OPERATION
&
MAINTENANCE
MANUAL

E-Type Electronic Table -Top Autoclaves
models 1730, 2340, 2540, 3140, 3850,3870
E, EK, EA & EKA

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1 GENERAL

Read the Operating Instructions carefully, before beginning any operation on the autoclave!

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 paragraph 9.1 (Preventive and Scheduled 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 autoclaves that have been repaired or altered by an un-authorized person.
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, P.C. Box 7191, 4800GDBreda, Netherlands.) +31/76-5423510, 0 Fax: +31/76-5423540, E-mail: Tuttnauer@tip.nl

+ **Tuttnauer USA** Co. 25 Power Drive Hauppauge, NY, 11788, USA) (800) 624 5836, (631) 737 4850, 0 Fax: (631) 737 07 20 Email: info@tuttnauer.com

Rudolf Gunz & Co. PTY LTD:
+ Service Department, 26-34 Dunning Avenue, Ros, 2018, Sydney, Australia.
+ Service Department, Locked bag 690, Beaconsfield, NSW 2014, Australia.
) +61-2-99356600 0 Fax: +61-2-99356650

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 autoclaves 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.

2 TECHNICAL DATA

2.1 Introduction

This E-Type table-top autoclave is designed for the sterilization of medical and surgical solid instruments in dental, medical and veterinary clinics, first aid rooms, laboratories etc.

Types E and EK are intended to sterilize non wrapped solid products.

Types EA and EKA are intended for sterilization of non-wrapped and wrapped solid products.

The autoclave models E, EK, EA and EKA are electrically - heated sterilizers of different dimensions, using steam as the sterilizing agent. A computerized control unit ensuring a fully automatic sterilization cycle and precise control and monitoring of physical parameters and a clear documentation of the sterilization cycle controls the autoclave.

Five automatic programs are available, according to the material to be sterilized. All sizes (except 1730) ha

The company – qualified technician can cancel this feature on EK or EKA models, or activate it on E and EA models, according to customer requirements.

2.3 Operating Conditions

This device is for indoor use only!
The sterilizer should be loaded only with autoclavable material!
The environment shall not exceed an ambient temperature of 40°C and a relative humidity of 85% respectively.

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!

2.4 Utilities

2.7 Specifications

Overall Dimensions

[redacted]	**1730**	**2340**	**2540**	**3140**	**3850**	[redacted]**scn291 476.36 56**

[redacted]

[redacted]

No. of trays	No. of standard Cassettes (Optional)		Printer	Shipping Weight	Shipping Volume
	Half	Full			
3	2	—	N/A	25 kgs. (55 lbs.)	0.18 m^3 (6.35 cu.f.)
3	2	2	Yes	36 kgs. (79 lbs.)	0.27m3 (9.4 cu.f.)
4	3	3	Yes	48 kgs. (106 lbs.)	0.27m3 (9.4 cu. f.)
2	4	4	Yes	60 kgs. (132 lbs.)	0.35 m3 (12.4cu.f.)
28 x 50 x 2.5 cm (11" x 20 " x 1") 35 x 50 x 2.5cm (14" x 20 " x 1")	2	10	—	Yes	89 kgs. (196 lbs.)	0.63 m3 (22.2cu.f.)
28 x 67 x 2.5cm (11" x 26" x 1") 35 x 67 x 2.5 (14" x 26" x 1")	2	15	—	Yes	102 kgs. (225 lbs.)	0.76m3 (26.8cu.f)

2.9 Construction

The main parts of the autoclave are made of materials as indicated below:

- Chamber is electro-polish and built of stainless steel 316 L.
- Door is made of stainless steel CF8.
- Trays are made of stainless steel 316.
- Water reservoir is made of hard plastic material.
- Door handle is made of hard plastic material, which is safe to touch and thermo-insulated.
- Covers are made of aluminum sheet, coated with Epoxy paint.

2.10 Directives and Standards

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

2.10.1 Technical Directives

1. Medical device directive MDD/93/42/EEC.

2.10.2 Technical Standards

1. A.S.M.E. Code, section VIII division 1 for pressure vessels.
2. EN 61010-1:93 – Safety of electrical equipment …General requirement.
3. EN 61010-2-041:97 – Particular requirement for steam autoclaves.
4. EN 50081-1:92 – (EMC) Emission compatibility…
5. EN 50082-1:97 – (EMC) Immunity compatibility….
6. prEN 13060-1:97-General requirements for all types of small steam sterilizers.
7. prEN 13060-3 and 4:97-Particular requirements and test method for type N and S sterilizers.

2.10.3 Quality standards

The manufacturing plant meets the following quality standards:

1. EN ISO 9002 (7.94) – Quality System
2. EN 46002 (8.96) - Quality System - Medical device - Particular requirements.
3. ISO 13488 – Quality systems – Medical devices – Particular requirements for the application of ISO 9002.

The manufacturer retains all supporting documentation.

2.11 Water quality

2.11.1 Water for generation of steam

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 acceptable contaminants levels in water, for sterlizers

Evaporate residue	< 15 mg/l
Silica	< 2 mg/l
Iron	< 0.2mg/l
Cadmium	< 0.005 mg/l
Lead	< 0.05 mg/l
Rest of heavy metals	< 0.1 mg/l
Chloride	< 3 mg/l
Phosphate	< 0.5 mg/l
Conductivity	< 50 µs/cm
pH	6.5 to 8

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.

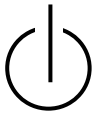
2.12 Symbol Description

Caution! Consult accompanying documents

Caution! Hot surface.

Caution! Hot steam.

Protective earth (Ground)



Stand by

Front View

No.	Description

Rear View

3 STERILIZATION PROGRAMS

The autoclave offers 5 sterilization programs, with or without drying stage.

3.1 PROGRAM 1 (134°C with no drying)

For unwrapped instruments and materials when the manufacturer recommends autoclaving at temperatures of 134°C / 273°F with no drying.

Nominal Parameters

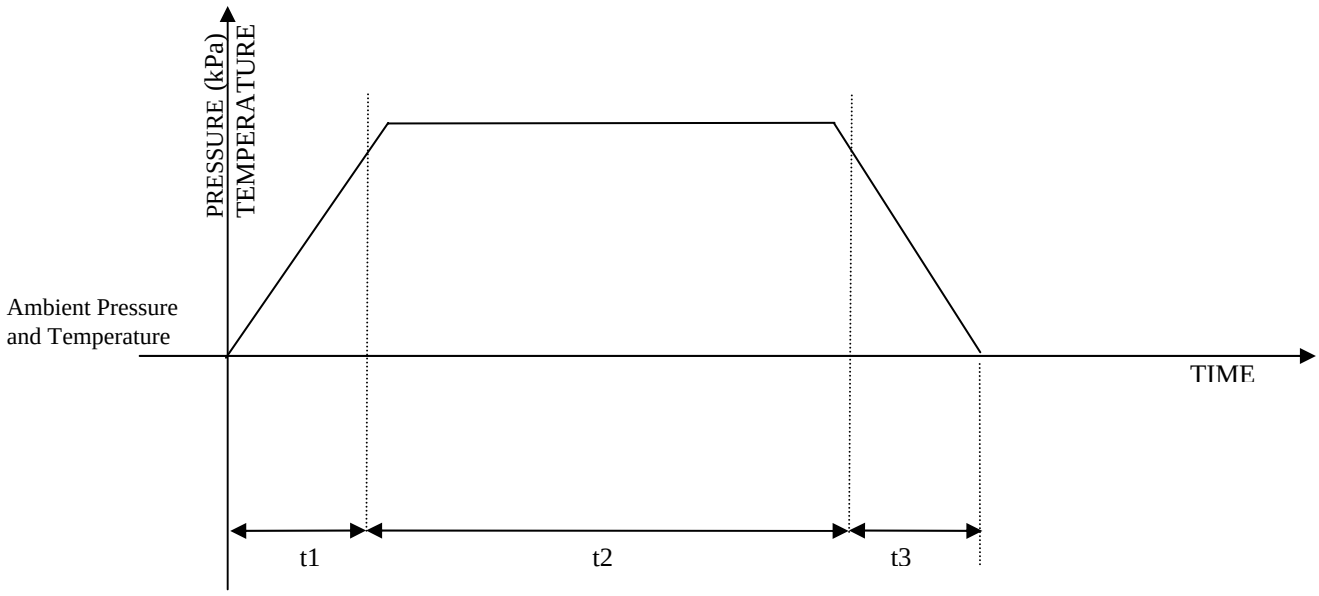
- Sterilization temperature: 134°C (273°F).
- Sterilization time: 3 mins.

Operation Sequence

- Steam is generated by electric heating elements heating the water 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 drops to atmospheric pressure.

Attention:

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



t1 = steam generation stage
t2 = Sterilization stage
t3 = Fast exhaust Stage

3.2 PROGRAM 2 (121°C with no drying)

For unwrapped instruments and materials when the manufacturer recommends autoclaving at temperatures of 121°C / 250°F with no drying.

Nominal parameters

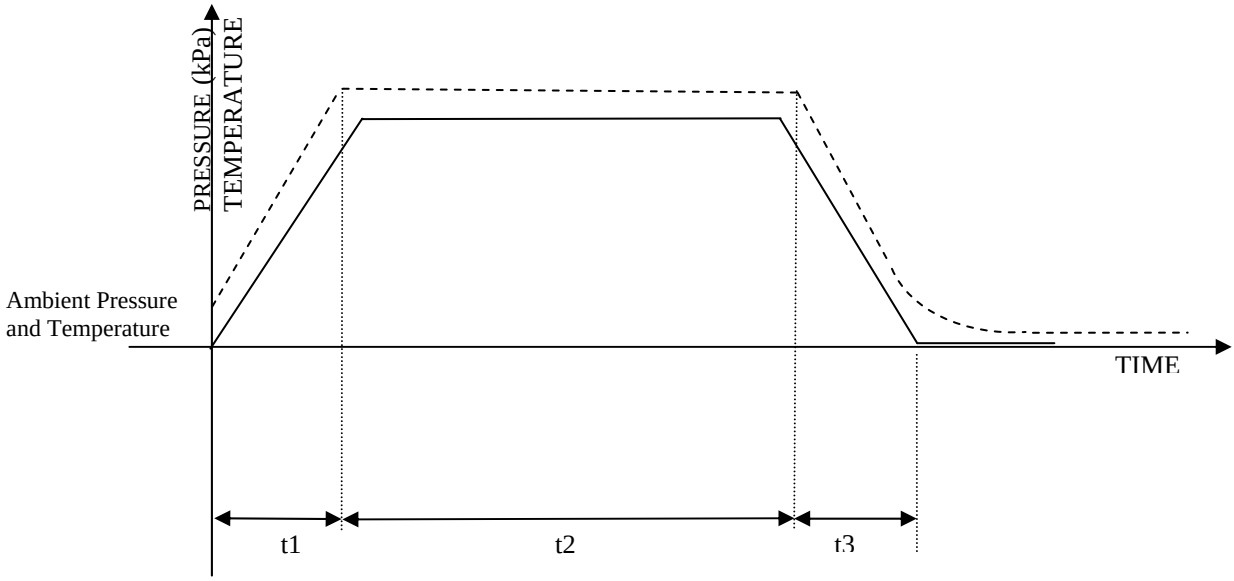
- Sterilization temperature: 121°C (250°F).
- Sterilization time: 15 mins.

Operation Sequence

- Steam is generated by electric heating elements heating the water 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 drops to atmospheric pressure.

Attention:

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



——— = Pressure

- - - - - - - - - - = Temperature

t1 = Steam generation stage
t2 = Sterilization stage
t3 = Fast exhaust Stage

3.3 PROGRAM 3 (134°C with drying)

For unwrapped instruments, paper packed instruments and other

3.4 PROGRAM 4 (121°C with drying)

For unwrapped instruments, paper packed instruments and other materials when the manufacturer recommends autoclaving at temperatures of 121°C/250°F with drying stage.

Nominal Parameters

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

Operations Sequence

- Steam is generated by electric heating elements heating the water until the sterilization temperature is reached.
- Fast exhaust; steam is exhausted out of the chamber at a fast rate until pressure drops to atmospheric pressure.
- Drying; heating of the chamber 30 mins. at a reduced power. Venting the chamber with a pump (on EA, EKA model).

Note:

1. On E, EK models the door shall be opened to reduce drying time.
2. On EA, EKA models the drying stage is performed with a closed door. Filtered air is pumped into the chamber to ventilate the chamber during the drying stage.
3. After operating the sterilizer, brown stains might appear on the bottom of the chamber. These stains are a result of the heating elements that are located at the lower external part of the chamber. The brown color is a common phenomenon, can be easily be removed, and will not have any effect on the steriliszed goods.

Attention

3.5 PROGRAM 5 (121°C with slow exhaust)

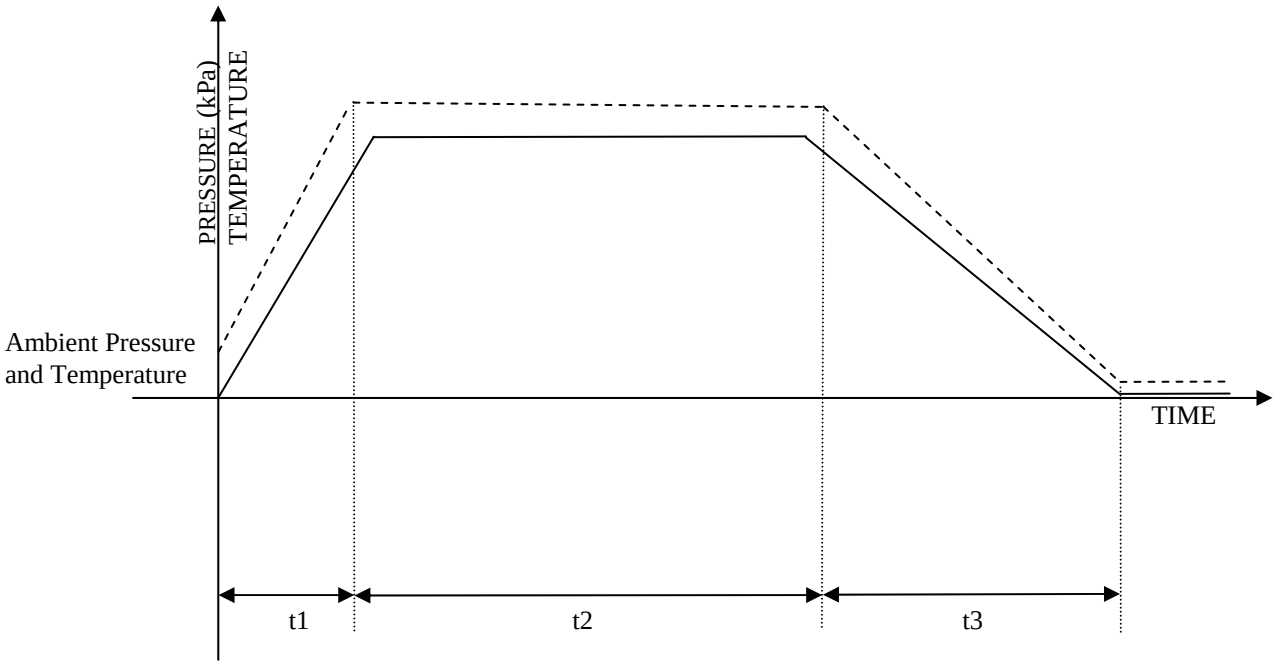
For very delicate goods when the manufacturer recommends autoclaving at 121°C/250°F with slow exhaust.

Nominal Parameters

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

Operations Sequence

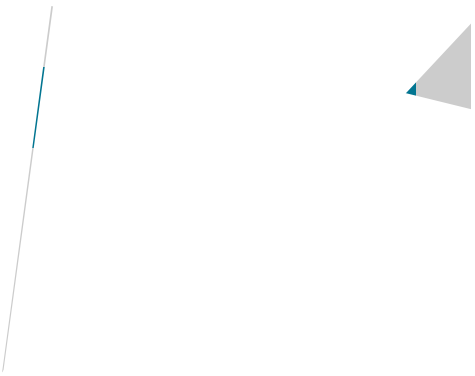
- Steam is generated by electric heating elements heating the water until the sterilization temperature is reached.
- Sterilization temperature is maintained constant for the preset sterilization time.
- Slow exhaust; steam is exhausted out of the chamber at a slow rate (natural cool down) until the temperature drops to 85^0C (185^0F).



= Pressure

= Temperature

t1 = Steam generation stage
t2 = Sterilization stage
t3 = Slow exhaust Stage



4.1 Description and Functions of the Front Panel Keyboard

The command panel is comprised of 3 sections:
On the lower section there are 6 keys; 3 command keys and 3 programming keys.
The middle section consists of the LCD display with two rows and 16 characters on each line.
The top section consists of 4 signal lights that indicate the status of the autoclave.

1. Sel. Cycle (select cycle) key 

This key enables selecting the desired program out of 5 programs. Pressing this key advances the selected program to the next program (e.g. from program 2 to 3).

If the system is set to program 5, pressing the key returns to program 1.

This autoclave has the following available programs:

1. Unwrapped instruments 134°C (273°F)/3min with fast exhaust without drying.
2. Unwrapped instruments 121°C (250°F)/15min with fast exhaust without drying.
3. Unwrapped and paper packed instruments, 134°C (273°F)/12min. with 30min.and drying stage.
4. Unwrapped and paper packed instruments 121°C (250°C)/30min. with 30min. and drying stage.
5. Very delicate goods 121°C (250°C)/30min. with slow exhaust.

2. Parameters key 

This key displays for 3 seconds the three parameters of the program. After selecting the program, it is possible to have the parameters displayed by pressing this key; the top line reads the following data:

Sterilization Temp	**Sterilization Time**	**Dry Time**
134°C	**S = 3m.**	**D=1Ø**

The data is erased automatically after 3 seconds, or if the parameter key is pressed again during these three seconds.

3. Start/ Stop key 

This key commands the following 3 functions:

- Starting the process.
- Stopping the process.
- Canceling the FAIL message from the command panel and opening the electric door locking.

Note: “STOP” does not operate in EXH stage.

Starting the process:

It is active while the autoclave is in standby position, if the door is closed and water level in the reservoir is normal. Pressing this key starts the selected process.

Stopping the process:

It is active while the autoclave is in process. Pressing this key at any stage of the process stops operation.

Canceling the FAIL message

The end of an aborted pr

7. START LED indicator 

When the “START” LED indicator is on it; indicates that the system is running a program.

8. FAIL LED indicator 

When the “FAIL” LED indicator is on; it indicates that the cycle has failed either as a result of exceeding the allowable limits or the

4.2 Description of the Operational Messages

The display is comprised of 2 rows, each row has 16 characters.

4.2.1 The upper row:

On the right side of the upper row, 6 characters are allotted for displaying the stage in progress

- WATER – water inlet stage.
- HEAT – heating stage.
- STER – sterilization stage.
- EXH – exhaust stage
- DRY – dry stage

On the left side of the upper row, 10 characters are allotted for the selected programs.

- Fast 134 (FAST 273) – fast exhaust
- Fast 121 (FAST 250) – fast exhaust
- W.dry 134 (W.dry 273) – with drying stage.
- W.dry 121 (W.dry 250) – with drying stage.
- Slow 121 (Slow 250) – slow exhaust.

When the PARAMETERS key is pressed, the parameter of the selected program is displayed on the upper row.

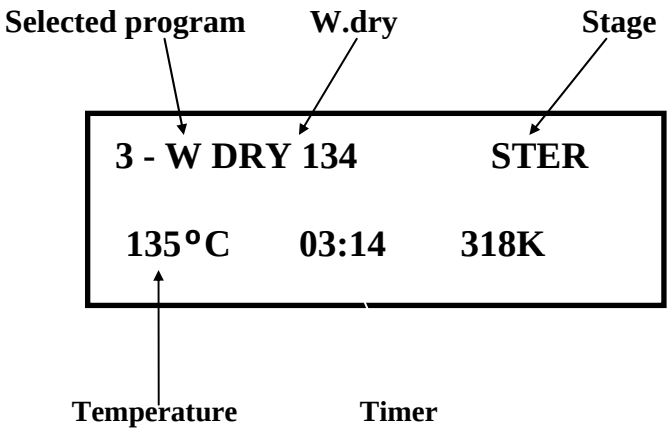
4.2.2 The lower row:

- On the right side of the lower row, 5 characters are allotted for chamber pressure display.
- The actual pressure is continuously displayed at all stages of the process and between processes (standby).
- On the left side, of the lower row the temperature is displayed; 5 characters are allotted for the display of temperature in °C or °F, in the form 134°C or 273°F.
- In case the process is aborted, the diagnosis of the fail is displayed on the left, of the lower row, instead of the temperature. 11 characters are allotted for this error message.
- On completion of the process, the END message is displayed in the interval between the readouts of temperature and pressure.
- At the sterilization and dry stage, the countdown of the time left to the completion of the stage will be displayed in the interval between the readouts of temperature and pressure. The format of the display will be MM: SS (two digits for minutes and two digits for seconds).
- The time between 2 complete cycles must be at least 10 minutes, in order to give the machine time to cool.
- When a cycle is started by means of pressing the START key, the load number is displayed for 2 seconds on the left of the lower row.

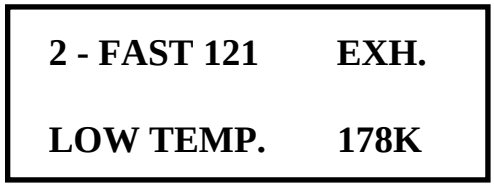
Examples

Example 1: Autoclave between processes, the program No.1 has been selected.

Example 2: The autoclave in the sterilization stage, program No.3 is running. Time left to completion is 3 minutes and 14 seconds.



Example 3: The process failed due to temperature drop in the
sterilization stage in program No.2.



4.3 Description of Displayed Error Messages and Safety Measures

Low Temp. Message is displayed, FAIL LED indicator lights and cycle is aborted, if the temperature drops for more than 5 seconds below the sterilization temperature.

Low Heat Message is displayed and sterilization does not start if the autoclave has not reached sterilization temperature after heating for 30 minutes (except in slow exhaust program), and 60 minutes for the slow exhaust program**.**

High Temp. Message is displayed, FAIL indicator lights and the cycle is aborted in one of the following cases:

- If the temperature rises 3°C (6°F) above the sterilization temperature during the sterilization stage.
- If the temperature sensor is damaged, this message appears during the HEAT stage.

Low Pres. Message is displayed, FAIL indicator lights, and the cycle is aborted if the pressure drops for more than 5 seconds below the pressure correlated to the

Add Water Message is displayed and the “WATER” LED is lit in

5 PRINTER

The printer is an optional device. If the autoclave is not equipped with a printer paragraph 5 is not applicable.

5.1 Printer Operation

The autoclave is equipped with a character printer, which prints a detailed history of each cycle performed by the instrument (for the record or for subsequent consideration).

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

- Software version
- Real time
- Selected program
- Sterilization pressure
- Sterilization temperature
- Sterilization time
- Summary of performed cycle and identification hints.

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

PRINTER OUTPUT	DESCRIPTION
Autoclave:01	Number of autoclave.
Operator :_____	To be filled in manually by operator.
09/03/2000 09:45:01	Date and time sterilization cycle ended.
Load number: 0011	Load number. Useful to determine when to clean the chamber.
Cycle ended	
_____	
D31:47 117.8°C 095k	The time, temperature and pressure during drying.

E30:46 120.6°C 119k	The time, temperature and pressure during exhaust.

S30:07 134.6°C 310k	The time, temperature and pressure during sterilization.
*	
*	Prints sterilization data every 1 minute.
*	
S16:06 134.3°C 310k	The time, temperature and pressure during sterilization.
S15:06 134.1°C 312k	The time, temperature and pressure during sterilization.

H00:50 073.2°C 094k	The time, temperature and pressure during heating.

W00:00 071.9°C 094k	The time, temperature and pressure during water inlet.
_____	
09/03/2000 09:13:04	Date and time sterilization cycle begun.
Dry time: 001min	Drying time for selected program.
Ster time: 015min	Sterilization time for selected program.
Ster Temp: 134°C	Sterilization temperature in chamber for selected program.
PROGRAM: 1-Fast	Selected program: 1-Fast 134 cycle
Ver-EAEn3WP20	Number and version of the program

Legend

W	***Water inlet stage***	***E***	***Exhaust stage***
H	***Heating stage***	***D***	***drying stage***
S	***Sterilization stage***	***k***	***kPa***

6 INSTALLATION PLACING AND LEVELING INSTRUCTIONS

Network

Network and connection should comply to the devices consumption. It must comply with local installation and safety rules and regulations. The voltage supplied to the device must comply with the label ± 5%.

Caution:

The sterilizer must be placed on a rigid and leveled surface. The stand must be able to hold the load of the device and loaded material.

Note:

Make sure while placing the autoclave, to leave space around the machine, to give the technician access to service the machine.

In order to avoid any injury by electrical hazard, it is mandatory for the customer to have installed an earth leakage relay in the electrical board to which the autoclave is connected.

This relay disconnects all the poles of the electrical power line in case of accidental contact with the instrument metal enclosure, by the operator or another person, leading to a dangerous leakage current.

Note*: Keep the back and the right side of the autoclave approximately 1" (25mm) away from the wall to allow for ventilation.*

Connect the power cord to the socket on the rear side of the autoclave; plug it into the supply socket.

6.1 leveling

The legs (2) of the autoclave are factory set for the autoclave to hold this amount of water when the autoclave stands on a level surface (3). To check the water level fill a beaker (4) with the recommended quantity of water, pour the water into the chamber. The water must reach the indicator groove (1) in front of the chamber.

1730 E,EK		**2340/2540 E,EK**		**3140 E**		**3850 E**		**3870 E**	
300 ml.	11 ozs.	350 ml.	12 ozs.	400 ml.	14 ozs.	500 ml.	17 ozs.	650 ml.	23 ozs.

6.2 Water quantity for a cycle

The amount of water in the autoclave chamber necessary for each sterilization cycles as follows:

1730 E,EK	2340/2540 E,EK	

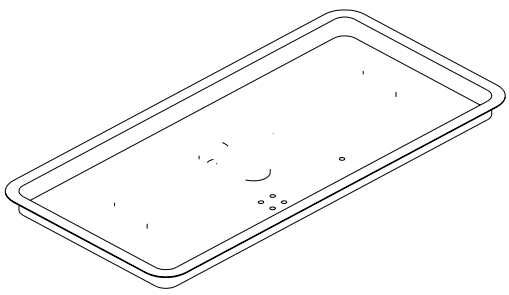
6.5 Filling the Water Reservoir

Remove the water reservoir cover. Pour distilled water into the reservoir through the opening on top of the autoclave until it reaches the base of the safety valve holder, approximately 0.7 gallons (3 liters).

Use water-having characteristics as per table in para 2.11

Caution:
Under no circumstance should water be filled above the safety valve holder.

Use distilled water only. Tap water may block the hole of the air trap. This causes increase of pressure, which prevent temperature from rising. It is essential from time to time during heating and sterilization phases that a spray of steam should escape, causing a hissing sound. If no steam is evident, follow instructions in paragraph 9.4 (Air Trap Jet Cleaning Procedure).



11. Verify that the packaging method is in accordance with good practice approach and the packaging materials are in accordance with the applicable standards (e.g. EN868 series).
12. Place a sterilization indicator strip in each tray.
13. Place instruments with ratchets opened and unlocked or clipped on the first ratchet position.
14. 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.
15. Tilt on edge items prone to entrap air and moisture, e.g. hollowware, so that only minimal resistance to air removal, the steam passage and condensate will be met.
16. Load items within the boundaries of the tray so that they do not touch the chamber walls, or fall off when the loading car is in transit.
17. The operator may use racks to allow for adequate separation of packaged instruments.
18. Load trays loosely to capacity.
19. Once a week, use a biological spore test indicator in any load to make sure sterilization is performed.
20. Make sure that all instruments remain apart during the sterilization cycle.
21. Empty canisters should be placed upside-down, in order to prevent accumulation of water.
22. Allow a distance of approximately 2.5 cm (1”) between trays to permit steam circulation.

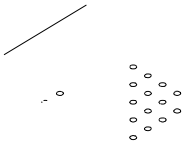
23. Wrapped Instruments

Wrapped instruments should be packed in material that promotes drying such as autoclave bag, autoclave paper, and muslin towels.

It is highly recommended to utilize the Tuttnauer™ Pouch Rack. This rack allows the operator to place pouches on their side, thus increasing the capacity of the autoclave significanTD0reTJ/TT10 1rayseasing

26. Liquids

Use only heat-proof glass, filled to 2/3 capacity. Ensure that the glass container is covered, but not sealed to prevent pressure build-up.



Note: A table of suitability steam sterilization process for various goods and methods of packing is included with accompanying documents.

8 OPERATING INSTRUCTIONS

To avoid possible damage, do not leave the autoclave un-attended while in operation

It is important to clean the hole of the air jet, as described in para. 9.3 before starting operation of the autoclave, for the first time.

1. Remove the water reservoir cover. Pour distilled water into the reservoir through the opening on top of the autoclave, until it reaches the base of the safety valve holder, approximately 0.7 gallons (3 liters).
2. Insert the plug into the electric socket.
3. Turn on the rocker switch mounted on the front panel to power control circuits.
4. Set the clock for the proper date and time, by means of the PROGRAM key (4), UP (5) and DOWN (6); see section 4.
5. Press the SELECT key (1) to select the required program. The name of the program is displayed indicating the program that has been selected.
6. Press PARAMETERS key (2) to monitor the nominal parameters of the program.
7. Load the material to be sterilized into the chamber according to instructions in para. 7 (Preparation Before Sterilization), and close the door, until hand-tight.

   The Door signal light is turned off indicating door is closed. Once the sterilization cycle is in progress, a safety device locks the door and makes it impossible to open it until completion of the cycle.

   Note:
   Due to inherent elasticity of the door gasket, the Door indicator light may be turned OFF before a complete seal is made between the door and the chamber.

   Therefore, in order to ensure the door is fully sealed, when the Door light has been illuminated continue to tighten the door bolt until "hand-tight".

   Do not over - tighten the bolt as this may result in damage to the gasket.

   Should the autoclave fail to reach the sterilizing temperature/pressure, always check if the door is fully sealed. If not, tighten the door bolt further, as described above, until completely sealed.
8. Press the START/ STOP key to put the autoclave in operation.
   The autoclave starts performing sequence of operations. The actual measured values of pressure and temperature are displayed continuously and printed (if equipped with a printer) every minute at STE stage, and every 4 minutes at the other stages. The phase in progress is displayed at the right side of the upper line as WATER, HEAT, STER., EXH., and DRY.

   If the operator presses the START key and the door is not completely closed, the process will not start and the DOOR light will flash twice then turn off and the buzzer will sound four times.

9. To obtain better drying results at the E, EK models, open the door partially– at an angle of approx. 20-25 degrees-during the dry stage.

Unscrew the locking screw to maximum and let the door to open to maximum feasible opening. (see picture).

Note:
This is not necessary for the EA, EKA models which ensure a continuous air circulation through the chamber in the dry stage.

10. At the end of the cycle, the START light is put off, the END message is displayed and the buzzer will ring a continuous sound for 7 seconds. In case of a failed cycle, the diagnosis of the failure followed by the "FAIL" message will be printed (if equipped with a printer) and the buzzer will output an interrupted sound.

11. Open the door and unload the sterilized goods from chamber. In case of fail press the START/STOP key to cancel the locking of the door.

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

Note:
A minimum interval of 10 minutes will be observed between the end of a cycle and the start of a new cycle.

For unloading hints – see para. 6.3.2 (Unloading).

Attention

Do not touch the strainer's cover, mounted on the exhaust line, during and short after operation.

Touching the hot strainer's cover may cause severe injuries.

9 MAINTENANCE INSTRUCTIONS

9.1 Preventive and Scheduled Maintenance

The maintenance operations described in this chapter have to be fulfilled periodically to keep the device in good condition and to reduce the breakdown time to a minimum.
The user maintenance personnel, in accordance with further instructions can easily execute these operations.
The owner of the autoclave is responsible to call for 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 para. 2.11 (water quality).

9.1.1 Daily

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

9.1.2 Weekly

1. Take out the tray holder and trays. Clean the tray holder and trays with a cleaning agent & water and with a cloth sponge. You may use diluted lemon acid (25-50 CC lemon acid in 1 liter of water) as cleaning agent. If detergent is used, rinse the tray holder and trays immediately with water to avoid stains on then metal.
2. Once a week clean and descale the chamber, copper tubes and the reservoir using 'Chamber Brite™' (see para. 9.11).

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

3. Put a few drops of oil on the 2 door pins and door tightening bolts.
4. Clean the outer parts of the autoclave with a soft cloth.
5. Once a week, or after 20 cycles (whichever comes first), drain the water from the reservoir, and refill with fresh mineral-free water or distilled water (see para. 9.3).
6. Clean the electrode with a soft cloth.
7. Clean the air jet as per para. 9.4.

9.1.3 Periodically

1. Clean the strainer once a month as per para. 9.5. Cleaning frequency may be reduced according to previous maintenance.
2. Once every month activate the safety valve (see para. 9.8).
3. Once every month, check the air trap jet.
4. On EA, EKA replace the air filter, every 6 months (see para. 9.5).

5. Once every six months clean the fan grid with a

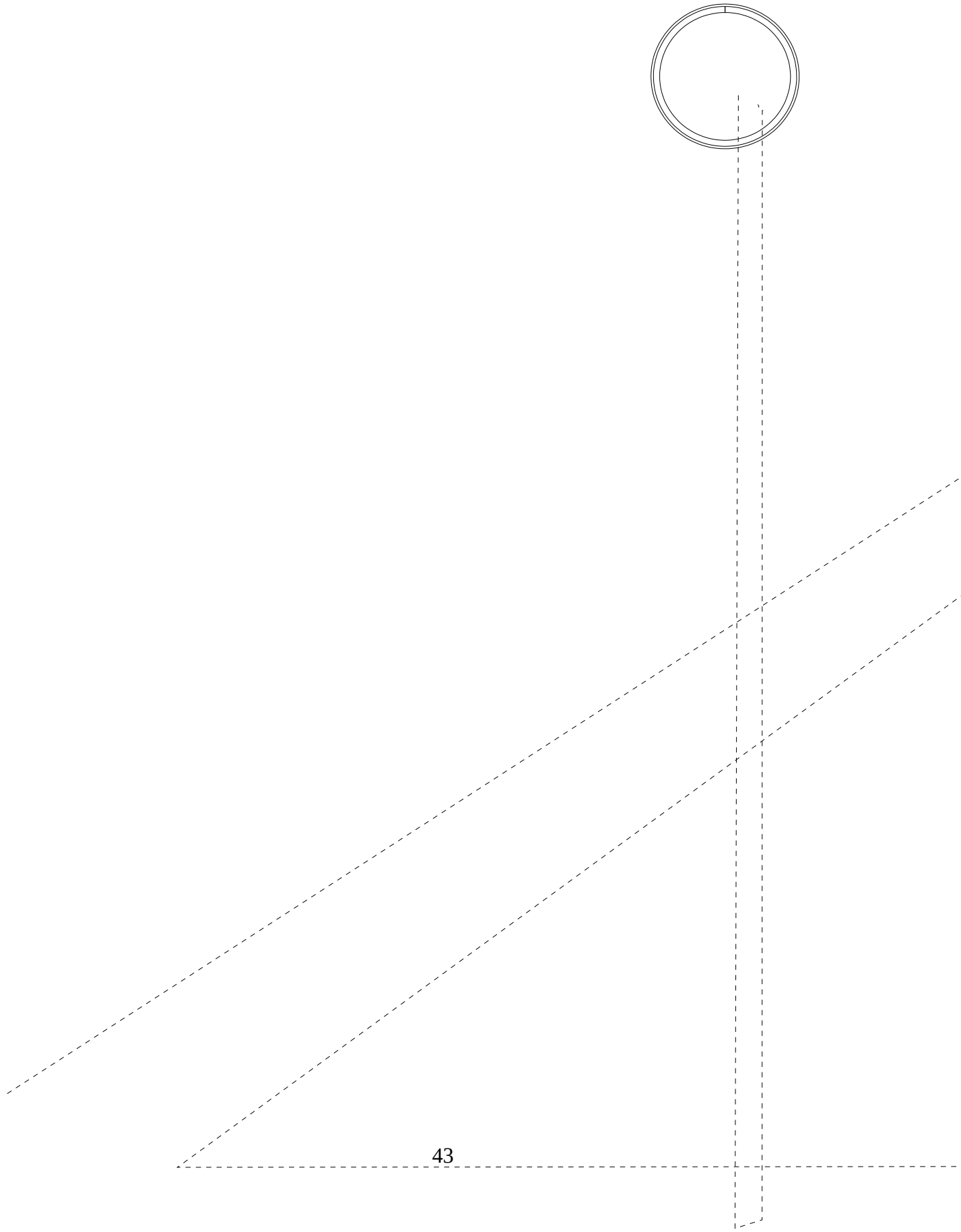
9.3 Cleaning Air Jet

(Located in the water reservoir.)

The elimination of air pockets from the sterilization chamber during heating and sterilization phases is achieved by means of the air trap jet. This device consists of a small orifice that is obtrusive and opened by a small wire moving forth and back.
The air pockets and small steam quantities are pushed up by the steam pressure and evacuated through this orifice.

Caution:

Before proceeding, make sure that the electric cord is disconnected and that there is no pressure in the autoclave. Allow the instrument to cool and the pressure to drop to atmospheric pressure, before cleaning the jet.



9.5 Replacing the Air Filter (models EA, EKA)

In order to ventilate the chamber during the dry phase and to assist in cooling the chamber at the end of the cycle, filtered atmospheric air enters the chamber via a solenoid valve. The filtration of the air is performed by the bacteriological filter that is placed at the inlet of the chamber.

The filter is mounted near an opening on the right sidewall of the autoclave enclosure, to ease access for replacing it.

To replace the filter proceed as follows:

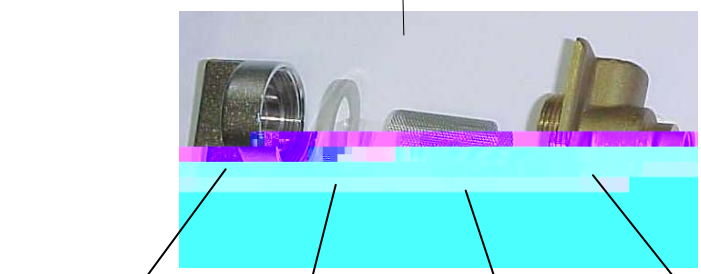
1. Remove the securing screws (see “REAR VIEW”) and the filter cover by turning the cover counter- clockwise until the handle is at a vertical position.
2. Pull out the cover.
3. Cut the tie wrap fixing the flexible tubing connecting the filter to the copper pipe, and pull off the filter.
4. Pull out the filter through the opening.
5. Replace the filter with a new one connecting it with the flexible tubing and tightening it with a tie wrap.
6. Re-assemble the cover and lock it into position by turning it a ¼ turn. Fasten the securing screws.

9.6 Cleaning water outlet strainer

Caution!
Before proceeding, Make sure that the electric cord is disconnected and there is no pressure in the autoclave.

1. Open the strainer cover.
2. Remove the strainer element.
3. Rinse the strainer with water, using a brush if necessary.
4. Reinstall the strainer element.
5. Close the strainer cover.

CAUTION
Do not touch the strainer's cover, mounted on the exhaust line, during and short after operation.
Touching the hot strainer's cover may cause severe injuries.
If maintenance operation is performed while strainer cover is hot, use heat resistant gloves to avoid injuries.



9.7 Replacing the Cartridge Fuse

Caution
Make sure that the electrical power cord is disconnected!

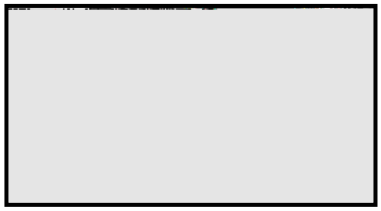
9.10 Cleaning Table Top Autoclaves with Chamber Brite™

CHAMBER BRITE™ is a cleaning and descaling agent designed specifically for the cleaning and removal of water deposits, oxides and other sediments that are found in steam sterilizers. The material is a combination of acidic salts and additional cleaning materials.

Cleaning Procedure

1. Important – all steps in this procedure must be completed without interruption.
2. When the autoclave chamber is cold, remove instruments and trays from the autoclave.
3. Open the door and spread the contents of a packet in a straight even line along the bottom of the chamber, from back to front.
4 Select and start program No. 1. When the cycle is finished exhaust the unit.
5. At the end of the exhaust cycle drain the water from the reservoir.
6. Fill the water reservoir with distilled water.
7. Repeat a sterilization cycle without Chamber Brite™ powder, to remove any excessive dirt in the pipes. Select and start program No. 1. When the cycle is finished exhaust the unit
8. At the end of the exhaust cycle drain the water from the reservoir.
9. Turn the autoclave off and allow chamber to cool.
10. Remove the tray holder; wipe the interior of the chamber with a damp cloth.
11. Fill the reservoir with distilled water or mineral free water only.
12. The instrument is ready to use.

11.Fill tnrc47.8 138.3



IMPORTANT:
DO NOT sterilize instruments during the cleaning process!!!

CAUTION:

Keep out of reach of children. Contains mildly acidic ingredients. Avoid contact with the skin, eyes or clothing. Wash hands well after touching the powder, in the case of eye contact flush with continuous running water for at least 15 minutes. If irritation persists get medical attention. If accidentally swallowed, do not induce vomiting, drink large amounts of water and obtain medical attention. MSDS available upon request.

For models 1730, 2340, 2540 use one packet of CHAMBER BRITE™.
For models 3140, 3850, 3870 use two packets of CHAMBER BRITE™.
Clean every 20 cycles or as needed.

10 TROUBLESHOOTING

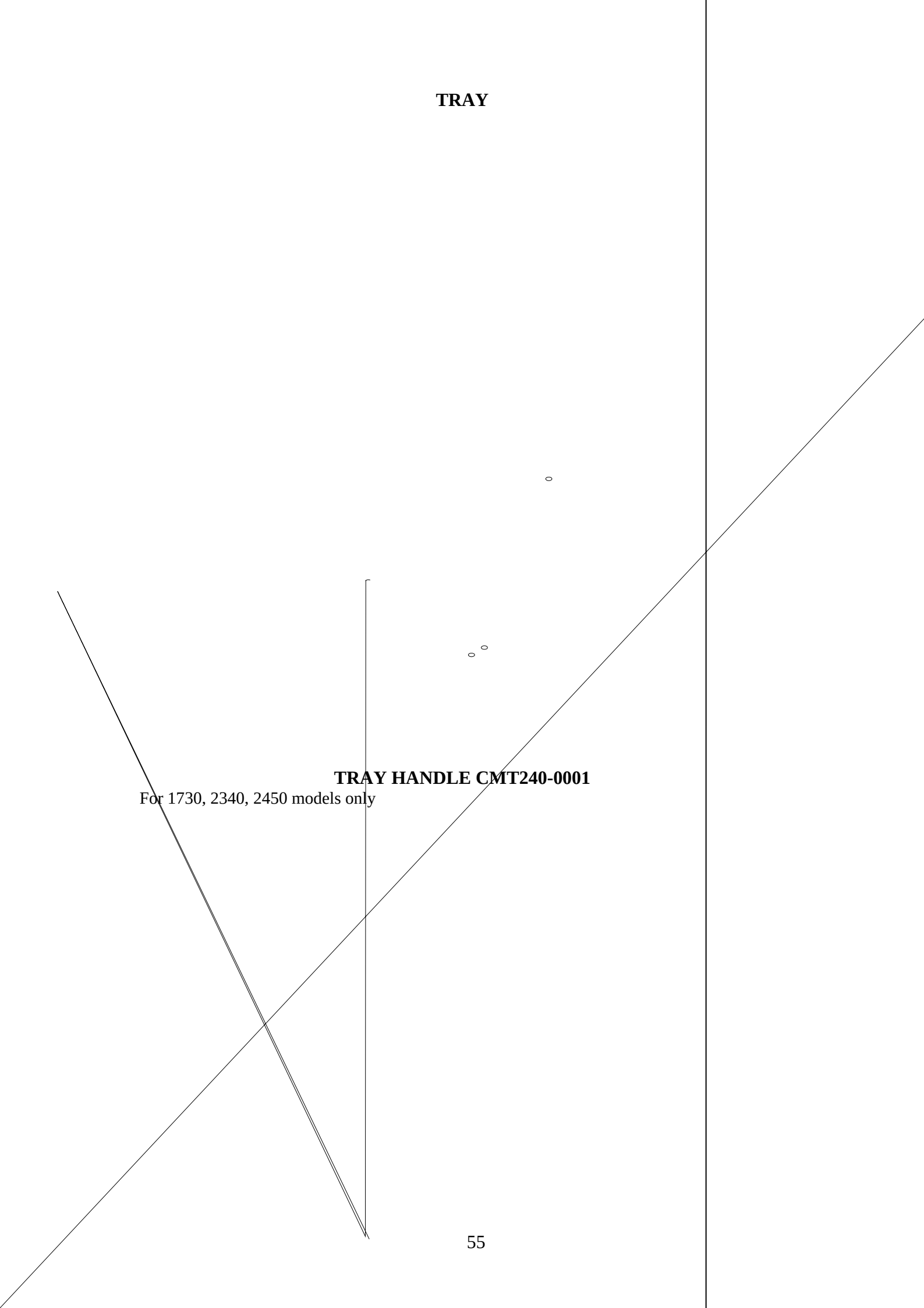
This troubleshooting chart enables the user to solve minor malfunctions, prior to contacting our service department. Only technical personnel having proper qualifications and holding technical documentation (including a technician manual) and adequate information are authorized to service the apparatus.

Problem	*Solution*
1. The machine is not responding	1.1 Make sure the main switch is in the 'On' position. (see front view drawing). 1.2 Make sure the power cord is properly connected to the machine and the mains. (see rear view drawing) 1.3 Check the reset button on the cut-out thermostat. (see para. 9.7 Replacing the Cartridge Fuse) 1.4 Make sure the circuit breaker has not tripped. Lift the circuit breaker lever.
2. 'Low Heat' is displayed	2.1 Check the air trap (inside the water reservoir). (see para. 9.3 Air Trap Cleaning Procedure) 2.2 Make sure the machine has the proper amount of sterilization load.
3. 'Low Water' is displayed	3.1 Add water to the reservoir 3.2 Clean the water level electrode inside the vessel. Check the leveling of the machine. (see para. 6, Installation).
4. 'Low Pres' is displayed	4.1 Check the air trap inside the water reservoir. (see para. 9.3 Air Trap Cleaning Procedure) 4.2 Check the leveling of the machine. (see para. 6, Installation). 4.3 Check the door for leakage and replace the door gasket if necessary. (see para. 9.4 Replacing the Door Gasket)

	Solution
5.1	Check the air trap inside the water reservoir. (see 9.3 Air Trap Cleaning Procedure)
5.2	Check the leveling of the machine. (see para. 6, Installation)
6.1	Clean the water level electrode inside the vessel. Check leveling of the machine. (see para. 6, Installation)
7.1	Clean the water level electrode inside the vessel. Check the leveling of the machine. (see para. 6, Installation)
8.1	Make sure the paper is mounted in the right way. Only one side of the paper is printable. (see para. 5.2, Printer handling)
9.1	Make sure the paper is inserted in the printer. (see para. 5.2, Printer handling)
9.2	Switch off the machine and switch it back on while pressing the feed button on the printer. If the printer prints a test printout, the printer is O.K. and there is a problem with the electronics. Contact your dealer to solve the problem. If the printer does not print the test printout, there is a problem with the printer. Contact your dealer to solve the problem.
10.1	Make sure the ‘feed button’ on the printer is not stuck.

	Solution
11.1	Make sure the door is tightened enough. Replace the door gasket. (see para. 9.4 Replacing the Door Gasket)
12.1	If you are running a ‘liquids’ program this is normal. (see, PROGRAM 5)
13.1	Clean strainer according to instructions.

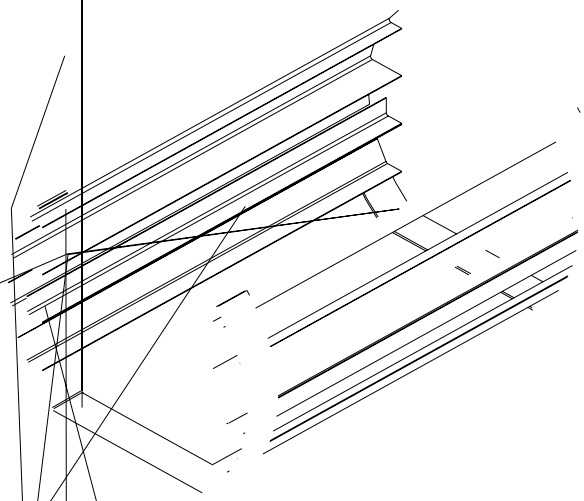
TRAY



TRAY HANDLE CMT240-0001

For 1730, 2340, 2450 models only

TRAY HOLDER



ALTERNATIVE TRAY HOLDER

These tray holders are designed for use in models 2340 & 2540 only.

11 ACSSESORIES LIST

Description		*Cat. No.*					
		1730	*2340*	*2540*	*3140*	*3850*	*3870*
Tray Handle		**CMT240-0001**	**CMT240-0001**	**CMT240-0001**	—	—	—
Pouch Rack		—	**ACS215-0008**	**ACS215-0008**	—	—	**ACS215-0010**
Tray	Big	**TRY173-0002**	**TRY240-0001**	**TRY240-0001**	**TRY314-0001**	**TRY385-0003**	**TRY387-0001**
	Small				**TRY314-0002**	**TRY385-0004**	**TRY387-0003**
Tray holder		**TRH173-0002**	**TRH234-0001**	**TRH254-0001**	**TRH314-0000**	**TRH385-0001**	**TRH387-0002**
Alternative Tray Holder		—	**TRH234-0008**	**TRH254-0009**	—	—	—
Silicon drain tube		**GAS084-0007**	**GAS084-0007**	**GAS084-0007**	**GAS084-0007**	**GAS084-0007**	**GAS084-0007**
Chamber Brite™ 1box (10 packets)		**CLE096-0026**	**CLE096-0026**	**CLE096-0026**	**CLE096-0026**	**CLE096-0026**	**CLE096-0026**

12 SPARE PARTS LIST

Description	*Cat. No.*					
	1730	*2340*	*2540*	*3140*	*3850*	*3870*
Water reservoir cover						