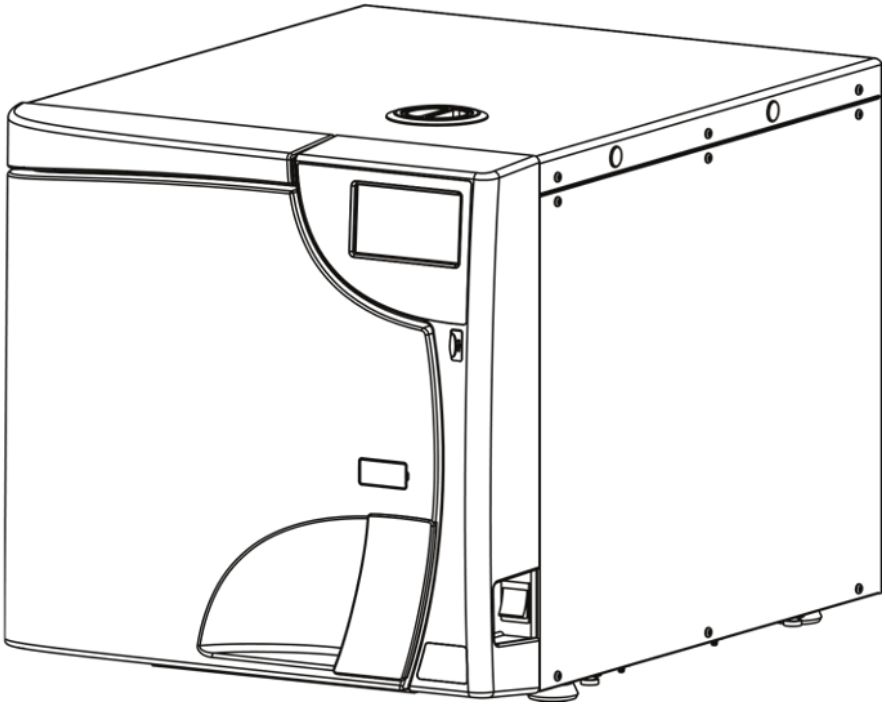
SciCan

BRAVO™ G4

Chamber Autoclave



Technical Service Manual

SD-603 EU EN R3 | 97071291-3

COLTENE

97071291
Rev. 03
2021-09

EN

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Manufactured by:
CEFLA s.c.
Headquarter:Via Selice Provinciale 23/A
40026 Imola (BO) IT

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Contents

1. GENERAL WARNINGS

1.1. FOREWORD

The device described in this manual is manufactured by CEFLA s.c. - via Selice Provinciale 23/A - 40026 Imola (BO) Italia, which is the manufacturer, in compliance with the applicable European Directives detailed in the declaration of conformity.

These technical instructions are addressed to the personnel in charge of repair and/or maintenance operations and contain all the necessary information.

CEFLA s.c. shall be responsible for the safety, reliability and efficiency of the equipment provided that:

- Installation, any modifications, settings or repairs are made by authorised technical personnel using CEFLA s.c. original spare parts.
- In case of installation in medical locations: the electrical installation of the relevant location complies with IEC 60364-7-710:2002 Standards (Standards on electrical installations of medical locations) or with the equivalent Standards in force in the country of installation.
- The equipment is used as outlined in User Manual.

1.2. SAFETY INSTRUCTIONS

Information that draws the user's attention to the need of preventing dangerous situations and ensuring the correct and safe use of the device is reported in the text according to the following layout:

SYMBOL	DESCRIPTION
	**WARNING**: General obligation
	**WARNING:** It is mandatory to wear safety gloves
	**WARNING:** It is mandatory to wear safety shoes
	**WARNING:** Use eye protections
	**WARNING:** Use protective clothing
	**WARNING:** It is mandatory to ensure that there is a grounding connection
	**WARNING:** See the User Manual
	**WARNING:** Disconnect the device from the power mains
	**WARNING:** See the Technical Manual
	**DANGER:** It indicates a situation in which the failure to follow the instructions may lead to a fault of the equipment or injuries to the user
	**DANGER:** High voltage
	**DANGER:** Crushing of hands
	**DANGER:** Crushing of feet
	**DANGER:** Hot surface
	**DANGER:** Biological risk
	**DANGER:** Sharp objects
	**DANGER:** Corrosive substances
	**DANGER:** Flammable materials

SYMBOL	DESCRIPTION
	**DANGER**: Tipping over
	**DANGER**: Heavy object. Two persons are required

WARNING!

ALWAYS DISCONNECT power supply before performing any maintenance or cleaning operation.

The packed device must be handled using, where possible, suitable mechanical means (forklift, pallet truck, etc.) and following the indications on the package.
In case of manual handling, the device must be lifted by several persons using the suitable available means and, if possible, it must be moved with a truck or similar means.

Wear the proper protections.

2. PACKING AND TRANSPORT

2.1. TRANSPORT AND STORAGE

Instructions on how to handle, store and open the package are given on the outside of the cardboard box. These instructions must be carefully followed.

1) Transport and store only in the direction indicated by the arrows.

2) Do not overlap more than three units.

3) Avoid collisions.

4) Protect against humidity.

5) The required storage conditions are indicated:

a) temperature from - +5° to +70° C (41°F to 158°F).

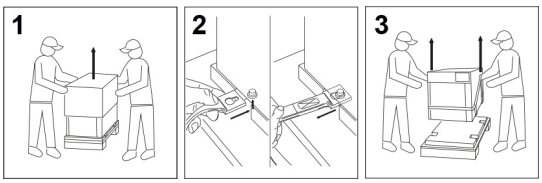
b) relative humidity from 20 to 80%.

c) atmospheric pressure from 50 to 110 kPa.

It is recommended to transport and store the device at a temperature not lower than that indicated on the packing. A prolonged exposure to a low temperature can damage the device.

The packed device must be handled using, where possible, suitable mechanical means (forklift, pallet truck, etc.) and following the indications on the package.

In case of manual handling, the product must be lifted by two persons using the suitable available means.



Once removed from the box, the device must be lifted by two persons using the suitable available means and moved, if possible, with a truck or similar means.

2.2. DAMAGE DURING SHIPMENT

When the device is received, check the packing container for any damage suffered.

If the packages are found to be damaged on delivery, accept them with reserve by signing the delivery note and indicating that the “CONTENTS ARE ACCEPTED BUT THEY NEED TO BE CHECKED”.

If the contents are actually damaged, notify the shipping agent and request insurance compensation for damage within five work days. The claim is to be made by the person who commissioned the shipping agent. I.e.:
- If the goods are delivered “carriage forward”, the receiver shall notify the shipping agent.
- If the goods are shipped “carriage free” or “free delivered”, the consigner shall notify the shipping agent and file a claim for damages. In this case, the supplier shall be informed as soon as possible.

The damaged parts returned to the supplier for replacement shall be placed inside the same damaged package.

Return to the supplier shall be “carriage free” (at the expense of the consigner), while shipment back to the customer shall be at the expense of the supplier (carriage free).

3. GUIDELINES - SAFETY TEST - VALIDATION (IF REQUIRED)

Periodical checks to be carried out every year and checks after repair/updates/settings with reference to Standard IEC 61010.

Safety standards for medical electrical equipment classified according to IEC 61010 in Class 1.

3.1. CHECKS REQUIRED FOR THE DRAFTING OF CONFORMITY REPORT

a) Visual inspection

The purpose of visual inspection is to ensure that the equipment in use still complies with the specifications released by the manufacturer through the following checks:

- Condition of power cables and connectors.
- Condition of grounding cables and correct tightening.
- Condition of covers.
- Condition of electrical board protections and correct value of the fuses.
- Conditions of warning plates.
- Conditions of light and sound indicators (display, buzzer, etc.).
- Presence of liquid leaking out from ducts or on the bottom of the device.
- Presence of the updated user manual in printed or electronic format.

b) Electric measure test (to be carried out with special instruments)

- Measurement of ground conductor resistance.
- Measurement of the device's ground leakage currents:
  1) Current under normal conditions.
  2) Current under single failure conditions.
- Measurement of insulation resistance between network and ground conductor.

c) Functional checks

- Check the door opening and closing controls.
- Check the display and perform a test cycle.

3.2. CONFORMITY REPORT

CONFORMITY REPORT - Ref. Standard:			STANDARD	CLASS
cefla	Scheduled maintenance	☐	IEC 61010	CL1
			DEALER:	
	Unscheduled maintenance	☐	_____	

DENTAL SURGERY Dr.: _____ DEVICE: _____ SERIAL NUMBER: _____
MEASUREMENT INSTRUMENT - MODEL: _____ S/N: _____

VISUAL INSPECTION				
Conditions of:	• power cables and connectors • grounding cables and correct tightening	• electrical protections • covers	• warning plates • light indicators	OK ☐
Presence of:	• liquid leaking out from ducts or on the bottom of the device • user manual			

ELECTRICAL SAFETY TEST		
(MEASUREMENT POINT AND MAX VALUE)		
MEASUREMENT OF GROUND CONDUCTOR RESISTANCE	Ω	OK
Ground conductor ≤ 0.1 Ω		☐
MEASUREMENT OF GROUND-LEAKAGE CURRENT:	A	OK
1) under normal conditions ≤ 0.5 mA		☐
2) under single failure conditions ≤ 3.5 mA		☐
INSULATION RESISTANCE TEST - Test voltage = 500 Vdc	Ω	OK
Measurement between network and grounding > 2 MΩ		☐

VISUAL INSPECTION		
• Door opening and closing controls	• Light indications and/or acoustic signals	OK ☐

Notes:	FINAL EVALUATION:			
	OK	☐	FAULT	☐

DEALER: _____ TECHNICIAN: _____

DATE: _____ SIGNATURE: _____

3.3. APPLICATION EXAMPLE WITH INSTRUMENT SECUTEST SIII+ ON STERILIZER

- Measurement of ground conductor resistance.
- Measurement of ground-leakage current.
- Measurement of insulation resistance between network and grounding.

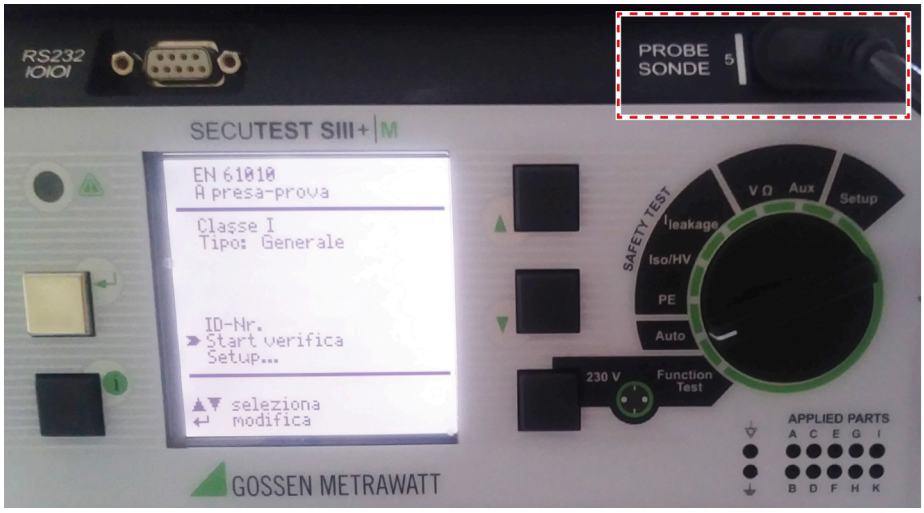
Disconnect power supply cable of the device and connect it to the relevant instrument socket (e.g.: SECUTEST SIII+). Activate the device to be tested.

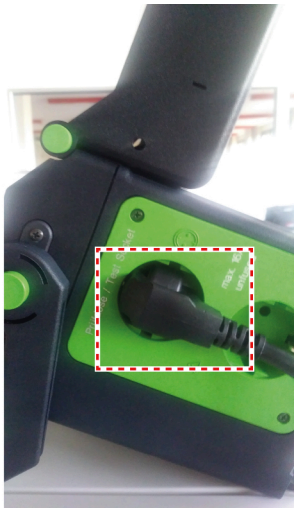
NOTE: The device under test must be on and must be pre-heated in advance by operating a cycle of at least 30 minutes, until it reaches the operating temperature, as required by the Standard.

Select the type of test with reference to standard IEC 61010, from PC or tester screen. Follow the instructions displayed with reference to the visual check and device data entry (e.g.: serial number).

Power up the device and select the Standard.

INITIAL SETTING

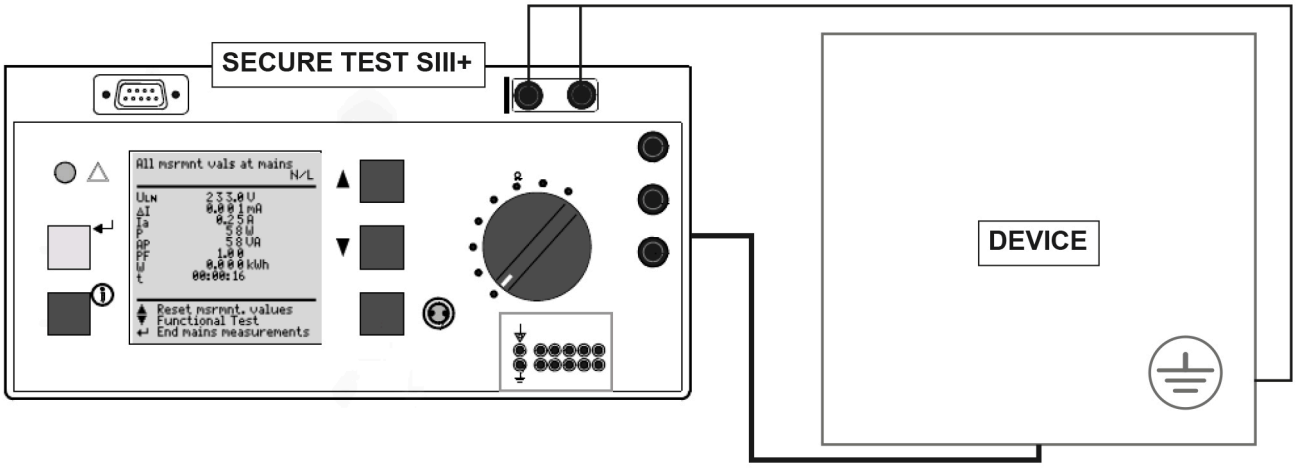




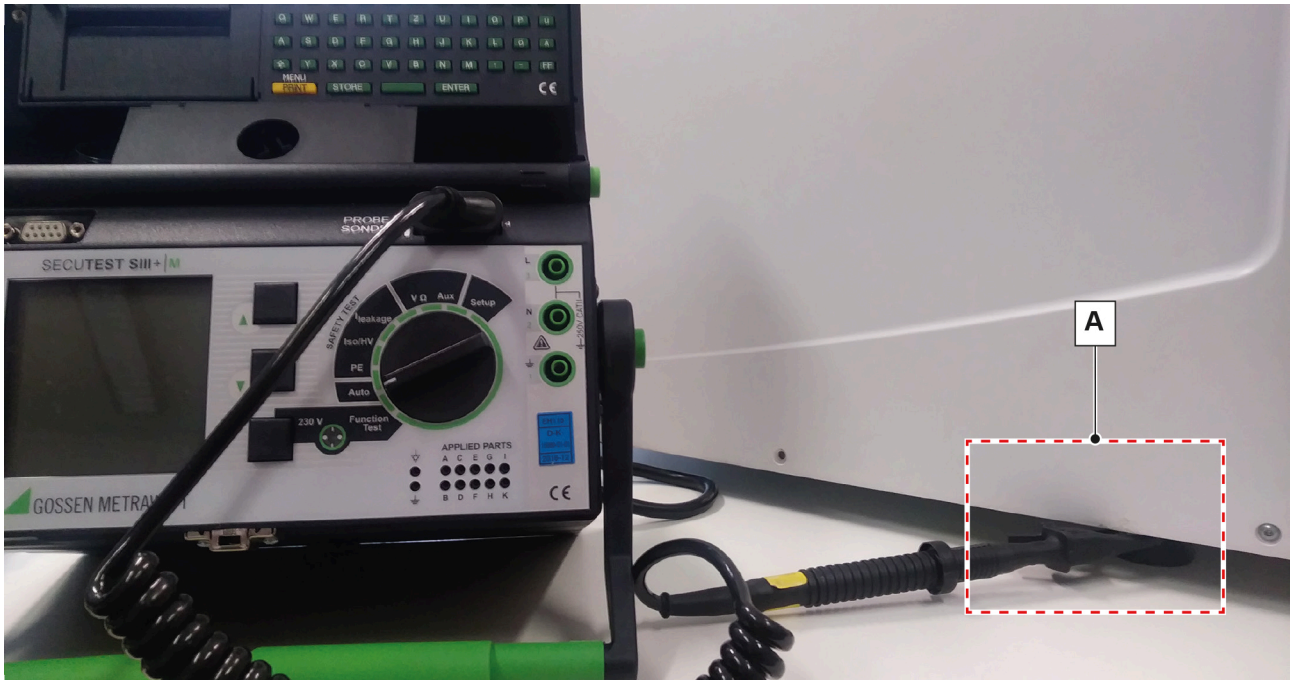
CONNECTIONS WITH THE MACHINE POINTS MUST BE KEPT FOR THE TESTS DESCRIBED BELOW.

NOTE: Follow the instructions requested by the control instrument.

E.G.: SECUTEST SIII+ instrument connection



Connect the clamp to the frame at the point indicated in the following picture:



Metal foot **[A]**

WARNING: During measurement execution, hazardous voltage could remain in the device.

Press "Start" to start test sequences.

Depending on your instrument, you have to select all the tests indicated below:

A) Measurement of ground conductor resistance.
B) Measurement of ground-leakage current.
C) Measurement of insulation resistance between network and grounding.

A) Measurement of ground conductor resistance (to be carried out after setting the test current of 25 Amperes in the tester).

B) Measurement of ground-leakage current.
Select the specific test on the tester:
- **"Ground conductor"**: start the test; it must be carried out under single failure conditions (interruption of a network conductor at a time) - (normal tester automatism).

C) Measurement of insulation resistance between network and grounding.
This test does not require special wiring, the tester will perform it automatically after your authorisation to proceed. Keep the probe connected as in the previous point.

NOTE: PHASE and NEUTRAL are short-circuited with each other by the tester.

The tester issues (where applicable) a paper report with test results.

a) Check that the test has passed.

b) Add the values to the conformity report only in the absence of the paper report (otherwise attach the report and tick the tests in the report as performed).

c) If one or more tests have not passed, see section 4 (“Indications for the solution of non-conformities detected in the test”).

WARNING: If safety checks are not passed, the device must NOT be used; before using it again, the device must be repaired by an authorised technician.

The correct operation of the device must be verified by performing a full functional check.

File the report in the warranty and maintenance booklet of the device.

3.4. INDICATIONS FOR THE SOLUTION OF NON-CONFORMITIES DETECTED IN THE TEST

A) Ground conductor resistance

- Check the presence and continuity of the grounding conductor between the measurement point and the main grounded node and in the intermediate sections.
- Check correct tightening of ground conductor fastenings.

B) Insulation resistance / ground-leakage current

- **Sterilizers**

  Disconnect, in sequence, the following conductors from the main board (repeat the test at each time):
  - Conductors of the sterilization chamber heating band
  - Conductors of steam generator
  - Vacuum pump
  - Connector of the power transformer primary winding

4. FUNCTIONING

NOTE - UNIT OF MEASURE: Pressure (a.s.l.) 1 bar (value in relative barg at sea level)
0 relative bar = 1 absolute bar.

4.1. PRE-HEATING

When the autoclave is turned on, the pre-heating setting screen is displayed, set by default to ON with a time of 60'.
Depending on the user's choice, it can be:
- PRE-HEATING not active (OFF).
- PRE-HEATING active (ON).

The pre-heating phase, depending on the user's choice, can be modified from the menu "SETTINGS" - "PREFERENCES" - "PRE-HEATING".

With PRE-HEATING not active, the following components will not be powered nor activated:
- Solenoid valves
- Fans
- Water pump
- Vacuum pump
- Chamber tube bundle heating element
- Generator heating element

With PRE-HEATING active, the chamber tube bundle heating element is activated and managed through a temperature control that allows keeping:
- Chamber temperature at 50°C (122°F) with open door.
- Chamber temperature at 100°C (212°F) with closed door.

When the device is started with PRE-HEATING active, the actual operation starts:
- After one successfully completed cycle (test cycle or sterilization cycle).
- After one aborted cycle (except in case of "vacuum test" cycle).

The PRE-HEATING **is disabled**:
- When a cycle is performed with delayed start.
- At the end of the set pre-heating time.

NOTE: The timer restarts when the door is closed when performing pre-heating with open door.

With PRE-HEATING active and closed door, solenoid valve EV5 is activated.

PRE-HEATING - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FANS	WATER PUMP - EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
OFF	Off open	Off closed	Off closed	Off (0)	Off closed	OFF	OFF	OFF	OFF	OFF
ON door open	Off open	Off closed	Off closed	Off (0)	Off closed	OFF	OFF	OFF	ON	OFF
ON door closed	Off open	Off closed	Off closed	Off (0)	On open	OFF	OFF	OFF	ON	OFF

4.2. WARM UP

With the door closed, select and activate a sterilization cycle chosen among the 6 available cycles; the door is locked and the WARM UP phase is activated.
During this phase the following components are heated up:
- Chamber by means of the tube bundle heating element.
- Generator by means of the heating element.

The following temperature values are observed:
- Tube bundle heating element > PT3 temperature detection - 135°C (275°F)
- Generator heating element > PT2 temperature detection - 155°C (311°F)
- Chamber inside > PT1 temperature detection - 55°C (131°F)

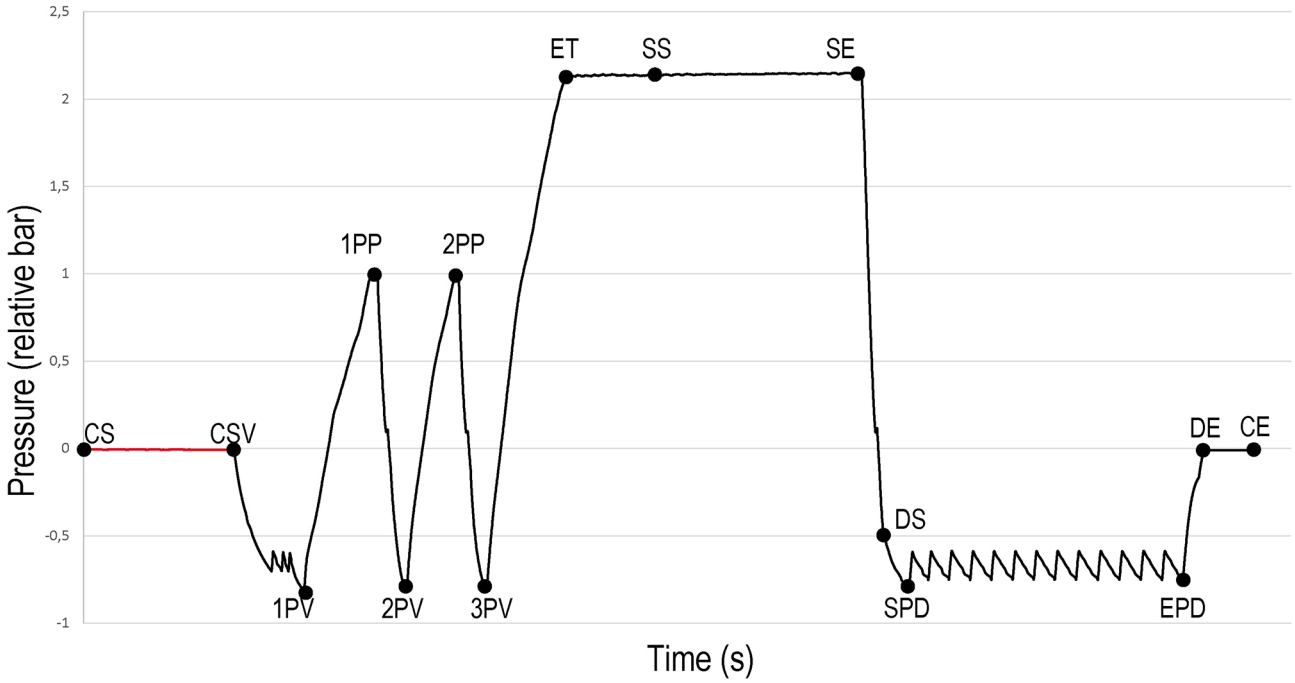
The achievement of the values listed above determines the start of the following phase - 1st VACUUM PHASE.
The WARM UP phase is divided into 2 sections:
- Section 1 active until PT3 temperature is detected= 135°C (275°F)
- Section 2 active until PT2 temperature is detected= 155°C (311°F)

During WARM UP section 2, the following components are activated:
- Vacuum pump
- Solenoid valve EV2 (air inlet)
- Solenoid valve EV4 (vacuum pump deflection)

which allow reaching the full operation of the pump, draining, at the same time, any condensate from the pipes.

WARM UP - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP– EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Section 1	On closed	Off closed	Off closed	Off (0)	On open	OFF	OFF	OFF	ON	ON
Section 2	Off open	On open	Off closed	On (1)	Off closed	ON	OFF	ON	ON	OFF

134° C Program B Cycle - 4 minutes (ROW versions only)	**132°C/270°F Hollow Wrapped Cycle - 4 minutes** (US/CA versions only)
1. CS – Cycle Start 2. CSV – Cycle Start Vacuum 3. 1PV – First Pulse Vacuum 4. 1PP – First Pressure Pulse 5. 2PV – Second Pulse Vacuum 6. 2PP - Second Pressure Pulse 7. 3PV - Third Pulse Vacuum 8. ET – Equilibration Time 9. SS – STERILIZATION Start 10. SE – STERILIZATION End 11. DS – Drying Start 12. SPD – Start Drying Pulse 13. EPD – End Drying Pulse 14. DE – Draining End 15. CE – Cycle End	1. CS – Cycle Start 2. CSV – Cycle Start Vacuum 3. 1PV – First Pulse Vacuum 4. 1PP – First Pressure Pulse 5. 2PV – Second Pulse Vacuum 6. 2PP - Second Pressure Pulse 7. 3PV - Third Pulse Vacuum 8. ET – Equilibration Time 9. SS – STERILIZATION Start 10. SE – STERILIZATION End 11. DS – Drying Start 12. SPD – Start Drying Pulse 13. EPD – End Drying Pulse 14. DE – Draining End 15. CE – Cycle End



4.3. 1st VACUUM PHASE

This phase represents the actual start of the sterilization cycle; with the activation of the vacuum pump it is possible to reach the maximum level of vacuum inside the chamber at - 0.80 bar.
During the whole phase, the chamber tube bundle heating element and the generator heating element are activated to allow for a correct management of the following steam generation.
The 1st VACUUM PHASE must ensure the maximum removal of air from the chamber; during the pressure decrease, steam injections are carried out to achieve this result and improve the elimination of residual air.
Steam injections are managed automatically, based on the pressure value in the chamber, as follows:

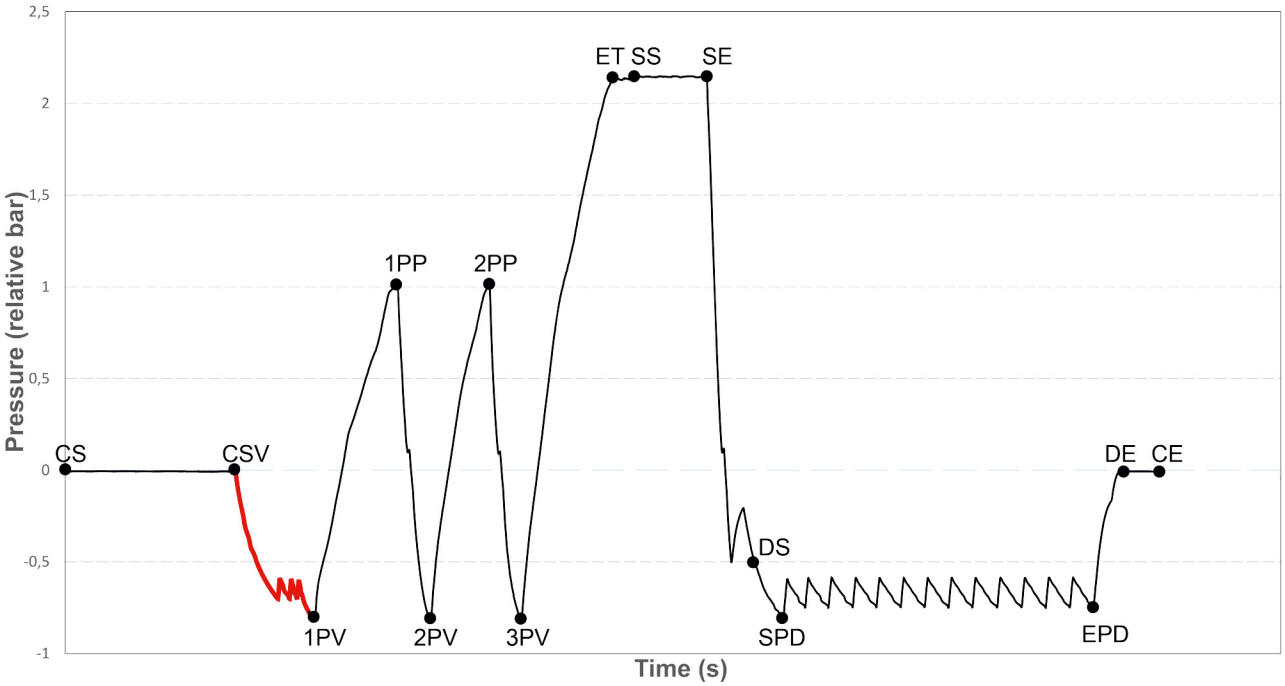
SINGLE VACUUM CYCLE:
- injection activation > chamber pressure detection – 0.40
- injection end > chamber pressure detection – 0.20

FRACTIONATED VACUUM CYCLE:
- injection activation > chamber pressure detection – 0.70
- injection end > chamber pressure detection – 0.60

The sequence is repeated 3 times, with a subsequent pressure decrease until the vacuum level set at - 0.80 bar is achieved; this value determines the start of the following phase - 1st PRESSURE RISE.
The control system allows the managing of any activation of the solenoid valve EV2 (air inlet) and a better operation of the vacuum pump, in particular during the last phase of pressure decrease.

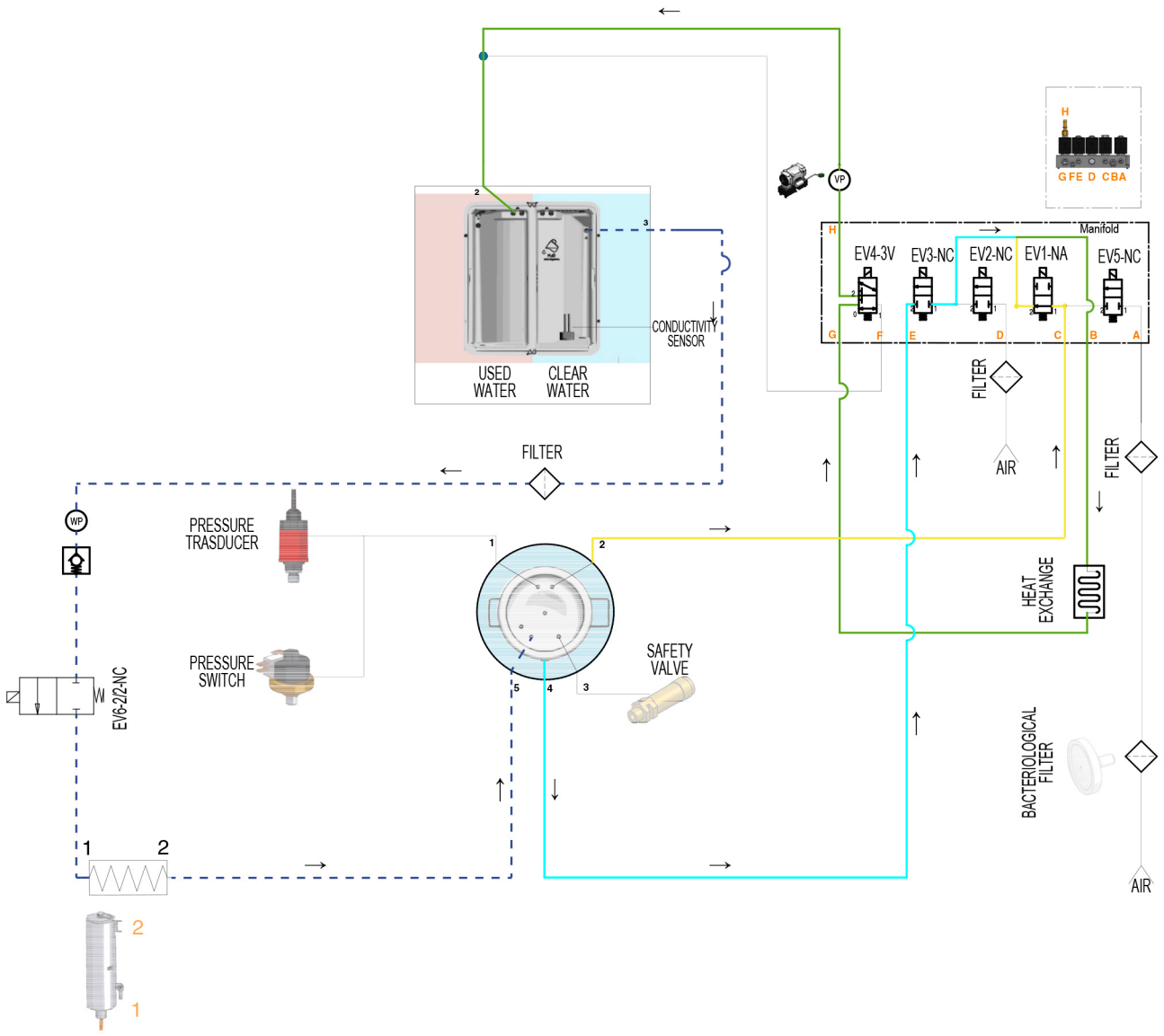
1st VACUUM PHASE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP – EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Hydraulic Circuit pressure compens.	On closed	On open	Off closed	On (1)	Off closed	ON	OFF	ON	ON	OFF
Vacuum decrease	On closed	Off closed	On open	On (1)	Off closed	ON	OFF	ON	ON	ON
Steam injection	Off open	Off closed	Off closed	On (1)	Off closed	ON	ON	ON	ON	ON

134° C Program B Cycle - 4 mins (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins (US/CA versions only)



According to the vacuum pump model present in the autoclave, a specific minimum pressure value is required, that can be achieved during vacuum pulses.

VACUUM PUMP	PMIN [bar]
Model HX10P3	-0.80



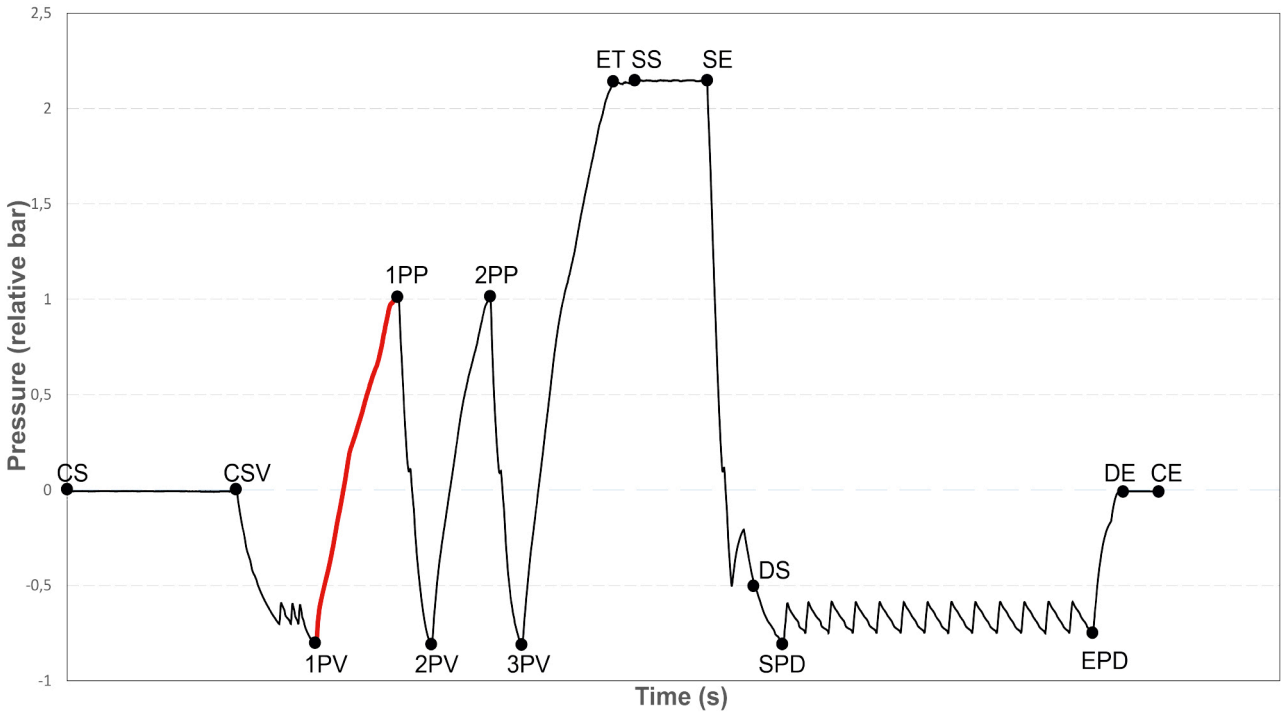
4.4. 1st PRESSURE RISE

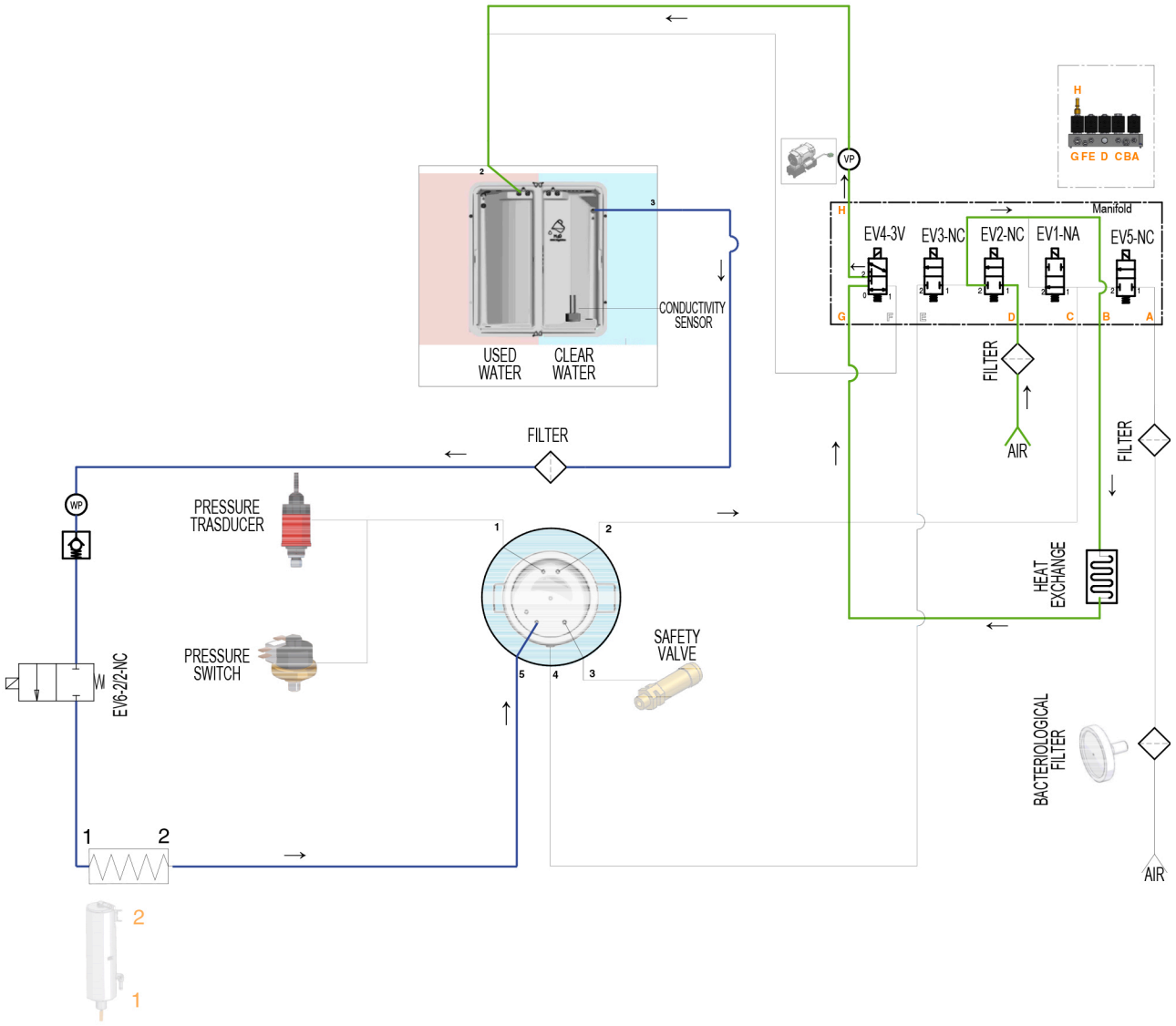
In this phase the steam injection is activated in the chamber, bringing the pressure from the negative value reached during vacuum pulse to 1.00 bar.
The pressure rise is divided into two parts; the first part from - 0.80 bar to 0.00 bar and the second part from 0.00 bar to 1.00 bar.
In the first pressure rise phase, solenoid valve EV2 is activated to compensate for any air pockets that may form inside the hydraulic circuit outside the chamber.
During the whole pressure rise phase, the chamber tube bundle heating element and the generator heating element are activated to ensure that the correct temperature is kept inside the chamber and that steam is quickly generated.

1st PRESSURE RISE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP – EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Part 1 from - 0.80 to 0.00	On closed	On open	Off closed	On (1)	Off closed	ON	ON	OFF	ON	ON
Part 2 from 0.00 to 1.00	On closed	Off closed	Off closed	Off (2)	Off closed	ON	ON	OFF	ON	ON

Once the 1st PRESSURE RISE has been correctly carried out, the sterilization cycle performs two additional VACUUM PHASES with a second PRESSURE RISE in between at 1.00 bar; during this two phases the same negative pressure value required for the 1st VACUUM PHASE is achieved.

134°C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)



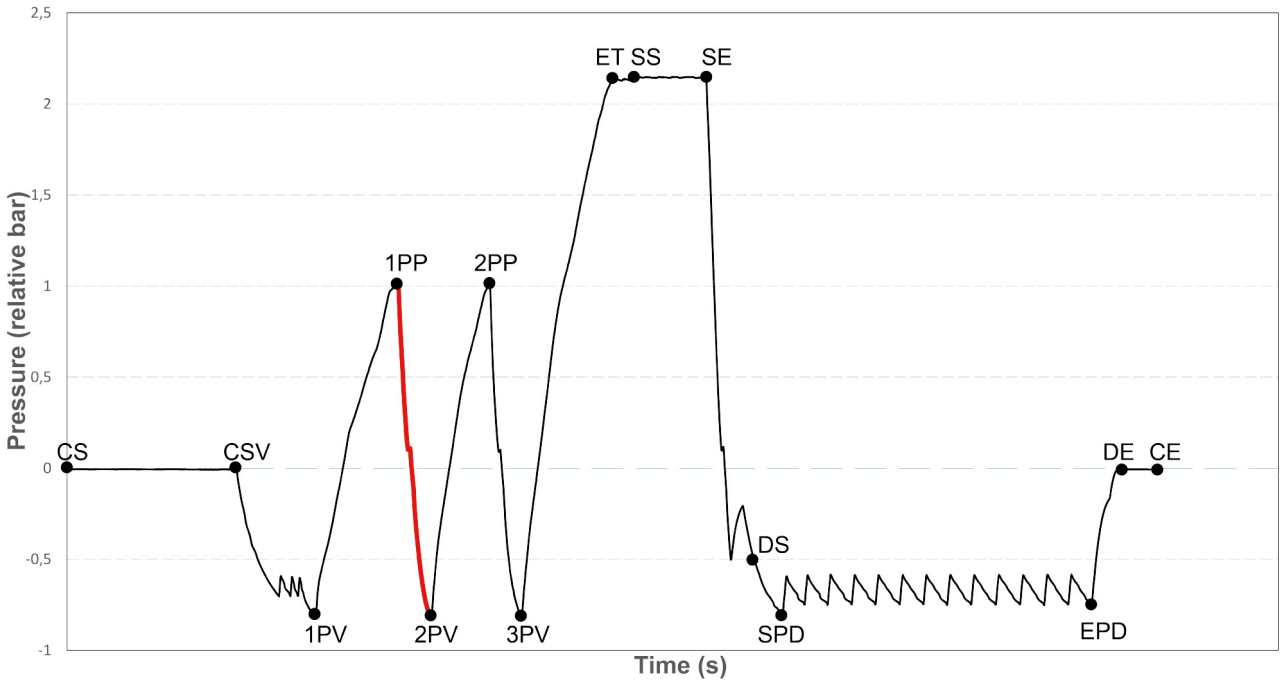

H
G F E D C B A
VP
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
WP
PRESSURE TRASDUCER
HEAT EXCHANGE
PRESSURE SWITCH
SAFETY VALVE
EV6-2/2-NC
BACTERIOLOGICAL FILTER
AIR
1
2
2
1

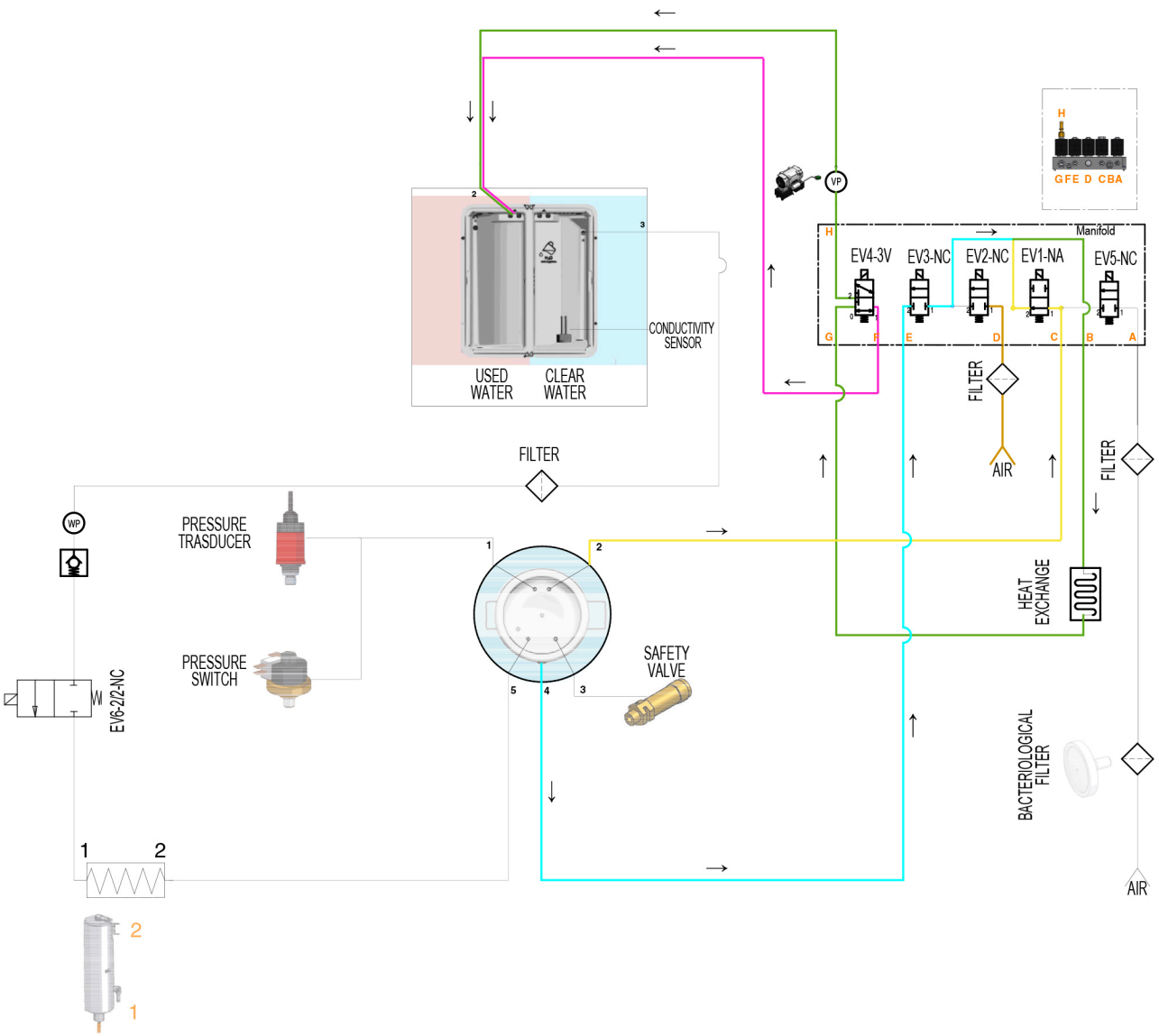
4.5.2nd VACUUM PHASE

This phase of the cycle allows the chamber pressure to drop below the value of 1.00 bar reached during the 1st PRESSURE RISE, by discharging steam through solenoid valve EV1 and draining condensate through the solenoid valve EV3 connected to the chamber filter.
When the value of 0.10 bar is reached, with the activation of solenoid valve EV4, the pressure continues dropping until reaching the value of - 0.80, by means of the vacuum pump, already activated at the beginning of the 2nd VACUUM PHASE.
In order to make it easier to reach the value of - 0.80 bar, solenoid valve EV2 is also activated for 5".

2st VACUUM PHASE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP – EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Hydraulic Circuit pressure compens.	On closed	On open	Off closed	On (1)	Off closed	ON	OFF	ON	ON	OFF
Direct steam drainage	On closed	Off closed	Off closed	Off (2)	Off closed	ON	OFF	ON	ON	ON
Direct condensate drain	On closed	Off closed	On open	Off (2)	Off closed	ON	OFF	ON	ON	ON
Decrease from 0.10 to - 0.80 bar	Off open	Off closed	On open	On (1)	Off closed	ON	OFF	ON	ON	ON

134° C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)



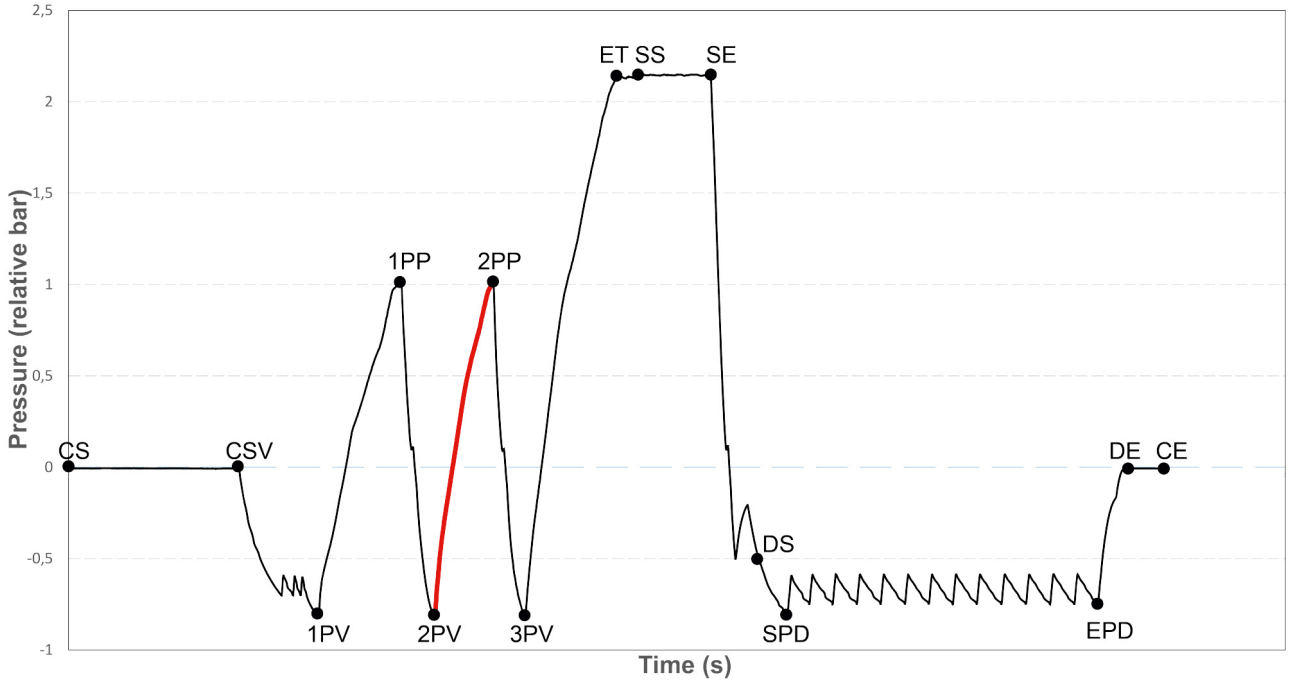

H
GFE D CBA
VP
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
G F E D C B A
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
HEAT EXCHANGE
WP
PRESSURE TRASDUCER
PRESSURE SWITCH
SAFETY VALVE
EV6-2/2-NC
BACTERIOLOGICAL FILTER
AIR
1 2
2
1

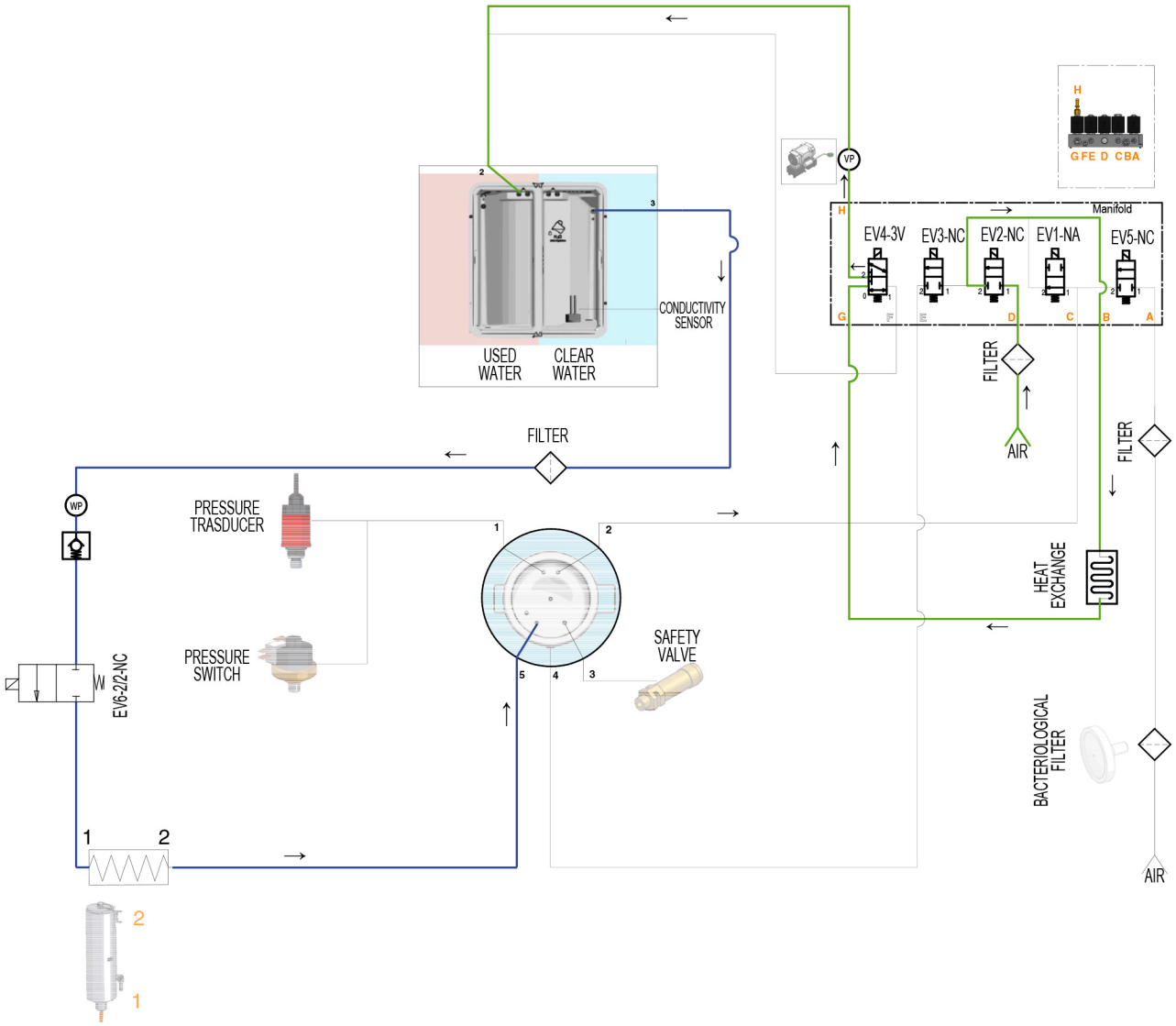
4.6.2nd PRESSURE RISE

This phase is similar to the 1st PRESSURE RISE and brings the pressure from the negative value reached during vacuum pulse to 1.00 bar.
The sequence of vacuum pulses and pressure rises eliminates almost totally the residual air from the sterilization chamber, which is also discharged from any hollow bodies or porous materials belonging to the load.
The elimination of air will allow for an optimal diffusion of steam, ensuring the same temperature in all the areas of the load.

2st PRESSURE RISE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP – EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Part 1 from -0.80 to 0.00	On closed	On open	Off closed	On (1)	Off closed	ON	ON	OFF	ON	ON
Part 2 from 0.00 to 1.00	On closed	Off closed	Off closed	Off (2)	Off closed	ON	ON	OFF	ON	ON

134° C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)



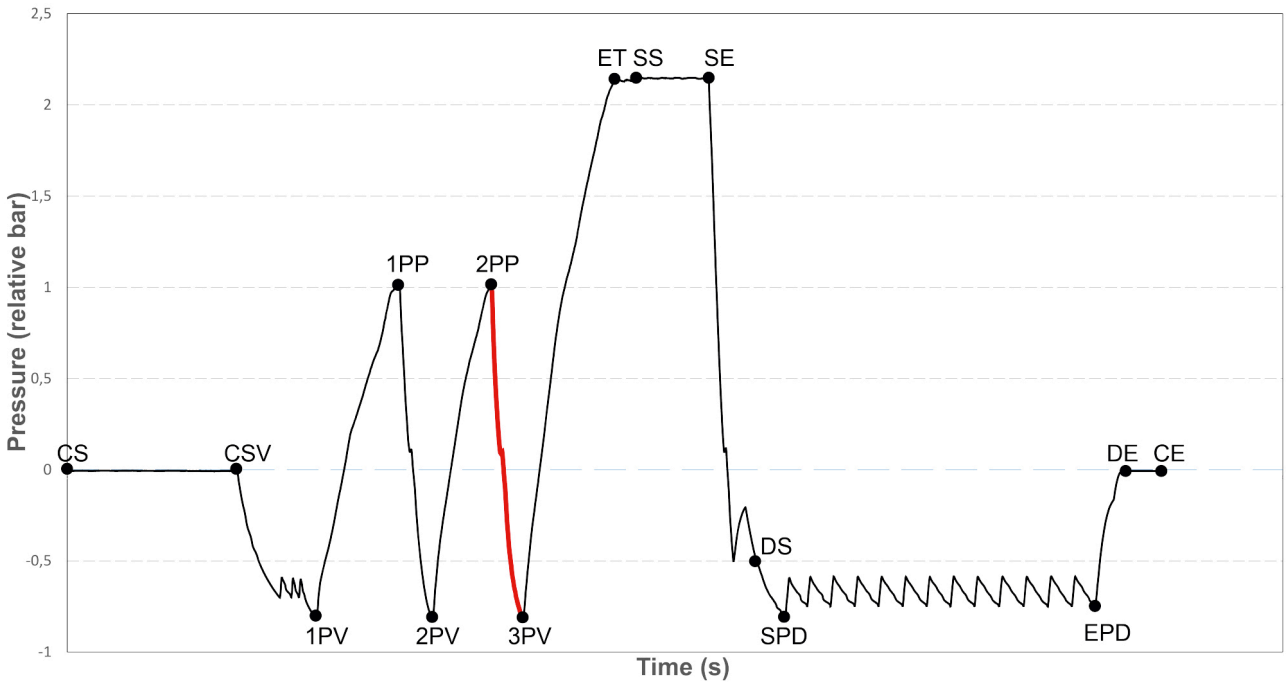

H
G F E D C B A
VP
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
G
D
C
B
A
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
WP
PRESSURE TRASDUCER
PRESSURE SWITCH
EV6-2/2-NC
SAFETY VALVE
HEAT EXCHANGE
BACTERIOLOGICAL FILTER
AIR
1
2
3
4
5

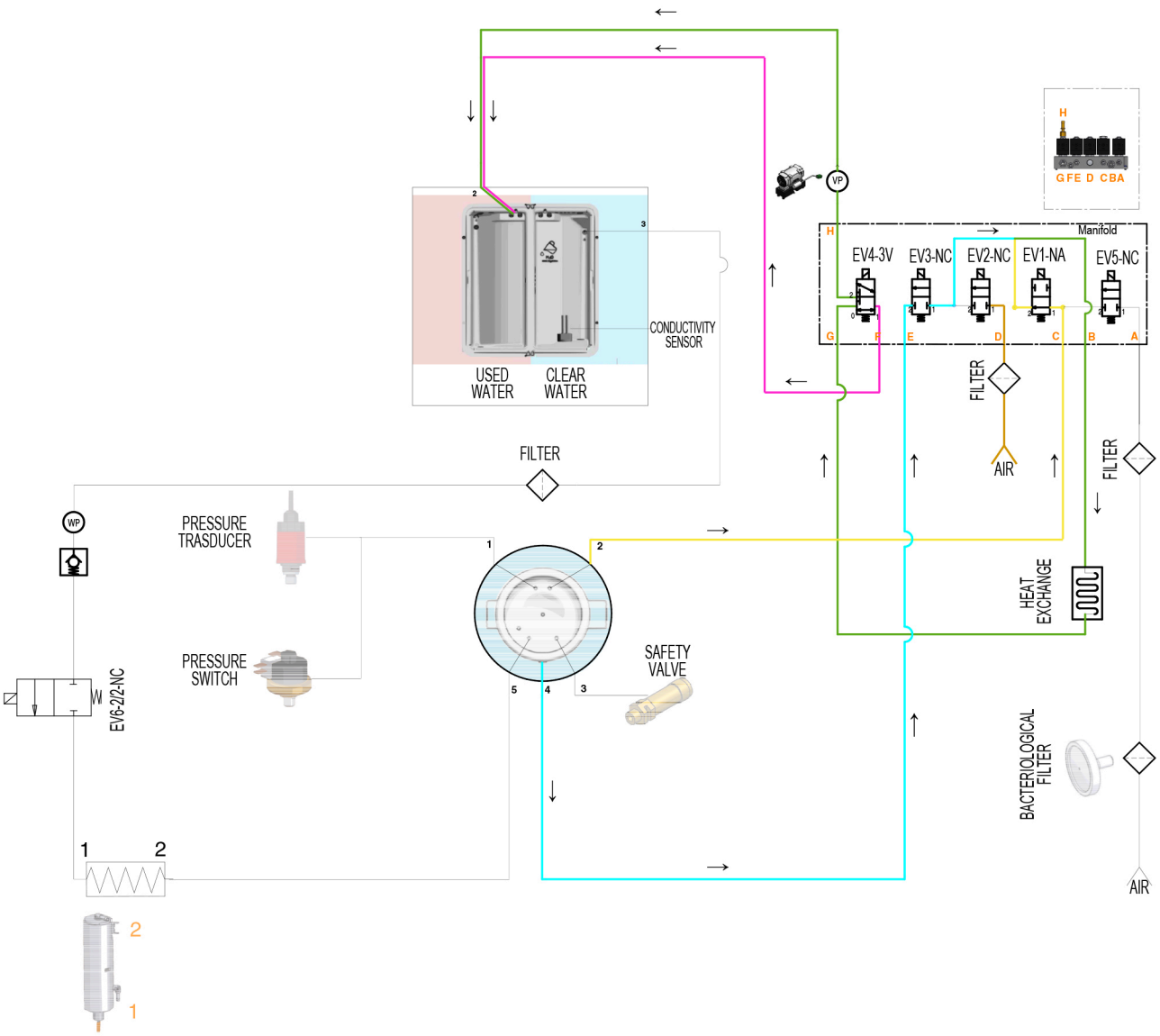
4.7.3rd VACUUM PHASE

This phase, which precedes the PROCESS phase, includes the direct steam and condensate drainage followed by a forced decrease down to - 0.80 by means of the vacuum pump.
In order to make it easier to reach the value of -0.80 bar, solenoid valve EV2 is activated for 5".

3st VACUUM PHASE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP – EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Hydraulic Circuit pressure compens.	On closed	On open	Off closed	On (1)	Off closed	ON	OFF	ON	ON	OFF
Direct steam drainage	On closed	Off closed	Off closed	Off (2)	Off closed	ON	OFF	ON	ON	ON
Direct condensate drain	On closed	Off closed	On open	Off (2)	Off closed	ON	OFF	ON	ON	ON
Decrease from 0.10 to -0.80 bar	Off open	Off closed	On open	On (1)	Off closed	ON	OFF	ON	ON	ON

134°C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)




H
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VP
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
FILTER
WP
PRESSURE TRASDUCER
PRESSURE SWITCH
EV6-2/2-NC
HEAT EXCHANGE
SAFETY VALVE
BACTERIOLOGICAL FILTER
AIR
1
2

4.8. 3rd PRESSURE RISE

Alternating vacuum decreases down to the value of - 0.80 bar with 2 pressure rises up to 1.00 bar ensures that the residual air in the chamber is about 0.06% of the initial total amount.

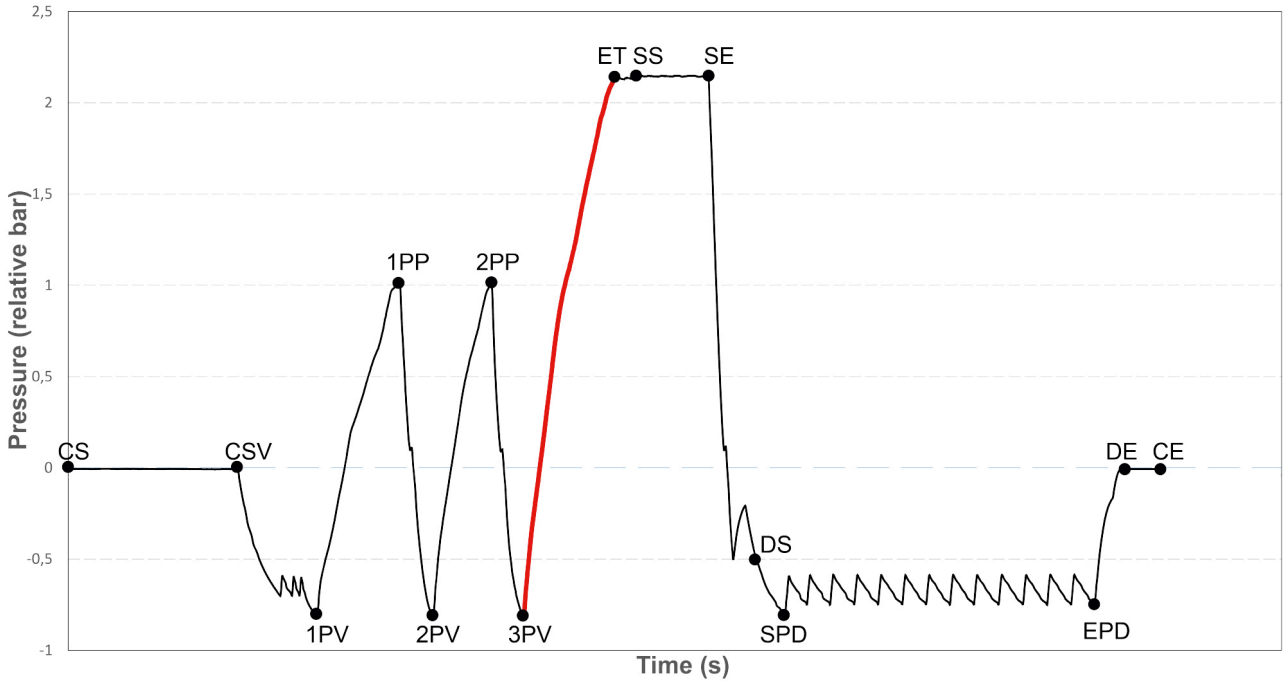
Following the phases indicated above, the 3rd PRESSURE RISE starts, leading to the actual STERILIZATION PROCESS, carried out at:

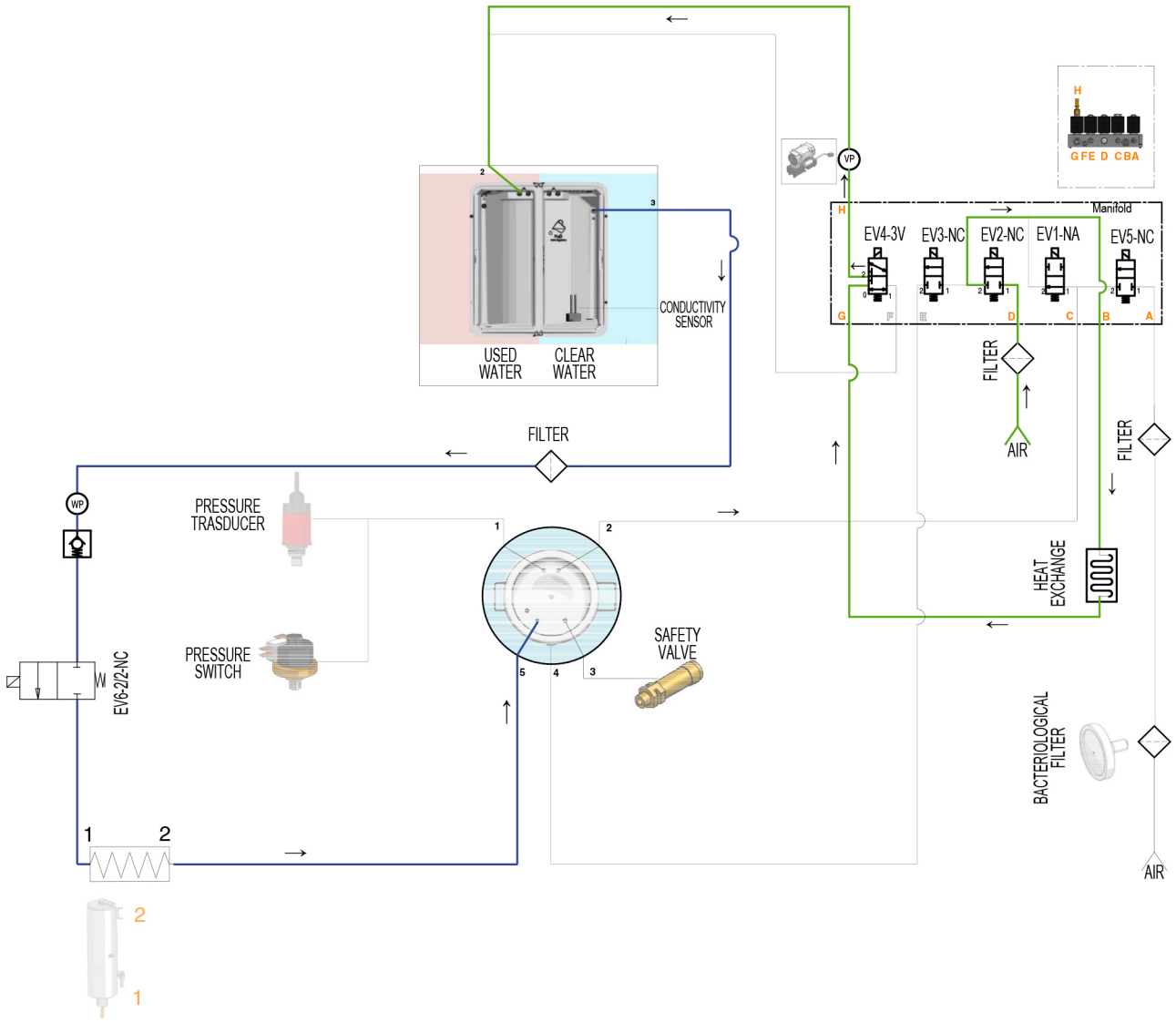
- 134°C/2.15 bar (ROW versions only)
- 132°C (270°F)/2.15 bar (US/CA versions only)
- 121°C(249.8°F)/1.10 bar (ALL versions)

depending on the type of cycle selected.
In this pressure rise phase, the activation conditions of the various components are the same as the previous ones.

3st PRESSURE RISE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP - EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Part 1 from -°0.80 to 0.00	On closed	On open	Off closed	On (1)	Off closed	ON	ON	OFF	ON	ON
Part 2 from 0.00 to 2.14	On closed	Off closed	Off closed	Off (2)	Off closed	ON	ON	OFF	ON	ON

134°C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)





Once the pressure and temperature values set for the selected sterilization cycle have been reached, the 3rd pressure rise ends and the sterilization process starts with the balancing phase.

4.9. STERILIZATION PROCESS

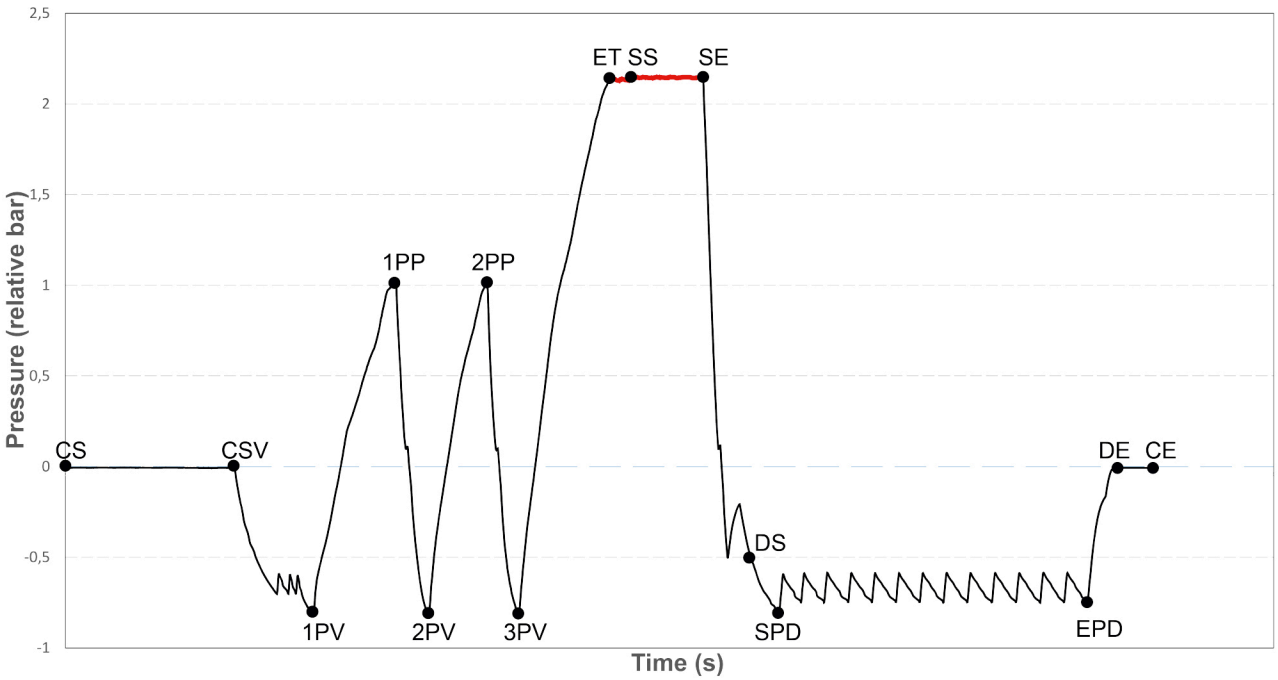
The BALANCING phase lasts approximately 15" and allows stabilising the thermodynamic conditions inside the chamber before starting the actual PROCESS phase.

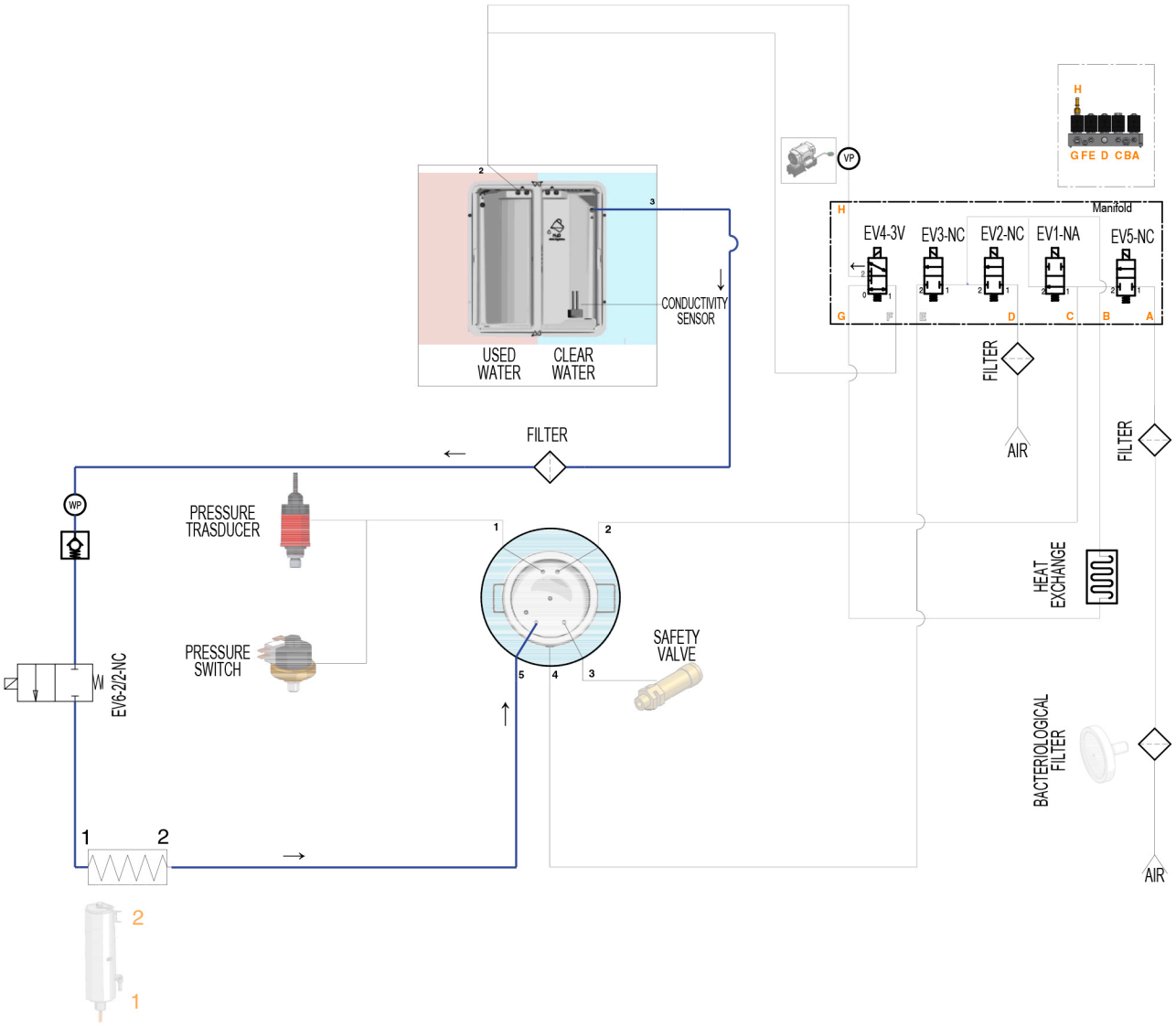
Maximum, normal and minimum pressure values have been defined for each cycle and must be observed with during the BALANCING and PROCESS phases.

Cycle type	Pmax bar	Pnorm bar	Temperature treshold	Pressure treshold
121°C(249,8°F) (ALL versions)	1.14	1.11	122°C(251.6°F)	1.11
134°C (ROW versions only)	2.17	2.14	135°	2.14
132°C/270°F (US/CA versions only)	1.99	1.96	133°C(271.4°F)	1.96

During BALANCING and PROCESS phases the control system, if necessary, ensures that:
- The chamber tube bundle heating element is powered to increase the T value in the chamber.
- EV1 is powered by draining the steam from the chamber if the pressure value exceeds the Pmax permitted value.
- Water injection pump / EV6 is powered by delivering steam to the chamber if the pressure value is below the Pmin permitted value.

134°C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)



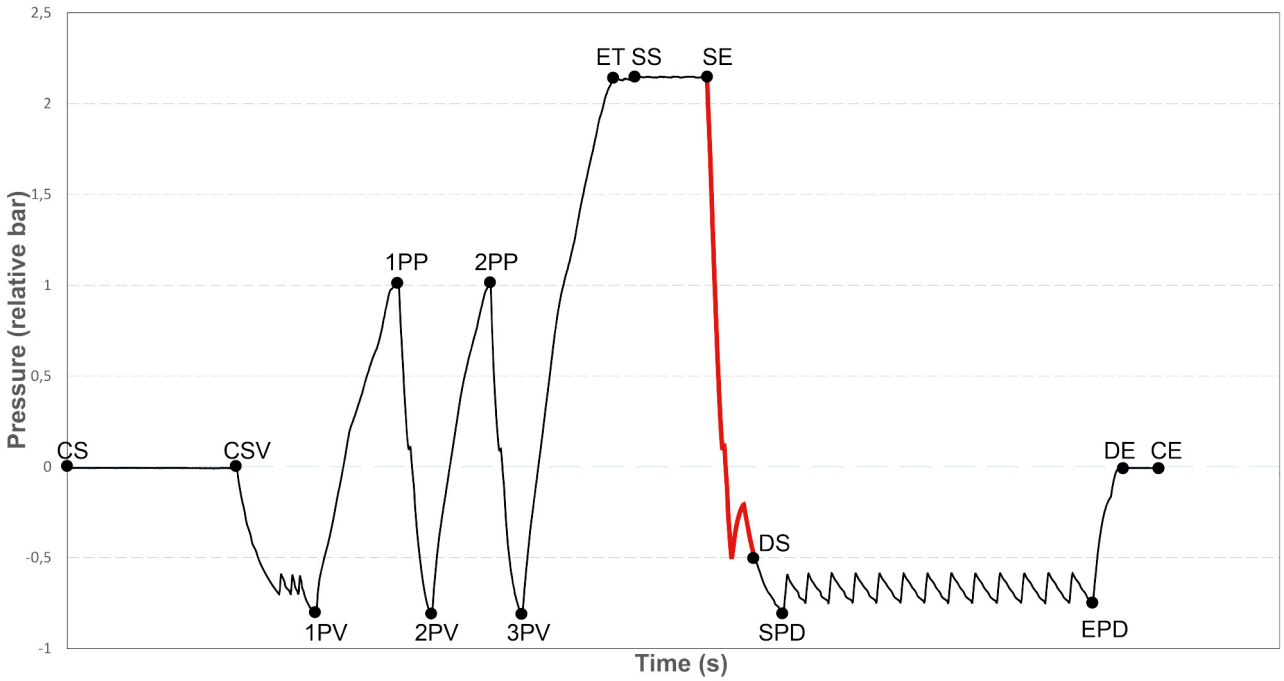

H
G F E D C B A
VP
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
WP
PRESSURE TRASDUCER
HEAT EXCHANGE
PRESSURE SWITCH
SAFETY VALVE
EV6-2/2-NC
BACTERIOLOGICAL FILTER
AIR

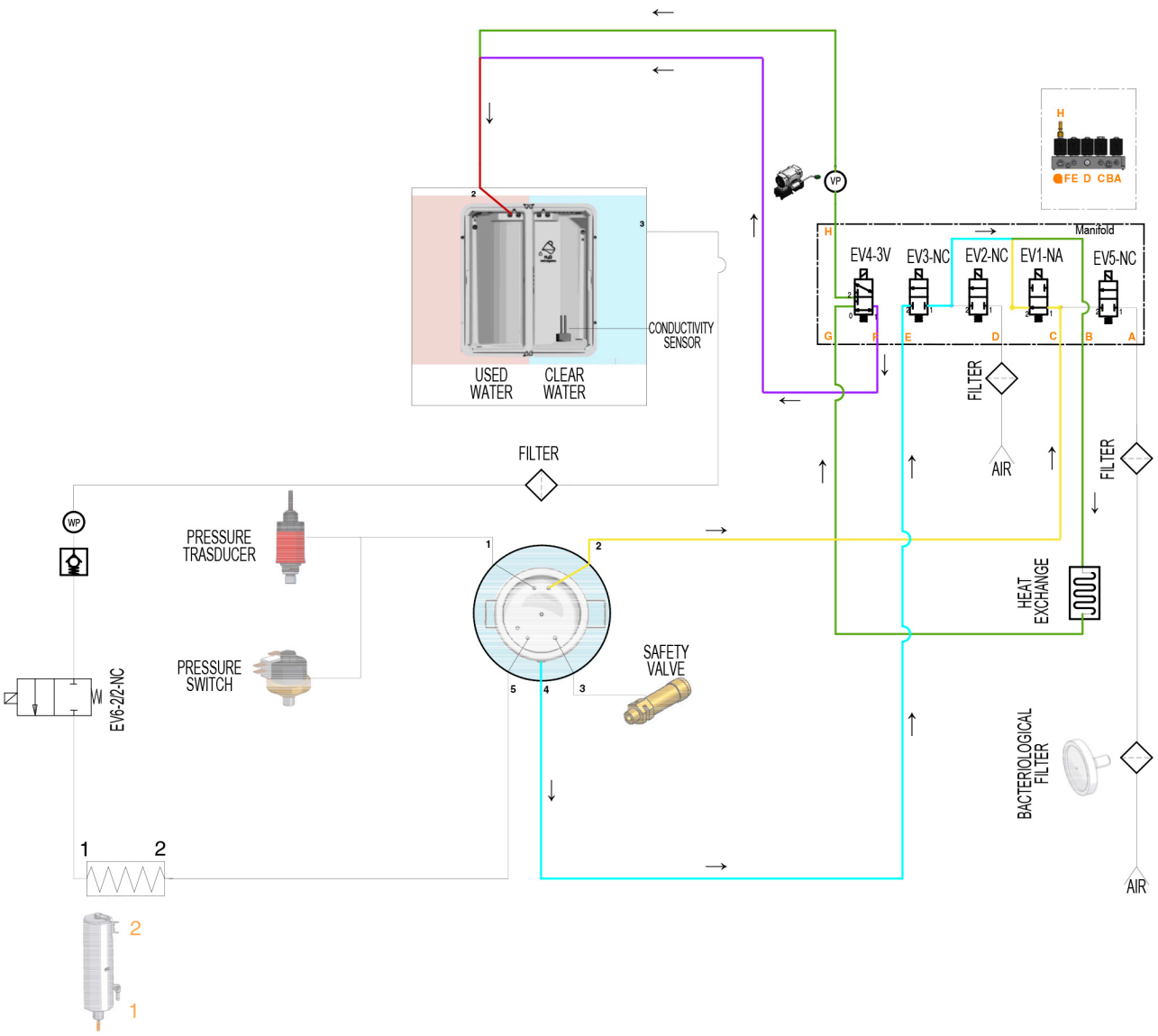
4.10. DISCHARGE

At the end of the PROCESS cycle, the DRAINAGE phase starts to allow draining all the steam present in the chamber, with a vacuum decrease to the value of - 0.80 bar.
As for previous VACUUM DECREASE phases, the DRAINAGE includes a first spontaneous depressurisation that exploits the pressure generated by the steam and that only requires the control of drainage solenoid valves EV1 and EV3.
To complete the DRAINAGE until reaching the value of 0.50 bar, the decrease continues by means of the vacuum pump and the simultaneous activation of solenoid valve EV4.
In this phase, activations of solenoid valve EV2 are required to balance the pressure value inside the hydraulic circuit and facilitate the activation of the vacuum pump.

DRAINAGE - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP - EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Hydraulic Circuit pressure compens.	On closed	On open	Off closed	On (1)	Off closed	ON	OFF	ON	ON	OFF
Direct steam drainage	On closed	Off closed	Off closed	Off (2)	Off closed	ON	OFF	ON	ON	ON
Direct condensate drain	On closed	Off closed	On open	Off (2)	Off closed	ON	OFF	ON	ON	OFF
Decrease from 0.10 to - 0.80 bar	Off open	Off closed	On open	On (1)	Off closed	ON	OFF	ON	ON	OFF

134°C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)



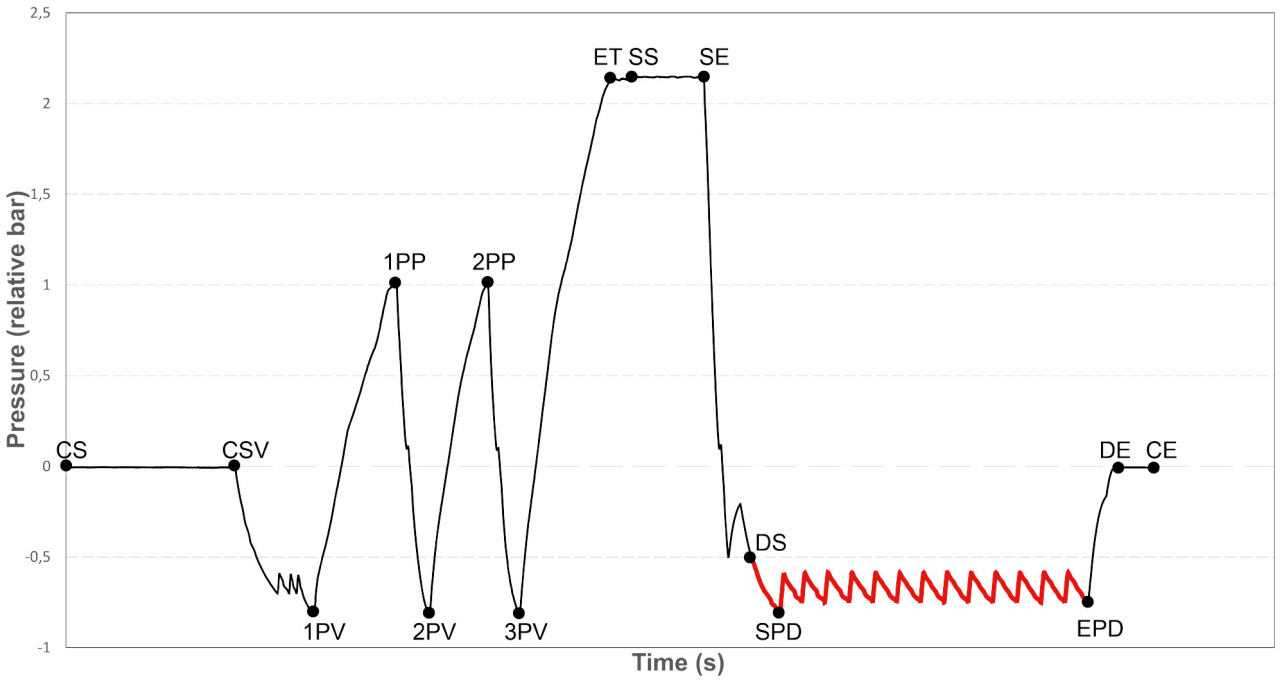

H
FE D CBA
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
G F E D C B A
VP
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
HEAT EXCHANGE
WP
PRESSURE TRASDUCER
PRESSURE SWITCH
EV6-2/2-NC
SAFETY VALVE
BACTERIOLOGICAL FILTER
AIR
1 2
2
1

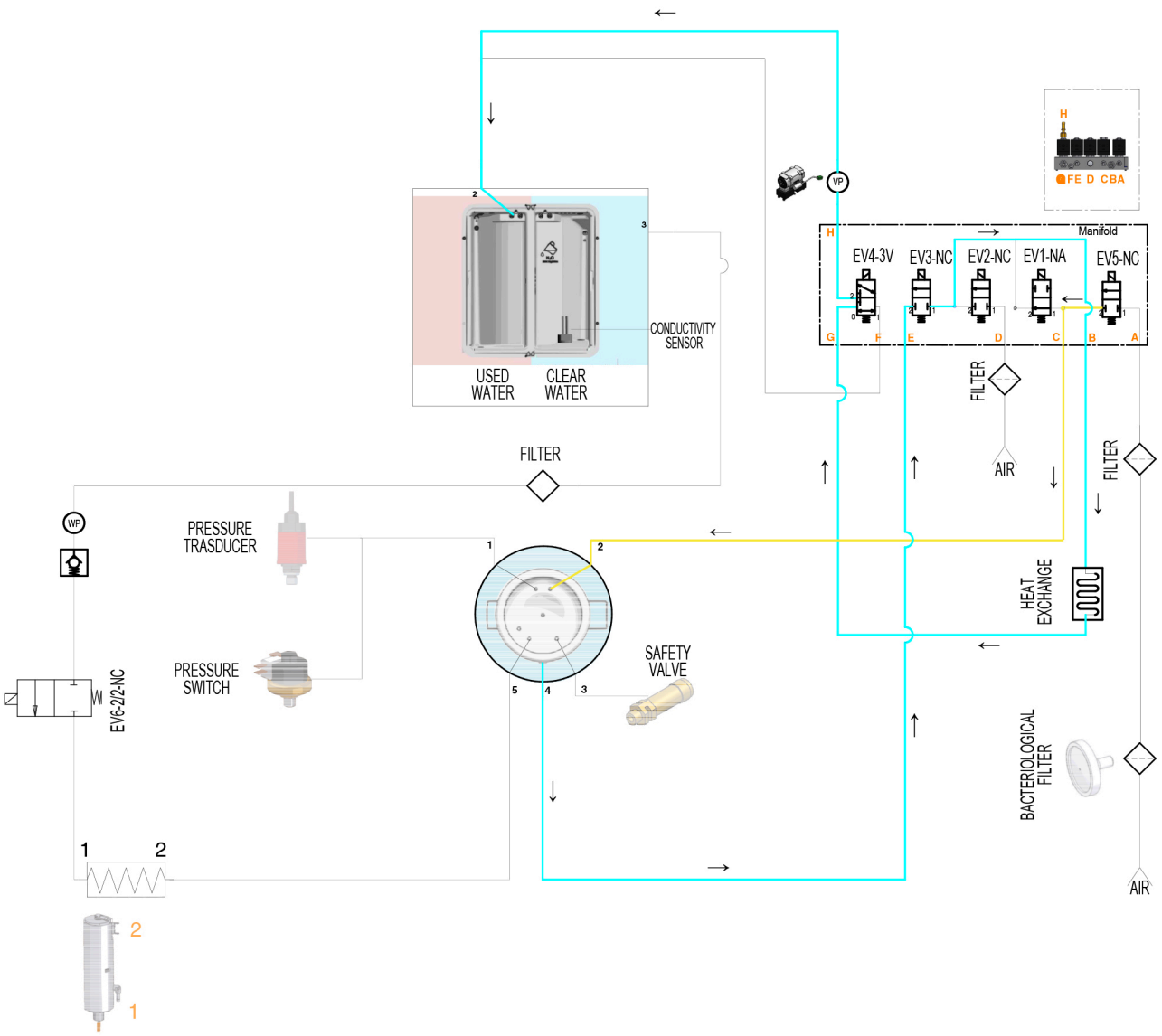
4.11. DRYING

This phase of the sterilization cycle eliminates the residual humidity from the chamber, by completely drying the load. The drying is carried out keeping a negative pressure level inside the chamber and allows the condensate to evaporate at a temperature lower than 100°C (212°F).
During the drying phase, which requires a specific time for each sterilization cycle (e.g.: 12' for 134°C universal cycle) a series of pressure pulses are performed in the chamber, indicatively between - 0.80 bar and 0.60 bar, to improve the removal of the residual steam; the number of pulses performed can vary according to the humidity level in the load.
In the pressure rise phases carried out during pulses, solenoid valve EV5 is activated to allow the air to flow inside the chamber through the bacteriological filter; this air flow helps remove steam.

DRYING - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP - EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING	GENERATOR HEATING ELEMENT
Pressure decrease	On closed	Off closed	On open	On (1)	Off closed	ON	OFF	ON	ON	OFF
Pressure rise with air	On closed	Off closed	On open	On (1)	On open	ON	OFF	ON	ON	OFF

134°C B Cycle - 4 mins. (ROW versions only)
132°C/270°F Hollow Wrapped Cycle - 4 mins. (US/CA versions only)





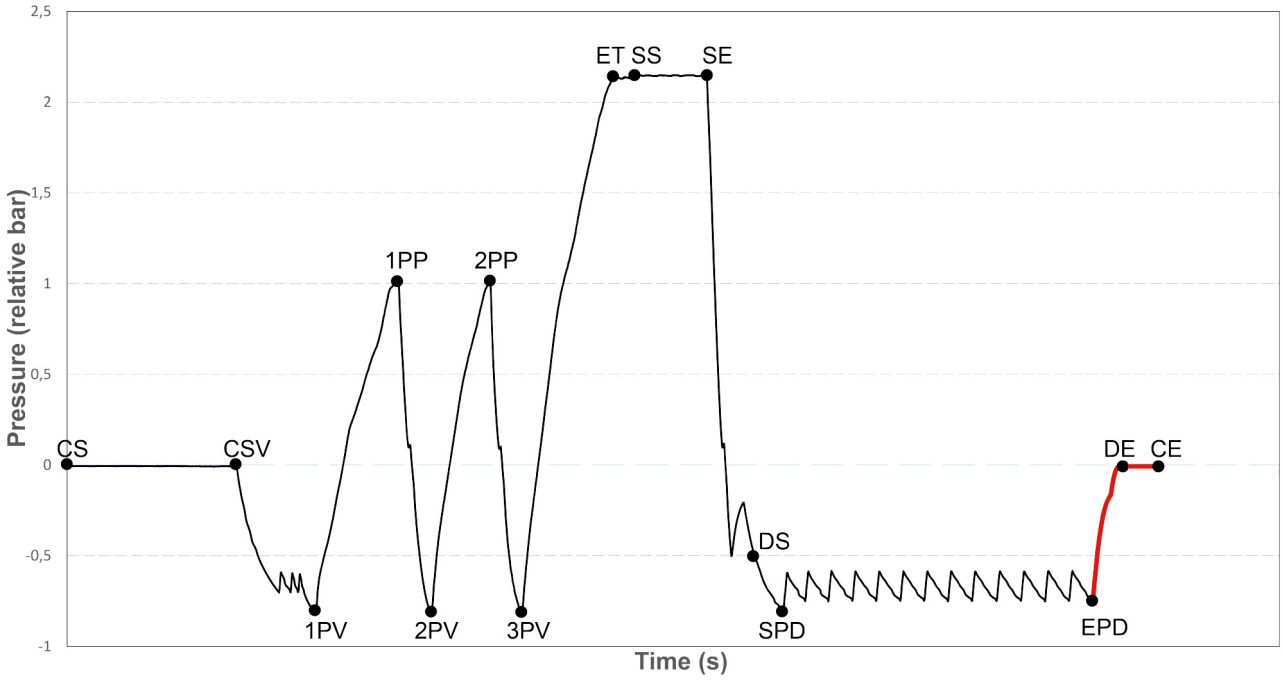
The LEVELLING phase starts at the end of the standard drying time, and at the end of any additional drying time that can be set by the user.

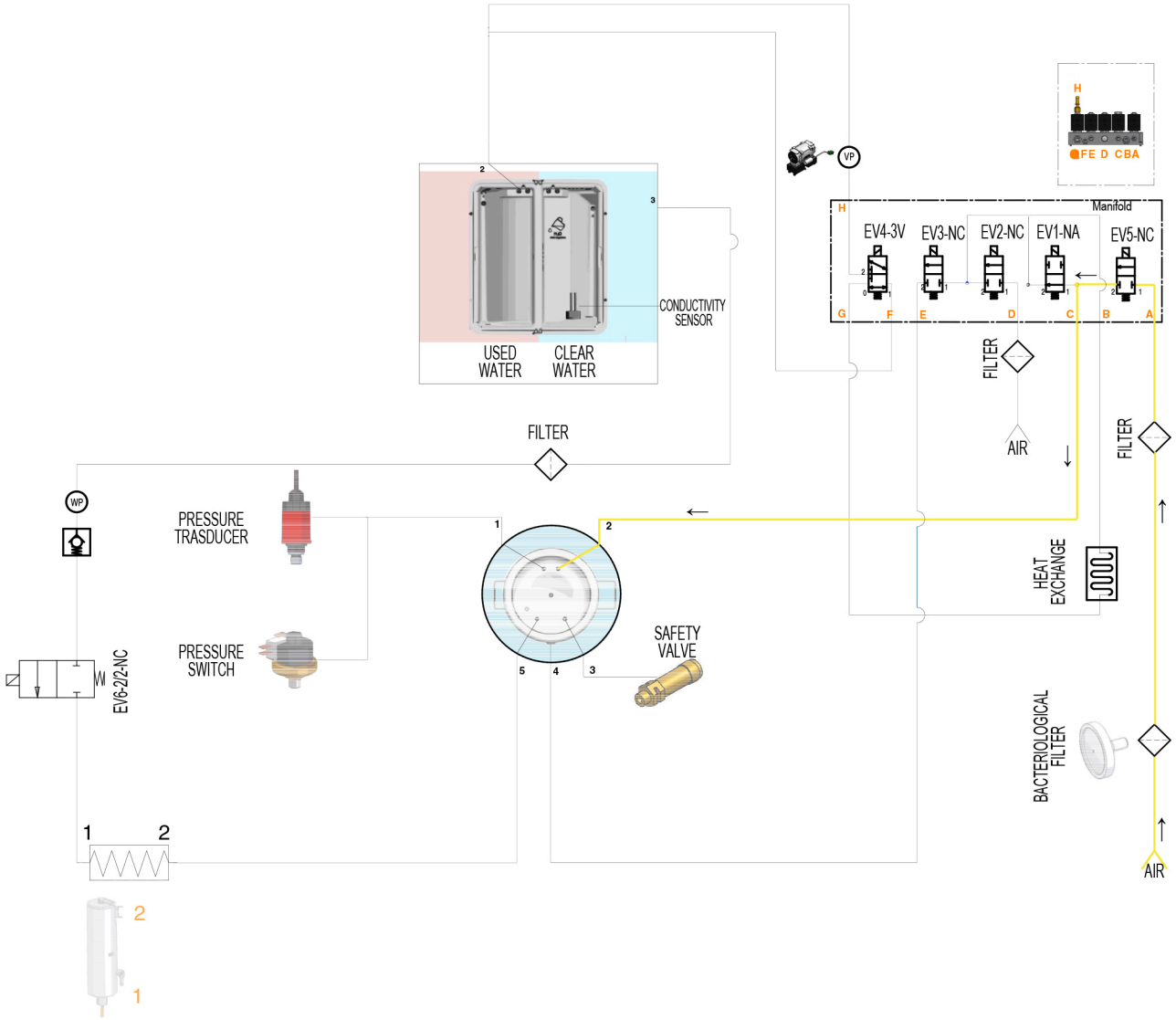
4.12. PRESSURE LEVELLING

With the PRESSURE LEVELLING phase, the ambient pressure is levelled, which is an essential condition to determine the end of the cycle and allow opening of the door.
The values of chamber pressure and ambient pressure are balanced by making air flow into the chamber for 60", through the bacteriological filter/EV5, without suction.

LEVELLING - component activation status										
STATUS	EV1 High drain (N.O.)	EV2 Air inlet (N.C.)	EV3 Low drain (N.C.)	EV4 Drain deflector (3V)	EV5 Chamber air inlet (N.C.)	FAN	WATER PUMP - EV6	VACUUM PUMP	CHAMBER TUBE BUNDLE HEATING ELEMENT	GENERATOR HEATING ELEMENT
Pressure rise with air	Off open	Off closed	Off closed	Off (2)	On open	ON	OFF	OFF	ON	OFF

Once the pressure value of - 0.03 bar is reached in the chamber, the CYCLE END phase starts, properly signalled on the display.
Only at this point the user can activate the door opening command.

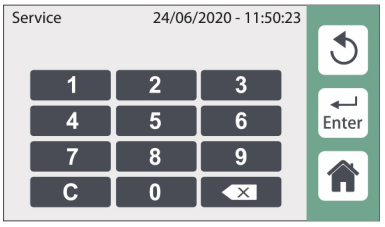


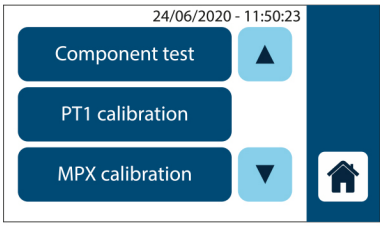

H
FE D CBA
VP
Manifold
EV4-3V
EV3-NC
EV2-NC
EV1-NA
EV5-NC
G F E D C B A
CONDUCTIVITY SENSOR
USED WATER
CLEAR WATER
FILTER
AIR
FILTER
WP
PRESSURE TRASDUCER
PRESSURE SWITCH
EV6-2/2-NC
SAFETY VALVE
HEAT EXCHANGE
BACTERIOLOGICAL FILTER
AIR
1 2
2
1

5. SERVICE MENU

SEQUENCE	"TOUCH SCREEN" LCD CONTROL PANEL
COMMANDS - just select the desired command.	

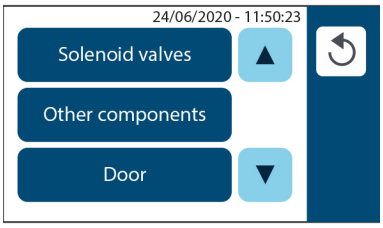
SQ1 - ACCESSING THE SERVICE MENU	
From the home screen, select the gear icon and then the SERVICE menu.	

SQ2 – ENTER PIN	
Enter the PIN 7242 and confirm with ENTER. PIN can't be modified.	

SQ3 – SERVICE MENU	
The SERVICE menu offers the following options: - Component test - PT1 probe calibration - MPX calibration - Display calibration - Test cycles - Initial settings - User management - Enter REF - Enter SN - Report management - Water loading times - Service reset - Backup message - 134° sterilization (ROW versions only) - Extended drying - Service customisation - Counter recovery - Viewed cycles	

SQ4 - COMPONENT TEST

Select **COMPONENT TEST** to display a vertical scroll menu with the following options:
- Solenoid valves
- Other components
- Door
- Water
- Safety valve test



SQ5 - SOLENOID VALVES

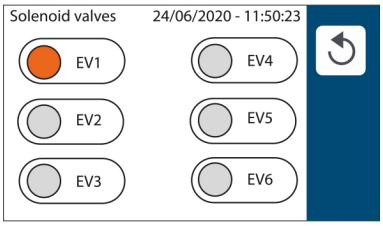
Select **SOLENOID VALVES** to display the status of the 6 solenoid valves, which are indicated with:

solenoid valve open

solenoid valve closed

It is possible to check the opening/closing of individual solenoid valves.

Several elements can be turned on at the same time to check specific sections of the autoclave hydraulic circuit.

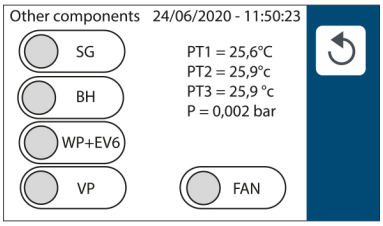


SQ6 - OTHER COMPONENTS

Select the **OTHER COMPONENTS** menu to display the following components:
- BH – chamber tube bundle heating element
- SG – generator heating element
- VP – vacuum pump
- WP & EV6 – water injection pump, solenoid valve EV6
- FAN – heat exchanger fans

The following values are also displayed:
- PT1 – chamber temperature
- PT2 – steam generator temperature
- PT3 – chamber tube bundle heating element temperature
- P – chamber pressure

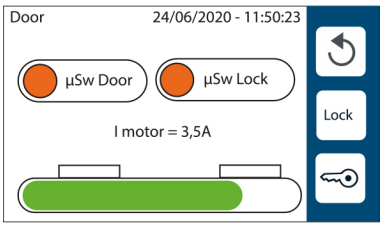
The status of each component that can be activated/deactivated is detected.
The BH-tube bundle heating element activation is indicated by the increase in the PT3 value.
The SG-generator heating element activation is indicated by the increase in the PT2 value.
A safety timeout is provided for the BH and SG functions, so that the component are turned off after 120 seconds.



SQ7 – DOOR

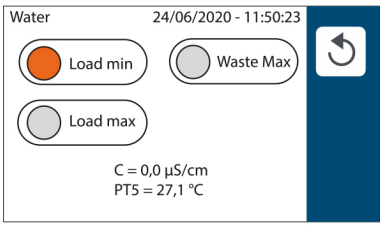
From the **DOOR** menu, you can establish:
- The door status (closed/locked).
- The status of the closing system microswitches.
- The values of the current absorbed by the motor during the different door closing phases.

The door can be manually unlocked, locked and fully opened.
During the door closing and locking phases, the variations of the I motor parameter are displayed in the digital bar at the bottom of the DOOR screen.



SQ8 – WATER

The operation of the level sensors located inside the tanks can be checked in the **TANK MANAGEMENT** section.
Lifting a sensor, the relevant box lights up.
C indicates water conductivity value.
PT5 indicates the clear water temperature. PT5 probe integrated on water quality sensor

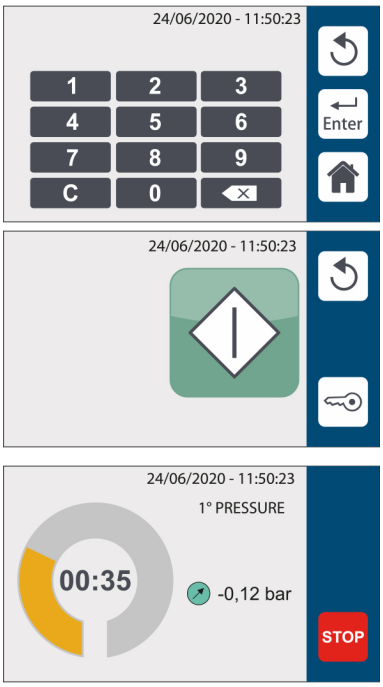


SQ9 – SAFETY VALVE TEST

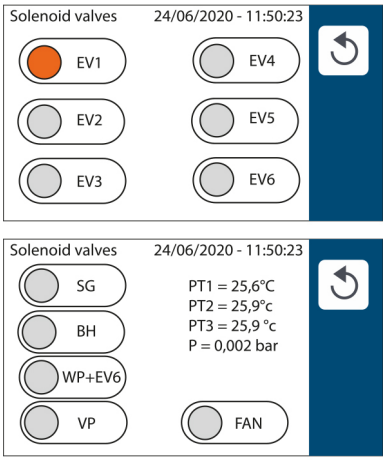
The **SAFETY VALVE TEST** allows checking the safety valve sealing by means of a cycle bringing the chamber pressure over 2,64 bar.
The test does not provide a result regarding safety valve opening.
The operator who runs the test has to check the correct operation of the valve, as in case of any other component in the Component Test menu.
The safety valve can open suddenly and remain open (for some seconds) causing a significant steam outflow or it opens intermittently, causing only a light blow. In both cases, the valve operates correctly, since it prevents an anomalous chamber pressure rise.

The access to Safety Valve test requires a specific PIN. Contact customerservice@scican.com to receive the Safety Valve test PIN.
The test ends with the opening of the safety valve or at a max pressure value of 2,80 bar. It's not possible to run more than one test in sequence.

Completed the test, the display shows the maximum chamber pressure value, reached when safety valve open.

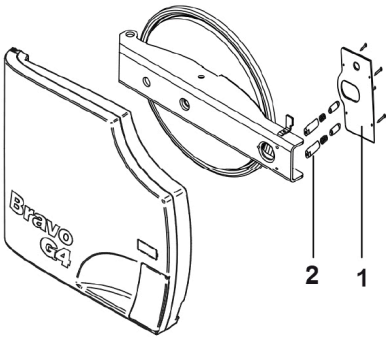


5.1. COMPONENT TEST – FUNCTIONAL CHECKS ON SOLENOID VALVES/OTHER COMPONENTS

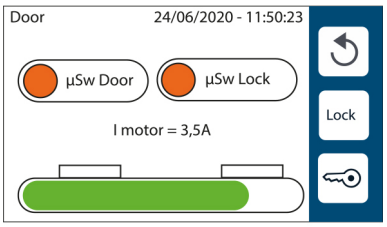
SQ10 – COMPONENTS TEST	
The following menus can be used: - SOLENOID VALVES - OTHER COMPONENTS This menu is used to test individual component or to activate and test several components at the same time to check the different functions that are supposed to be performed during a sterilization cycle. To activate several components available in the two menus at the same time, you may toggle between the two menus using the command  which changes between menus while retaining the previously selected commands.	

SQ11 – CHECK EV5 FOR PROPER CLOSING

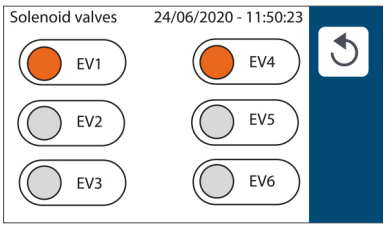
Remove steel plate (**1**) to separate the door cover from the crossbar/porthole unit
- Be careful with the spring/cylinder units (**2**).
- Close the door.
- Access the SERVICE menu.
- Select COMPONENT TEST.



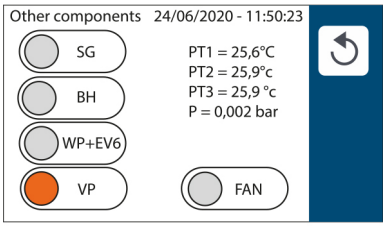
From DOOR menu:
- Lock the door.



From SOLENOID VALVES menu:
- Open EV1 and EV4.
- Close the other solenoid valves, if open.



From OTHER COMPONENTS menu
- Activate VP – vacuum pump.

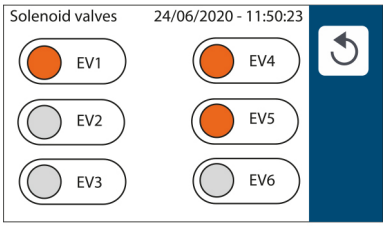


Then, back to the SOLENOID VALVES menu.

With EV5 closed, (not activated), there should be no air suction from the middle of the bacteriological filter.

With EV5 open, (activated), there should be air suction from the middle of the bacteriological filter.

Deactivate the components after completing the test.



SQ12 – CHECK EV1/EV3 FOR PROPER CLOSING

- Close the door.

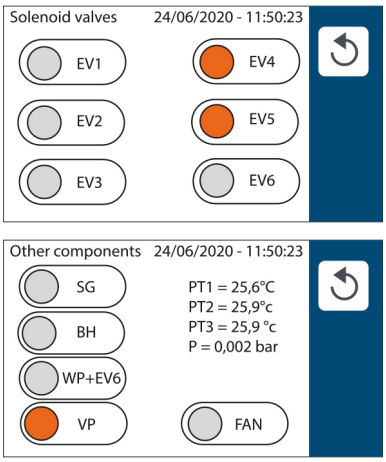
From SOLENOID VALVES menu:
- Close EV1.
- Open EV4.

Go to the OTHER COMPONENTS menu then:
- Take note of the reading “P” of chamber pressure.
- Activate VP – vacuum pump.

If EV1/EV3 are closing properly, chamber pressure value “**P**” will not change.

With the door open, proper closing of EV1/EV3 is confirmed when there is no suction from:
- Steam outlet, top/rear section of chamber for EV1.
- Chamber filter coupling for EV3.

Deactivate the components after completing the test.



SQ13 – CHECK FOR EV1 OPENING

- Close the door.

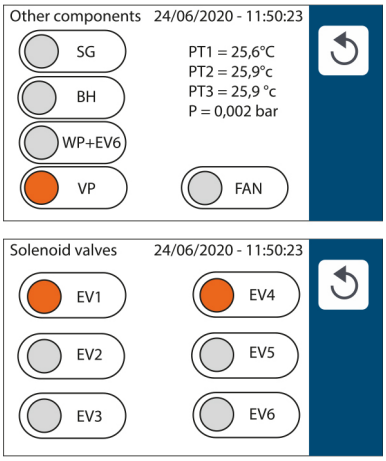
From SOLENOID VALVES menu:
- Open EV1 and EV4.
- Close EV3.

Go to the OTHER COMPONENTS menu, then:
- Take note of the reading “P” of chamber pressure.
- Activate VP – vacuum pump.

If EV1 is open (powered off), chamber pressure value “**P**” will decrease.

With the door open, EV1 opening can be confirmed by checking the effect of suction from the steam outlet, top/rear section of chamber.

Deactivate the components after completing the test.



SQ14 – CHECK FOR EV3 OPENING

- Close the door.

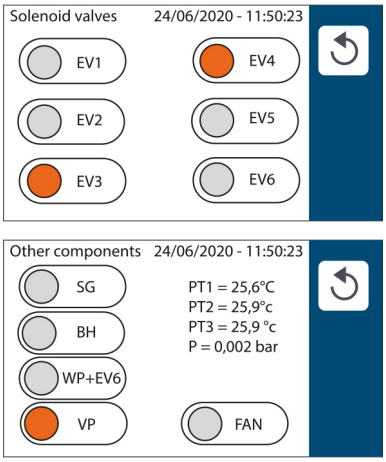
From SOLENOID VALVES menu:
- Close EV1.
- Open EV3 and EV4.

Go to the OTHER COMPONENTS menu, then:
- Take note of the reading “**P**” of chamber pressure.
- Activate VP – vacuum pump.

If EV3 is open (powered on), chamber pressure value “**P**” will decrease.

With the door open, EV3 opening can be confirmed by checking the effect of suction from the chamber filter coupling.

Deactivate the components after completing the test.



SQ15 – CHECK FOR EV2 OPENING

- Close the door.

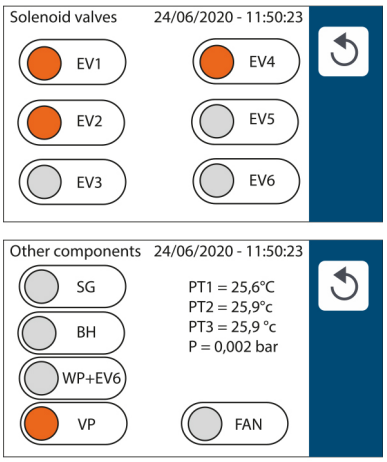
From SOLENOID VALVES menu:
- Open EV1, EV2 and EV4.

Go to the OTHER COMPONENTS menu:
- Take note of the reading "**P**" of chamber pressure.
- Activate VP – vacuum pump.

With EV2 open, chamber pressure value "**P**" will decrease and stabilize at around 0.035/0.040 bar, and will not drop further.

Test example:
- Chamber pressure reading 0.000 bar.
- Activate VP – vacuum pump.
- Chamber pressure reading of – 0.038 bar confirms that EV2 opened correctly.

Deactivate the components after completing the test.



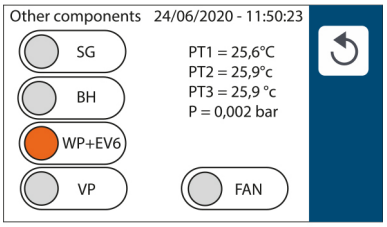
SQ16 – CHECK FOR WATER INJECTION PUMP/EV6 ACTIVATION

- Open the door.

From the OTHER COMPONENTS menu:
- Activate WP/EV6.
- Check that water is supplied to chamber properly.

Perform test only if PT2 - steam generator temperature is lower than 70°C (158°F).

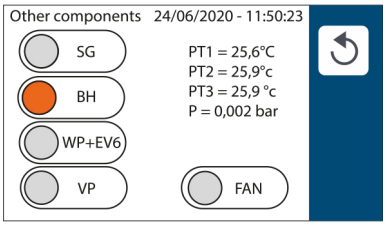
Deactivate the components after completing the test.



SQ17 - CHECK FOR TUBE BUNDLE HEATING ELEMENT ACTIVATION

From the OTHER COMPONENTS menu:
- Activate "BH - chamber tube bundle heating element".

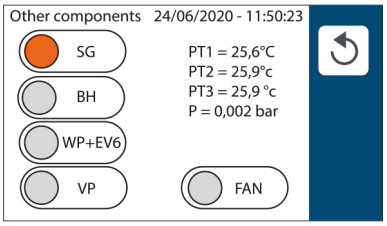
Proper activation is indicated by parameter PT3 – chamber tube bundle heating element temperature increasing.



SQ18 - CHECK FOR GENERATOR HEATING ELEMENT ACTIVATION

From the OTHER COMPONENTS menu:
- Activate "SG - generator heating element".

Proper activation is indicated by parameter PT2 – steam generator heating element temperature increasing.



SQ19 - CHECK FOR DOOR MICROSWITCH ACTIVATION

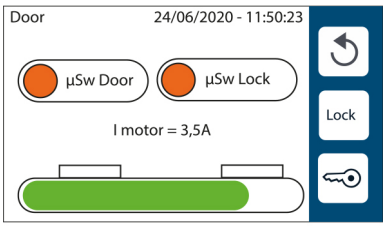
From DOOR menu:
- Manually press the actuator pin of the door checking the activation of µSw door indicator.
- Close the door and detect the activation of µSw door indicator and of µSw lock indicator.

For both microswitches, the indication

Shows microswitch closed/enabling signal active.
After closing, the I motor indicator should display 1.4/1.8 A.

- With command LOCK activate the door lock.
  After locking, the I motor indicator should display 3.4/3.8 A.
- With command LOCK it is possible to unlock the door, moving it to the closing position, keeping the 2 microswitches activated.
- With command it is possible to open the door unlocking the 2 microswitches.'

With the door open, **µSw door** and **µSw lock** must be disabled, with **I motor indicator = 0.5A- 0.7A.**

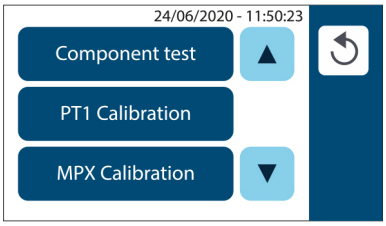


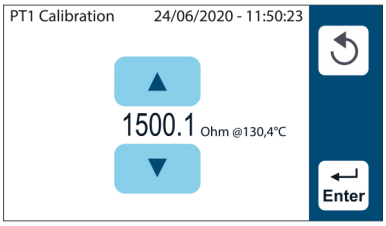
SQ20 – PT1 PROBE CALIBRATION

Selecting PT1 CALIBRATION displays the check/edit screen for the typical reading of PT1 probe at 130.4°C (266.72°F).
This value is indicated directly on PT1 probe.

If the PT1 probe is replaced, proceed as follows:
- Note typical reading of new probe.
- Activate setup system by pressing OK.
- Change reading using + / - as required.
- Press OK/ENTER to confirm.

The system allows a maximum variation range of +/- 10 ohm with respect to a nominal reading of 1500 ohm at 130.4°C (266.72°F).





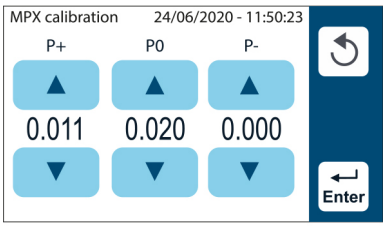
SQ21 – MPX CALIBRATION

Select PRESSURE SENSOR CALIBRATION to correct any differences between the pressure value displayed and the pressure measured with a reference pressure gauge.

The three counters displayed can be modified and represent:
- P+ pressure value correction at + 2.10 bar.
- P0 pressure value correction at 0.00 bar.
- P- pressure value correction at – 0.80 bar.

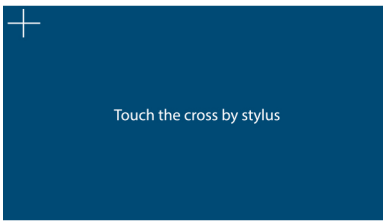
In order to determine whether the pressure value displayed is accurate, you will need to connect the device to an external gauge, allowing a comparison with the displayed pressure values.

The displayed value can be changed in 0.001 bar steps.



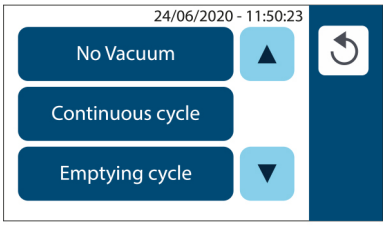
SQ22 – DISPLAY CALIBRATION

With the tip of a pen, press on the central part of each cross to calibrate the display.



SQ23 – TEST CYCLES

Select TEST CYCLES to display a vertical scroll menu with the following options:
- No vacuum
- Continuous cycle
- Emptying cycle

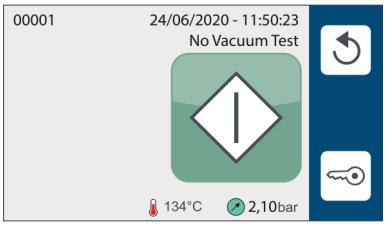


SQ24 – NO VACUUM (ROW version only)

Select NO VACUUM to display the 134°C S cycle start-up screen.

With the command indicated on the left, you can activate the cycle, which will be performed without the pre-vacuum phase.

After the heating phase, the pressure rise is performed to achieve the process values of 134°/2.10bar, a condition that will be maintained for 4'. This special cycle, which has no alarms, is designed to detect any steam leaks from chamber, door, generator and connected tubes.

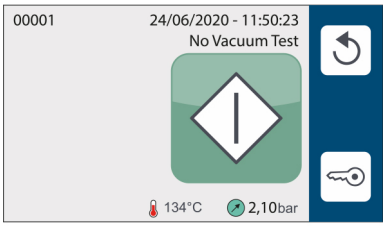


SQ24.1 – NO VACUUM (US/CA versions only)

Select NO VACUUM to display the 132°C (270°F) Solid wrapped cycle start-up screen.

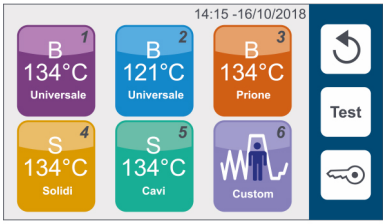
With the command indicated on the left, you can activate the cycle, which will be performed without the pre-vacuum phase.

After the heating phase, the pressure rise is performed to achieve the process values of 132°C(270°F)/1.90bar, a condition that will be maintained for 4 mins.
This special cycle, which has no alarms, is designed to detect any steam leaks from chamber, door, generator and connected tubes.



SQ25 – CONTINUOUS CYCLE (ROW versions only)

Select CONTINUOUS CYCLE to display the STERILIZATION cycle selection screen.
Select and activate one of the cycles to run it and repeat it automatically with a 5 minutes pause between subsequent cycles.
The same procedure can be applied to the TEST cycles

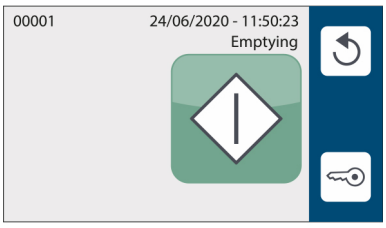


SQ25.1 – CONTINUOS CYCLE (US/CA versions only)

Select CONTINUOUS CYCLE to display the STERILIZATION cycle selection screen.
Select and activate one of the cycles to run it and repeat it automatically with a 5 minutes pause between subsequent cycles.
The same procedure can be applied to the TEST cycles

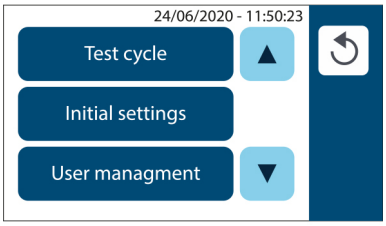
SQ26 – EMPTYING CYCLE

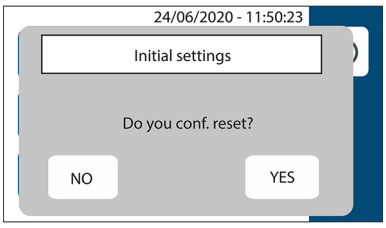
Select EMPTYING CYCLE to eliminate any residual water from the circuit.



SQ27 - INITIAL SETTINGS

CAUTION
Confirming the reset will delete any custom settings for use and all data and cycles.
The set language will not be changed.





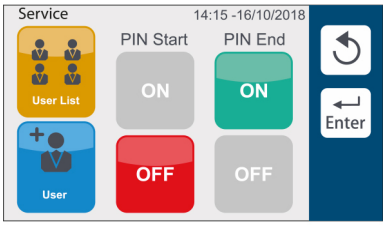
SQ28 – USER MANAGEMENT

Select USER MANAGEMENT to display the user list management screen, normally used by the dental surgery's personnel.

The login password is not requested to users, including the administrator, when operating from the SERVICE/USER MANAGEMENT menu.

It is possible to apply modifications, delete users, add users, change authorisations.

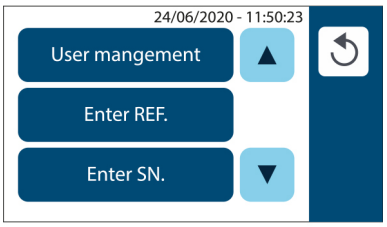
CAUTION
The changes made, if confirmed, cancel the previous configuration.

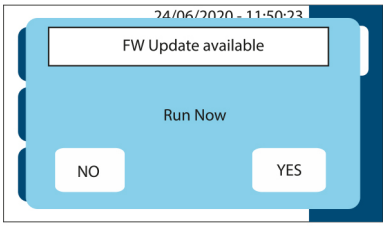


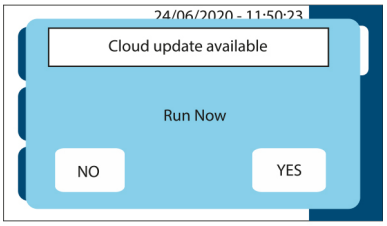
SQ29 – ENTER REF

The ENTER REF function lets you enter the product code specific to each individual model.
This code is stored at the factory and **needs only to be re-entered after the PCB has been replaced**, according to the following procedure.

- With device ON, home screen, plug a USB key pre-loaded with FW, original version or later one. Make sure of the correct USB detection, confirmed by 2 beeps.
- Confirm NO to Update FW request and Cloud update request. Display back to ENTER REF.





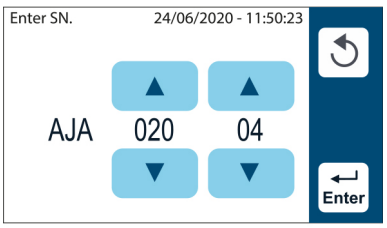


- From ENTER REF screen, select the correct product code, among the proposed one's, by means of the scrolling control buttons, screen side. The product code is reported on ID label, on the rear panel confirm the product code, remove the USB key when required. The device restarts automatically.

SQ30 – ENTER SN

Function ENTER SN lets you store the unique serial number of each individual autoclave.
The serial number is stored at the factory using the three counters displayed.

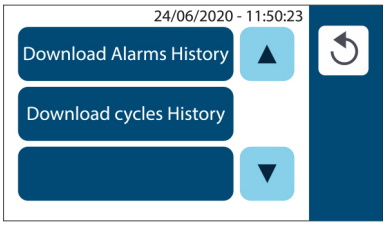
The first three digits, unique to each model, are automatically assigned when product code is entered (see REF INPUT).



SQ31 – REPORT MANAGEMENT

This function allows:

- **Downloading alarms history**: .csv file (compatible with Excel) containing information about the alarms generated by the autoclave.
- **Downloading cycles history**: .csv file (compatible with Excel) containing information about all cycles performed by the autoclave.



SQ32 – WATER LOADING TIMES

The time settings for the water filling can be set automatically or manually.

AUTOMATIC SETTING:
With empty tank, click on START to activate the automatic water filling. The device detects the time necessary to reach the minimum level (alarm time) and the time required to reach the maximum level. At the end of the procedure, the display shows the new values.
Press ENTER and reconfirm the new values.

MANUAL SETTING:
The technician must manually set the filling time and the alarm time, by means of the counters.
Press ENTER to confirm.

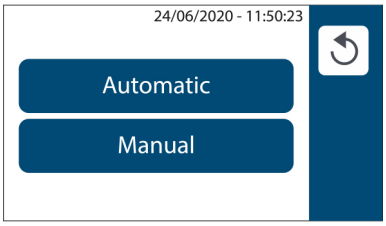
Pre-set times are as follows:

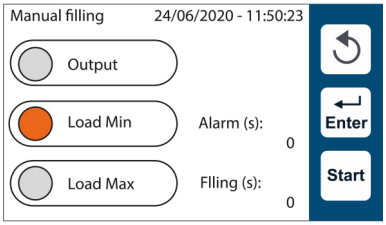
External Pump Option:
- Alarm Time: 170 seconds
- Filling Time: 150 seconds

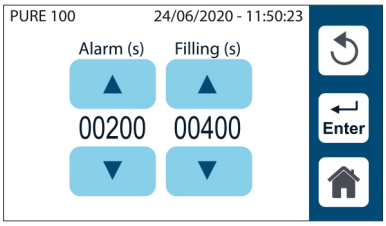
Pure 100 Option: (ROW versions only)
- Alarm Time: 1000 seconds
- Filling Time: 500 seconds

Pure 500 Option: (ROW versions only)
- Alarm Time: 2500 seconds
- Filling Time: 900 seconds

Ev Aux Option:
- Alarm Time: 1000 seconds
- Filling Time: 1000 seconds

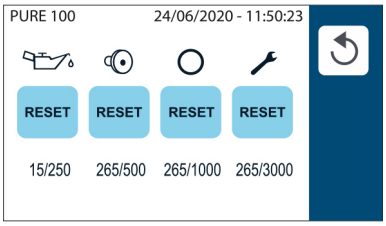






SQ33 – SERVICE RESET

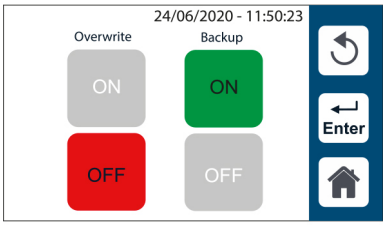
It allows resetting the counters of the intervals of the maintenance messages.
It must be used when a maintenance operation is performed in advance.



SQ34 - BACKUP MESSAGE

Select BACKUP MESSAGE to display a screen where it is possible to select whether to activate/deactivate backup and overwrite messages.
In particular, the backup message warns the user to run a backup every 250 cycles.
The overwrite message warns the user that the oldest data will be overwritten.
The values can be modified by:
- Changing the value (ON/OFF).
- Pressing ENTER to confirm.

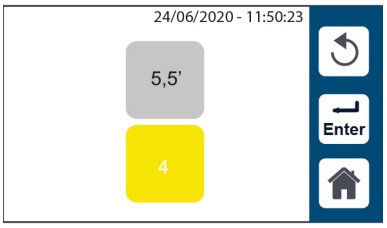
The user may reset the BACKUP and OVERWRITE messages by downloading the cycles using the NEW option.



SQ35 - 134° C STERILIZATION TIME (ROW versions only)

Select 134° STERILIZATION TIME to display a screen where it is possible to select the sterilization time between 4 and 5.5 minutes.
This option is valid only for sterilization cycles performed at 134°C, except for Prion cycle.
Confirm this selection with ENTER.

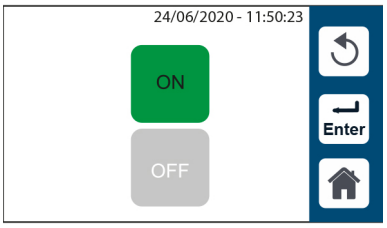
NOTE: screen not available for US/CA versions.



SQ36 – EXTENDED DRYING

Select EXTENDED DRYING to enable/disable an improved drying function, adding 10' to pre-set drying for all sterilization cycles.

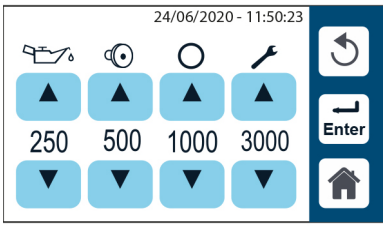
The EXTENDED DRYING can be enabled/disabled:
- Changing the value (ON/OFF).
- Pressing ENTER to confirm.



SQ37 – SERVICE CUSTOMISATION

This function allows displaying four counters with the values stored at the factory, corresponding to the following maintenance operations:
- Closing system lubrication.
- Bacteriological filter replacement.
- Door seal replacement.
- Scheduled maintenance.

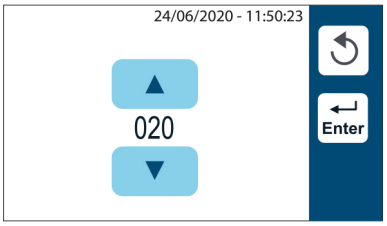
The values can be modified, lowering only the original values, confirming the new values with ENTER.



SQ38 – COUNTER RECOVERY

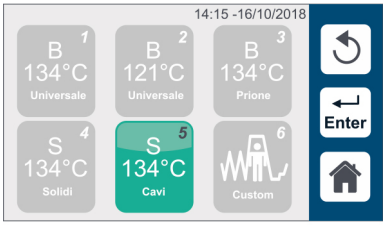
In case of main electronic board replacement, COUNTER RECOVERY allows to set the cycle counter to the total number of already performed cycles.
CYCLE RECOVERY is active only with cycle counter at 0000.

To set cycle counter:
- Select the cycle number by means of the arrows.
- Press ENTER to confirm.



SQ39 – VIEWED CYCLES (ROW versions only)

VIEWED CYCLES allows disabling one or more cycles, among those available in the autoclave.
Press the cycle icon to disable it, confirm the selection pressing ENTER.
When a cycle is disabled from VIEWED CYCLE menu, the relevant icon is no longer displayed on main cycle menu.



SQ39.1 – VIEWED CYCLES (US/CA versions only)

VIEWED CYCLES allows disabling one or more cycles, among those available in the autoclave.
Press the cycle icon to disable it, confirm the selection pressing ENTER.
When a cycle is disabled from VIEWED CYCLE menu, the relevant icon is no longer displayed on main cycle menu.

6. ERROR/WARNING-ALARM-HAZARD-SYSTEM ERROR

6.1. CODE "E" ERROR/WARNINGS

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E000 **POWER OUTAGE CONTACT TECH. SERVICE**	Blackout	A power voltage failure occurred.	Once the power is back, follow the indications on the display to open the door. Reset the alarm and repeat the sterilization cycle.	**2**
		Autoclave accidentally turned off with the main switch.	Turn the autoclave on again and follow the indications on the display to open the door. Reset the alarm and repeat the sterilization cycle.	
		Autoclave accidentally turned off due to the disconnection of the power cable from the power socket.	Reconnect the power cable properly and follow the indications on the display to open the door. Reset the alarm and repeat the sterilization cycle.	
		Alarm shown at every start-up.	Check that the operator has properly reset the alarm and give advices on its correct use.	
		Problem with fuse holders.	Check the mains 16 A fuse continuity with tester. Replace the blown fuse with one having the same rate. Turn the autoclave on again and follow the indications on the display to open the door.	
		Check the plug of the fuse holder.	Make sure that the plug is not excessively tightened. Tighten the plug correctly by slightly loosening it.	
		Problem with the power cable - cable check.	If the cable is damaged, replace it.	
E001 **OVERVOLTAGE CONTACT TECH. SERVICE**	Overvoltage	Supply voltage value beyond limits - check supply voltage.	Disconnect the power cable and check the mains voltage. The value must be within the rated voltage limits +/- 10%. If it exceeds the limits, do not connect the autoclave and check the power mains.	**1**
		Excessive voltage value at transformer output - check output voltage.	Disconnect the wiring at transformer output and check voltage. The value must not exceed 34V. Replace the transformer.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E002 **INSUFFICIENT H_2O QUALITY**	H_2O conductivity above 20 uS/cm (manual filling).	Use of poor quality demineralized water - check label data.	Empty the filling tank and fill it with demineralized water falling within the limit of 15 µS.	**1**
		Conductivity sensor problem.	Check that the water in the tank has an appropriate conductivity using an external sensor. Empty the filling tank, replace the conductivity sensor and fill it with demineralized water falling within the limit of 15 µS.	
E003 **QUALITY H_2O BAD CHANGE WATER**	H_2O conductivity above 60 uS/cm (manual filling). NOTE: IN THESE CONDITIONS, THE DEVICE ALLOWS STARTING UP TO 5 CONSECUTIVE CYCLES, THEN IT LOCKS OUT UNTIL WATER WITH PROPER QUALITY IS DETECTED (<15 µS/cm). THIS PRECAUTION IS NECESSARY TO PREVENT ANY DAMAGE TO THE DEVICE.	Use of water with inadequate quality. Lock counter activated - it is possible to run up to 5 cycles.	Empty the filling tank and fill it with demineralized water falling within the limit of 15 µS. Activate the sterilization cycle to reset the cycle counter for autoclave lock.	**1/2**
		Conductivity sensor problem.	Check that the water in the tank has an appropriate conductivity using an external sensor. Empty the filling tank, replace the conductivity sensor and fill it with demineralized water falling within the limit of 15 µS. Activate the sterilization cycle to reset the cycle counter for autoclave lock.	
E004 **LINE FREQ. ERROR CONTACT TECH. SERVICE**	Mains frequency reading error.	Electrical mains failure.	RESET following the instructions. Connect the device to another power socket. If the problem persists, have the mains system checked by an electrical installer (check also the uninterruptible power system, if present).	
		Main board fault.	RESET following the instructions. Replace the board.	
E007 **FAN PROBLEM CONTACT TECH. SERVICE**	One of the two fans does not rotate.	Breakage of one or more rear fans.	RESET following the instructions. Check the operation of rear fans.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E008 **FILTERS NEARLY EXHAUSTED**	H_2O conductivity above 20 uS/cm (automatic filling with centralized system or Pure 100/500 - ROW versions only).	For connection to demineralizer PURE 100 - device check (ROW versions only).	Empty the filling tank and replace the 2 PURE 100 resin cartridges. Top up the tank (ROW versions only).	**1**
		For connection to demineralizer PURE 500 – device check (ROW versions only).	Empty the filling tank, replace the PURE 500 filtering element kit. Top up the tank (ROW versions only).	
		For connection to demineralization centralized system - check the quality of the water supplied by the system.	Empty the filling tank, select manual supply mode and fill the tank with demineralized water falling within the limit of 15 µS. After checking and restoring the correct conductivity value of the water supplied by the centralized system, select the automatic supply and top up the tank.	
		Conductivity sensor problem.	Check that the water in the tank has an appropriate conductivity using an external sensor. Empty the filling tank, replace the conductivity sensor and fill it with demineralized water falling within the limit of 15 µS.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E009 **QUALITY H_2O BAD CHANGE FILTERS CHANGE WATER**	H_2O conductivity above 60 uS/cm (automatic filling with centralized system or Pure 100/500 - ROW versions only). NOTE: IN THESE CONDITIONS, THE DEVICE ALLOWS STARTING UP TO 5 CONSECUTIVE CYCLES, THEN IT LOCKS OUT UNTIL WATER WITH PROPER QUALITY IS DETECTED (<15 µS/cm). THIS PRECAUTION IS NECESSARY TO PREVENT ANY DAMAGE TO THE DEVICE.	For connection to Demineralizer PURE 100 – device check. (ROW versions only.	Empty the filling tank and replace the 2 PURE 100 resin cartridges. (ROW versions only). Top up the tank, activate the sterilization cycle to reset the cycle counter for autoclave lock.	**1/2**
		For connection to Demineralizer PURE 500 - device check. (ROW versions only.	Empty the filling tank and replace the PURE 500 filtering element kit. (ROW versions only). Top up the tank, activate the sterilization cycle to reset the cycle counter for autoclave lock.	
		For connection to Demineralization centralized system - check the quality of the water supplied by the system.	Empty the filling tank and select manual supply mode and fill the tank with Demineralized water falling within the limit of 15 µS. Check and restore the correct conductivity value of the water supplied by the centralized system, select automatic supply, top up the tank, activate the sterilization cycle to reset the cycle counter for autoclave lock.	
		Conductivity sensor problem.	Check that the water in the tank has an appropriate conductivity using an external sensor. Empty the filling tank, replace the conductivity sensor and fill it with demineralized water falling within the limit of 15 µS. Activate the sterilization cycle to reset the cycle counter for autoclave lock.	
E010 **DOOR OPEN CLOSE DOOR**	Door open.	The door is not properly closed.	Properly train the operator on the correct ways to close and open the door.	**1**
		Door closing activation failure - check ajar door microswitch.	Check the correct operation of the microswitch by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the microswitch - see the technical sheet DOOR CLOSING UNIT.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E020 **DOOR CLOSING ERROR CONTACT TECH. SERVICE**	Door lock system (closing) activation timeout exceeded.	Closed door detection microswitch fault - microswitch check.	Check the correct operation of the microswitch by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the microswitch - see the technical sheet ST03 - DOOR CLOSING UNIT.	**1 (then new attempt to turn off)**
		Closing system safety pressure switch fault - pressure switch check.	Analyse continuity between the connection points of white cables to check the correct closing of the pressure switch contact. Replace the pressure switch – see technical sheet ST04 - PRESSURE TRANSDUCER - SAFETY PRESSURE SWITCH.	
		Door closing servomotor fault - servomotor operation check.	Check: - Correct operation of the servomotor by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the gearmotor - see the technical sheet ST03 - DOOR CLOSING UNIT.	
		Problem when screwing crossbar threaded bushing/servomotor worm screw - correct screwing check.	Check: - Lubrication and integrity of the threads of the 2 components. - Correct positioning of door seal. Replace: - Motor worm screw - see the technical sheet ST03 - DOOR CLOSING UNIT. - Crossbar threaded bushing.	
E021 **DOOR OPENING ERROR CONTACT TECH. SERVICE**	Door lock system (opening) activation timeout exceeded.	Door microswitch fault - microswitch check.	Check: - Correct operation of the microswitch by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the microswitch.	**1 (then new attempt to turn off)**
		Door closing servomotor fault - servomotor operation check.	Check: - Correct operation of the servomotor by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the gearmotor - see the technical sheet ST03 - DOOR CLOSING UNIT.	
		Door rotating problem when opening - hinge check.	The door does not rotate during the closing phase and does not unlock the microswitch. Check the door hinge and lubricate it if necessary.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E022 **DOOR LOCK PROBLEM CONTACT TECH. SERVICE**	Door locking system microswitch failure.	Check microswitch wirings.	Check: - Correct wiring of cables on the door ajar microswitch and door closing microswitch. - Correct operation of the microswitches by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the microswitch - see the technical sheet ST03 - DOOR CLOSING UNIT.	**2**
		Door microswitch check.	Check: - Correct operation of the microswitches by means of the SERVICE/COMPONENT TEST/DOOR menu. Replace the microswitch - see the technical sheet ST03 - DOOR CLOSING UNIT.	
E030 **LOAD TANK MINIMUM LEVEL FILL TANK**	Filling tank in reserve.	Minimum water level detected in the filling tank upon cycle activation - level check.	Top up water until the maximum level symbol is displayed.	**1**
		Minimum level sensor reading not correct - sensor check.	Check: - Level sensor positioning. - Minimum level sensor wiring. - Correct operation of the sensor by means of the SERVICE / WATER FILLING TIMES menu. Replace the minimum level sensor.	
E031 **DISCHARGE TANK MAXIMUM LEVEL EMPTY TANK"**	Full Discharge Tank.	Maximum water level detected in the discharge tank upon cycle activation - level check.	Empty the tank completely.	**1**
		Maximum level sensor reading not correct - sensor check.	Check: - Discharge maximum level sensor positioning. - Maximum level sensor wiring. - Correct operation of the sensor by means of the SERVICE / WATER FILLING TIMES menu. Replace the level sensor.	
E042 **LOAD TANK MAXIMUM LEVEL**	Maximum level error in the filling tank (manual filling).	Excessive manual filling - level check.	MESSAGE reset and cycle activation.	**1**
E050 **TEST REMINDER RUN VACUUM TEST**	Reminder to run Vacuum Test.	Reminder to run Vacuum Test cycle.	Run Vacuum Test cycle as planned.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E051 **TEST REMINDER RUN HELIX TEST**	Reminder to run Helix Test.	Reminder to run Helix Test cycle.	Run Helix Test cycle as planned.	
E052 **TEST REMINDER RUN VACUUM+HELIX TEST**	Reminder to run Vacuum + Helix Test.	Reminder to run Vacuum + Helix Test combined cycle.	Run Vacuum + Helix Test combined cycle as planned.	
E060 **ETHERNET CONFIG. ERROR CHECK SETTINGS**	Error during connection to Lan network due to Ethernet configuration parameters.	The autoclave cannot connect to the Lan network.	Check that Lan network configuration parameters are correct. Check that Lan network to which the connection is to be performed is correctly working.	**1**
		Connectivity module problem.	Replace the board on which there is the connectivity module.	
E061 **WI-FI CONFIG. ERROR CHECK SETTINGS**	Error during connection to Wi-Fi network due to Wi-Fi configuration parameters.	The autoclave cannot connect to the Wi-Fi network.	Check that Wi-Fi network configuration parameters are correct. Check that the router than manages the Wi-Fi network is on and that the Wi-Fi network to which the connection is to be performed is correctly working.	**1**
		Connectivity module problem.	Replace the board on which there is the connectivity module.	
E126 **ESP32 UPDATING WAIT**	Esp32 update in progress.	Update of the connectivity module started from USB or remotely. The message signals that the update is in progress.	If the update from USB is not successful, try to replace the USB key.	
E130 **CYCLE NOT AVAILABLE**	Cycle disabled.			**1**
E141 **CLOUD FIRMWARE VERSION ERROR UPDATE FW**	Cloud firmware version error. Update firmware.	Process board FW found incongruity with Cloud FW.	Update firmware.	**1**

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E900 **TEST FAILED SECOND STEP CONTACT TECH. SERVICE**	Error in the second phase during the Vacuum Test.	Problem in the door seal sealing - seal check.	Thoroughly clean the seal and the stainless steel door leaf, reset the alarm and repeat a test cycle. Clean the seat of the seal in the plate. Check: - The presence of residues inside the seal lip. - The adjustment of the plate and correct it, if necessary.	**2**
		Problem in the tightness of reinforced pipes - check pipes and connections.	For all the reinforced pipes connected to chamber, steam generator, Manifold unit, check: - The status of reinforced pipes, in the connection point, the correct positioning of the pipe on the fitting. - That the stainless steel clamp is present and correctly tightened. - To check the tightness, it can be useful to activate a test cycle by means of the SERVICE/TEST CYCLES/NO VACUUM menu, which allows to pressurize the system without performing pre-vacuum phases.	
		Problem in the tightness of Teflon pipes - checks of pipes and connections.	For the Teflon pipes connected to pressure transducer and safety pressure switch, check: - The correct fixing of pipes to the chamber's rear fittings and the 2 components. - The integrity of the Teflon pipe on the fitting, under the locking ring nut. - Restore, if necessary, the correct fixing by removing the end part of the Teflon pipe, previously locked by the fastening ring nut. - To check the tightness, it can be useful to activate a test cycle by means of the SERVICE/TEST CYCLES/NO VACUUM menu, which pressurizes the system without performing pre-vacuum phases.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
E902 **TEST FAILED VACUUM NOT ACHIEVED CONTACT TECH. SERVICE**	Vacuum test failed (vacuum pulse timeout exceeded).	Problem in vacuum pump start - pump check.	Detect the pump start at the activation of the test cycle. For the check, it can be useful to activate the vacuum pump by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS - SOLENOID VALVES menu, which allows to detect air suction from the chamber. Check/replace the vacuum pump.	**2**
		Problem in vacuum pump efficiency - pump check.	Check: - Chamber drainage filter. - Vacuum pump membranes and shutters. Perform vacuum pump maintenance.	
		Problem in the activation of solenoid valves - check of solenoid valves.	Check: - Correct activation and opening of EV3 - EV4 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS - SOLENOID VALVES menu, which allows to detect air suction from the chamber.	
		Problem with pipes - check of pipes.	Check integrity and correct connection of: - Chamber reinforced pipes. - TEFLON pipes. - Heat exchanger sleeved pipes.	
		Problem in the heat exchanger sealing - heat exchanger check.	Connect the exchanger inlet and outlet pipes together to exclude it from the connection. Activate the test cycle. Replace the heat exchanger.	
E998 **REMOTE SERVICE ACTIVE**	Access from remote in service mode.	A connection to the Service menu has been made by means of the Ethernet or Wi-Fi connection.	Service maintenance in progress. If it was not planned, IMMEDIATELY contact the provider of the network to which the device is connected or nothing can be done.	**1**
E999 **MANUAL INTERRUPTION**	Manually interrupting the cycle.	The user pressed the START/STOP key.	The STOP manual control must be used only in case of need. Do not use to add load to be sterilized in the chamber.	**2**

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

6.2. CODE "A" ALARM

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A032 **FILL WATER LEVEL SENSOR PROBLEM: CONTACT TECH. SERVICE**	Filling tank: inconsistency of water level sensor reading.	Sensor connection problem - check of connections.	Check connections: - Wirings → level sensors. - Sensor wirings → PCB. Check correct operation of sensors by means of the SERVICE/WATER FILLING TIMES menu.	**1**
		Level reading problem - check of sensors.	Check correct operation of sensors by means of the SERVICE/WATER FILLING TIMES menu. Replace the damaged level sensor.	
		PCB problem during sensor reading - reading check.	Replace the board.	
A040 **FAILED WATER INLET CHECK AUTOMATIC LOAD**	Tank filling failed with automatic filling.	For connection of external filling pump - operation check.	Check connections: - Pump power cable → jack socket on the rear side of the autoclave. - Pump outlet pipe → automatic filling connection on the autoclave rear side. Check: - Pump suction filter. - Activation of external pump by means of the SERVICE/WATER FILLING TIMES menu.	**1**
		For connection of demineralizer PURE 100/ PURE 500 (ROW versions only).	Check connections: - Solenoid valve power cable → jack socket on the rear side of the autoclave. - Demineralizer outlet pipe → automatic filling connection on the autoclave rear side. Check: - Water mains supply. - Inspectionable filter on the autoclave/demineralizer connection. - Activation of demineralizer solenoid valve by means of the SERVICE/WATER FILLING TIMES menu.	
		Level sensor problem - sensor check.	Check: - Minimum level sensor wiring. - Correct operation of sensors by means of the SERVICE/WATER FILLING TIMES menu. Replace the level sensor.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A042 **WATER FILLING MAXIMUM LEVEL CHECK TANK**	Maximum level reached in filling tank with Automatic Filling or Pure, stop the device.	Maximum level reached in filling tank with Automatic Filling or Pure.	Stop the device.	**1**
		Problem with filling tank level sensors.	Check the correct operation of level sensors and replace them if necessary.	
		Automatic filling time problem.	Check filling and alarm times for automatic filling in the Service menu.	
A043 **DISCHARGE TANK MAXIMUM LEVEL CHECK TANK**	Maximum level error in the discharge tank (with active recirculation).	Problem with discharge tank level sensors.	Check the correct operation of level sensors and replace them if necessary.	
A101 **CHAMBER PROBE PT1 OPEN CIRCUIT CONTACT TECH. SERVICE**	PT1 probe open circuit (chamber).	PT1 wiring problem - wiring check.	Check connections: - PT1 → PCB	**1**
		PT1 open circuit problem - probe check.	Examine cycle report and find out when the alarm was triggered. Disconnect the PT1 probe from the PCB. Detect continuity and resistive value, which must fall between 1000 and 1500 ohm. Replace PT1 probe - see technical sheet ST05 - PT1 PROBE - CHAMBER TEMPERATURE READING.	
		PCB problem.	Replace the PCB.	
A102 **GENERATOR PROBE PT2 PT2 SHORT-CIRCUIT CONTACT TECH. SERVICE**	PT2 probe open circuit (steam generator).	PT2 wiring problem - wiring check.	Check connections: - PT2 → PCB	**1**
		PT2 open circuit problem - probe check.	Examine cycle report and find out when the alarm was triggered.	
		PCB problem.	Disconnect the PT2 probe from the PCB.	
A103 **HEATING BAND PROBE PT3 OPEN CIRCUIT CONTACT TECH. SERVICE**	PT3 probe open circuit (tube bundle heating element).	PT3 wiring problem - wiring check.	Check connections: - PT3 → PCB	**1**
		PT3 open circuit problem - probe check.	Examine cycle report and find out when the alarm was triggered. Disconnect the PT3 probe from the PCB. Detect continuity and resistive value, which must fall between 1000 and 1500 ohm. Replace PT3.	
		PCB problem.	Replace the PCB.	
A105 **CONDUCTIVITY SENSOR PT5 OPEN-CIRCUIT CONTACT TECH. SERVICE**	PT5 probe open circuit (conductivity sensor).	PT5 wiring problem - wiring check.	Check connections: - conductivity sensor → PCB	**1**
		PT5 open circuit problem - probe check.	Disconnect the conductivity sensor from the PCB. Detect continuity. Replace the conductivity sensor.	
		PCB problem.	Replace the PCB.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A111 **CHAMBER PROBE PT1 SHORT-CIRCUIT CONTACT TECH. SERVICE**	PT1 probe short circuit (chamber).	PT1 wiring problem - wiring check.	Check the integrity of PT1 wiring, paying special attention to the connector on the PCB.	**1**
		PT1 probe problem - probe check.	Check PT1 resistive value Replace PT1 probe - see technical sheet ST05 - PT1 PROBE - CHAMBER TEMPERATURE READING.	
A112 **GENERATOR PROBE PT2 SHORT-CIRCUIT CONTACT TECH. SERVICE**	PT2 probe short circuit (steam generator).	PT2 wiring problem - wiring check.	Check the integrity of PT2 wiring, paying special attention to the connector on the PCB.	**1**
		PT2 probe problem - probe check.	Check PT2 resistive value. Replace PT2 probe - see the technical sheet ST01 - STEAM GENERATOR.	
A113 **HEATING BAND PROBE PT3 SHORT-CIRCUIT CONTACT TECH. SERVICE**	PT3 probe short circuit (tube bundle heating element).	PT3 wiring problem - wiring check.	Check the integrity of PT3 wiring, paying special attention to the connector on the PCB.	**1**
		PT3 probe problem - probe check.	Check PT3 resistive value. Replace PT3 probe.	
A115 **CONDUCTIVITY SENSOR PT5 SHORT-CIRCUIT CONTACT TECH. SERVICE**	PT5 resistance thermometer in short circuit (conductivity sensor).	PT5 wiring problem - wiring check.	Check the integrity of conductivity sensor wiring, paying special attention to the connector on the PCB.	**1**
		PT5 probe problem - probe check.	Check resistive value. Replace the conductivity sensor.	
A116 **PROCESS BOARD ERROR CONTACT TECH. SERVICE**	ADC error.	ADC damaged.	Replace the PCB.	**1**
A117 **MOTOR DOOR OVERCURRENT**	Door motor overcurrent error.	Closing system lock lubrication.	Check the lubrication of the closing system lock and lubricate if necessary. Restart the device to reset the alarm.	**2**
		Microswitch problem.	Check the correct operation of the door closing system lock microswitches from the Service menu. Replace or adjust the microswitches. Restart the device to reset the alarm.	
		Motor problem.	Check the correct operation of the motor from the service menu. Replace the motor if necessary. Restart the device to reset the alarm.	
		Board problem.	Replace the PCB. Restart the device to reset the alarm.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A120 **PROCESS BOARD ERROR CONTACT TECH. SERVICE**	Reference heating element 1k0 error.	Check R143 heating element on the PCB.	Replace the PCB.	**1**
A121 **PROCESS BOARD ERROR CONTACT TECH. SERVICE**	Reference heating element 1k5 error.	Short-circuit R143 reference heating element to check it.	Replace the PCB.	**1**
A122 **PROCESS BOARD ERROR CONTACT TECH. SERVICE**	Reference heating element 1k8 error.	Check R142 heating element on the PCB.	Replace the PCB.	**1**
A126 **WI-FI MODULE ERROR CONTACT TECH. SERVICE**	Communication error with ESP32 on process board or on L4.	Connection error with Wi-Fi module.	Replace the PCB.	**1**
A127 **CAN ERROR CONTACT TECH. SERVICE**	Communication error between process board and L4 via CAN.	Communication error between graphic interface and process board via CAN.	Replace one PCB at a time until the problem is solved.	**1**
A128 **ETHERNET MODULE ERROR CONTACT TECH. SERVICE**	Communication error between graphic interface and board.	Communication error between graphic interface and Ethernet module.	Replace one PCB at a time (in versions with two boards) until the problem is solved.	**1**
A131 **SOLENOID VALVE 1 ERROR CONTACT TECH. SERVICE**	Error from solenoid valve driver on EV1.	Solenoid valve 1 broken.	Check the correct operation of the solenoid valve from the Service menu and replace it if necessary.	**2**
		PCB problem.	Replace the PCB.	
A132 **SOLENOID VALVE 2 ERROR CONTACT TECH. SERVICE**	Error from solenoid valve driver on EV2.	Solenoid valve 2 broken.	Check the correct operation of the solenoid valve from the Service menu and replace it if necessary.	**2**
		PCB problem.	Replace the PCB.	
A133 **SOLENOID VALVE 3 ERROR CONTACT TECH. SERVICE**	Error from solenoid valve driver on EV3.	Solenoid valve 3 broken.	Check the correct operation of the solenoid valve from the Service menu and replace it if necessary.	**2**
		PCB problem.	Replace the PCB.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A134 **SOLENOID VALVE 4 ERROR CONTACT TECH. SERVICE**	Error from solenoid valve driver on EV4.	Solenoid valve 4 broken.	Check the correct operation of the solenoid valve from the Service menu and replace it if necessary.	**2**
		PCB problem.	Replace the PCB.	
A136 **SOLENOID VALVE 6 ERROR CONTACT TECH. SERVICE**	Error from solenoid valve driver on EV6.	Solenoid valve 6 broken.	Check the correct operation of the solenoid valve from the Service menu and replace it if necessary.	**2**
A140 **ESP32 UPDATING ERROR**	Error during the transfer of the update file.	Update from USB.	Try with a different model of USB key.	**1**
		Remote update.	Check the device connection.	
A145 **FAULTY CURRENT DRAW CONTACT TECH. SERVICE**	Anomaly in the total current measure (too high or too different from the estimated one).	Problem on the process board. A current draw greater than expected has been detected.	Check that the mains outlet power voltage is correct. If it is correct, replace the process board.	**2**
A146 **SOLENOID VALVE DRIVER ERROR CONTACT TECH. SERVICE**	Fault signal from solenoid valve driver.	Problem on the process board.	Replace the PCB.	**2**
A147 **DOOR MOTOR DRIVER ERROR CONTACT TECH. SERVICE**	Fault signal from door motor driver.	Problem on the process board.	Replace the PCB.	**2**
A201 **STEAM GENERATOR RESISTOR OPEN CIRCUIT CONTACT TECH. SERVICE**	Open generator heating element (it does not heat).	Generator safety thermostat problem - device check.	Check the safety thermostat by performing a manual “click” reset. Replace the safety thermostat. See technical sheet ST05 - PT1 PROBE - CHAMBER TEMPERATURE READING.	**2**
		Generator heating element problem - component check.	Check continuity and resistive value of the heating element. See technical sheet ST05 - PT1 PROBE - CHAMBER TEMPERATURE READING.	
		The PCB is damaged.	Replace the PCB.	
A202 **HEATING BAND OPEN CIRCUIT CONTACT TECH. SERVICE**	Open tube bundle heating element (it does not heat).	Generator safety thermostat problem - device check.	Check the safety thermostat by performing a manual “click” reset. Replace the safety thermostat.	**2**
		The PCB is damaged.	Replace the PCB.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A250 **1PV TIMEOUT CHECK LOAD CHECK CHAMBER FILTER**	1st vacuum pulse not achieved within timeout.	Autoclave loading problem - load check.	Check quantity and arrangement of the load inside the chamber. Follow the instructions in the User Manual.	**2**
		Chamber discharge filter problem - component check.	Check and clean the chamber filter. Follow the instructions in the User Manual.	
		Vacuum pump activation problem - pump check.	Detect the vacuum pump start. For the check, it can be useful to activate the vacuum pump by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS - SOLENOID VALVES menu, which allows to detect air suction from the chamber. Detect pump supply voltage. Replace the vacuum pump.	
		Vacuum pump efficiency problem - device check.	Check: - Connection of vacuum pump pipes, membranes and shutters. Perform vacuum pump maintenance.	
		Problem in the activation of solenoid valves - check of solenoid valves.	Check: - Correct activation and opening of EV3 - EV4 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS - SOLENOID VALVES menu, which allows to detect air suction from the chamber.	
		Problem with pipes - check of pipes.	Check integrity and correct connection of: - Chamber reinforced pipes - TEFLON pipes - Heat exchanger sleeved pipes	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A251 **ATM1 UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	The 1st pressure pulse does not achieve 0.00 bar within timeout.	Autoclave loading problem - load check.	Check quantity and arrangement of the load inside the chamber. Follow the instructions in the User Manual.	**2**
		Steam generator water injection pump problem - device check. Steam generator clogging problem - device check.	Check: - filling tank filter and water injection pump inlet filter. - correct activation of water pump and opening of EV6. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which allows to detect air passage through the generator to the chamber. - presence of any leakage on the water pump and generator connecting pipes. Replace vibration pump. Perform steam generator maintenance - see sheet ST01.	
		Generator heating problem - device check.	Check the safety thermostat and reset it if necessary. Check steam generator heating element. See ST01 - steam generator sheet.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A252 **1PP UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	The 1st pressure pulse does not achieve 1.00 bar within timeout.	Steam generator water injection pump problem - device check. Steam generator clogging problem - device check.	Check: - Filling tank filter and water injection pump inlet filter. - Correct activation of water pump and opening of EV6. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which allows to detect air passage through the generator to the chamber. - Presence of any leakage on the water pump and generator connecting pipes. Replace vibration pump. Perform steam generator maintenance - See sheet ST01.	**2**
		Generator heating problem - device check.	Check the safety thermostat and reset it if necessary. Check steam generator heating element. See sheet ST01 - STEAM GENERATOR.	
		Manifold solenoid valve sealing problem - component check.	Check: - correct power supply and sealing of EV1 - EV3 sealing See sheet ST02 - MANIFOLD.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A253 **2PV TIMEOUT CHECK LOAD CHECK CHAMBER FILTER**	2st vacuum pulse not achieved within timeout.	Vacuum pump activation problem - component check.	Detect the vacuum pump start. For the check, it can be useful to activate the vacuum pump by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS - SOLENOID VALVES menu, which detects air suction from the chamber. Detect pump supply voltage. Replace the vacuum pump.	**2**
		EV1 - EV3 discharge solenoid valve problem - component check. EV4 exchange solenoid valve problem - component check.	Check: - EV1 correct opening, not powered. - Correct power supply and opening of EV3. - Solenoid valve seat and slider of EV1 and EV3. - Correct power supply of EV4, with direct discharge/vacuum pump connection exchange. - MANIFOLD - see sheet ST02.	
		Heat exchanger problem - device check. Autoclave positioning problem.	Check: - That exchanger grille and blades are clean. - Correct activation of cooling fans. - Rear space for hot air evacuation. - That the air suction filter located under the autoclave is clean. - Autoclave positioning on the resting surface, to ensure a correct inclination of the chamber lower at the rear.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A254 **ATM2 UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	The 2st pressure pulse does not achieve 0.00 bar within timeout.	Steam generator water injection pump problem - device check. Steam generator clogging problem - device check.	Check: - Filling tank filter and water injection pump inlet filter. - Correct activation of water pump and opening of EV6 For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which detects air passage through the generator to the chamber. - Presence of any leakage on the water pump and generator connecting pipes. Replace vibration pump. Perform steam generator maintenance - see sheet ST01	**2**
		Generator heating problem - device check.	Check the safety thermostat and reset it if necessary. Check steam generator heating element. See ST01 - steam generator sheet.	
		Manifold solenoid valve sealing problem - component check.	Check: - Correct power supply and sealing of EV1. - EV3 sealing. - MANIFOLD - see sheet ST02.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A255 **2PP UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	The 2st pressure pulse does not achieve 1.00 bar within timeout.	Steam generator water injection pump problem - device check. Steam generator clogging problem - device check.	Check: - Filling tank filter and water injection pump inlet filter. - Correct activation of water pump and opening of EV6. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which detects air passage through the generator to the chamber. - Presence of any leakage on the water pump and generator connecting pipes. Replace vibration pump. Perform steam generator maintenance - see sheet ST01.	**2**
		Generator heating problem - device check.	Check the safety thermostat and reset it if necessary. Check steam generator heating element. See ST01 - steam generator sheet.	
		Manifold solenoid valve sealing problem - component check.	Check: - correct power supply and sealing of EV1. - EV3 sealing. - MANIFOLD - see sheet ST02.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A256 **3PV TIMEOUT CHECK LOAD CHECK CHAMBER FILTER**	3st vacuum pulse not achieved within timeout.	Vacuum pump activation problem - component check.	Detect the vacuum pump start. For the check, it can be useful to activate the vacuum pump by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS - SOLENOID VALVES menu, which allows to detect air suction from the chamber. Detect pump supply voltage. Replace the vacuum pump.	**2**
		EV1 - EV3 discharge solenoid valve problem - component check. EV4 exchange solenoid valve problem - component check.	Check: - EV1 correct opening, not powered. - Correct power supply and opening of EV3. - Solenoid valve seat and slider of EV1 and EV3. - Correct power supply of EV4, with direct discharge/vacuum pump connection exchange. - MANIFOLD - see sheet ST02.	
		Heat exchanger problem - device check. Autoclave positioning problem.	Check: - That exchanger grille and blades are clean. - Correct activation of cooling fans. - Rear space for hot air evacuation. - That the air suction filter located under the autoclave is clean. - Autoclave positioning on the resting surface, to ensure a correct inclination of the chamber lower at the rear.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A257 **ATM3 UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	The 3st pressure pulse does not achieve 0.00 bar within timeout.	Steam generator water injection pump problem - device check. Steam generator clogging problem - device check.	Check: - Filling tank filter and water injection pump inlet filter. - Correct activation of water pump and opening of EV6. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which detects air passage through the generator to the chamber. - Presence of any leakage on the water pump and generator connecting pipes. - Replace vibration pump Perform steam generator maintenance - see sheet ST01.	**2**
		Generator heating problem - device check.	Check the safety thermostat and reset it if necessary. Check steam generator heating element. See ST01 - steam generator sheet.	
		Manifold solenoid valve sealing problem - component check.	Check: - Correct supply and sealing of EV1 and EV3. - MANIFOLD - see sheet ST02.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A258 **3PP UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	The 3rd pressure pulse does not achieve: - 1.11 bar (121°C) - 2.14 bar (134°C) - 1.96 bar (132°C/270°F) within timeout	Autoclave loading problem - load check.	Check quantity and arrangement of the load inside the chamber. Follow the instructions in the User Manual.	**2**
		Steam generator water injection pump problem - device check. Steam generator clogging problem - device check.	Check: - Filling tank filter and water injection pump inlet filter. - Correct activation of water pump and opening of EV6. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which allows to detect air passage through the generator to the chamber. - Presence of any leakage on the water pump and generator connecting pipes. Replace vibration pump. Perform steam generator maintenance - see sheet ST01.	
		Steam generator heating problem - device check.	Check the safety thermostat and reset it if necessary. Check steam generator heating element. See ST01 - steam generator sheet.	
		Manifold solenoid valve sealing problem - component check.	Check: - Correct power supply and sealing of EV1. - EV3 sealing. MANIFOLD - see sheet ST02.	
		Steam leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Replace the door seal.	
		Door sealing problem - closing system check.	Check: - Steam leakage from the door. - That the door seal is intact and correctly positioned. - The correct operation of the door closing and locking system. For the check, it can be useful to activate the closing system by means of the SERVICE / COMPONENT TEST / DOOR menu, detecting the current value required by the tightening servomotor.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A260 **ATM3 DOWNSTROKE TIMEOUT CHECK LOAD CHECK CHAMBER FILTER**	Chamber depressurisation not completed within the timeout.	EV3 shaft does not slide.	Clean and/or replace the slider and the slider holder of EV3 - see technical sheet ST02 – MANIFOLD.	**2**
		EV3 dirty.		
		EV3 not powered.	Check: - EV3 connections and power supply. To perform the check, activate EV3 from SERVICE menu.	
		Check the position of autoclave feet.	Check the presence of feet (reposition them, if removed). Train the personnel in charge. Adjust feet for a correct inclination of the autoclave.	
		Check the chamber filter.	Clean the chamber filter. Replace the chamber filter.	
A261 **PRESSURE LEVELLING TIMEOUT CONTACT TECH. SERVICE**	Chamber levelling not completed within the timeout.	EV5 shaft does not slide.	Clean or replace EV5 shaft.	**2**
		EV5 dirty.		
		EV5 not powered.	Replace EV5 wiring. Replace the fuse. Replace the board.	
		Check for an air leakage from one of the MANIFOLD solenoid valves. Start EV5 check.	Check the valve overheating. Loosen the fastening ring nut of the coil. Replace the corresponding coil. Replace the slider. Check the stability of the dental surgery's power voltage. Insert a power conditioner. Remove the other components fitted on the line dedicated to the autoclave. Check the inside of the solenoid valves. Clean any dirty valve (Loctite, chips, filaments). Replace the slider and slider holder. Replace the MANIFOLD.	
		Vacuum pulse during drying not performed within the timeout.	Clean or replace the bacteriological filter (see Maintenance Appendix in the user manual).	
		Vacuum pump malfunction.	Check pump operation and perform maintenance or replace it if necessary.	
		Ambient pressure change.	Check that there are no pressure changes between the beginning and the end of the cycle. For instance, if the sterilizer is positioned in a chamber with climate air conditioner (clean room).	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A262 **PD PRESSURE UPSTROKE TIMEOUT CONTACT TECH. SERVICE**	Pressure pulse error in the chamber during drying.	Vacuum pulse during drying not performed within the timeout.	Clean or replace the bacteriological filter (see Maintenance Appendix in the user manual).	**2**
		Check for an air leakage from one of the MANIFOLD solenoid valves. Start solenoid valve EV5 check.	Check the valve overheating. Loosen the fastening ring nut of the coil. Replace the corresponding coil. Replace the slider. Check the stability of the dental surgery's power voltage. Insert a power conditioner. Remove the other components fitted on the line dedicated to the autoclave. Check the inside of the solenoid valves. Clean any dirty valve (Loctite, chips, filaments). Replace the slider and slider holder. Replace the MANIFOLD.	
		Vacuum pump malfunction.	Check pump operation and perform maintenance or replace it if necessary.	
A353 **ATM1 DOWNSTROKE TIMEOUT CHECK LOAD CHECK CHAMBER FILTER**	1st return from pressure at 0.10 bar not completed within the timeout.	Chamber chamber drain filter problem - component check.	Check and clean the chamber filter. Follow the instructions in the User Manual.	**2**
		EV1 - EV3 discharge solenoid valve problem - component check.	Check: - EV1 correct opening, not powered. - Correct power supply and opening of EV3. - Solenoid valve seat and slider of EV1 and EV3. - MANIFOLD - see sheet ST02.	
A356 **ATM2 DOWNSTROKE TIMEOUT CHECK LOAD CHECK CHAMBER FILTER**	2nd return from pressure at 0.10 bar not completed within the timeout.	Chamber chamber drain filter problem - component check.	Check and clean the chamber filter. Follow the instructions in the User Manual.	**2**
		EV1 - EV3 discharge solenoid valve problem - component check.	Check: - EV1 correct opening, not powered. - Correct power supply and opening of EV3. - Solenoid valve seat and slider of EV1 and EV3. - MANIFOLD - see sheet ST02.	
A360 **SPD PRESSURE DOWNSTROKE TIMEOUT CONTACT TECH. SERVICE**	Chamber depressurisation not completed within the timeout.	Chamber depressurisation not completed within the timeout.	Clean the chamber drain filter (see Maintenance Appendix in the User Manual).	**2**

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
A362 **PD PRESSURE DOWNSTROKE TIMEOUT CONTACT TECH. SERVICE**	Vacuum phase error during decreases in drying cycle.	Chamber depressurisation not completed within the timeout.	Clean the chamber drain filter (see Maintenance Appendix in the User Manual).	

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

6.3. CODE "H" HAZARD

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
H150 **PRESSURE SENSOR OPEN CIRCUIT CONTACT TECH. SERVICE**	MPX sensor open circuit (chamber). The pressure read by the transducer is lower than the minimum pressure (=-0.95 bar).	Transducer connection wiring is disconnected/damaged.	Check wiring and relevant connection.	**2**
		Transducer connection pipe is disconnected/damaged.	Check the transducer connection pipe.	
		The transducer does not work properly.	Replace the pressure transducer - see sheet ST4 - PRESSURE SWITCH_MPX.	
H160 **PRESSURE SENSOR SHORT-CIRCUIT CONTACT TECH. SERVICE"**	MPX sensor short circuit (chamber). The pressure read by the transducer is higher than the maximum pressure (=2.60 bar).	The pressure transducer wiring is damaged.	Check wiring and relevant connection.	**2**
		Pressure transducer short circuit.	Check the transducer connection pipe.	
		The pressure transducer is damaged.	Replace the pressure transducer - see sheet ST4 - PRESSURE SWITCH_MPX.	
H400 **INCORRECT P/T RATIO CHECK LOAD**	During the process, Tsteam value is too high with respect to PT1. The value resulting from the difference between Pconv and T is higher tan 2°C (35.6°F).	Discharge solenoid valve EV1 does not open properly.	Check EV1 slider/slider holder - see sheet ST02 - MANIFOLD.	**2**
		Firmware version not updated.	Check/update autoclave FW version.	
		The pressure transducer is broken.	Replace the pressure transducer - see sheet ST4 - PRESSURE SWITCH_MPX.	
		PT1 – chamber temperature reading problem.	Check that PT1 value is correctly stored. For the check, use the SERVICE/PT1 CALIBRATION menu. Replace PT1 probe - see sheet ST5-PT1.	
		Check for a steam leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Reset the alarm and repeat a sterilization cycle. Replace the door seal.	
		The board is damaged.	Replace the PCB.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
H401 **INCORRECT T/P RATIO CHECK LOAD**	During the process, PT1 value is too high with respect to Tsteam. The value resulting from the difference between T and Pconv is higher tan 2°C (35.6°F).	Discharge solenoid valve EV1 does not open properly.	Check EV1 slider/slider holder - see sheet ST02 - MANIFOLD.	**2**
		Firmware version not updated.	Check/update autoclave FW version.	
		The pressure transducer is broken.	Replace the pressure transducer - see sheet ST4-PRESSURE SWITCH_MPX.	
		The board is damaged.	Replace the PCB.	
		Check for a steam leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Reset the alarm and repeat a sterilization cycle. Replace the door seal.	
H402 **TEMPERATURE BEYOND MAXIMUM LIMIT CONTACT TECH. SERVICE**	During the process, PT1 value is too high. The temperature detected by PT1 temperature sensor is higher than Tnom + 4°C (39.2°F).	Steam generator clogging problem.	Generator maintenance - See sheet ST01 – Steam generator.	**2**
		Insufficient water supply to the generator. The steam generator vibration pump does not work properly. Solenoid valve EV6 does not open properly.	Check/clean filling tank filter. Check/replace vibration pump water filter. Check vibration pump. Check EV6. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which detects air passage through the generator to the chamber. Replace vibration pump.	
		PT1 temperature sensor is damaged.	Replace PT1 – see sheet ST5-PT1.	
		The board is damaged.	Replace the PCB.	
		Firmware version not updated.	Check/update autoclave FW version - see ST7-FW update.	
		Check for a steam leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Reset the alarm and repeat a sterilization cycle. Replace the door seal.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
H403 **TEMPERATURE BELOW MINIMUM LIMIT CONTACT TECH. SERVICE**	During the process, PT1 value is too low. The reading of temperature probe during sterilization phase is lower than Tnom. PT1 lower than: - 121°C - 134°C - 132°C/270°F	The steam generator does not work properly.	Check generator safety thermostat. See sheet ST01 - Steam generator.	**2**
		There is a leakage from one of the pipes connected to the chamber.	Check the pipes connected to the rear/lower part of the chamber and the relevant fasteners.	
		Check for an air leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Replace the door seal.	
		Check the quantity and quality of the material inserted in the sterilization chamber.	Provide the user with proper instructions (see User manual).	
		PT1 temperature sensor is damaged.	PT1 temperature sensor is damaged.	
		The board is damaged.	Replace the PCB.	
		Firmware version not updated.	Check/update autoclave FW version.	
H404 **ERRATIC TEMPERATURE CONTACT TECH. SERVICE**	During the process, the difference between max and min PT1 is too great. The difference between max and min temperature is higher than 5°C (41°F).	The steam generator does not work properly. Solenoid valve EV6 does not open properly. The vibration pump does not work properly.	Check: - Steam generator. - Generator heating element connection wirings. - EV6 activation. - Vibration pump. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which detects air passage through the generator to the chamber. See sheet ST01 - Steam generator.	**2**
		There is an air leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Replace the door seal.	
		There is a leakage from solenoid valves EV1/EV3.	Check/update autoclave FW version.	
H405 **PRESSURE BEYOND MAXIMUM LIMIT CONTACT TECH. SERVICE**	During the process, MPX value is too high. The pressure is higher than: - 1.24 bar (121°C) - 2.31 bar (134°C) - 2.13 bar (132°C/270°F).	The board is damaged.	Replace the PCB.	**2**
		The pressure transducer is damaged/not working.	Replace the pressure transducer - see sheet ST4-PRESSURE SWITCH_MPX.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
H406 **PRESSURE BELOW MINIMUM LIMIT CONTACT THE TECH. SERVICE**	During the process, MPX value is too low. The pressure is lower than: - 1.04 bar (121°C) - 2.03 bar (134°C) - 1.86 bar (132°C/270°F).	The steam generator does not work properly. The steam generator is getting clogged. Solenoid valve EV6 does not open properly. The vibration pump does not work properly.	Check: - Steam generator. - Generator heating element connection wirings. - EV6 activation. - Vibration pump. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which detects air passage through the generator to the chamber. See sheet ST01 - Steam generator.	
		There is an air leakage from door seal.	Thoroughly clean the door seal and the steel door leaf. Replace the door seal.	
		Firmware version not updated.	Check/update autoclave FW version.	
		The board is damaged.	Replace the PCB.	
		There is a leakage from the pipes connected to the chamber.	Check the pipes connected to the rear/lower part of the chamber and the relevant fasteners.	
H410 **INTERNAL TIMER ERROR CONTACT TECH. SERVICE**	Internal timer error.	The PCB is damaged.	Replace the PCB.	**2**
H411 **STERILIZATION TIME ERROR**	Sterilization time error, checked with double variables.	Board or control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**
H990 **PRESSURE BEYOND MAXIMUM LIMIT CONTACT TECH. SERVICE**	MPX too high. The pressure is higher than 2.38 bar.	The pressure transducer is damaged.	Replace the pressure transducer - see sheet ST4-PRESSURE SWITCH_MPX.	**2**
		The PCB is damaged.	Replace the PCB.	

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
H991 **PT1 OVERHEATING CHECK LOAD**	PT1 overheating. The chamber internal temperature is higher than 138°C (280°F).	The chamber PT1 temperature probe is damaged.	Replace PT1 probe - see sheet ST5-PT1.	**2**
		The vibration pump does not work properly. Solenoid valve EV6 does not open properly.	Check EV6 activation. Check vibration pump. For the check, it can be useful to activate the water pump and EV6 by means of the SERVICE/COMPONENT TEST/OTHER COMPONENTS menu, which allows to detect air passage through the generator to the chamber.	
		The PCB is damaged.	Replace the PCB.	
H992 **PT2 OVERHEATING CONTACT TECH. SERVICE**	PT2 overheating. The chamber internal temperature is higher than 230°C (446°F).	The steam generator PT2 temperature probe is damaged.	Replace PT2 probe - see sheet ST01 - Steam generator.	**2**
		The PCB is damaged.	Replace the PCB.	
H993 **PT3 OVERHEATING CONTACT TECH. SERVICE**	PT3 overheating. The tube bundle temperature is higher than 200°C (446°F).	The tube bundle heating element PT3 temperature probe is damaged.	Replace the probe.	**2**
		The PCB is damaged.	Replace the PCB.	

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

6.4. CODE "S" SYSTEM ERROR

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
S001 **FLASH MEMORY NOT ACCESSIBLE CONTACT TECH. SERVICE**	8MB Flash Memory outside the microswitch on the process board cannot be accessed.	The Flash Memory is damaged.	Replace the PCB.	**2**
		The PCB is damaged.		
S002 **FLASH MEMORY NOT ACCESSIBLE CONTACT TECH. SERVICE**	512MB Flash Memory outside the microswitch on the process board cannot be accessed.	The Flash Memory is damaged.	Replace the PCB.	**2**
		The PCB is damaged.		
S005 **PROBLEM WITH USB KEY CHANGE KEY**	USB key not accessible.	USB key is not detected.	Reconnect USB memory. Check that the USB memory is correctly formatted (up to 4G > FAT/16 Kbit/sector - beyond 4G > FAT32/16 Kbit/sector). Replace USB memory.	**2**
		USB card is damaged.	Replace USB card.	
		The PCB is damaged.	Replace the PCB.	
S006 **USB KEY NOT ACCESSIBLE CHANGE KEY**	USB key not accessible.	USB key is not detected.	Reconnect USB memory. Check that the USB memory is correctly formatted (up to 4G > FAT/16 Kbit/sector - beyond 4G > FAT32/16 Kbit/sector). Replace USB memory.	**2**
		USB card is damaged.	Replace USB card.	
		The PCB is damaged.	Replace the PCB.	
S007 **USB KEY FULL CHANGE KEY**	USB key full.	USB key full.	Empty USB key.	**2**
S009 **PRINTER DISCONNECTED CHECK CONNECTION**	Communication with printer failed.	Printer not connected.	Check that the wiring is correct.	**2**
		Printer not active/not powered.	Check that the printer is turned on/powered.	
		The PCB is damaged.	Replace the PCB.	
S010 **PRINTER PAPER OUT CHECK PAPER**	Printer: no paper.	Incorrect roll fitting. Incorrect roll positioning.	Check that the fitting is correct. Check that the positioning is correct.	**2**

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
S011 **PRINTER: DOOR OPEN**	Printer: door open.	Printer: door open.	Check the proper closing of the door.	**1**
S012 **PRINTER: NOT READY TRY AGAIN**		Printer configuration error.	Configure.	**2**
S015 **FLASH MEMORY NOT ACCESSIBLE CONTACT TECH. SERVICE**	512MB Flash Memory outside the microswitch on L4 board cannot be accessed.	The Flash Memory is damaged. The PCB is damaged.	Replace the PCB.	**2**
S016 **FLASH MEMORY NOT ACCESSIBLE CONTACT TECH. SERVICE**	4GB Flash Memory outside the microswitch on L4 board cannot be accessed.	The Flash Memory is damaged. The PCB is damaged.	Replace the PCB.	**2**
S020 **RUN BACKUP DOWNLOAD NEW CYCLES**	The maximum number of cycles has been reached without downloading in New mode.	250 cycles have been completed without downloading reports.	Download cycle reports in PDF by selecting “NEW” from the USB/DATA MANAGEMENT menu.	**1 - Download NEW cycles**
S021 **CYCLE MEMORY FULL START OVERWRITING**	Start overwriting data in Flash Memory.	500 cycles have been completed without downloading reports.	Download cycle reports in PDF by selecting “NEW” from the USB/DATA MANAGEMENT menu.	**1 - Download NEW cycles**
S030 **SYSTEM ERROR CONTACT TECH. SERVICE**	Check through watchdog that one of the main tasks has not crashed.	Control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**
S031 **SYSTEM ERROR CONTACT TECH. SERVICE**	Check through hardware watchdog that one peripheral device is not blocked.	Board or control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**
S032 **SYSTEM ERROR CONTACT TECH. SERVICE**	Check through watchdog that one of the main tasks is not blocked (e.g. infinite loop).	Control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**
S034 **SYSTEM ERROR CONTACT TECH. SERVICE**	Structural integrity error on RAM data and parameters used in the cycle.	Control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**
S035 **SYSTEM ERROR CONTACT TECH. SERVICE**	Solenoid valves activated in a combination that is not permitted (check hydraulic ducts).	Control software malfunction when managing solenoid valves.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**

CODE AND MESSAGE ON THE DISPLAY	DESCRIPTION	Possible causes / Checks	Solution	ERROR OUTPUT (**)
S040 **LOG SAVE ERROR CONTACT TECH. SERVICE**	Error while saving a Log in the Flash Memory.	Control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**
S041 **4-MINUTE STERILIZATION COMPLETED**	Error in the selection of process time 5.5' option for the concerned cycles only.	Board or control software malfunction.	RESET following the instructions. Try to restart the program a second time. Try to set the option again from Service. If the problem persists replace the PCB.	**2**
S050 **CONFIGURATION SAVED REMOVE USB KEY SWITCH OFF AND SWITCH ON THE DEVICE**	Device configuration after REF saving has been completed.			**1**
S051 **FAILED START. SWITCH OFF/ON THE DEVICE. IF THE PROBLEM PERSISTS, CONTACT TECH. SERVICE**	START failed. Switch off/on the device. If the problem persists, contact Technical Service.	Process board and L4 board failed to communicate. This also happens when the process board is new.		
S099 **PROBLEM IN CREATING CYCLE REPORT CONTACT TECH. SERVICE**	Problem when issuing the cycle report.	Board or control software malfunction.	Try to restart the program a second time. Try to replace the USB key.	**2**
S100 **SYSTEM ERROR CONTACT TECH. SERVICE**	Internal management control of the state machine that manages the process.	Board or control software malfunction.	RESET following the instructions. Try to restart the program a second time. If the problem persists, replace the PCB.	**2**

(**)
1 = OK (warning) - Tap OK on pop-up window.
2 = OK + door unlock / RESET - Keep OK pressed for 3 seconds on the pop-up window and the autoclave will start the procedure to open the door in full safety. When the RESET key appears in the left area of the LCD, hold it pressed for 3 seconds.

7. TECHNICAL SHEETS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

7.1. TECHNICAL SHEET ST01 - STEAM GENERATOR (ON ALL MODELS)

The STEAM GENERATOR is secured to the rear/left upright of frame and can be accessed after removing the left side panel and the rear panel.

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

WARNING:
The STEAM GENERATOR can become very hot and may reach temperatures above 150°C (302°F); check the reading of PT2 – generator temperature probe in the SERVICE menu before removing the side covers.
Power off the autoclave and disconnect the power mains cord before removing the side covers.

The GENERATOR is protected by a ceramic insulating covering that must be refitted after completing any maintenance operation; two double insulating washers are required at each fastening point to the frame and they must be refitted correctly.

GENERAL CHARACTERISTICS

The generator is made of a cylindrical outer body and a grooved inner core that are connected by a threaded coupling; the two sections can be separated for maintenance purposes.
Pressure is sealed between cylindrical body and inner core thanks to two O-rings placed on the core; these O-rings must be replaced each time the generator is disassembled.
The cylindrical body accommodates:
- PT2 - generator temperature probe, housed in a suitable seat, secured with a retaining screw; PT2 can be removed and replaced
- Safety thermostat – 300°C (572°F) operation threshold – manual reset
- Water inlet fitting – bottom
- Steam outlet fitting – top

The grooved inner core accommodates the heating element:
- 2000W/230V with a value of 26.6 ohm – (ROW versions / US/CA versions 240V-60Hz)
- 1500W/120V with a value of 9,6 ohm – (US/CA versions 120V-60Hz)

Resistance values can be measured directly at the points where the heating element is connected to the main PCB using a common tester.

SERVICE OPERATIONS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

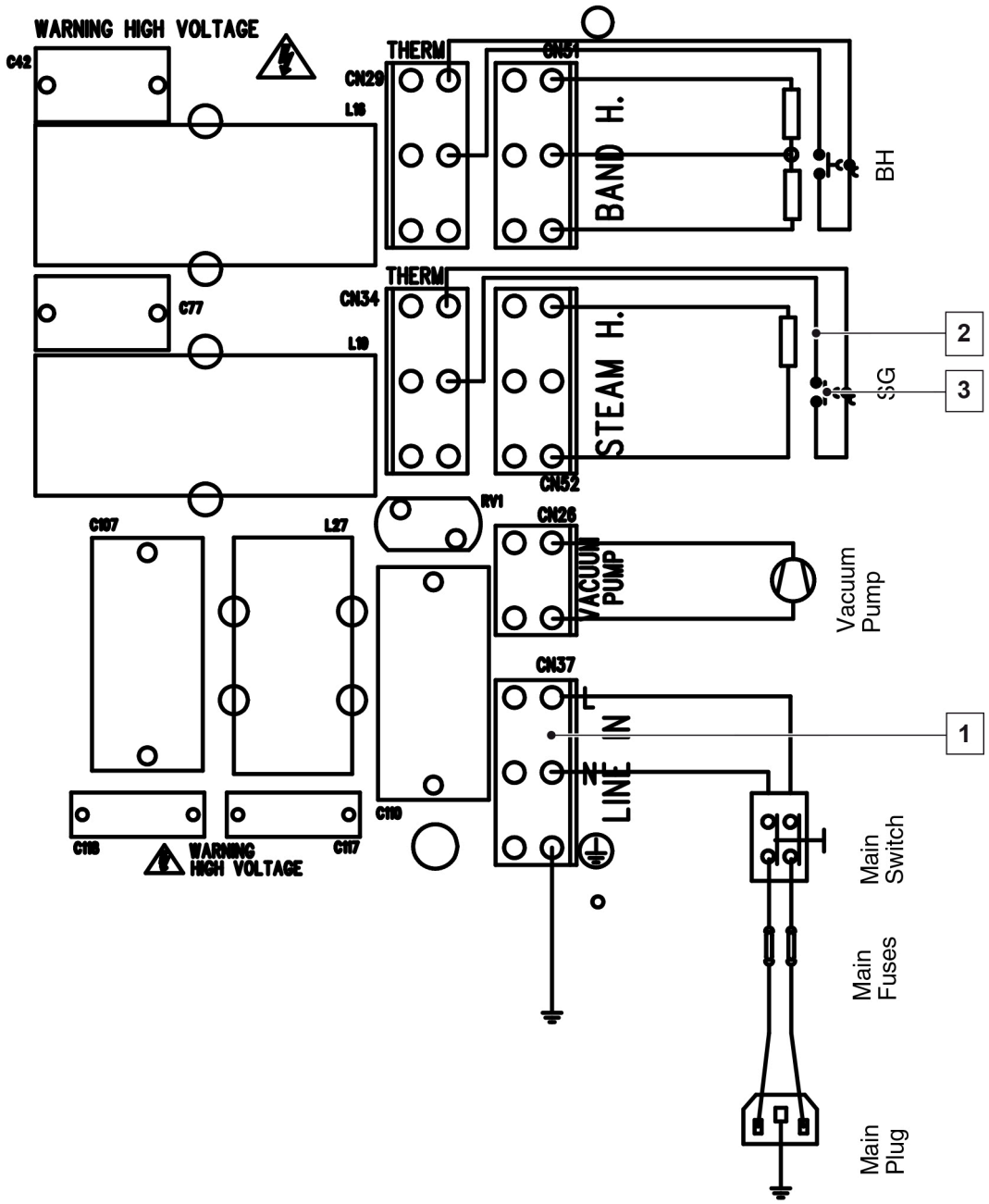
Replacing the safety thermostat
The thermostat can be removed without taking off the external heat insulation.
Disconnect the wirings connected to the safety thermostat, remove the 2 fastening screws, position the new thermostat and secure it using the 2 screws; reconnect the wirings.

Replacing the heating element
- Remove the 2 fastening screws and their double insulating washers.
- Open the lower section of the heat insulator, remove the retaining screw that holds the heating element in place, withdraw the heating element from its seat in the middle of the central core.
- Insert the new heating element gradually to let air flow out and push until fully home.
- Lock the heating element in place using the locking screw.
- Restore insulation using aluminium tape and refit the generator onto the support.
- Add heat-dissipating paste on the heating element.

Replacing the PT2 probe
- Remove the 2 fastening screws and their double insulating washers.
- Disconnect the wiring of PT2 probe from the main PCB located in the right lateral side of the device.
- Remove the retaining screw and pull the probe out of the seat in the generator outer body.
- Position the new probe and lock it with the suitable screw.
- Re-connect PT2 wiring to general PCB.
- Restore insulation using aluminium tape and refit the generator onto the support.

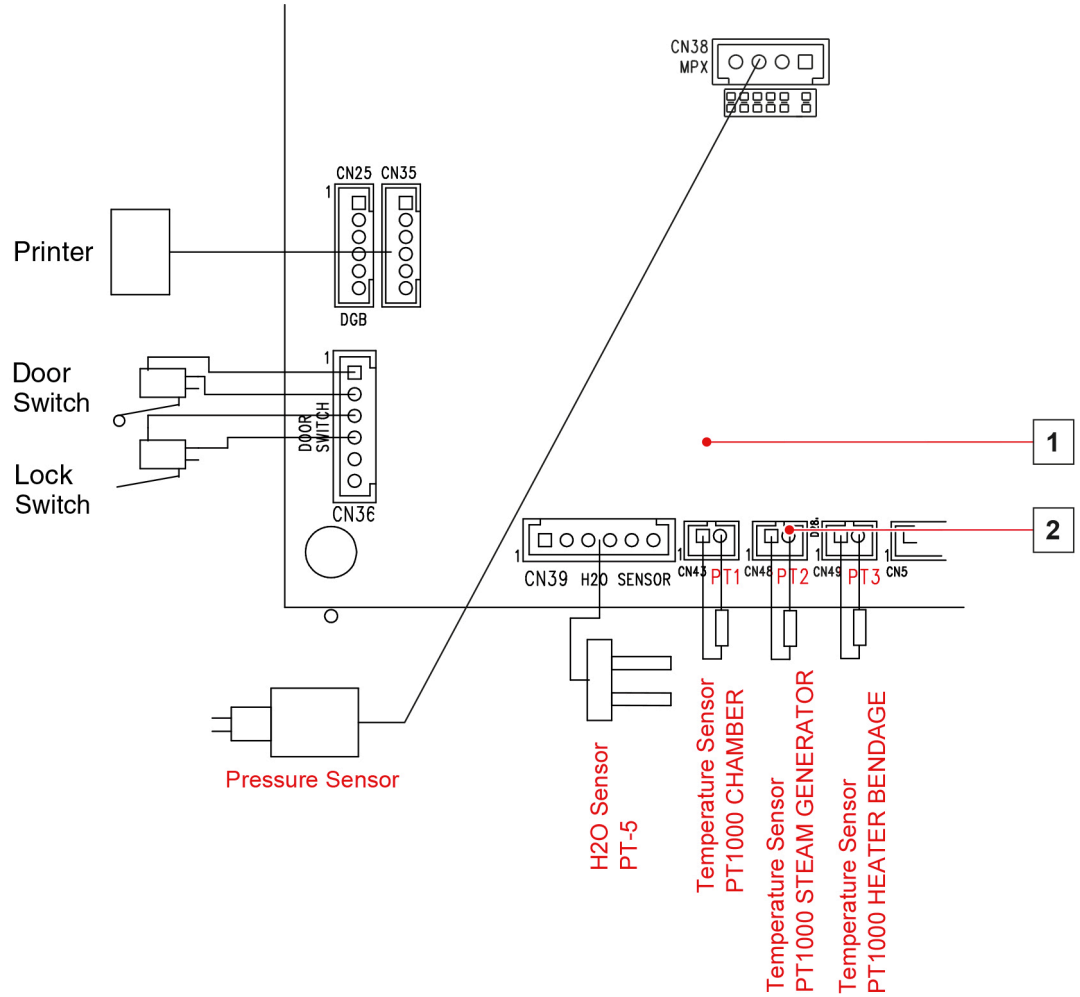
Cleaning inside of generator
- Remove the 2 fastening screws and their double insulating washers.
- Remove the 2 black stainless steel clamps to disconnect inlet and outlet reinforced pipes.
- Disconnect the wiring connected to the safety thermostat.
- Disconnect the wiring of PT2 probe from the main PCB.
- Remove the external heat insulation.
- Lock the central core from the 2 suitable flats at the sides of the heating element seat.
- Unscrew the internal body of the generator to extract it.
- Remove any residue from the central core.
- Clean the inside of generator body.
- Remove the 2 O-rings from the central core and replace them with new O-rings wetted with water and soap or with silicone grease.
- Screw the central core fully home onto the outer body until reaching the mechanical stop.
- Restore insulation using aluminium tape and refit the generator onto the support.
- Reconnect the reinforced pipes and secure them in place using new black stainless steel clamps.
- Reconnect the safety thermostat wiring and PT2 probe wiring.

GENERATOR HEATING ELEMENT TO GENERAL CARD CONNECTION

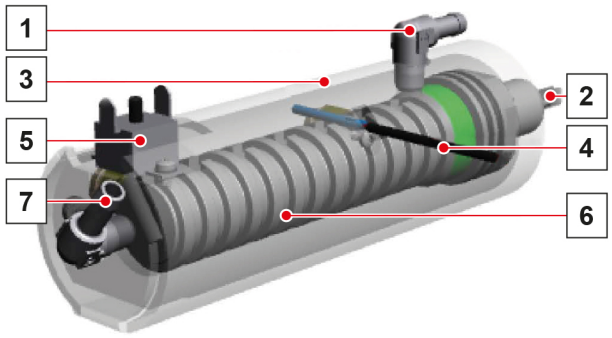


1 Autoclave main board
2 Heating element connection
3 Safety thermostat

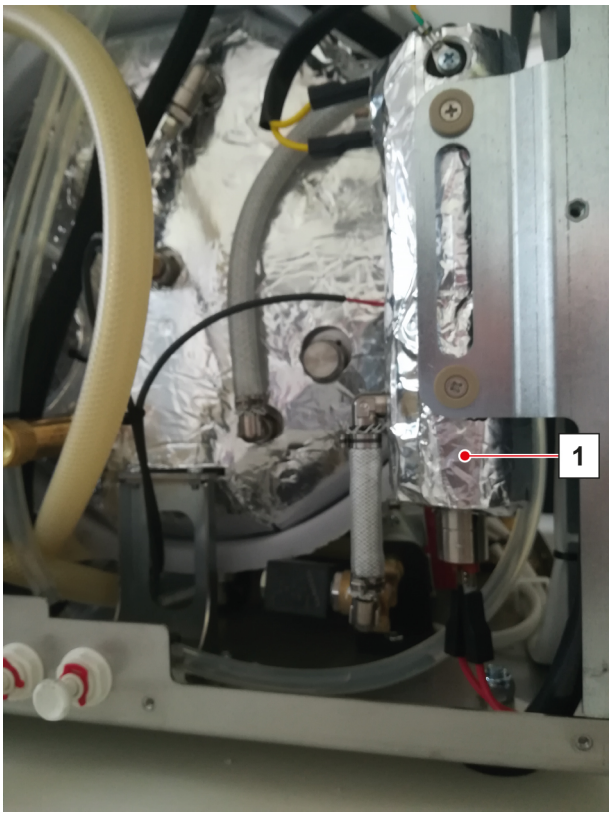
PT2 PROBE TO GENERAL CARD CONNECTION



1 PCB
2 PT2 wiring connection



1 Water inlet
2 Heating element
3 Cylindrical outer body
4 PT2 probe
5 Safety thermostat
6 Inner core
7 Steam outlet



1 Steam generator complete with heat insulation

7.2. TECHNICAL SHEET ST02 - MANIFOLD

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

The MANIFOLD is positioned on the left side of the chamber. For maintenance operations, open the left side panel secured with 6 screws. It is not necessary to disconnect pipes and wiring.
Solenoid valves feature 24Vdc coils - Class H, suitable for temperatures up to 150°C (302°F).
The power supply of solenoid valves has an inrush current of 24Vdc reduced to 16Vdc during operation.
The connection requires a common (black) wire and one specific wire per solenoid valve; note down the colours before disconnecting them.
The five solenoid valves are clearly identified by the relevant number engraved on the back side of the MANIFOLD.
The seat of EV1 and EV3, which control the steam drainage from the chamber, is in stainless steel.

FUNCTIONAL CHARACTERISTICS OF SOLENOID VALVES

- EV1 — 2 ways, normally open **(NO)**
- EV2/EV3/EV5 — 2 ways, normally closed **(NC)**
- EV4 — 3 ways

In case of blackout, EV1-NO allows rebalancing the chamber pressure and opening the door manually.

OPERATION

EV1 NO connected in the chamber upper part, controls the steam drainage during pressure release phases (vacuum pulses, cycle end, drying pulses). It is powered (closed) during all the pressure maintaining phases.

EV2 NC connected to the MANIFOLD filter, controls the air at atmospheric pressure flowing into the external circuit of the chamber, preventing any negative pressure values that could cause problems for vacuum pump start.

EV3 NC connected to the lower part of the chamber (chamber filter), controls the condensate drain in the pressure release phases.

3-Way EV4 connected to the heat exchanger, vacuum pump and the discharge tank, controls the condensate steam direct drainage to the tank; when the chamber pressure value decreases and reaches P=0.10 bar, it deflects the heat exchanger outflow towards the vacuum pump.

EV5 NC connected to the bacteriological filter, controls the filtered air flow towards the chamber during the balancing phase at the end of the cycle; the filtered air flow is delivered to the chamber through EV1, which is closed during the pressure balancing phase.

SERVICE OPERATIONS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

It is possible to work on each solenoid valve to perform operations concerning:
- Check and cleaning of solenoid valve seat.
- Check and cleaning of the slider.
- Replacement of the complete slider/slider-holder unit.

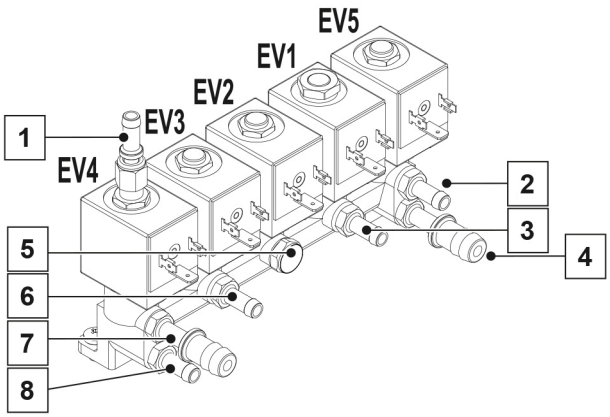
For solenoid valves EV1 - EV2 - EV3 - EV5, proceed as follows:
- Disconnect the power wiring (2 wires) from the coil (note down the colours before disconnecting them).
- Unscrew the coil retaining nut.
- Slide the coil out of the slider-holder unit.
- Unscrew the slider-holder unit using a hexagonal wrench; do not act on the cylindrical body of the slider-holder unit, taking care do not affect it in any way.

For the reassembly, follow the operations described in reverse order.

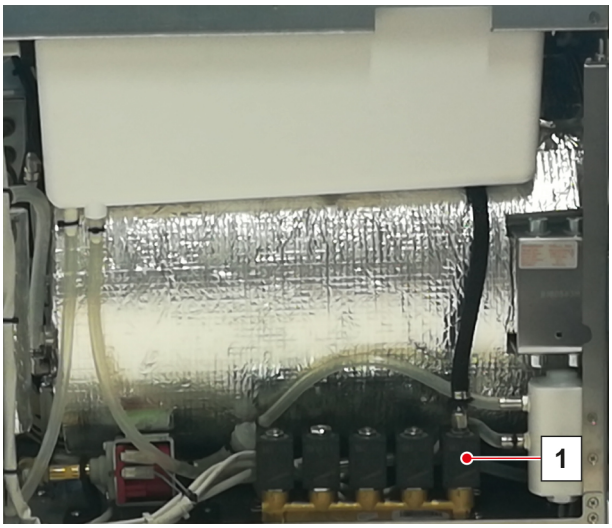
For EV4 only, proceed as follows:
- Disconnect the power wiring (2 wires) from the coil (note down the colours before disconnecting them).
- Remove the locking clamp to disconnect the pipe fixed to the upper fitting.
- Unscrew the upper pipe holder fitting complete with intermediate fitting.
- Unscrew the coil retaining nut and slide it out from the slider-holder unit.
- Using the hexagonal wrench, unscrew the slider-holder unit.

WARNING:
Do not act on the cylindrical body of the slider-holder unit, taking care do not affect it in any way.

For the reassembly, follow the operations described in reverse order. Use a new stainless steel clamp.



1 EV4 - discharge towards used water tank
2 EV5 - bacteriological filter inlet air
3 EV1 / EV3 - outlet towards heat exchanger
4 EV1 – inlet: steam drainage from upper chamber outlet
EV1 – outlet: chamber levelling air flow, from EV5/bacteriological filter
5 Air Inlet
6 EV3 - chamber discharge inlet - chamber filter
7 EV4 - capacitor steam inlet from heat exchanger
8 EV4 - outlet towards vacuum pump



1 Manifold

7.3. TECHNICAL SHEET ST03 - DOOR CLOSING UNIT

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

The autoclaves are equipped with a motorised door closing and locking device that uses a worm screw system, driven by the door gearmotor powered with 24Vdc.
The door servomotor unit is secured to the right side of the chamber and can be accessed after removing the right side panel.

The servomotor unit includes a vertical gearmotor which transmits the drive to a horizontal drive shaft ending with a worm screw with a trapezoidal cross-section.

The latter, once activated, is screwed to the threaded bushing fitted on the porthole support crossbar, making the porthole move until the door is closed and then locked.
To ensure a silent rotation and a better resistance to effort, the shaft rotates on a ball slewing ring positioned inside the front support of the servomotor unit.
The servomotor unit activation is controlled by the door itself, by means of an actuator pin which acts on the door ajar microswitch.
In this first closing phase, the servomotor unit, supported by the sliding plate in anti-friction material, reacts mechanically moving forward and sliding on the steel pins. The closing phase ends when the end-of-stroke microswitch is activated and stops the servomotor.
When the cycle starts, the gearmotor is activated; it stops when a value ranging from 3.2 to 3.6A is reached.
Upon the first vacuum pulse, with a negative pressure of -0.80 bar, the door is further closed by approx. ½ of the shaft rotation, ensuring a perfect sealing of the closure.
The opening command allows the servomotor to move back, freeing the door, which is moved away from the chamber thanks to the thrust of the actuator pin; the end-of-stroke microswitch and the door ajar microswitch are disabled in this phase.

SERVICE OPERATIONS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

Replacing the gearmotor

- With the door open, remove the Benzing ring from the rear side to unlock the gearmotor of the drive shaft.
- Remove the gearmotor carefully, making it slide towards the rear part, without removing the front retaining ring and the pre-load spring washer.
- Check the correct positioning of the front retaining ring and of the pre-load washer and insert the new gearmotor in the drive shaft.
- Exert a moderate pressure on the gearmotor to facilitate the insertion of the Benzing ring.

Replacing shaft / worm screw

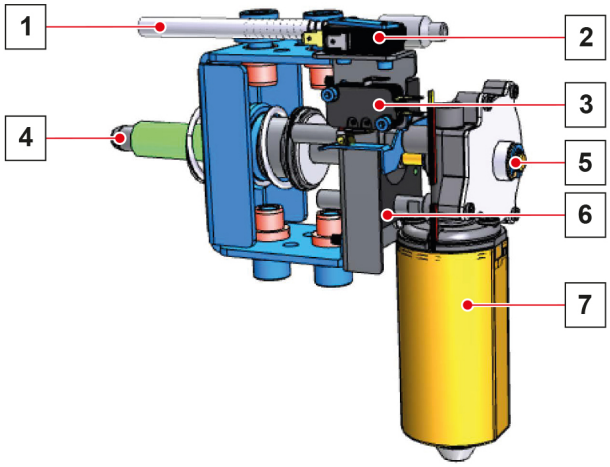
- With the door open, remove the Benzing ring from the rear side to unlock the gearmotor of the drive shaft.
- Remove the gearmotor carefully, making it slide towards the rear part, removing the front retaining ring and the pre-load spring washer.
- Remove the 4 screws securing the full shaft support plate to the servomotor support.
  For an easier operation in models equipped with HX10P3 vacuum pump, extract the pump from the autoclave.
- Slide the support out, complete with shaft/worm screw, actuator pin, plate and sliding pins, ball slewing ring.
- Insert the new complete support; check the correct positioning of the slewing ring and of the actuator pin and lock it using the 4 retaining screws.
- Check the correct positioning of the front retaining ring and of the pre-load washer and insert the new gearmotor in the drive shaft.
- Exert moderate pressure on the gearmotor to facilitate the insertion of the Benzing ring.

Replacing the door closed microswitch

- With the door open, disconnect the microswitch connectors (note down the position of connections).
- Remove the 2 screws and the retaining washers.
- Position the new microswitch, fixing the 2 screws and washers, connect the wiring.

Replacing the door ajar microswitch

- With the door open, disconnect the microswitch connectors (note down the position of connections).
- Remove the 2 screws and the retaining washers.
- Position the new microswitch, fixing the 2 screws and washers; connect the wiring.



1 Servomotor actuator pin
2 Door ajar microswitch
3 Closed door microswitch
4 Shaft with worm screw
5 Rear spring ring
6 Servomotor sliding plate
7 24Vdc gearmotor

7.4. TECHNICAL SHEET ST04 - PRESSURE TRANSDUCER - SAFETY PRESSURE SWITCH

PRESSURE TRANSDUCER

The pressure transducer detects the internal pressure during the various cycle phases and generates an electrical signal that is sent to the main PCB.

WARNING:
No repair interventions can be performed on the pressure transducer.

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

Should it be necessary to replace the pressure transducer:
- Remove the right-side external covering panel.
- Remove the protective cover of the main PCB, which is held in place by 5 snap locks and a screw.
- Fully unscrew the locking ring nut from the support and from the lower fitting.
- Disconnect the transducer wiring from the main PCB.
- Loosen the retaining nut of the transducer and slide it out of the support.
- Place the new transducer in the relevant seat and secure it with the nut.
- Reconnect the transducer wiring to the main PCB, making sure to correctly position the connector.
- Cut the final part of the TEFLON pipe, removing the section previously inserted on the fitting.
- Insert the TEFLON pipe on the fitting, locking it with the retaining ring nut.

NOTE
This operation must be performed making sure that the tightening is not excessive, in order to prevent any damage to the pipe.

SAFETY PRESSURE SWITCH

The safety pressure switch stops the power supply to the door closing system unit when the pressure is positive inside the chamber.

With pressure values below 0.40 bar, the pressure switch:
- Is not activated.
- The power contact of the gearmotor is closed (red and white wires).
- The safety contact is open (red and black wires).
- The door motor-driven opening can be activated.

With pressure values above 0.40 bar, the pressure switch:
- Is activated (safety condition).
- The power contact of the gearmotor is open.
- The safety contact is closed, short-circuiting the gearmotor control relay.
- The door motor-driven opening cannot be activated.

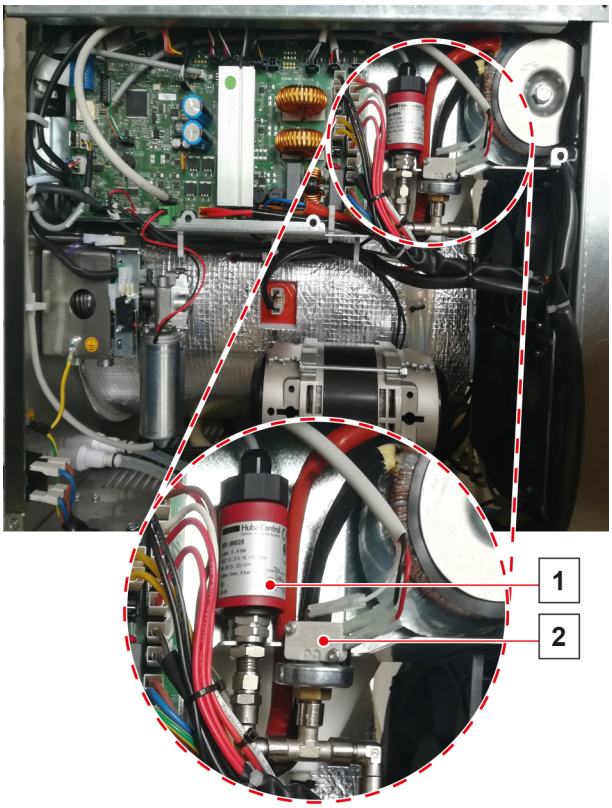
SERVICE OPERATIONS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

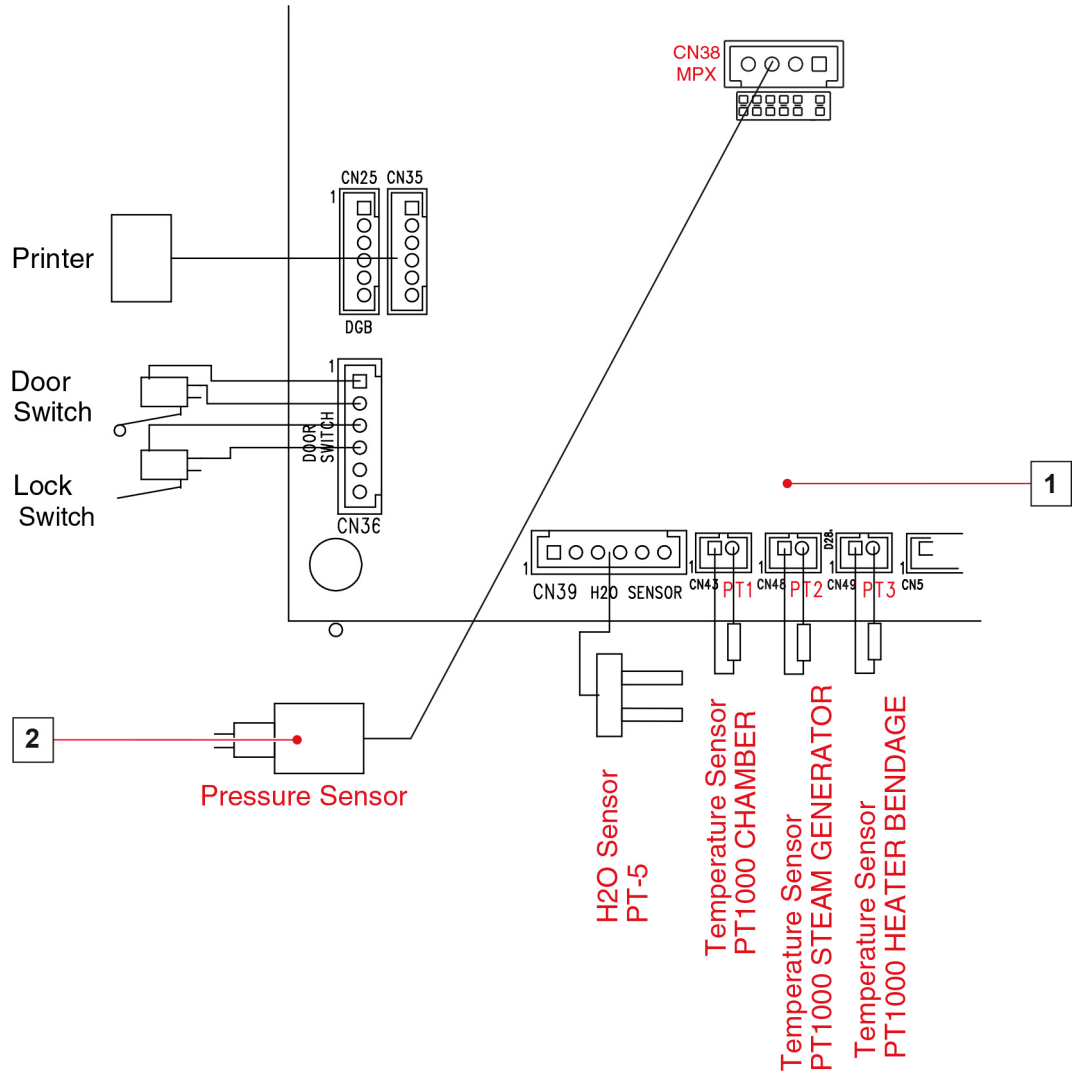
WARNING:
No repair interventions can be performed on the safety pressure switch.

Should it be necessary to replace the safety pressure switch:
- Remove the right-side external covering panel.
- Remove the protective cover of the main PCB, which is held in place by 5 snap locks and a screw.
- Fully unscrew the ring nut retaining the TEFLON pipe from the lower fitting of the pressure switch, slide the pipe out of the fitting.
- Disconnect the pressure switch wiring making sure to note the correct position of the 3 wires.
- Loosen the retaining nut of the pressure switch and slide it out of the support.
- Place the new component in the relevant seat on the support, locking it with the retaining nut.
- Reconnect the pressure switch wiring to the main PCB, making sure to correctly position the wires.
- Cut the final part of the TEFLON pipe, removing the section previously inserted on the fitting.
- Insert the TEFLON pipe on the fitting, locking it with the retaining ring nut.

NOTE
This operation must be performed making sure that the tightening is not excessive, in order to prevent any damage to the pipe.



1 Pressure transducer
2 Safety pressure switch



1 PCB
2 Pressure transducer

7.5. TECHNICAL SHEET ST05 - PT1 PROBE - CHAMBER TEMPERATURE READING

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

Temperature inside the chamber is measured by a probe, termed PT1, which sits in the middle of the chamber back wall; this position ensures more accurate readings and reduces the chances of the probe contacting the load placed inside the chamber.
The probe is the PT1000 and features the following resistance ratings:
- 1000 Ω at 0°C (32°F)
- 1500 Ω at 130.4°C (266.72°F)

In addiction, to ensure improved accuracy, the actual resistance reading given by the sensor PT1 at 130.4°C (266.72°F) is stamped on the probe
This value is stored in the autoclave at the factory and must be checked/modified when the probe is replaced.

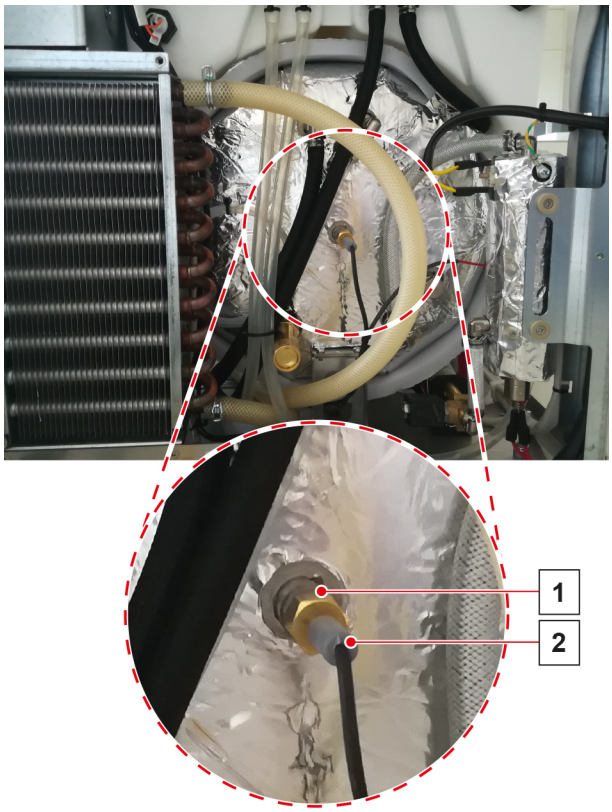
The PT1 probe is connected to the general PCB, which incorporates a probe input calibration circuit, which automatically checks calibration during operation.
Automatic input calibration is provided for the other probes as well as:
PT2 – Steam Generator,
PT3 – Chamber tube bundle heating element,
which do not require any manual setting.

SERVICE OPERATIONS

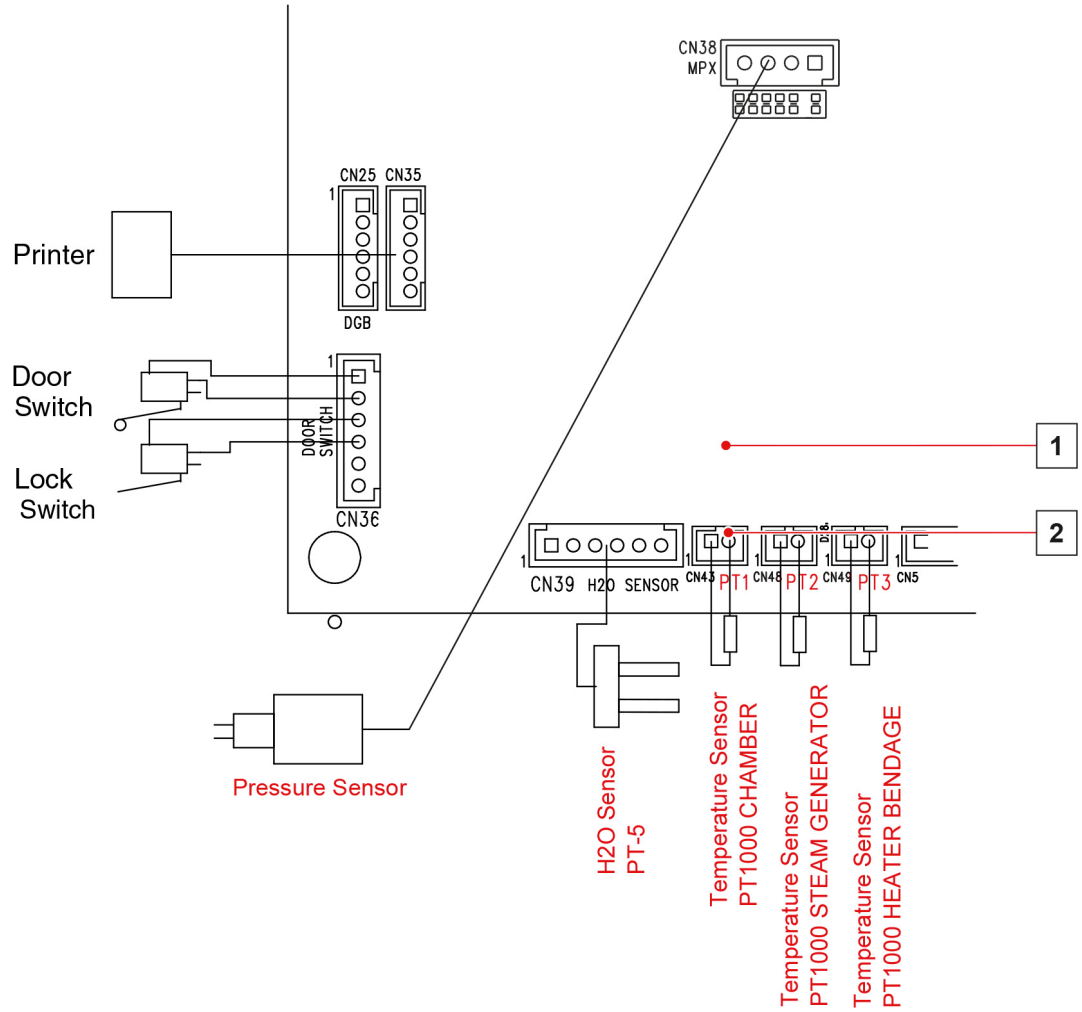
WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

Replacing PT1
- Remove the right side cover and the metal rear cover to gain access to the main PCB and the rear area of the chamber.
- Remove the protective cover of the main PCB, which is held in place by 5 snap locks and a screw.
- Disconnect the PT1 probe wiring from the main PCB.
- Loosen the fastening ring nut of PT1 probe to release it completely.
- Unscrew the nut located inside the boiler and remove the ceramic cover.
- Slide PT1 probe, complete with ring nut, out of its seat.
- Mark the new PT1 probe at a position 60mm (2.36 inches) away from the probe end and measure its actual reading at 130.4°C (266.72°F), which is stamped on the wiring output terminal.
- Fit a new fastening ring nut and a new taper fitting onto the new probe.
- Insert the probe into its seat; making sure not to distort or bend the probe.
- Fix the probe with the ring nut, making sure to place the mark at 60mm (2.36 inches) flush with the ring nut itself, when the latter is tightened.
- Position and connect the probe wiring; the connector has a mounting position, be sure to observe it.

When you have installed the new probe and refitted the board protective cover and the external covers, you will need to check/modify the PT1 value stored at the factory as follows:
- Activate the device.
- Access the SETTINGS menu.
- Access the SERVICE menu using PIN **7242.**
- Select the PT1 CALIBRATION menu.
- Compare the value at 130.4°C (266.72°F) stored with the actual reading of the new PT1.
- Change and confirm the new value if needed.

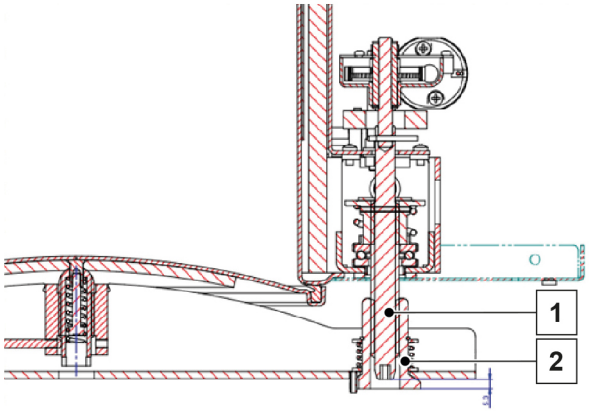


1 PT1 PROBE complete with fastening ring nut
2 PT1 actual reading at 130.4°C (266.72°F)



1 PCB
2 PT1 wiring connection

7.6. TECHNICAL SHEET ST06 - DOOR ADJUSTMENT



1 Worm screw
2 Threaded bushing

The image above indicates the optimal value - equal to 5.3mm (0.21 inches) - read with the door **locked**, between the outer surface of the threaded bushing, fitted on the door crossbar, and the head of the worm screw, activated by the door closing system.
A tolerance of +/- 0.5 mm (0.020 inches) is permitted on the indicated value [min. value 4.8mm (0.189 inches) / max. value 5.8mm (0.223 inches)].

The value of 5.3mm (0.21 inches), which is the same for all the models of autoclave, depends on the position of the stainless steel door with respect to the door crossbar.
The door position can be changed by adjusting it; this operation is performed at the factory and, usually, there is no need to repeat it.
Checks / adjustments are required only in case of replacement of one of the mechanical parts of the closing system - door, door crossbar, threaded bushing, worm screw.

To read the value indicated above and perform, if necessary, the adjustment of the door, use the manual command of the closing system from the SERVICE / COMPONENT TEST / DOOR menu.

7.7. TECHNICAL SHEET ST07 - CONDUCTIVITY SENSOR

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

The conductivity sensor is located inside the demineralized water tank.

G4 17 – G4 22 – G4 28

Conductivity sensor

SERVICE OPERATIONS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

- Empty both the demineralized water tank containers.
- Remove all the covers and disconnect connector CN39 (H_2O Sensor) from the PCB.
- Disconnect all the pipes connected to the tank and the electrical connections.
- Remove the retaining screws and extract the tank to access the sensor and replace it.

7.8. TECHNICAL SHEET ST08 - VIBRATION PUMP UNIT

WARNING:
The service activity on this component requires the side covers removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).

The vibration pump unit, powered with 24 Vdc - 48 W, controls the water flow through EV6 and allows it to enter the steam generator.
In the brass part inside the vibration pump, there is a check valve which prevents any back pressure.

Vibration pump unit

SERVICE OPERATIONS

WARNING:
Before performing any type of operation on internal components, turn off the autoclave and disconnect the mains cable.

- Empty the demineralized water tank.
- Remove the left side cover.
- Disconnect all the pipes connected to the pump and the electrical connection. Remove the two retaining screws, extract the pump and replace it.

To replace the water filter, remove the clamps.
Replace filter and clamps, close the device again and reset the “filter replacement” message via the relevant SERVICE MENU.

7.9. TECHNICAL SHEET ST09 - MAIN PCB - REPLACEMENT PROCEDURE

The service activity on this component requires the side cover removal. Once the intervention has been completed, correctly refit all covers and carry out the SAFETY TEST (including dielectric strength and ground continuity tests).
New printed circuit board ref. 97668177, suitable for all Bravo G4 models and complete with connectivity module, is supplied as following:

- Bootloader SW pre-loaded
- Main board FW not loaded
- Connectivity module FW not loaded

The following device data:

- Model reference
- Serial no.
- PT1 – chamber temperature probe value

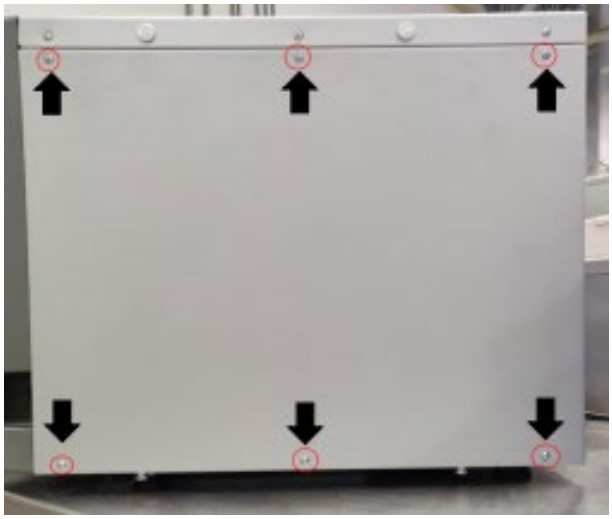
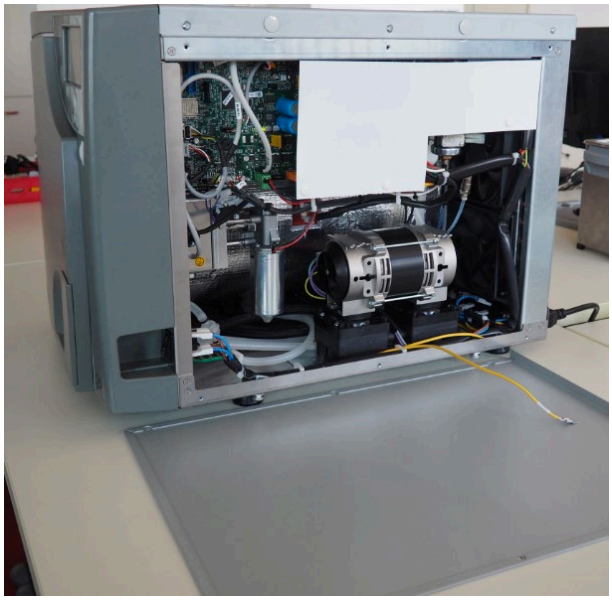
are not pre-set and memorized/saved in the internal memory.
The cycle counter is set to 00000 cycle.
Upon completion of the replacement activity, it is required to upload the FW and perform device data recovery.

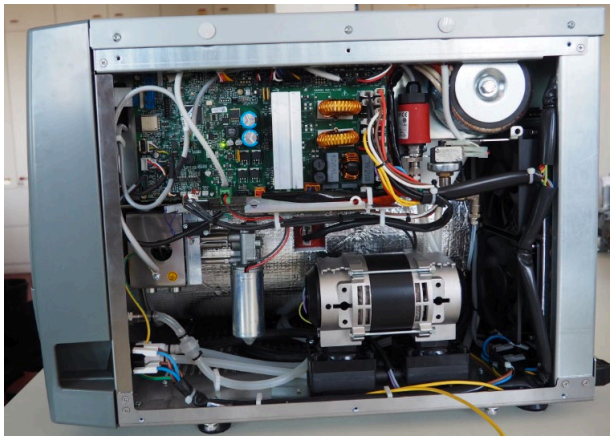
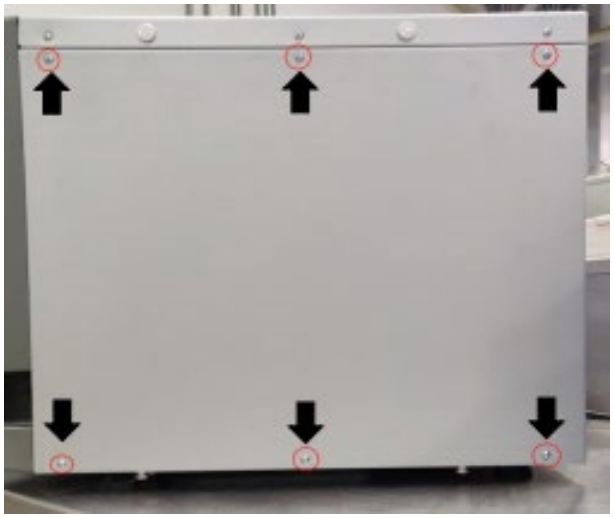
ACTIONS PRIOR THE PCB REPLACEMENT
Before proceeding with the main PCB replacement, it is mandatory to prepare the USB memory stick, upload the FW files to be used for new main PCB, programming device data recovery, and collecting all data to be recovered on the new PCB.

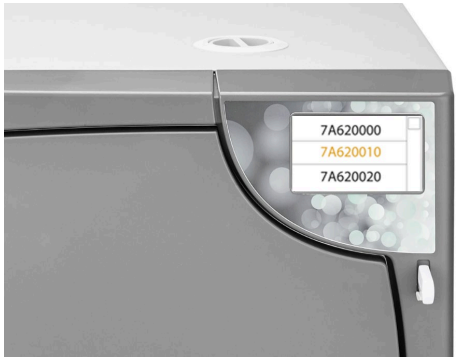
USB MEMORY STICK PREPARATION	
FW available as a compressed.zip folder containing 5x files.	
Upload the files (unzipped) to the USB memory stick root.	

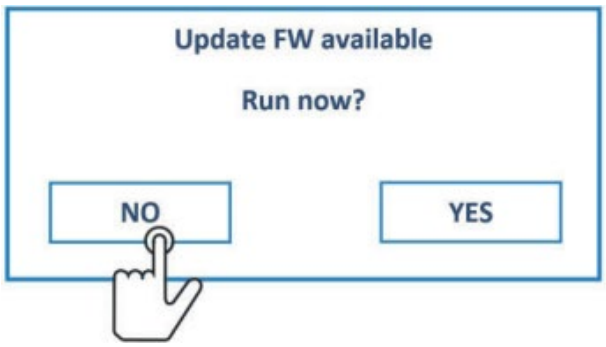
DEVICE DATA RECOVERY

- Model reference, shown on the device ID label, applied to the device back plate.
- Unit serial no, shown on the device ID label, applied to the device back plate.
- PT1 probe value at 130.4°C (266.72°F). Refer to 7.5. TECHNICAL SHEET ST05 – PT1 PROBE – CHAMBER TEMPERATURE READING to find it.
- Cycle counter.

MAIN PCB ref. 97668177 – REPLACEMENT PROCEDURE	
Switch OFF the unit. Disconnect the power supply cord from the mains.	
Remove the right-side cover, secured by 9 x screws, to gain access to main PCB.	
Remove the white plastic protection cover.	

Disconnect all cables from main PCB. Pay careful attention to the relevant positions/plug no. Proceed with main PCB removal, secured by 1 screw (left/lower corner) and 7 snap supports. Install new PCB, taking care of the correct snap support insertion. Secure the PCB by means of the screw (left/lower corner). Connect back all cables. Take care to correctly fasten the display cable flat into the slot.	
Install and secure the right-side cover. Connect the power supply cord to the mains.	
With the unit OFF, plug the USB memory stick (already loaded with the FW files) into the unit.	
MAIN BOARD FW upload With USB memory stick plugged into the unit, switch the unit ON. The FM upload will start automatically.	

Step 1 - Display calibration This action is required to calibrate the touch screen sensitive area. Touch the LCD screen with a pen tip, touching each of the 4 crosses (+) shown in sequence.	
Step 2 – Model reference memorisation This action is required to enter the product code, specific for each model (based on chamber volume, power supply). Select the correct product code by scrolling through the available options. Confirm the chosen code. The model reference is shown on the device ID label located on the rear panel. Remove the USB stick and the device restart automatically. The main board FW upload is complete.	
CONNECTIVITY FW upload. With the unit ON, plug the USB memory stick into the front USB port The upload will start automatically once the USB and FW files are detected.	

Step 1 – Main board FW update request Answer NO since the main board FW upload has already been completed.	
Step 2 – Connectivity module FW update request Confirm **YES** to activate the upload.	
A pop-up message is displayed while running the cloud FW update process.	
Once the update is complete, the LCD will automatically display the HOME screen. Remove the USB memory stick.	

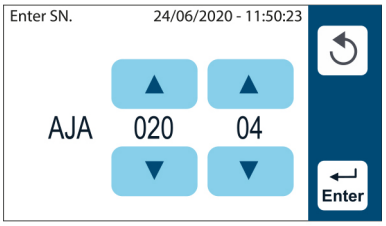
Once the main board FW & connectivity module FW uploads are complete, proceed with the recovery of:
- Device serial no.
- PT1 – chamber temperature probe value.

Both required actions can be made using the dedicated controls available in the SERVICE MENU.

DEVICE SERIAL No. MEMORISATION

Refer to Chapter 5. SERVICE MENU:
- Action SQ1 - to access the Service menu.
- Action SQ3 - to enter the SN menu.
- Action SQ30 - to enter the device serial no.

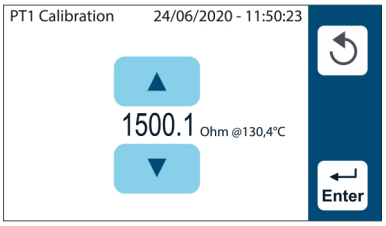
Press ENTER to store the serial no, unique for of each individual autoclave. Use the two counters to edit the serial no., confirm with ENTER.
The first three digits are automatically assigned when the Model reference is entered.



PT1 – CHAMBER TEMPERATURE PROBE VALUE

Refer to Chapter 5. SERVICE MENU:
- Action SQ1 - to access the Service menu.
- Action SQ3 - to access to PT1 probe calibration.
- Action SQ20 - to enter the PT1 value.

The PT1 calibration function lets you store the typical PT1 reading, at 130.4°C (266.72°F). Use the counter to edit the value, and confirm by pressing ENTER.
Leave the SERVICE menu.

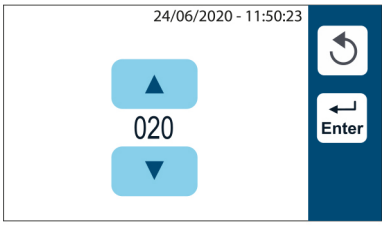


If required, it's possible to proceed with the COUNTER RECOVERY which allows the device cicle counter to recovered to the total number of cycles already performed before the main PCB replacement.

COUNTER RECOVERY

Refer to Chapter 5. SERVICE MENU:
- Action SQ1 - to access the Service menu.
- Action SQ3 - to access the Cycle Counter recovery.
- Action SQ37 - to enter the cycle number.

The function COUNTER RECOVERY lets you edit the cycle number. Confirm cycle count by pressing ENTER.
COUNTER RECOVERY is available only when the counter at 00000.



8. TECHNICAL MAINTENANCE

In addition to correct use, the user performs regular basic maintenance in order to guarantee efficient operation over the device's entire life.
In order to grant full device efficiency, additional routine checks with regular periodic check-ups must be performed by Technical Service. It is also fundamental to perform a **periodic sterilizer validation**, i.e. a check of process thermo-dynamic parameters and their comparison with the reference values detected by duly calibrated tools. Refer to chapter 'GUIDELINES-SAFETY TEST-VALIDATION' included in this Technical Service Manual.

8.1. MAINTENANCE PROGRAMME

The table summarises the maintenance interventions required to maintain the sterilizer efficiency and performances. Relevant Warnings messages, displayed by the unit, recall to some maintenance activities in charge to User and/or Service.

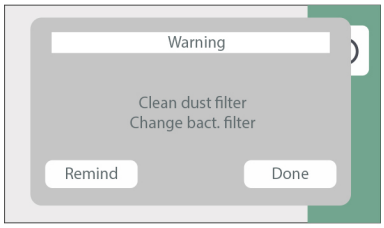
<table>
<tr><th>SCHEDULE</th><th colspan="2">ACTIVITY</th><th>PERFORMED BY</th></tr>
<tr><td>DAILY</td><td colspan="2">Clean the Door Gasket and the internal part of the door</td><td>USER</td></tr>
<tr><td>WEEKLY</td><td colspan="2">Clean external surfaces.
Clean the sterilization chamber and its accessories.
Clean the anti-dust filter.</td><td>USER</td></tr>
<tr><td>MONTHLY</td><td colspan="2">Clean the internal water tank (ref. User Manual).</td><td>USER</td></tr>
<tr><td rowspan="8">PERIODICALLY</td><td colspan="2">Warnings related to Scheduled Maintenance are displayed with the following frequency.</td><td rowspan="2"></td></tr>
<tr><td>WARNING MESSAGES</td><td>FREQUENCY</td></tr>
<tr><td>Chamber Filter Cleaning.</td><td>250 cycles or 3 months.</td><td>USER</td></tr>
<tr><td>Door Lock Lubrication.</td><td>250 cycles or 3 months.</td><td>USER</td></tr>
<tr><td>Anti-Dust Filter Cleaning.</td><td>500 cycles or 3 months.</td><td>USER</td></tr>
<tr><td>Bacteriological Filter Replacement.</td><td>500 cycles or 6 months.</td><td>USER</td></tr>
<tr><td>Door Gasket Replacement.</td><td>1000 cycles* or 1 year.</td><td>SERVICE</td></tr>
<tr><td>General Service.</td><td>3000 cycles ** or 3 years.</td><td>SERVICE</td></tr>
<tr><td>YEARLY</td><td colspan="2">Sterilizer validation (chapter 'GUIDELINES-SAFETY TEST-VALIDATION') ***.
Door Gasket Replacement*.
Clean the internal water tank.</td><td>SERVICE</td></tr>
</table>

* Replacement every 1000 cycles or 1 year, whichever is first.
** Replacement every 3000 cycles or 3 years, whichever is first.
***Depending on local guidelines or regulations.

8.2. SCHEDULED MAINTENANCE MESSAGES

The sterilizer periodically displays warning messages relevant to "routine" maintenance operations, required to ensure the proper operation of the device.

Press DONE to confirm that the required operation has been made.
The relevant cycles counter will be reset.
Press REMIND button to postpone the operation.
The warning message will reappear the next time the sterilizer is used.



The cycle counter, related to SCHEDULED MAINTENANCE MESSAGES display, can reset in advance using the SERVICE RESET menu (SQ34) from SERVICE mode.

8.3. DESCRIPTION OF MAINTENANCE INTERVENTIONS

8.3.1. DOOR GASKET AND THE INTERNAL PART OF THE DOOR CLEANING

To eliminate any traces of limescale, clean the gasket of the chamber and the door porthole with a clean cotton cloth soaked in a soft solution of water and vinegar (or a similar product, checking the contents on the label before using). Dry the surfaces and remove any residues before using the device.

8.3.2. STERILIZATION CHAMBER AND ACCESSORIES CLEANING

Clean the sterilization chamber, support and trays (and internal surfaces in general) with a clean cotton cloth soaked in water and, possibly, the addition of a small amount of neutral detergent.
Carefully rinse with distilled water, taking care not to leave any type of residue in the chamber or on accessories.
Do not use pointed or sharp tools to remove scale from the sterilization chamber.
Should there be evident deposits, immediately check the quality of the distilled water used (see technical characteristics appendix).

8.3.3. EXTERNAL SURFACE CLEANING

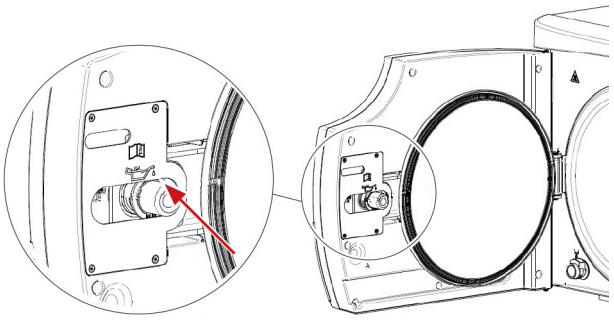
Clean the external surfaces using appropriate product (i.e. Ethyl alcohol, 50% diluted with water).
Apply product with a soaked cloth, then dry.
Do not spray or vaporise any product directly on device surfaces.
Inflammable liquid.

8.3.4. CHAMBER FILTER CLEANING

While using the sterilizer, various residues accumulate in the filter and with time obstruct the lower drain duct. To clean the filter, open the sterilizer door and remove the cap using a coin or another suitable tool.
Loosen the union that contains the filter. Remove the filter from its support and thoroughly clean it under a running water jet, if necessary using a sharp tool to remove any large foreign bodies. It is possible to use a compressed air jet. If it is impossible to recover the filter, replace it with a new one.
Refit everything operating in reverse order and making sure to screw the union, positioning the drain holes at the level of the boiler wall.
Properly fit the filter in its housing, a partial fitting may damage the component.

8.3.5. DOOR LOCK LUBRICATION

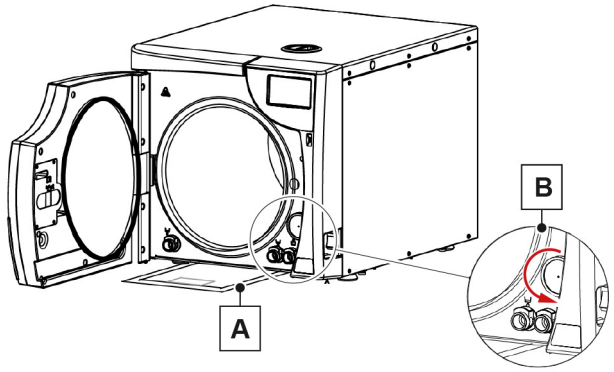
By using a clean cloth, remove any residues from the bushing and the screw.
Lubricate the inside of the bushing on the sterilizer door with a film of the silicon-based grease provided (as shown in the figure).



Wear single-use gloves before application. Essentially, the lubricant is not irritant to the skin; nevertheless, it may cause unpleasant effects if it accidentally comes into contact with eyes.
In case of contact with eyes, rinse with plenty of water.

8.3.6. ANTI-DUST FILTER CLEANING

Remove the filter (**A**) from the lower part of the autoclave, thoroughly rinse it with water and dry it before refitting it. The filter cleaning is possible using a jet of compressed air, making sure not to disperse any dust into the environment.



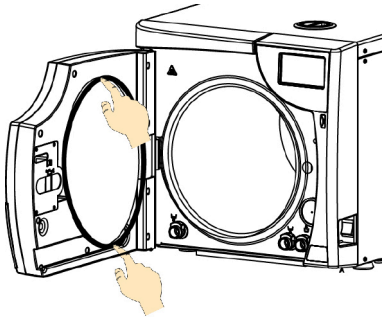
8.3.7. BACTERIOLOGICAL FILTER REPLACING

When filter maintenance is due or every time you notice visible clogging of the filter (indicated by the filter markedly turning grey), unscrew the bacteriological filter (**B**) from its support and replace it with a new one, screwing it fully down on the union. A spare bacteriological filter included with standard equipment.

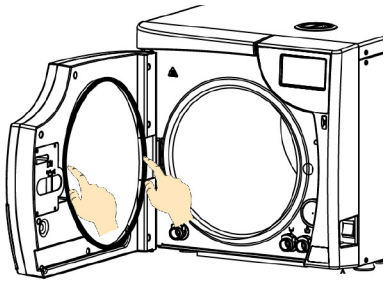
8.3.8. DOOR GASKET REPLACEMENT

Before proceeding, open the door then switch off the device.
Remove the old gasket from the door simply pulling it out by hands (no tools required).
Clean the door gasket seat, to ensure it is debris-free.

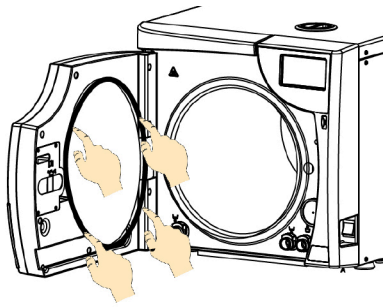
Install the new door gasket by pressing it into its seat, starting from the top/bottom.



then the sides.



Finally press the remaining gasket sections completely into its seat. Do not lubricate the gasket nor the seat.

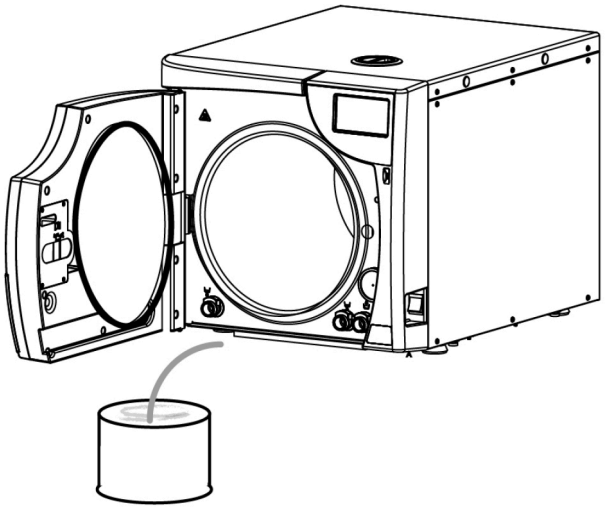


8.3.9. WATER TANK CLEANING

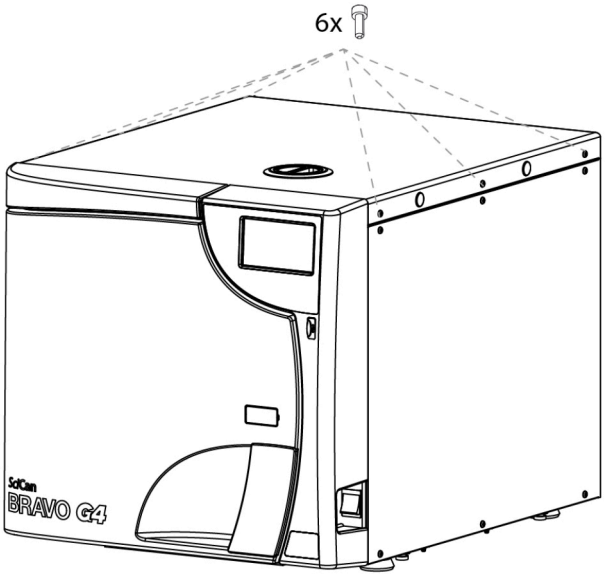
Bravo G4 are equipped with two water tanks:
• Clean water on upper right side.
• Used water on upper left side.
Both inspectable and cleanable.
To gain access to the water tanks, proceed with the following actions.

WARNING: Before performing any maintenance or cleaning intervention, ALWAYS DISCONNECT power supply.
Whenever it is not possible to disconnect the power supply from the device, or if the external mains switch is distant or not visible to the maintenance technician, place a "work in progress" sign on the external mains switch after having turned it off.

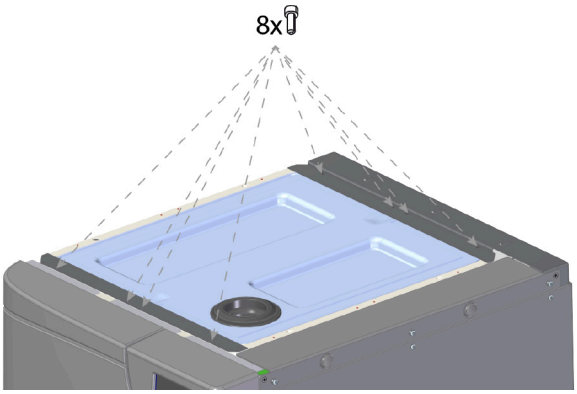
Drain both clean water tank and used water tank by means of the relevant quick connections, available on the lower front side.



Metal upper cover removal.
Unscrew 6x securing screws, along the upper cover sides.
Lift and remove the metal cover.



Anti-condensation cover removal.
Unscrew 8x screws, securing the plates fastening the anti-condensation cover to the water tanks.
Remove the plates.



Lift and remove the anti-condensation cover.

Water tanks cleaning.
Clean and disinfect filters and internal walls only with a disposable wipe/cloth soaked in 70% ethyl alcohol.
Be careful do not damage the level sensors, on the tank rear wall.

The clean water tank is equipped with water quality sensor (**1**).
Clean the sensor probes by means of disposable wipe/cloth soaked in 70% ethyl alcohol.