NÜVE SANAYİ MALZEMELERİ İMALAT VE TİCARET A.Ş.

NC 150 / NC 150D

STEAM STERILIZERS

USER'S MANUAL

CE 1984

Z14 K25 149 Rev.No: 09 Rev.Tarihi: 01/2019

Dear Nüve User,

We would like to take this opportunity to thank you for preferring this Nüve product. Please read the operating instructions carefully and keep them handy for future reference.

Please detain the packing material until you see that the unit is in good condition and it is operating properly. If an external or internal damage is observed, contact the transportation company immediately and report the damage. According to ICC regulations, this responsibility belongs to the customer.

While you are operating the instrument please;

1. obey all warning labels,
2. do not remove warning labels,
3. do not operate damaged instrument,
4. do not operate instrument with a damaged cable,
5. do not move instrument during operation.

In case of a problem contact your Nüve agent for an authorized service or maintenance.

The validity of the guarantee is subject to compliance with the instructions and precautions described in this manual.

Nüve reserves the right to improve or change the design of its products without any obligation to modify previously manufactured products.

NÜVE
SANAYİ MALZEMELERİ
İMALAT VE TİCARET A.Ş.

Saracalar Mah. Saracalar Kümeevleri No: 4/2
Akyurt 06750
Ankara / TÜRKİYE
Tel : (90.312) 399 28 30 (pbx)
Fax : (90.312) 399 21 97
Sales : sales@nuve.com.tr
Technical Service: nuveservice@nuve.com.tr

WARRANTY CERTIFICATE

1. Nüve warrants that the equipment delivered is free from defects in material and workmanship. This warranty is given for a period of two years. The warranty period begins from the delivery date.
2. Warranty does not apply to parts normally consumed during operation or general maintenance or any adjustments described in the operating instructions provided with the instrument.
3. Nüve does not accept any liability in case where the goods are not used in accordance with their proper intent.
4. The warranty may not be claimed for damages incurred during the shipment, for damages resulting from improper handling or use, abuse, fire, liquid spillage, tampering or unauthorized repairs by any persons, use of defective or incompatible accessories, exposure to abnormally corrosive conditions, use of the product in non-standard environmental conditions, including but not limited to failure to meet requirements of ambient temperature, lubrication, humidity or magnetic field influences, from the defects in maintenance, negligence, bad functioning of auxiliary equipment, in the case of force majeure or accident and incorrect power supply.
5. Any injury, loss or damage caused; due to a failure resulting from negligence of the instructions given in this manual; is beyond the scope of the warranty conditions.

☞ **BEFORE OPERATING THE INSTRUMENT THIS MANUAL SHOULD BE READ CAREFULLY.**

☞ **THE VALIDITY OF THE GUARANTEE IS SUBJECT TO THE OBSERVATION OF THE INSTRUCTIONS AND PRECAUTIONS DESCRIBED IN THIS MANUAL.**

PLEASE REGISTER ONLINE TO VALIDATE YOUR WARRANTY:

To register your warranty online, please visit our webpage **www.nuve.com.tr** and fill in the **"Warranty Registration Form"**.

ELECTROMAGNETIC COMPATIBILITIY DECLARATION

Guidance and Manufacturer's Declaration – Electromagnetic Emissions		
NC series are intended for use in the electromagnetic environment specified below. The customer or the user of this NC series should assure that it is used in such environment.		
Emissions test	**Compliance**	**Electromagnetic Environment - Guidance**
RF Emissions CISPR 11	Group 1	The NC series uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class B	The NC series are suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Compliance	

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
NC series are intended for use in the electromagnetic environment specified below. The customer or the user of this nebuliser should assure that it is used in such environment.			
Immunity Test	**IEC 60101-1 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±4 kV contact ±8 kV air	±4 kV contact ±8 kV air	Floor should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.

Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial and/or hospital environment.
Surge IEC 61000-4-5	±1 kV line to line ±2 kV line to earth	±1 kV line to line ±2 kV line to earth	Mains power quality should be that of a typical commercial and/or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply IEC 61000-4-11	<0 % UT (>100 % dip in UT) for 1 cycle	<0 % UT (>100 % dip in UT) for 1 cycle	Mains power quality should be that of a typical commercial and/or hospital environment.
	40 % UT (60 % dip in UT) for 10 cycles	40 % UT (60 % dip in UT) for 10 cycles	
	70 % UT (30 % dip in UT) for 25 cycles	70 % UT (30 % dip in UT) for 25 cycles	
	<0 % UT (100 % dip in UT) for 5 sec.	<0 % UT (100 % dip in UT) for 5 sec.	
Power frequency (50/ 60 Hz) magnetic field IEC 61000-4-8	30 A/m	30 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the A.C. mains voltage prior to application of the test level.			

Guidance and Manufacturer's Declaration – Electromagnetic Immunity			
NC series are intended for use in the electromagnetic environment specified below. The customers or the users of this nebuliser should assure that it is used in such environment.			
Immunity Test	**IEC 60101-1 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the NC series devices' including cables, than the recommended separation distance calculated from the equation appropriate to the frequency of the transmitter. Recommend separation distance:
Conducted RF IEC 61000-4-6	3 V_{rms} 150 kHz to 80 Mhz	3 V_{rms}	d=1.2 √P 150 KHz to 80 MHz
Radiated RF IEC 61000-4-3	10 V_m 80 MHz to 1 GHz	10 V/m	d=1.2 √P 80 MHz to 800 MHz
Radiated RF IEC 61000-4-3	3 V_m 1.4 GHz to 2 GHz	3 V/m	d=1.2 √P 80 MHz to 800 MHz
Radiated RF IEC 61000-4-3	1 V_m 2 GHz to 2.7 GHz	1 V/m	d=2.3 √P 800 MHz to 2.7 GHz
			Field strengths from fixed RF transmitters as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:

			
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
a Field strengths from fixed transmitters, such as base stations for radio (cellular/ cordless) telephones and land mobile radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the NC series are used exceeds the applicable RF compliance level above, the NC series should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the NC series.			
[b] Over the frequency range 150 kHz to 80MHz, field strengths should be less than 3 V/m.			

Recommended separation distance between portable and mobile RF communications equipment and the NC series

NC series are intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customers or the users of these NC series can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the NC series as recommended below, according to the maximum output power of the communications equipment.

Output Power of Transmitter in Watt	**Separation distance according to frequency of transmitter in Output Power of meter**		
	80 MHz - 1 GHz d = 1,2 √P	1.4 GHz - 2 GHz d = 1.2 √P	2 GHz - 2.7 GHz d = 2.33 √P
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.2	1.17	2.33
10	3.79	3.69	7.37
100	11.67	11.67	23.33

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1: At 80MHz and 800MHz, the separation distance for the higher frequency range applies

NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

CONTENT

1. INTRODUCTION

1.1. USE AND FUNCTION

NC 150 and NC 150D steam sterilizers are designed to use in operating theatres and laboratories of hospitals; in medicine and dentistry faculties of universities; biology, veterinary and agriculture departments of universities; microbiology and quality control laboratories of industry as food and biotechnology.

NC 150 and NC 150D steam sterilizers use saturated steam to sterilize. They are used to sterilize wrapped or unwrapped solid products, porous products, hollow load products, metal, glass, and rubber material.

NC 150 and NC 150D steam sterilizers, which are suitable for the loads mentioned above, have 7 preset programs for sterilization temperatures of 136°C, 134°C, 125°C and 121°C and 2 test programs. In addition, NC 150 and NC 150D have 10 special programs for sterilization temperatures of 136°C, 134°C, 125°C and 121°C; one program for liquid sterilization; and one program for drying.

The steam is produced by the steam generator. The jacket system which surrounds outside of the chamber provides temperature homogeneity. Jacket system is also used for pre-heating which helps to decrease total sterilization cycle duration.

All programs operate full-automatically without user's interference.

NC 150 and NC 150D steam sterilizers have several safety functions with its integrated safety thermostat, safety valve and surface thermostat in addition to the safety features of the control system (i.e. high pressure, high temperature).

NC 150 and NC 150D steam sterilizers are designed and manufactured in accordance with international directives and EN 285, EN 61010-1, EN 61010-2-040, EN 60601-1-6, EN 61326-1, EN 62304, EN 62366-1, EN ISO 14971, EN 50419, EN ISO 15223-1, EN 12100 and EN 13445 standards under the supervision of total quality management systems ISO 9001 and ISO 13485.

This device is in compliance with WEEE Regulation.

Do not operate the instrument for purposes other than main purpose.

This instrument is only to be used by authorized people after the user manual has been read.

If the warnings mentioned in this manual are not considered, NUVE will not be responsible from their results.

2. TECHNICAL SPECIFICATIONS

2.1. TECHNICAL SPECIFICATIONS TABLE

Technical Specifications	NC 150	NC 150D
Usage Method	Single Door	Double Door
Power supply	400 VAC	
Frequency	50-60 Hz.	
Power Consumption	11,5 kW	
Chamber Material	316L Stainless Steel	
Steam Generator Material	316L Stainless Steel	
Memory	30000 cycle	
Number of Preset Programs	7	
Special Programs	1 liquid,1 drying, 10 special	
Sterilization Temperatures	121°C – 125°C – 134°C – 136°C	
Maximum Chamber Pressure	3,0 Bars	
Maximum Generator Pressure	3,0 Bars	
Sterilization Time	1 – 99 minutes	
Number of Pre-Vacuum	1 – 4	
Drying Time	0 – 30 minutes	
Stand-by	20 – 999 minutes / HOLD	
Temperature Sensors	Pt-100	
Control System	**N-SmArt$_{TM}$** Programmable Microprocessor	
Display	Full-color LCD	
USB	Standard	
Ethernet	Standard	
RS 232	Standard	
Test Programs	Vacuum Test, Bowie&Dick Test	
Chamber Volume	150 Liters	
Chamber Dimension (diameter x depth) mm	Ø496 x 880	Ø496 x 777
External Dimension (W x D x H) mm	670 x 1010 x 1580	670 x 1030 x 1580

2.2. ACCESSORIES

F 06 048 Microbiological Filter
A 08 209 Loading cart for shelf and STU carrier
A 08 210 STU carrier and 1 pc. STU
A 08 211 Shelf carrier and 6 shelves(4 pc. 420x740 mm, 1 pc. 275x740 mm, 1 pc. 330x740)

OPTIONAL ACCESSORIES

S 09 026 Basket (300x600x300mm)
A 08 104 Printer paper
A 08 191 GSM alarm module
A 08 XXX **NuveCloser^{TM}** Software CD with 3 m. RS 232 cable
A 08 225 Water Softening Unit
A 08 233 Sterilization bag sepatation wire rack

3. PRECAUTIONS AND LIMITATIONS ON USE

The user shall pay attention to the following:

- Do not operate the instrument for purposes other than its main purpose.
- Handling, transportation, installation, first operation, service and maintenance should be handled by authorized personnel appointed by the manufacturer.
- The instrument should only be used by authorized and trained staff after the instruction manual has been read carefully. Only authorized technical staff can handle the product in case of a failure.
- Installation place must be durable for device weight and isolated for vibration.
- Electricity line is suitable for the power of device and correctly grounded power supply should be used.
- NC 150 and NC 150D steam sterilizers are suitable for the sterilization of the textiles, rubber, glass, plastics; all of which are resistant to high pressure and temperature. Materials other than these and heat susceptible objects, explosive, flammable, adhesive and fusible materials **shall not be used.**
- The liquid to be sterilized in the NC 150/NC 150D sterilizer should have a boiling point of 100 ° C at sea level at 760 mmHg (1 atm) atmospheric pressure.
- Prior the sterilization, to be sterilized materials should be cleaned and disinfected.
- The load which would be sterilized should withstand to the applied sterilization temperature. Proper sterilization program shall be selected in accordance with the load type.
- Make sure that nothing left on the door gasket. If something is left, it will cause rising steam and can imperil the sterilization.
- Do not attempt to open the door during the operation.
- Do not touch the body of sterilizer during operation as it can be hot.
- Wear the protective gloves while taking the sample out after sterilization.
- If there is “OPEN DOOR” warning on the display when the door is closed, ensure that the door is fully closed.
- Only original spare parts and original accessories supplied by Nüve should be used.
- Only authorized technical staff can handle the product in case of a failure. Incorrect attempts may cause severe damages.

4. SYMBOLS AND LABELS

	Symbol in the operating instructions: Attention, general hazard area. This symbol refers to safety relevant warnings and indicates possibly dangerous situations. The non-adherence to these warnings can lead to material damage and injury to personal.
	Notified Body: KİWA BELGELENDİRME HİZMETLERİ A.Ş. (İTOSB) İstanbul Tuzla Organize Sanayi Bölgesi Tepeören Mevkii 34957 Tuzla-İstanbul / TURKEY
	Symbol in the operating instructions: This symbol refers to important circumstances.
	Type B protection.
	To identify the manufacturer of a product.
	To indicate the date on which a product was manufactured.
	This product is subject to the directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) of the European Parliament and of the EU Council of Ministers.
	Before operating the instrument this manual should be read carefully.

Labels on the product:

CE 1984

5. INSTALLATION

5.1. ENVIRONMENTAL CONDITIONS

The instrument is designed to operate safely under the following conditions:

- Indoor use only
- Ambient temperature: 5°C to 40°C
- Maximum relative humidity for temperature up to 31°C: 80%
- Maximum altitude: 2000 m
- Temperature for maximum performance: 15°C / 25°C

5.2. HANDLING AND TRANSPORTATION

All handling and transportation must be carried out by using proper equipment and experienced staff. The instrument must be supported underneath and never be turned upside down.

5.3. UNPACKING

Remove the cardboard box packing and the second nylon wrapping around the instrument. Ensure that no damage has occurred during transportation. The below mentioned are provided with the instrument, please check them;

- 1 ea. user's manual and warranty
- 1 ea. microbiological filter
- 1 ea. 3-phase plug and socket
- 1 ea. union
- 1 pc and 2m of grey water hose(Z12.H 10 038)
- 6 ea. tray

5.4. MAINS SUPPLY

The instrument requires 400 V, 50/60 Hz. (3-phases+N+G)

Please make sure that the supplied mains matches the required power ratings which are written

on the name of plate of the instrument located at the back of the instrument.

⚠	Always plug-in the instrument to correctly grounded sockets.

⚠	A supply fitted with a circuit breaker should be used for protection against indirect contact in case of isolation fault.

☞	The steam sterilizer NC 150D is a double door sterilizer and installation should be handled as shown in Figure 1.

5.5. POSITIONING

- Check that the positioning is suitable for the usage purpose and users.
- Check that the instrument is stable on its four pedestals.
- The area where the instrument is positioned should be resistant to the weight of the instrument and vibration free.
- Check that the user will be able to follow up the operation even when he deals with something else.
- Check that the positioning of the device prevents interference with other equipment in the near surrounding.
- The place where NC 150D would be installed should have two rooms as shown in Figure 1; one room for loading nonsterile items and one room for unloading sterile items.

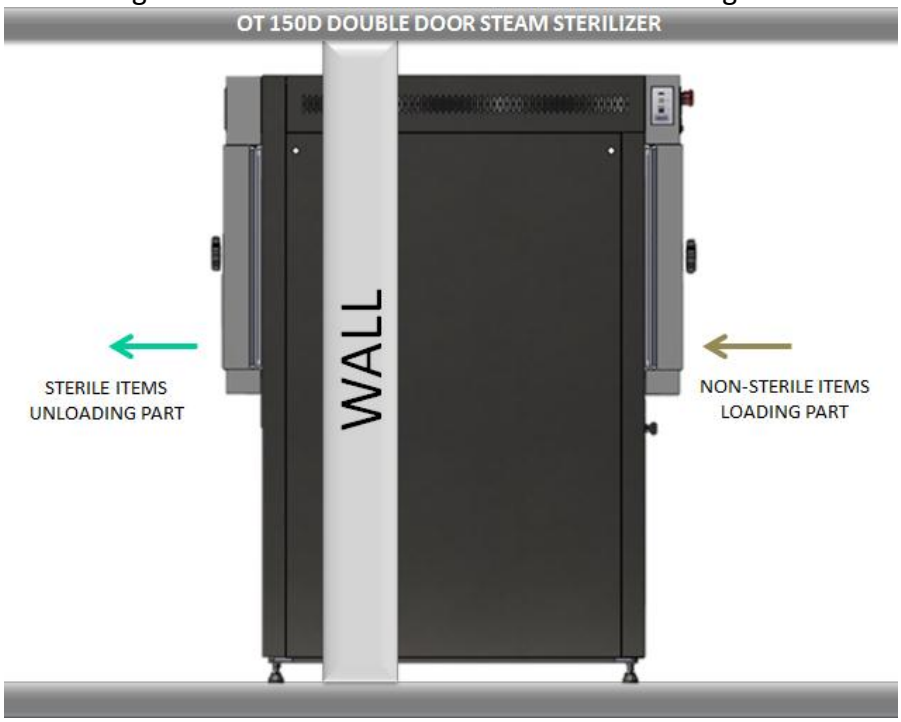


Figure 1

5.6. GENERAL PRESENTATION

Figure 2

Figure 3

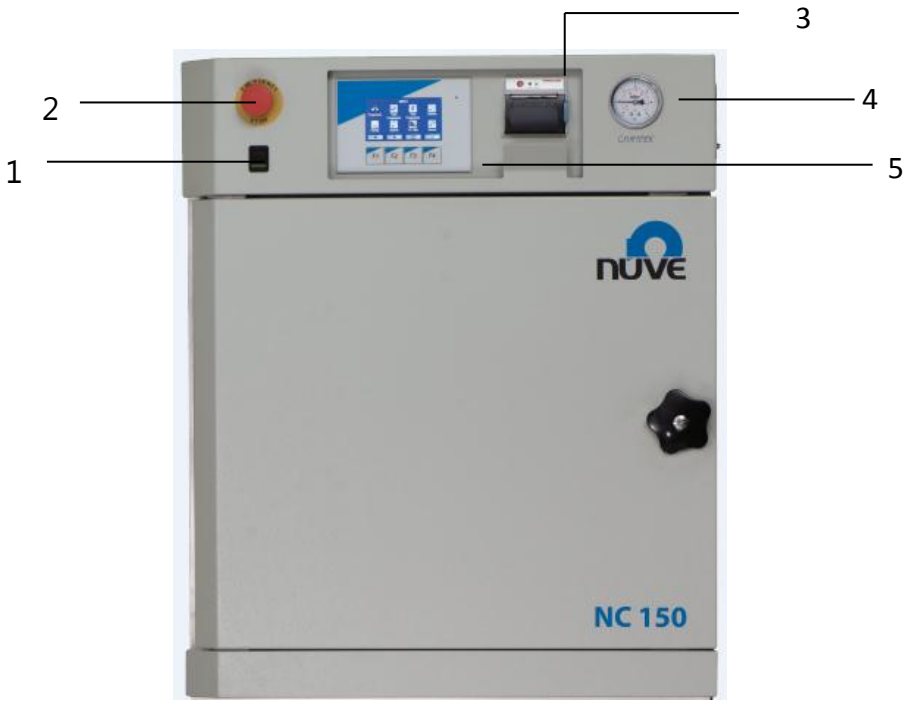
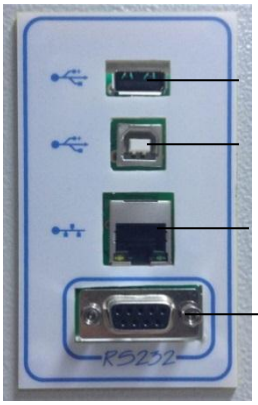


Figure 4



Communication Unit (6)

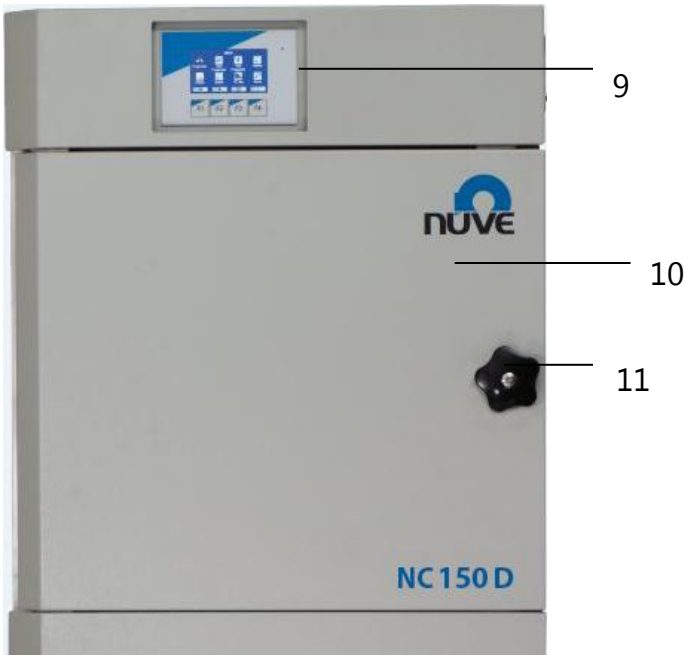


Figure 5

1- **Power Switch:** Puts the unit on and off power.

2- **Emergency Stop Button:** Stops all the control functions of the unit. When it is pushed, the sterilizer immediately stops and if there is pressure in the chamber, it would be automatically released. If the chamber is under vacuum, the vacuum would be broken. Then, the pressure within the gasket channel will be released.

3- **Panel Type Printer:** A thermal printer that is used to print the completed program or any program recorded in the memory. The output involves parameters such as the sterilization phases, pressure-temperature data during sterilization phases' time and installation settings.

4- **Chamber Manometer:** Shows pressure in the chamber.

5- **Loading Door Control Panel:** It is user interface and used to configure settings of sterilizer. The display is full-color LCD with 480x272 pixels resolution and controlled by four keys.

6- **Communication Unit:** Four outlets on communication unit can be used for saving data, remote control and software update.
USB Port-1: It is used for data saving and software update via USB stick.
USB Port-2: It is used to connect sterilizer to a computer for PC communication software.
Ethernet: It is used for remote control and sending e-mail in case of any failure.
RS 232: It is used to connect sterilizer to a computer for PC communication software. Optional GSM module is also connected to this port.

7- **Loading Door:** The door is used to load materials to be sterilized. (It is also unloading door for NC 150.)

8- **Loading Door Locking Knob:** It is used for opening the loading door.

9- **Unloading Door Control Panel:** It is user interface and used to monitor operation phases of sterilizer and to open unloading door. The display is full-color LCD with 480x272 pixels resolution and controlled by four keys. (Only for NC 150D)

10- **Unloading Door:** The door is used to unload sterile materials. (Only for NC 150D)

11- **Unloading Door Locking Knob:** It is used for opening the unloading door. (Only for NC 150D)

5.7. CONTROL PANEL

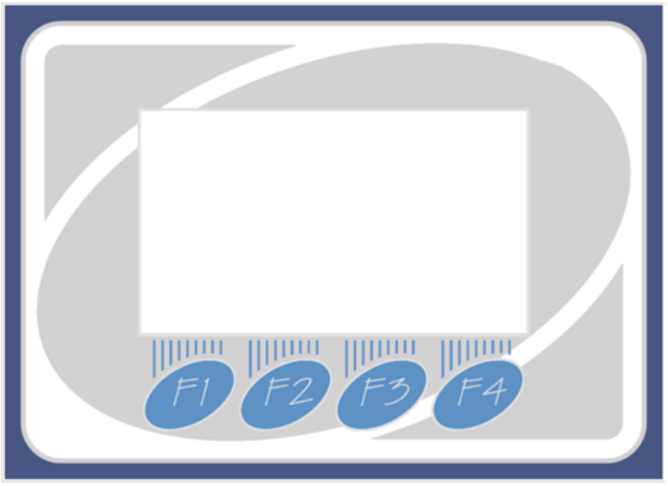


Figure 6

The functions of F1, F2, F3 and F4 keys depend on the meaning of the corresponding symbol appearing on the display. The following table shows the meaning of these symbols.

	This symbol denotes the menu. You can enter the menu by pushing the key corresponding to this symbol.
°C / Bar	This symbol denotes temperature and pressure. When the key corresponding to this symbol is pushed, the screen which shows temperature and pressure values of all sensors in sterilizer.
	This symbol denotes the graph screen. Temperature and pressure values of a sterilization cycle can be monitored on a graph by pushing the key corresponding to this symbol.
	This symbol denotes the door lock. On stand-by, door is unlocked when the key corresponding to this symbol is pushed.
Start	This symbol denotes the start key. When the key corresponding to this symbol is pushed, the chosen sterilization program would start.
Stop	This symbol denotes the stop key. When the key corresponding to this symbol is pushed, the chosen sterilization program would stop.
	This symbol denotes backspace. You can return the previous page or exit from the page by pushing the key corresponding to this symbol.
	This symbol denotes the value increase key. You can increase the value by pushing the key corresponding to this symbol while adjusting the numerical values such as temperature or password. It is also used to select next menu item.
	This symbol denotes the value decrease key. You can decrease the value by pushing the key corresponding to this symbol while adjusting the numerical values such as temperature or password. It is also used to select previous menu item.
	This symbol denotes the left key. It appears on the main menu and graph screen. On main menu, previous menu item is chosen when the key corresponding to this symbol is pushed. On graph screen, the previous graph appears when the key corresponding to this symbol is pushed.
	This symbol denotes the right key. It appears on the main menu and graph screen. On main menu, next menu item is chosen when the key corresponding to this symbol is pushed. On graph screen, the next graph appears when the key corresponding to this symbol is pushed.

	This symbol denotes enter key. It is used for approval of adjustments.
	This symbol denotes the tab key. When the key corresponding to this symbol is pushed, next item would be selected.
	This symbol denotes settings and it appears only on special programs page. When the key corresponding to this symbol is pushed, the page to set special program parameter is accessed.

5.8. PRIOR TO OPERATION

5.8.1. CONNECTION TO MAINS

- The unit is fed by 3-phased network supply.
- Plug-in the device to correctly grounded socket.

☞	The panel board where the socket is connected shall be fuse protected.

5.8.2. CONNECTION TO WATER SUPPLY

- There is a water supply line and a waste water discharge line on the device.
- Recommended to connect the water inlet line to a water softening unit. It shall be always kept in mind that the supply water quality has a direct effect on the lifetime of the equipment.
- The waste water discharge line shall be connected to the general drain system. The piping of the drain system shall be resistant to a water flow at 85°C.

⚠	Distilled water conductivity value to be used in the device must be at least 20 µS.
⚠	Irreparable damage may occur if water softening system is not used. In case of not using water softening unit, the damage occurred would be user's responsibility.

5.8.3. ATTACHING MICROBIOLOGICAL FILTER

Mount the microbiological filter (Figure 8) provided with the device to the top of the device where the filter fitting point is.

Figure 7

5.8.4. STERILIZATION PROGRAMS

NC 150 and NC 150D steam sterilizers, have 7 preset programs; **Resistant Textile, Wrapped Porous, Prion, Quick, Resistant Rubber, Sensitive Material** and **Gravity**. Loading methods is explained below. How to set preset and special programs is explained in Section 6.2.2.

Resistant Textile: Wrapped (single wrapped or double wrapped), or unwrapped textile materials that are resistant up to 136°C can be loaded, if resistant textile program is chosen.

Wrapped Porous: Wrapped (single wrapped or double wrapped), or unwrapped materials that are resistant up to 134°C can be loaded, if wrapped porous program is chosen.

Prion: Wrapped (single wrapped or double wrapped), or unwrapped materials or tools (solid tools as metals on which water do not accumulate) that are resistant up to 134°C can be loaded, if wrapped porous program is chosen.

Quick: When drying is not important, unwrapped tools (solid) that are resistant up to 134°C can be loaded, if quick program is chosen.

Resistant Rubber: Wrapped (single wrapped or double wrapped), or unwrapped tools (solid) that are resistant up to 125°C can be loaded, if resistant rubber program is chosen.

Sensitive Material Wrapped (single wrapped or double wrapped), or unwrapped heat-sensitive materials as textile or tools (solid tools as metals on which water do not accumulate) that are resistant up to 121°C can be loaded, if gentle program is chosen.

Gravity: Unwrapped heat and vacuum sensitive materials that are resistant up to 121°C can be loaded, if gravity program is chosen.

Before starting the device, pre-heating must be activated (See Section 7.3.1). Pre-heating helps to heat the load and prevent condensation.

Follow the instructions for loading, otherwise the efficiency of the device decreases and it gives error.

5.8.5. PACKAGING

In order to store sterile items for a long time, items should be packed prior to sterilization. Correct packaging of the materials is essential in ensuring that sterility is maintained.

The followings can be used as containers: metal containers with lids or perforated bottoms with filters in paper, pouches in paper or polypropylene, medical paper or trays that are perforated or with grilles. Pouches in paper-polypropylene, packaging system gives good results only for the steam sterilization of instruments or small surgical instruments.

Medical grade paper and pouches in paper-polypropylene cannot be sterilized again and protection characteristics of life is not very long.

For packaging, observe the following recommendations (for pouches in paper-polypropylene):

- Contents must not exceed ¾ of the volume of the pouch.
- The instruments must be positioned so that they can be extracted by their handle.
- The sealing strip on the pouch must be continuous with a height of at least 6 mm.

☞ Use materials that comply with **EN 868-1** for packaging the materials to sterilize

Each packaged prepared must at least indicate the date of sterilization, the type of cycle performed and the date in which the preservation of sterility expires. This latter value must be established considering the length of preservation of sterility as indicated by the manufacturer of the packaging material, the internal procedure used and stocking conditions of the sterilized material itself.

Instruments packaged in individual pouches have a life (in terms of sterility) of 30 days, those in double pouches of 60, if kept in closed cabinets. These values are, in any case, to be considered indicative, in that the date of preservation is influenced by various factors, as the environmental microbic level, the granulometry of environmental dusts (that act as carriers of micro-organism), as well as the temperature, pressure and ambient humidity parameters.

5.8.6. LOADING

☞ It is suggested to run a cycle at the beginning of each work-day without load.

The way in which the load to sterilize is arranged is also considerably important to sterility. Tested and valid methods are as followings:

⚠ Before sterilization process, to be sterile materials should be cleaned and disinfected. Used disinfectants effects should be cleaned carefully and thoroughly after the cleaning process. Uncleaned disinfectants can cause undesirable problems in the chamber during the sterilization phase.

⚠ Do not stack instruments on tray or in basket. Overloading could compromise sterilization.

- It is necessary to leave space between materials to be sterilized to allow for the circulation of steam during the sterilization phase and then to facilitate drying.
- Load supports can be used to facilitate the circulation of steam.
- Place a chemical sterilization indicator on each basket or tray.
- Position the instruments sufficiently distant from chamber walls and from one another.
- It is preferable that the sterilization container be made of aluminum, as this metal stores and conducts heat well, ensuring faster drying than other materials.
- Instruments made from different materials should be separated and placed to different baskets.
- To enable better drying, arrange such soft sterilization packages side-by-side and close to each other. Instruments should be placed to bags separately.
- When arranging sterilization containers, care should be taken that drops of condensate do not wet items being sterilized beneath, but can flow away to the base of the chamber. The

best arrangement is a stack of sterilization containers of the same size, so that condensate can flow down the sides.

Figure 8 - Stacked Sterilization Containers

- Textiles and instruments should not be sterilized together in one sterilization container. However, where this is unavoidable, the following rules should be observed:

    - Instruments and sterilization containers should be placed at the bottom.
    - Textiles should always be placed at the top.
    - If sterilization bags and instruments are loaded together, then instruments should be place at the bottom(Figure 8).
    - Bigger bags should be placed at the bottom; smaller bags should be placed at the top.

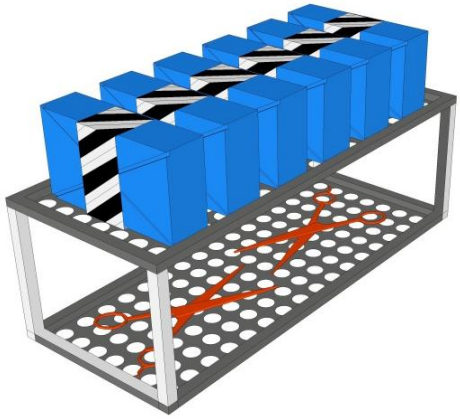


Figure 9

5.8.6.1. TEXTILES

When preparing textiles for treatment in the autoclave, care must be taken that the folds in the textiles are arranged in parallel, and that the items are packed side by side. This vertical configuration ensures that channels can form between the textile folds for the air to flow out and steam to flow in.

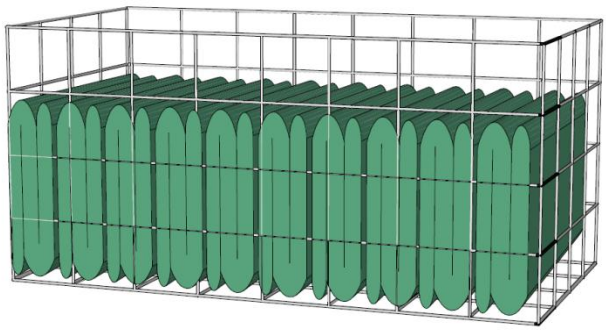


Figure 70 – Loading textiles properly

When loading sterilization containers with textile items, care should be taken ensure that they retain their vertical orientation. This would prevent the formation of flow channels for air and steam.

⚠	Do not stack textiles on the top each other as this hinders the penetration of steam into the packages of textiles.

5.8.6.2. INSTRUMENTS

- Ensure that instruments made from different materials are separated and placed on different trays. Stainless steel instruments and carbon steel instruments should not be sterilized to touch each other.
- Position the instruments sufficiently distant from one another that they remain separate for the whole sterilization cycle.
- Pay attention to the guidance of the manufacturer of the instrument.
- Where appropriate, instruments should be disassembled before placing them in the autoclave, as this will improve the drying results.
- Lubricants in the instruments (as instrument oil) can be hydrophobic and these are impenetrable for steam. In case of sterilization of these instruments, the sterilization may fail. Prior confirmation should be obtained from the manufacturer of such agents that they are in fact suitable for steam sterilization.
- Place the instruments in open position so that steam can penetrate more efficiently.

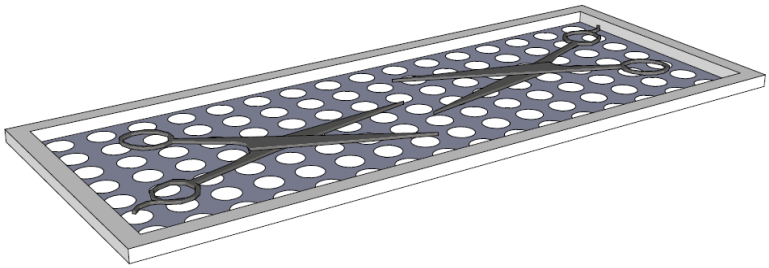


Figure 81

5.8.6.3. STERILIZATION BAGS

Sterilization packages can be sterilized either in sterilization containers or sterilization baskets. To enable better drying,

- Arrange soft sterilization packages vertically and side-by-side. This allows condensation to penetrate to the packages, while at the same time preventing possible bursting at the seams.
- Do not allow bags and chamber inside touch each other.
- Do not arrange packages as stacked.
- Insert tools into separate bags.
- While loading paper/plastic sterilization bags, place paper side of a paper/plastic bag towards paper side of the other bag. Place plastic side of paper/plastic bag toward plastic side of other bag.
- Ensure that space shall be left between sterilization bags.

6. OPERATING PRINCIPLES

6.1. OPERATION PHASES

PRE-VACUUM: As soon as the program is started, the pre-vacuum phase starts to operate. Pressure in the chamber decreases below ambient pressure by vacuuming the air in the chamber and steam is blown in to replace the volume of vacuumed air. This phase is repeated several times depending on the selected program.

HEATING: Steam is charged to the chamber to reach set steam temperature prior to sterilization.

STERILIZATION: The chamber temperature is kept at the required sterilization degree all through the sterilization phase.

STEAM DISCHARGE: The pressure in the chamber is decreased to the ambient pressure by discharging the steam in the chamber after the sterilization phase.

DRYING: Following the steam discharging, the pressure in the chamber decreases below ambient pressure and thus the humidity within the chamber is eliminated throughout the drying phase.

AIR INTAKE: Following the drying phase; ambient air passing through the filter is taken into the chamber to break the vacuum and raise the chamber pressure to ambient pressure.

☞	If the lid is not opened after the program is over, another program cannot start.

☞	When sterilization is completed, some condensate may be observed on the sterilized items. However, it does not show that the sterilization is unsuccessful. The German standard 'DIN 58953' Part 7 Section 7 comments on residual moisture on paper bags or transparent sterilization paper after sterilization: "..Small amounts of water on the surface of packages do not represent a cause for concern if they dry completely within thirty minutes after removal from a steam sterilization system...".

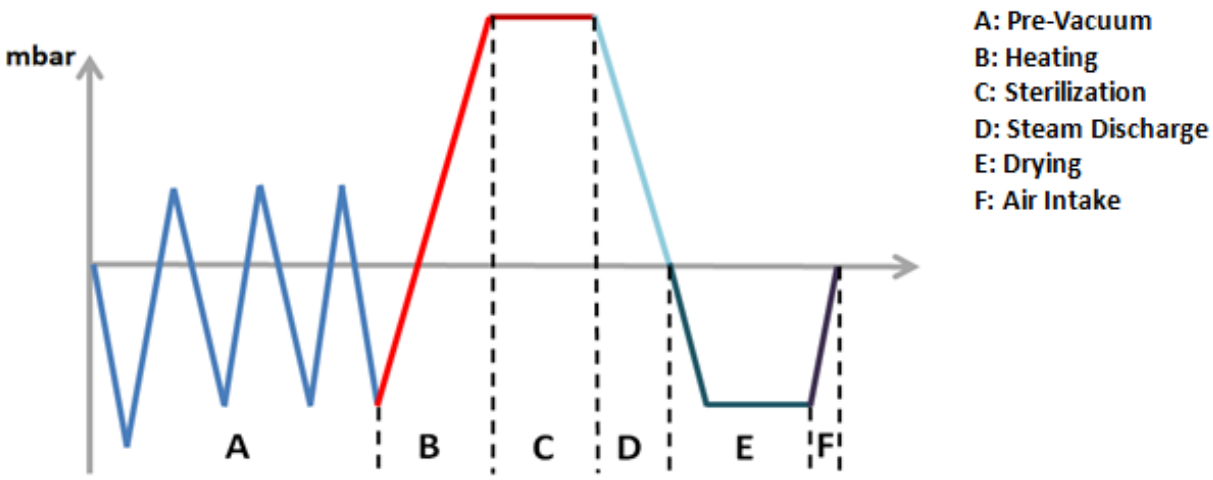
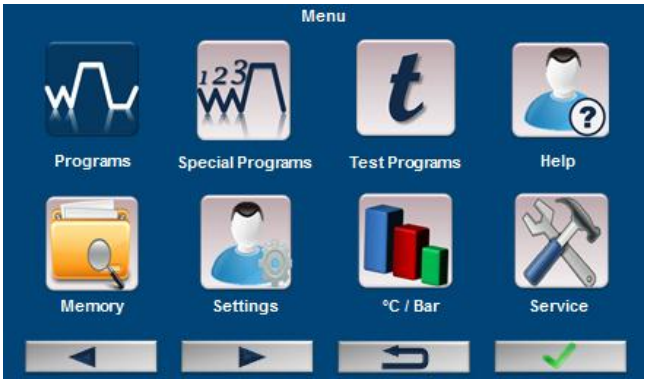
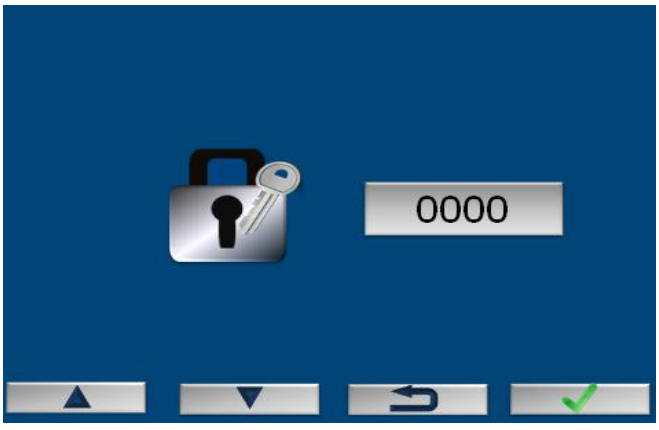


Figure 12

6.2. PROGRAMMING



See that display and control panel activates when the device is powered on. Firstly, the screen on the left appears. Use left (F1) and right (F2) keys to select a menu item. Selected menu item color changes to blue and enter (F4) key is used to access the selected menu item.



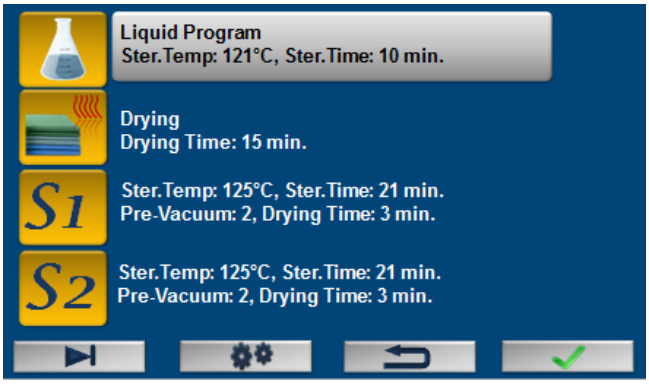
Password query screen on the left appears, while accessing to “Programs, Special Programs, Test Programs and Settings”. Enter password by using increase (F1) and decrease (F2) keys and push enter key (F4). The password is user password and it can be set on settings menu. The password is 0000 for the first use.

"Programs" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access programs page on the left. Use left (F1) and right (F2) keys to select the program to operate. Working screen appears when enter (F4) key is pushed on the selected program.

The screen on the left is working screen and on working screen sterilization chamber temperature and pressure values can be monitored. Current date and time are shown at the top line. Push enter (F4) key to start the selected program. When program starts to run, total sterilization cycle time and related sterilization cycle phase time appears at the top line.

Push "**°C / Bar**" key (F2) on the working screen to see the temperature and pressure sensor values which are placed in the different parts of the sterilizer. Back key (F3) is used to exit the screen. You may also access this page by using "**°C / Bar**" sub menu on main menu.

6.2.1. SPECIAL PROGRAMS



"Special Programs" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access special programs page on the left. Use tab (F1) key to select the program to operate. Working screen appears when enter (F4) key is pushed on the selected program.

Use the key (F2) corresponding to " " symbol to set the parameters of a special program.

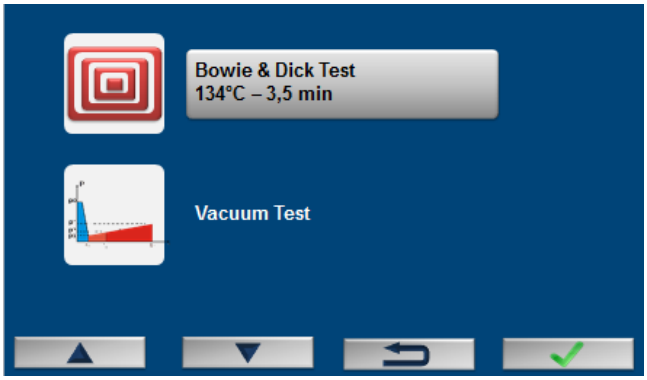
The screen on the left is special program parameter settings page. Use increase (F1) and decrease (F2) keys to change the value of the selected parameter. To change the selection to the next parameter, use tab (F3) key. After setting all parameters, push enter (F4) key to return special programs screen.

Working screen appears when enter (F4) key is pushed on the selected special program. Push start (F4) key on the working screen to start the selected program.

In liquid sterilization working, the sample temperature is not controlled by an external temperature sensor. Therefore, the sterilization parameters will be determined by the user. The assurance of product sterility in the special program is the responsibility of the user!

The parameters of a special program shall be set by user who should be authorized and have knowledge about sterilization and its phases. Incorrect setting of a special program may cause irreparable damages on the sterilizer and on sterilized items.

6.2.2. TEST PROGRAMS



"Test Programs" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access test programs page on the left. Use increase (F1) and decrease (F2) keys to select the test program to operate. Working screen appears when enter (F4) key is pushed on the selected test program. Push start (F4) key on the working screen to start the selected program.

6.3. DRYING PROGRAM

The NC series steam sterilizers provide very good drying standards for sterilized items. Particularly difficult drying tasks (e.g. double wrapping) can also be dried to very good standards with the help of the supplementary drying function and the automatic pre-heating.

Steam is obtained by heating the water in the sterilizer. The steam transfers heat to the instruments and sterilization container and warms these. This leads to steam condensing on the instruments and containers. Some of the condensation drops to the bottom of the sterilization container.

After sterilization, during the drying phase, all condensation must evaporate from the sterilization container and from the sterilized items. It is preferable that the sterilization container be made of aluminum, as this metal stores and conducts heat well, ensuring faster drying than other materials

6.4. COMPLETION OF THE OPERATION

When working program is completed successfully; if preset program is selected “LOAD IS STERILE” appears on the screen, if special program is selected “WORKING IS COMPLETED” appears on the screen.

- See that the program is over.
- Push stop key (F4) to stop the running program at any time.
- Be careful while handling the samples after the operation as they can be hot.
- You may leave the sterilizer at the stand-by position or switch it off.

6.4.1. UNLOADING AND PRESERVING

The material is at the greatest risk of contamination while it is still hot, because the barrier capabilities of the packaging materials are much lower in the presence of residual humidity, compared to an ambient temperature situation. Wait for temperature of material to drop to room temperature before stocking it: before stocking, make sure that the packages are intact and check the chemical indicator color change; if the package is broken or torn, the load can only be used immediately, in that preservation of sterility cannot be guaranteed.

The indicative times for preserving the material are shown below, considering that the material itself is kept in closed cabinets away from light, heat and humidity.

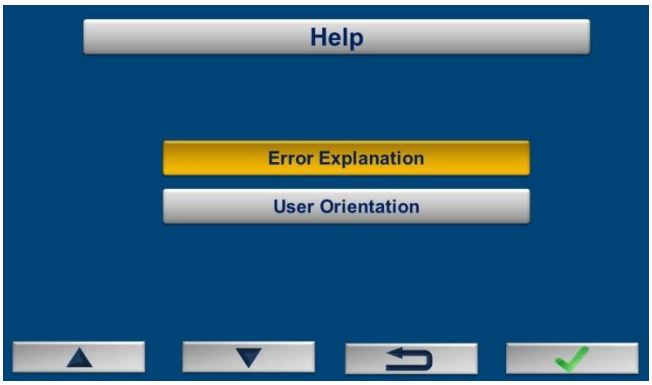
Type of material	Suggested time (days)
Combination of paper-polypropylene	30 (single) – 60 (double)
Metal containers, with standard-grade filters	28/30
Medical Grade with double orthogonal layer	28/30

We emphasize the fact that the times indicated in the table above are indicative, in that the preservation of sterility depends on numerous factors, as ambient microbic level, size of the dust particles, ambient conditions of temperature, pressure and humidity, as well as the degree of handling of the sterilized materials themselves.

The material should be stocked in sealed cabinets, 30 cm away from the floor and 5 cm from the ceiling; if this is not possible protect the material in nylon bags.

7. MENUS

7.1. HELP

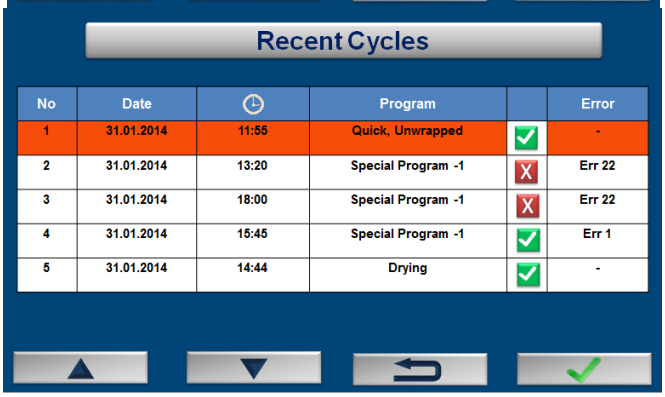


"Help" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access help page which contains submenus which includes failure explanations which user may encounter and some useful information for user.

7.2. MEMORY

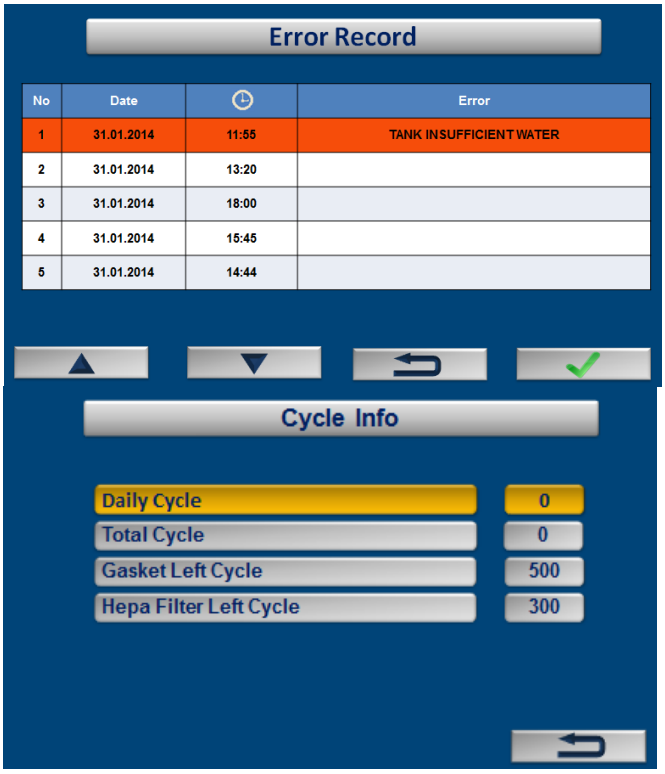
"Memory" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access memory page. Use increase (F1) and decrease (F2) keys to select a submenu on memory page and push enter (F4) key to access the selected sub menu.

When you select "All Cycles" on memory page by using increase (F1) and decrease (F2) keys and push enter (F4) key, the page on the left appears.



When "Active Cycles" is selected on all cycles page, you are asked to enter a date to inquiry of a cycle. After entering the date and time by using increase (F1) and decrease (F2) keys and pushing enter (F4) key, a page consisting of records of cycles appears as on the left. Choose a cycle by using increase (F1) and decrease (F2) keys and push enter (F4) key to see detailed record of cycle. Push print (F4) key to print out the record.

“Passive Cycles” page is similar to “Active Cycles” except it contains less detailed information regarding a cycle.



“Error Record” submenu is selected on the memory page by the value increase (F1) and decrease (F2) keys. The page on the left appears when enter key (F4) is pushed. Failures are listed from the current date to the earlier. Push the value increase (F1) and decrease (F2) keys to pass the other page. Push the backspace key (F4) in order to exit the page.

Select “Cycle Info” submenu on memory page by using value increase (F1) and decrease (F2) keys and push enter (F4) key. The page consisting of number of daily cycles and number of total cycles appears. Total number of cycles left to next replacement of gasket and filter are also shown on this page. Push the backspace key (F4) in order to exit the page.

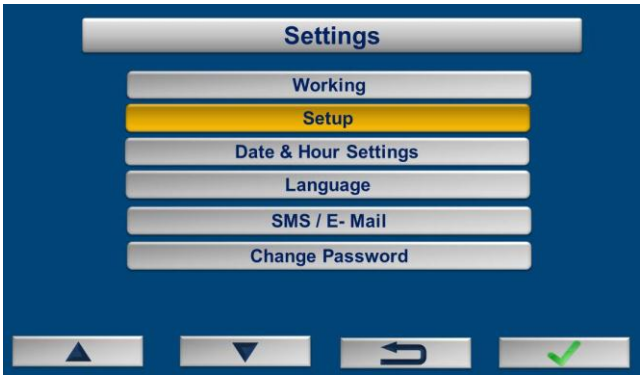
7.2.1. EXTERNAL MEMORY (USB STICK)

USB Stick is connected to USP port-1 of the communication unit. “” appears on the working screen when the USB stick is identified by the microprocessor system.

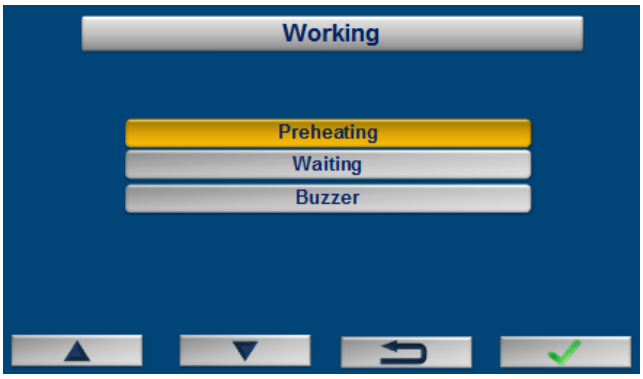
If does not appear on the screen, USB stick may be defective or may not be connected correctly.

When “USB Record” submenu is selected on the memory page, there are four options: “Active Cycles”, ”Passive Cycles”, ”Error”, “All”. Use increase (F1) and decrease (F2) keys to select one of the options and push enter (F4) key to transfer to USB stick.

7.3. SETTINGS



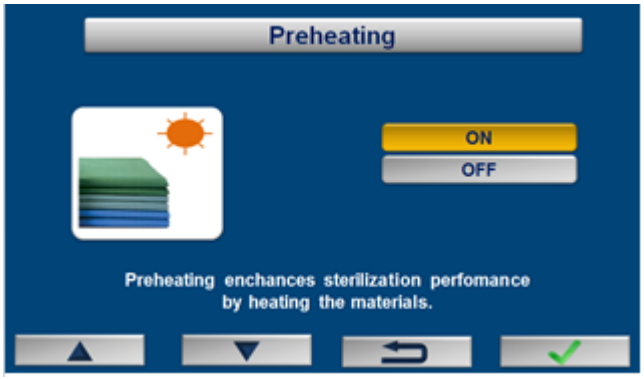
"Settings" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access settings page on the left. Use increase (F1) and decrease (F2) buttons to select a submenu.



"Working" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to access settings page on the left. Use increase (F1) and decrease (F2) buttons to select "Preheating", "Waiting" and "Buzzer" submenus.

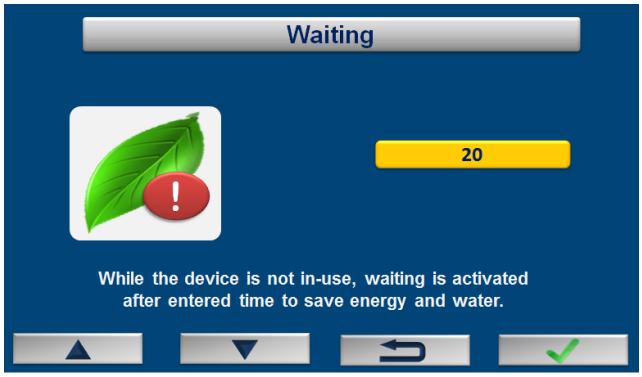
7.3.1. PREHEATING

Steam is produced by heating water in steam sterilizers. The steam penetrates to materials and heats materials to be sterilized. This may lead to steam condensing on the instruments and containers. Condensation forms on the objects being sterilized, and some of the condensation drops to the bottom of the sterilization container. After sterilization, during the drying phase, all the condensation is eliminated from the sterilization container and from the sterilized items themselves. Activate 'preheating' section for better drying result.



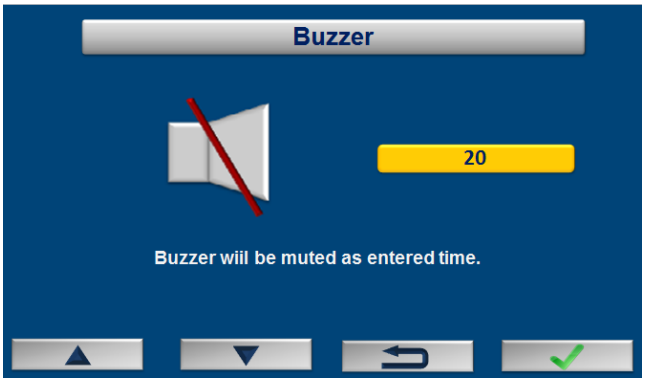
Select “Working” submenu on the settings page by increase (F1) and decrease (F2) keys and push enter (F4) key. On the next page, select Preheating by using increase (F1) and decrease (F2) keys and push enter (F4) key. Select ON and push enter (F4) key.

7.3.2. STANDBY



Standby is for energy saving while the sterilizer is not in use. Select “Working” submenu on the settings page by increase (F1) and decrease (F2) keys and push enter (F4) key. On the next page, select Standby by using increase (F1) and decrease (F2) keys and push enter (F4) key. Adjust the time (in minutes) when to activate standby by using increase (F1) and decrease (F2) keys and push enter (F4) key.

7.3.3. BUZZER

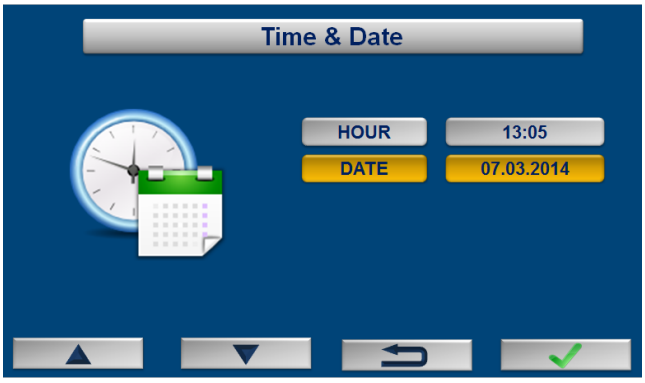


“Buzzer” submenu is selected on the working page by using the value increase (F1) and decrease (F2) keys. If the alarm condition continues after muting the alarm buzzer, “Buzzer” reactivates audible alarm at the end of the desired time (in minutes). If you want to exit this page without any change, push the backspace key (F3).

7.3.4. SETUP

Select “Setup” by using increase (F1) and decrease (F2) buttons and push enter (F4) button to access the page where the company name, address and phone number can be entered. This information is to be used in print outs and memory. Each character of data is entered one by one. Enter first character by using increase (F1) and decrease keys (F2) and push tab key (F3) to enter next character. After all characters of the data is entered completely, push enter (F4) key to enter next data.

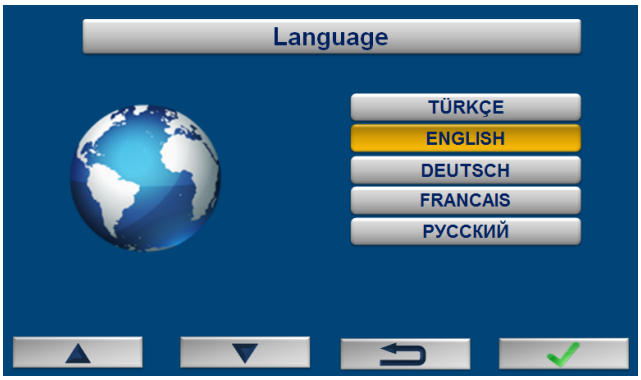
7.3.5. TIME/DATE



"Date/Time Settings" submenu is selected on the settings page by the value increase (F1) and decrease (F2) keys. The page shown on the left appears when enter key (F4) is pushed. Time is shown in the format of "hour:minute" and the cursor is on hour part when "Date/Time Settings" page comes to the screen. Hour is adjusted by pushing the value increase (F1) and decrease (F2) keys. In order to continue to adjust, push enter key.

If you want to exit this page without any change, push the backspace key (F3).

7.3.6. LANGUAGE



"Select Language" submenu is selected on the settings page by using the value increase (F1) and decrease (F2) keys. The page on the left appears when enter key (F4) is pushed. The language of the control panel can be set as Turkish, English, French, Russian or Spanish. Push the value increase (F1) and decrease (F2) keys to select the language and then push the enter key (F4) to save the selection.

7.3.7. PASSWORD

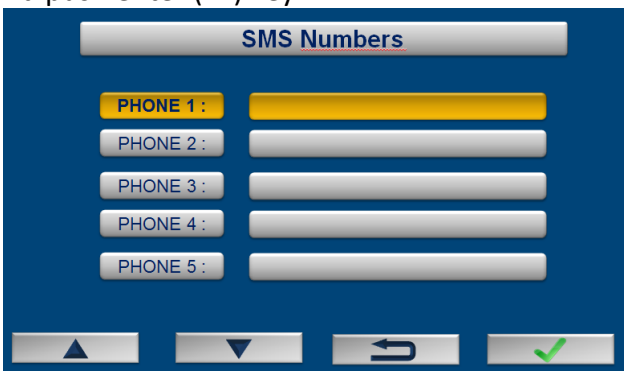
"Change Password" submenu is selected on the settings page by the value increase (F1) and decrease (F2) keys. The page on the left appears when enter key (F4) is pushed. After old password value is entered by pushing the value increase and decrease keys, push the enter key. New password value can be entered in the "New Password" and "Retype New" sections.

Password query page provides to access to "Programs", "Test Programs", "Special Programs" and "Settings" pages. If "New Password" is selected "0000", Password query page does not appear to access these pages.

7.3.8. SMS

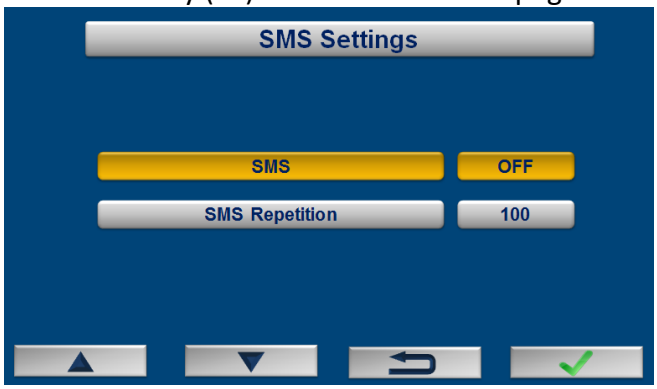
> In order to use SMS, optional GSM module is mandatory to have. Refer to Section 11.1 for information regarding GSM module connection.

Select “SMS/E-mail” submenu on the settings page by increase (F1) and decrease (F2) keys and push enter (F4) key. On the next page, select SMS by using increase (F1) and decrease (F2) keys and push enter (F4) key.



“SMS Numbers” is selected on the SMS page by using the value increase (F1) and decrease (F2) keys. The page on the left appears when enter key (F4) is pushed. The phone numbers can be entered in this page and SMS notifications are delivered to these phone numbers in case of any failure.

- SMS can be sent to 5 different mobile phones.
- Enter country code before the phone numbers.
- A cursor flashes under a digit which means you can set this digit of the number. Each digit of phone numbers is entered one by one. The first digit of the phone number is entered by pushing value increase (F1) and decrease keys (F2) and tab key (F3) is pushed to enter the second digit. The second number is entered pushing value increase (F1) and decrease keys (F2) and tab key (F3) is pushed to enter the next digit. After all digits of the phone number are entered completely by this way, push the enter key (F4) to enter the next phone number.
- Tab key (F3) is used for changeover from one digit of phone number to another.
- After all phone numbers from “Phone 1” to “Service 2” is entered as mentioned above, push the enter key (F4) and return to main page.



Use increase (F1) and decrease (F2) keys to select “SMS settings” on SMS page and push enter (F4) key to access the page.

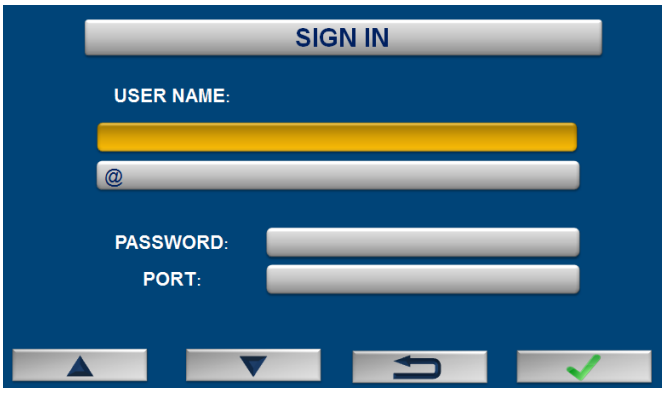
- Activation or deactivation of SMS function can be adjusted. If you want to activate this function, choose “on” by pushing the enter key (F4). If you want to deactivate SMS function, choose “Off” by pushing the enter key (F4).
- “Repeat time” is the frequency of sending SMS. The user is notified again by sending SMS if the failure still continues. Repeat time can be adjusted to 8 hours, 16 hours and 24 hours by pushing enter key (F4).

7.3.9. E-MAIL

Select “SMS/E-mail” submenu on the settings page by increase (F1) and decrease (F2) keys and push enter (F4) key. On the next page, select “E-Mail” by using increase (F1) and decrease (F2) keys and push enter (F4) key.

- Activation or deactivation of e-mail function can be adjusted from “E-mail” submenu. If you want to activate this function, choose “on” by pushing the enter key (F4). If you want to deactivate e-mail function, choose “off” by pushing the enter key (F4).

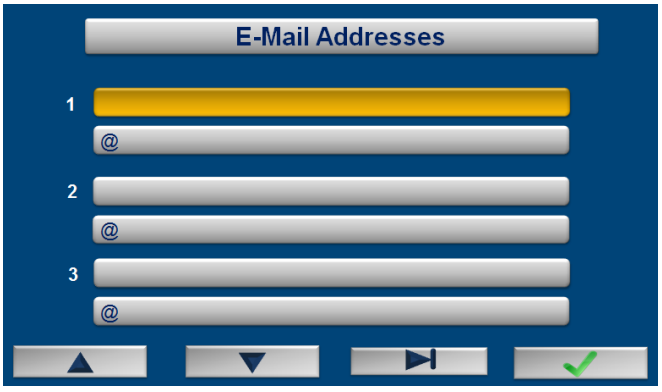
> ☞ Ethernet settings should be adjusted by technical service staff for the first usage. Otherwise, this function does not work.



“Sign In” is selected on the e-mail page by the value increase (F1) and decrease (F2) keys. The page on the left appears when enter key (F4) is pushed. Each character of e-mail addresses is written one by one. The first character is entered by pushing value increase (F1) and decrease keys (F2) and tab key (F3) is pushed to enter the next character. The second character is entered by pushing value increase (F1) and decrease keys (F2) and tab key (F3) is pushed to enter the next character. After all characters of user’s name are entered by this way, push enter key (F4) to enter the mail server of the e-mail address. After mail server is entered in the same way, push enter key (F4) to pass the “password” submenu.

Enter the password and push enter key (F4).

The port provided by internet server is entered on the part of “Port”. After port is entered, enter key (F4) is pushed to return the main menu. Tab key (F3) is used for changes from one character of address to another.



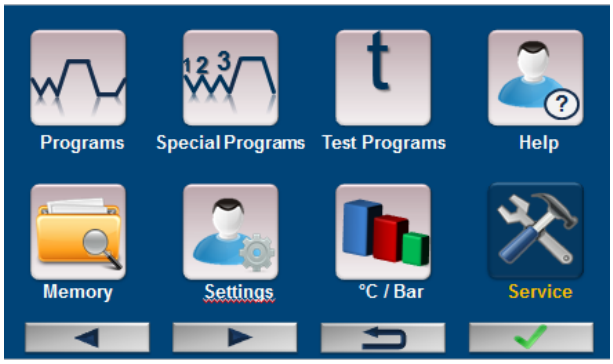
“E-Mails” is selected on the e-mail page by the value increase (F1) and decrease (F2) keys. The page on the left appears when enter key (F4) is pushed. The e-mail addresses can be typed in this page and e-mail is sent to these addresses in case of any failure.

- Each character of e-mail addresses is typed one by one. The first character is entered by pushing value increase (F1) and decrease keys (F2) and tab key (F3) is pushed to enter the second character. The second character is written by pushing value increase (F1) and decrease keys (F2) and tab key (F3) is pushed to enter the next character. After all characters are written completely in this way, push the enter key (F4) to enter the mail server. After mail server is written in the same way, push the enter key (F4) to write next e-mail address.
- After all e-mail addresses from 1 to 5 are written as mentioned above, push enter key (F4) and return to main page.
- Tab key (F3) is used for changeover from one character of address to another.

7.4. °C/BAR

"**°C / Bar**" menu is selected from the main menu by using left (F1) and right (F2) keys. Push enter (F4) key to monitor temperature and pressure sensor values which are placed in the different parts of the sterilizer. Back key (F3) is used to exit the screen. You may also access this page by using "**°C / Bar**" (F3) key on working screen.

7.5. SERVICE



"Service" menu is selected from the main menu by using left (F1) and right (F2) keys nad push enter (F4) key to access. Service menu is password protected and it is for authorized technical staff.

8. PERIODIC MAINTENANCE AND CLEANING

8.1. PERIODIC MAINTENANCE

> Cleaning and periodical maintenance operations should be performed the manometer pressure is 0 bar, the lid is open position and the chamber is cold. During cleaning and maintenance operation, remove the plug from the outlet.

- Security valves which are in direct contact with pressure shall be replaced in every 5 years by authorized personnel.

- After each 2000 runs the instrument should be controlled by authorized technical service personnel.
- The door gasket shall be replaced by the authorized personnel after each 500 cycles or in every six months.
- The air filter shall be replaced after in every 300 cycles.
- It is recommended that the Bowie&Dick Test shall be performed weekly, while the Vacuum Test shall be executed at the beginning of every working day while the chamber is not yet heated; to assure efficient functioning of the unit.

8.2. PERIODIC CONTROL

The service technician shall perform the following preliminary checks before operating the autoclave.

NO	TEST PARAMETERS	CONTROL RANGE
1.	Check the safety valve by operating it.	2 months
2.	Remove the cover of the autoclave, check and tighten the ports and valves.	6 months
3.	Check the lid gasket.	6 months
4.	Check that the autoclave is leveled.	Annual
5.	Check the continuity of the grounding connections.	Annual
6.	Check the safety elements (safety valve, safety and cut-off thermostats and lid locking mechanism).	Annual
7.	Check the water reservoir, piping and plastic parts of autoclave.	Annual
8.	Run the sterilization programs of autoclave and check the operational/ sterilization parameters.	Annual
9.	Check the precise operation of the earth leakage relay and electrical control systems.	Annual
10.	Check and tighten all screw connections in the control box, valves and instrument.	Annual
11.	Check the temperature sensor calibration.	Annual
12.	Validate autoclave effectiveness (loading/ unloading).	6 months/ Annual
13.	Observe the closing device for excessive wear.	5 years
14.	All safety valves exposed to direct steam pressure must be checked.	5 years

Safety tests (pressure vessel, efficiency, electrical) shall be performed in accordance with local rules or regulations, by an authorized inspector.

According to calculations, number of allowable cycles for the operation conditions are 10.000 at pressure fluctuation between 0 bar to 2,05 bar and 20.000 at pressure fluctuation between 0 bar to 1,05 bar.

8.3. CLEANING

- Weekly cleaning should be performed if the sterilizer operates daily. Use liquid detergent to remove tough dirt. Take precautions while handling chemical cleaners. Please be aware of the undesirable effects of the chemicals and be careful while applying them.
- A soft washcloth shall be used not to cause any detriment in the chamber.
- The chamber shall be checked before loading sterilizer; and shall be immediately cleaned if needed.*
- The sterilization load should be disinfected prior to loading sterilization chamber.

*Used chemical materials effects for the chamber cleaning should be cleaned carefully and thoroughly after the cleaning process. Uncleaned chemical materials can cause undesirable problems in the chamber during the sterilization phase.

Cleaning shall be performed while chamber is cold.

9. DISPOSAL MANAGEMENT CONCEPT

The currently valid local regulations governing disposal must be observed. It is in the responsibility of the user to arrange proper disposal of the individual components.

All parts which may comprise potentially infectious materials have to be disinfected by suitable validated procedures (autoclaving, chemical treatment) prior to disposal. Applicable local regulations for disposal have to be carefully observed.

The instruments and electronic accessories (without batteries, power packs etc.) must be disposed off according to the regulations for the disposal of electronic components.
Batteries, power packs and similar power source have to be dismounted from electric/electronic parts and disposed off in accordance with applicable local regulations.

10. TROUBLESHOOTING

If the device fails to operate, please check the followings:

- The power switch is on;
- The plug is plugged-in properly;
- The plug is not defective;
- The mains supply is present.

10.1. ERROR CODES

Error Codes may appear immediately after the sterilizer is turned on or following a time lag after the unit is turned on, before any program is started.

Error Codes may appear immediately after a program is started or during any program execution.

In case of any failure during a program run; the program is interrupted and the sterilizer either releases steam or vents the chamber according to the pressure condition in the chamber.

During a program run;

- In case of any failure before sterilization phase, the load would **not be sterile** since the sterilization phase is not started.
- In case of any failure after sterilization phase, the load would be **sterile**. However, loads could be **wet**, since drying phase would be interrupted.

Failures which may be encountered during operation is listed below:

Error 01: Vacuum Time Exceeded – The chamber pressure does not drop to the required vacuum value within preset duration.

Error 02: Chamber Air Dedector - There is residual air in the chamber during sterilization phase. Please check loading method.

Error 03: Steam Discharge – The steam in the chamber is not released within the preset time following the sterilization phase.

Error 04: Air intake – Following the drying phase, the airflow rate is below the preset value.

Error 06: Door Open – Door lock has been released during operation.

Error 07: Steam Generator Over Heating – Steam generator is overheated.

Error 09: Generator Insufficient Water – Insufficient water in steam generator. Please check water tank.

Error 10: Broken Sensor PT1, PT2, PT3, PT4, BT1, BT2, BT3 – Temperature and/or pressure sensors are broken. Please check nominated sensor.

Error 11: Pre-Heating – The duration for pre-heating has exceeded the preset time.

Error 12: Pre-Heating High Temperature – The maximum pre-heating temperature has been exceeded.

Error 16: Power Failure – The mains supply has interrupted during a cycle. If chamber is pressurized in case of power failure, pressurized air is released. Thus, the filter on the air release line should be sterilized by running quick program after power failure.

In case of power failure during sterilization phase, chamber temperature is checked when the power is on again. Program continues to run if the temperature is in the safe limits. Otherwise, it stops. If the power failure occurs before or after the sterilization phase, the operation stops and audible and visual alarm appears.

Error 17: Heater Failure – Steam generator's heaters are defective.

Error 18: Steam Generator High Pressure - Pressure in the steam generator exceeds acceptable limits during the cycle.Please contact with authorized Nüve Service.

Error 19: Low Temperature – The temperature in the chamber remains below the preset temperature after the sterilization phase has started.

Error 20: High Temperature – The sterilization temperature exceeds the maximum permitted temperature.

Error 21: Low Pressure – The pressure in the chamber remains below the preset pressure after the sterilization phase has started.

Error 22: High Pressure – The sterilization pressure exceeds the maximum permitted pressure.

Error 24: **Low Gasket Pressure -** The pressure on the door gasket has dropped under the acceptable pressure value during the cycle.Please replace door gasket.

Error 25: High Gasket Pressure - The pressure in the door gasket has exceeded the acceptable pressure value during the cycle. Please contact with authorized Nüve Service.

Error 26: Generator Water Level - Level sensors in steam generator could be defective. Please check steam generator's water level sensors.

Error 27: Low Water Level - Insufficient water in water tank.Please refill water to the tank.

Error 29: **Gasket Air Charge -** Gasket pressure is not reached to the required level. Please contact with authorized Nüve service.

Error 31: **Gasket Air Intake -** Gasket pressure is not decreased to required level. Please contact with authorized Nuve service.

Error 32: **High Temp. At Vacuum Test -** The chamber pressure is high during vacuum test. Please wait until the chamber is cooled down and repeat the test.

Error 46: **Gasket -** Please Change The Gasket!

Error 47: Hepa Filter - Please Change The HEPA Filter!

Error 48: Communication - There is no connection between main PCB and display.Please contact with authorized Nüve Service.

Error 49: SMS - SMS can not be sent SMS to user in case of any error situation. Please check whether GSM modul is connected with the device and SMS optional is selected as “OPEN”.

Error 50: **Modem -** This message appears if the device can not send E-Mail to user in case of any error situation. Please check whether Ethernet cable is connected with the device and E-Mail option is selected as “OPEN”.

If an error occurs, please contact with an authorized Nüve agent to seek technical help.

10.2. FUSE REPLACEMENT

The fuses shall always be replaced by the authorized personnel.

11. OPTIONS

11.1. AlerText™ GSM MODULE

In case of error, the device can send SMS to five different phone numbers by GSM module as an option.

Figure 93

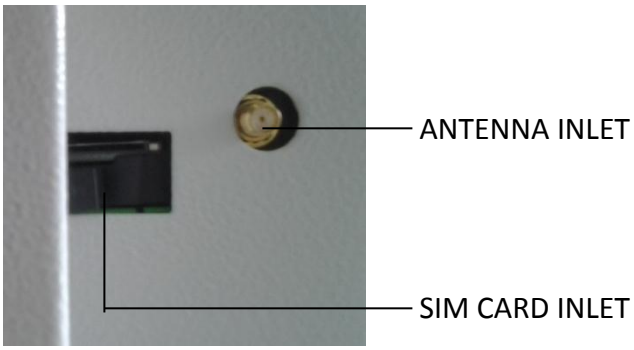


Figure 104

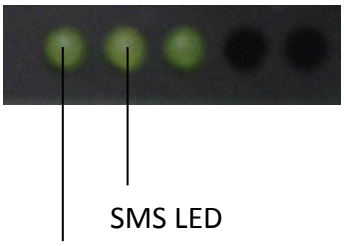


Figure 115

Please carry out the following steps for connection of GSM module:

- Insert SIM card in the GSM module (See Figure 13).

> SIM card is provided by the user. The cost of SIM card and SMS differs according to the GSM providers and all the charges will be covered by the user.

> SIM card which will be used for GSM module should not have PIN code.

- Plug-in the GSM module to correctly grounded sockets.
- Connect the end of RS 232 cable of GSM module to the RS 232 port on the steam sterilizer.
- Ensure that power led is turned on (See Figure 15). Power led is on when energy is supplied to the GSM module. SMS led starts to flash while the module sending SMS.
- Connect the antenna cable to antenna inlet on the GSM module (See Figure 14).

Antenna has magnet to place it easily. Place the antenna on a place where the signal of GSM module is high.

> If the GSM module is not connected or does not send messages although it is connected, “modem” error code appears in the error history. If the GSM module is connected and cannot send messages, “SMS” error code appears in the error history. Modem and SMS errors do not appear when SMS submenu on the SMS page is selected as “off”.

12. ELECTRICAL CIRCUIT DIAGRAM