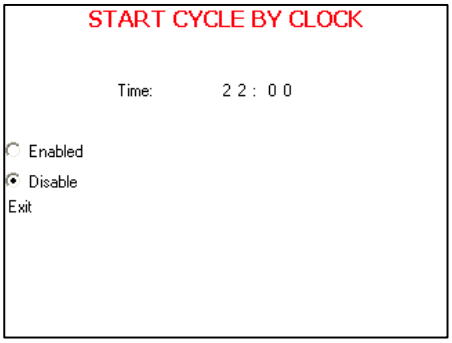
Enabling the START CYCLE BY CLOCK

1. To increase or decrease the time use the **UP** or **DOWN** keys.
2. To move the cursor from one digit to another press the **START/STOP** key.
3. After changing the time move the cursor to **Enabled**
4. Confirm the **START CYCLE BY CLOCK** by pressing **UP** or **DOWN** keys.
5. Move the cursor by pressing **START/STOP** key to **Exit** and press **UP** or **DOWN** keys to return to **ADVANCED OPTIONS** screen.



Canceling the START CYCLE BY CLOCK

1. To cancel the **START CYCLE BY CLOCK** move the cursor by pressing **START/STOP** key to **Disable** and press **UP** or **DOWN** keys.
2. Move the cursor to **EXIT** by pressing **START/STOP** key and press **UP** or **DOWN** keys, the **START CYCLE BY CLOCK** will be canceled.



6.8.2 Export all settings to USB device

This subdirectory enables the operator to export all settings to USB device.

1. Insert the USB device into the USB Socket
2. Move the cursor to Export all settings to USB device
3. Press the **START/STOP** key.
4. The following screen will be displayed:

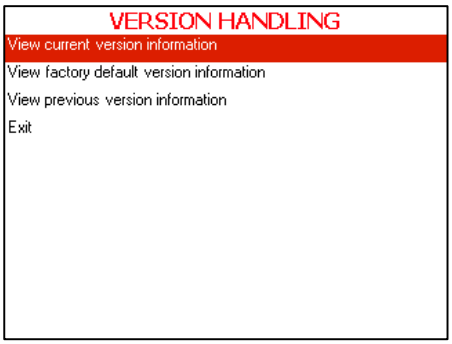
5. Remove the USB device from the USB Socket
6. In order to exit this screen and return to **ADVENCED OPTIONS** directory press **START/STOP** key.

In order to exit from the **ADVANCED OPTIONS** directory follows one of the next:

- Move the cursor to **EXIT** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
- Press the **UP** and **DOWN** keys simultaneously

6.9 Version information

This directory includes two subdirectories
The following screen will be displayed when entering **VERSION INFORMATION** directory:

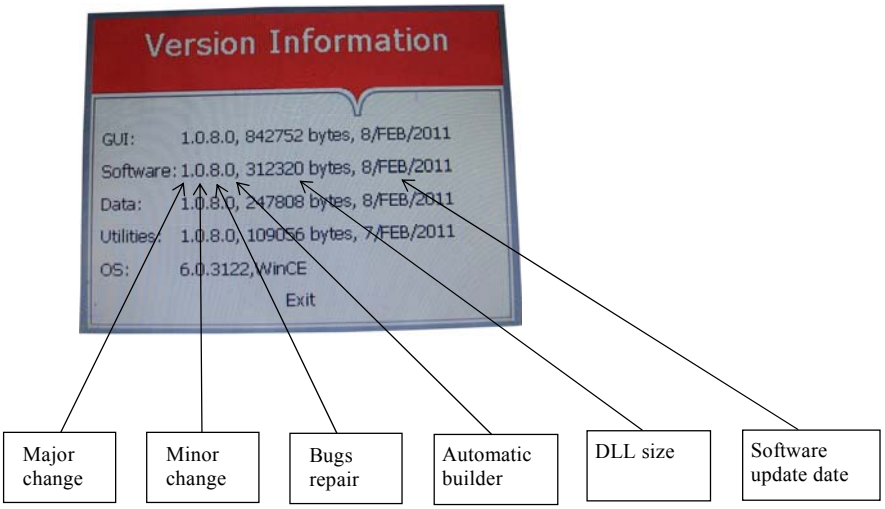


1. In order to enter to the sub directories move the cursor by pressing **UP** or **DOWN** keys to the required item and press **START/STOP** key
2. In order to exit this screen follows one of the next:
   - Move the cursor to **Exit** with the **UP** or **DOWN** keys and select it by pressing the **START/STOP** key.
   - Press the **UP** and **DOWN** keys simultaneously.

6.9.1 View current version information

In order to view this subdirectory press **START/STOP** key on the **View current version information** item.
This subdirectory enables the operator to see the current version information as described below:

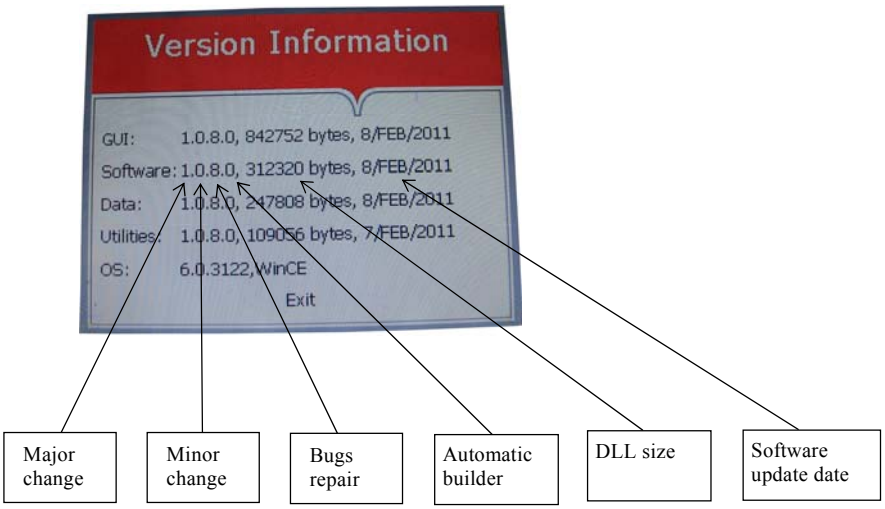
1. GUI — Graphic user interface – Holds the entire Human Machine interface including the main application screen and all the configuration screens, which enable the user to handle the machine.
2. Software — Logic – Holds all the application logic for running the machine.
3. Data — Code section that handle the entire data storage in the application.
4. Utilities – — Utilities – Holds general functionality which is used by the logic section and the GUI section e.g: converting function to display different pressure or temperature units , languages types etc.
5. OS — Operational System – Microsoft Windows CE. Version 6.0.



- Major change — Concept change eg: changing the operating system, Changed by the programmer in accordance with the change sequence.
- Minor change — Feature change or function change, changed by the programmer in accordance with the change sequence.
- Bugs repair — Software bugs repair changed by the programmer in accordance with the change sequence.
- Automatic builder — Changed (updated) automatically after each source code compilation
- DLL size — Dynamic-Link Library size

6.9.2 View factory default version information

This subdirectory enables the operator to see the factory default version information.
In order to see this subdirectory press **START/STOP** key on the **View factory default version information** item.
The following screen will be displayed:



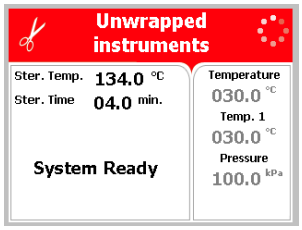
6.9.3 View previous version information

This subdirectory enables the operator to see the previous version information.
In order to see this subdirectory press **START/STOP** key on the **View previous version information** item.

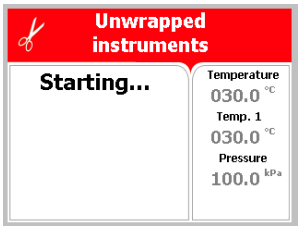
7. *SCREENS*

7.1 Screens following a complete successfully cycle – "Cycle Ended"

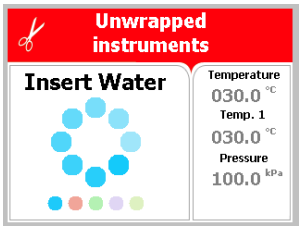
1. System Ready



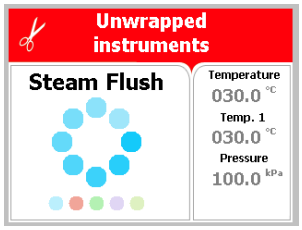
2. Starting



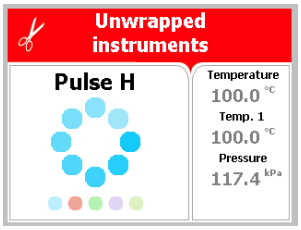
3. Insert Water



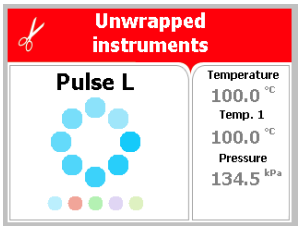
4. Steam Flush



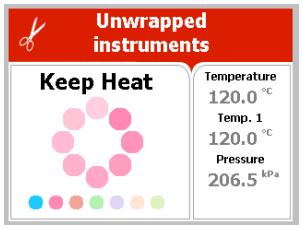
5. Pulse H



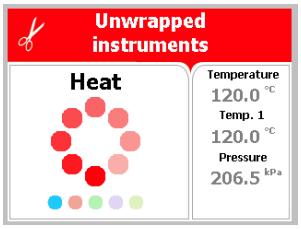
6. Pulse L



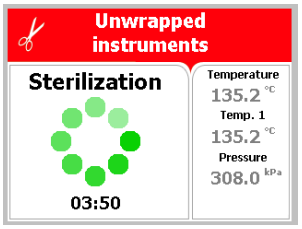
7. Keep Heat *



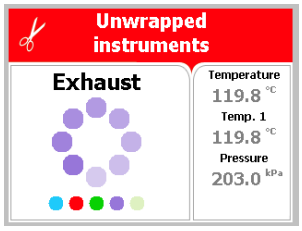
8. Heat



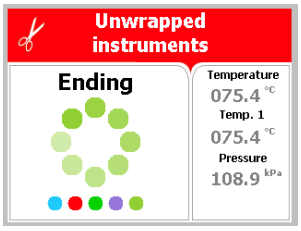
9. Sterilization



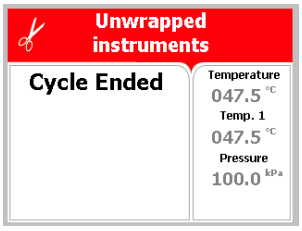
10. Exhaust



12. Ending



13. Cycle Ended



* Display can be activated only by an authorized person.

In order to open the door press **START / STOP** key

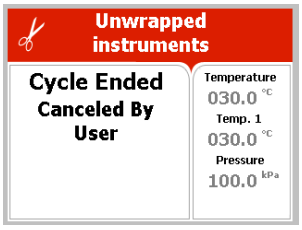
7.2 Screens following aborted cycles after complete sterilization stage

The sterilization phase ended successfully – cycle ended and the reason of failure is displayed

For example the next two scenarios:

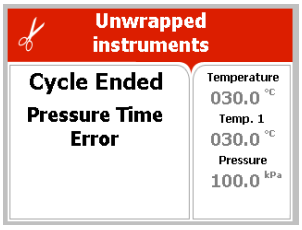
7.2.1 Canceled by user after complete sterilization stage

The cycle ended successfully, the reason for aborted cycle is displayed.



7.2.2 Pressure Time Error Failure occurrence after complete sterilization stage

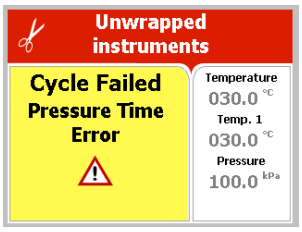
The cycle ended successfully, the reason of failure is displayed.



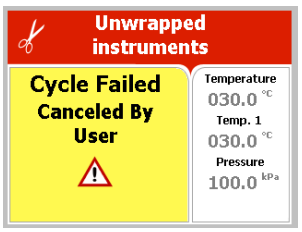
7.3 Screens following a fail cycle:

In this case, the display becomes yellow, a warning  sign and the reason of failure will be displayed.
For example the next two scenarios:

7.3.1 Failure according to Pressure Time Error



7.3.2 Failure according to Cancellation by user before complete sterilization stage



When "Cycle Failed" appears on the screen, the user shall press **START/STOP** key in order to delete the "Cycle Failed" message

An example for all displayed warnings according to Cycle Failed:

8. PRINTER

8.1 Printer Output

The printing is on thermal paper with 24 characters per line and contains the following information:

- Date:
- Time:
- Ser. Num:
- Model:
- Version:
- Cycle Num:
- Cycle:
- Dry Time:
- Ster Temp:
- Ster Time:

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

After the preliminary printing, the autoclave starts performing the sequence of operations of the cycle. The measured values of temperature and pressure are printed at fixed time intervals, according to the phase of the process, as shown in the table on the next page.
The data is printed from the bottom up, beginning with the date and ending with "Cycle Ended". For an aborted cycle, "Cycle Failed" and the Error message are printed (refer to "Displayed Error Messages/Symbols").
For an example of a typical printout, see next page.

PRINTER OUTPUT			DESCRIPTION
Operator**:**	_____		To be filled in manually by operator
Time:	12:14:47		Time sterilization cycle ended
Cycle Ended			
00:24:43	101.3	099.7	Cycle finished time
E 00:23:43	107.0	107.4	The time, temperature and pressure during exhaust
E 00:22:08	134.5	311.9	The time, temperature and pressure during exhaust
CLK 2:	12:12:10:00		
CLK 1:	12:12:10:00		
S 00:22:07	134.5	311.6	The time, temperature and pressure during sterilization
S 00:22:06	134.5	311.6	The time, temperature and pressure during sterilization
S 00:21:06	134.6	311.0	The time, temperature and pressure during sterilization
S 00:20:06	134.5	310.1	The time, temperature and pressure during sterilization
S 00:19:06	134.8	311.1	The time, temperature and pressure during sterilization
S 00:18:06	134.5	315.8	The time, temperature and pressure during sterilization
CLK 2:	12:08:08:00		
CLK 1:	12:08:08:00		
H 00:18:04	134.4	315.1	The time, temperature and pressure during heating
H 00:16:35	128.9	268.4	The time, temperature and pressure during heating
H 00:13:35	116.3	180.9	The time, temperature and pressure during heating
A 00:11:04	107.0	120.9	The time, temperature and pressure during Air removal
A 00:10:22	115.1	180.4	The time, temperature and pressure during Air removal
A 00:10:00	113.7	170.5	The time, temperature and pressure during Air removal
A 00:07:00	098.7	101.5	The time, temperature and pressure during Air removal
A 00:06:45	097.6	101.4	The time, temperature and pressure during Air removal
A 00:03:45	080.2	099.4	The time, temperature and pressure during Air removal
A 00:00:45	053.7	099.4	The time, temperature and pressure during Air removal
A 00:00:04	046.5	100.0	The time, temperature and pressure during Air removal
TIME	**°C**	**kPa**	
Ster Time:	4.0min		Sterilization time for selected program
Ster Temp:	134.0°C		Sterilization temperature in chamber for selected program
Cycle:	Unwrapped instru		Cycle name
Cycle Num:	000001		Cycle number
Version:	1.0.00.00		Software version A.B.CC.DD = 1.0.00.00 A: Door Type: Single Manual = 1 B: Vacuum Type = 0 C: Total number of Input/Output functionality that are not as default = 00 D: Total number of parameters values that are not as default = 00
Model:	5050ELVC		Model name
Ser. Num:	000000000001		Model Serial number
Time:	11:50:05		Time sterilization cycle started
Date:	9/FEB/2010		Date sterilization cycle started

Time:	08:51:39		Time of turning on
Date:	9/FEB/2010		Date of turning on
POWER ON			The device is turned on
Time:	00:00:00		Time of turning off
Date:	9/FEB/2010		Date of turning off
POWER OFF			The device is turned off

Legend			
A	Air removal stage (Steam flash)	E	Exhaust stage
H	Heating stage		
S	Sterilization stage	CLK 1	Real Time Clock
C	Cooling stage (for ELVC only)	CLK 2	Software clock

8.2 Printer Handling

8.2.1 Maintenance

Wipe off the soiling on the printer surface with a dry soft cloth with a weak neutral detergent. After that, wipe the printer with a dry cloth.

8.2.2 Setting paper

PLUS II Front view

1-Paper mouth
2-STATUS Led
3-OPEN key (for paper roll compartment opening)
4-FEED key
5-Paper roll compartment
6-Paper end sensor

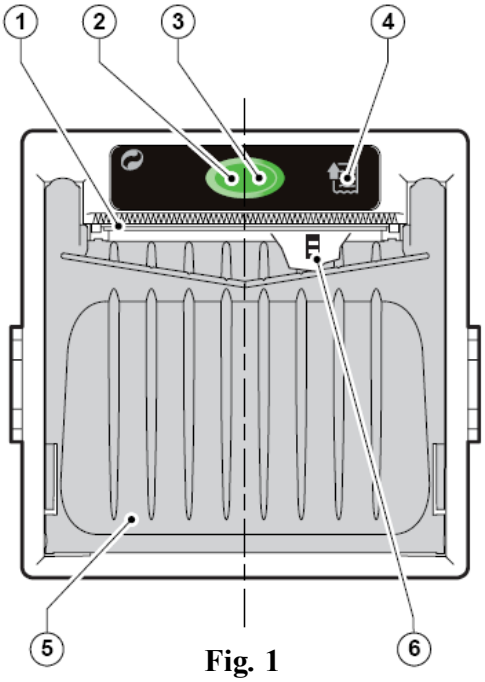


Fig. 1

1. Open the printer's cover door (1) by pulling it up (see Fig. 2).

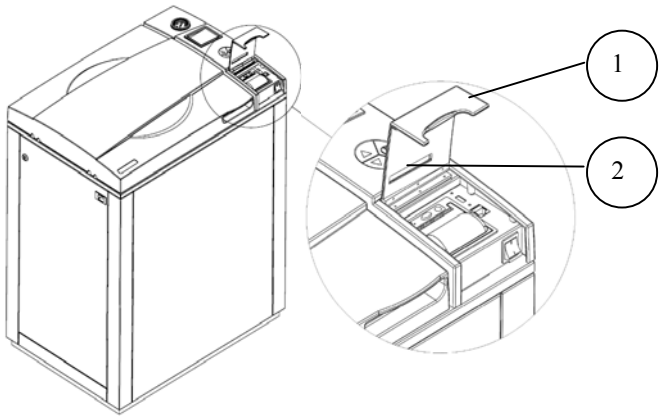


Fig. 2

2. Press the OPEN key to open the printer cover as shown (see Fig. 3/1). Handle the paper cutter carefully not to cut your hand.
3. Place the paper roll making sure it unrolls in the proper direction as shown (see Fig. 3/2).
4. Take out the paper and re-close the cover as shown (see Fig. 3/3) the printer cover is locked.
5. Tear off the exceeding paper using the jagged edge (see Fig. 3/4).

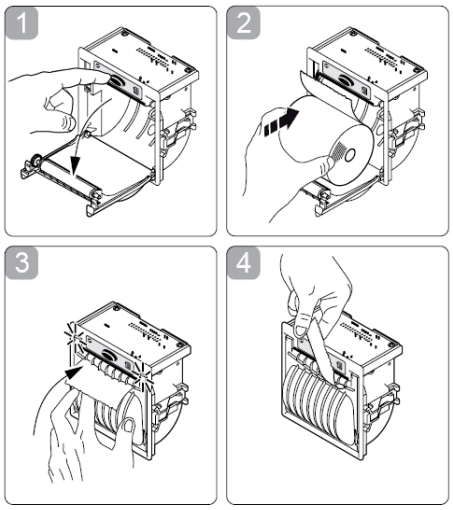


Fig. 3

6. Close the printer's cover door (1) by pulling it down, with the tip end of the paper emerging from the slot (2) (see Fig. 2).

8.2.3 Treating the thermal papers:

- Store the papers in a dry, cool and dark place.
- Do not rub the papers with hard substance.
- Keep the papers away from organic solvent.

Cautions

Never disassemble the printer. Failure to follow this instruction may cause overheating or burning of the printer or the AC adapter. Or an electric shock, which may lead to fires or accidents.

Never use the printer in a place of extreme humidity or any place where it can possibly be splashed by any liquids. If any liquids get into the printer, it could lead to fire, electric shock, or other serious accidents.

Never touch the thermal head immediately after printing because it becomes very hot. Make sure that the thermal head is cool before setting papers or cleaning the thermal head.

Power OFF the printer in any of the following cases:

- The printer does not recover from an error.
- Smoke, strange noise or smells erupt from the printer.
- A piece of metal or any liquid touches the internal parts or slot of the printer.

9. PREPARATION BEFORE STERILIZATION

The purpose of packaging and wrapping of items for sterilization is to provide an effective barrier against sources of potential contamination in order to maintain sterility and to permit aseptic removal of the contents of the pack. Packaging and wrapping materials should permit the removal of air from the pack, penetration of the sterilizing water vapor into the pack and removal of the sterilizing vapor.

The basic principle determining the size, mass and contents of instrument and hollowware packs is that the contents are sterile and dry immediately on completion of the drying cycle and removal of the pack from the sterilizer chamber.

Instruments to be sterilized must be clean, free from any residual matter, such as debris, blood, pads or any other material. Such substances may cause damage to the contents being sterilized and to the sterilizer.

1. Immediately after use, clean instruments thoroughly to dispose of any residue.
2. Follow the instrument manufacturer instructions.
3. It is recommended to wash instruments with an ultrasonic cleaner, using detergent and mineral-free water.
4. Launder textile wraps prior to reuse.
5. After cleaning, rinse instruments for 30 seconds. (Follow manufacturer's instructions on the use of products for cleaning and lubricating instruments after using the ultrasonic cleaner).
6. Materials, including materials used for inner wraps, shall be compatible with the item being packed and the sterilizing method selected.
7. Use single-use wraps once only and discard after use.
8. If the unit is equipped with a printer, verify if a new roll of paper is necessary.

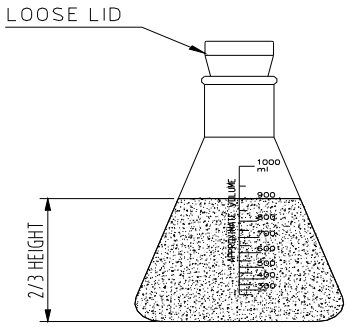
9.1 Instruments

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

9. Once a week, use a biological spore test indicator in any load to make sure sterilization is performed.
10. Make sure that all instruments remain apart during the sterilization cycle.
11. Load the basket loosely to capacity.

9.2 Liquids

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

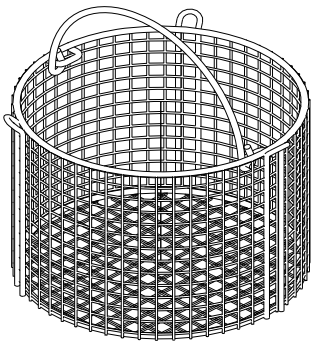


9.3 Loading

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

There are 2 types of baskets:

1. Baskets that are fully perforated.
2. Baskets that are not perforated except one row of holes adjacent to the basket's top. These baskets are intended for waste cycles, to avoid clogging of the vessel's drainage pipe by overflowing liquids.



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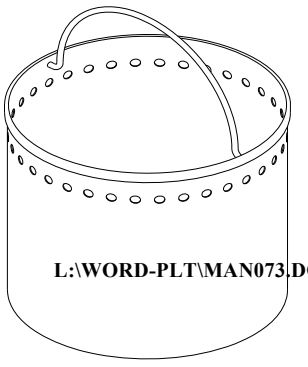

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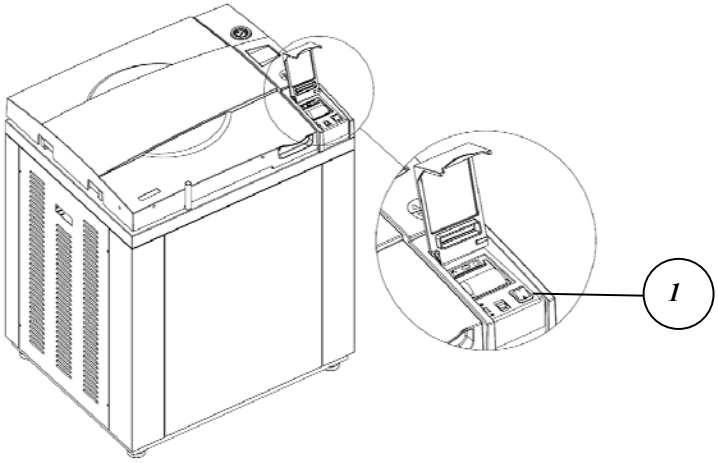
10. OPERATION

10.1 Turning on the autoclave

- To start the system, turn on the main switch (1), located under the printer cover.



The door is equipped with an electrical cylinder. This electrical cylinder perform the automatic opening and closing of the door.

10.2 Opening the door

- Move the door handle (1) from position "locked" (2) to position "unlocked" (3).
- Open the door.

10.3 Loading

- Load the autoclave properly according to instructions in sec. 9.
- Select the program.
  - **UP** key: next program.
  - **DOWN** key: previous program.
- Verify that you chose the required program.

10.4 Selecting program

- Select the required program
  - **UP** key: next program
  - **DOWN** key: previous program
- Verify that you chose the required cycle.

Attention:
Selecting a program is possible only when the door is open.

10.5 Closing the door

- Close the door.
- Move the door handle (1) from position "unlocked" (3) to position "locked" (2).
- The open door symbol  is replaced by the message "System Ready".

10.6 Starting cycle

- Start the cycle by pressing the **START/STOP** key.

10.7 Unloading

When the cycle ended successfully (including pressing the **START/STOP** key, or any failure, after completing the sterilization stage) message "Cycle Ended" (and the relevant failure message, if applicable) is displayed on the screen.

- Verify that there is no pressure in the chamber, according to the reading on the display. Only than you may open the door.
- Open the autoclave. (see sec. 10.2 Opening the door)

Warning
To avoid sever injuries from hot steam when opening the door:

— **It is strictly forbidden to lean on the autoclave.**
— **It is strictly forbidden to place your hand or any part of your body over the door.**

- Wear heat-resistant gloves or use the tray handle to remove the load from the autoclave
- On completion of the cycle, the load shall be visual inspected to ascertain that the load is dry, and that the colour of the sterilization indicators turned to the required colour.

10.8 Stopping the process and cancelling the ERROR message

- It is possible to stop the program while the autoclave is operating. Pressing the **START/STOP** key at any stage of the process stops the operation. If the cycle was aborted before completing the sterilization stage, it will leave the load unsterilized.
- At the end of the aborted process (before completing the sterilization stage), **"Cycle Failed"** message, error message and a warning symbol ⚠ are displayed on the screen. Refer to "Displayed Error Messages/Symbols".
- Pressing the **START/STOP** key cancels the displayed message and enables opening the door.

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

10.9 Start Cycle by Clock mode

- This mode enables the operator to define the time of the beginning of the cycle. The maximum possible delay is 24 hours. For further information see sec. 6.8.1. “Start Cycle by Clock”.

10.10 Moving the Autoclave

1. Disconnect the power supply cord.
2. Disconnect the water and drain hoses.
3. Disconnect the compressed air hoses (if applicable).
4. Drain the water from the chamber.

To avoid injuries, Moving the autoclave should be done by using a forklift.

Caution:
Before moving the autoclave, verify that the electrical, air and water connections have been disconnected, and there is no pressure in the chamber.

Do not drop this device!

10.11 Loading and Unloading the Device

10.11.1 Safety

Protective equipment and clothes and other safety instructions should be implemented in accordance with local and national regulations and/or rules!
For proper sterilization - Do not overload the chamber. Only autoclavable products shall be used; please refer to the manufacturer instructions for sterilization of unknown materials or instruments.

10.11.2 Loading

Correct loading of the autoclave is essential to successful sterilizing for several reasons. Efficient air removal from the chamber and the load will permit effective steam penetration and saturation, and allow proper drainage of condensate. Additionally, correct loading will prevent damage to packs and their contents and maximize efficient use of the sterilizer.
For detailed loading instructions, see sec. 9 (Preparation before sterilization)

10.11.3 Unloading

On completion of the cycle, take out the load immediately from the sterilizer. Do not remove the load from the basket until its temperature reduces to the room temperature. Let the load cool down in an area without air movement (air conditioning, etc.) and with minimum people passing by to avoid possibility of touching the hot load. Do not touch the hot load since hot load absorbs moister and, therefor, may absorb bacteria from your hand. Do not transfer hot load to metal shelves for cooling. Perform a visual inspection to ascertain that sterilizing indicators have made the required colour change, and that the load is dry.
The load shall be rejected if:

a. The package has been compressed.
b. The package is torn.
c. The load is suspected to be wet.
d. The load fell on the floor.
e. Condensed drops can be detected on the load.

To avoid injuries use heat resistant gloves while unloading the autoclave.

11. DOOR SAFETY SYSTEM

The door safety consists of two safety means:

11.1 Pressure switch and Locking solenoid

While at "stand-by" mode and the pressure in the chamber is less than 10 kPa above ambient pressure, the solenoid's pin is retracted.

The autoclave is equipped with a NC 10 kPa (1.4 psi) pressure switch that is connected to the chamber. When the pressure switch senses pressure of 10 kPag (1.4 psig) it disconnects the electrical command of the locking solenoid to avoid accidental opening of the door.

12. SERVICE AND MAINTENANCE

12.1 Preventive Maintenance

The maintenance operations described in this chapter must be fulfilled periodically in order to keep the autoclave in good working condition and to reduce the breakdown time to a minimum.
The user's maintenance personnel, according to the following instructions can easily execute these operations.
The owner of the autoclave is responsible to order an authorized technician to perform the periodical tests and preventive maintenance operations, as specified in the technician manual.
Use only mineral-free water as detailed in sec. 3.11 (water quality).

Warning
Before carrying out any preventive maintenance operation, ensure that the electrical cord is disconnected and there is no pressure in the autoclave.

12.1.1 Daily

Clean the door gasket with a soft cloth. The gasket should be clean and smooth.

12.1.2 Weekly

1. Remove the baskets (if applicable). Clean the chamber and baskets with a cleaning agent & water and with a cloth sponge. You may use diluted Chamber Brite™ solution as cleaning agent. To prepare this solution, pour one bag of Chamber Brite™ into 3/4 – 1 liter of warm mineral-free water. Immediately after cleaning, rinse the baskets and the chamber's interior with water to avoid stains on the metal.

Caution
Do not use steel wool or steel brush as this can damage the chamber!

2. Put a few drops of oil on the two door pins and door tightening bolts.
3. Clean outer parts of the autoclave with a soft cloth.
4. Drain out the vessel and clean the electrode with a soft cloth.

12.1.3 Periodically

1. Every 6 months replace the air filter, (if installed) (to be done by an authorized technician).
2. Check the door gasket every 12.
3. Once a year check and tighten the piping joints to avoid leakage (to be done by an authorized technician).
4. Once a year check and tighten all screw connections in the control box, heaters, valves and instrumentation (to be done by an authorized technician).

12.1.4 Periodical Tests

1. Once every month activate the safety valve (see sec. 12.2).

12.2 Checking the Safety Valve

The safety valve is located on the rear side of the autoclave
In order to prevent the safety valve from a blockage, operate it once a month.

12.2.1 PED-approved type safety valve

Operate the sterilization cycle according to the manual.

Allow a pressure of approximately 200 kPa (29 psi) to build up in the chamber.

Turn the safety valve pressure-regulating nut clockwise for 2 seconds. Be careful not to burn your hands.

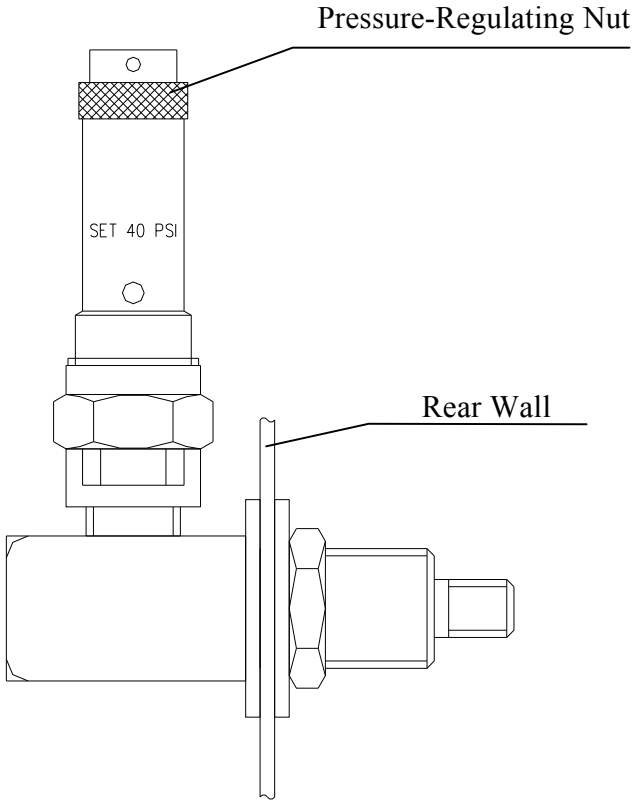
Return the nut to its original position.

Press the **STOP/STOP** key to interrupt the operation, and exhaust steam from chamber.

Wait until the pressure decreases to zero, only then can the door be opened.

Attention:

Use protective gloves in order not to burn your hands with the hot steam.



12.2.2 ASME-approved type safety valve

Operate the sterilization cycle according to the manual.

Allow a pressure of approximately 200 kPa (29-psi) to build up in the chamber.

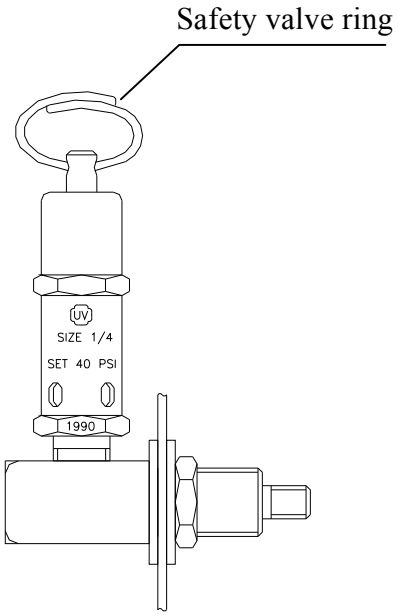
Operate the safety valve by pulling the ring of the safety valve using a tool, i.e. screwdriver, hook etc and lift the safety valve ring for 2 seconds. Be careful not to burn your hands.

Press the **STOP/STOP** key to interrupt the operation, and exhaust steam from chamber.

Wait until pressure goes down to zero, only then can the door be opened.

Attention:

Use protective gloves in order not to burn your hands with the hot steam.



13. TROUBLESHOOTING

This troubleshooting chart enables the user to solve minor malfunctions, prior to contacting our service department.
Only technical personnel having proper qualifications and holding technical documentation (including a technician manual) and adequate information are authorized to service the apparatus.

Message / Symbol / Problem	Failure Description	Corrective Action
The machine is not responding	1 The main switch is in 'OFF' position. 2 The power cord is disconnected from the machine or the mains. 3 The circuit breaker has tripped.	1 Turn the main switch to the 'On' position. (see front view drawing). 2 Make sure the power cord is connected properly to the machine and the mains. (see rear view drawing) 3 Lift the circuit breaker lever.
The printer prints, but nothing is printed on the paper.	1 The Paper roll is not installed in the right way. (see sec. 8.2, Printer handling)	1 Install the paper roll in the right way. Only one side of the paper is printable. (see sec. 8.2, Printer handling)
The printer does not print.	1 No paper is inserted in the printer. (see sec. 8.2, Printer handling) 2 No obvious reason.	1 Make sure the paper roll is inserted in the printer. (see sec. 8.2, Printer handling) 2 Switch off the machine and switch it back on for restart
The machine is leaking at the door	1 The door gasket is dirty. (see sec. 12.1.1, daily maintenance) 2 The door gasket is damaged.	1 Clean the door gasket. (see sec. 12.1.1, daily maintenance). 2 call for service.
Low Temp	This message is displayed if the temperature drops for more than 1 second below the sterilization temperature during sterilization cycle.	Perform a new cycle.
High Temp	This message is displayed if the temperature raises 7°F (4°C) above sterilization temperature during the sterilization stage for 2 seconds during sterilization cycle.	Perform a new cycle.
High Temp. (Ending)	This message is displayed if the system cannot reach the required temperature, in the chamber, within 10 minutes.	Perform a new cycle.
High Temp. (Cooling)	This message is displayed if the system cannot reach the required temperature, in the cooling stage, within preset time.	Check and fix the city (tap) water supply.

Message / Symbol / Problem	Failure Description	Corrective Action
Heat Time Error	This message is displayed if the system cannot reach the required temperature, in the chamber, within the preset time.	Verify that the autoclave is not overloaded.
Heat Time Error (Keep)	This message is displayed if the system cannot reach the required temperature, in the chamber, during the optional "Keep Heat" stage, within the preset time.	Verify that the autoclave is not overloaded.
Low Pressure	This message is displayed if Chamber Pressure drops below the sterilization pressure (134°C = 304 kPa, 121°C = 205 kPa) for 2 seconds during the sterilization stage.	Perform a new cycle.
Low Pressure (Cooling)	This message is displayed if the pressure in chamber does not reach the preset pressure before initiating the cooling stage.	Check and fix the compressed air supply.
High Pressure	This message is displayed if Chamber Pressure raises 4.2 psi-29 kPa above sterilization pressure (134°C = 304 kPa, 121°C = 205 kPa) for 2 seconds during the sterilization stage.	Perform a new cycle.
High Pressure (Ending)	This message is displayed if the system cannot reach atmospheric pressure ± 5kPa during the ending stage.	Perform a new cycle.
High Pressure (Exhaust)	This message is displayed if the system cannot reach preset pressure within 10 minutes from the beginning of the exhaust stage.	Perform a new cycle.
Pressure Time Error	This message is displayed if the system cannot reach the required pressure conditions in the chamber, after preset time, during the air removal stage.	Verify that the autoclave is not overloaded.
RTC Error - Please Set Current Date and Time	This message is displayed in order to set the date and the time.	Set Current Date And Time. If the problem persists, call the technician.
Time Error	This message is displayed if the real time clock is faulty.	Call the technician.
Door is open (During the cycle)	This message is displayed when the door is open: During the cycle.	Close the door to perform a new cycle.
Canceled By User	This message is displayed after the START/STOP key is pressed and cycle aborted.	Wait until "cycle failed – canceled by user" or "cycle end – canceled by user" is displayed. Perform a new cycle.

Message / Symbol / Problem	Failure Description	Corrective Action
Cycle Failed 	This message and symbol are displayed if an error occurs before sterilization cycle is completed.	Perform a new cycle.
Air Error	This message is displayed at the end of the cycle If the autoclave does not reach the atmospheric pressure after 10 minutes.	Wait until the autoclave reaches the atmospheric pressure and perform a new cycle.
Compressed air supply error	This message is displayed in case of a compressed air supply malfunction.	Check and fix the compressed air supply.
Periodical check time exceeded - Please call for service	The periodical maintenance time has passed.	Call for service.
Cycle counter exceeded - Please call for service	Number of cycles, since last periodical maintenance, exceeded the preset number as defined by "cycle counter" parameter.	Call for service.
Power Down	This message is displayed if power down has occurred during the cycle. (this message will print out in the printer after the autoclave will turn on).	Turn on the autoclave and wait until the autoclave is ready (reaches the safe condition) and perform a new cycle.
Supply distilled water error (digitat input option)	This message is displayed in case of a mineral free water supply malfunction.	Check and fix the mineral free water supply
Supply water error (digitat input option)	This message is displayed in case of a city (tap) water supply malfunction.	Check and fix the city (tap) water supply.
Compressed air supply error (digitat input option)	This message is displayed in case of a compressed air supply malfunction.	Check and fix the air supply.
No Water	This message is displayed if the electrode in the chamber did not sense water within the preset time.	1. check and fix the mineral free water supply. 2.check and clean the water inlet filter. 3. Clean the water level electrode.

BASKETS AND CONTAINERS

Container for waste products **High Basket** **Low Basket**

Type	Stainless steel wire baskets		Stainless steel container for waste products, with vent holes	
Model	**Dia. x Height (mm)**	**Capacity**	**Dia. x Height (mm)**	**Capacity**
5050	465 x 235	2	474 x 350	1
	465 x 350	1	474 x 235	2
5075	465 x 350	2	474 x 350	2
	465 x 235	3	474 x 235	3

14. SPARE PARTS LIST

Description	Cat. No.
Cap for ¼" strainer	FIL175-0027
Strainer element	FIL175-0046
Teflon gasket 4 mm	GAS082-0008

15. ACCESSORIES

Description		Cat. No.
Printer, PLUSII-S2B-0004		THE002-0052
Stainless steel wire basket	High	BSK507-0001
	Low	BSK507-0003
Stainless steel container for waste products, with vents holes	High	BSK507-0009
	Low	BSK507-0002