SERVICE MANUAL

SterilClave® 6 B SPEEDY®

-Steam Sterilizer-

FOREWORD

This manual IS NOT an integral part of the sterilizer.
The manual is addressed to qualified, specialized technicians for routine maintenance and repairs.
Technicians or operators must be authorised in writing by **COMINOX**.
Technicians must read this manual and follow the instructions herein contained. **COMINOX** is not liable for any injury and/or damage to people or property or to the sterilizer itself should the conditions herein illustrated be disregarded.
This manual contains industrial secrets which must not be disclosed. The manual and its annexes must not be edited, modified, copied or given to third parties unless authorised by **COMINOX**.

CE 0051

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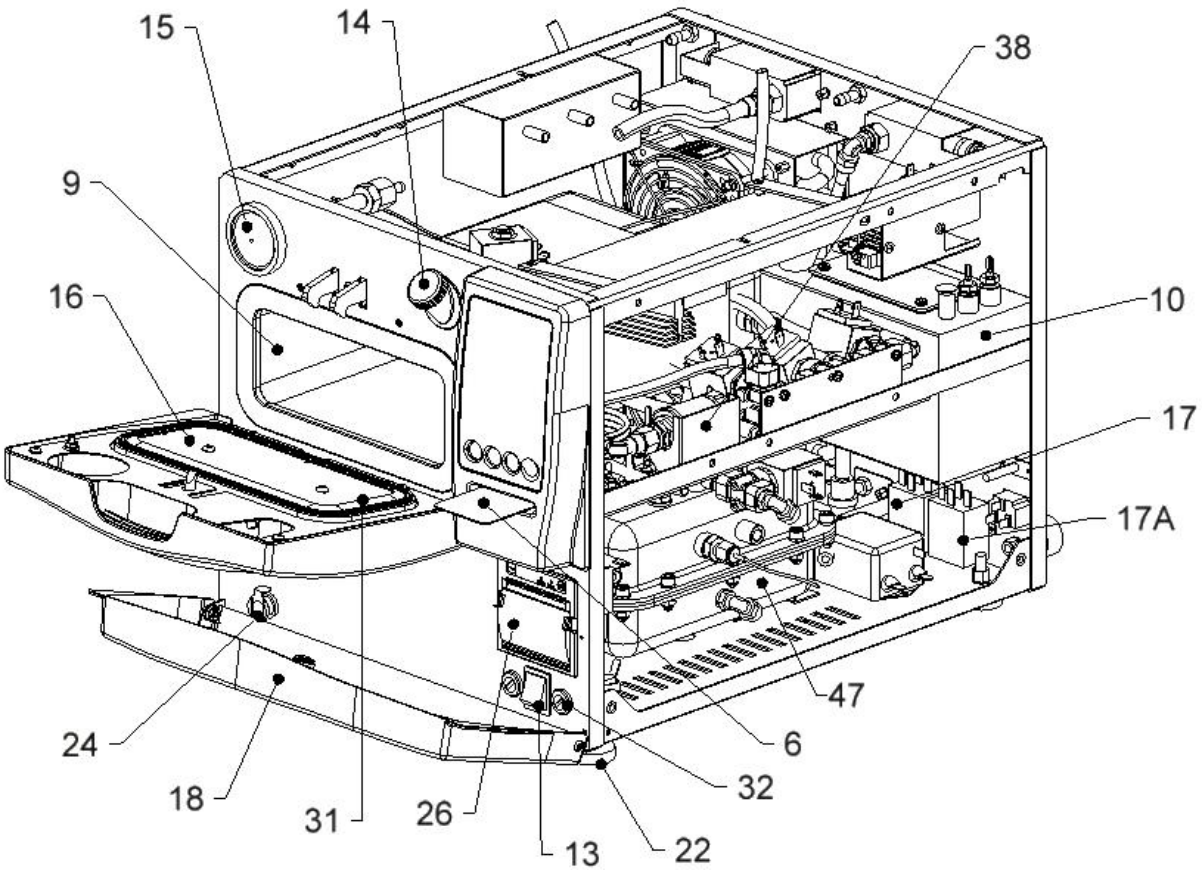
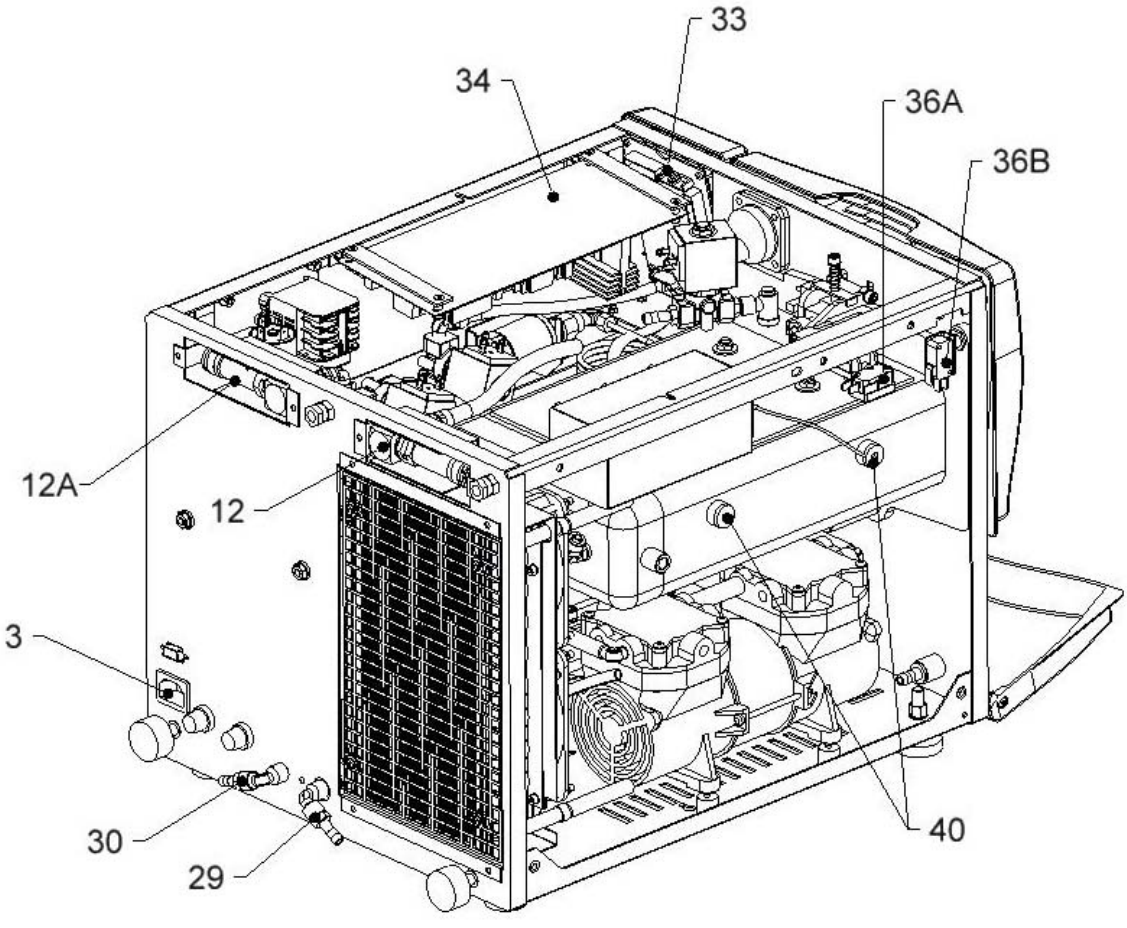
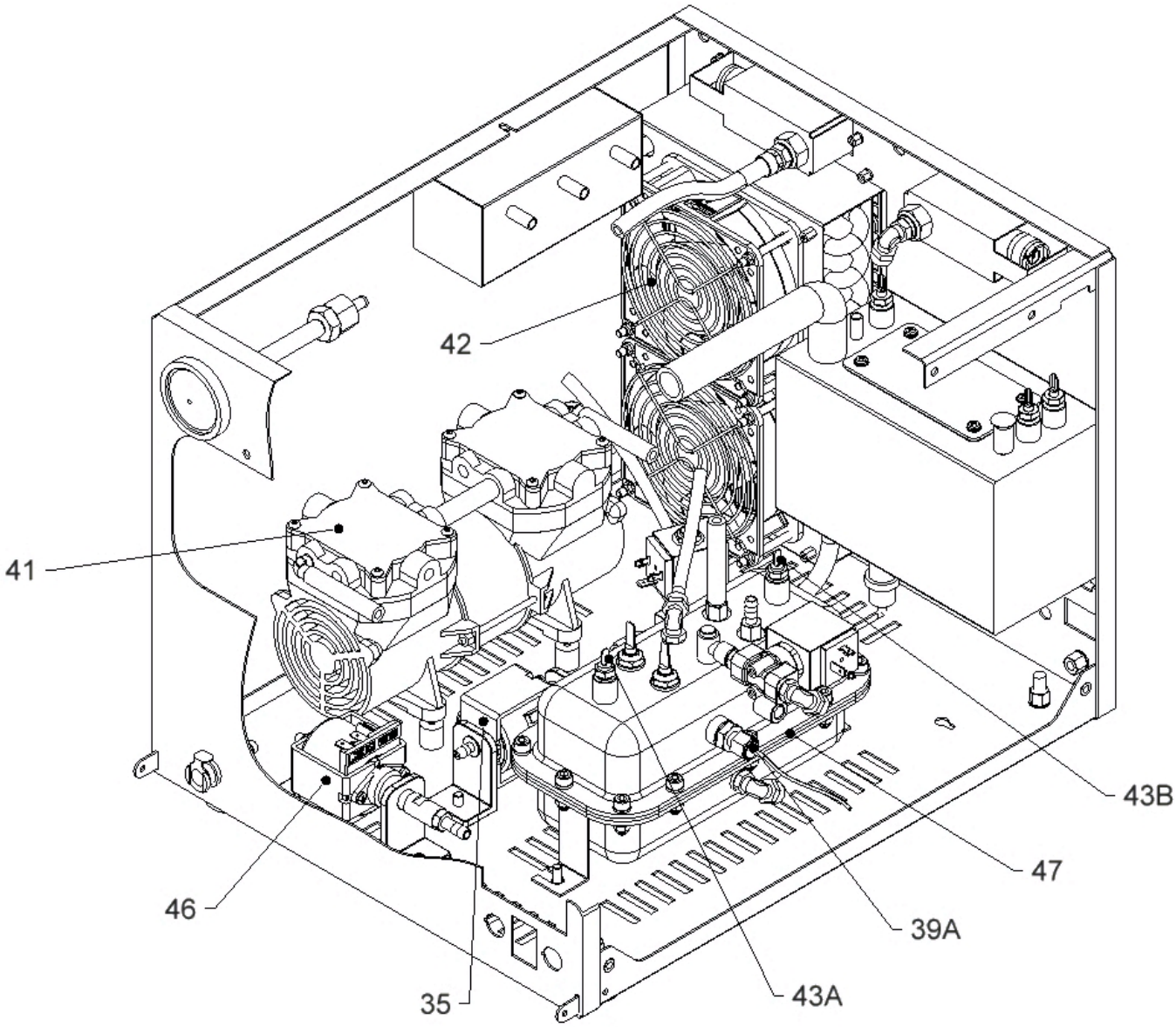
Reference list

01, tray handle
02, waste pipe
03, power cable
04, trays
05, funnel
06, SterilCard
08, tray support
09, chamber
10, clean water tank
12, chamber safety valve
12A, generator safety valve
13, main switch
14, filler
15, air sterilization filter
16, door
17, chamber safety thermostat
17A, generator safety thermostat
18, lower panel
20, drain filter
24, clean water drain tap
26, printer
29, automatic water inlet
30, direct drain
31, chamber gasket
32, fuses
33, logic board
34, power board
35, water inlet pump
36A, micro-switch M1
36B, micro-switch M2
38, transducer
39, chamber temperature probe PT1
39A, generator temperature probe PT1
39B, temperature probe of the coil PT3
40, inspection plugs
41, vacuum pump
42, fans
43A, generator minimum level probe
43B, generator maximum level probe
46, automatic water inlet pump
47, steam generator

Graphical reference representation Mod. 6 B SPEEDY



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43B
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39A
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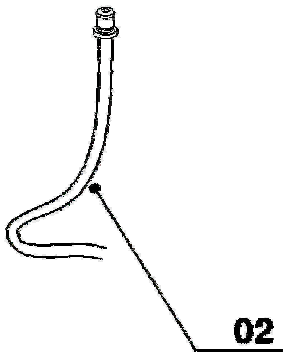
43A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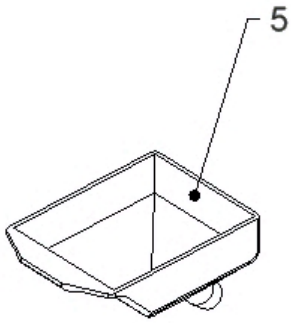
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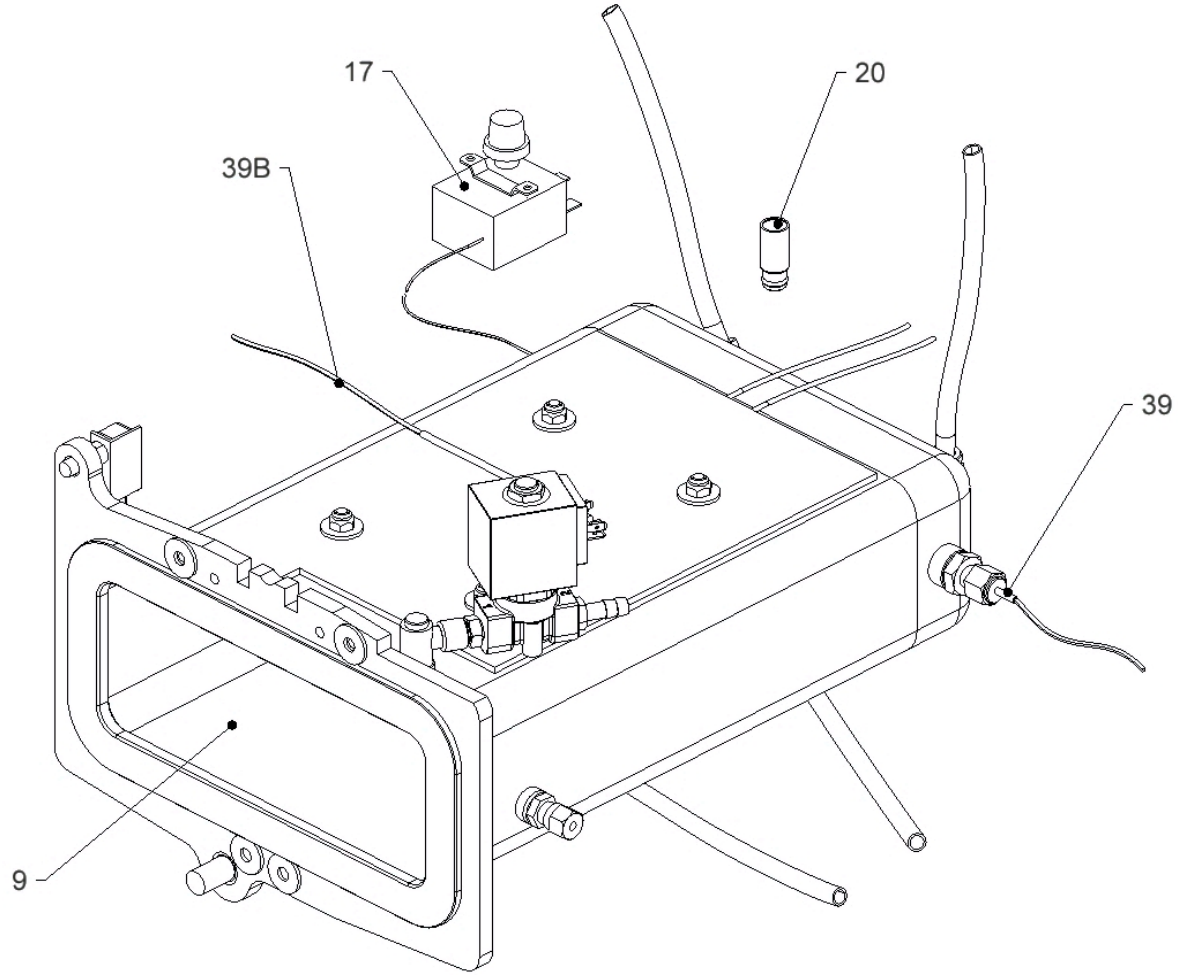
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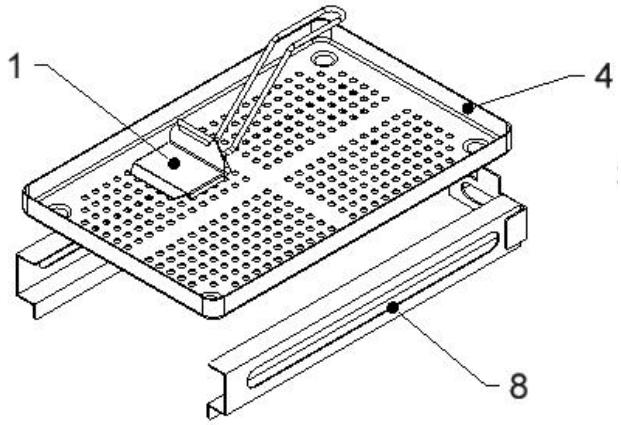
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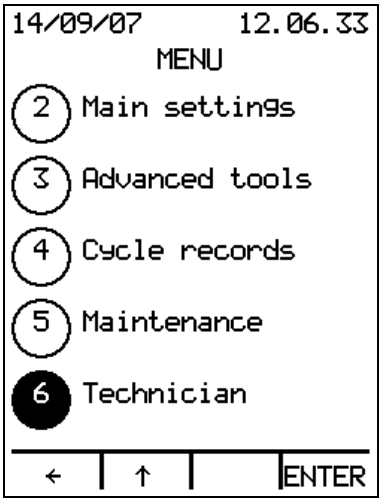
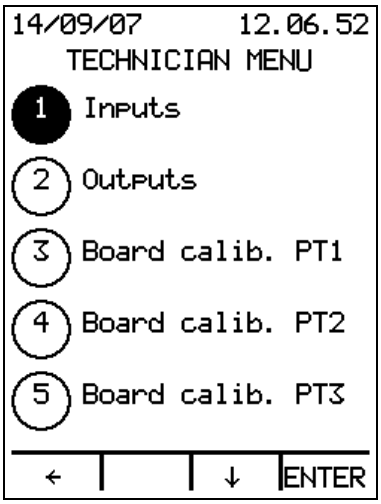
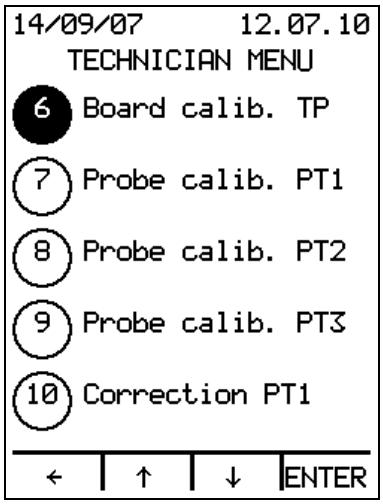
TECHNICIAN MENU

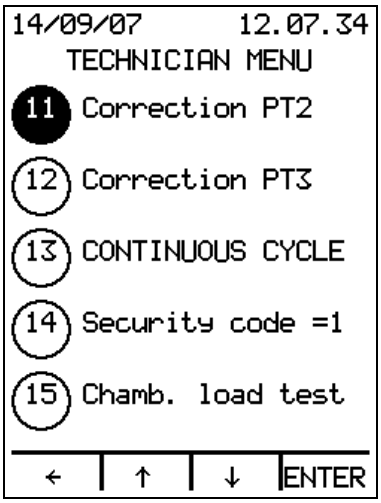
Insert the Technician SterilCard to access the Technician Menu.
If the sterilizer is not equipped with a SterilCard reader, a Technician SterilCard kit may be employed. The kit includes a reader, a Technician SterilCard and a cable for connecting the reader to the ***logic board 33*** (connector J5).
In STAND BY mode, press MENU and use the ↑↓ arrows to select the Technician Menu (option 6):

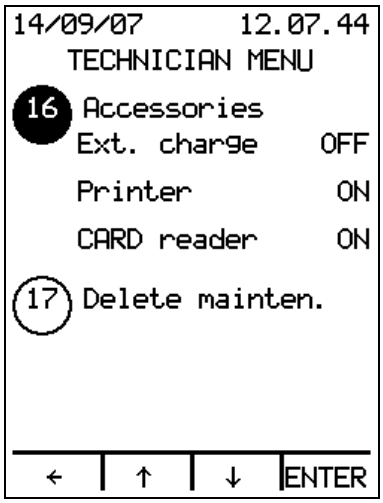


Press ENTER to open the Technician Menu:



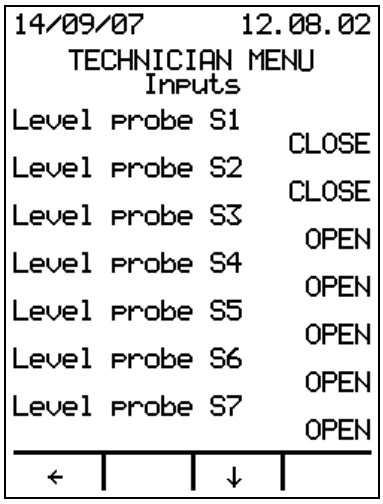


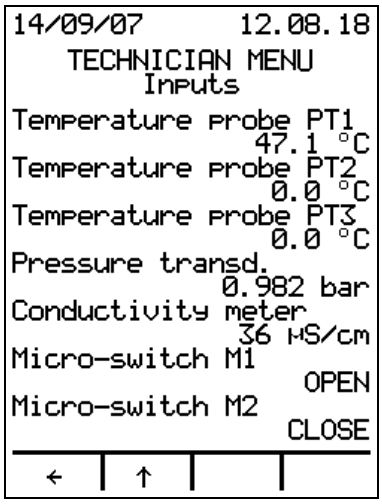




Use the ↑↓ arrows to scroll the list and highlight the required option. Press ENTER to access the selected option.
Press ← to go back to the MENU page.

1 Inputs



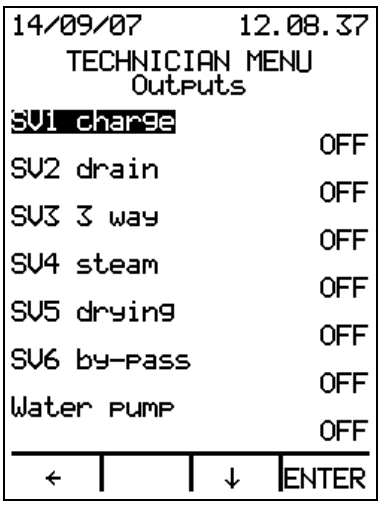


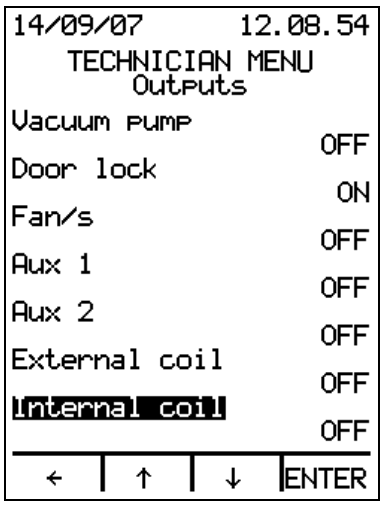
The status of the sterilizer inputs can be displayed:

- S1 is the clean water tank ***10*** *safety probe*
- S2 is the clean water tank ***10*** *minimum level probe*
- S3 is the clean water tank ***10*** *maximum level probe*
- S4 is not used in 6 B SPEEDY model
- S5 is the *maximum level probe* ***43B*** of the *steam generator* ***47***
- S6 is the *minimum level probe* ***43A*** of the *steam generator* ***47***
- S7 is not used
- PT1 is the *temperature probe* ***39*** in the *chamber* ***09***
- PT2 is the *temperature probe* ***39A*** in the *steam generator* ***47***
- PT3 is the *temperature probe* ***39B*** on the external coil
- *Pressure Transducer* ***38***
- Conductivity meter
- *Micro-switch M1* ***36A***: door locked
- *Micro-switch M2* ***36B:*** door pre-closure

Use the ↑↓ arrows to scroll the list and press ← to go back to the Technician Menu.

2 Outputs





The status of the sterilizer outputs can be displayed and modified:

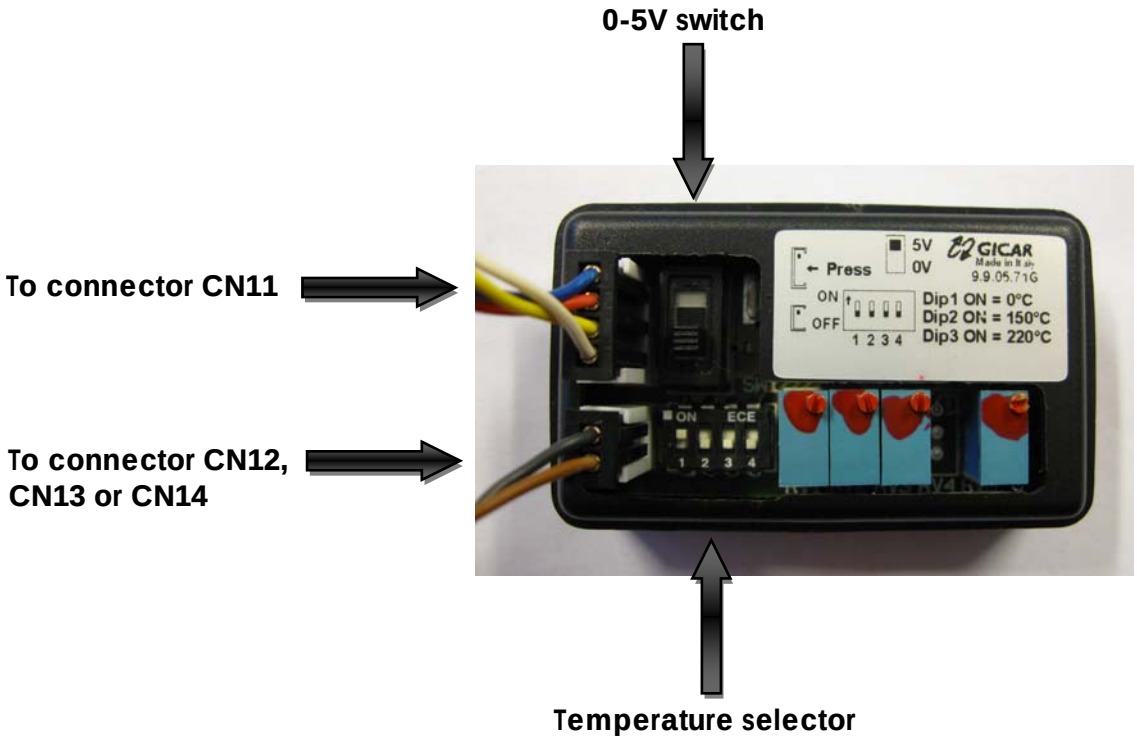
- EV1 charge to which the *water inlet pump* ***35*** is connected in parallel
- EV2 drain
- EV3 3-way
- EV4 steam
- EV5 drying
- EV6 by-pass
- Water pump is the *automatic water inlet pump* ***46*** (optional). If the sterilizer is provided with connections to the SPEEDY WATER demineralization system, the pump is replaced by the solenoid valve EV7.
- Vacuum pump is the *vacuum pump* ***41***.
- Door lock
- Fan(s) is the *fan* ***42***
- Aux 1 is not used
- Aux 2 is not used
- External coil for pre-heating and drying *chamber* ***09***
- Internal coil for steam generation

Note: The external coil is the series of lower and upper coils external to the *chamber* ***09***.
The internal coil is the coil internal to the *steam generator* ***47***.

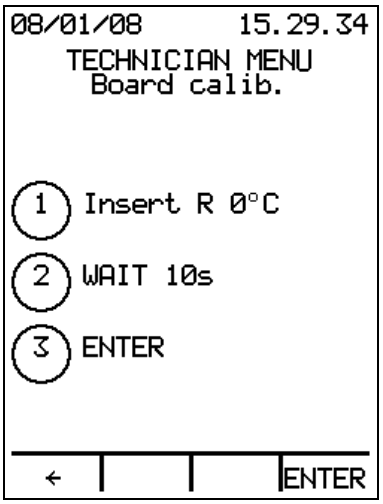
Use the ↑↓ arrows to scroll the list and highlight the required option. Press ENTER to change the output state (ON/OFF).
Press ← to go back to the Technician Menu.

3 4 5 PT1 / PT2 / PT3 board calibration

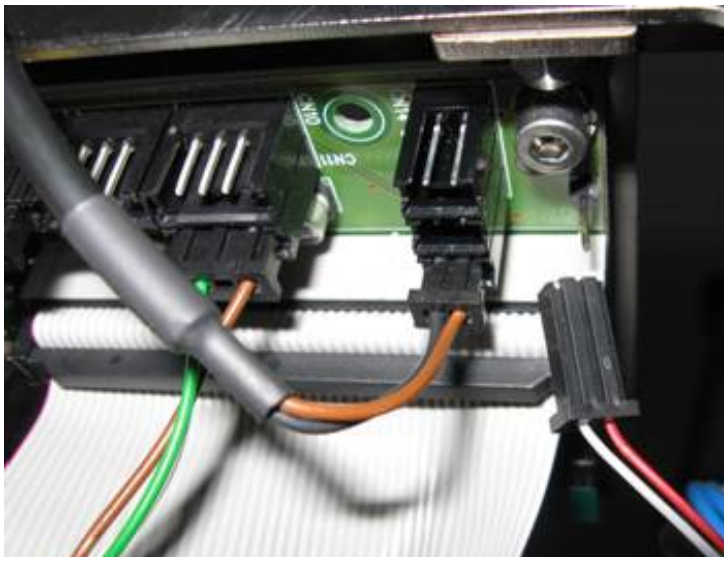
This procedure is used to calibrate temperature probe PT1, PT2 and PT3.
A specific calibration kit is needed for calibration:



To calibrate PT1, PT2 or PT3 select option 3, 4 or 5 in the Technician Menu respectively.

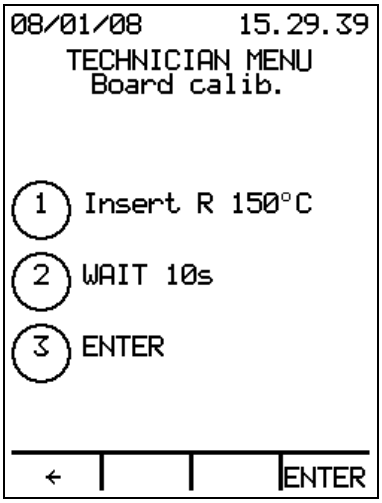


Disconnect the connector corresponding to the temperature probe you want to calibrate from the *electronic power board* ***34***. Disconnect connector CN12 for sensor PT1, connector CN13 for sensor PT2 or connector CN14 for sensor PT3.

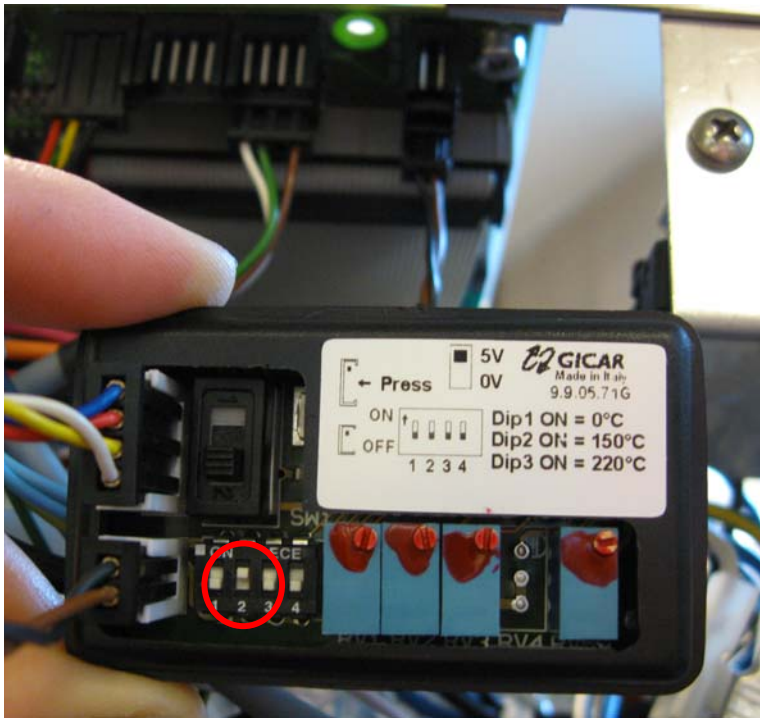


Connect the calibration tool 2-pin cable to the connector CN12, CN13 or CN14 of the *power cable* ***34.*** Switch pole number 1 of the temperature selector to ON, which corresponds to a 1000 Ohm sample coil (0°C).

Wait for at least 10 seconds and press ENTER.



To calibrate sensor PT1, switch the pole number 1 of the temperature selector to OFF and switch pole number 2 of the temperature selector to ON, which corresponds to a 1573 Ohm sample coil (150°C).



Wait for at least 10 seconds and press ENTER.

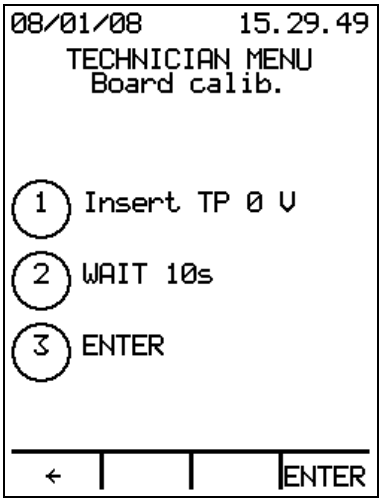
To calibrate sensor PT2 or PT3, switch pole number 1 of the temperature selector to OFF and switch pole number 3 of the temperature selector to ON, which corresponds to a 1832 Ohm sample coil (220°C).

Wait for at least 10 seconds and press ENTER.

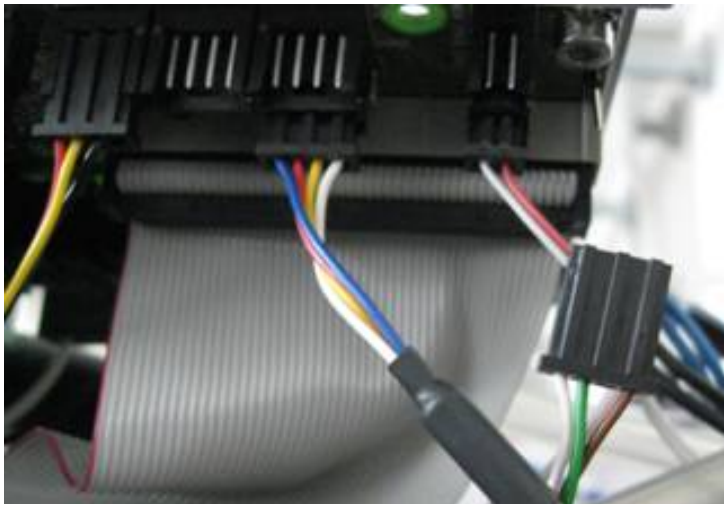
Press ← to go back to the Technician Menu without changing the calibration.

6 TP board calibration

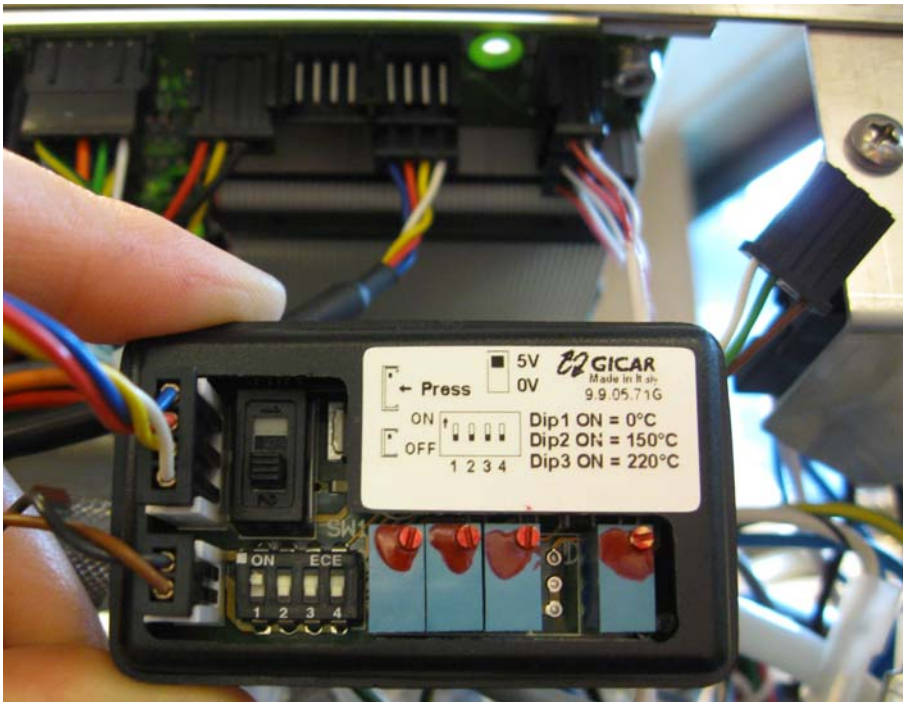
This procedure is used to calibrate the pressure transducer.



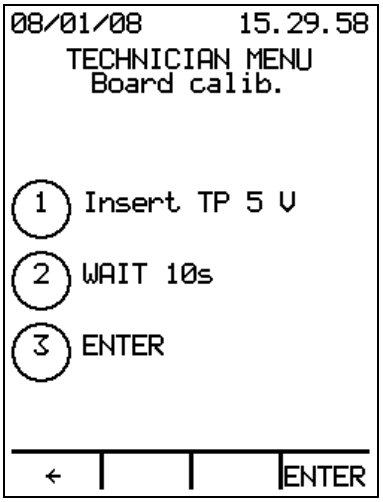
Disconnect the connector CN11 corresponding to the pressure transducer from the *electronic power board* ***34***.



Connect the calibration tool 4-pin cable to the connector CN11 of the ***power cable* 34.**
Set the calibration tool switch to 0 V (position 2).



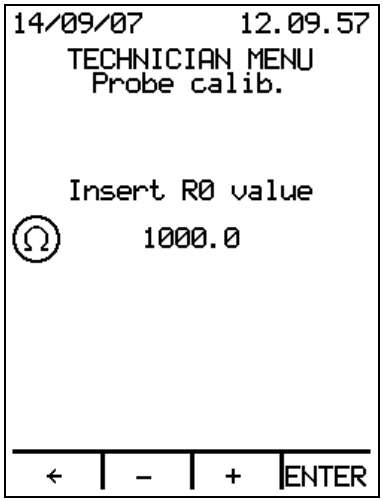
Wait for at least 10 seconds and press ENTER.



Now set the calibration tool switch to 5 V (position 1).
Wait for at least 10 seconds and press ENTER.
Press ← to go back to the Technician Menu without changing the calibration.

7 8 9 PT1 / PT2 / PT3 probe calibration

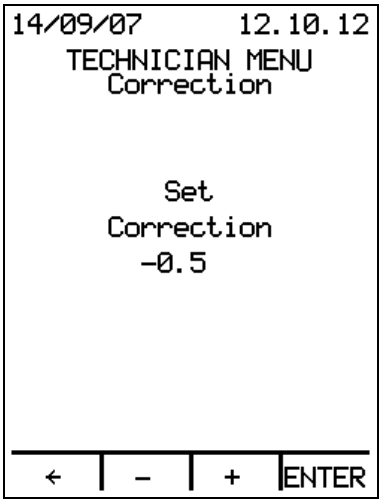
This procedure is used to complete the calibration of the temperature probes PT1, PT2 and PT3.
This operation must be performed whenever a temperature probe is replaced.



Press +/- to enter the value 0°C for the temperature probe shown on the label or on the wire sheath (e.g.: if a value of 1000.2 is shown on the PT1 sensor label, press + twice to display 1000.2). Press ENTER to confirm.
Press ← to go back to the Technician Menu without changing the calibration.

10 11 12 PT1 / PT2 / PT3 correction

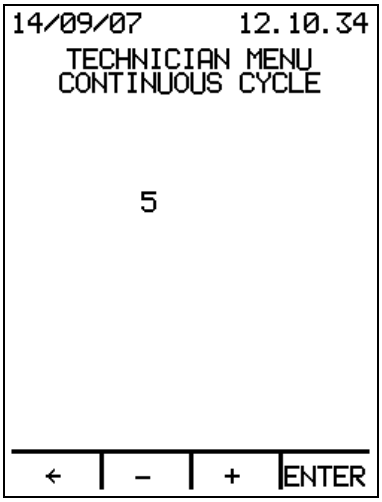
This procedure is used to correct the temperature value displayed during the sterilization process. For example, if using an external sampling tool a temperature lower than the one displayed is measured in the chamber during the sterilization process, the temperature may be corrected as follows:



Press +/- to enter the correction which will change the temperature shown on the display. Press ENTER to confirm.
Press ← to go back to the Technician Menu without changing the value.

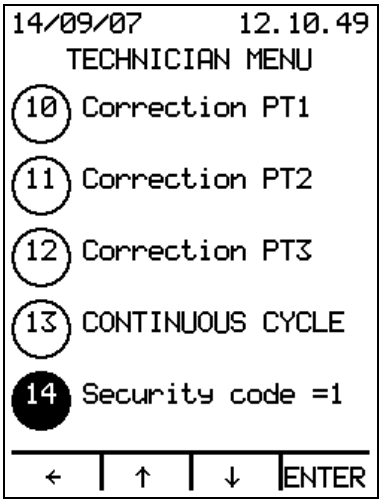
13 Continuous cycle

A CONTINUOUS CYCLE is a test cycle which includes pre-vacuum, 2 fractioned vacuum pulses, pressurisation, sterilization (2 minutes) and drying (3 minutes). Minimum pressure values higher than standard cycles are reached during the vacuum phases. The purpose of the test cycle is to run the sterilizer continuously, for instance at night, to test efficacy of the performed maintenance operations.



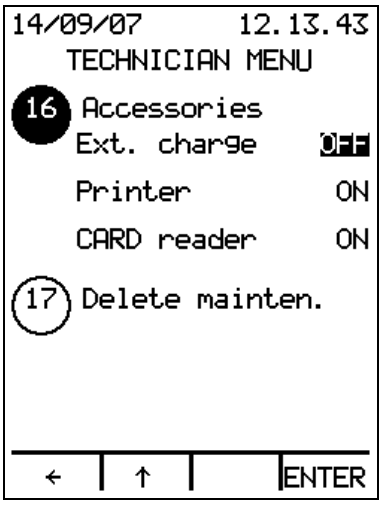
Press +/- to enter the number of cycles and press ENTER to confirm.
Press ← to go back to the Technician Menu without making changes.
CONTINUOUS CYCLE will be available in STAND BY mode if a number higher than zero is set; press ENTER to repeat the cycle for the set number of times.

14 Security code



Press ENTER to set the security code to 1.

15 Accessories



Select Accessories (option 16) and press ENTER. The external charge value (ON/OFF) will appear. Press ↑↓ to change the value, press ENTER to confirm and move to the next option.
Press ← to go back to the Technician Menu without making changes to the accessory settings.

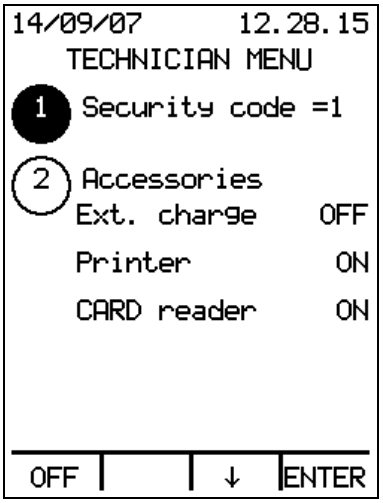
16 Delete maintenance

Press YES to delete all maintenance interventions performed on the sterilizer from the machine memory and reset the remaining day and cycle counters for all components.
Press NO to keep the maintenance log and go back to the Technician Menu.

Note: After installing the sterilizer, delete the maintenance log to reset the remaining days and cycles for all components.

Simplified version of the Technician Menu (PUCK)

To access the simplified version of the Technician Menu when the Technician SterilCard is not available, simultaneously press the second and fourth button on the left and switch the sterilizer on using the *main switch* ***13.***
The following screen will appear:



This Technician Menu contains only three options:

1. Security code=1;
2. Accessories;
3. Correction PT1.

These options correspond exactly to those contained in the Technician Menu and described above.

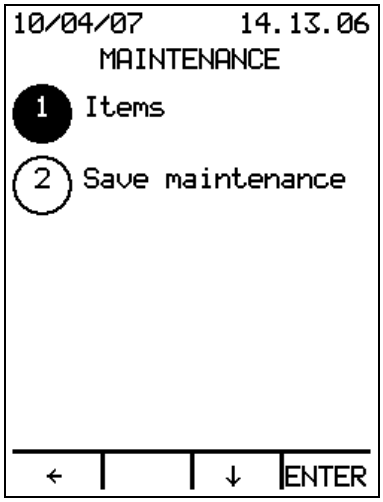
Main Settings Menu

You can access the Main Settings Menu at any time (for example during the installation process to change the LANGUAGE). To access the menu press the second button on the left and simultaneously switch the sterilizer on using the *main switch* ***13.***
The following screen will appear:

These options correspond exactly to those contained in the Main Settings Menu and described in the Use and Maintenance Manual.

MAINTENANCE

In STAND BY mode, press MENU and use the ↓ arrow to select the Maintenance Menu (option 5). Press ENTER to display the following screen:

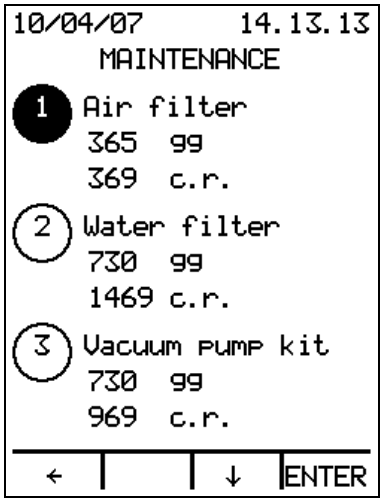


This Menu contains two options:

1. Items
2. Save maintenance

1 Items

Press ENTER to display the list of items subject to scheduled maintenance.



The remaining days and cycles and the last three replacements are shown for each item with the date of intervention and the total number of cycles when the replacement was performed.
Use the ↑↓ arrows to scroll the list of items.

Press ENTER to record replacement.

Press YES to store replacement information in the maintenance log. Press NO to go back to the list of items.

2 Save maintenance

Press ENTER to display the following screen.

Press No to go back to the Maintenance Menu.
Press YES to store the maintenance activity in the log on the inserted *SterilCard* ***06***. The log will be overwritten each time.

Scheduled maintenance table

Item	Number of cycles or max allowed time	Service date	Number of cycles performed at maintenance activity	Technician signature
Air filter*	400 1 year			
Water filter	1500 2 years			
Vacuum pump kit	1000 2 years			
EV2 drain	1500 2 years			
EV4 steam	3000 3 years			
EV6 by-pass	3000 3 years			
Water inlet pump	2000 2 years			
Internal coil	6000 6 years			
Door gasket	3000 2 years			
Generator level probes	3000 3 years			
Fan(s)	4000 3 years			
Temperature probe 1	6000 6 years			
Temperature probe 2	6000 6 years			
Chamber safety thermostat	6000 6 years			
Generator safety thermostat	6000 6 years			
Pressure transducer	6000 6 years			
Chamber safety valve	3000 3 years			
Generator safety valve	3000 3 years			

* can be replaced by the user.

! *After each component fixing or replacing, please check the correct functioning of the component itself and the whole sterilizer by running a complete sterilization cycle.*

MESSAGES

Messages contain information and warnings and usually require the user to perform a simple correction or check.

Message/ *Cause* / • Solution

Scheduled maintenance
This message indicates the need for a scheduled maintenance on one or more components.

This message will appear when the sterilizer is in STAND BY mode and the remaining cycles or days of life of one or more components are expiring.

- The sterilizer may however allow to run one or more cycles but the component subject to scheduled maintenance must be replaced (see chapter MAINTENANCE).

Check water quality
This message appears only on models fitting an external water demineralization system (optional) or if the water is automatically loaded from an external tank (optional); in this case, the sterilizer monitors conductivity of loaded water.

*The sterilizer will display this message in STAND BY mode and only when an automatic water inlet **29** is installed (see USE AND MAINTENANCE MANUAL, chapter CONNECTIONS) and Self-filling in the Main Settings Menu is ON. This indicates that the water conductivity has exceeded the optimal level (15 µS/cm) but is still acceptable.*

- The sterilizer may allow to run one or more cycles but it is advisable to proceed as described in section INSUFFICIENT WATER QUALITY because this alarm could stop operation of the sterilizer.

Note: If the water conductivity increases, it means that the mineral salts content has increased and water is therefore NO LONGER suitable.

Cooling pause
This message indicates that the temperature in *chamber **09*** is too high to start or continue a cycle (see USE AND MAINTENANCE MANUAL, chapter OPERATION).

The sterilizer will display this message in STAND BY mode or after starting a cycle and will stop only during the pre-vacuum phase. This message normally appears when several cycles are run one after the other and no time is allowed for the chamber to cool down.

- In such conditions, simply let the chamber cool down. To speed up cooling, open *door **16***, otherwise cooling will take considerably longer. To open the door, press STOP, cancel the MANUAL STOP ALARM and wait for a few seconds for the pressure inside the chamber to equalise ambient pressure to allow the door to be opened.
- **With the door closed** the operating cycle will resume automatically when the allowed temperature is reached.
- **If you opened the door**, start the cycle again after cooling down the sterilizer.

Generator warm up
This message indicates that the *steam generator **47*** is being warmed up.

During the warm up of the *steam generator **47***, you can only start the VACUUM TEST. For all other tests, the ENTER button is not available. When the *steam generator **47*** reaches the set temperature, the message "Generat. warm up" is cleared and the START button is available for all cycles.

ALARMS

Alarms indicate the presence of a possible fault and the need for repairs.
If a fault occurs during a cycle, the cycle will be immediately interrupted and a buzzer will sound for 15 seconds to indicate the alarm conditions. A description of the alarm will appear on the display along with the cycle and phase in which the alarm occurred. To reset an alarm, press SILENCE ALARM and enter the security code or *SterilCard* ***06.***
An alarm will cause the sterilizer to be switched off. Therefore, after cancelling the alarm and solving the cause, you will need to switch the sterilizer back on before starting a new cycle.
The load in the sterilizer during the cycle interrupted by the alarm is to be considered NON STERILE and must be dried and repacked, if required.

Description*/ Cause /* • **Solution**

Insufficient water quality alarm
This alarm is available only on models fitting an external water demineralization system (optional) or if the water is automatically loaded from an external tank (optional); in this case, the sterilizer monitors conductivity of loaded water.
In such conditions, the alarm indicates that the water conductivity value has exceeded an acceptable level and stops the automatic water inlet.

The sterilizer will display this message when a cycle is started (see USE AND MAINTENANCE MANUAL, chapter ALARMS), only when an automatic water inlet ***29*** *is installed (see USE AND MAINTENANCE MANUAL, chapter CONNECTIONS) and Self-filling in the Main Settings Menu is ON.*
It indicates that the conductivity of the water provided is no longer acceptable (>25 µS/cm); this alarm is always preceded by the CHECK WATER QUALITY message.

- If the sterilizer is connected to a demineralization system, change the cartridge following the manufacturer's instructions. After replacing the cartridges, rinse the *clean water tank* ***10****.*
- If the sterilizer takes water from an external tank, change the water because it is no longer suitable.
- If you want to run the sterilizer without replacing the cartridges in the water demineralization unit, re-start the sterilizer by setting Self-filling OFF and manually fill the tank through the *filler* ***14***. In this case, the water will not be monitored and you should make sure that the quality is suitable.

Insufficient water level alarm
It indicates that there is no distilled or demineralized water in the *clean water tank* ***10***.

The sterilizer will show this alarm if probe S2 is uncovered when cycle is started or if probe S1 is uncovered during a cycle S1.

- **If the alarm appears when a cycle is started** fill the *clean water tank* ***10***.
  To fill the tank without the self-filling function, loosen and remove the plug from *filler* ***14*** and insert the supplied *measuring funnel* ***05*** (use suitable water only).
  If the sterilizer is on and in STAND BY mode when filled, the *"Minimum water level" and "Maximum water level"* messages on the display may be used to check the level.

A buzzer will sound for 3 seconds when the *"Maximum water level"* is reached to indicate that the tank is full. If you do not hear the signal, excess water will flow out from the filler.

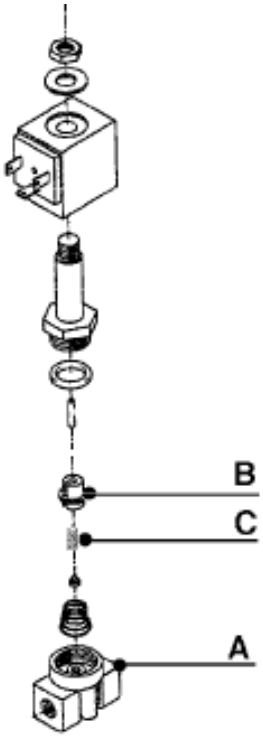
- **If the alarm is displayed during a cycle,** fill the tank and proceed as shown in the INSUFFICIENT STEAM ALARM procedure. Furthermore, check and replace the *clean water tank* ***10*** level probe insulation.

Insufficient steam alarm

This alarm indicates leakage of steam from *chamber* ***09***.

The alarm may appear during a cycle, when the suitable pressure needed to run a cycle is not reached at a temperature of 114°C. Pressure is detected by transducer ***38*** *and temperature by chamber temperature probe PT1* ***39.***

- Check the efficiency and cleanliness of the *chamber gasket* ***31*** and of the flange of *chamber* ***09*** on which it is fitted. Replace if damaged.
  If leakage of steam is found, adjust the door closing as shown in chapter DOOR ADJUSTMENT.
- Check correct operation of the *pressure transducer* ***38*** and *temperature probe PT1****39*** using an appropriate measuring tool***.***
- Check the internal coil of the *steam generator* ***47***.
- Check that the total weight of the load is not exceeded (see USE AND MAINTENANCE MANUAL, chapter OPERATING USE).
- Check the steam solenoid valve **EV4.**
- If the alarm is not resolved after these checks, check drain solenoid valve **EV2** (see diagrams). This is connected to the chamber drain and is the first solenoid valve to intercept the steam. For this reason, it might need to be replaced.



Replace the solenoid valve when time or number of cycles shown in the Scheduled service table is exceeded (see USE AND MAINTENANCE MANUAL, chapter MAINTENANCE). Proceed as follows if cleaning is required:

- Remove the solenoid valve keeping track of the sequence of parts in order to refit them correctly
- Carefully clean the hole in the valve body **(A)**;
- Carefully clean the core **(B)**. The gasket pushed by the spring **(C)** should slide smoothly inside. Should the gasket be deformed, the solenoid valve will need to be replaced.

If the steam keeps leaking, pressurise the sterilizer and locate the leak by following these steps:

- Close the previously checked chamber door properly.
- Remove the cover from the sterilizer.
- Excite the coil of solenoid valve **EV2** (see wiring diagrams) with an external power cable at 230V: it should be normally open **NO**.
- Remove one of the *inspection plugs **40*** and connect a compressor (2 ÷ 3 bar).
- Introduce compressed air and hold the chamber pressurised for approximately 15 minutes.
- Locate the leakage by observing the unit.

- Check the pressure/temperature alignment during a cycle (see STERILIZATION TEMPERATURE BAND ALARMS).
- Run a VACUUM TEST to check for pressure losses.

Pressurisation alarm

This alarm indicates that the temperature has not increased properly in the *chamber **09*** during the steam phase (steam or pressurisation peaks).

The sterilizer may display this alarm during a cycle, during steam phases, when the pressure does not correspond to the saturated steam curve.

- Follow the instructions in the INSUFFICIENT STEAM ALARM solution.
- If the alarm persists, there could be a fault in the heating circuit. Check that during pressurisation or steam peaks (fractioned vacuum), the chamber internal coil is correctly powered (see wiring diagrams).

PT1 overtemperature alarm

The alarm indicates that temperature inside the *chamber **09*** has exceeded 150°C.

The sterilizer displays this alarm when the temperature reaches 150°C.

- Check that the wires of the *temperature probe PT1 **39*** and the *transducer **38*** are neither disconnected, nor worn or faulty.
- Check the correct load positioning, which should be correctly arranged on the supports.

Insufficient vacuum alarm

This alarm indicates that during the pre-vacuum phase, the pressure did not drop to the correct set value.

This alarm is displayed during the pre-vacuum phase of a cycle when the pressure does not drop to the correct value in the expected time.

- Check the efficiency and cleanliness of the *chamber gasket **31*** and of the flange of the *chamber **09*** on which it is fitted. Replace if damaged.
- Check the *vacuum pump **41*** ((see ADDITIONAL CHECKS AND SETTINGS – Vacuum Pump).
- Check correct positioning of the *drain filter **20*** and its cleanliness.
- Check correct positioning of *fans **42***.
- Check that the sterilizer is sufficiently ventilated.

Fractioned vacuum alarm
This alarm indicates that vacuum was not created inside the *chamber* ***09***.

This alarm is displayed during a cycle, during a vacuum pulse in the fractioned vacuum phase, when the pressure does not drop to the correct value in the expected time.

- Check that the total maximum load weight was not exceeded and that the materials forming the load are compatible with the selected cycle (see USE AND MAINTENANCE MANUAL, chapter OPERATING USE), for example, NEVER mix fabrics with solid materials.
- Check correct positioning of *fans* ***42***.
- Check the sterilizer is sufficiently ventilated (in particular if built-in).
- Check that the *vacuum pump* ***41*** is properly powered and that it works correctly.

Sterilization temperature band alarm: overtemperature / undertemperature
Both alarms indicate that the temperature is out of the sterilization band (tolerance) defined by EN 13060. This standard defines the tolerance band (0°C - +4°C) from the setting value during sterilization. For example, if the setting is 134°C, the temperature should be in the band 134°C-138°C.

The sterilizer displays one of these alarms during sterilization when the temperature in the chamber ***09*** *and/or the theoretic steam temperature are out of the tolerance band.*

This alarm could be generated by incorrect temperature and pressure values.
- If the UNDERTEMPERATURE alarm appears, check that the load weight does not exceed the maximum value allowed (see USE AND MAINTENANCE MANUAL, chapter OPERATING USE).
- Check sterilizer temperature and pressure.

Temperature adjustment
The temperature displayed must be 0.5°C lower than the actual temperature in the *chamber* ***09***.
To adjust the temperature, firstly calibrate the *chamber temperature probe PT1* ***39*** in the Technician Menu, options 3 (Board calibration PT1) and 7 (Probe calibration PT1).
If the temperature is still not correct, adjust the Correction parameter in the Technician Menu (see step 1 and 2) or replace the sensor (step 3).

1. Using an external tool
- Remove the sterilizer from the unit (if it is built-in) and remove the covering.
- Loosen and remove one of the *inspection plugs* ***40*** on the *chamber* ***09***.
- Insert the probe of the external tool checking its tightness and place it in contact with the end of *temperature probe PT1* ***39***. Alternatively, wireless probes may be used. These are introduced into the sterilization chamber and do not require assembly.
- Start an operating cycle and check the values. This operation should preferably be performed with Cycle 134 HOLLOW/POROUS, because the pressure in this cycle is best aligned to the saturated steam curve.
- Adjust the temperature using the Correction parameter in the Technician Menu (option 10).

2. Using a sample coil
- Switch off the sterilizer using the *main switch* ***13*** and disconnect the *temperature probe PT1* ***39*** (connector CN12 on the *power board* ***34***).
- Connect a sample coil with an R value from 1000 to 1573 Ohm, corresponding to a temperature (°C) of

  T = (-R0*A+(R0^2*A^2-4*R0^2*B+4*R0*R*B)^0,5)/2/R0/B

  where
  R0 = value of the *temperature probe PT1* ***39*** at 0°C (written on label and set in PT1 probe calibration in the Technician Menu)
  A = 0,0039083
  B = -0,0000005775
- Switch on the sterilizer and check the temperature value which appears on the display.
- Adjust the temperature using the Correction parameter in the Technician Menu (option 10).

3. Replacing the temperature probe PT1
- Replace the *temperature probe PT1* ***39***.
- Select option 3 in the Technician Menu (Board calibration PT1) and proceed with calibration.
- Select option 7 in the Technician Menu (Probe calibration PT1) and enter the R0 value.

Adjusting pressure setting
To adjust pressure setting select option 6 from the Technician Menu (Board calibration TP) and follow the instructions.
Replace the transducer if the error between the pressure shown on the display and the pressure indicated by an external calibration tool exceeds ±50 mbar.

- If the alarm is not resolved, possible causes can be:
  - sudden leakage from a valve or a disconnected pipe;
  - faulty *temperature probe PT1* ***39***;
  - faulty pressure *transducer* ***38***;
  - faulty electronic board.

Level probe alarm
This alarm indicates inconsistent operation of the level probes in the *clean water tank* ***10***. For example, if the maximum level probe detects presence of liquid, minimum level probe and tank safety probe should also detect it.

The sterilizer shows this message in STAND BY mode.

- Empty, clean and fill the *clean water tank* ***10***. The operation must be performed at environmental temperature.
- Check the level probes.
- Replace the level probe insulation.
- Check water quality. Excessively pure water is corrosive (it removes salts from metals) and cannot be detected by the probes. **In particular, DO NOT use bidistilled water or water with a conductivity of less than 1 µS/cm.**

Coil alarm
This alarm indicates that the coil element circuit is either open or interrupted.

The alarm is displayed on the sterilizer in any condition when the coil circuit is NOT detected as closed.

Perform the following checks in the order shown:
- Rearm the *safety thermostat **17*** or ***17A*** by removing the plug and pressing the button underneath. The thermostat may be rearmed only if the *chamber **09*** has cooled down. To speed up cooling, open the *door **16*** which will however be locked. The *door **16*** can be opened by turning the sterilizer on with the *main switch**13***. Press ON to display the message CLOSE THE DOOR? YES/NO. Press YES to start the procedure to open the door.
- Check the coils with a tester for continuity without checking the value.
- Check TRIAC components of the *power board **34*** and replace the electronic board pair, if required.

Self-filling alarm
This alarm is present on models with the *automatic water inlet **29*** (optional).

The sterilizer will display this message in STAND BY mode only when the automatic water inlet is fitted (see USE AND MAINTENANCE MANUAL, chapter CONNECTIONS).

- **In configuration (A)**, fill or replace the distilled or demineralized water tank.

Note: Constantly running the pump without water will effect durability and drastically reduce the component's life.
- Check that the inlet pipe is neither bent nor twisted.
- If the problem persists, check if the *automatic water inlet pump **46*** is working.

- **In configuration (B)**, check that the mains water tap is open and that the mains water pressure is higher than the minimum pressure indicated for the installed demineralization system.
- If the problem persists, check if the solenoid valve **EV7** above the water inlet opens correctly.

In both cases, check:
- that all connections are properly connected;
- that all pipes are in their seats and neither cracked nor twisted.

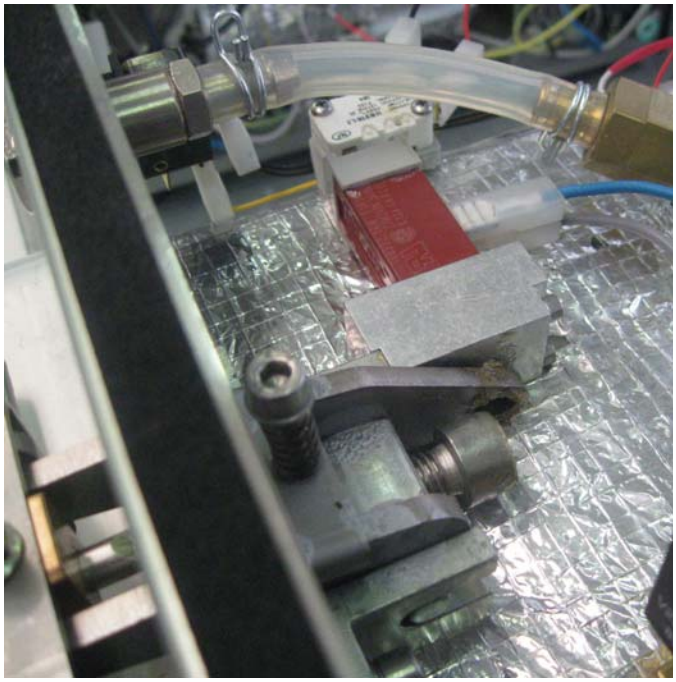
Door alarm
This indicates that the *door **16*** is not correctly closed.

The sterilizer may display this message when an attempt is made to start a cycle but the door is not completely locked. The sterilizer will not start in this condition.

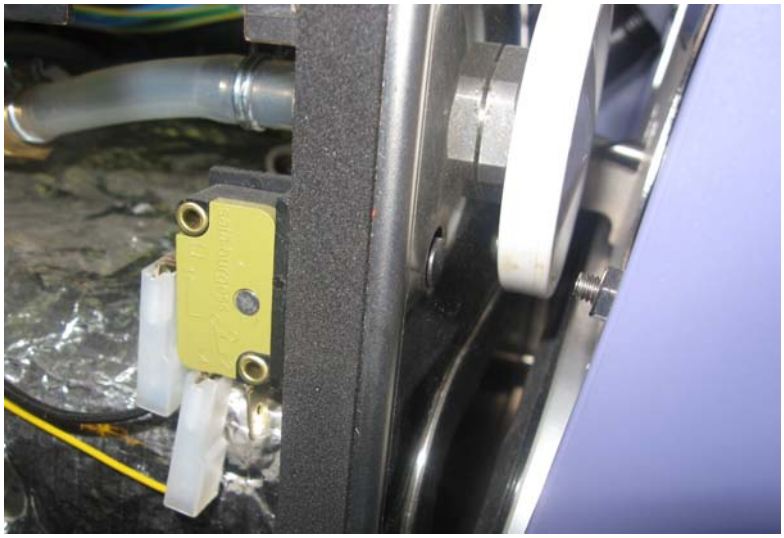
- Close the door properly before starting a cycle.
- If the problem persists, despite the door being locked, *micro-switch M1 **36A*** and/or *micro-switch M2 **36B*** are not correctly pressed or are faulty. Check that:
  - the lock nuts on the micro-switches are tight;
  - the pin is not bent, out of its seat, or loose;
  - there is continuity at micro-switch contacts (use a tester);
  - there are no obstructions or dirt near the micro-switch rod;
  - the connection cables between the door and the sterilizer are operating and properly connected.

Note: Determine which of the two micro-switches is generating the signal:
- if the alarm is triggered immediately after starting the cycle, the pre-closing micro-switch is not working (*micro-switch M2* ***36B***);
- if the alarm is triggered 3 minutes after starting the cycle, the door lock micro-switch is not working (*micro-switch M1* ***36A***).

Micro-switch M1 ***36A***:



Micro-switch M2 ***36B***:



PT1 temperature probe alarm
This is triggered when the *temperature probe PT1* ***39*** in the sterilizer is disconnected or faulty.

The sterilizer shows this alarm during operation when the probe PT1 detects a temperature of less than 3°C.

- Check the connection of the *chamber temperature probe PT1* ***39*** to connector CN12.
- Replace the probe if faulty.
- Check temperature setting following the instructions shown in the section STERILIZATION TEMPERATURE BAND ALARM.

Drain alarm
This indicates that the pressure did not drop to the correct predetermined value during draining.

This alarm is displayed during the draining phase of a cycle when the pressure does not drop to the correct value in the expected time.

- Check the solenoid valve EV6.
- Check the solenoid valve EV3.
- Check operation of the *vacuum pump* ***41***.
- Proceed as shown for the FRACTIONED VACUUM ALARM.

Misalignment alarm
This indicates that the temperature in the *chamber* ***09*** does not correspond to the theoretic steam temperature.

The sterilizer displays this alarm during sterilization phase when the temperature in the chamber ***09*** *and the theoretic steam temperature differ by more than 2°C.*

This alarm could be generated by incorrect temperature and pressure values.
- Check the temperature and pressure settings of the sterilizer following the instructions shown in the STERILIZATION TEMPERATURE BAND ALARM section.

Pressure transducer alarm
This is triggered when the *transducer* ***38*** in the sterilizer is disconnected or faulty.

The sterilizer shows this alarm during operation when the transducer detects a pressure of less than 30 mbars.

- Check the connection of the transducer 38 to connector CN11.
- Replace the transducer if faulty.
- Check pressure setting following the instructions shown in the STERILIZATION TEMPERATURE BAND ALARM section.

Manual stop alarm
This indicates that STOP was pressed during a cycle before the cycle was completed.

The sterilizer displays this alarm during operation and stops to inform the user that the load MAY NOT BE STERILE.

- This is not a failure but a cycle stop override caused by the operator. For this reason, there are no operations to be performed but the load MAY NON BE STERILE. A new sterilization cycle must be started.

Note: Manual cycle stops should always be avoided unless absolutely necessary. If the sterilizer has already performed the fractioned vacuum or pressurisation phases, the material inside could be wet and the sterilizer may not start properly. Dry the material well and change the bags.

Power missing alarm
This indicates that a power blackout occurred during a cycle.

The sterilizer displays this alarm when power is restored. The cycle and the phase when the blackout occurred will appear on the display.
If the blackout occurred while an alarm was issued, the last alarm issued will be displayed.

- On the basis of the message on the display, you can infer if the sterilizer managed to complete the sterilization cycle or not despite the power blackout.

A blackout may be caused by various reasons:
- the sterilizer was accidentally switched off by means of the *main switch* ***13***;
- mains blackout;
- *power cable* ***03*** not plugged in correctly or damaged;
- blown *fuses* ***32***.

PT2 overtemperature alarm
The alarm indicates that temperature inside the *steam generator* ***47*** has exceeded 170°C.

The sterilizer displays this alarm when the temperature of the steam generator ***47*** *reaches 170°C.*

- Check that the wires of the *temperature probe PT2* ***39A*** are neither disconnected, nor worn or faulty.
- Check that the load is positioned correctly on the supports.

PT2 temperature probe alarm
This is triggered when the *temperature probe PT2* ***39A*** of the *steam generator* ***47*** is disconnected or faulty.

The sterilizer shows this alarm during operation when the temperature probe PT2 ***39A*** *detects a temperature of less than 3°C.*

- Check the connection of the *chamber temperature probe PT2* ***39A*** to the connector CN13.
- Replace the probe if faulty.

Generator insufficient vacuum alarm
This indicates that during the pre-vacuum phase in the *steam generator* ***47***, pressure did not drop to the correct predetermined value.

- Check the efficiency and cleanliness of the *door gasket* ***31***. Replace if damaged.
- Check the efficiency and cleanliness of the gasket of the *steam generator* ***47***. Replace if damaged.
- Check operation of the *vacuum pump* ***41***.
- Check the cleanliness and correct positioning of the *drain filter* ***20***.
- Run a VACUUM TEST to check for pressure losses.
- Check that ventilation air vents are clear and check efficiency of internal fans.

Generator warm up alarm
It informs about a problem in the warm up of the *steam generator* ***47***.

The sterilizer displays this alarm when the warm up of the steam generator ***47*** *has not been completed within the maximum time set by the corresponding parameter.*

- Check the efficiency and cleanliness of the gasket of the *steam generator* ***47***.
- Check the *temperature probe PT2* ***39A***.
- Check the efficiency and cleanliness of the internal coil of the *steam generator* ***47***.
- Check the solenoid valve **EV4**.

Generator level alarm
This alarm indicates that the time has been exceeded for the correct level of water to be reset in the *steam generator* ***47***.

The sterilizer displays this alarm when the water inlet pump ***35*** *is supplied for a period of time exceeding the time set in the corresponding parameter.*

- Check:
  - that the *water inlet pump* ***35*** and the solenoid valve **EV1** are correctly feeding water in the *steam generator* ***47***.
  - that the coil of the solenoid valve **EV1** is not burnt.
  - the *water inlet pump* ***35***.
  - the *level probes* ***43A*** and ***43B*** of the *steam generator* ***47;***
  - the water filter;
  - the fuse **F1** on the *power board* ***34***.

Generator insufficient water level alarm
This alarm indicates that the *steam generator* ***47*** does not contain enough water to complete the cycle.

The sterilizer displays this alarm when the minimum level probe of the steam generator ***47*** *is open.*

- Fill the tank.
- Check the efficiency and cleanliness of the *chamber gasket* ***31***. Replace if damaged. If leakage of steam is found, adjust the *door* ***16*** closing.
- Check the efficiency and cleanliness of the *level probes* ***43A*** and ***43B*** of the *steam generator* ***47.***
- Check that the maximum load is not exceeded.
- If the alarm is not resolved, check the drain solenoid valve EV2.

PT3 overtemperature alarm
The alarm indicates that temperature of the external coil has exceeded 220°C.

The sterilizer displays this alarm when the temperature of the external coil has reached 220°C.

- Check that the wires of the *temperature probe PT3* ***39B*** are neither disconnected nor worn and that the probe is not faulty.

PT3 temperature probe alarm
This is triggered when the *temperature probe PT3* ***39*** of the external coil is disconnected or faulty.

The sterilizer shows this alarm during operation when the sensor PT3 ***39B*** *on the external coil detects a temperature of less than 3°C.*

- Check the connection of the *temperature probe PT3* ***39B*** to the connector CN14.
- Replace the probe if faulty.

Events alarm
This alarm indicates that one of the timed cycles (sterilization, drying or maintenance in the Vacuum Test) was not completed successfully.
- Contact COMINOX.

Alarm code list

Code	Alarm type
00	COILS
01	PT1 OVERTEMPERATURE ALARM
02	
03	INSUFFICIENT STEAM
04	INSUFFICIENT WATER LEVEL
05	
06	
07	DOOR
08	GENERATOR LEVEL
09	MANUAL STOP
10	INSUFFICIENT VACUUM
11	FRACTIONED VACUUM
12	
13	LEVEL PROBES
14	PRESSURISATION ALARM
15	OVERTEMPERATURE BAND
16	UNDERTEMPERATURE BAND
17	
18	POWER MISSING
19	GENERATOR INSUFFICIENT WATER LEVEL
20	PT2 OVERTEMPERATURE
21	DRAIN
22	MISALIGNMENT
23	PRESSURE TRANSDUCER
24	TEMPERATURE PROBE PT1
25	TEMPERATURE PROBE PT2
26	PT3 OVERTEMPERATURE
27	TEMPERATURE PROBE PT3
28	
29	
30	EVENTS

ADDITIONAL CHECKS AND SETTINGS

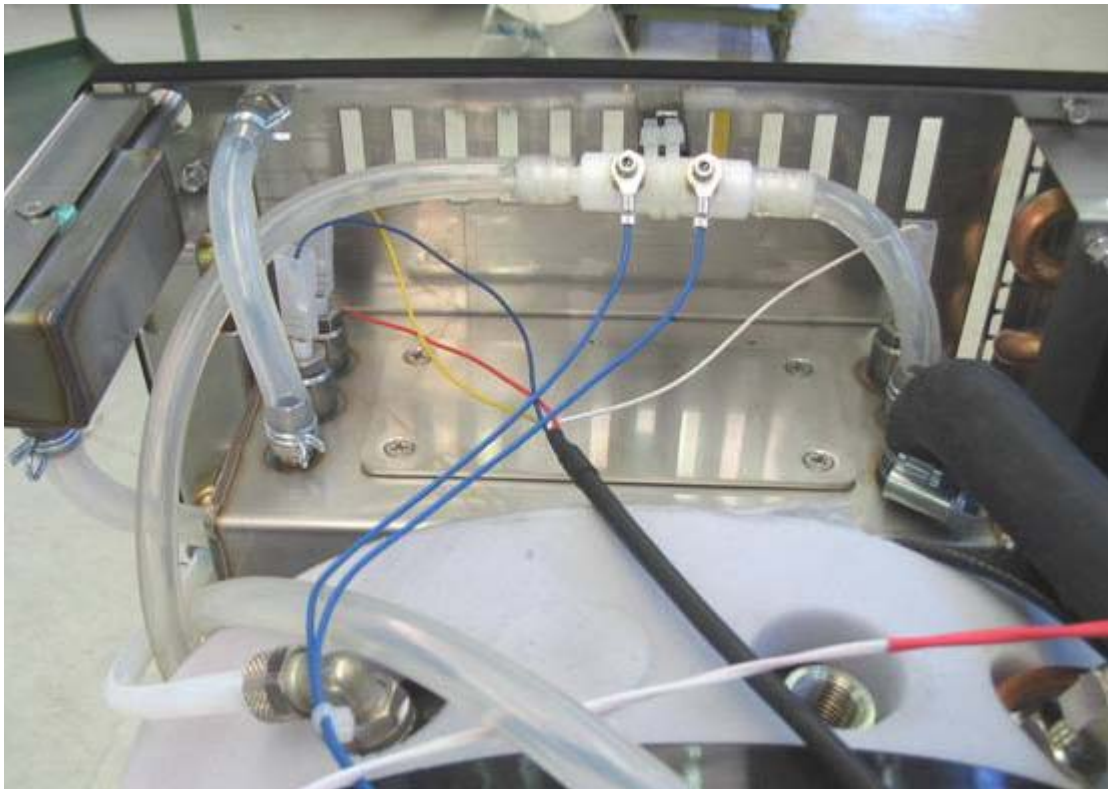
Display off or not clear

Proceed as follows if no writing appears on the display and/or if the display is not very clear:

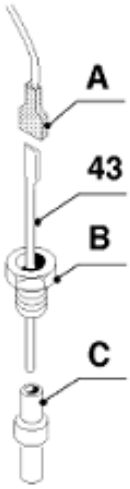
- Check that power socket is powered, the *power cable* ***03*** is correctly plugged in and connected to the sterilizer.
- Check the *fuses* ***32*** and check that the *main switch* ***13*** is pressed to position "I".
- Check the fuses on the *electronic power board* ***34***.
- If the display is not clear from where you are standing, change reading position or angle. If the display is clearer, adjust contrast by means of the trimmer **PT1** starting from your preferred reading position (see chapter DIAGRAMS AND WIRING, Electronic logic board).

Level probe check

The level probes of the *clean water tank* ***10*** and of the *steam generator* ***47*** are metal rods fitted into the container to be monitored and insulated from the container itself. The probe circuit is closed when liquid is present.



The presence of fouling or lime scales in the *clean water tank* ***10*** may create electric continuity between tank metal and level probe rod and consequently detect the presence of liquid in the tank when the tank is empty.
If messages and alarms appear after emptying the *clean water tank* ***10*** remove the probes and clean them carefully as follows.
Follow the same procedure to check the level probes of the *steam generator* ***47.***

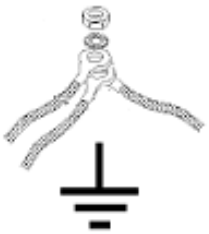


- Remove the cover and the faston **(A)** on the probe bulb.

- Use a wrench **ch 13** to loose the probe holder **(B)** and remove the probe rod.

- Remove the Teflon ogive gasket **(C)**. The ogive gasket is generally deformed to seal the probe holder and takes the shape of the threaded hole. To remove the ogive gasket, unscrew it with a screwdriver and replace it, if needed.

- Carefully clean inside the casing **(C)** and the rod and refit.



Safety valve check

The safety valves should be checked every six months. For this check, the *chamber* ***09*** should be cold and the *door* ***16*** open.

To ensure proper operations of the *chamber safety valve* ***12*** and of the *generator safety valve* ***12A***, remove the cover and unscrew the valve upper plug until it rubs. Pull the plug upward to open the valve manually. Close the plug.

Door adjustment

In case of leakage:

- Check and carefully clean the *chamber gasket* ***31***.
- Adjust the door closing by following these steps:
  - Switch the sterilizer off and wait for it to cool down, then open the door.
  - Remove the cover from the sterilizer.
  - Rotate the screw on top of the chamber to adjust the hook and thus adjusting the door closing.
  - Test tightness by starting a new cycle. Repeat the operation if needed.

Note: Do not tighten the door excessively. Excessive pressure may deform the gasket.

Water in the chamber after the cycle

Proceed as follows if there is still water inside the *chamber **09***:

- Check that a cycle with drying phase has been selected. Otherwise, the presence of water or humidity in the chamber is a normal condition.
- Check the cleanliness and correct positioning of the *drain filter **20*** (see USE AND MAINTENANCE MANUAL, chapter MAINTENANCE).
- Check again the inclination of sterilizer (see USE AND MAINTENANCE MANUAL, chapter INSTALLATION).
- Check that the direct drain pipe is clear (it must NEVER be immersed in water).

Pressure rises too slowly

Proceed as follows if the pressure, rises too slowly at the end of the cycle:

- Check the *air sterilization filter **15*** and replace it, if needed. Note that this filter, as many other components, has a specific life (see USE AND MAINTENANCE MANUAL, chapter MAINTENANCE). NEVER run sterilization cycles without this filter or if the filter is damaged or perforated. The load could be contaminated by ambient air.

Poor drying

Proceed as follows if drying is not satisfactory at the end of the cycle:

- Check that a cycle with drying phase has been selected and that the selected cycle is suitable for the material to be sterilized (see USE AND MAINTENANCE MANUAL, chapter OPERATING USE).
- Check that the total maximum load is not exceeded.
- Check that load is prepared correctly.
- Check the cleanness and correct positioning of the *drain filter **20***.
- Check the *air sterilization filter **15*.**
- Check again the inclination of sterilizer (see USE AND MAINTENANCE MANUAL, chapter INSTALLATION).
- Check that the valve **EV5** (see wiring diagrams) opens during the drying phase. This valve is normally closed but allows air peaks in during the drying phase.

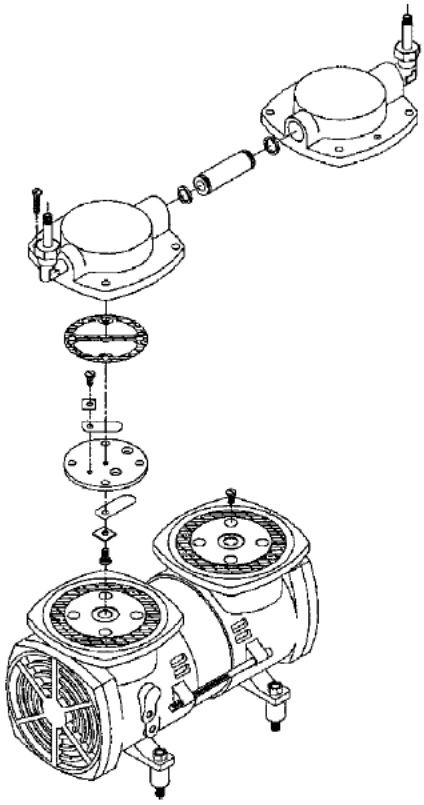
Steam leakage from the safety valve

A steam leakage from the *chamber safety valve **12*** o ***12A*** can occur in various conditions:

- A suitable safety valve must be fitted if the sterilizer is installed at more than 1500 meters above sea level (see USE AND MAINTENANCE MANUAL, chapter TECHNICAL SPECIFICATIONS).
- If the unit is installed at an altitude below 1500 meters above sea level and/or the problem repeatedly occurs, check the valve efficiency or replace it.

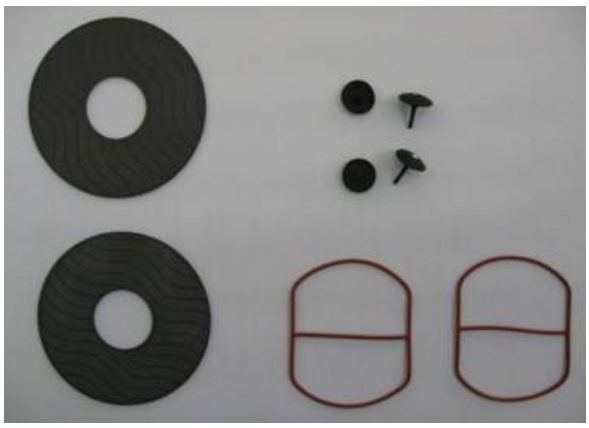
Vacuum pump servicing procedure

The *vacuum pump* ***41*** can be serviced by cleaning it and replacing the gaskets which are supplied in the specific kit.



- Remove the pump and carefully check the position of components.
- Check that the membranes are not cracked. Clean them or replace them, if needed.
- Check the rubber valves. Clean them or replace them, if needed. Make sure position and orientation are correct when refitting.

Vacuum pump kit 2119:



Vacuum pump 2119:

Automatic water inlet does not work correctly

If the *automatic water inlet* ***29*** (optional) is not working correctly, proceed as follows:

- Check that the automatic water inlet is actually available since not all models are supplied with this device.
- Check the External Charge setting (ON) in the Technician - Accessories Menu.
- Check the Self-filling setting (ON) in the Main Settings Menu (see USE AND MAINTENANCE MANUAL, chapter OPERATION).
- For configuration **A** from external tank, check that there is water in the tank; if there is water and the AUTOMATIC WATER INLET ALARM is on, check that the inlet pipe is properly positioned and touches the bottom of the tank; check that the pipe is not bent or twisted; check operation of the *automatic water inlet pump* ***46***;
- In some cases, if the *automatic water inlet pump* ***46*** runs dry for a long period of time, performances may degrade and priming and filling the unit will not be possible in the expected time. In this case, replace the pump.
- For configuration **B** from water mains, check that the mains water tap is open. If the tap is open and the AUTOMATIC WATER INLET ALARM is on, check for flow of water downstream of the installed demineralization system. Check the inlet solenoid valve **EV7** .
- Check the fuse **F1** on the *power board* ***34***. This fuse protects all loads. Replace it, if necessary.

Printer does not print

Check that the *printer* ***26*** is present and that Printer ON is selected in the Technician - Accessories Menu, then proceed as follows:

- Check that Printer setting in the Main Settings Menu allows use of the printer (see USE AND MAINTENANCE MANUAL, chapter OPERATION).
- Check that the internal flap of the printer containing the roll is closed.
- Check that the paper roll is present and correctly fitted.

Note: Never pull paper out as this may open the internal flap or tear the paper out of position. To eject the entire printout, press FEED (in STAND BY mode) on the printer control panel. The paper will be fed by a small amount each time the button is pressed.

- Check *fuses* ***32*** and fuse **F1** on the *power board* ***34.*** Check the connection between the board and the printer (see chapter Printer installation).

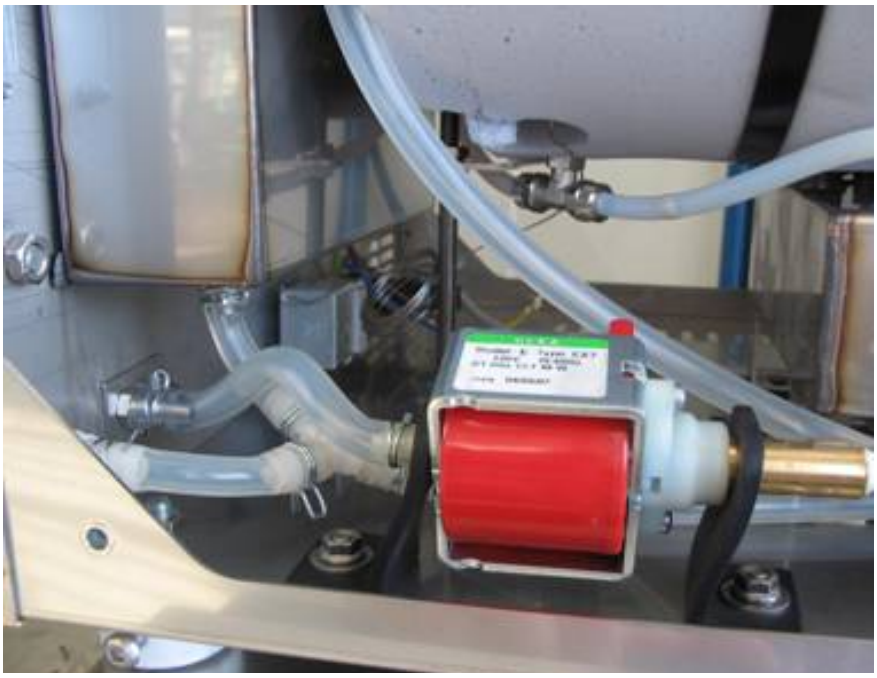
Automatic water inlet and direct drain system installation

This accessory may be fitted after installing the sterilizer and it includes the ***automatic water inlet 29***. Components are the same for all models, except for the pipes which may have different length and placement.

- Pull out the sterilizer (if built-in), place it in an appropriate position and remove the cover.
- Remove the plugs (**T**) from the lower part of the sterilizer (right-hand side).
- Fit the plastic fitting on the larger hole used for draining.
- Fit the fittings and the hose holders for the ***automatic water inlet 29*** on the smaller hole. Direct the hose holder towards the drain.

- Mount the *automatic water inlet pump* ***46*** on its base, strapping it to the supports.

- Fit the branches (**Y**) and all connecting pipes.



- Fit the external filling and waste pipes; the end of the inlet pipe is cut in a particular manner to prevent a suction effect when it rests on the bottom of the tank. The waste pipe is provided with a quick coupling male attachment.
- Test tightness.
- In the Technician Menu, Accessories option (option 16), set External Charge ON; check operation of the sterilizer. Close and restart the unit.

Installation of the SPEEDY WATER demineralization system

The SPEEDY WATER demineralization system should be used to connect the SterilClave 6/18/24 sterilizers to the mains water in automatic water inlet configuration B (see USE AND MAINTENANCE MANUAL, chapter CONNECTIONS).
The SPEEDY WATER demineralization system consists of:

- *conductivity meter* to be fitted on the sterilizer;
- *purification block B* (ionic exchange resins), easy to substitute;
- *support bracket A* for the above mentioned block, to be attached to the wall.

Water quality check

The conductivity meter allows the sterilizer to constantly check that the quality of the water coming from the purification block is suitable for sterilization.
In particular, when the first threshold (15 µS/cm, maximum conductivity recommended under EN 13060 for feedwater) is exceeded, when in STAND BY mode the sterilizer displays the message "Check water quality", to remind that resins replacement is needed.
When the second threshold (30 µS/cm) is exceeded, the INSUFFICIENT WATER QUALITY ALARM stops water coming in automatically from the purification block and warns that it is necessary to change the resins.

Purification block

By treating mains water with a flow of about 650 µS/cm the *purification block B* is able to produce 250 liters of water below the first threshold (15 µS/cm) and another 50 before reaching the second (30 µS/cm) threshold, for a total of 300 liters (→ 600 cycles).

Technical data

Flow rate	between 0.5 and 0.7 l/min
Size H x W x D	520 x 160 x 90 mm
Operating weight	4.7 kg
Mains water requirements	pressure between 1 and 4.5 bar

Support bracket

The *support bracket A* is equipped with rapid connections for connecting to the mains water (inlet) and to the sterilizer (outlet). These fittings are suitable for 8 mm external diameter pipes. Four 7 mm holes for wall mounting are also available.

Bracket technical data

Size H x W x D	270 x 160 x 180 mm
Operating weight	0.9 kg

Maintenance of the SPEEDY WATER demineralization system

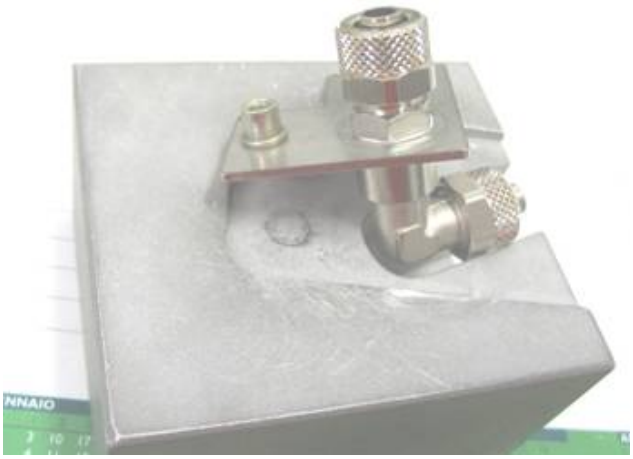
When the *purification block B* needs to be replaced, follow these steps:

- Switch OFF the sterilizer, close the mains water tap and place a container below the *support bracket A* to collect any water spillage.
- Lift the front cover of the *support bracket A*.
- Remove the *metal blocking plate D*.
- Detach the *purification block B* from the support and install the new one as described below.

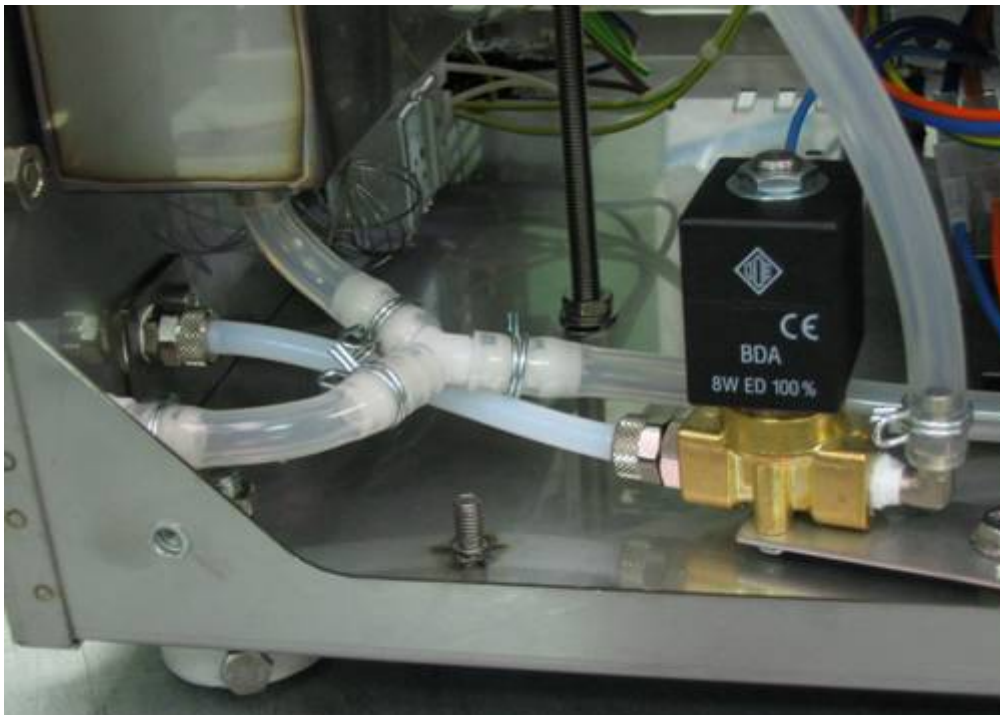
Installation of the SPEEDY WATER demineralization system

To install the SPEEDY WATER demineralization system on a sterilizer already fitted with the *automatic water inlet* ***29*** and the *direct drain* ***30***, follow these steps:

- Install the *support bracket A* to a wall suitable to hold the weight of the plate and of the *purification block B* during operations (5.6 kg). Take into account the vertical space needed to position the block.
- Turn off the mains water tap and remove the plugs from the connections behind the bracket.
- Connect the pipe from the water mains to the rear right section of the bracket (bearing the label "IN" at the front) and the pipe to the sterilizer to the rear left section of the bracket (bearing the label "OUT" on the front). Use the supplied pipes (2 m each) and push them as far as possible into the connections.
- Remove the plugs positioned under the front cover of the bracket.
- Remove the protective plugs from the *purification block B* inlet and wet their gaskets with demineralized water to ensure maximum efficiency.
- Lift the cover of the bracket and place the *purification block B* on the metal *guide pin C* pushing it till the notch in the guide pin appears at the front.
- Fix the *purification block B* by fitting the *metal blocking plate D* into the groove in the *guide pin C* and lower the cover of the *support bracket A*.
- Pull out the sterilizer (if built-in), place it in an appropriate position and remove the cover.
- Replace the hose holders of the *automatic water inlet* ***29*** joint with the straight fittings supplied and connect the pipe from *support bracket A* to the external one.



- Replace the *automatic water inlet pump* ***46*** and the connection pipes with the *solenoid valve EV7* (mounted on its support and with the outlet hose holders and the inlet L-joint) and the pipes supplied. Use the teflon pipe to connect the internal joint on the back of the sterilizer with the *solenoid valve EV7* (inlet 1) and the silicone pipe to connect the *solenoid valve EV7* (outlet 2) to the *clean water tank* ***10***.



- Insert the *probe support E* in the silicon pipe and fasten the ends with the pipe clamps provided. Connect to the pins using the appropriate screws and ready to use, clamped blue cables with eyelets to the *filler* ***14***. Clamp the *probe support E* to the supplied support screwed into the *slit J*, making sure there is no contact between the pins and other parts of the sterilizer.
- Open the mains water.
- Test the sterilizer and the joints.
- Check operations, close the mains water tap and install the sterilizer again.

SterilCard Reader installation

The SterilCard reader kit includes:

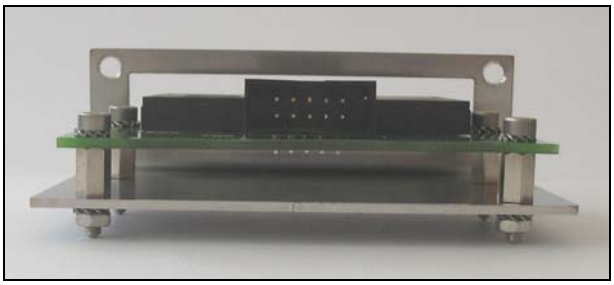
- Administrator and User SterilCard
- SterilCard reader
- SterilCard reader support
- Cable
- 4 self-tapping screws
- 4 spacers
- 4 M3x6 screws
- 4 nuts
- 8 washers

Follow these instructions to assemble the SterilCard kit:

1. Assemble the SterilCard reader on its support as shown in the picture:

- M3x6 screw
- Washer
- SterilCard reader
- Spacer
- SterilCard reader support
- Washer
- Nut

In order to obtain this assembly:



2. Mount the assembly in the control panel with the 4 self-tapping screws.

Note: The assembly must be placed as high as possible, so that the opening of the control panel is aligned with the one of the SterilCard reader.

3. Connect end A of the cable to the SterilCard reader and connect end B to the J5 connector of the logic board. Reassemble the control panel on SterilClave.
4. Turn on the sterilizer and insert the Technician SterilCard. In the Technician Menu, scroll to Accessories (option 16) and set CARD Reader to ON. Check that the card reader works correctly.
5. Turn off the sterilizer using the main switch and remove the Technician SterilCard. Turn on the sterilizer and insert the Administrator SterilCard.

Printer installation

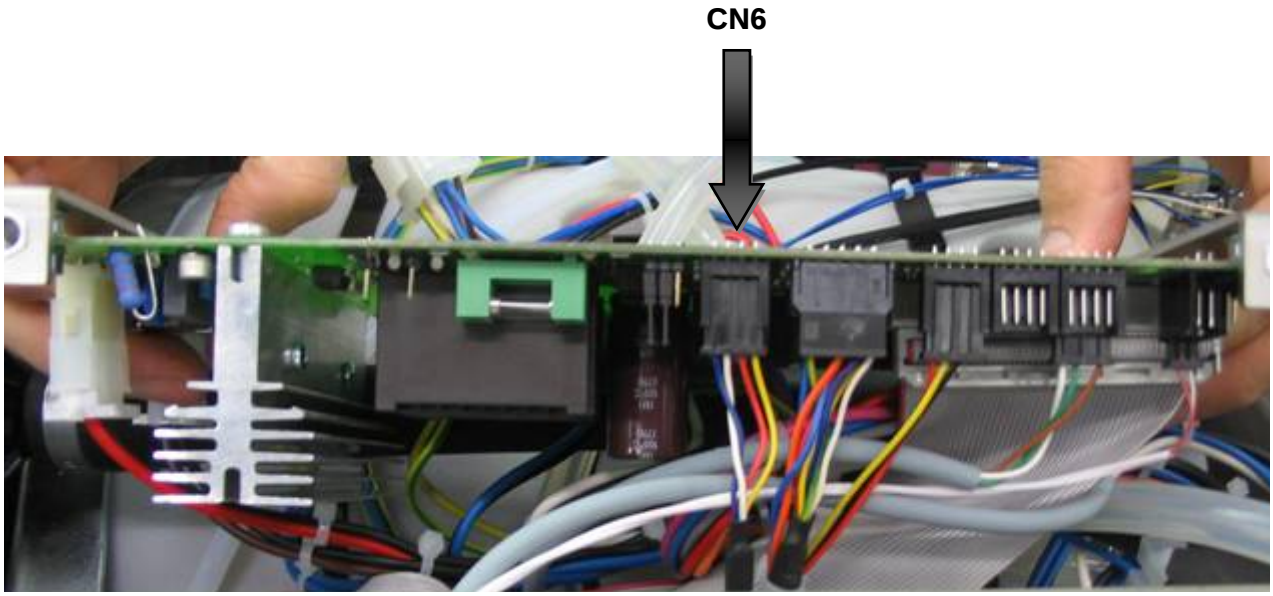
If the set up of the *printer* ***26*** (optional) takes place following the purchase of the sterilizer, a specific kit is provided. To install the components follow the procedure described below.

- Pull out the sterilizer (if built-in), place it in an appropriate position and remove the cover.
- Unscrew the 4 fastening screws to remove the lid.

- Connect the printer cable to printer connector **CN2** .

- Insert the printer into the hole until the side tabs snap into place.

- Connect the printer cable to connector **CN6** on *power board* ***34***:



- In the Technician Menu, scroll to Accessories (option 16) and set Printer ON. Specify the number of copies for the Printer option in the Main Settings Menu.
- Check operation. Close and reinstall the sterilizer.

Firmware upgrade

To upgrade the firmware file, the configuration file and the parameters file of the sterilizer, follow these steps:

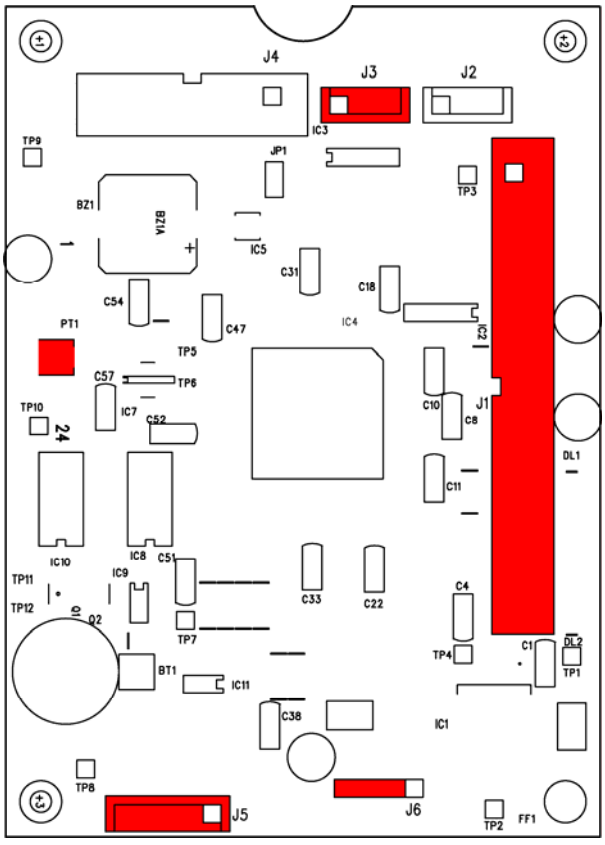
1. Connect the sterilizer to the computer using the USB serial cable.
2. Turn on the sterilizer from the ***main switch 13***.
3. Turn on the computer and install the SterilClaveVxx.exe program following the instructions displayed on the screen.
4. Start the SterilClaveVxx.exe program.
5. Choose the data transfer rate: click on 115200 bps.
6. Type the number of the COM port to which the sterilizer is connected.
7. Click Open.
8. Click the Debug tab.
9. Click Identify. If the numbers displayed in the box are different from zero the connection has been established correctly; otherwise, check the number of the COM port and the cable since the connection is not working.
10. Click the Download tab to download the firmware file, the configuration file and the parameter file, IN THIS ORDER.
11. Click Download Firmware File and select the firmware file (.s19) to start downloading. When the download is completed, the message OPERATION SUCCESSFUL will be displayed.
12. Click Download Configuration File, select the configuration file (.cmxcnf) to start downloading.
13. Click Download Parameters File, select the parameters file (.cmxpars) to start downloading.

Click Close to close the connection and click Exit to exit the program.

DIAGRAMS AND WIRINGS

Electronic logic board
The *Logic board* ***33*** is a low voltage board common to all models.

J1	Connection cable to *power board* ***34***
J3	Connection cable to the serial port
J5	Connection cable to the SterilCard reader
J6	Connection cable to the keyboard
PT1	Display adjustment trimmer (see chapter DISPLAY OFF OR NOT CLEAR)



Electronic power board

The *power board* ***34*** is common to all models.

J1 Connection cable to *logic board* ***33***

CN1 Load connector:
- **1** - Solenoid valve **EV1** and *water inlet pump* ***35*** [orange]
- **2** - Water drain solenoid valve **EV2** [brown]
- **3** - Three-way solenoid valve **EV3** [pink-black]
- **4** - Steam solenoid valve **EV4** [green]
- **5** - By-pass solenoid valve **EV5** [purple]
- **6** - Drying solenoid valve **EV6** [white-black]
- **7** - *Automatic water inlet pump* ***46*** (configuration **A**) or solenoid valve **EV7** (configuration **B**) [blue]
- **8** - *Vacuum pump* ***41*** [pink]
- **9** - Door lock [gray]
- **10** - *Fans* ***42*** [red]

CN2 Contactor connector

CN3 Power supply connector

CN4 Internal coil connector

CN5 External coil connector

CN6 Printer connector

CN7 Level probe connector:
- **1** – Ground [yellow-green]
- **2** - Conductivity meter ground [blue]
- **3** - Probe S7 (not used)
- **4** - Minimum level probe of the *steam generator* **47**
- **5** - Maximum level probe of the *steam generator* **47** [orange]
- **6** - Conductivity meter signal [blue]
- **7** - Maximum level probe S3 for *clean water tank* ***10*** [blue]
- **8** - Maximum level probe S4 for *waste water recovery tank* ***11*** (not used in 6 B SPEEDY models) [red]
- **9** - Safety probe S1 for *clean water tank* ***10*** [white]
- **10** - Minimum level probe S2 for *clean water tank* ***10*** [yellow]

CN8 Micro-switch connector:
- **1** - M1 door locked [red]
- **2** - M2 pre-lock [yellow]
- **3** - Common [black]

CN9 Volumetric counter connector

CN11 Pressure transducer connector

CN12 *Temperature probe PT1* ***39*** connector

CN13 *Temperature probe PT2* ***39A*** connector

CN14 *Temperature probe PT3* ***39B*** connector

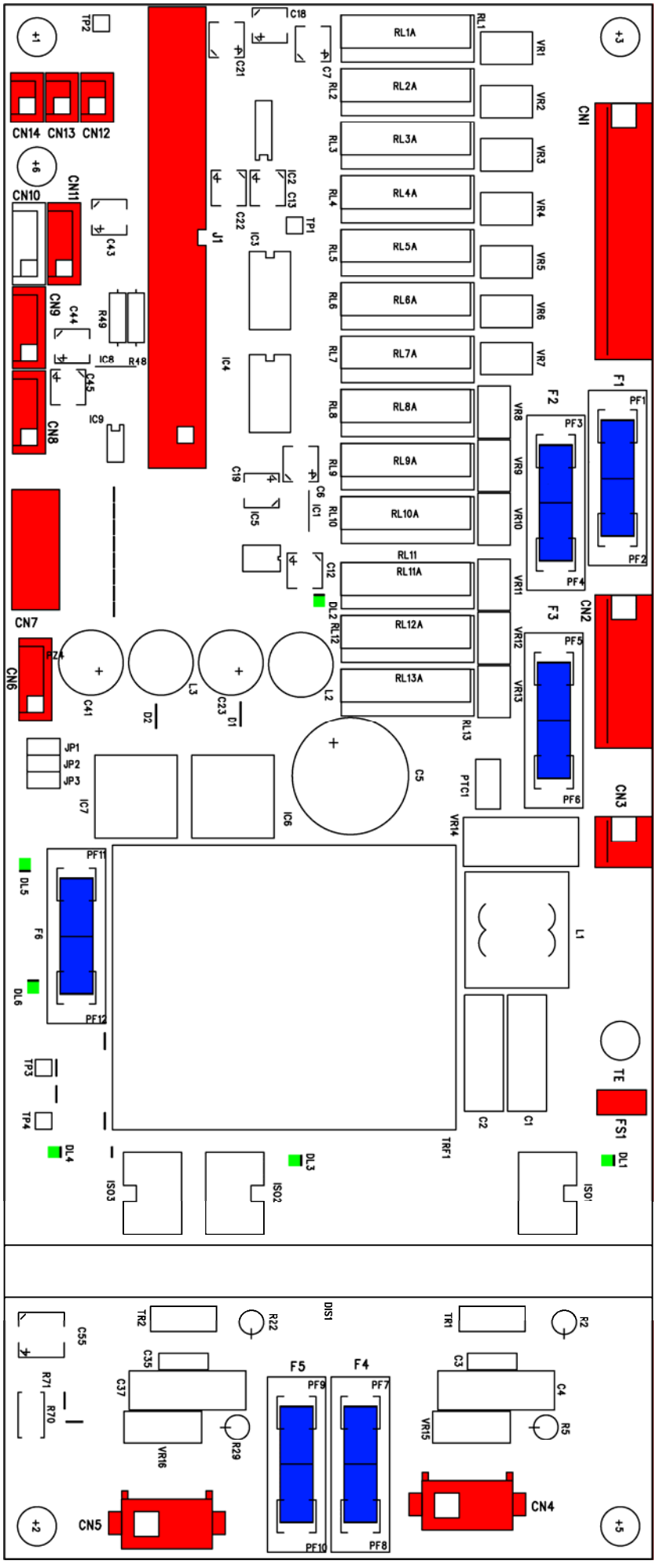
FS1 Grounding connector

FUSES

F1	4 A
F2	4 A
F3	4 A
F4	16 A
F5	10 A
F6	0.63 A

LEDS

DL1	Internal coil on LED
DL2	+5V power LED
DL3	External coil on LED
DL4	Coil safety LED (on in normal conditions, off when a COIL ALARM occurs)
DL5	Printer power LED
DL6	+24V power LED


CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
RL1A
RL2A
RL3A
RL4A
RL5A
RL6A
RL7A
RL8A
RL9A
RL10A
RL11A
RL12A
RL13A
VR1
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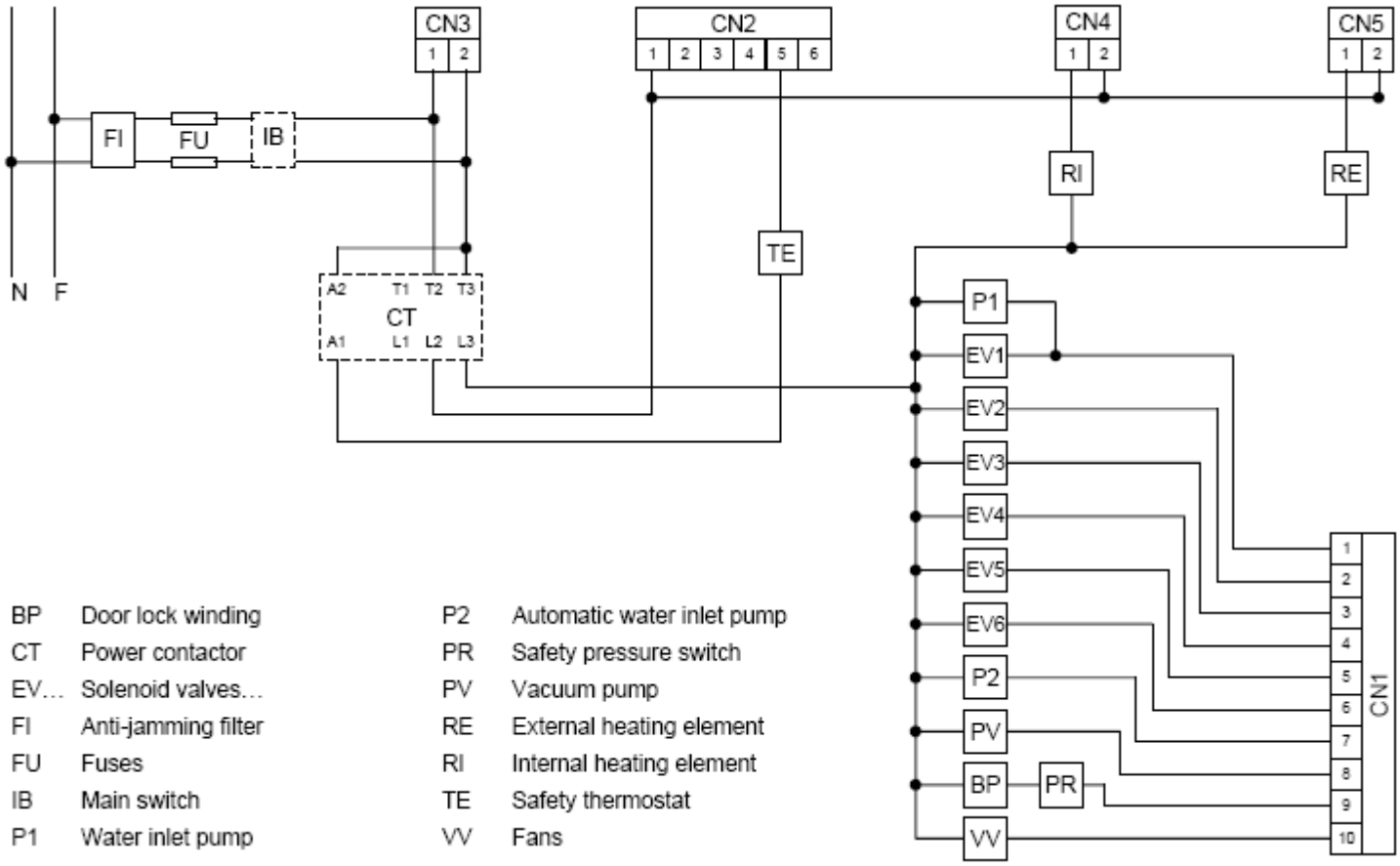
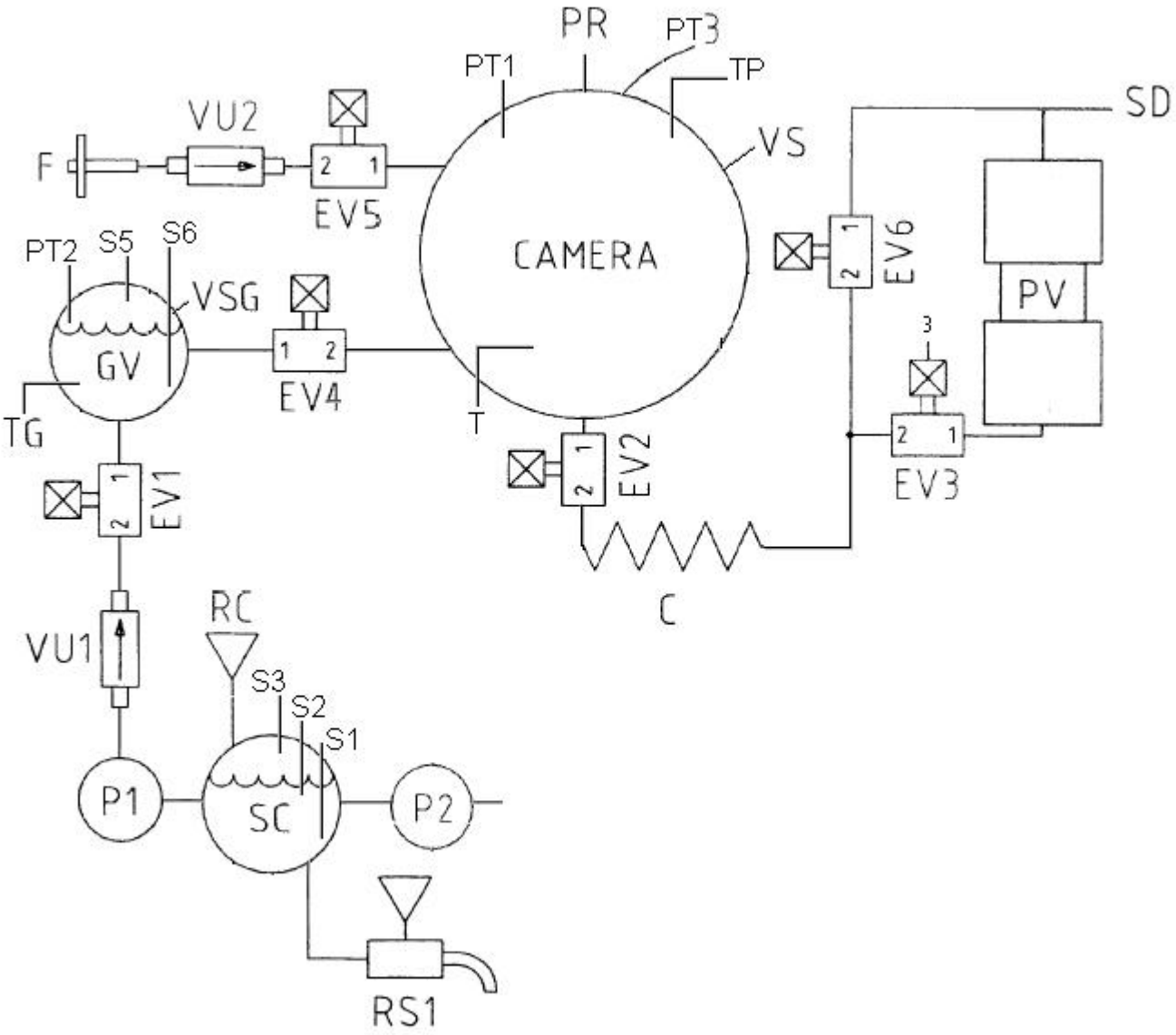
TP1
TP2
TP3
TP4
JP1
JP2
JP3
J1
TRF1
PTC1
FS1
TE
ISO1
ISO2
ISO3
DIS1
TR1
TR2
R2
R5
R22
R29
R48
R49
R70
R71
+1
+2
+3
+5
+6

Wiring diagram 6 B SPEEDY



BP	Door lock winding	P2	Automatic water inlet pump
CT	Power contactor	PR	Safety pressure switch
EV…	Solenoid valves…	PV	Vacuum pump
FI	Anti-jamming filter	RE	External heating element
FU	Fuses	RI	Internal heating element
IB	Main switch	TE	Safety thermostat
P1	Water inlet pump	VV	Fans

Hydraulic diagram 6 B SPEEDY

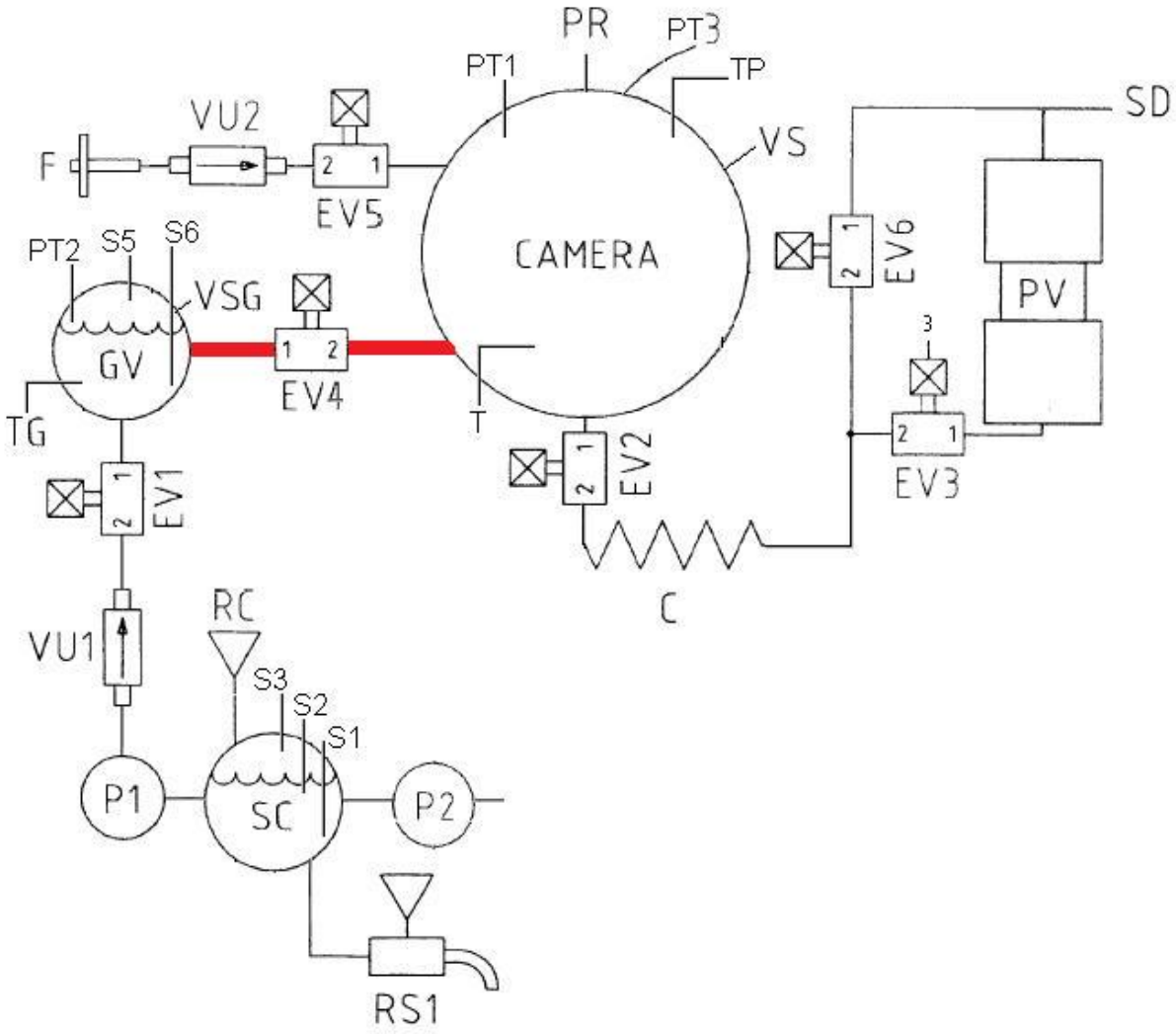


C	Condenser	***PV***	Vacuum pump
EV1	Water inlet N.C. solenoid valve N.C. Ø 4,5	***P1***	Water inlet pump
EV2	Drain N.O. solenoid valve Ø 3	***P2***	External inlet pump
EV3	Vacuum pump 3-way solenoid valve	***RC***	Inlet tap
EV4	Steam generator solenoid valve	***SC***	Inlet tank
EV5	Drying solenoid valve Ø 4,5	***SD***	Direct drain
EV6	Vacuum pump by-pass solenoid valve Ø 4,5	***TG***	Generator thermostat
F	Air Filter	***TP***	Pressure transducer
PR	Safety manostat	***VS***	Safety valve
PT1	Chamber PT1000	***VSG***	Generator safety valve
PT2	Steam generator PT1000	***VU1***	Pump one-way valve
PT3	External coil PT1000	***VU2***	Air filter one-way valve

STEAM PEAK diagram

EV2 **ON**
EV4 **ON**
Internal coil **ON**

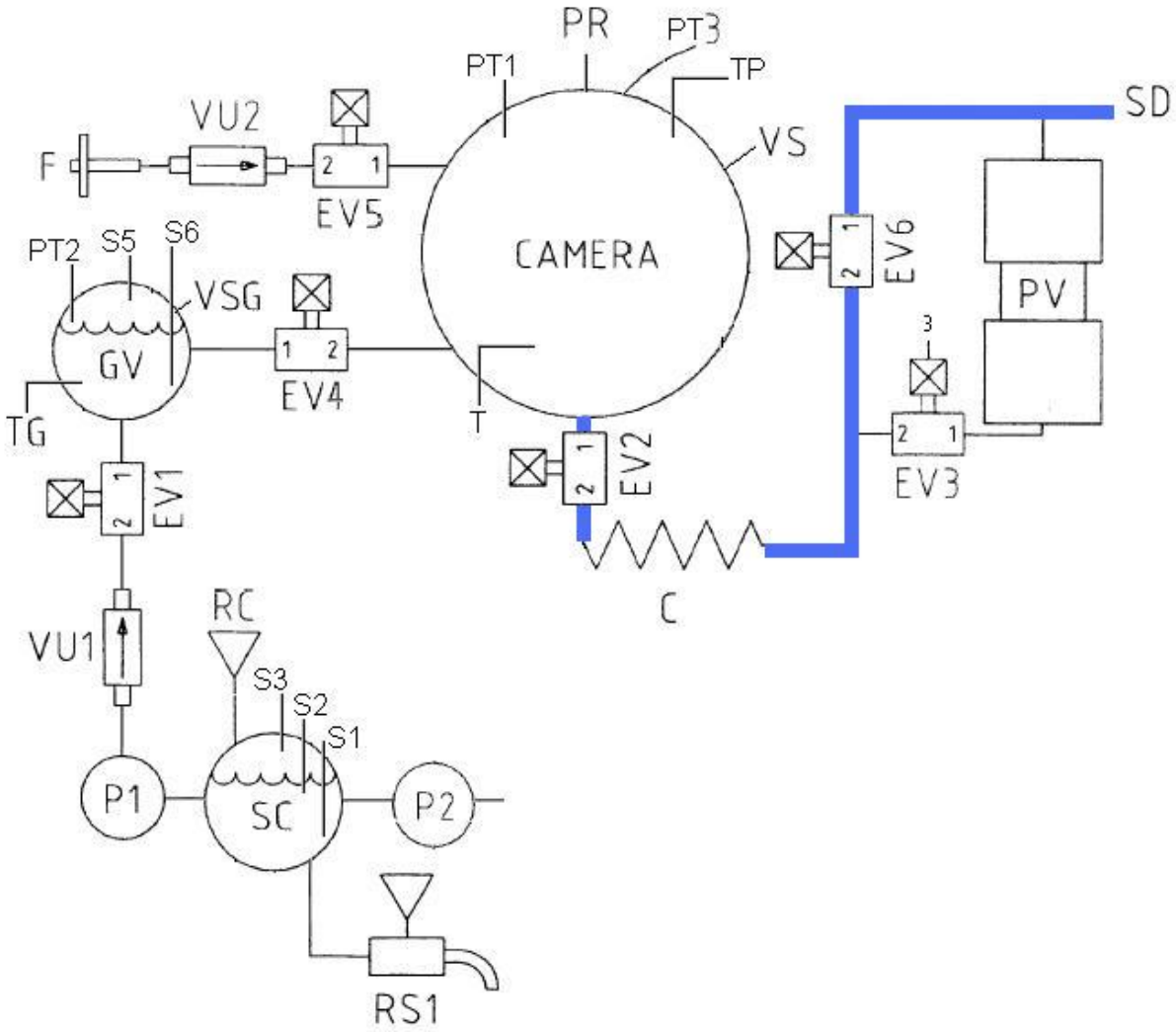
➔ steam is injected in the *chamber **09***



VACUUM PULSE diagram (p>1,2 bar)

Pressure inside the chamber is higher than the atmospheric value

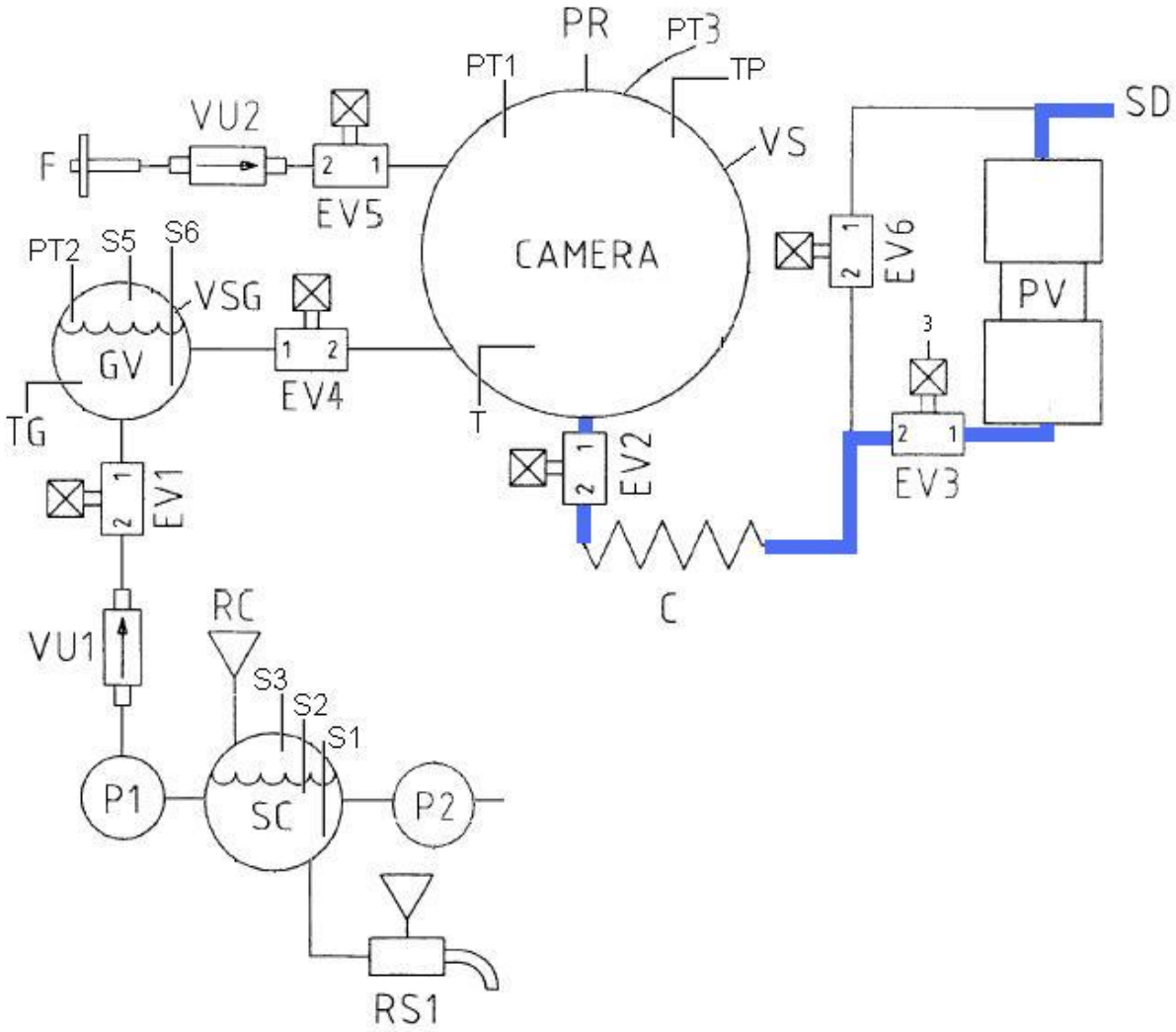
➔ Steam flows naturally



VACUUM PULSE diagram (p<=1,2 bar)

EV3 **ON**
EV6 **ON**
PV **ON**

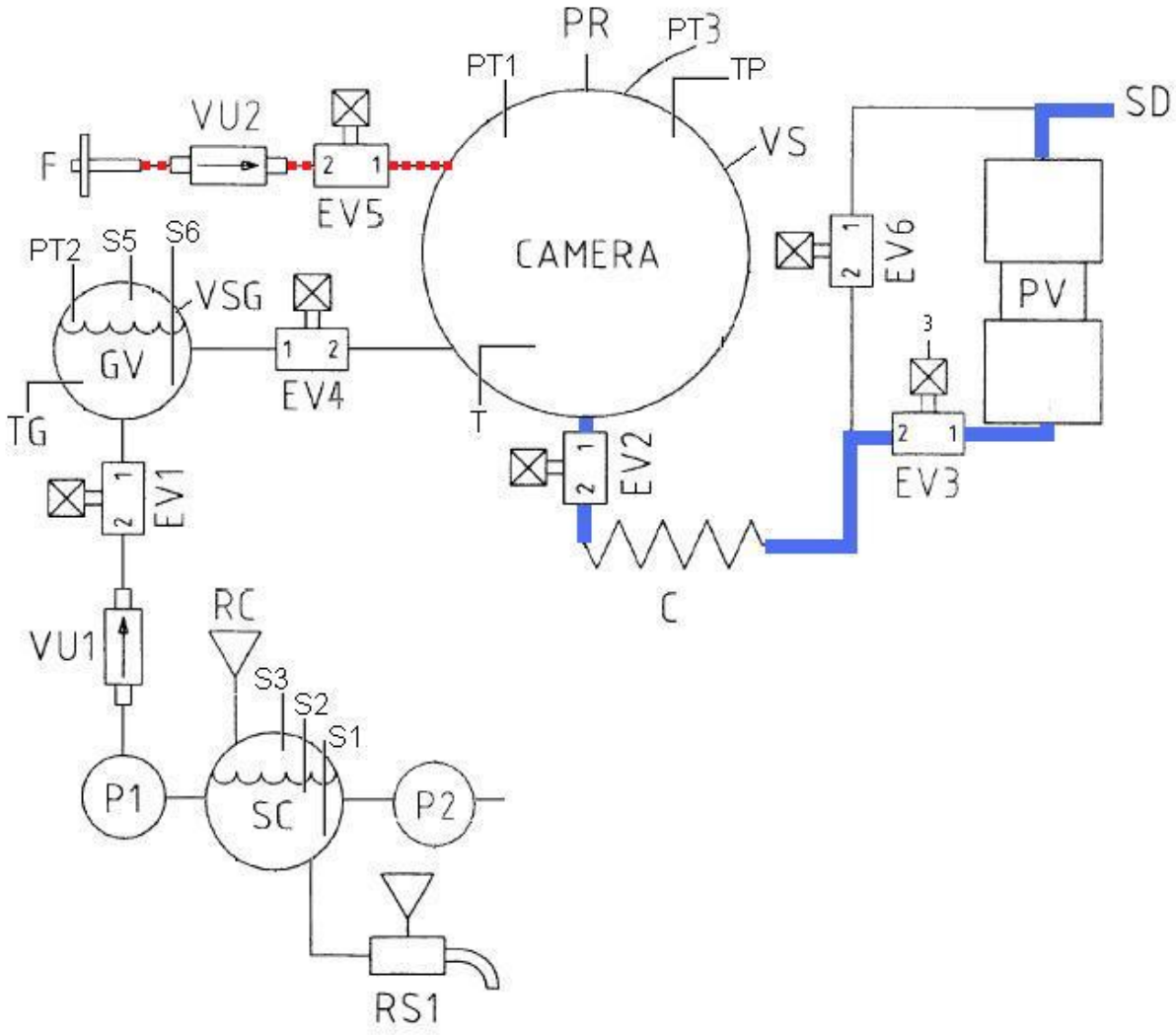
➔ Steam/air removal from the chamber
EV2/EV3 cycle introduces air in the pump and removes condesed steam



DRYING diagram

EV3 **ON**
EV6 **ON**
PV **ON**
EV5 **ON**

➔ Steam removed from the chamber is replaced by filtered air



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