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80 LR Sterilizer

Operating Instructions

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OPERATOR'S MANUAL

This manual describes operating procedures for normal use of the sterilizer. It confines itself to those which are essential for operating the appliance.

1 BEGINNING A WORKING DAY. CONNECTING THE APPLIANCE.

1) Open the shut-off valves at the service supply points. If they are fitted with a manometer, check the supply pressures as follows:

- Water: between 2 and 6 bar.

2) Check that the chamber emptying valve is closed.

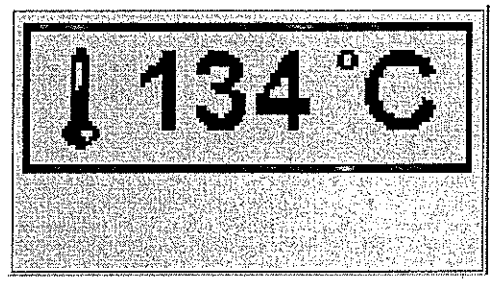
3) Turn on the power switch located on the front panel.

2 SELECTING AND EXECUTING A PROGRAM

2.1 SELECTING THE DESIRED PROGRAM

1) Press ☐ until the Program selection page is displayed.

2) Press ↑ several times until the required program is obtained.



Program selection

2.2 CHECKING TIMES

1) Press ☐ again until the Editing Times page is displayed.

2) Check the pre-assigned times and if necessary change them as indicated:

Sterilisation time (1):	↑	increases by 0.1 min
	↓	decreases by 0.1 min
Drying time / Cooling (2):	→	increases by 0.1 min
	←	decreases by 0.1 min

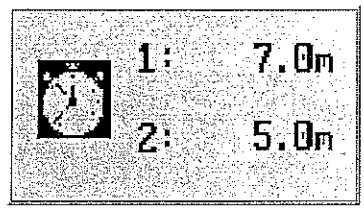
2.3 LOADING THE STERILIZER

1) Open the door by pressing to withdraw the locking device and then turn the door opening handle

2) Fill the water chamber up to the opening. Then check that the chamber Fill and Empty valve handles are in the closed position.

3) Load the sterilizer. See Section 6.2 Loading the sterilizer in the Operating Manual, for instructions on how to load the material correctly.

4) Manually shut the door.



Checking Times for phases 1 and 2

2.4 EXECUTING THE PROGRAM

1) Select the process status page.

2) Press ▶ to start Process Under Way. The red ON pilot will light up.

3) The process proceeds according to the phases described in chapter 5, Programs and Parameters, in the Operations Manual.

4) End of process: the CONTROL pilot light flashes. Press ■ to end the process.

2.5 UNLOADING THE MATERIAL

1) Press to unlock the door and unload the material.

2) If a new process is to be carried out, refill with water.

3 AT THE END OF THE WORKING DAY SHUTTING DOWN

1) Turn off the power switch on the front of the panel.

2) Turn off the water supply tap.

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0 SYMBOLS AND SAFETY

See figure 2.1. You will find the warning signals fitted to the sterilizer. These signals are identified with a letter and they are described below

Figure 2.1 (A):
Shows some electrical risk when the cover has been removed for accessing to the electrical parts.

Switch off the main switch always before removing the front cover and before opening the electro-cabinet located at right side of the sterilizer.

Switch off the main switch when checking the vacuum pump and / or heating elements connections

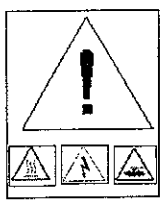
Figure 2.2 (B):
Before opening the door, check that the pressure inside the chamber is zero by reading the pressure gauge.

Figure 2.2 (C):
Risk of contact with heated parts.

When the sterilizer is running door cover and door arm might be hot. Avoid to touch them.

When loading the load into the chamber and when unloading it from the chamber, take care of hot parts: the door, the chamber, the loading accessories and the load itself.

Figure 2.2 (D)
Use gloves to protect from hot parts when loading and unloading the sterilizer.



When removing the lateral panelling of the sterilizer, i.e. for maintenance purposes, several risk might occur. Take care of parts potentially hot, electrical parts and pressurized parts.

Indication for all terminals for the earth protection lines of the appliance.

WARNING: For cleaning the appliance, follow instructions given in sections 10.3.1, 10.3.2 and 10.5

WARNING: To avoid harm to people and/or to the appliance, ensure the supplies to the appliance remain within the limits specified by the manufacturer

WARNING: The sterilizer should be used only by suitable trained personnel

WARNING: The appliance should only be transported, commissioned, maintained and decommissioned by personnel duly authorised by the manufacturer.

WARNING: Use only loading systems homologated by the manufacturer.

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1 INTRODUCTION, GENERAL DESCRIPTION AND START-UP

1.1 INTRODUCTION

Matachana would like to thank you for the trust you have placed in us by acquiring one of our products. We hope that it will help to satisfy all your requirements.

All Matachana machines are manufactured under strict quality control conditions, which ensures their high level performance. The equipment complies with all current safety standards and therefore represents no danger to its operator, provided that it is used in accordance with the instructions set out in this User's Manual.

This Manual will allow you to start up the machine correctly and operate it efficiently. It is arranged so that it can be used as a reference guide. However we recommend that you read it all the way through first in order to have an overview of how the machine works.

Basic handling is summarized in the Operator's Manual, appended to the present User's Manual. It provides a description of the operations to be carried out in running any test or sterilising program.

The appendices includes the Warranty Certificate which details the relevant terms and conditions. This warranty is backed up by an extensive technical assistance network across Spain and a list of the service points is included in this chapter.

DO NOT CONNECT THE STERILIZER YET. First follow the instructions in section, Start-up.

Finally, we would like to remind you that it is forbidden to reproduce this Manual and that as a result of our constant quest for technological innovation and quality, the technical characteristics may be modified without prior warning.

1.2 DESCRIPTION AND TECHNICAL DATA

1.2.1 DESCRIPTION

The 80 LR Series MATACHANA sterilizers are equipped with a circular, 400 mm diameter chamber. The manually operated door.

The sterilizers are controlled centrally by a microcomputer with both digital and analog inputs and outputs. They are also provided with display facilities allowing the operator or maintenance technician to receive information about the status of the machine and the progress of the program cycle.

Each sterilizer is provided with 3 sterilisation programs specified in the corresponding Technical Factsheet.

1.2.2 TECHNICAL DATA

The main technical details and characteristics can be found in the Technical Factsheet for the sterilizer. That information is repeated below together with other useful complementary data.

a) Design

Code:	AD Merkblatt-2000
Pressure:	3 bar
Temperature:	100 / 150 °C
Chamber safety valves:	1 calibrated at 3 bar

b) Main construction materials

Chamber:	Stainless steel No. 1.4404 EN 10028 - 7, AD 2000-W2
Door:	Stainless steel No. 1.4408 EN 10213 - 4, AD 2000-W5
Braces:	Stainless steel No. 1.4408 EN 10213 - 4, AD 2000-W5

c) Dimensions

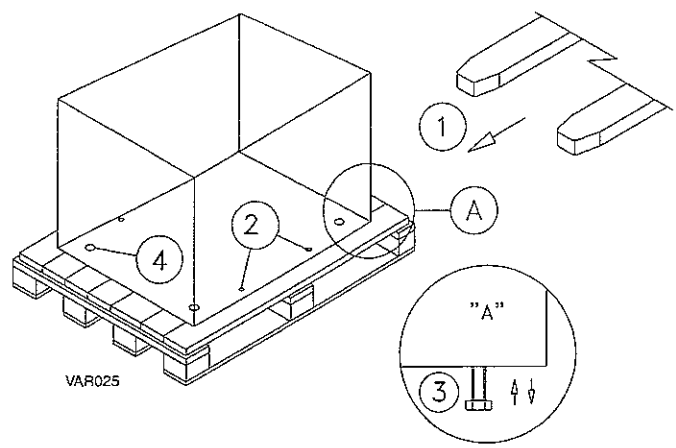
See table 1.1.

MODEL	Nº OF DOORS	TOTAL VOLUME (m^3)	AVAILABLE SPACE WIDTH (mm)	AVAILABLE SPACE HEIGHT (mm)	AVAILABLE SPACE DEPTH. (mm)	CHAMBER MEASUREMENTS DEPTH (mm)	CHAMBER MEASUREMENTS DIAMETER (mm)	TOTAL MEASUREMENTS WIDTH (mm)	TOTAL MEASUREMENTS HEIGHT (mm)	TOTAL MEASUREMENTS DEPTH. (mm)
80 LR	1	0,073	348	300	550	400	685	682	1800	704

Table 1.1: Measurements

1.2.3 INSTALLATION

The sterilizer shall be installed in accordance with the installation drawings supplied by the manufacturer. It should be deposited in the place where it is going to be installed and used in accordance with the handling conditions shown in figure 1.1



1. Use a fork-lift truck to transport the sterilizer assembled on the wooden pallet.

2. Before depositing the machine in the place where it is to be installed, remove the screws attaching it to the wooden pallet..

3. Once the sterilizer has been put in the place where is going to be installed and used, it has to be levelled with the aid of the four adjustable legs.

4. If it is needed to move the machine or to change its installation site, use the same means and follow the same instructions as for installing it

The recommended procedure is described in the following sub-sections.

1.3 START-UP

The recommended procedure is described in the following sub-sections.

1.3.1 INSTALLATION CHECK

Before starting up the sterilizer, you should make sure that it has been correctly installed. You can do this by consulting the installation instructions and diagrams, which are supplied whenever a firm order is placed, and checking the points listed below:

a) The electrical supply voltage and frequency must be the same as those shown on the electrical specifications plate on the sterilizer. This plate is located on the electrical connecting terminals casing.

b) Check that the water supply is connected and that it is fitted with a service tap.

DO NOT TURN ON THE SERVICE TAPS.

c) Set the power switch TC1 at "0". See the electrical wiring diagram at the end of these instructions.

d) Use a voltmeter to check that the voltage at the terminals connecting the sterilizer to the mains supply is correct. If necessary, turn on the power switch. (i.e. the switch external to the sterilizer).

WARNING: This check shall be done only by trained personnel.

1.3.2 START-UP

WARNING: The set of checks and operations described below shall be done only by well trained personnel

a) Check that the water shut-off valve is closed.

b) Check that the vacuum pump power switch TC1 is set at "0". If it is not, turn it to this position.

c) Turn on the power switch, IP1, located on the front panel. (Turn the control from "O" to "I").

d) Bleed the water line. Disconnect the water system and circulate the fluid by opening the service tap to bleed the line and flush out the deposits and sediment.

e) Reconnect the water intake. Open the service tap and check that the supply pressure is between 2 and 6 bar.

f) Check the direction of rotation of the pump. It should turn in a clockwise direction when looked at from the motor side.

Adjust the connection and, if necessary, change the direction of rotation of the pump. This is done by disconnecting the sterilizer from the power supply (by the external service switch) and checking that there is no voltage in the terminals connecting the sterilizer to the mains. Then swap round the two-phase connection before or after these terminals.

Turn on the (external) power switch and check again which way the pump turns.

Once the start-up procedure has been completed, the sterilizer is ready for normal operation.

1.3.3 SUPPLY QUALITY

WATER

The water quality should be suitable to prevent corrosion, wear and build-up of fur on the components of the machine. It should be classified as potable, should preferably be supplied at a temperature of less than 15° C and have a hardness of between 0.7 and 2.0 mmol/l.

2 STERILIZER CONTROL FEATURES

This section describes the various monitoring and control devices located on the front panel of the machine. All these elements are shown in Figure 2.1. The number identifying each item in the figure is the same as the last digit in the corresponding subsection.

2.1. POWER SWITCH

The power switch connects the sterilizer to, or disconnects it from, the electrical power supply.

PROGRAM INTERRUPTION: If, for any reason, the current cycle has to be stopped, disconnect the machine using the power switch for more than 30 seconds. On reconnecting the controller interprets that there has been a power supply fault and carries out the necessary operations to finish the cycle and open the door.

2.2 RECORDER (optional)

The sterilizer is equipped with an analog recorder (options 09.2 and 09.3) located on the non-sterile area side, as follows:

Analog recorder: A strip chart graphic recorder produces a continuous line graph of temperature.

Temperature: Range:	50 to 150 °C
Line colour:	RED

2.3 OPERATING PANEL

This is the communications interface with the user. It consists of a graphics screen to display the parameters and variables for the process and for the various buttons. Chapter 4 explains how they operate. OPERATING PANEL.

2.4 MANUAL OPENING AND CLOSING DOOR HANDLE

Manual control for opening or closing the door. Turn it to the left to open or to the right to close. The door cannot be opened until the opening button is pressed [⊡] located on the operating panel. This unlocks the opening control movement.

IMPORTANT: only refill with the door open and always prior to starting a process.

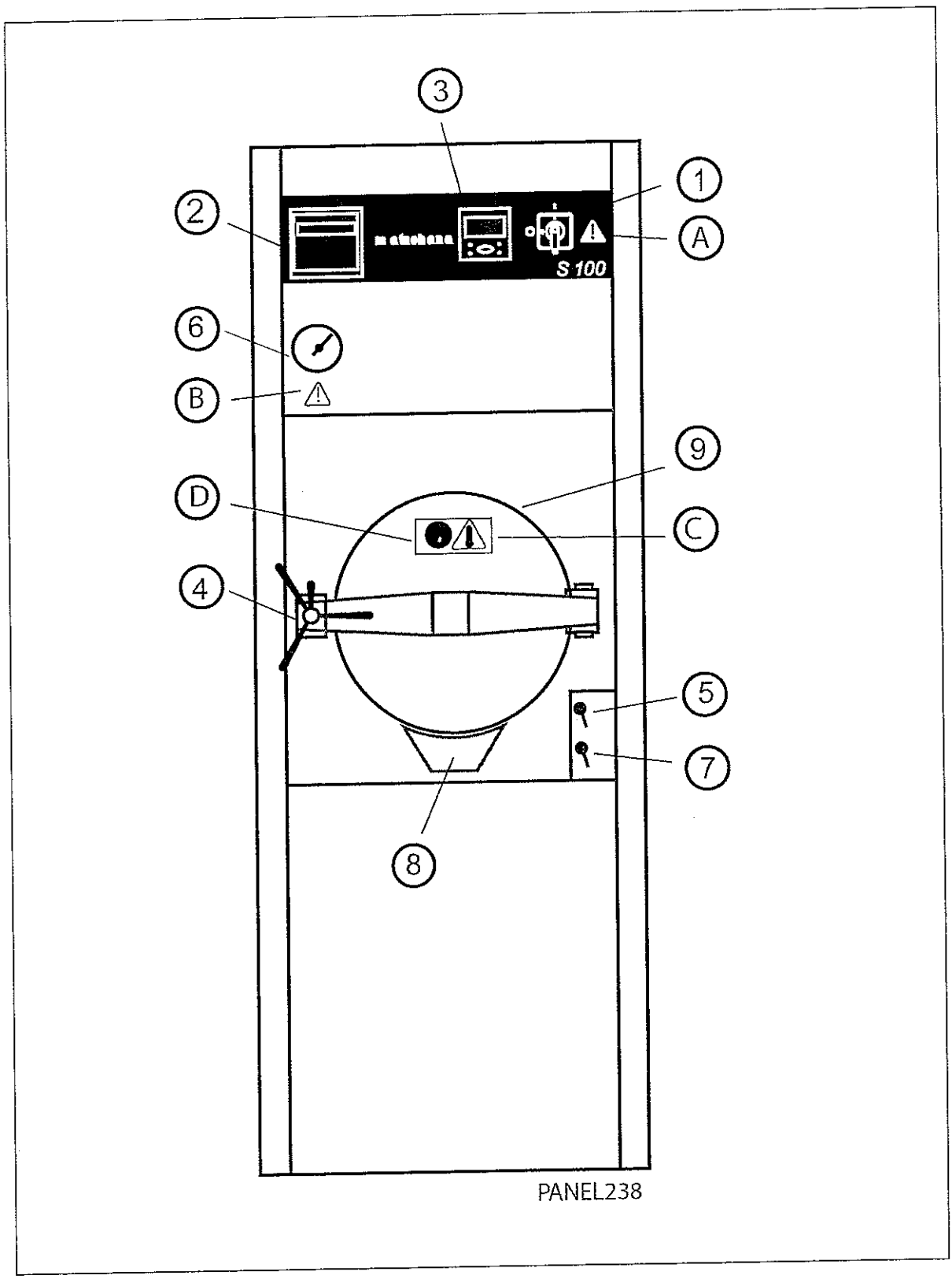


Figura 2.1: Sterilizer 80 LR

2.5 FILLING VALVE CONTROL

During the process, steam is generated inside the chamber by vaporizing the water accumulated in its lower section. This water must be replaced before restarting the process. It is vital that the user supervises this operation via the level indicator. To do so, fully open the door. Turn the filling valve control from "O" to "I". Check the rising level and when it reaches the level shown in the chamber return the control to the initial position. If the water rises above the level shown, it will overflow and will run in to the waste pipe.

2.6 MANOMETER

The pressure in the chamber is displayed on a vacuum/pressure manometer, with a scale of -1 to +4 bar.

2.7 EMPTYING VALVE CHAMBER CONTROL

If necessary, the water in the chamber can be removed by opening the emptying valve. To do so, move the control from "O" to "I". Then, restart from the initial position. Before starting any process check that this valve control is on "O".

2.8 FLASHING TRAY

Sometimes water or condensation may run out from the chamber when the door is open or being opened (e.g: on resetting the water level in the chamber, if it is exceeded, or during liquid processes). These fluids are taken out via the drainage pipe avoiding any overflow.

2.9 DOOR

Once the door is in the closed position, turn the handle to the right until the door's green pilot light (located on the operating panel) is continuously on. The door will now remain closed and locked allowing a new process to start.

IMPORTANT:	**Do not open the chamber emptying valve with the door closed. Check that it is closed before starting any process.**

3 OPERATING THE DOOR

The door may be opened or closed at will, provided that the sterilizer is connected to the power supply, and it is not in the midst of carrying out a process. Both operations must be done manually. For safety reasons opening the door is subject to a series of conditions and it will remain locked if these conditions are not met.

3.1 OPENING AND CLOSING THE DOORS

To open the door, press the open button . Then turn the opening / closing handle counter clockwise until its shaft can be removed from its housing towards the left. Manually open the door by pulling the handle.

To close the door, it first has to be raised to the close position. Place the opening / closing handle vertically on the front of the machine and turn it clockwise. When it is tightened enough, the green light on the operator's panel will come on.

3.1.1 DOOR STATUS SIGNALS

The status of the door is shown in two ways: by a green pilot light and by an icon on the screen, both located on the operator's panel.

When the door is closed, the pilot light is continuously on. On pressing to open the door, it will be flashing on while the door is not open. Once it is open, it goes off. If the door has not been opened within the preset time or if the door is closed again, it will be continuously on.

An open door image is intermittently displayed on the status screen when the door is open. It is not while the door is closed.

3.2 DOOR SAFETY SYSTEM

The door is equipped with the following safety mechanisms and functions:

1) The locked door closure mechanism prevents it from opening.

2) It is not possible to manually open the door without previously unlocking the opening handle mechanism by pressing . An additional mechanism prevents it from turning.

3) The door cannot be opened while an operation is under way. If, for any reason, there is a forced opening, it will be interrupted.

4) If there is a malfunction in handling the door, the process status screen will display an advisory alarm. See chapter 7: WARNING ALARMS.

5) 30 seconds are allowed after pressing the button to open. If not, the opening will be cancelled.

6) It is not possible to open the door if a process is under way. If it is necessary to end a process, switch off the sterilizer for 30 seconds and switch it back on. The necessary operations will be undertaken to end the process. When the end process is reached, press the button . Then proceed as previously described.

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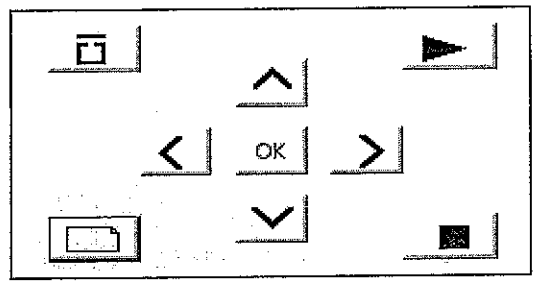
4 OPERATING PANEL

4.1 OPERATING INSTRUCTIONS

On connecting the equipment and for a few seconds, the display will show an image of the system status. It will then change to the start page:

Start page: model:, date and time



Operator's panel keys

The operator's panel has several keys to select programs, times, process start and finish, unlocking the door, etc. Each of these has an icon that shows its function. These are:

- Unlocking de la door (operation prior to manual opening)
- Page change (or screen image): press to move on the following
- ▶ - Start the selected process (only active from the Process Status page)
- ■ - End the current process (only active from the Process Status page)

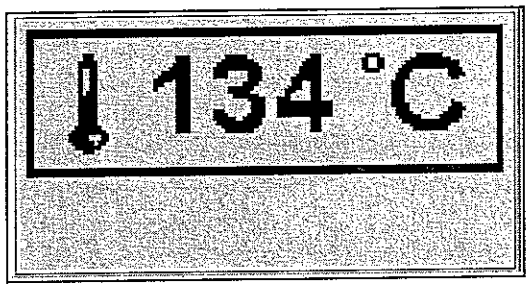
The function of these keys is always the same, as opposed to the direction keys (up, down, left and right) which carry out different functions depending on the page being displayed. In this mode, the door is unlocked by pressing in any of the displayed pages (if the necessary conditions are met).

4.2 START PAGE

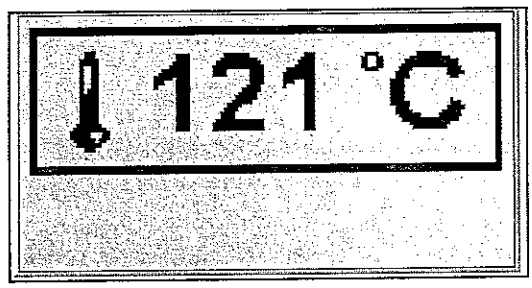
The date, time, brand, series and model of the sterilizer are shown on this page. The System Tools pages are accessed from here (by pressing) and Program Selection (by pressing)

4.3 START PAGE

The sterilizer has 3 programs (134 °C Solids, 121 °C Solids and 121 °C Liquids). To select one of these press the button . The program icon changes each time a key is pressed. The values assigned to the sterilisation and drying / cooling times also change in this way. See Time Adjustment.



Process selected: Solids 134 °C



Process selected: Solids 121 °C

At the start of the process an initial prevacuum extracts the air from the chamber and product. Air acts as a barrier to the sterilizing agent, i.e. steam. Non extracted air is subsequently purged.

At the same time the water inside the chamber will be heated up. When the water is boiling, two fractionation steps follows.

The prevacuum may cause Liquids to boil when they are processed, and in particular if they are placed in the chamber above 50 °C. Therefore, for liquids programs these fractionation steps are disabled

Press ☐ to go to the next page: Time Adjustment

4.4 TIME ADJUSTMENT

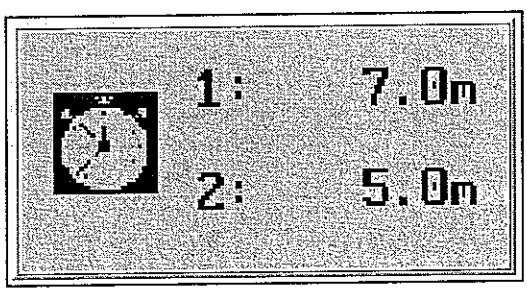
Each program has preassigned values for Sterilisation time (1) and Drying / Cooling time (2), that are copied each time the selected program is changed. These values may be temporarily changed (swhich then remain valid whilst the selected program is not changed). To adjust them proceed as follows:

Sterilisation time (1): ↑ increases by 0.1 minute

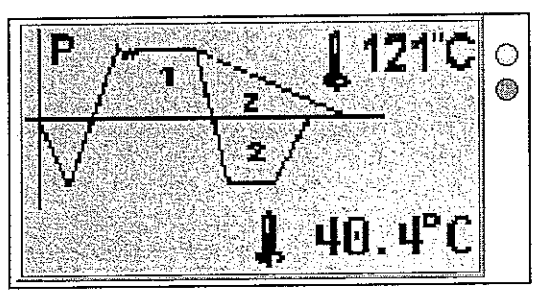
↓ decreases by 0.1 minute

Drying time / Cooling (2): → increases by 0.1 minute

← decreases by 0.1 minute



Time adjustment for phases 1 and 2

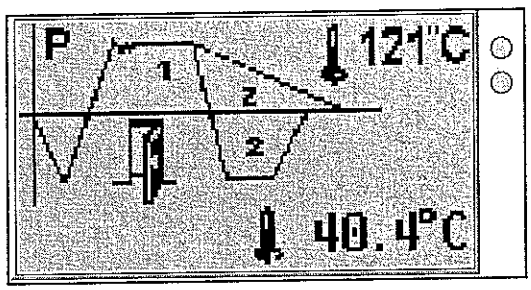


Corresponding with process phases

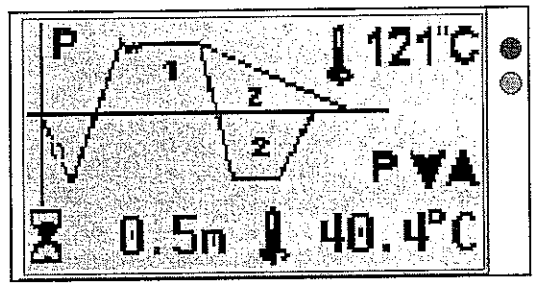
Press ☐ to go to the next page: Process status

4.5 PROCESS STATUS

This page shows information on the process: status (under way or stopped), phase, door status, alarms, product probe temperature, time lapsed for the phase under way and steam and vacuum generation indicators.

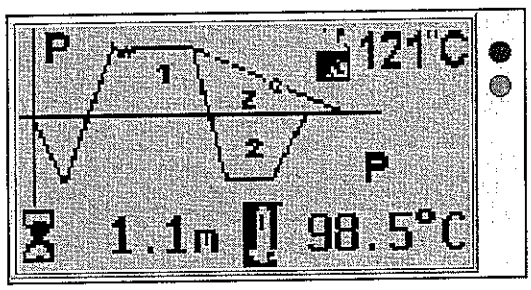


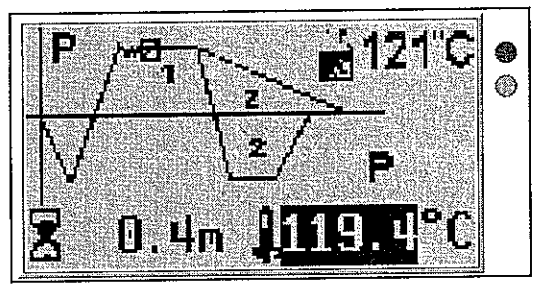
Process Stopped: upper red LED ON Door open: door icon and lower LED OFF
Selected program: 121 °C Solids
Selected program: 121 °C Solids Product Temperature: 40.4 °C.



Process Running: upper red LED ON
Door closed: lower green LED ON
Selected program: 121 °C Solids
Current Phase: Prevacuum
Steam generation icon (up arrow)
Chamber vacuum icon (down arrow)

The On ▶ and the off ■ push buttons only operate on this page. Once a process has started it is not possible to exit from it until it has finished. Therefore, the program and phase times cannot be changed. To cancel the current program the machine must be switched off for 30 seconds and then switched back on.





The sterilization time used for calculation is stopped if the temperature drops below that programmed during the sterilization phase. The temperature is displayed in reverse video to show this anomaly.

For liquid processes, the product temperature must be below 95 °C to end the cooling phase and to be able to safely take out the material. During this phase, if this temperature is higher, the thermometer symbol will flash.

When an alarm situation occurs a warning signal is displayed. This signal consists in a number that corresponds to the alarm code, followed by the icon ⚠ When the alarm situation disappears, the warning signal also disappear from the display.

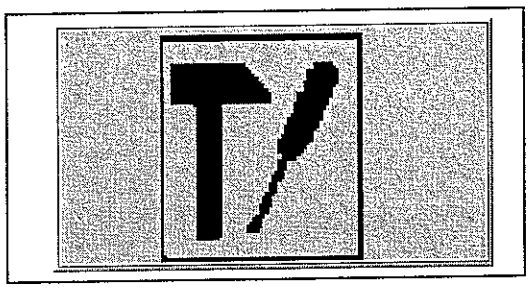
The direction keys ⇧ and ⇩ respectively increase and decrease the screen luminosity. The central key [ok] reactivates the screen's background light when it automatically disconnects itself after an inactive period.

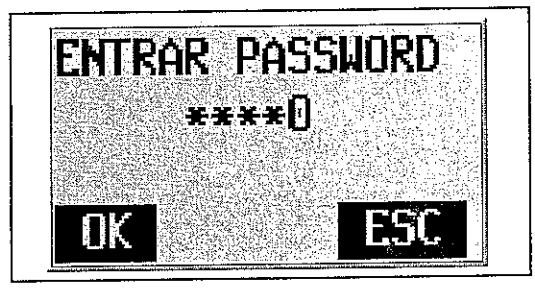
As described on previous pages, the ⇥| key withdraws the door locking mechanism to allow the door to be manually opened. This is not possible if the process is under way.

By pressing ⎋ the start page is accessed again.

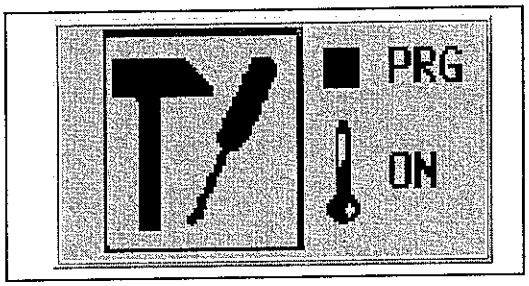
4.6 SYSTEM TOOLS

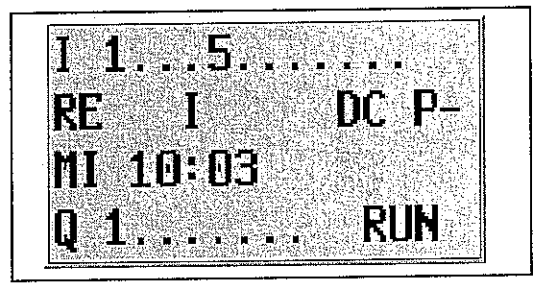
This page is accessed from the start page by pressing ↵. It is protected with an access code which prevents the values being accidentally changed. If the page has been accessed and the access code which is [00001] cannot be remembered the machine must be switched off in order to exit the page.





Press ☐ to confirm the requirement to enter and then the access code will be requested. Enter the code and the page will change as follows.





The figure on the left shows the page's new appearance. Here, the product temperature probe can be enabled or disabled (for example in the event of it breaking down and being replaced) and can access the electrical control system.

Product temperature probe:	↵	OFF	probe disabled
	↵	ON	probe enabled

Pressing ■ accesses the system menu. Changes are not recommended except for changes to the equipment's internal clock. Some areas of the menu are protected with special access codes.

To change the clock press [ok] and then ↓ until the Clock Setting section appears. Press again and the Clock Setting submenus will be accessed (to change date and time) and Time Change (displays the time zone according to the location of the country).

5 PROGRAMS AND PARAMETERS: OPERATING

The sterilizer is equipped with 3 programs, with changeable parameters that are described below.

Program means the sequence or operations that the sterilizer carries out from when it is started until it finishes. These programs have parameters which the user may adjust according to requirements.

The available programs and the times pre-assigned on the sterilizer for the sterilizing (T1) and drying / cooling (T2) phases are:

SOLIDS 134 ºC - T1: 10.0 min / T2: 15.0 min

SOLIDS 121 ºC - T1: 20.0 min / T2: 15.0 min

LIQUIDS 121 ºC - T1: 20.0 min / T2: 30.0 min

RUNNING A PROCESS

Operations prior to starting the process:

- Open the door: press ⊓ to unlock the opening wheel and turn it anticlockwise until the door can be manually opened.
- With the door open, refill the water to the level up to the opening: to do so, turn the fill key and check that the water in the chamber reaches the level shown in it.
- Load the sterilizer with the product to be processed.
- Optional: Place the temperature probe in the product: if packaged solids are being processed, for example in paper bags, locate the probe between the bags. If the product is a liquid, place the probe in the largest container without it touching the sides, i.e. only in contact with the product.
- Manually close the door.
- Select the program to be carried out on the operator's panel.
- Check the pre-assigned times and adjust them where necessary.
- Finally, press ▶ to start the process.

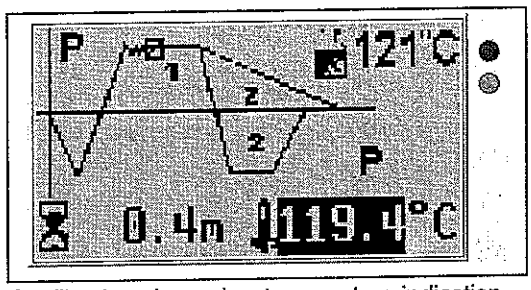
During the process:

- The process proceeds according to its phases as described for each program.
- To initiate the sterilization phase, it is necessary that the chamber will reach the pressure and temperature conditions according to the program running.

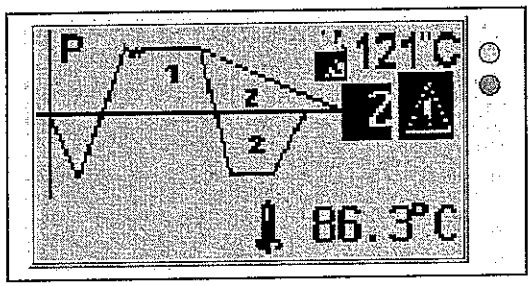
- If the temperature measured by the product temperature probe drops down under the sterilization temperature, the indication of the temperature changes to reverse video display. Also, the holding time count stops until the product temperature will be back over the sterilization temperature.

End of the process:

- If the process is not in the END OF PROCESS phase, the lower pilot light (red) will flash: press ■ and the process will be ended.



Sterilizating phase: low temperature indication



Alarm worning code.

- On the other hand, if it has not reached the end process, the sterilizer must be disconnected for at least 30 seconds to create an electrical supply failure. The process will then be terminated. Continue as described until the END OF PROCESS phase is reached.

- The START light will be turned off.

- If on the other hand, it has not reachthe end phase, the use should disconnect the sterilizer for at least 30 seconds in order to cause an electricity feeding faiture.

- Proceed as described previously.

- In any case, always that the alarm warning appears, the reason will be indicated with a numerical code and a flushing light. See chapter 7. Alarm warnings

SOLIDS 134 °C

This program is used to sterilise solids materials, instruments wrapped in paper bags, mixed bags or any other solid material capable of standing temperatures of up to 137 °C. It is specially suitable for sterilising "porous" items that are able to withstand such a temperature.

1) DESCRIPTION OF THE PROCESS

After start-up, by pressing ► , the process proceeds according to the following phases:

START: A red pilot light comes on indicating that the process is under way. The display on the operator's panel remains fixed showing the process status and cannot be changed until the end of the process.

1. **PREVACUUM:** For extraction of air from the chamber and the product and preheating of both, a fractionated vacuum-steam pressure increase is performed in three steps.
2. **HEATING:** Steam is continued to be generated until the sterilizing temperature is reached in the chamber.During this phase, the pressure increase is two times interrupted by fractionation steps for better deaeration.
3. **STERILISATION:** The sterilisation temperature is maintained throughout the sterilisation phase.
4. **EXHAUSTING:** A vacuum is induced to extract steam from the chamber.
5. **DRYING:** The vacuum pump continues to operate while resistances take heat into the product to dry it. The operation ends when the indicated time has run out.
6. **PRESSURE EQUALISATION:** The atmospheric and chamber pressures are equalized by air entering through an absolute filter.
7. **END OF PROCESS:** The processed material is ready to be taken out. Press to end the process. During this phase, the red pilot light flashes to indicate the end of the phase.

2) PROGRAM PARAMETERS:

The program may be adapted to the specific requirements of each product, so that sterilisation and drying times may be defined. Air removal (purge) by gravity and /or additional prevacuum can also be defined

Sterilisation time: (1) 10.0 min

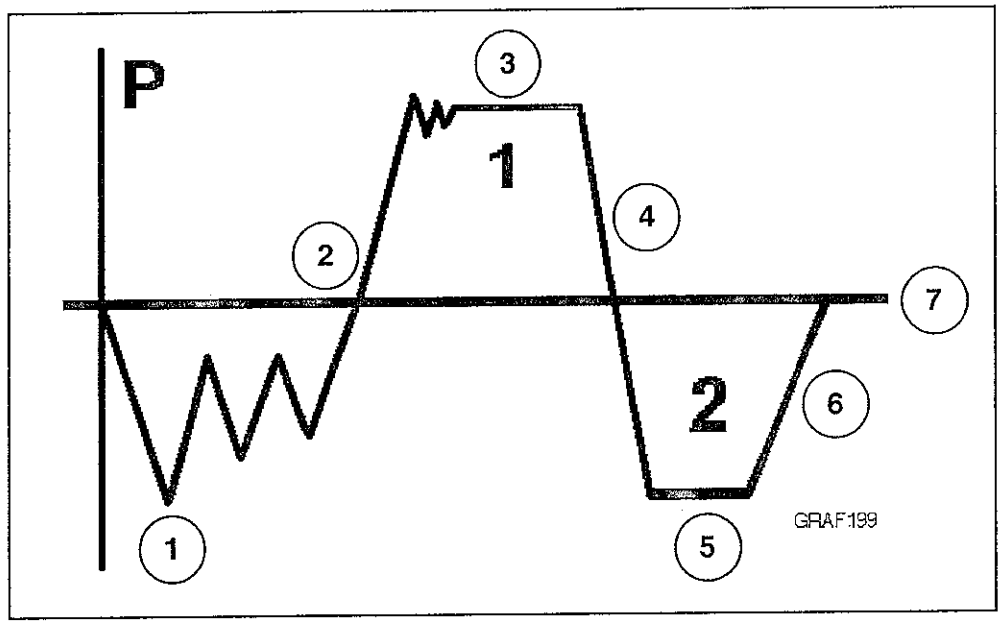
Time during which the chamber and material to be sterilised is exposed to the sterilisation temperature. The time the sterilisation phase lasts.

Drying time: (2) 15.0 min

It is the time the drying phase lasts.

Prevacuum: OFF / ON

Select if initial air removal (purge) is only to be done using gravity or also with an initial prevacuum.



The phases correspond to the chart on the process status screen.

SOLIDS 121 °C

This program is used to sterilise solids materials, instruments wrapped in paper bags, mixed bags or any other solid material capable of standing temperatures of up to 125 °C. It is specially suitable for sterilising "porous" items that are able to withstand such a temperature.

1) DESCRIPTION OF THE PROCESS

After start-up ►, by pressing, the process proceeds according to the following phases:

START: A red pilot light comes on indicating that the process is under way. The display on the operator's panel remains fixed showing the process status and cannot be changed until the end of the process.

1. **PREVACUUM:** For extraction of air from the chamber and the product and preheating of both, a fractionated vacuum-steam pressure increase is performed in three steps.
2. **HEATING:** Steam is continued to be generated until the sterilizing temperature is reached in the chamber.During this phase, the pressure increase is two times interrupted by fractionation steps for better deaeration.
3. **STERILISATION:** The sterilisation temperature is maintained throughout the sterilisation phase.
4. **EXHAUSTING:** A vacuum is induced to extract steam from the chamber.
5. **DRYING:** The vacuum pump continues to operate while resistances take heat into the product to dry it. The operation ends when the indicated time has run out.
6. **PRESSURE EQUALISATION:** The atmospheric and chamber pressures are equalized by air entering through an absolute filter.
7. **END OF PROCESS:** The processed material is ready to be taken out. Press ■ to end the process. During this phase, the red pilot light flashes to indicate the end of the phase.

2) PROGRAM PARAMETERS:

The program may be adapted to the specific requirements of each product, so that sterilisation and drying times may be defined. Air removal (purge) by gravity and /or additional prevacuum can also be defined

Sterilisation time: (1) 20.0 min

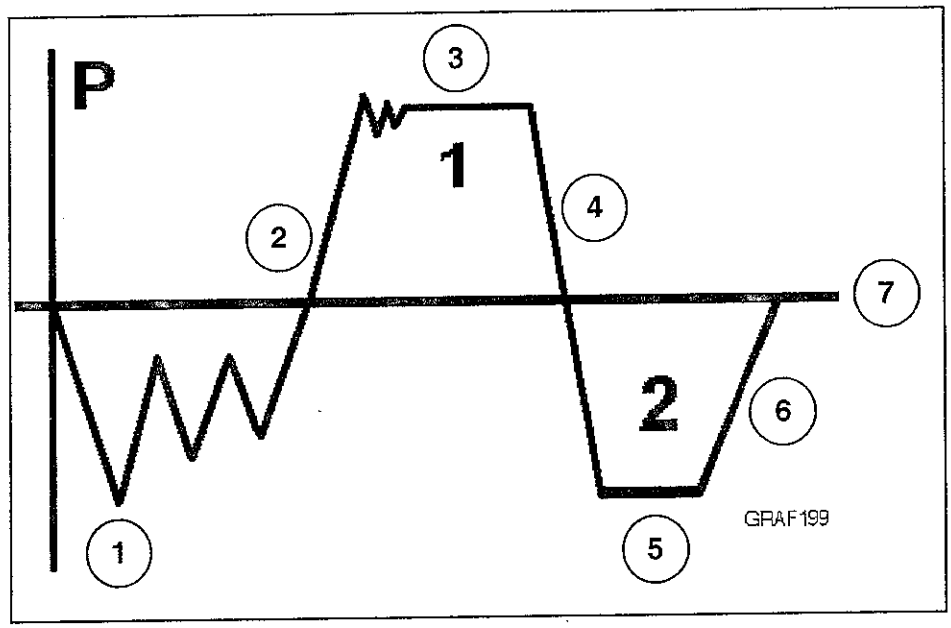
Time during which the chamber and material to be sterilised is exposed to the sterilisation temperature. The time the sterilisation phase lasts.

Drying time: (2) 15.0 min

It is the time the drying phase lasts.

Prevacuum: OFF / ON

Select if initial air removal (purge) is only to be done using gravity or also with an initial prevacuum.



The phases correspond to the chart on the process status screen.

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LIQUIDS 121 °C

Program for sterilizing Liquids in open containers (not hermetically sealed) and which are able to withstand process temperatures (124 ºC maximum). At the start of the process the liquids may be hot or cold.

1) DESCRIPTION OF THE PROCESS

After start-up, by pressing ► , the process proceeds according to the following phases:

START: A red pilot light comes on indicating that the process is under way. The display on the operator's panel remains fixed showing the process status and cannot be changed until the end of the process.

1. **AIR REMOVAL:** For extracting air from the chamber and the load,. the steam, generated by the boiling water, replaces it step by step streaming through a permanent purge to the drain.
2. **HEATING:** Steam is continued to be generated until the sterilizing temperature is reached in the chamber and in the product.
3. **STERILISATION:** The sterilisation temperature is maintained throughout the sterilisation phase.
4. **COOLING:** The steam in the chamber is gradually removed, producing a slow decrease in pressure. In the same way, temperatures in the chamber and in the product decrease. The phase finishes when temperatures are below 95 ºC and the pressure in the chamber reaches atmospheric pressure.
5. **END OF PROCESS:** The processed material is ready to be taken out. Press ■ to end the process. During this phase, the red pilot light flashes to indicate the end of the phase.

2) PROGRAM PARAMETERS:

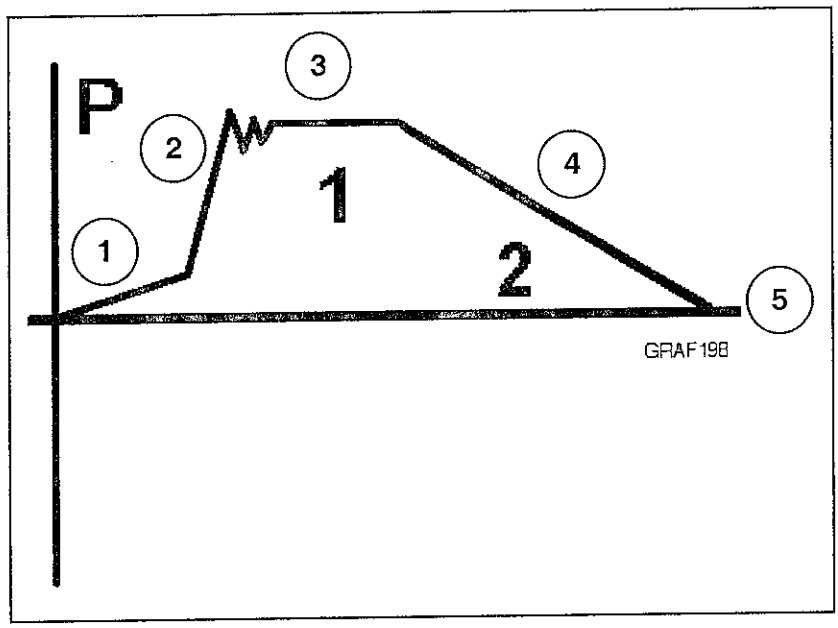
The program may be adapted to the specific requirements of each product, so that sterilisation and cooling times may be defined. Air removal (purge) by gravity can also be defined.

Sterilisation time: (1) 20.0 min

Time during which the chamber and material to be sterilised is exposed to the sterilisation temperature. The time the sterilisation phase lasts.

Cooling time: (2) 30.0 min

Minimum time that the cooling phase must last. This allows the approximate adjustment of the temperature to which the process liquid must be cooled. This must always be below 95 °C.



The phases correspond to the chart on the process status screen.

6 STEAM STERILISATION TECHNIQUES AND CONTROL

This section provides general information and guidance to help you get maximum performance out of your sterilizer, ensure that it operates properly and achieve the best steam sterilisation results.

6.1 PREPARING MATERIALS FOR STERILISATION

Steam sterilisation is specially indicated for all materials that are capable of withstanding temperatures of up to 137 °C. It is also suitable for sterilising liquids in open or hermetically sealed receptacles, although this requires the use of specific sterilisation processes.

The following guidelines should be borne in mind when preparing items for sterilisation:

- The items to be sterilised should be thoroughly clean and dry. Any organic waste will prevent correct sterilisation.
- Packets of solids should be no bigger than 300 x 300 x 600 mm and have a maximum weight of approximately 2 kilos. This will ensure full penetration of the steam and make the material easier to dry.
- The instruments should be placed in perforated baskets or in containers. The weight of each loaded basket or container should not exceed 2 kilos. This will make both drying and subsequent handling easier.
- Packets should be wrapped in a double layer of textile material or sterilisation paper to facilitate protection and conservation.
- If paper or mixed material (i.e. paper and plastic) bags are used, the contents should not be packed too tightly. This will prevent bags being torn or coming open during the sterilisation process.

6.2 LOADING THE STERILIZER

Satisfactory sterilisation depends in large part on how the items to be sterilised are arranged in the sterilizer.

- Packets should be placed in wire baskets ensuring that there is sufficient space between the baskets for the steam to circulate and get inside each one.
- Perforated trays containing instruments should be laid flat.
- When sterilising mixed loads, such as instruments and textiles, place the items with a higher density (usually the instruments) at the bottom of the chamber to prevent the steam that condenses on them from dripping down and making the rest of the load wet.
- Do not overload the sterilizer.

- The load should not touch any part of the chamber walls. This applies to both packages and instrument cases.

- As far as possible, packages should not touch each other.

- Paper or mixed material bags should be placed upright in the baskets. Mixed material bags must be stowed turn and turn about so that the sides in contact of any two bags are always of the same material, (Plastic against plastic and paper against paper).

6.3 STERILISATION CONTROL

6.3.1 PHYSICAL CONTROLS

The temperature and pressure of the sterilizer chamber are monitored throughout the process. The sterilizer has a graphic recorder (optional) which provides an analogical recording of the process. See also chapter 2, Sterilizer Control Features.

6.3.2 CHEMICAL CONTROLS

a) INDICATOR TAPE

This is used to tie up the packs. It indicates only whether or not the pack has undergone a sterilisation process.

MATACHANA supplies steam indicator tape, product reference code 85456.

b) INTERNAL CONTROL STRIPS

These are placed inside the packs and indicate whether or not the required temperature and steam penetration conditions have been achieved and maintained for a sufficient length of time in that particular spot.

MATACHANA supplies several types of internal control strips. The relevant product reference codes are 85440, 85442 and 85446.

6.3.3 BIOLOGICAL CONTROLS

Biological controls are one of the best ways of determining the efficiency of different sterilisation processes.

This method employs dry spores of Bacillus Stearothermophilus, a microorganism which is particularly resistant to heat and steam sterilisation.

The drawback with this method is that the results are not known immediately. It is necessary to observe whether there is any growth of the spore population after it has been through the sterilisation process. This requires cultivating it for at least 48 hours in a suitable medium.

Such controls should therefore be used systematically, being applied periodically to the different sterilisation cycles.

For detailed instructions on how to use this method correctly, please refer to the instructions supplied by the manufacturers of the control.

7 WARNING ALARMS

The machine is designed to detect operational anomalies and alarm situations as listed below:

ALARM 1 : PROCESS CANCELLED
ALARM 2 : RESIDUAL PRESSURE IN CHAMBER
ALARM 3 : VACUUM SYSTEM FAILURE
ALARM 4 : SYSTEM HEATING FAILURE
ALARM 5 : FAILURE or FORCED DOOR LOCKING SYSTEM

The alarm code number will appear automatically on the display together with the alarm icon. Both flash while the alarm situation continues. The meaning of the alarm code is described in section 7.2.

7.1 REASONS FOR ALARMS

The alarm is set off when any of the following situations occur:

ALARM 1 : PROCESS CANCELLED: the current process has been terminated and only those operations necessary to safely finish the process will be carried out.

- Condition: Power failure: electrical power supply failure lasting more than 30 seconds. Power failures of less than 30 seconds are ignored.
  Heating system failure (Alarm 4): if this alarm is set off, the process is terminated in order to prevent damage to the processed product and to the equipment itself.
- Operational: Whenever a process is being carried out.

ALARM 2 : RESIDUAL PRESSURE IN CHAMBER: prevents the door from being unlocked and therefore opened when the chamber pressure is higher than atmospheric pressure. This will be removed via the purge circuit.

- Condition: Excess pressure indicated by the PS14 pressure monitor.
- Operational: Whenever a process is not being carried out.

ALARM 3 : VACUUM SYSTEM FAILURE: the start-up of the vacuum pump is stopped.

- Condition: The thermo switch on the vacuum pump has disconnected its power supply due to over consumption.
- Operational: Whenever the machine is operating.

ALARM 4 : SYSTEM HEATING FAILURE: disconnects the resistances.

- Condition: The protective thermo switch for the resistances has disconnected their power supply due to a lack of water inside the chamber during steam generation.
- Operational: The heating contactor must always be activated.

ALARM 5 : FAILURE or FORCED DOOR LOCKING SYSTEM

- Condition: The door locking device status is not what it should be, either because it has been manually unlocked or the mechanism has not been removed.
- Operational: Whenever a process is being carried out.

7.2 ALARM CODE: MEANING

Due to the fact that several can be set off at the same time the code shown does not directly correspond with the alarm number. If not, it corresponds to the total for the codes for each alarm that has been set off.

Codes:

Alarm warning 1:	01	Process cancelled
Alarm warning 2:	02	RESIDUAL PRESSURE IN CHAMBER
Alarm warning 3:	04	Vacuum System Failure
Alarm warning 4:	08	Heating System Failure
Alarm warning 5:	16	Failure of Door Locking System

For example, if alarms 1 and 4 are set off at the same time, the alarm code shown is 9 corresponding to the total of the codes (01 + 08 = 09). If, on the other hand only one alarm is set off, the corresponding code is displayed (example: Alarm Warning 3 - displayed code: 4).

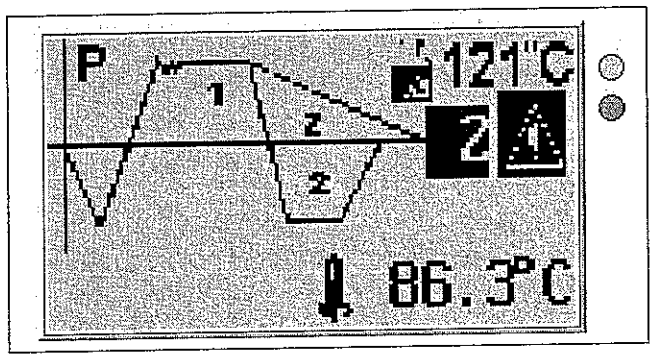


Figure 7.1: Alarm warning

8 MANUAL CONTROL OF PROCESS

8.1 INTERRUPTING A PROCESS

A process can be stopped at any time by disconnecting the power switch for more than 30 seconds and then connecting it again.

On reconnecting the switch, the sterilizer carries out the necessary phases so that the doors can be opened.

While these phases are being carried out, the alarm warning indicator flashes and displays the code 01. When the end of the process is reached, the CONTROL pilot light, located on the operator's panel also flashes.

Press ■ to end the process.

9 TROUBLESHOOTING GUIDE

The present chapter offers a troubleshooting guide to help locate sterilizer failures or breakdowns and operator errors. The aim is to avoid false alarms and unnecessary intervention by the technical assistance service.

Where necessary, you should contact the Matachana Technical Assistance Service (SAT Matachana), informing them of the fault number or code given in the guide.

The guide concentrates on the faults and errors that tend to occur when user intervention is greatest, particularly in opening and closing the doors before and after a process. A number of other more general problems which may arise while a process is being performed are also included.

9.1 CONNECTING UP THE EQUIPMENT

The following checks do not need to be carried out routinely every time the sterilizer is used, but rather when there is some reason to believe that the sterilizer is not functioning correctly.

11) Check electrical connection/power supply.

- Is switch IP1 on the front panel in the "I" position?

NO ⇒ - Turn IP1 to (position "I")

YES ⇓

- Is the operator's panel illuminated?

NO ⇒ - Contact SAT Matachana, quoting fault 11.3.

YES ⇒ - Carry out the checks in section 12)

12) **Check microcomputer connection.**

- The display correctly shows the messages ?

YES ⇩

- Is the value of the temperature probe visible on the Process Status page ?

YES ⇩

- Is the temperature probe reading correct? Is it displaying an extreme value (around 0 or 150 °C?

NO ⇨ - The probe has been deactivated. Access the System Tools page and activate it. Check its read out.

YES ⇨ - Probable temperature probe breakdown. Check connections and/or contact SAT Matachana, quoting fault 12.1.

9.2 STERILIZER STOPPED (CONNECTED)

21) **The door fails to open when the unlock button is pressed** ⏏

- Is the red CONTROL pilot light on?

NO ⇩

YES ⇨ - The process is RUNNING. Wait until the End of Process phase has been reached (the red pilot light flashes) and press ■ to end.

Check the chamber pressure on the corresponding circular manometer. It is above +0.2 bar?

NO ⇩

YES ⇨ - Wait until the pressure in the chamber is equal to the atmospheric pressure.

- Is the green DOOR pilot light flashing?

NO ⇨ - Press the button again ⏏ and check if it changes.

If the green pilot light is not on, the control unit may be on STOP or damaged.
If the pilot light for all is continuously on, the panel may be faulty.

Contact SAT Matachana, quoting fault 21.2

YES ⇨ - Turn the handle and open the door. If it does not turn, check if the mechanism is locked or contact SAT Matachana, quoting fault 21.2

22) The process does not start on pressing ▶

- Is the door closed and locked correctly? Is the green DOOR pilot light is continually on ?

NO ⇒ - The door is open or badly closed. Manually close it and turn the handle until the indicator light is continually on. If the door open indicators persist, contact SAT Matachana, quoting fault 22.1

YES ⇓

- Is there an alarm warning on ?

YES ⇒ - Rectify the cause of the alarm. The process will not start if this persists.

NO ⇓ - The red CONTROL pilot light is on before pressing ▶ to start the process?

NO ⇒ - The sterilizer is still carrying out a process. Wait until it finishes .

9.3 DURING THE STERILISATION PROCESS

The descriptions of the operational anomalies and faults given here are of a general kind. In other words, they are not specific to the particular test or sterilisation process being performed.

This means that you must use your own knowledge, or refer to the information provided elsewhere in this User's Manual, to determine the likelihood of a given irregularity occurring at a particular moment or phase of the process in question.

The anomalies shown via the alarm warnings are described in chapter 7. Alarms. Please consult this for more information.

31) The sterilizer does not produce a vacuum or does so insufficiently or extremely slowly:

- Check that the chamber emptying valve is closed.
- Check that the water supply key is open and its pressure is between 2 and 6 bar.
- Check alarm warning: Vacuum System Failure

Contact SAT Matachana, quoting fault 31.1

32) The chamber pressure fails to increase when this increases:

- Has the chamber filled to the indicated water level? Possible insufficient amount.
- Check alarm warning: Heating System Failure.

Contact SAT Matachana, quoting fault 32.1

33) The cycle is slow to finish or does not reach the end. It remains at the EQUALISATION phase. (This only applies to processes which include a final vacuum phase).

- Check the status of the sterile air filter. If it is clogged up, replace the filter.

Contact SAT Matachana, Quoting fault 33.1

10 PREVENTIVE MAINTENANCE

10.1 THE AIMS OF PREVENTIVE MAINTENANCE

Any irregularity in the functioning of a component will affect, to a greater or lesser degree, the operation and the end results of the processes the sterilizer is designed to carry out. The aim of preventive maintenance is to act before these irregularities get a chance to happen, so that the percentage of problems affecting processes is as low as possible.

The sterilizer is equipped with all the components it needs to function. Some of these have a limited lifespan, while others will last practically for ever. However even the latter type may deteriorate if subjected to unfavourable working conditions.

Preventive maintenance ensures that parts which tend to wear out are replaced before they start to have an adverse effect on the working of the sterilizer. It also helps to perform the operations required to keep the machine in good working order and to detect parts which are affected by premature wear. Preventive maintenance must be carried out by fully trained personnel who are in a position to take responsibility for the results of their work.

When a maintenance technician inspects a machine and finds parts that are faulty or worn, s/he must do two things: replace the part concerned and make sure that the new component is working properly.

Steps must also be taken to ensure that the operation and results of the processes are not adversely affected by the sterilizer's supply sources, and that these are not harmful to either the personnel or the equipment. The first preventive measure must therefore be to ensure that:

1) The water and electricity supply conditions are as specified by Matachana S.A. See Section 1.4.3, Supply Quality and the Installation Instructions.

2) The instructions for proper operation of the sterilizer are being followed. See Operating Instructions.

3) The preventive maintenance is being carried out as laid down in this chapter.

4) The equipment has been installed in accordance with the standards currently in force.

5) All measuring and control instruments are properly calibrated.

10.2 TOOLS AND OTHER DEVICES NECESSARY FOR MAINTENANCE

A list of tools, measuring apparatuses and other essential accessories for performing the operations described in the preventive maintenance plan is provided here below. Ready access to these instruments will facilitate and speed up the work done by the technicians.

- Tester or voltmeter and amperimetric clip.
- Set of screwdrivers for straight-slot screws.
- Set of screwdrivers for cruciform slot screws.

- Set of double-ended or flat polygonal spanners.
- Set of double-ended hexagonal (box) spanners.
- Set of monkey wrenches or adjustable spanners.
- Set of hexagonal keys for screws with a hexagonal recess in the head ("Allen" screws).
- Grafite-free lithic grease. PTFE grease [code no. 55638.1] is recommended.
- Pin-tongs, flat-nose and cutting pliers.
- Terminal-pressing pliers.
- Fitter's hammer.

10.3 PREVENTIVE MAINTENANCE PLAN

WARNING: Unless otherwise indicated, maintenance operations are to be carried out while the sterilizer is disconnected from the following supply sources:

- Electricity.
- Water.

WARNING: Before to perform any maintenance operation, check that the sterilizer chamber and door are cold enough.

The normal inspection cycle described below includes operations to be carried out daily, weekly, etc.

10.3.1 DAILY

The following operations should be carried out on a daily basis. They may be performed by the sterilizer operator.

WARNING: Check that the sterilizer chamber and door are not hot. Use gloves for protection if necessary.

1) Clean the door seal with a damp cloth. This operation does not require removing the seals.

2) Check that there is no residue in the filter inside the chamber. Clean it if necessary: This is done by removing the filter by hand, holding it upside down and washing it under running water

3) If the sterilizer is provided with a graphic recorder, check that there is enough paper [code 41616.4] and the traces made by the pens are neat and clear

10.3.2 WEEKLY:

1) Clean the inside of the chamber with a neutral (non-acidic) soap solution.

2) Clean the door seal, as described in the section.

3) Check that the sterilizer's supply sources are functioning properly.

10.3.3 EVERY TWO MONTHS

ATTENTION: For general cleaning of external surfaces, use a damp cloth and non-acid detergent..
- Do not use abrasive materials to clean any of the surfaces

- Do not use strongly alkaline or acid cleaning products
- To avoid water getting into the electrical parts and thus damaging the appliance, do not use pressurised water to clean the sterilizer

1) Clean the water or steam filters by releasing the cap holding the filter, taking the filter out and flushing it under running water.

2) Lubricate the door hinge with lead-free lithic grease. Teflon grease, code number 55638.1, is recommended.

3) Grease the door locking safety device.

10.3.4 EVERY SIX MONTHS

1) Change the sterile air filter.

2) Change the door seal. Consult the instructions on how to clean and replace the seal in the Section.

3) Check the temperature indicator comparing the reading with the master thermometer. Adjust if necessary. To be done by Antonio Matachana, S.A. Technical Assistance Service or by other trained and authorised technical service.

10.3.5 EVERY YEAR

The following operations must be done by Antonio Matachana, S.A. Technical Assistance Service or by other trained and authorised technical service .

1) [1] Clean the safety valve seat and shutter. Check that the trip has occurred on the inhibitor pressure.

2) Clean the check valves' seat and shutter.

3) Check the bodies of the solenoid valves.

4) [1] Remove the vacuum pump and clean any scale or fur off the wheels.

5) [1] Inspect the sterilizer piping and if necessary remove any build-up of scale or fur.

10.3.6 EVERY TEN YEARS

The following operations must be done by Antonio Matachana, S.A. Technical Assistance Service or by other trained and authorised technical service .

1) Inspect and test the pressure vessel: In accordance with the regulations governing Pressure Vessels, a hydrostatic test must be performed on the autoclave.

The test may be carried out by the installer, the user's maintenance service or by an organisation collaborating in the scheme.

1. This should preferably be done by the Antonio Matachana S.A. Technical Assistance Service (S.A.T.) or by another authorized technical service.

10.4 GRAPHIC RECORDER (OPTIONAL - SEE ANNEX I: LINEAR RECORDER MANUAL)

10.5 CLEANING AND REPLACING THE DOOR SEAL

The door seal should only be cleaned or changed while the sterilizer is completely cold to avoid the risk of burns to the person carrying out this operation.

The procedure is as follows:

1) Open the door.

2) Remove the seal from its housing. This can be done with the aid of a screwdriver insert the screwdriver between the seal and the housing wall and press on the seal, taking care not to pinch it. Remove the screwdriver gradually. Work your way along repeating this operation until you can get hold of the seal with your fingers and pull it right out.

3) If it is not going to be replaced by a new one, clean the seal with a neutral soap solution and, if necessary, methyl alcohol.

WARNING: Do not use solvents, harsh soaps (with caustic soda) or silicone sprays containing benzol.

LIST OF ITEMS

MACHINE: 80LRV-1 LIST: 540-66-067
TYPE: ESP. DATE: 12-04-05 REV:0
TENSION: 380V, 50Hz PAGE: 1

ITEM	CODE	FUNCTION / DESCRIPTION
AP1	41316.6	CONTACTOR SUPRESOR (C1)
C1	41300	HEATINGS ELEMENTS CONTACTOR
C2	41300	DRYING ELEMENTS CONTACTOR
C3	41299.9	VACUUM PUMP CONTACTOR
C4	41299.9	HEATING ELEMENTS CONTACTOR
ES1	41345.2	CONTROL UNIT (12 INPUTS / 4 DIGITAL OUTPUTS)
ES2	41345.3	EXPANSION UNIT (12 INPUTS / 6 OUTPUTS)
ET1	41336.1	DOOR SAFETY ELECTROMAGNET
EV1	41411	SOLENOID VALVE (UPPER VACUUM)
EV2	41419.1	SOLENOID VALVE (AIR INLET)
EV3	41411	SOLENOID VALVE (VACUUM)
EV4	41428.2	SOLENOID VALVE (WATER INLET)
EV5	41428.2	SOLENOID VALVE
F4	41181	GLASS FUSE 1A
F5	41181	GLASS FUSE 1A
F6	41181	GLASS FUSE 1A
FA1	41345.5	POWER SUPPLY 220V AC - 24V DC
FV1	55138	NEEDLE VALVE (VACUUM PUMP WATER)
FV2	55138	NEEDLE VALVE (DRAINAGE)
FV3	55250	NEEDLE VALVE (CONSTANT PURGE)
FV4	55254.1	NEEDLE VALVE (WATER TO CHAMBER)
IR4	40995.1	GENERAL SWITCH
JS1	56502	DOOR JOIN
MG1	41191.5	CONTROL SWITCH MAGNETO THERMIC II 3A
MG2	41192.9	CONTROL SWITCH MAGNETO THERMIC III 20A
MP1	41791	CLOSING DOOR LEVER SWITCH
MP2	41789	CLOSED DOOR SWITCH
P1	41859.2	VACUUM PUMP
PC1	41345.1	PROGRAMABLE CONTROL UNIT
PI1	41598	JACKET GAUGE (-1 to 4 bar)
PS1	41392.1	CHAMBER DOUBLE PRESSURESTAT (LOW: 1,1 bar - HIGH: 2,2 bar)
PS14	41396.5	PRESSURE SWITCH (EXHAUSTING) +0,1 - +0,6 bar
RA1	55532	DOOR WATER COLLECTOR
RE1	41633	AUXILIARY RELAY (LIQUIDS PROGRAMME)
RT1	41906.9	HEATING ELEMENT, 2000W/380V
RT2	41087.4	RESISTANCE 500mohm, (ANALOGIC)
ST1	41581	FILTER (WATER INLET)
ST2	41581	FILTER (WATER INLET)
ST4	41581	FILTER (VACUUM)
ST6	41608.1	FILTER (STERILE AIR)
SV1	41444.4	SAFETY VALVE (CHAMBER 3 bar)
TC1	41288	VACUUM PUMP THERMAL RELAY 380V

LIST OF ITEMS

MACHINE: 80LRV-1 LIST: 540-66-067
TYPE: ESP. DATE: 12-04-05 REV:0
TENSION: 380V, 50Hz PAGE: 2

ITEM	CODE	FUNCTION / DESCRIPTION
TD1	41345.4	TOUCH SCREEN
TF1	41341.2	TRANSFORMER INSULATING
TM1	41358.1	TIMER (PREVACUUM)
TR1	41379.7	HEATERS SAFETY THERMOSTAT
TS1	41376.5	CHAMBER PROBE PT-100
TT1	41386	TEMPERATURE CONVERTER
VM1	41430.2	MANUAL VALVE (CHAMBER PURGE)
VM2	41430.2	MANUAL VALVE (CHAMBER WATER INLET)
VM3	41445.2	MANUAL VALVE (CHAMBER PRESSURE VALIDATION)
VR3	41451.6	RETAINER VALVE (CONDENSATES PURGE)
VR5	41451.6	RETAINER VALVE (EQUALIZATION)
VR6	41450.1	RETAINER VALVE (VACUUM)

LIST OF ITEMS

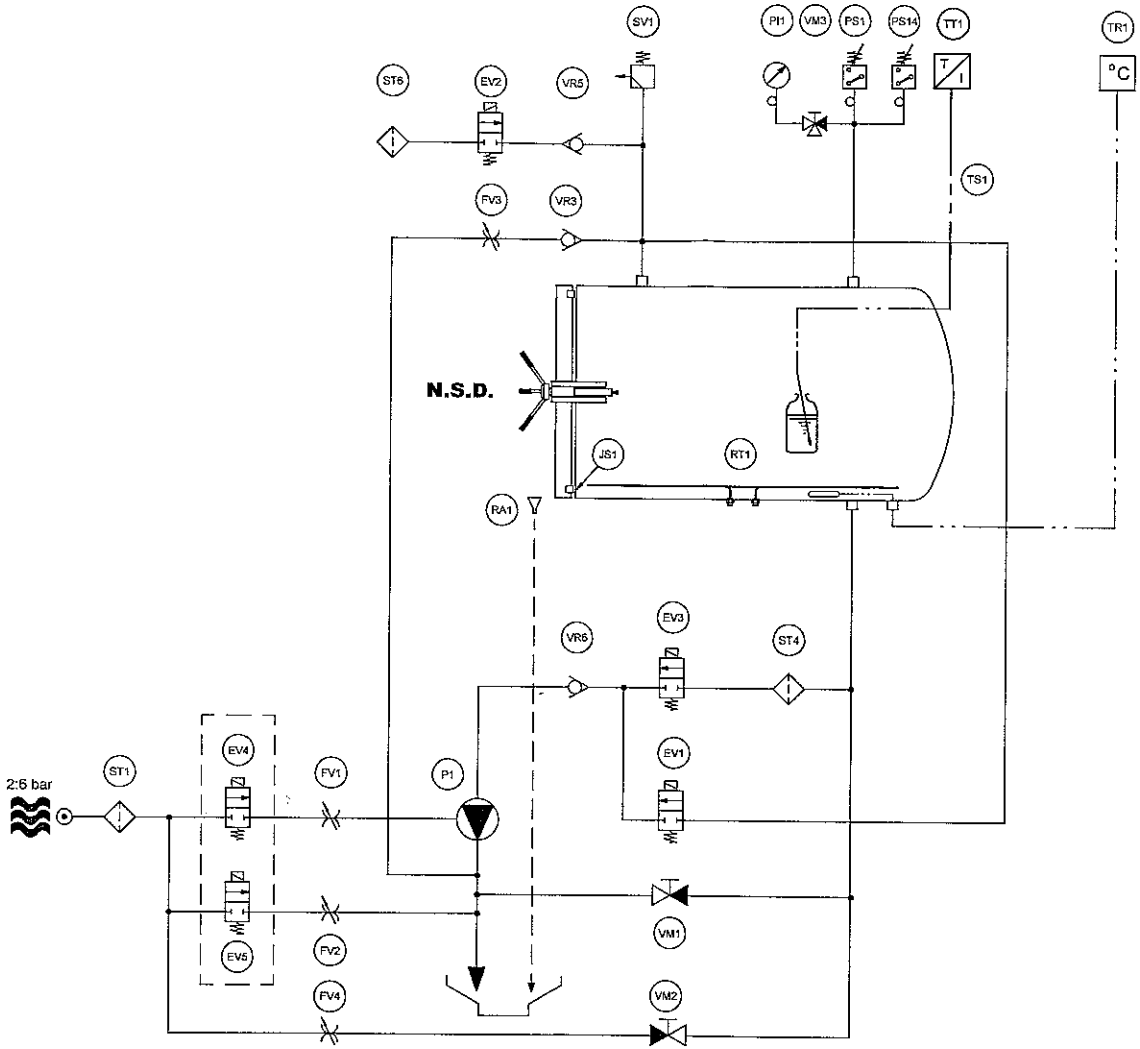
MACHINE: 80LRV-1
TYPE: ESP.
TENSION: 380V, 50Hz

LIST: 540-66-067
DATE: 12-04-05 REV:0
PAGE: 3

ITEM	CODE	FUNCTION / DESCRIPTION

LIST OF ACCESSORY

	41871	FLEXIBLE DRIVE JOINT
	41874	VACUUM PUMP PACKING
	41994.9	RESISTANCES JOINT



00	22-07-04		F.R.G.		
REV.		PROJ.	DW. M.	V. B.	MODIFICATION

DESCRIPTION: **FLOW DIAGRAM**

DRAWING: **540-70-086**

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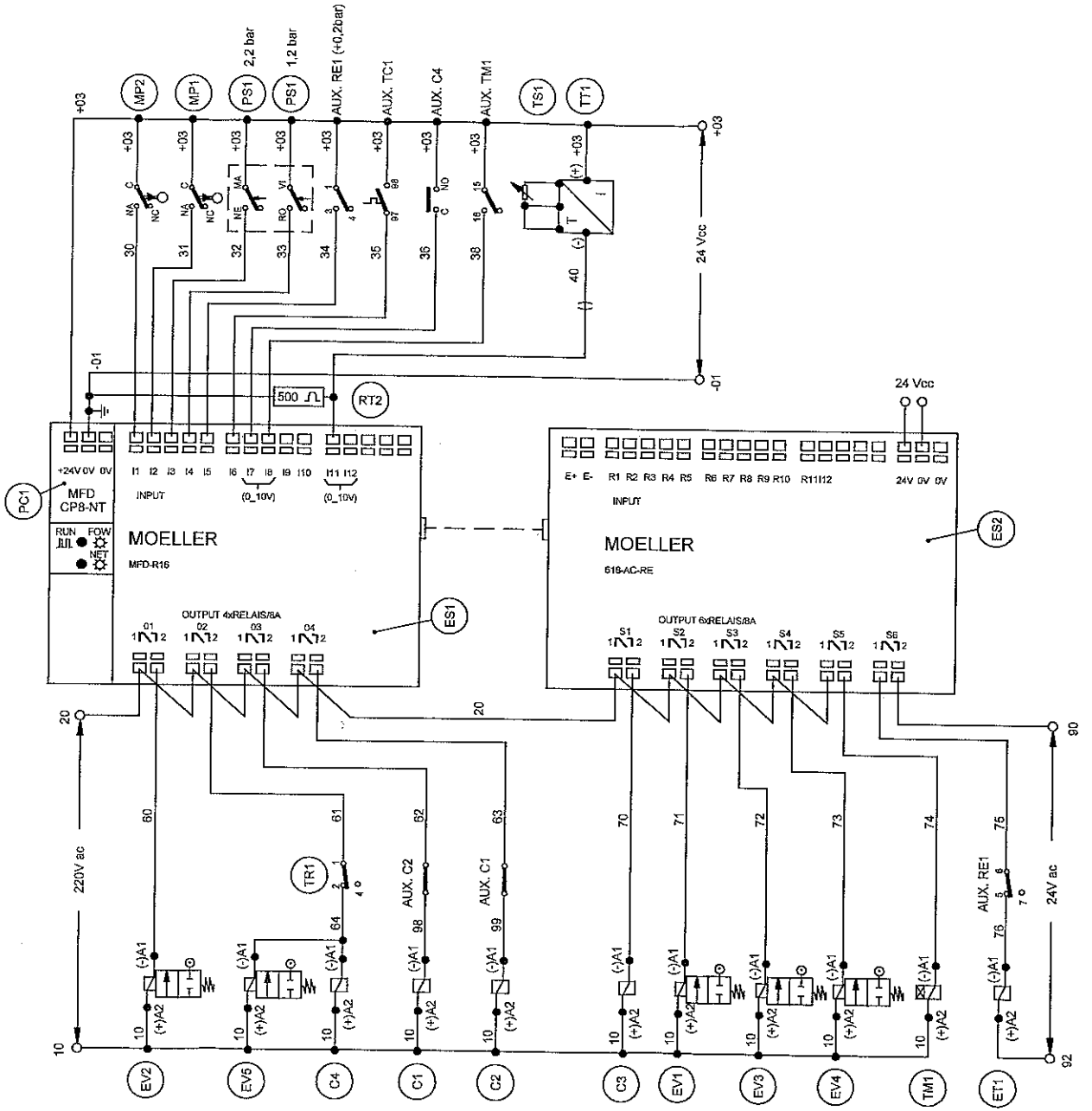
MACHINE	SHEET	ESCALE	CODE
AUT. 80 LRV-1			

Certificado ISO 9001
Nº 945738



00	18-03-04		F.R.G.		
REV.		PROJ.	DW. M.	V. B.	MODIFICATION
DESCRIPTION					DRAWING
ELECTROLINEAL DIAGRAM					540-50-118

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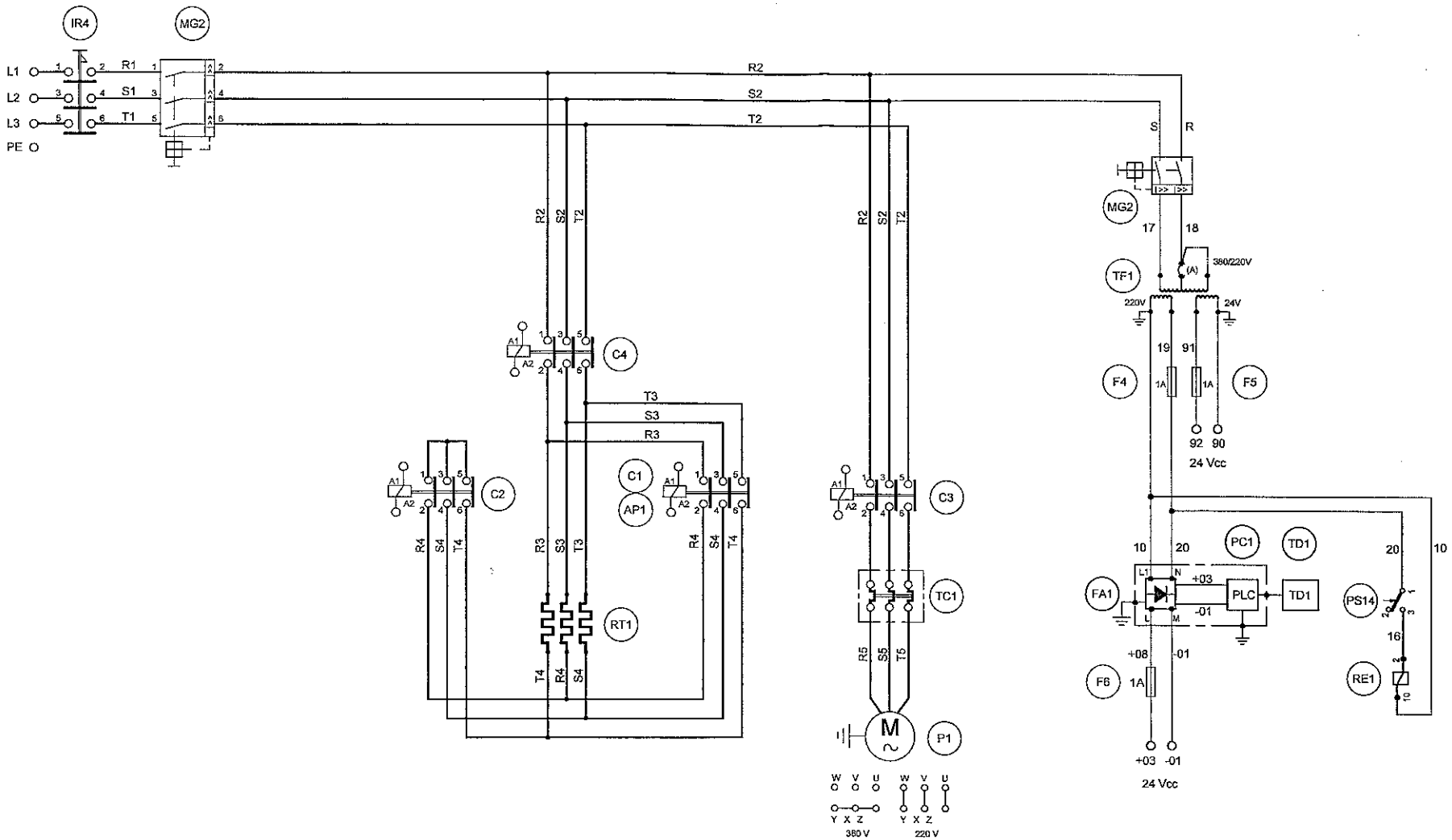
MACHINE	SHEET	ESCALE	CODE
AUT. 80 LRV-1			

Certificado ISO 9001
Nº 945738



NOTA:

DISCONTINUOS TRACED LINES INDICATE CONNECTION TO BE MADE IN THE CASE OF III 220V (— · — · —)

REV.	PROJ.	DW. M.	V. B.	MODIFICATION
00	09-06-04		F.R.G.	

DESCRIPTION	DRAWING
POWER DIAGRAM	542-50-003

matachana	MACHINE	SHEET	ESCALE	CODE
C/ HIERRO 20-22, 08038 BARCELONA	AUT. 80 LRV-1			

Certificado ISO 9001
Nº 945738