



Steam Sterilizer



E9 INSPECTION

E9 RECORDER

E9 MED

service manual

ENGLISH



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1 - Introduction

1.1 GENERAL PRECAUTIONS



Before performing any maintenance operations, carefully read the instructions manual supplied with the unit.



WARNING: When replacing components that directly or indirectly affect **safety**, it is essential to only use **ORIGINAL SPARE PARTS**.



WARNING: DISCONNECT THE POWER SUPPLY BEFORE STARTING WORK. Non-observance may cause serious injury to people.



DANGER: HIGH INTERNAL VOLTAGE.

ALL MAINTENANCE OPERATIONS MAY ONLY BE PERFORMED BY THE RESPONSIBLE AUTHORITY OR THE TECHNICAL ASSISTANCE SERVICE.

Have repairs carried out by EURONDA S.p.A. authorised centres using calibrated and certified instruments. Otherwise, send the autoclaves directly to EURONDA S.p.A..

The drawings and any other documents delivered with the unit may not be divulged to third parties in that Euronda S.p.A. is the sole owner and reserves all rights to them.

Euronda S.p.A. reserves the right to make modifications or improvements to the manual or the unit without notice and without being obliged to update previous production and manuals.

1.2 READING THE MANUAL: SYMBOLS AND CONVENTIONS

In this manual symbols are placed beside certain descriptions, notes, etc.. These symbols are used to attract the attention of readers to a particular note or explanation. Their meaning is explained below.

SYMBOL	DESCRIPTION
	IMPORTANT SAFETY INFORMATION This symbol is used to draw the attention of the reader to particularly important notions for operator safety.
	INFORMATION AND PRECAUTIONS This symbol refers to general indications and advice.
	STRICTLY FORBIDDEN This symbol means it is strictly forbidden to perform the operation in question. Non-observance may cause serious harm to the operator or damage to the equipment.

The manual is divided into chapters and subchapters; the figures are numbered with to chapter to which they refer, with the addition of a progressive number. E.g.: Fig. 3.4-1 (figure n°1 relative to chap. 3.4).

1.3 HOW TO OBTAIN A NEW COPY OF THE MANUAL

If the manual is lost or destroyed, ask Euronda S.p.A. for a new copy.

Provide the following information:

- name and model of the unit;
- name and address where the manual should be sent.

Send your request to the following address:

EURONDA SPA
Via dell'Artigianato, 7
36030 Montecchio Precalcino
Vicenza - Italy
Tel. 0445 329811 - Fax 0445 865246
E-mail info@euronda.com

2 - Safety

2.1 GENERAL SAFETY WARNINGS



Before using the equipment, read the safety information carefully. Non-observance could cause accidents or damage to the machine or injure the operator.

- Before using the unit, operators must have perfectly understood the meanings and functions of all the controls.
- Operators must be aware of and know how to apply the safety regulations governing the use of the unit.
- Operators must know and correctly interpret all the indications contained in this manual and those applied to the unit.
- Operators must not perform operations on their own initiative or operations that are not part of their job.
- The responsible authority is responsible for the professional training of operators.
- In the event of malfunctions or potentially dangerous situations, operators **MUST** immediately report the situation to the responsible authority.
- It is strictly forbidden to use or neutralize the safety devices.
- Make sure the unit is powered at the correct voltage.
- Make sure the unit is earthed and conforms to the standards applicable in the country of installation.
- Never dismantle the unit.
- Do not remove the outer safety guard. Even if the unit is not in operation, its cooling fan is always on if power supply to the machine is connected. Danger of injury to hands (see **chap. 2.3 “Residue risks”**).
- The high voltages inside the unit are dangerous.
- If it is not possible to disconnect the power supply, disconnect the mains supply. If this is distant or not visible by the person carrying out the maintenance work, place the sign, “Work in progress” on the mains switch after it has been turned “OFF”.
- Keep the area around the unit clean and dry.
- Do not use solvents on the label.
- Do not remove the label on the unit. If necessary, ask for a new one.
- Clean the unit with a damp cloth after checking that the power lead is not connected (before using the unit again, remove any traces of moisture).
- Do not pour water onto the unit or any other liquids that could cause short circuits or corrosion.
- Do not touch the unit with wet hands or if it is wet; always follow the precautions required for the use of electrical equipment.
- The unit was not designed for use in the presence of gas or explosive vapours.
- Do not submit the unit to excessive mechanical stress such as impacts or strong vibrations.
- Do not lean over or stand in front of the door when opening it as there is a risk of scalding from escaping steam (see **chap. 2.3 “Residue risks”**).
- The water used in the discharge tank could contain, in the case of incomplete or failed sterilisation, contaminated residues; it is therefore advisable to use protective rubber gloves when unloading (see **chap. 6.7 “Tanks: instructions for filling and emptying”** in the instructions manual supplied with the unit and **chap. 2.3 “Residue risks”** in this manual).
- Before transporting the machine, drain both water tanks. Use the supplied drain tube and follow the instructions for draining (see **chap. 6.7 “Tanks: instructions for filling and emptying”** in the instructions manual supplied with the unit).

2.2 SAFETY DEVICES


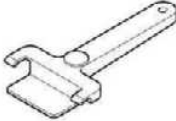

Electrical safety

Description	Effect
Double-pole thermal safety switch for protecting the device against short-circuits.	Disconnects main electrical power supply
Protection of the electronic board against short-circuits: both the transformer and the entire low-voltage circuit are self-protected	Disconnects one or more low-voltage circuits

Thermal protection

Description	Effect
The electronic board, the vacuum pump and the vibration pump are all protected by a thermostat	Temporary cut-off to permit cooling
Thermal protection of the unit: the device is blocked if made to work under conditions that do not fall within the ambient temperature range	Alarm message and use of the machine is prevented due to unsuitable environmental parameters
Resettable safety thermostat, complying with PED 97/23/CE standards, for protecting the steam generator from over-heating	Disconnection of power supply to the steam generator
Resettable safety thermostat, for protecting the heating resistance of the chamber	Disconnection of power supply to the resistances
Safety valve, complying with the PED 97/23/CE standards, for protecting the unit from over-pressure	Discharge of steam and re-balancing of pressure to safety values

Mechanical safety devices

Description	Effect
Door safety micro-switch: ensures that the door closes correctly	Message indicating wrong door position
Door lock micro-switch: shows the correct position of the locking system	Indication that the door is not locked
Door lock: electro-mechanical device that prevents the door from being opened accidentally	Prevents the door from being opened while the unit is in operation  Attempting to open the door with the door safety device applied may seriously damage the closing system
Extractor tool. It allows not to touch the inner hot parts. It avoids incidental burns while extracting the trays containing the sterilized tools. 	Door regulation tool 

Control devices

Description	Effect
Pressure levelling: restores the system to its normal pressure values, in the event of manual stops or alarms and/or warnings during the cycle	Automatic pressure re-balancing inside the sterilization chamber.
System for evaluating process parameters, managed entirely by the microprocessor	In the event of faults during the cycle, the program in progress is stopped immediately and alarms are generated
Constant monitoring of the device: the components of the autoclave are constantly monitored during operation	Generation of alarm messages and/or warnings in the event of faults



It is forbidden to remove, modify, tamper with or in any way neutralize the safety devices. Euronda S.p.A. declines all liability for accidents to people or damage or malfunctions of the unit if the above instruction is not observed.



Periodically check the safety systems (see chap. 8 "Maintenance").

2.3 RESIDUE RISKS

During the normal work cycle, the operator is exposed to certain risks that cannot be completely eliminated due to the nature of the unit.

- Danger of burns.

1. When the sterilizer finishes the sterilization cycle and the door is opened to remove the sterilized instruments, the inner parts of the boiler and door are still very hot. Do not touch these directly in order to avoid getting burnt (Fig. 2.3-1). Use the relative extractor tool (chap. 2.2 "Safety devices").
2. When opening the door, do not stand over or in front of it as you may be scalded by the steam (Fig. 2.3-2).

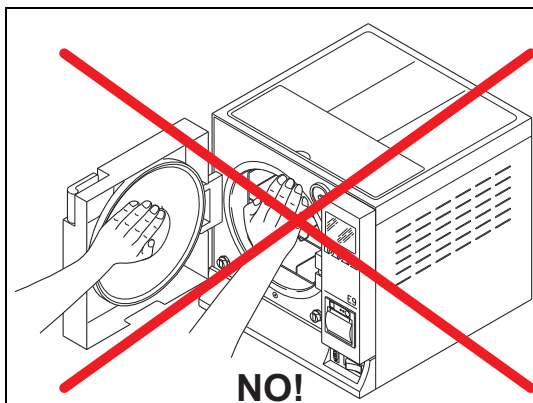


Fig. 2.3-1





Fig. 2.3-2

- **Danger of contamination.**
The water used in the discharge tank may, if not properly sterilized, contain contaminated residues: wear latex safety gloves when draining.
- **Danger of injury to hands.** Even if the unit is not in operation, its cooling fan is always on if power supply to the machine is connected. **Do not remove the outer safety guard before disconnecting power supply.**

2.4 SAFETY SIGNS ON THE UNIT

Safety signs on the unit:

	<p>WARNING: DISCONNECT FROM THE POWER SUPPLY BEFORE OPENING THE SAFETY GUARD</p>
	<p>ATTENTION: HOT SURFACE</p>

These signs must not be removed, covered or damaged.

3 - Technical data

3.1 OVERALL SPACE REQUIRED

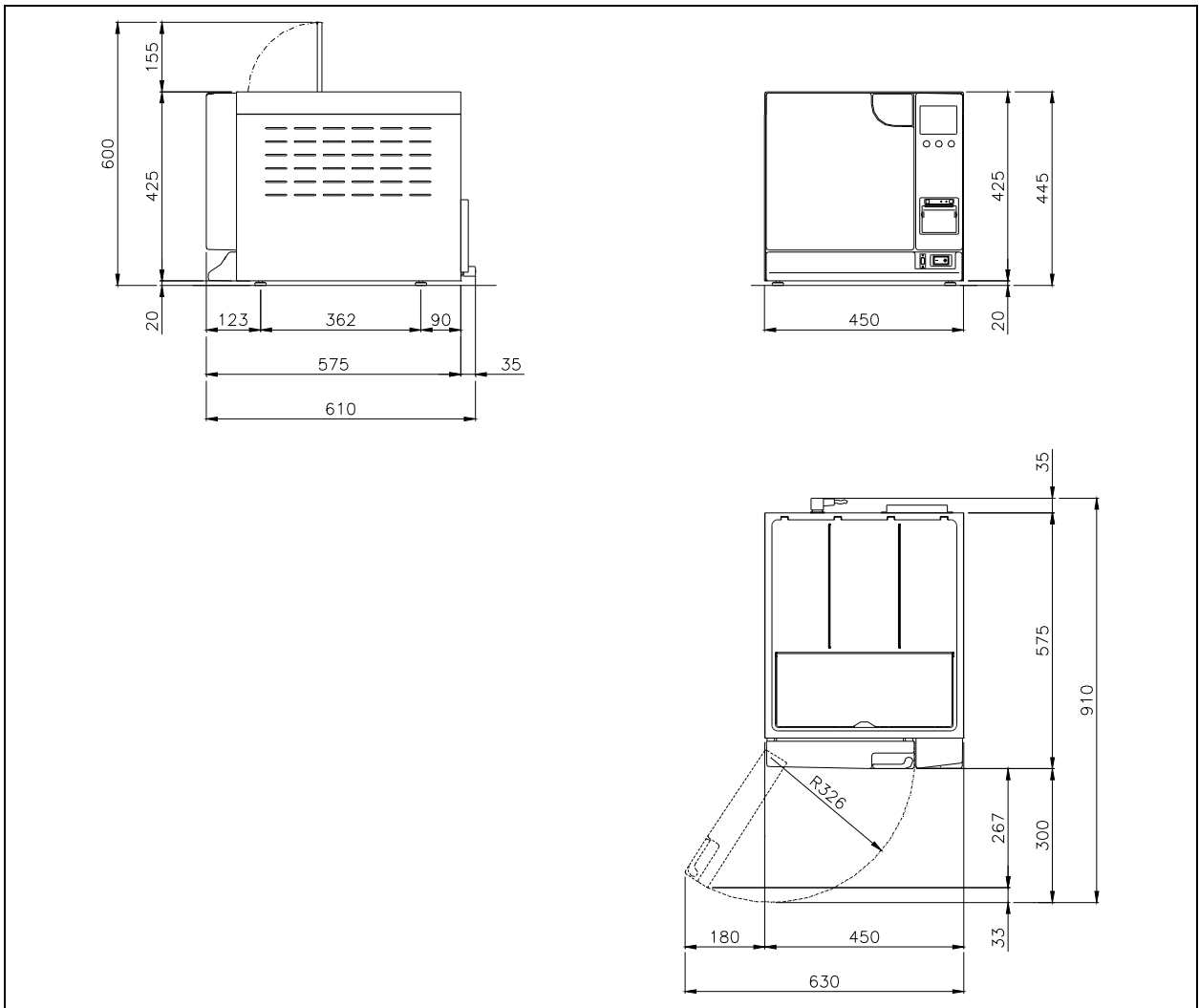


Fig. 3.1-1

Overall dimensions of the unit with the door closed (Fig. 3.1-1):	
E9 INSPECTION/RECORDER/MED 18	E9 INSPECTION/RECORDER/MED 24
L = 450 mm H = 445 mm P = 610 mm	
Overall dimensions of the unit with the door open (Fig. 3.1-1):	
E9 INSPECTION/RECORDER/MED 18	E9 INSPECTION/RECORDER/MED 24
L = 630 mm H = 445 mm P = 910 mm	
Weight of unit:	
E9 INSPECTION/RECORDER/MED 18	E9 INSPECTION/RECORDER/MED 24
Empty: 42 kg. Maximum weight with full tank and maximum load: 51 kg	Empty: 44 kg. Maximum weight with full tank and maximum load: 53 kg

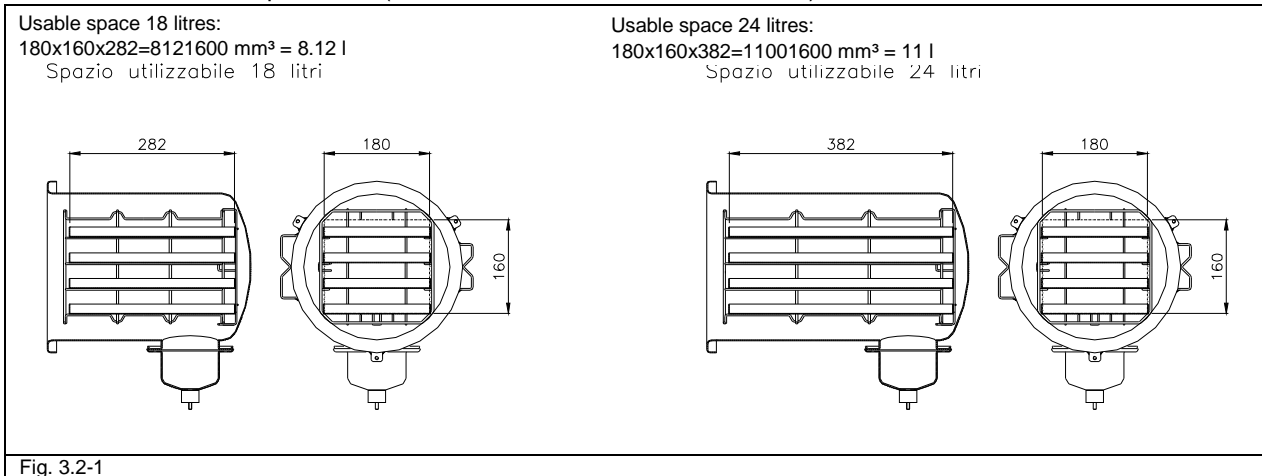
3.2 TECHNICAL DATA AND NOISE

CHARACTERISTICS	E9 INSPECTION 18	E9 INSPECTION 24
Power supply voltage	230 V	
Mains frequency	50 Hz	
Power output	2300 W	
Absorbed current	10 A	
Sterilization cycles	3 sterilization cycles	
Control cycles	Vacuum test - Bowie & Dick test - Helix test	
Range of environmental conditions in which the unit was designed to operate	- Indoor use - Altitude up to 2000 m - Temperature: +5 ÷ +40°C - Max. relative humidity 85% - Max. variation in mains voltage: ±10% - Installation category (overvoltage category) II	
Maximum pressure *	250 kPa (2.5 bar)	
Dimensions of sterilization chamber	Diameter: 250 mm Depth: 370 mm	Diameter: 250 mm Depth: 470 mm
Chamber capacity	18 litres	24 litres
Usable space** of chamber	180 x 160 x 282 mm (LxHxD)	180 x 160 x 382 mm (LxHxD)
Usable capacity of chamber	8.12 litres	11 litres
Capacity of water tanks	4 litres	
Weight for support area (full tank and chamber with maximum weight)	3.07 kg/cm ² (301210N/m ²)	3.21 kg/cm ² (315384N/m ²)
Operation control	Microprocessor	
Printer	Yes	
Bacteriological filter	Yes	
Pollution level	2	

Note: E9 MED has the built-in steam generator up to serial number EGO90101 18 litres e EGP090081 24 litres; the following E9 MED have no steam generator.

***Note:** In this manual, the word “pressure” always refers to gauge pressure.

****Usable space:** This is the internal capacity of the sterilization chamber available for material to sterilize (Fig. 3.2.1): Usable space 18 l (180x160x282 = 8121600 mm³ = 8,12 l)
Usable space 24 l (180x160x382 = 11001600 mm³ = 11 l)



3.3 QUALITY OF WATER

With reference to standard EN 13060, the table below indicates the recommended limit values (maximum) for contaminating agents, as well as the chemical-physical characteristics of the water used for condensate* and inlet water.

* Condensate is produced by the steam that was formed by the empty chamber of the sterilizer.

	Inlet water	Condensate
Evaporated residue	<10 mg/l	<1 mg/l
Silicon oxide	≤1 mg/l	≤0.1 mg/l
Iron	≤0.2 mg/l	≤0.1 mg/l
Cadmium	≤ 0.005 mg/l	≤ 0.005 mg/l
Lead	≤0.05 mg/l	≤0.05 mg/l
Heavy metal residues	≤0.1 mg/l	≤0.1 mg/l
Chlorides	≤2 mg/l	≤0.1 mg/l
Phosphates	≤0.5 mg/l	≤0.1 mg/l
Conductivity at 20°C	≤15 µS/cm	≤3 µS/cm
PH	5-7	5-7
Appearance	colourless, clean, sediment-free	colourless, clean, sediment-free
Hardness	≤ 0.02 mmol/l	≤ 0.02 mmol/l



The use of water for generating steam containing contaminants at higher levels than those shown in this table may considerably shorten the working life of a sterilizer and may invalidate the maker's guarantee.

3.4 SERIAL NUMBERS CODING

Autoclaves serial number is made of a combination of three letters and six numbers. The serial number identifies the autoclave model and the chamber capacity.

E9 18 (half band heater)	EDI000000
E9 24 (half band heater)	EDK000000
E9 18	EEG000000
E9 24	EEH000000
E9 18 200V 50 Hz	EFB000000
E9 24 200V 50 Hz	EFC000000
E9 18 200V 60 Hz	EEM000000
E9 24 200V 60 Hz	EEN000000
E9 18 230V 60 Hz	EEW000000
E9 24 230V 60 Hz	EEX000000
E9 18 SERVICE 230v 50 Hz	SER000000
E9 24 SERVICE 230v 50Hz	SET000000
E9 18 U-234 circuit	EGA080000
E9 24 U-234 circuit	EGB080000
E9 18 U-234 circuit Afnor	EEZ080000
E9 24 U-234 circuit Afnor	EFA080000
E9 18 U-234 circuit Recorder	EGM080000
E9 24 U-234 circuit Recorder	EGN080000
E9 MED 18 with steam generator	EGO090000
E9 MED 24 with steam generator	EGP090000
E9 MED 18 without steam generator since	EGO090101
E9 MED 24 without steam generator since	EGP090081
E9 MED 18 with steam generator	EHC000000
E9 MED 24 with steam generator	EHD000000

4 - Installation

4.1 POSITIONING THE UNIT



Lift the unit with care and do not turn it upside down.



The packaging and the equipment are fragile, handle with care. Transport as fragile. **THE HANDLES ON THE PACKAGING (1 of Fig. 4.1-1) MUST ONLY BE USED FOR VERTICAL LIFTING.** Keep in a dry and protected place. The packaging must be kept for the whole guarantee period.



NOTE: keep the original packaging and use it to transport the unit. The use of different packaging may damage the product during transport.

The unit must be removed from its packaging using the straps provided for the purpose: this operation must be carried out by **two people at the same time** (Fig. 4.1-2):

- Remove the upper protecting piece(s);
- Two people must then lift the unit out, keeping it in a horizontal position all the time;
- Place the unit on the work surface and then remove the straps by lifting it up slightly.



ATTENTION: follow the indications shown in figure 4.1-2.

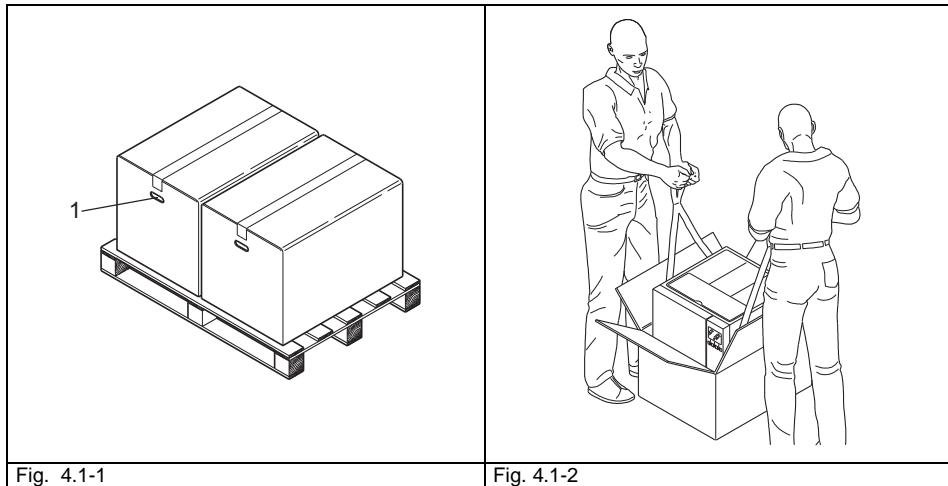


Fig. 4.1-1

Fig. 4.1-2

- The unit should be installed inside a laboratory, which is accessible only to authorised personnel.
- Position the unit on a flat and horizontal surface (Fig. 4.1-3).
- Leave at least 8 cm of distance from the back of the machine (as required by the bulk pins provided) to allow a sufficient aeration (Fig. 4. 1-3)
- Do not place the unit near sources of steam or where it could be splashed by water, which could damage the internal electronic circuitry.
- Do not install the unit where there is poor air circulation (Fig. 4.1-4).
- Do not place the unit near sources of heat (Fig. 4.1-4).
- The area where the unit is placed must be lit in accordance with standard UNIT 10380.
- Acceptable environmental conditions: temperature from 5 to 40°C – max. humidity 85% without condensation – max. altitude 2000 m.

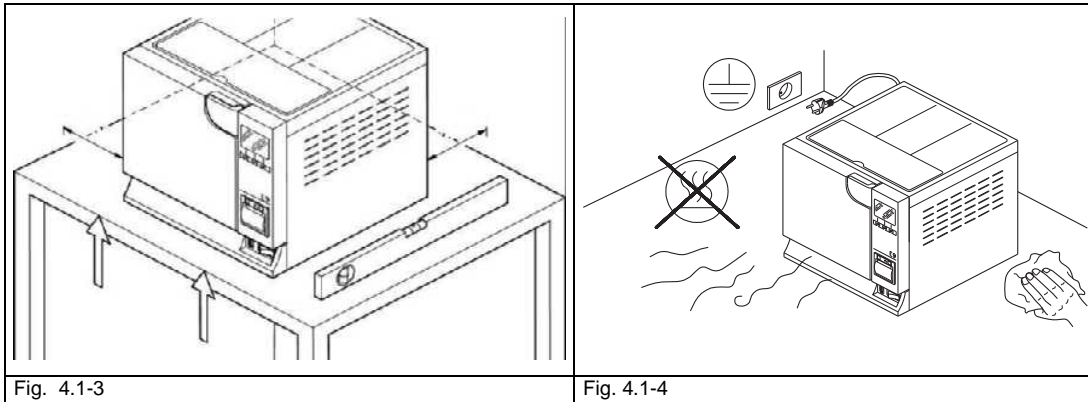


Fig. 4.1-3

Fig. 4.1-4

4.2 INSTALLING THE UNIT

Installation is a fundamental operation for the subsequent use and correct functioning of the unit.



ATTENTION: the unit MUST be installed by specialised technicians.

First, update the service booklet by writing the date of installation in the relative box and signing it.

The service booklet is inside the unit (1 in Fig. 4.2-1); remove the rear panel and fill in the installation box. Put back the service booklet and close the machine.



Do not leave the unit without the rear panel.

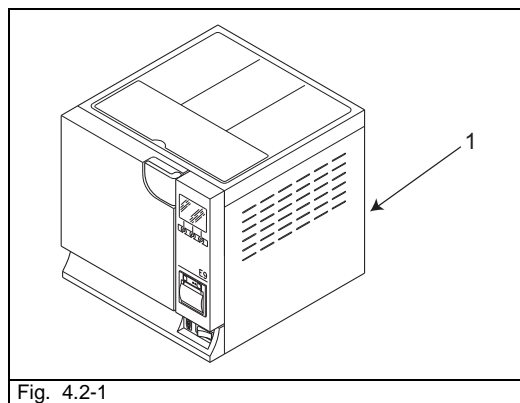


Fig. 4.2-1

4.2.1 Installation and adjustment

To install the unit, proceed as follows:

- Install the unit so that the power lead does not kink or become squashed but has a free run to the socket.
- The unit must be placed so that the plug is accessible.
- Place the unit at a height that will allow the user to inspect the entire sterilization chamber and clean it with ease.

- Connect the overflow connector (1 of Fig. 4.2.1-1) to allow the unit to drain any excess water created mistakenly.

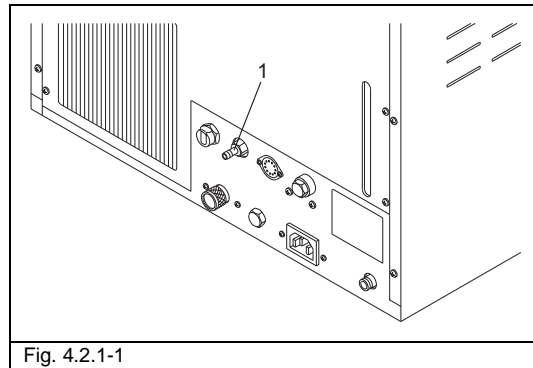


Fig. 4.2.1-1

- Do not place trays, newspapers, containers of liquids, etc. on the unit: the ventilation grilles must not be blocked.
- Do not lean on the door when it is open.
- When emptying the discharge tank directly into the waste pipes, position the unit at a height above the drain.

Making the electrical connections:

- Check that the power supply voltage indicated on the rear label (Fig. 4.2.1-2) corresponds to that available at the point of installation.

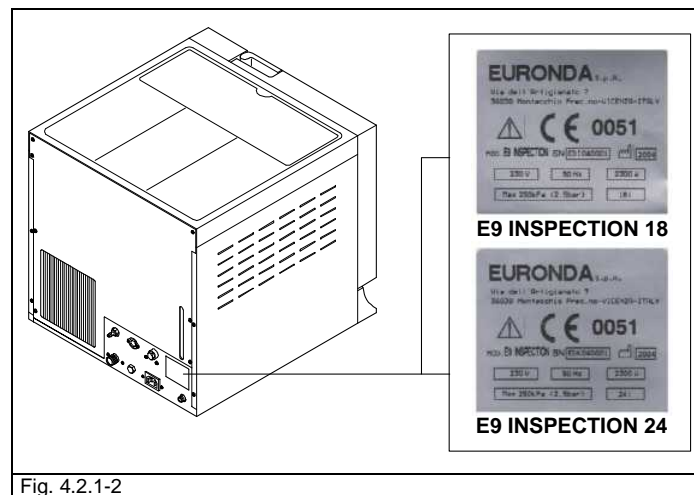


Fig. 4.2.1-2

- The unit must be connected with an overload cut-out switch to a system fitted with an adequate earth system that conforms to the standards applicable in the country of installation.
- The system must be connected according to current standards.
- Max. variation in mains voltage: +/- 10%.
- A differential switch featuring the following characteristics must be installed upstream of the power socket of the unit:
 - nominal current: 10 A
 - differential sensitivity: 0.03 A.
- Connect the supplied cable to the rear of the unit.
- Position the unit so that the plug is accessible.



Do not allow the lead to bend tightly and do not place any object on it.

Do not use extension leads.



**Only use the original lead.
ONLY USE ORIGINAL SPARE PARTS.**

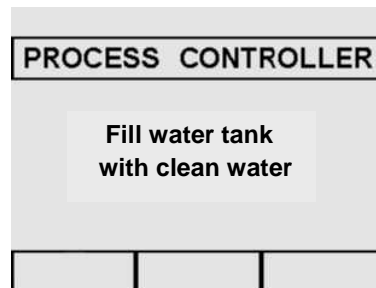
After making the electrical connections, **remove the clamp holding the electromagnet in place** and install any accessory devices.

Filling the tanks:

The unit features **two separate tanks**: one for the clean water required for the cycles, and one for the used water that is collected at the end of the cycles. Both tanks are connected with drain valves.

Filling with distilled water for the first time

1. Switch on the unit with the ON-OFF button (1 of Fig. 4.2.1-3). The following message will appear on the display:



- 2_a. **Manual** filling: lift the upper cover (2 of Fig. 4.2.1-3) and pour distilled water in through the inlet (3 in Fig. 4.2.1-3), observing the amounts indicated in chap. 3.2 "Technical data and noise".
- 2_b. **Automatic** filling: the water can be supplied totally automatically using a special dionizer (see Appendix 1 "Description of optional devices"). To install this optional, consult the respective "Aquafilter[®]" instruction manual supplied with the deonizer.

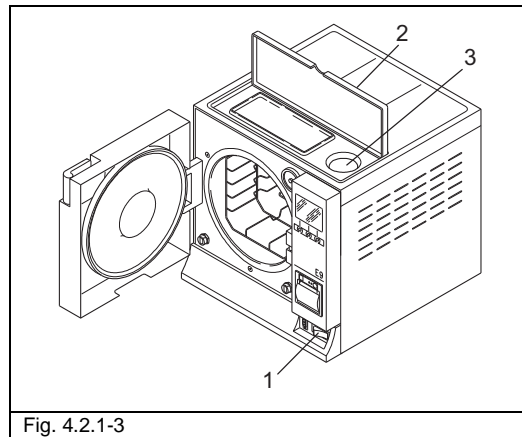
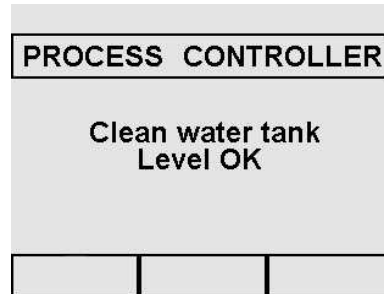


Fig. 4.2.1-3



WARNING: only use good quality clean water (Chap. 3.3 "Quality of process water").

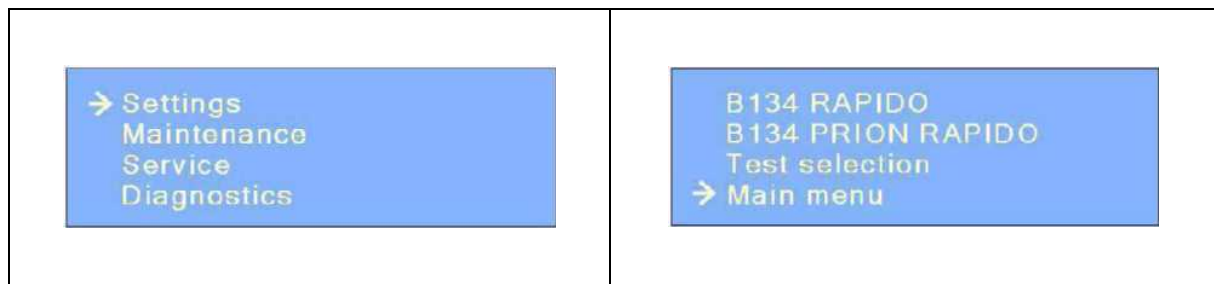
3. Once filling is complete, that can also be confirmed by the level indicator situated next to the inlet (3 of Fig. 4.2.1-3), the following screen appears on the display:



Installation registration



The functioning of Settings, Maintenance, Service and Diagnostic menus in E9 MED is the same as the E9 INSPECTION / RECORDER menus. The only difference is in the display's graphics.



Register the date of installation from the control panel.

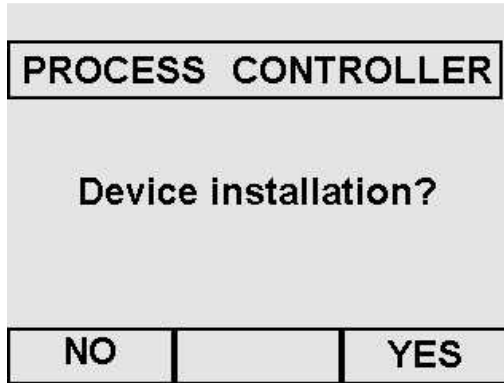
The first time the unit is switched on using the ON-OFF key (1 of Fig. 4.2.1-3), the LCD display turns on and the following welcome message appears:



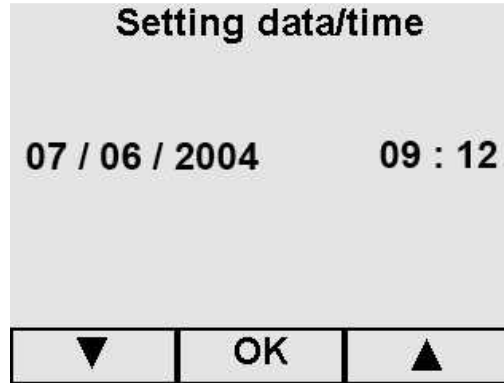
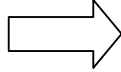
After 5", select the language desired.



Confirm the choice of the language with OK.
Note: The default language is English (this item cannot be de-selected).

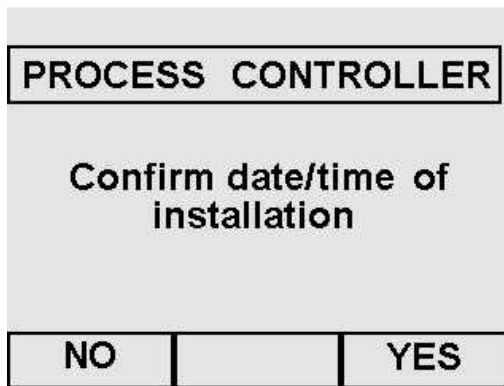


- If YES is pressed, the *Date/time setting* screen appears.
- If NO is pressed, you go to the Program Menu; the Installation Menu will appear again the next time the unit is switched on.



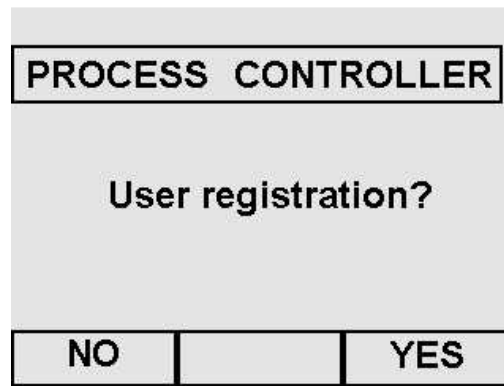
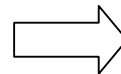
Setting Date and Time

Using the ▲ and ▼ keys, select the correct day, press OK to pass on to the choice of the month and so on until the minutes have been selected. When OK is pressed, the screen for confirming the date and time appears.



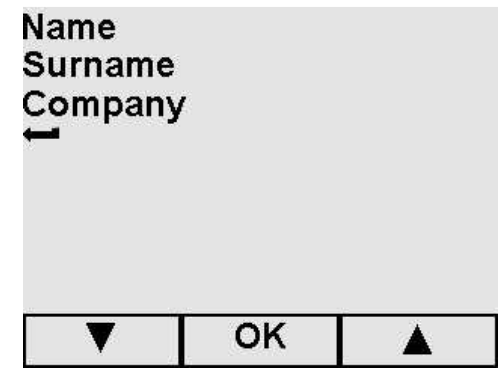
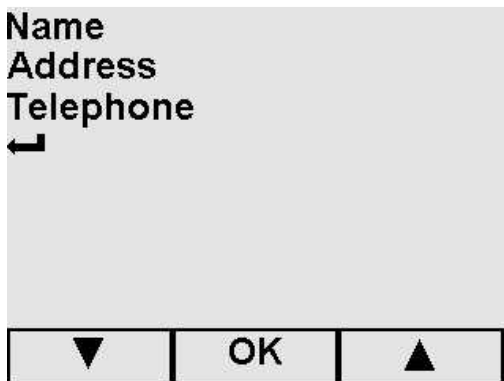
Confirm date/time

- If YES is pressed, **the date is registered as the date of installation, from which the timer for maintenance, etc. begins.**
- If NO is pressed, you move on to the Program Menu; the Installation Menu will appear the next time the unit is switched on.



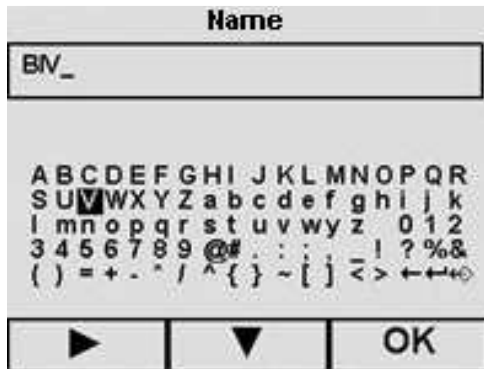
Confirm User Registration

Press YES to access the User Registration screen on the Main Menu.



User Registration

With the ▲ and ▼ keys, select the respective item and complete registration using the small keyboard, as in the example indicated below.

**E.g.: Name Registration**

After selecting the item *Name* from *User registration*, a screen appears in which the three items present are selected one by one: the screens used for registering the user's name and surname and the name of the company appear.

With the ▲/▼ and ►/◀ keys, select the respective letters and numbers; confirm with OK. Proceed in the same way with the other items in the Name Registration screen.

This registration determines the header that appears on the printer report: the name of the company appears if just the name of the company is registered or when all the fields available are filled out.

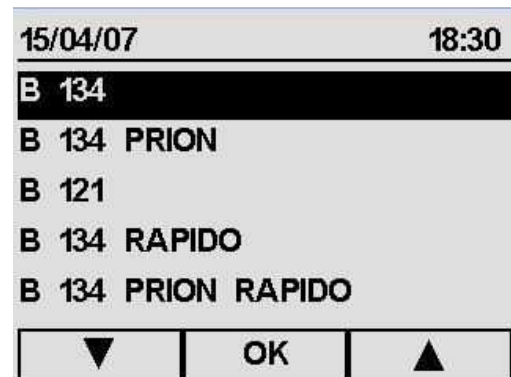


If you have the optional "E-memory[®]" (see Appendix 1 "Description of optional devices"), you can register all the data directly to the software and then export it to the unit without having to use the buttons on the display. All previous data is overwritten.



After installation, always complete all parts of the **INSTALLATION CARD** and **UPDATE THE SERVICE BOOKLET BY WRITING THE DATE AND SIGNING ON THE INSTALLATION LINE.**

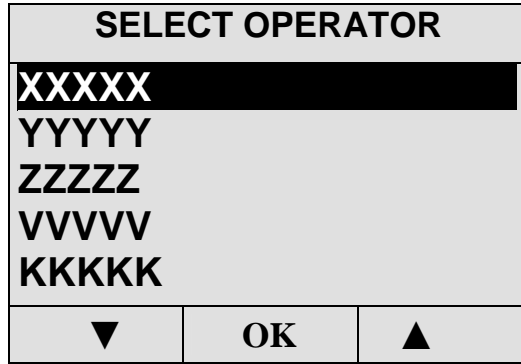
After installation has been completed, the following welcome screen will appear the next time the unit is switched on:



5" later, the Programme Menu automatically appears from which the required programme or test can be selected.

4.3 OPERATOR REGISTRATION

Since software version 6.01 it is possible to register up to 10 different sterilization cycle operator's name. See underlying display's screenshots for examples:



The cycle that follows the operator selection, the last selected voice remains highlighted.

3.1.1



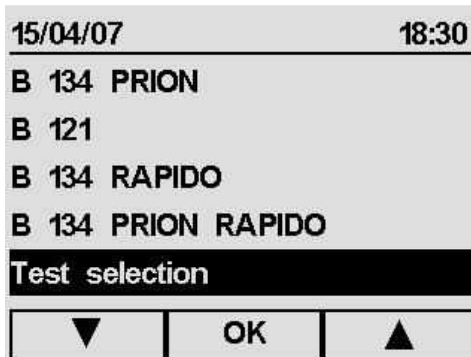
Note : this screen appears only if at least one operators name is set up . Please see User's Manual for more informations.

4.4 PERFORMING THE VACUUM TEST

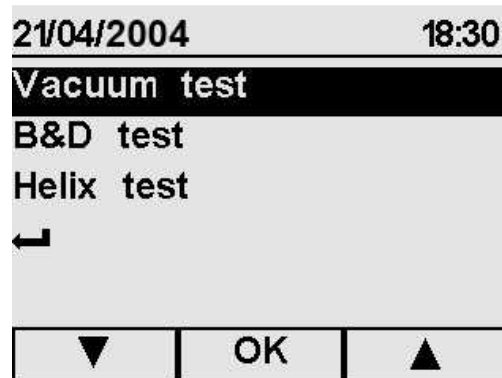


ATTENTION: the **VACUUM TEST** can only be activated with the machine cold, i.e. **WITHIN 3 MINUTES FROM SWITCHING ON THE UNIT**, in that once this time has elapsed, the unit starts pre-heating.

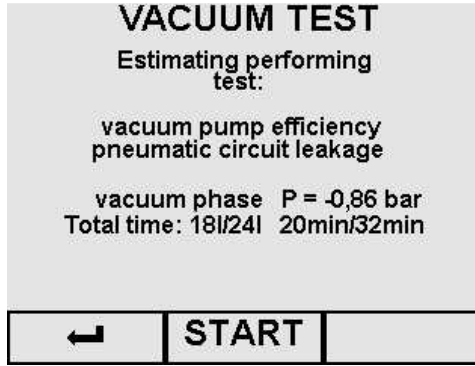
If three or minutes elapse from when the unit was switched on before the test is selected or if the temperature of the band heater is greater than or equal to 50°C, switch off the unit and wait a few minutes for it to cool down.



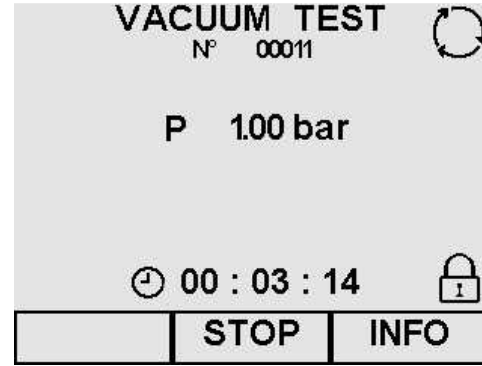
From the Program Menu, use the ▼ key to select *Test selection*.



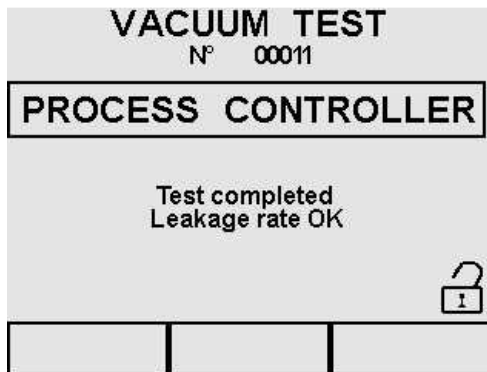
The *Test Selection* screen shows Vacuum Test by default; press OK.



Starting the Vacuum Test
Press START to begin the test; the following screen appears.



If required, press INFO to open the test control screen.



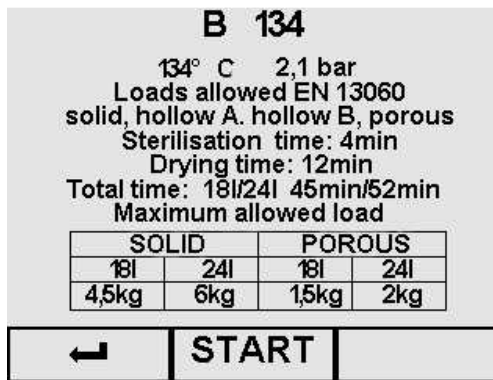
This screen appears when the test finishes. The door release symbol indicates that the door can be opened, and you return to the Programme Menu. If the test is completed but gives a negative outcome, the E34 alarm message appears (see Chap. 12.1 "Summary of alarm signals").



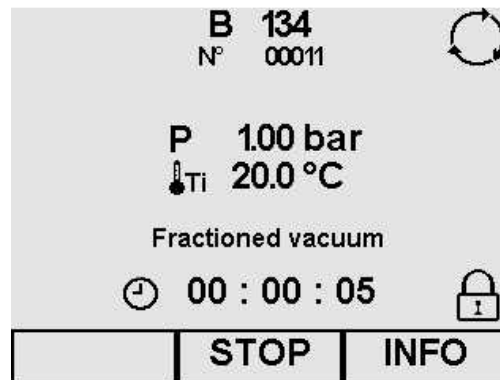
ATTENTION: Keep the results printout and attach it to the installation card.

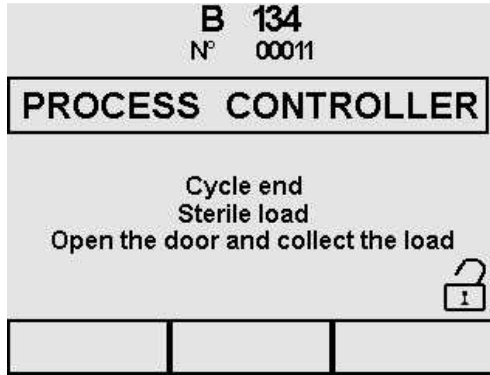
4.5 PERFORMING THE B134 CYCLE

Starting the B134 cycle.

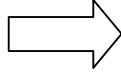


Starting the B134 cycle
After selecting the cycle, a presentation screen appears. Press START to begin the cycle. If required, press INFO to open the cycle control screen.



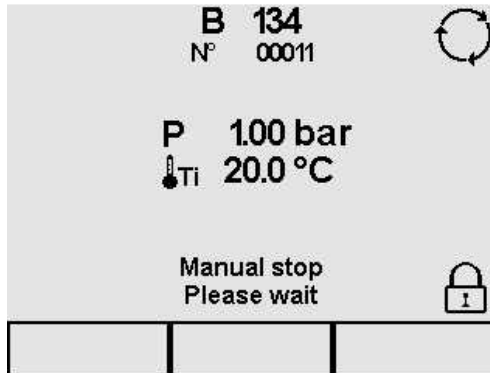


When the cycle has finished, the **Cycle End** screen appears. At this point, the door release symbol indicates that the door can be opened; if the door is not opened within 10 minutes, the unit performs a maintain drying operation.



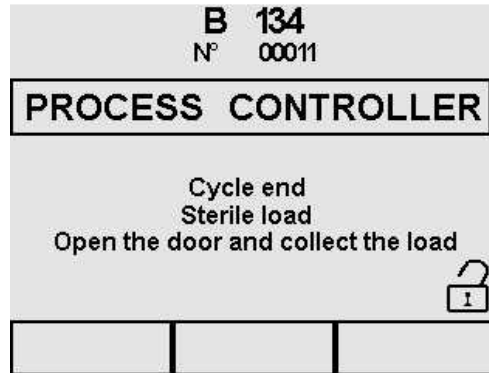
Maintaining drying

This operation is performed automatically to prevent condensation from forming inside the chamber as a result of cooling. With OK, the maintain drying operation is interrupted and the unit carries out the pressure levelling.



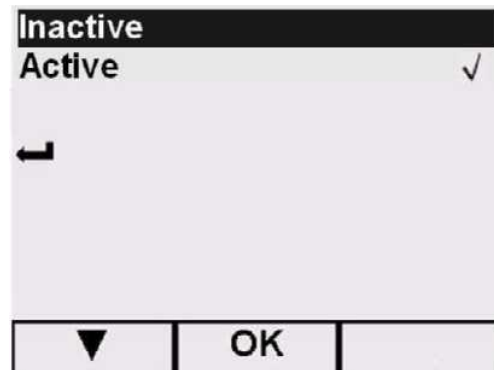
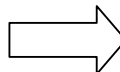
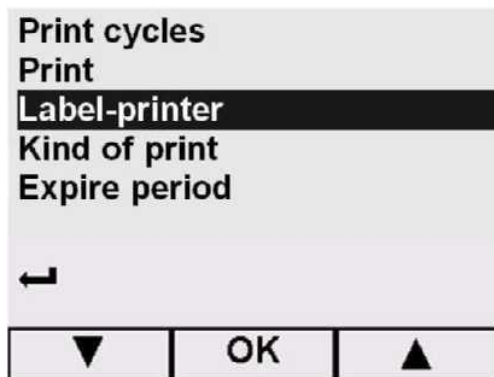
Pressure levelling

Once this has been performed, the Cycle End screen appears again.

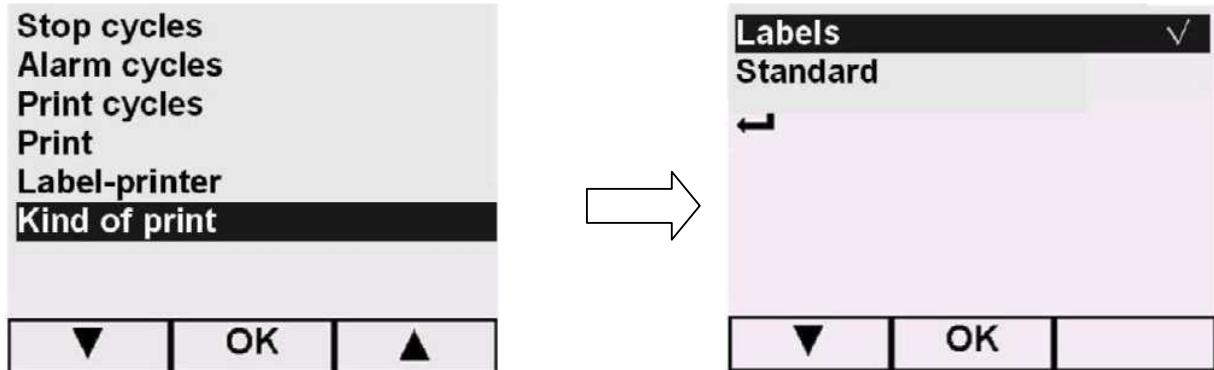


For optimum drying, open the door at the end of the cycle and leave the sterilised objects on the trays for about 5 minutes before removing them. When the door is opened, the Programme Menu screen appears.

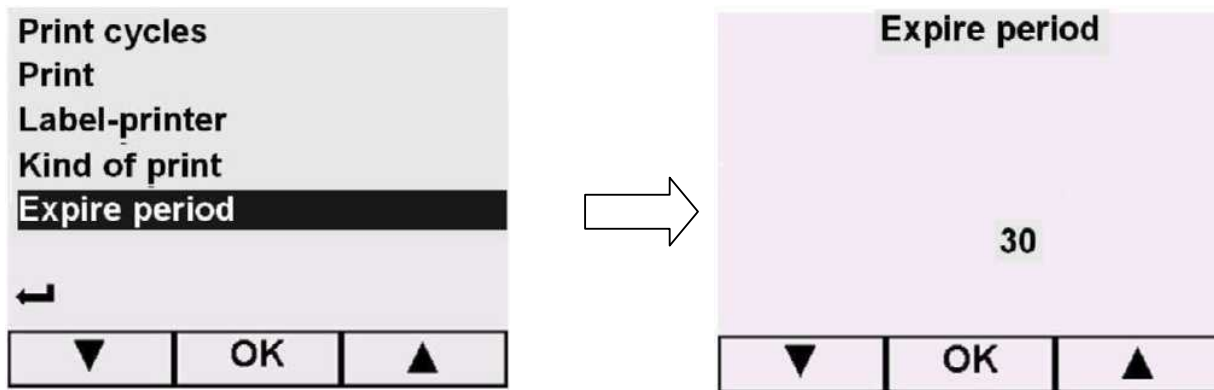
4.6 LABELS PRINTING (ONLY E9 RECORDER)



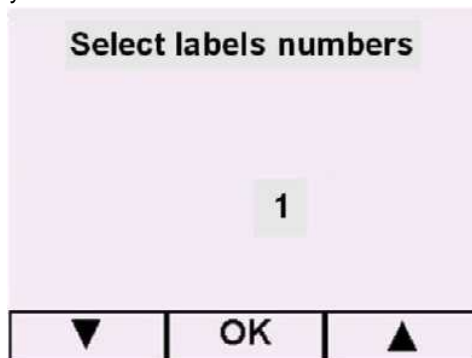
For printing labels, it is necessary to set the printer. In the initial screen select "Main menu", then in the following screens select: "Service", "Memory-print functions", "Label printer" and finally "Active".



Now must be setted the type of paper in use. In the initial screen select "Main menu", then in the following screens select: "Service", "Memory-print functions", "Kind of print" and finally "Labels".



To label the sterilized material with its expiration date the expire period must be setted. In the initial screen select "Main menu", then in the following screens select: "Service", "Memory-print functions", "Expire period" and finally enter the number of days.



To print labels of an ok cycle in the initial screen select "Main menu", then in the following screens select: "Service", "Memory-print functions", "Ok cycles", then select the desired cycle and finally the number of labels to be printed.



ATTENTION: To open the printer DO NOT pull the paper.



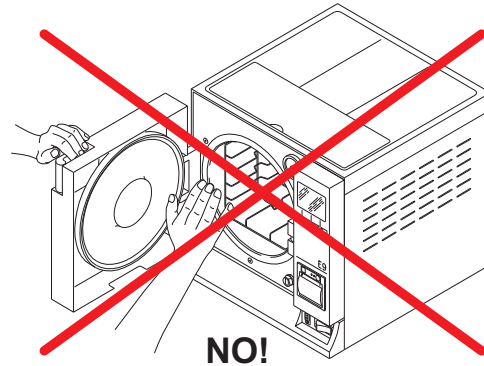
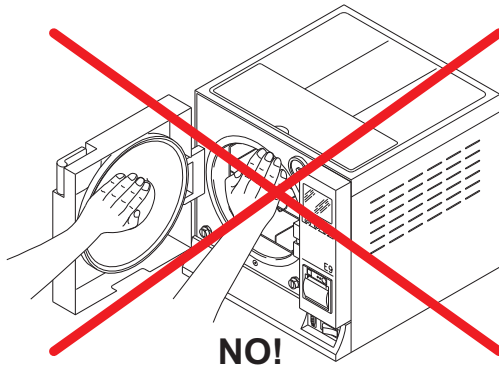
ATTENTION: Keep the results printout and attach it to the installation card.



ATTENTION: DANGER OF BURNS. When the unit finishes the sterilisation cycle and the door is opened to remove the sterilised instruments, the inner parts of the boiler and door are still very hot. These must not be touched directly in order to avoid getting burnt. Use the relative extractor tool (see Chap. 2.2 “Safety devices”).



ATTENTION: DANGER OF BURNS. Do not lean over or stand in front of the door when opening it as there is a risk of scalding from escaping steam. Use the relative extractor tool (see Chap. 2.2 “Safety devices”).



ATTENTION: a safety pin automatically locks the door when the cycle starts. The pin returns to its home position only at the end of the cycle. **Attempting to open the door with the door safety device applied may seriously damage the closing system. Always wait for the end of cycle signal on the LCD before opening the door.**

In the event of an alarm, the door can only be opened after the relative consent button is pressed.

4.7 DELIVERY OF TECHNICAL DOCUMENTATION

After installing the unit, hand over all the technical documentation contained inside the box to the customer:

Qty	Technical documentation to deliver
1	Certificate of guarantee
1	Instructions manual
1	Sheet for rapid use
2	Declaration of conformity for Autoclave and Boiler



If any optional accessories are installed (Appendix 1 “Description of optional accessories”), hand over the relative instructions manuals to the customer.

5 - Description of cycle and main performance data

5.1 E9 INSPECTION COMPONENTS

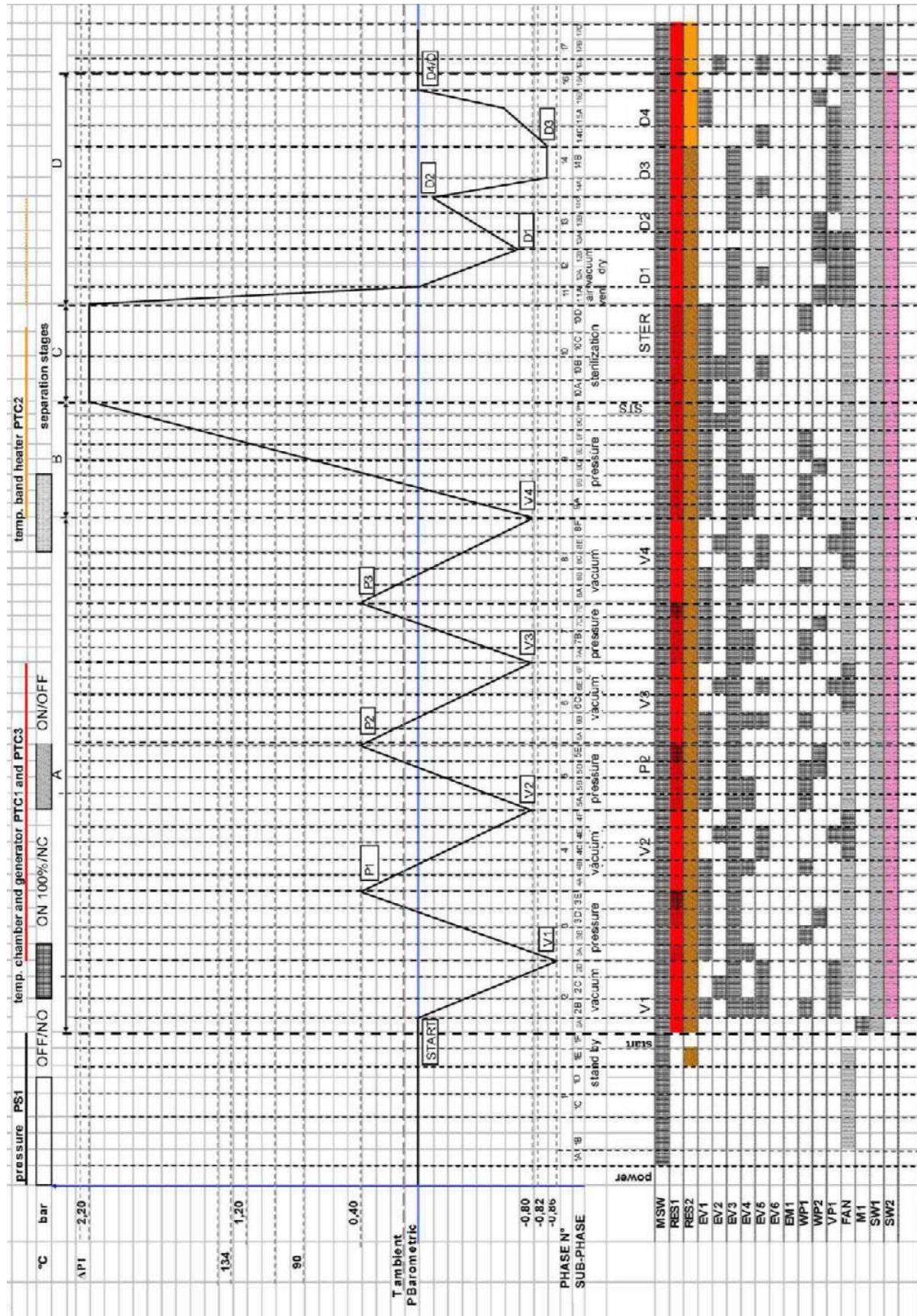
The E9 Inspection sterilizer comprises the following elements:

COMPONENTS	NAME OF SIGNAL	DESCRIPTION	Characteristics
MSW		Main switch	250V 12A
EV1	OD6A/OD6B	Two-way solenoid valve for discharging steam at the end of the cycle, power draw 9 W; normally open (NO)	24 VDC
EV2	OD5A/OD6B	Three-way solenoid valve for air prevacuum and water-air separation, power draw 12 W; normally closed (NC)	24 VDC
EV3	OD4A/OD6B	Two-way solenoid valve for bacteriological filter, power draw 9 W; normally open (NO)	24 VDC
EV4	OD3A/OD6B	Two-way solenoid valve for water exchange (steam gen. ~ drip collector), power draw 6 W; normally closed (NC)	24 VDC
EV5	OD2A/OD6B	Three-way solenoid valve for vacuum pump, power draw 12 W; normally closed (NC)	24 VDC
EV6	OD1A/OD1B	Solenoid valve for connection to water supply	24 VDC (outside unit)
EV7 (U-234)	OD4A/OD6B	Three-way solenoid valve vacuum pump suction, power draw 12W; normally closed (NC)	
EV8 (U-234)	OD2A/OD6B	Three-way solenoid valve vacuum pump delivery, power draw 12W; normally closed (NC)	
EM1	OD8A/OD8B	Door lock electromagnet, power draw 6 W	24 VDC
WP1	OD9A/OD9B	Boiler water inlet pump, power draw 48 W	230 VAC
WP2	OD10A/OD10B	Separator discharge water pump (SICCE), energy absorbed 16 W (Up to EEG060999 for 18 l) (Up to EEH060999 for 24 l)	230 VAC
WP2	OD12A/OD12B	Separator discharge water pump (SICCE), energy absorbed 10 W (From EEG061000 for 18 l) (From EEH061000 for 24 l)	230 VAC
VP1	OD11A/OD11B	Vacuum pump, impedance 90 Ohms	230 VAC
RES1	OD14A/OD14B	Heater for steam generator, power draw 1800 W	230 VAC
TS1		Manually resettable safety thermostat for generator heater, calibrated to mid-range, approx. 180°C	230 VAC
RES2	OD15A/OD15B	Stainless steel band heater for chamber, power draw 840 W for the 24 l version and 600 W for the 18 l version	230 VAC

TS2		Manually resettable safety thermostat (band heater for chamber), calibrated to 200°C	230 VAC
FAN1	OD17A/OD17B	Radiator fan, power draw 35 W	230 VAC
PTC1	IA1	PT1000 probe inside boiler (working space inside chamber)	
PTC2	IA2	PT1000 probe outside boiler (mounted on external band heater)	
PTC3	IA3	PT1000 probe for steam generator (located on the steam generator coil heater)	

COMPONENTS	NAME OF SIGNAL	DESCRIPTION	Characteristics
PTC4	IA4	NTC10000 temperature probe mounted on radiator	
PTC5		Temperature probe mounted on CPU card	
PS1	IA5	Pressure sensor	
LS1	ID4	Float sensor for MIN distilled water level, contact normally closed (NC)	
LS2	ID5	Float sensor for MAX distilled water level, contact normally closed (NC)	
LS3	ID6	Float sensor for MAX used water level, contact normally closed (NC)	
SW1	ID7	Door closed micro-switch, contact normally open (NO)	
SW2	ID8	Door lock micro-switch	
SW3	ID9	External Aquafilter signal (indicates the conductivity limit of the water produced by the deionizer)	
SERIAL 1 Software port		Main serial port (cpu flash software update, probe and sensor calibration, etc.)	
SERIAL 2 Printer port		Secondary serial port (external printer, external memory, etc.)	

5.2 CYCLE FOR E9 INSPECTION WITH SEPARATOR DRAINING PUMP



5.2.1 Phase 0: Turning on the sterilizer

PHASE 0: TURNING ON THE STERILIZER

When the unit is turned on with the ON-OFF switch, atmospheric pressure is measured with the pressure transducer if the door is open, otherwise the previous measurement is maintained. The R2 heater (band) is not powered for the first three minutes. This allows the Vacuum Test to be performed (this test cycle is performed within 3 minutes of when the unit is switched on or if the PTC2 probe detects a temperature of less than 50°C. See Appendix 6 "Test description" in the instructions manual). After the first three minutes have elapsed, the preheating phase begins during which the R2 heater is powered at 40% with a set point of 110°C. If the unit remains inactive for a certain period of time (the user can select the duration of this period: off, 30 minutes, 2, 4, 6 hours) the preheating phase terminates and the display goes blank. The preheating phase starts again if a button is pressed or if the door is opened.

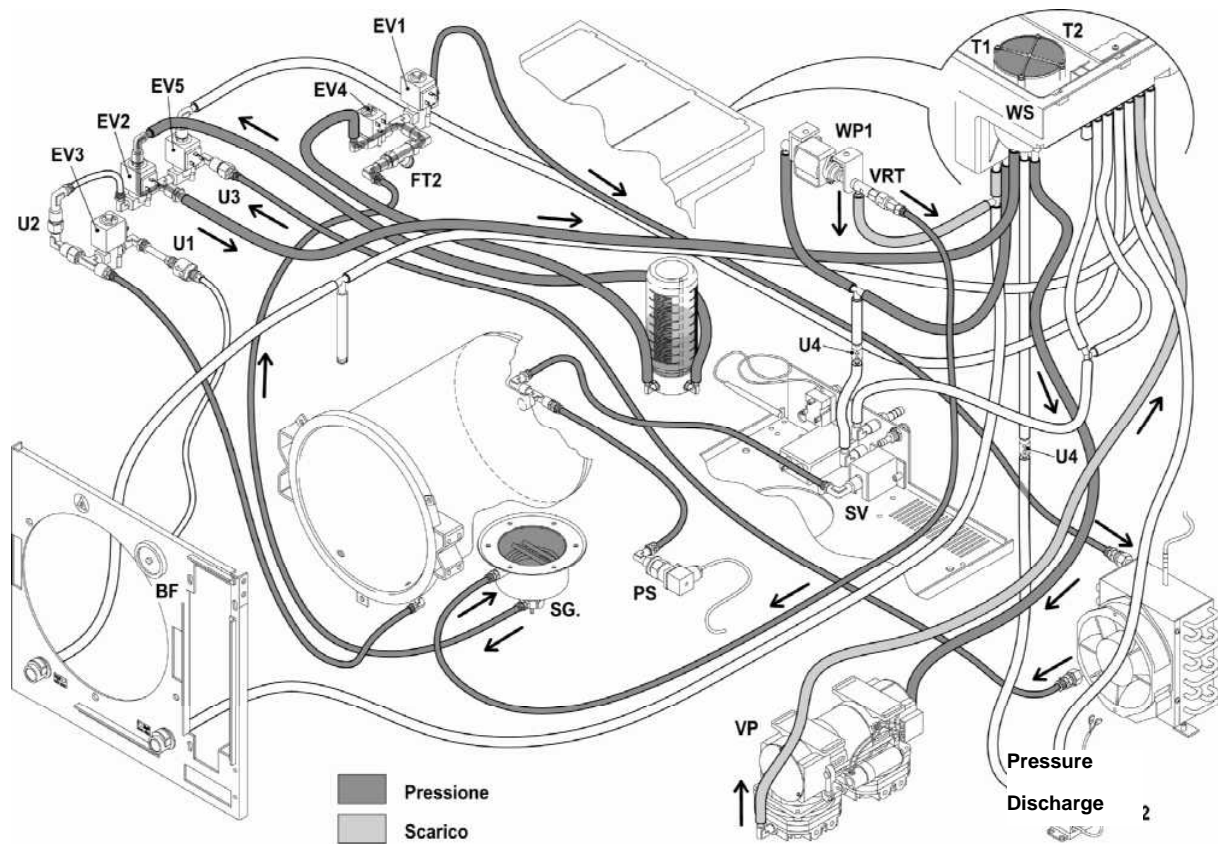
The unit can be filled with water either manually or using the mains water function with the support of a deionizer (see Appendix 10 "Euronda Aquafilter" and Chap. 6.7 "Tanks: instructions for filling and emptying" in the instructions manual). When the minimum water level sensor trips, the deionizer solenoid valve EV6 is powered and opens to let the water flow into the tank until the maximum level sensor trips.

When the door has been closed and the Start Key has been pressed, R2, supplied at 30% and checked by PTC2, is brought to 30°C beyond the set up cycle set-point. If the temperature surveyed by PTC2 at the Start is lower than 110°C, on the display will appear "Cycle in progress, please wait", otherwise the cycle begins.

The following are powered:

1. mechanical safety electromagnet (electrical safety is provided by the door micro-switch).

5.2.2 Start-Vacuum phase V1/I

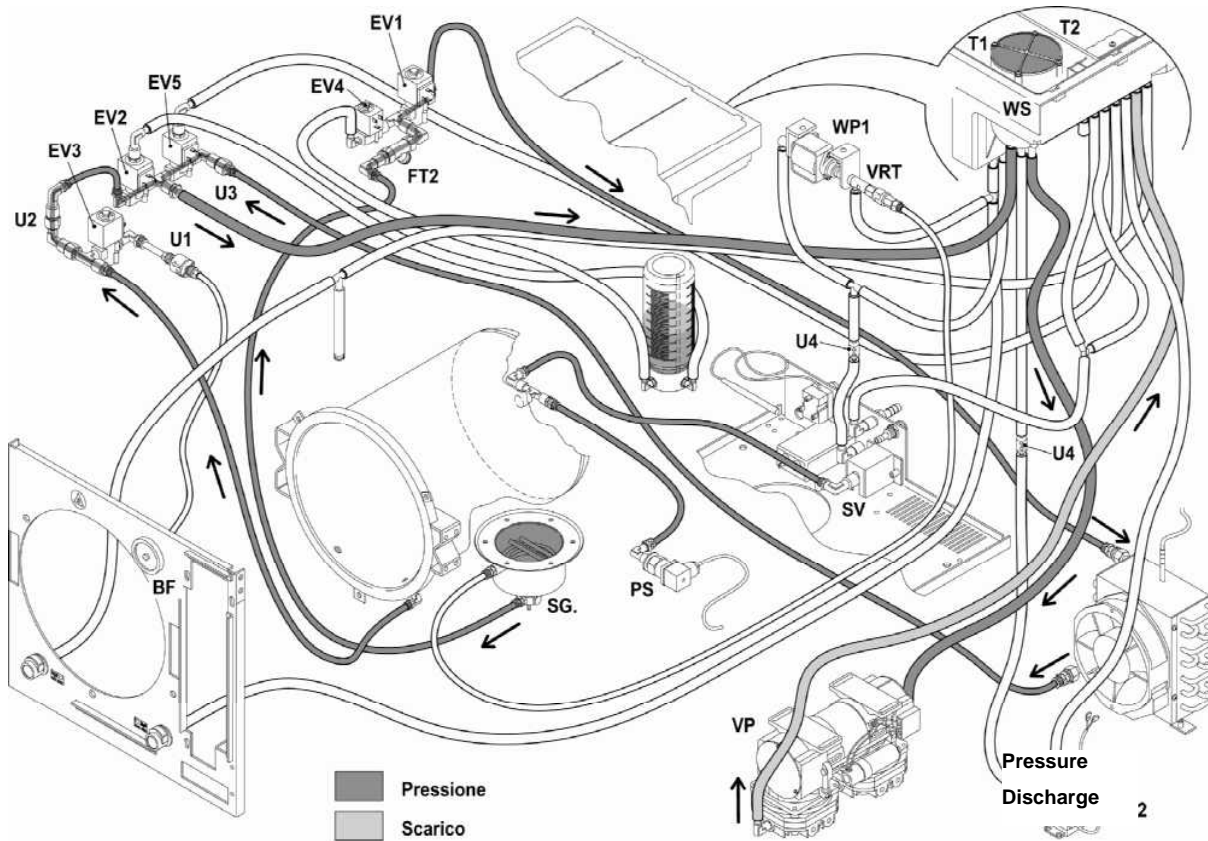
**START-VACUUM PHASE V₁/I**

The following are powered:

1. EV1: closes the pressure discharge circuit
2. EV3: closes the bacteriological filter
3. EV4: opens the water inlet to the air separator
4. EV5: opens to allow the vacuum pump to start smoothly by pumping air
5. Vacuum pump which starts pumping air
6. WP1 water pump which starts pumping water from the clean water tank to the air separator.

The vacuum pump begins to create a vacuum inside the air separator and then starts delivering water (pumped by WP1 for 30 seconds) to the air separator.

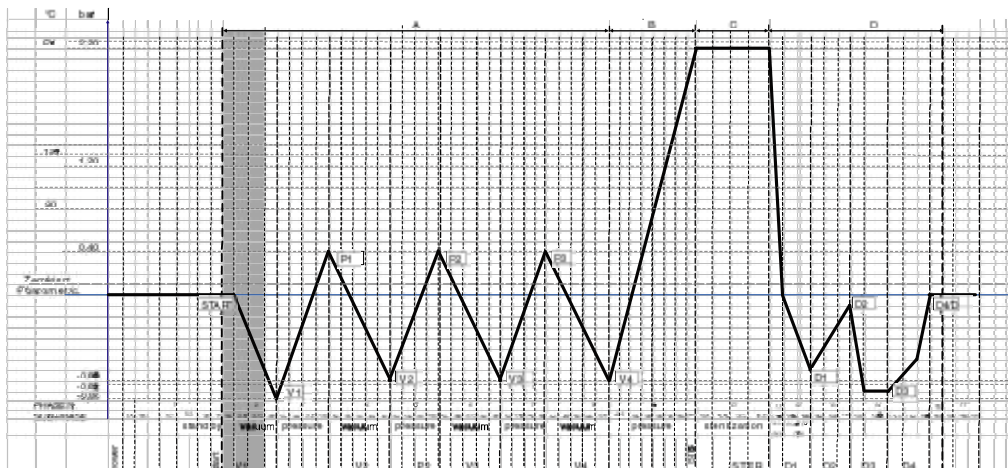
5.2.3 Vacuum phase V1/II



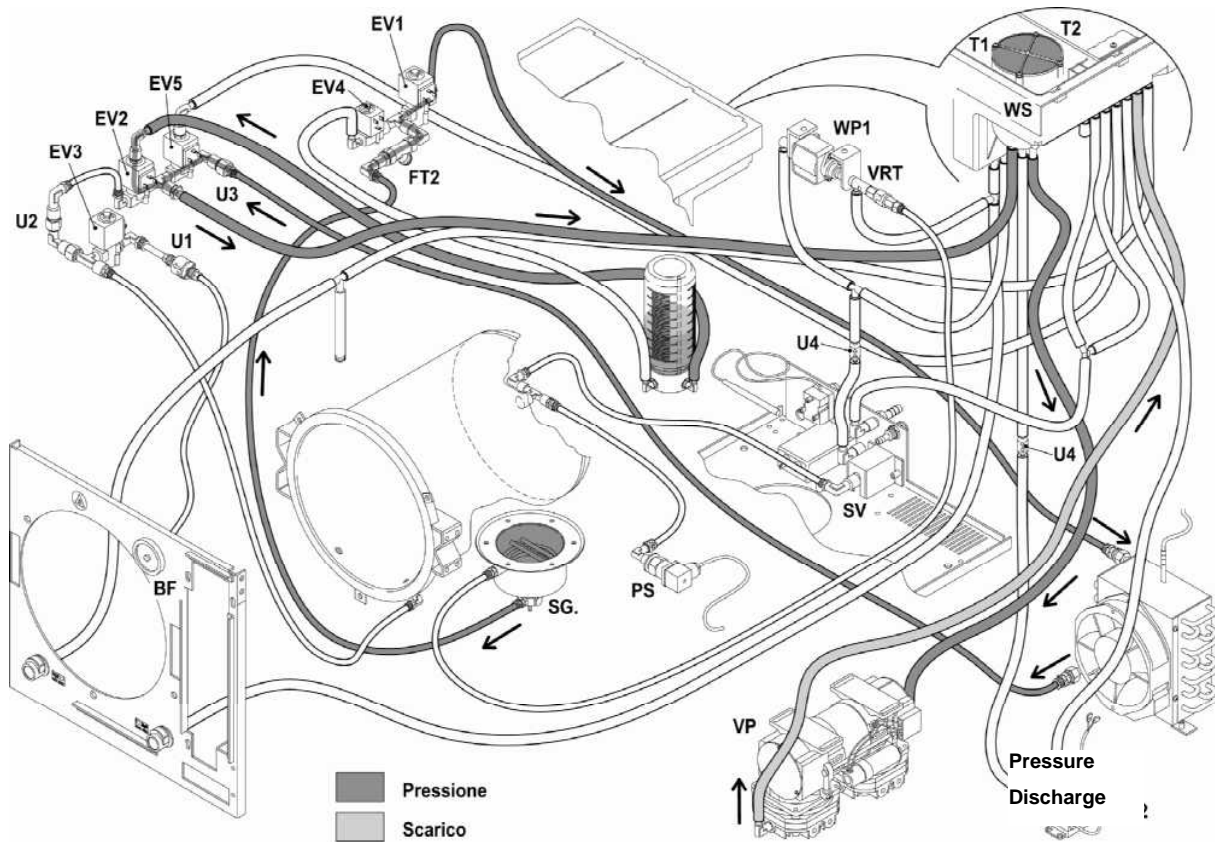
VACUUM PHASE V₁/II

3 seconds after WP1 stops working, EV2 is powered and EV4 and EV1 are de-energised. This allows the vacuum pump to create a depression inside the chamber by pumping air through EV1 ed EV2, hence by-passing the water circuit the air separator is connected to.

- EV2= ON
- EV4= OFF
- EV1= OFF

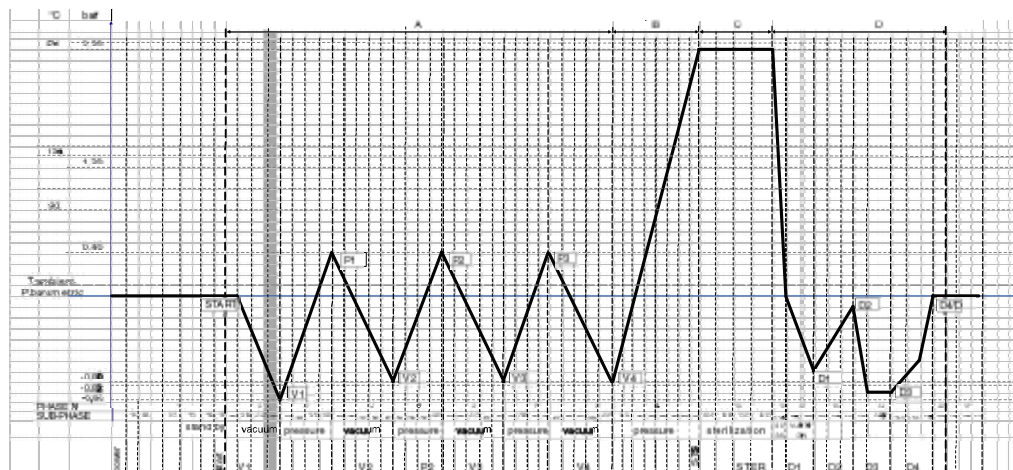


5.2.4 Vacuum phase V1/III

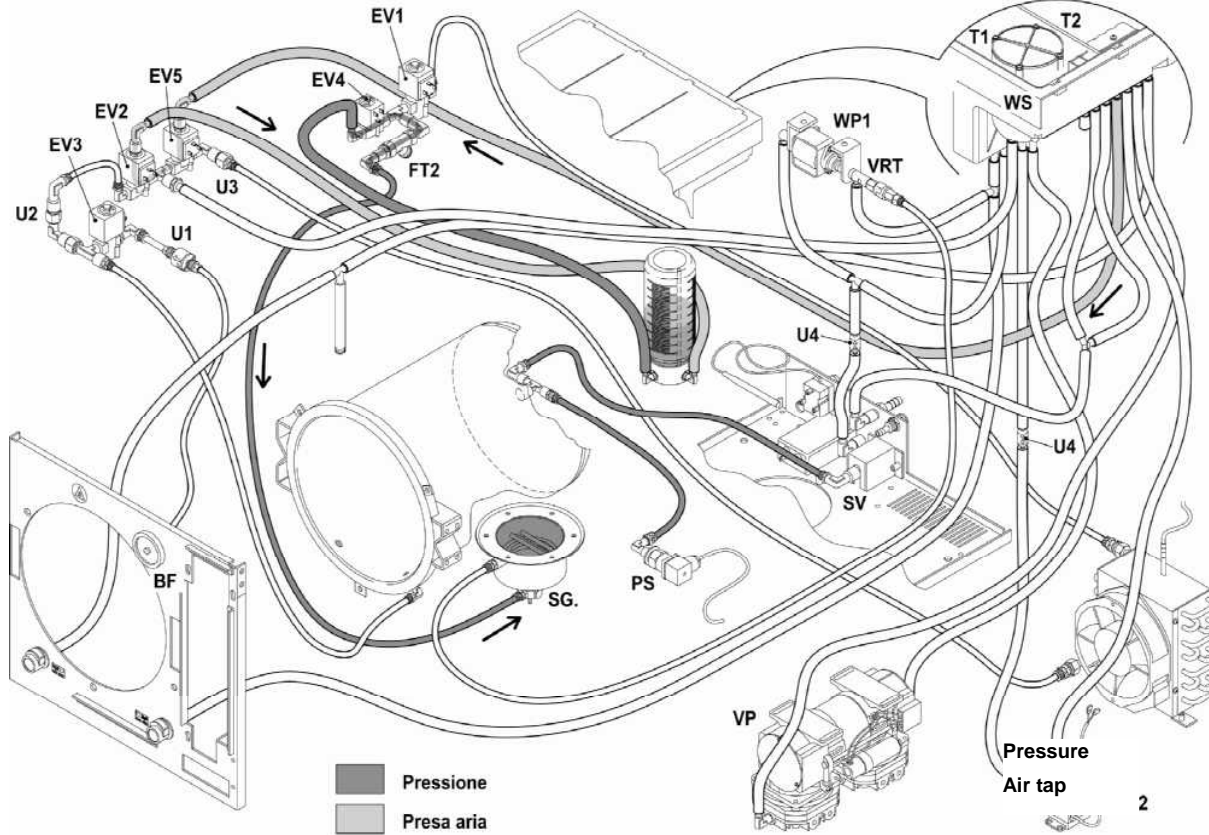


VACUUM PHASE V₁/III

When the pressure inside the chamber reaches -0.82 bar, EV2 is de-energised and the pump continues to pump from EV1 to separate the air from the water in the air separator. If in 4 minutes the pressure inside the chamber does not reach to -0.86 bar, EV3 ON for 15 sec, in order to clean the hydraulic circuit from



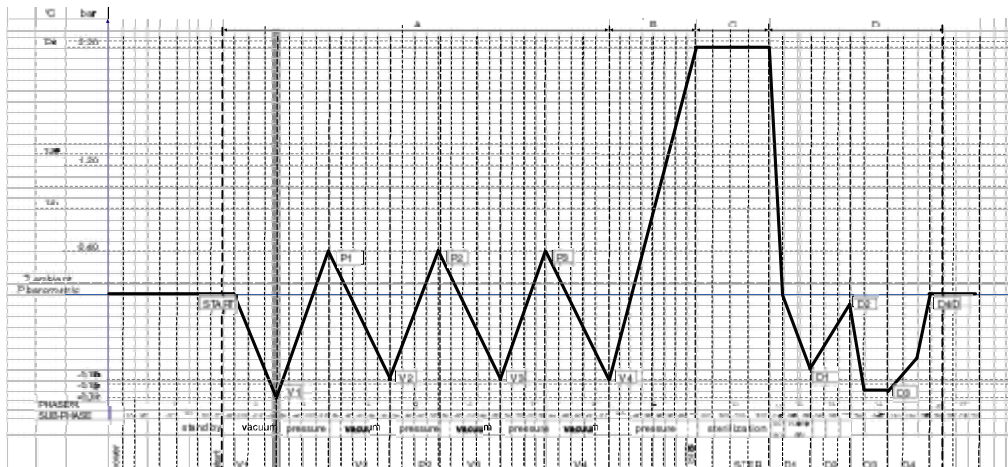
5.2.5 Water inlet phase



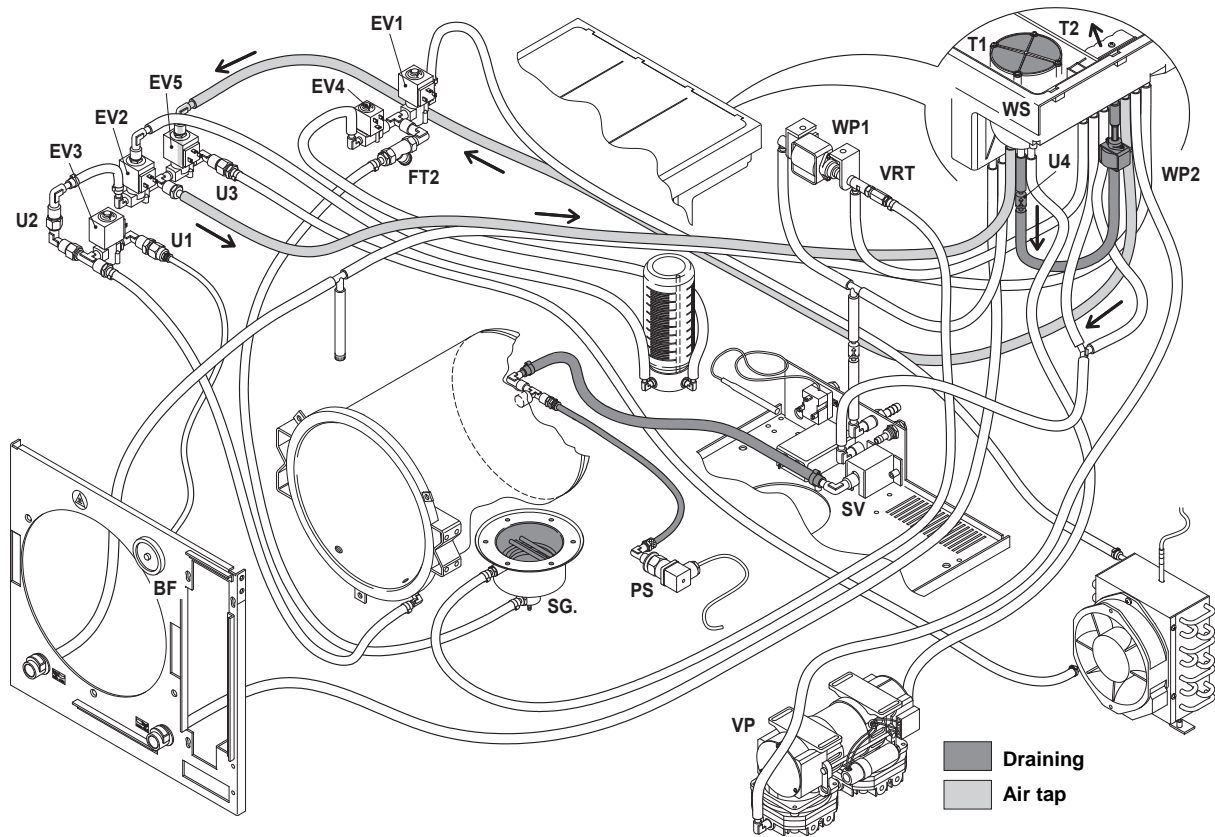
WATER INLET PHASE

When a pressure of -0.86 bar is reached, EV1 and EV4 are powered while EV5 is de-energised. The vacuum pump stops working and the generator heater R1 is powered at 50%. The water flows from the air separator to the steam generator by depression. After 15 seconds EV4 is de-energised (the air separator is disconnected from the chamber) (see next phase).

EV1= ON VP1= OFF
 EV4= ON FAN= 30%
 EV5=OFF RES1= 50%

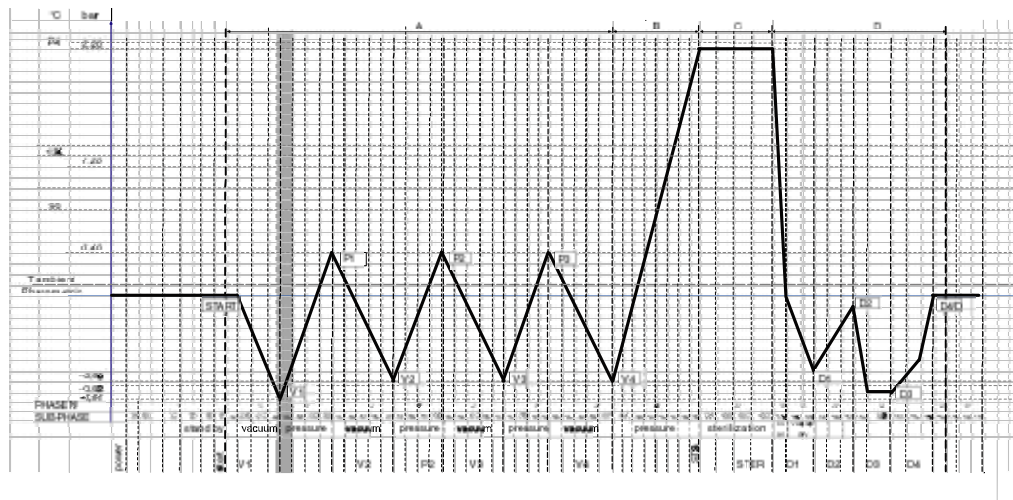


5.2.6 Water outgas system drain phase

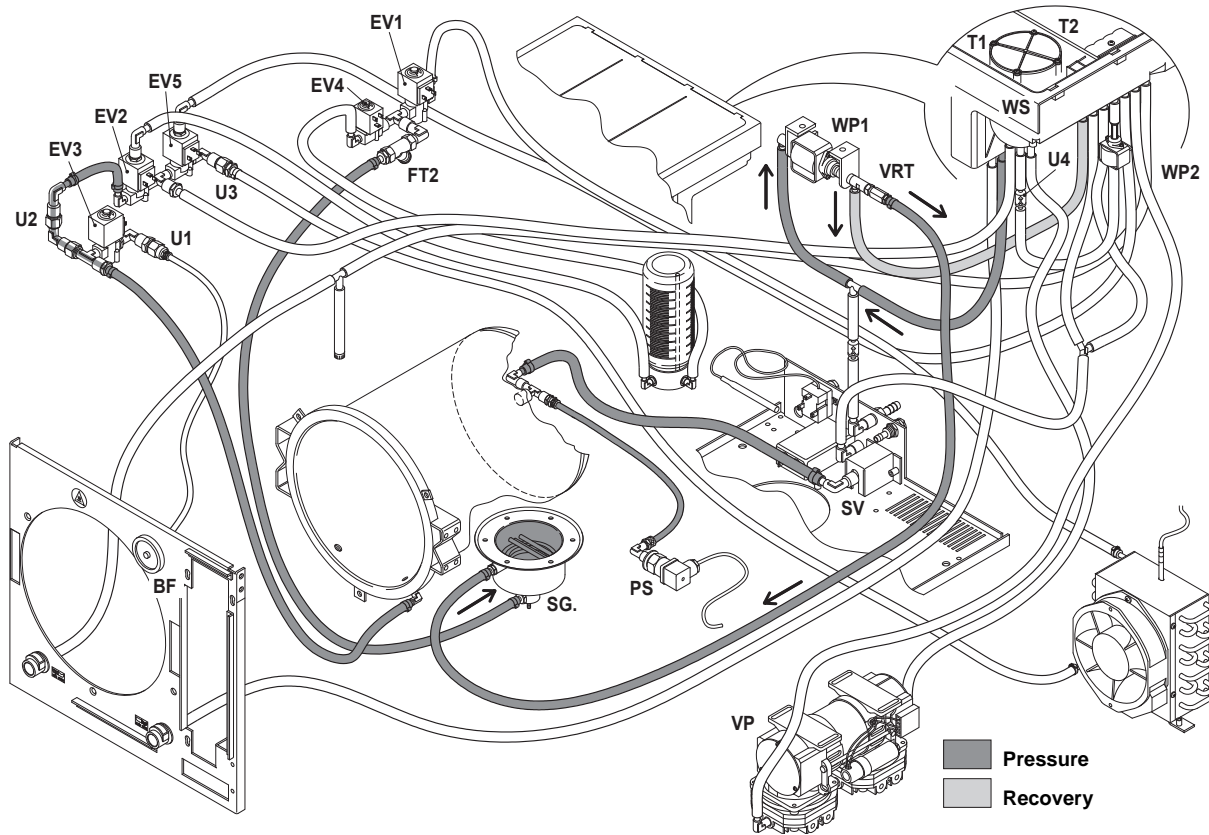


WATER OUTGAS SYSTEM (W.O.S.) DRAIN PHASE

After EV4 is de-energized, pump WP2 works for 120 seconds (NME up to EEG060999/EEH060999) for 8 seconds (SICCE from EEG061000/EEH061000) (draining any water remaining in the water outgas system).



5.2.7 Pressure increase phase P₁



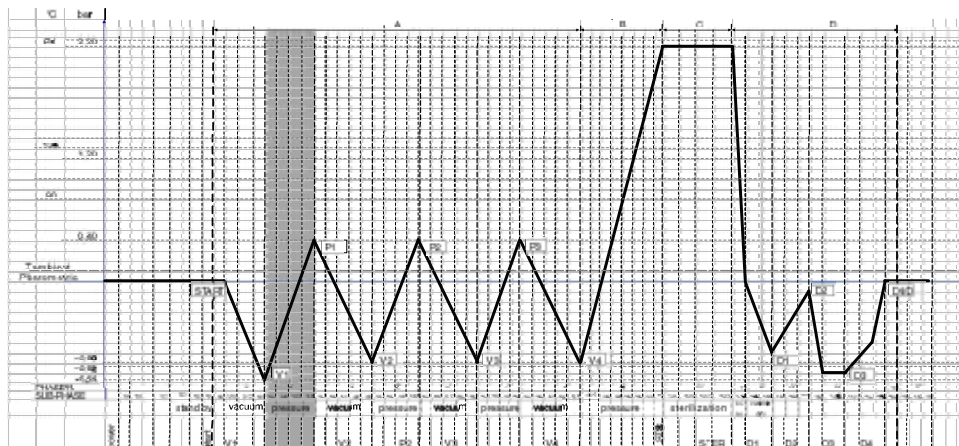
PHASE P₁ - PRESSURE INCREASE

After further 15 seconds, R1 Resistance is supplied at 80%, after 80 seconds at 100%; this permits to generate steam. The temperature control in this phase takes place according to the following formula: $(T_G - T_T) - (T_G^1 - T_T^1) \leq 0,4$ where T_G and T_T stand for the temperature in the selected moment, while T_G^1 and T_T^1 stand for the temperature after 1 second.

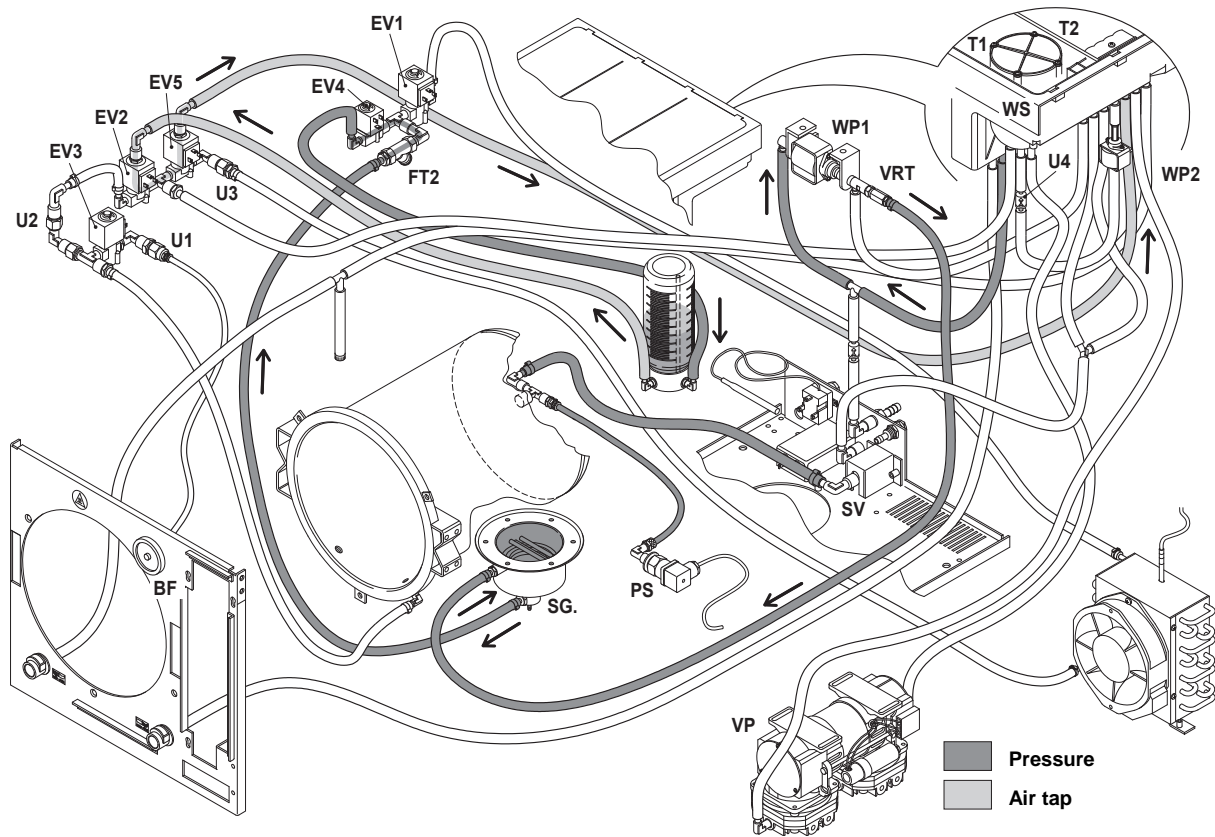
The difference between T_G and T_T must not be higher than 0,4 per second. If this value is not respected and:

PHASE 3e : Se $T_G > T_T + 4 \text{ }^\circ\text{C}$
 PHASE 3d : Se $T_G > 2 \text{ }^\circ\text{C/sec}$ or if $T_G > T_T + 10 \text{ }^\circ\text{C}$

then the WP1 pump executes 5 water recalls (it alternates 2.5 seconds of working and 2 of inactivity, for five times).

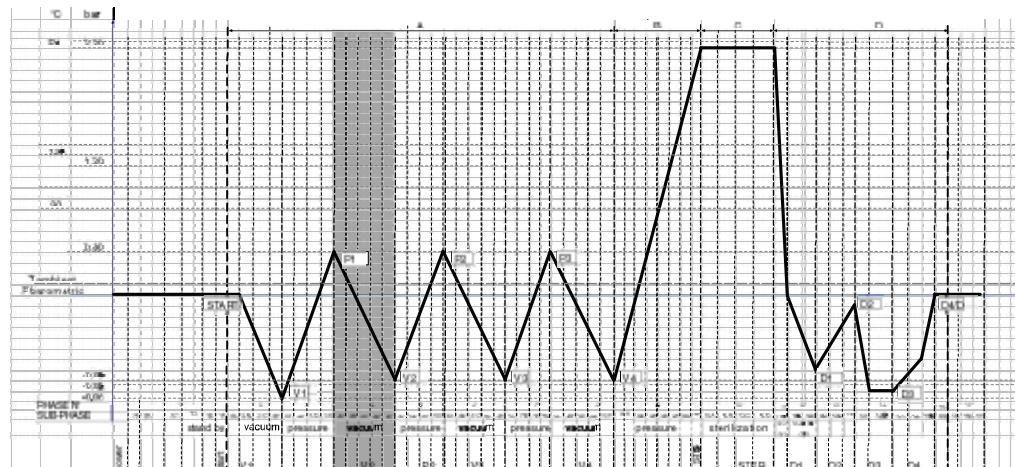


5.2.8 Water transfer phase

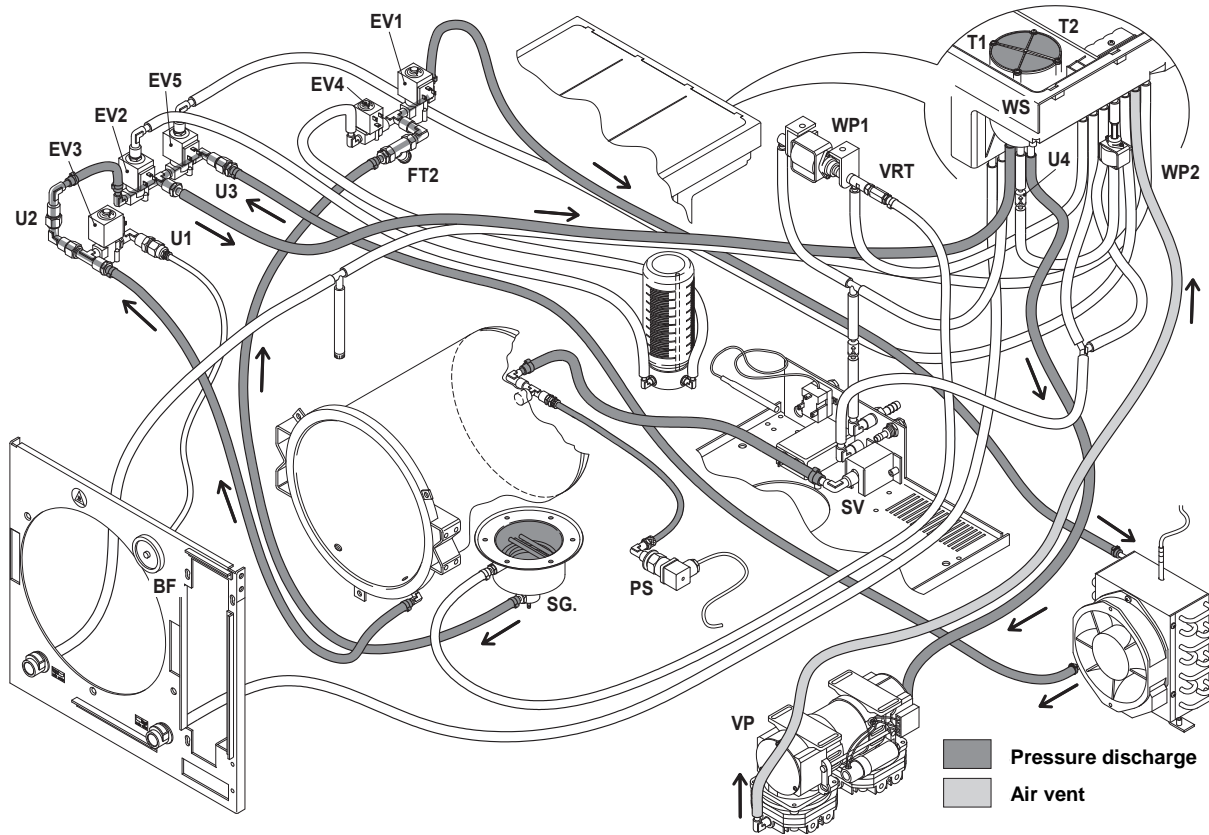


WATER TRANSFER PHASE

When the pressure reaches +0.40 bar, the heater R1 is disconnected from the power supply; after 1 second, EV4 is powered to allow the water to be transferred from the chamber to the air separator and pump WP1 is powered for 2 seconds to prevent the PTC3 probe from detecting an elevated temperature during transfer.

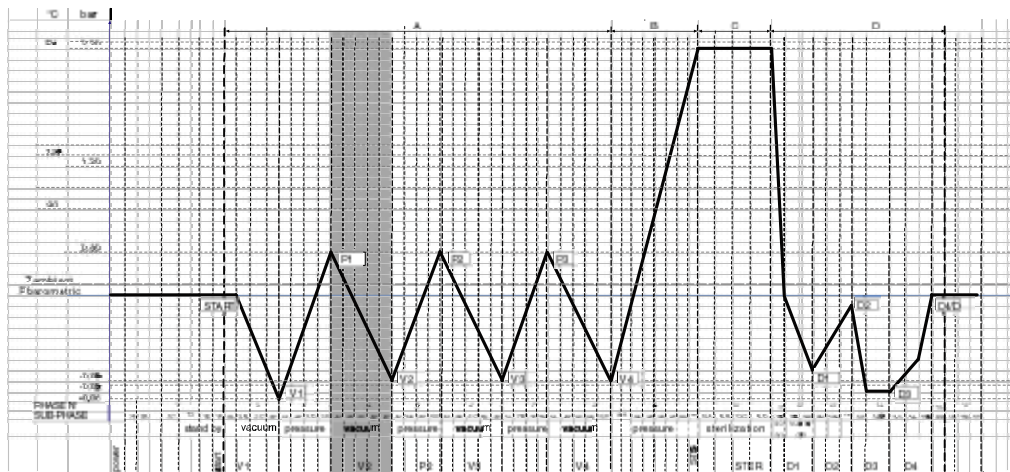


5.2.9 Vacuum - Thermodynamic vacuum phase V₂

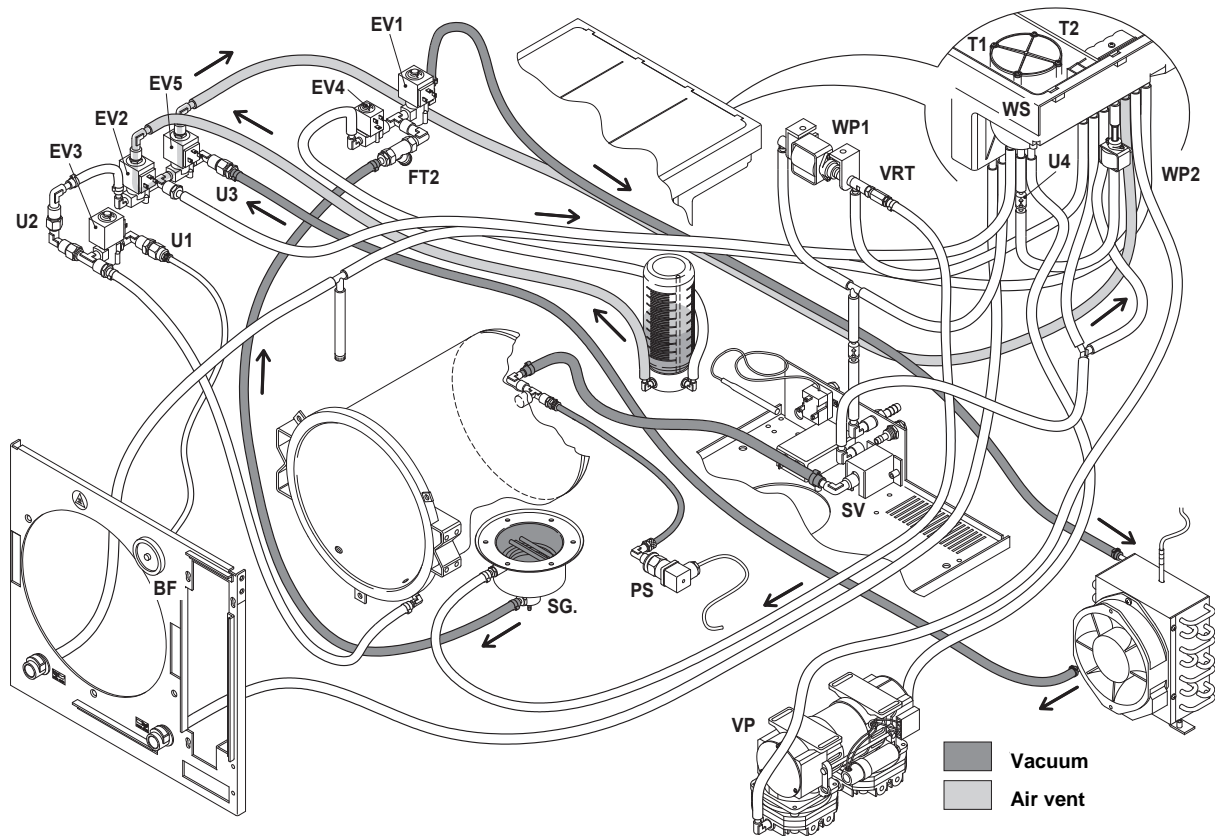


**PHASE V₂ – VACUUM –
THERMODYNAMIC VACUUM**

After 18 seconds, the fan is powered at 100%, EV4 and EV1 are de-energised, while EV5 is powered. After another 5 seconds, the vacuum pump starts working and EV2 is powered.

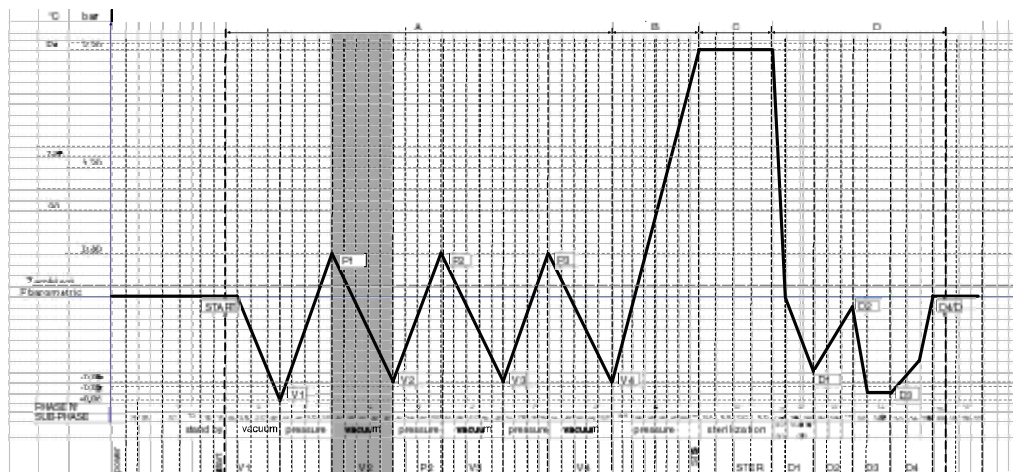


5.2.10 Vacuum 2,3,4 phase V2

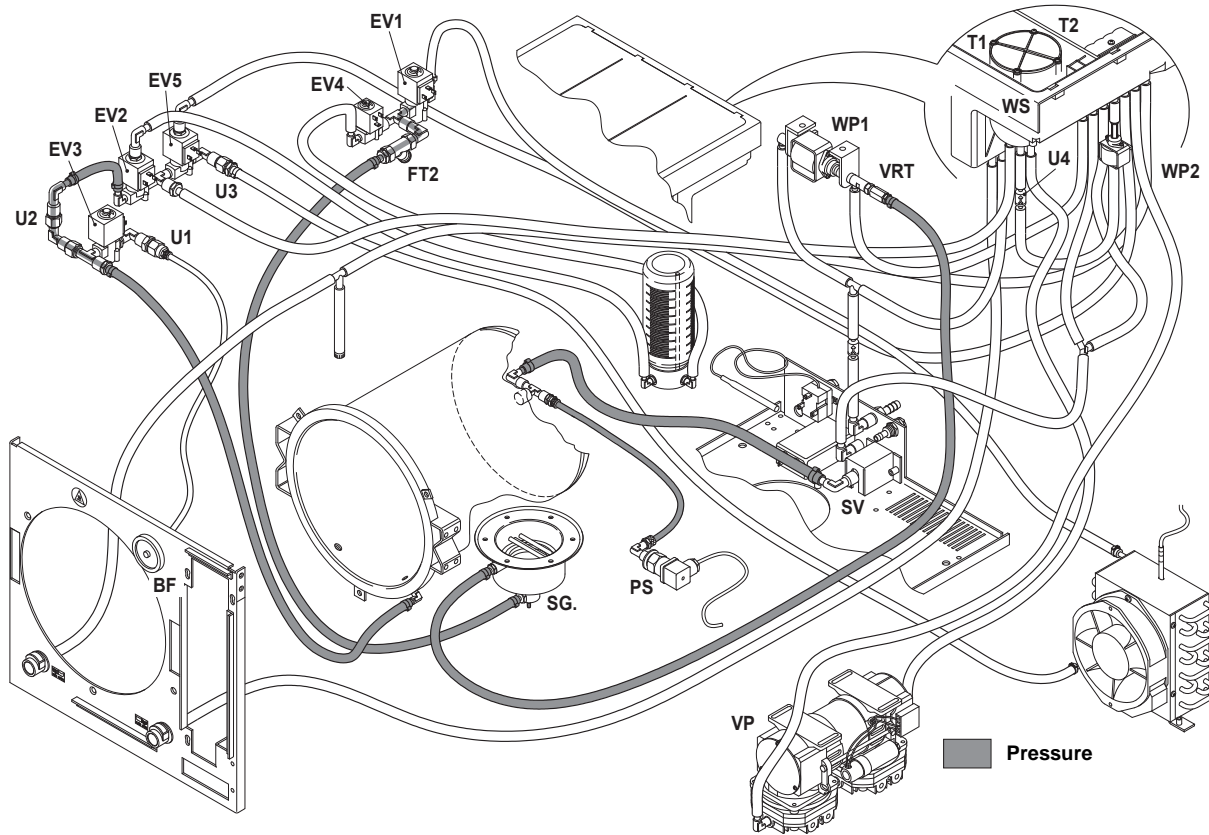


PHASE V₂ - VACUUM 2, 3, 4

If the temperature detected by the PTC4 probe is greater than 60°C, the vacuum pump stops working and EV2 and EV5 are de-energised. The vacuum is now only created by the fan. When the temperature falls below 60°C the pump starts working again. When a pressure of -0.80 bar is reached, the water is transferred again from the air separator to the chamber. During transfer, pump WP1 is powered for 3 seconds to offset any water leaks during the process, while pump WP2 works for 5 seconds. This sequence of decreasing and increasing pressure takes place four times with the difference that the first depression reaches -0.86 bar while the others reach -0.80 bar.

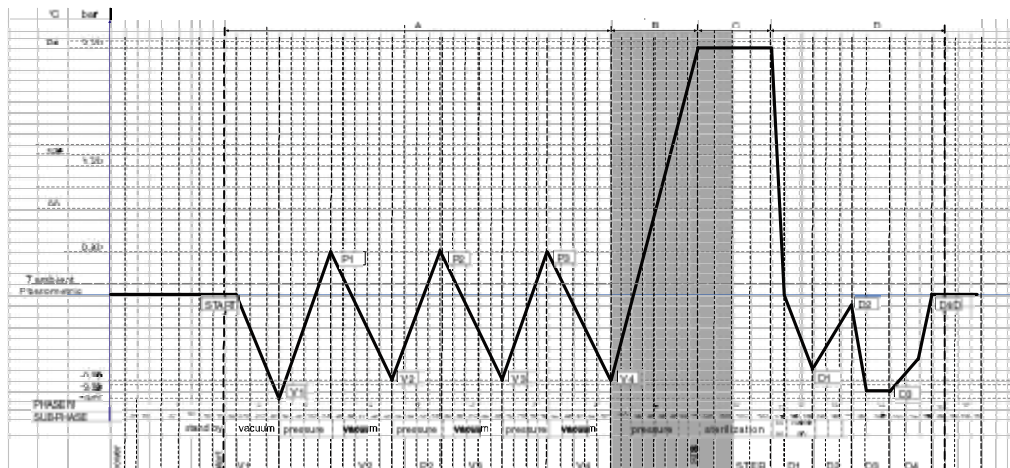


5.2.11 Pressure increase/Sterilization phase P₄

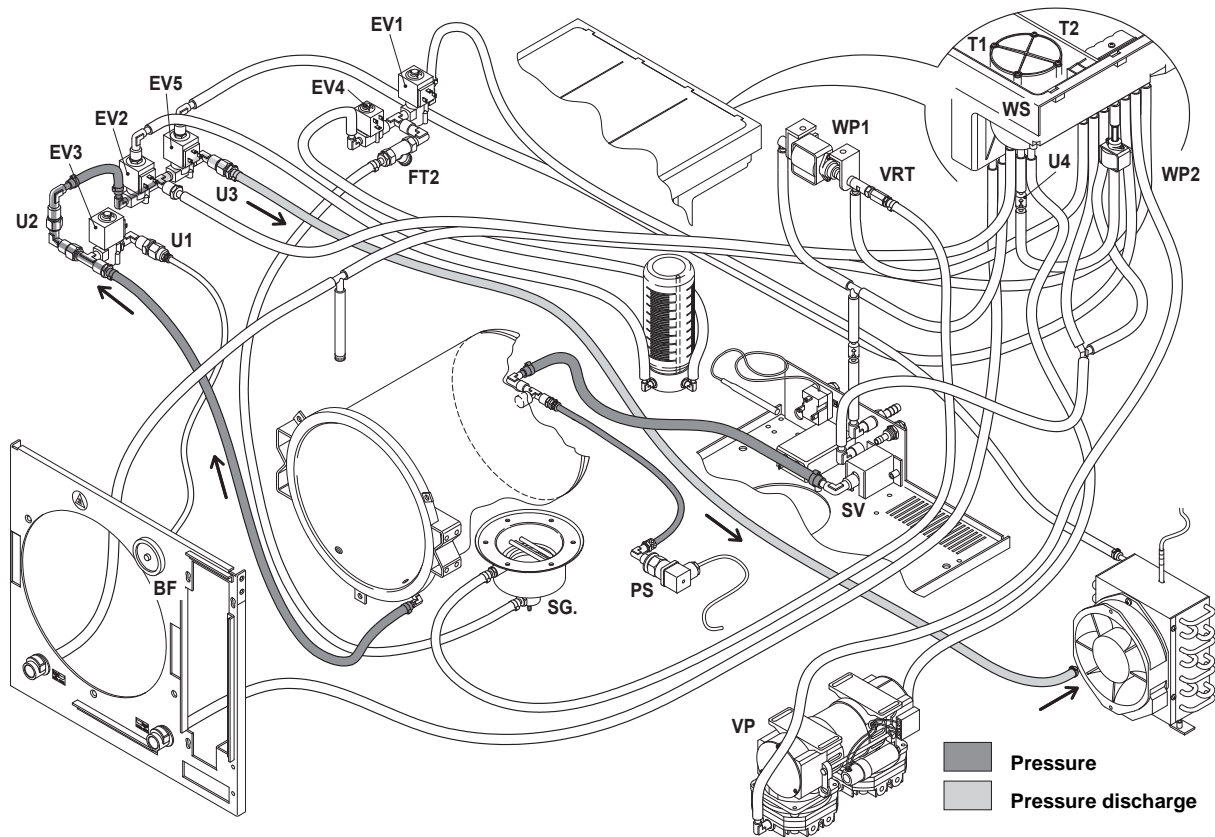


**PHASE P₄ - PRESSURE INCREASE/
STERILIZATION**

The fourth rising of pressure brings to sterilization. 4°C below set-point value, WP1 pump makes four water injections (1 second ON, alternated with 2 seconds' pause), in order to reach the sterilization temperature in the most graduated way. Sterilization begins in the moment when the temperature value is reached, or when the established pressure value is reached.

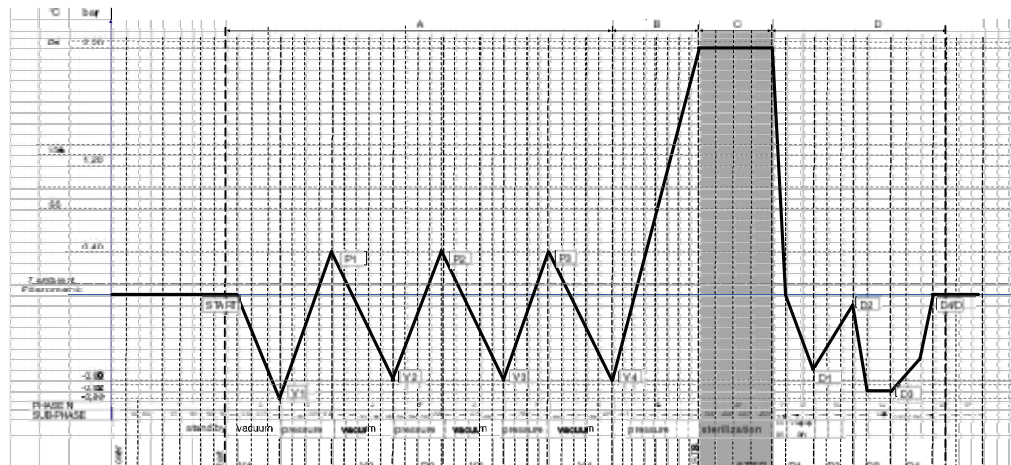


5.2.12 Sterilization phase

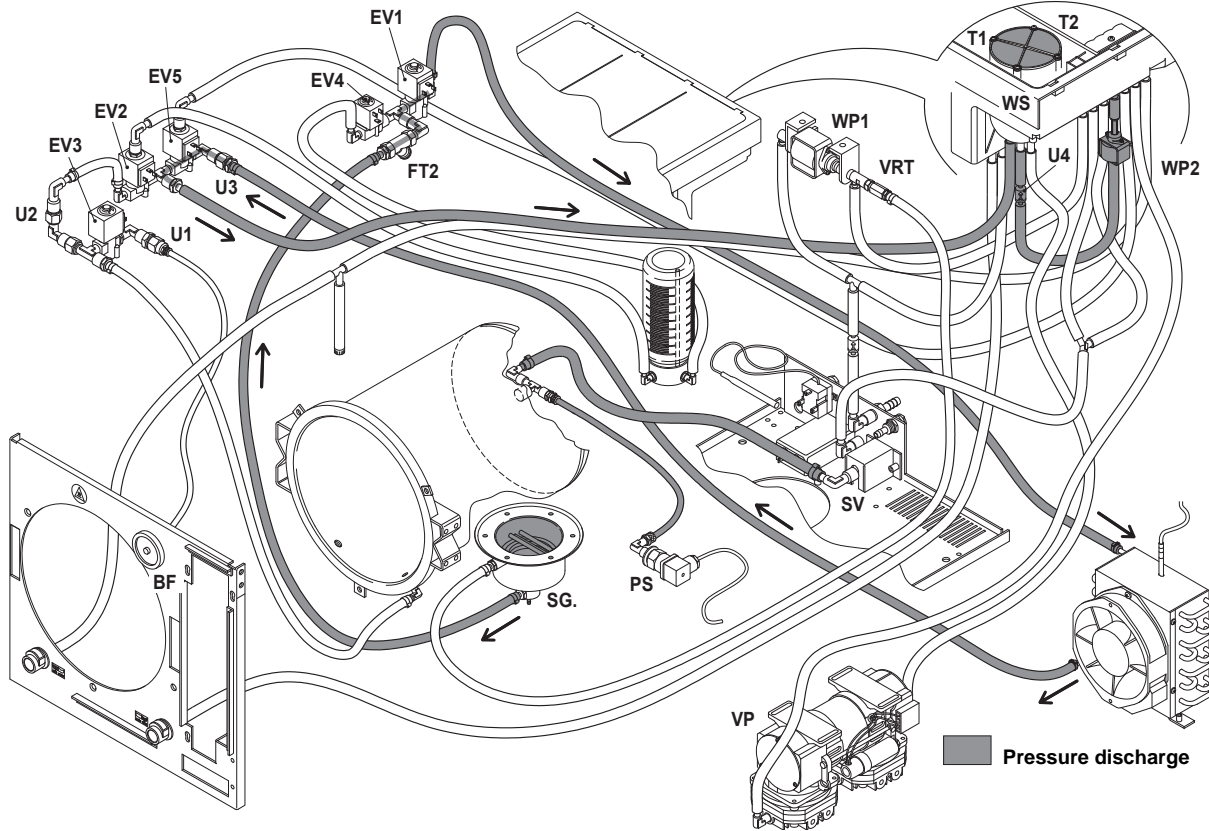


STERILIZATION PHASE

If inside the chamber is signalled a pressure of +0,2 bar higher than set point, EV2 and EV5 electro-valves are supplied for about 600 ms to allow the discharge of superfluous pressure. If during sterilization phase the PTC3 probe surveys a temperature 2°C higher than the temperature surveyed by PTC1 probe, WP1 executes 4 water recalls (it alternates 1.5 sec of working with 15 seconds of inactivity for 4 times).

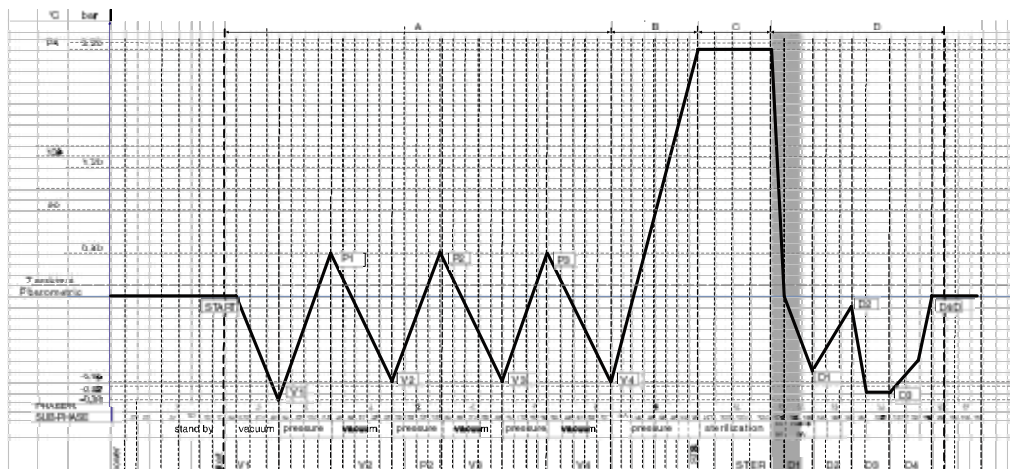


5.2.13 Steam discharge phase

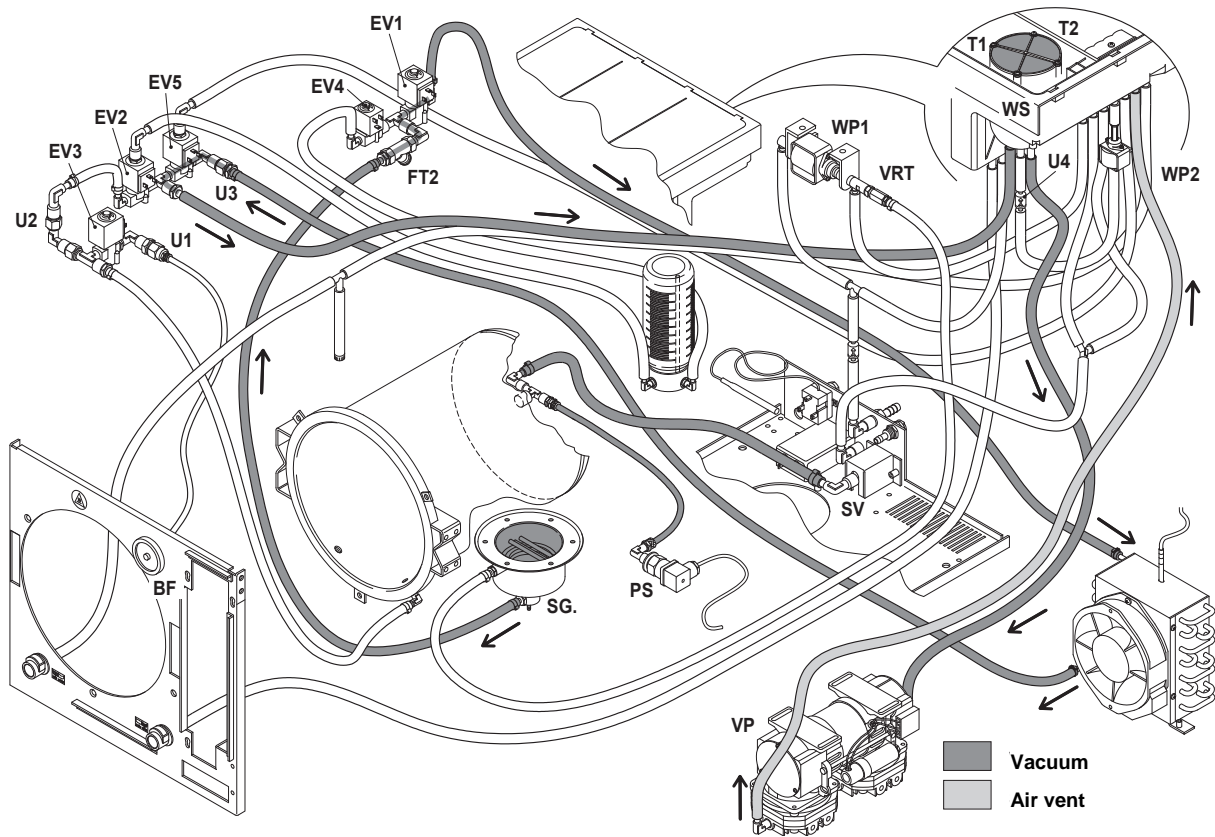


STEAM DISCHARGE PHASE

When the sterilization phase is finished (4, 18, 20 minutes according to the selected cycle) there takes place the pressure discharge and consequently the drying phase, whose duration time can be set up by user (auto = 15, 20, 25, 30 minutes; see chapter 8.9.1 "Drying time set up" from User manual). RES2 resistance is supplied at 50% in proportion to $V_1 - V_4$ time, superior to the set point value of the established time, R1 is not supplied, the fan is supplied at 100% and EV1 is de-energised (it allows the pressure discharge inside the condensation battery), WS2 is supplied for 8 seconds in order to empty the separator.

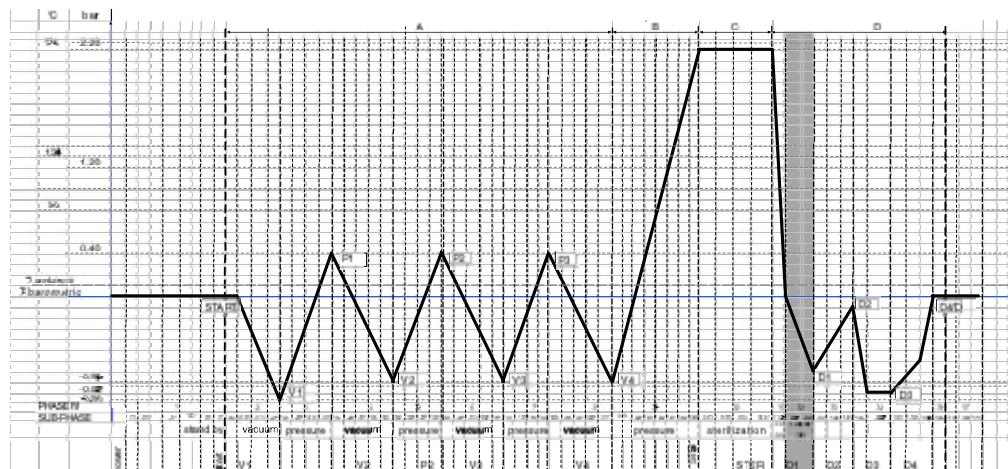


5.2.14 Steam discharge phase I

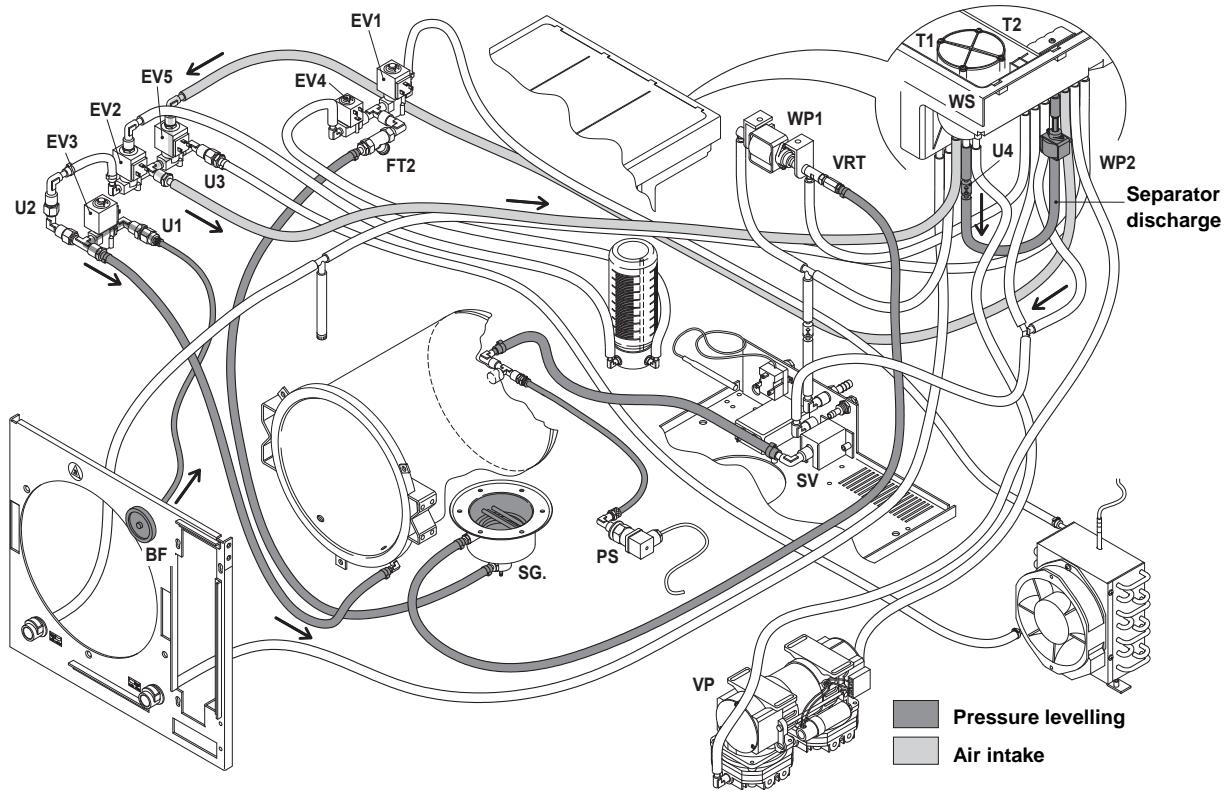


STEAM DISCHARGE PHASE I

After 8 seconds WP2 stop working, EV2 is de-energized, EV5 is supplied and VP1 pump begins to create vacuum inside the chamber. If during the pressure discharge the temperature surveyed by PTC4 is higher than 80°C, the vacuum pump does not work and, as in the previous depression phases, vacuum is executed only by the fan. The vacuum pump VP and the water pump WP2 never work together.

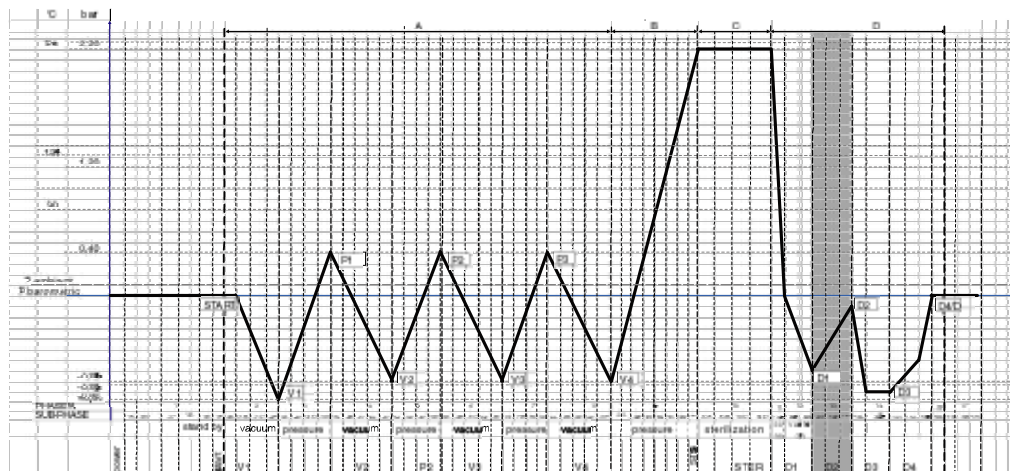


5.2.15 Pressure levelling phase I

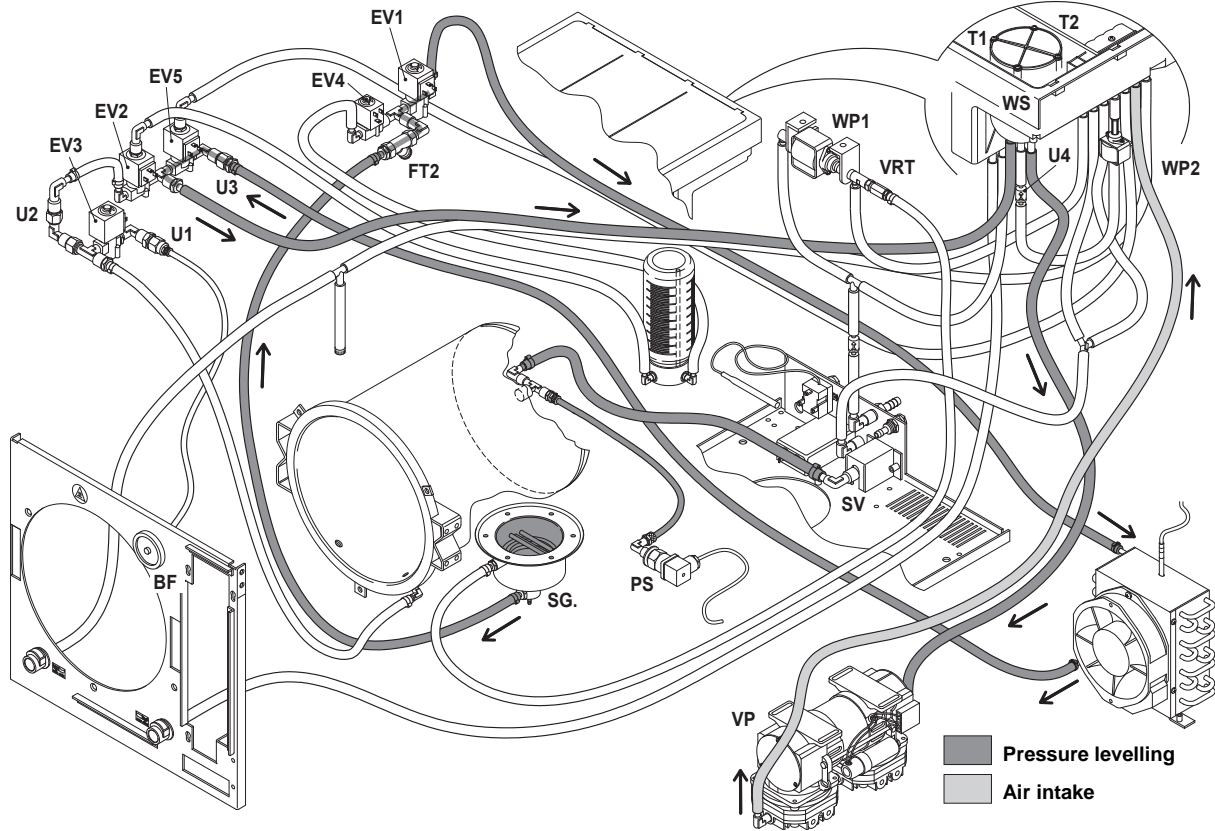


PRESSURE LEVELLING PHASE I

After 4 minutes takes place the drying pause phase. EV3 is de-energized, supplied and then de-energized with intervals of one second (to avoid any sudden pressure variation), the fan is supplied at 40%, EV5 is de-energized, the vacuum pump is not supplied any longer, while WP2 pump works for 5 seconds (WP1= OFF).

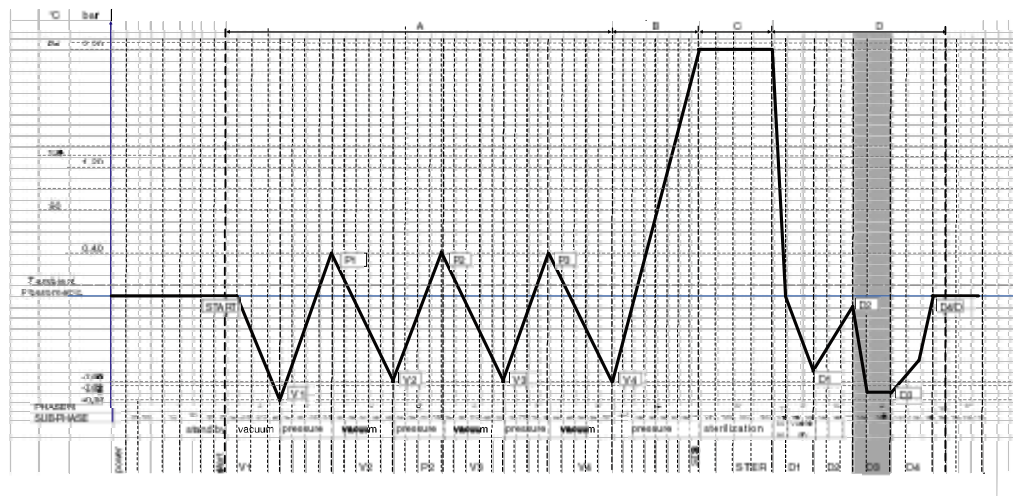


5.2.16 Vacuum phase II

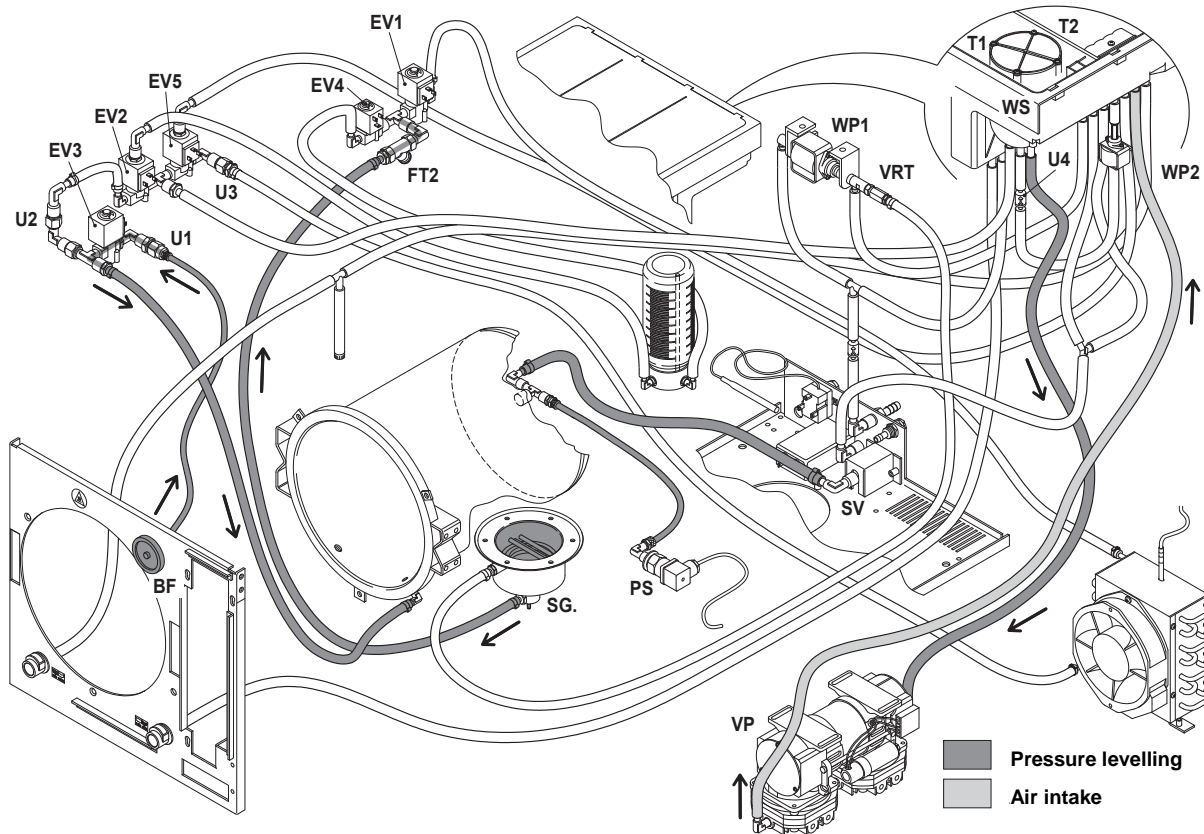


VACUUM PHASE II

After 60 seconds, EV3 is powered, EV1 de-energised and the pump (WP1=ON) recreates a vacuum. EV5 is powered three seconds after the pump starts. This allows the pump to pump both from the condensation coil and from the chamber.



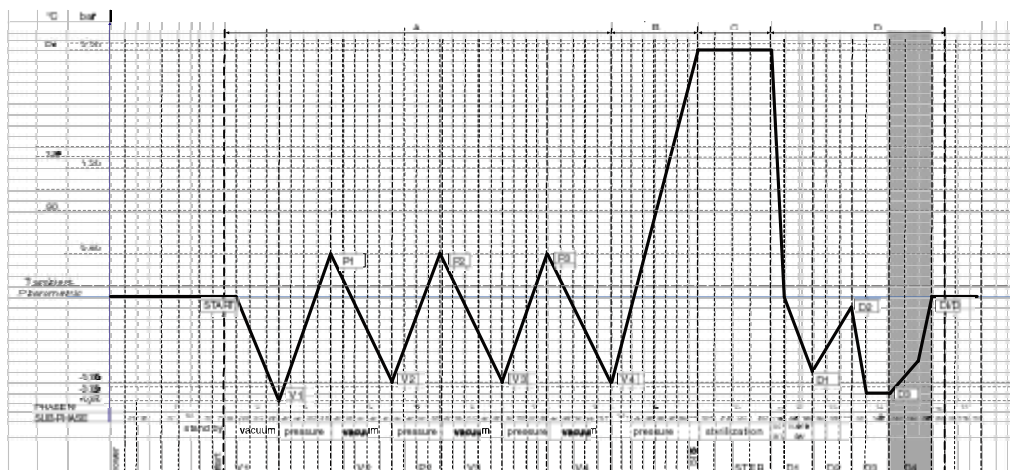
5.2.17 Pressure levelling phase II



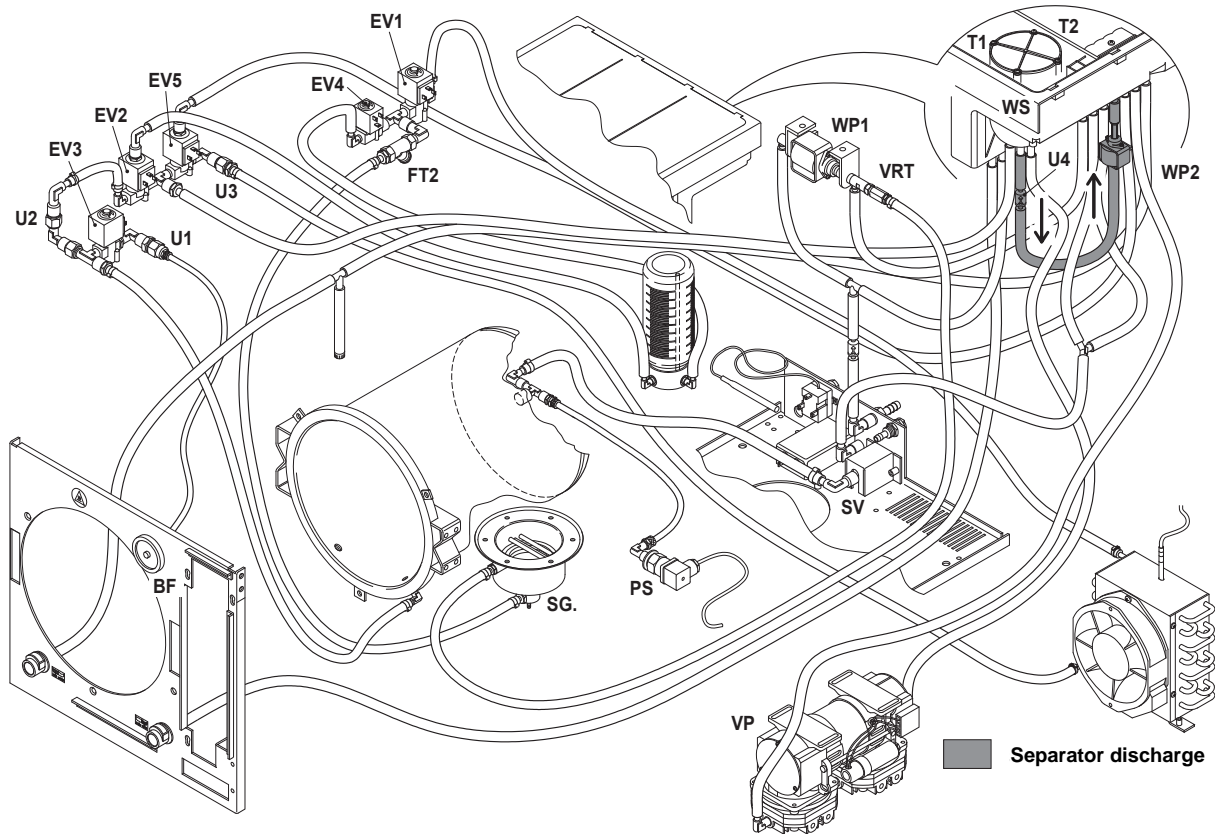
PRESSURE LEVELLING PHASE II

After 8 minutes have elapsed (if set up to auto= 15 min) or 13, 18, 23 respectively for drying period of 20, 25, 30 minutes, the ventilation phase takes place: RES2 is supplied no more, EV3 is de-energized and allows the air to enter from the bacteriological filter. EV5=OFF. After 2 minutes the fan is switched off.

- RES1=OFF
- RES2=OFF
- WP1=OFF
- WP2=OFF
- EV1=ON
- EV2, EV3, EV4, EV5=OFF

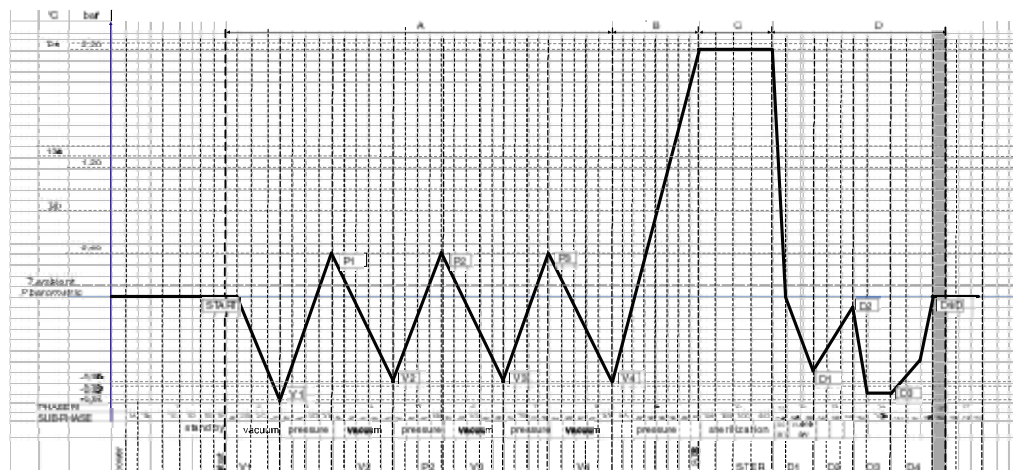


5.2.18 End of cycle phase



END OF CYCLE PHASE

After further 2 seconds, VP1 stops working, WP2 works for 5 seconds (in order to discharge water from separator) and when the pressure in the chamber reaches ± 100 mbar in comparison to the value that appears when the machine is switched on (atmospheric pressure) the cycle terminates. If the door is not opened in 10 minutes, the machine executes a vacuum for a minute (EV2, EV5 and VP1 are supplied). This phase is repeated for 10 times. When the door is opened, the R2 resistance is supplied to bring the machine to the pre-heating phase.



5.3 CYCLE FOR E9 INSPECTION/RECORDER WITH CIRCUIT U-234 (since firmware 7.01)

5.3.1 Turning on the sterilizer

PHASE 0: TURNING ON THE STERILIZER

When the unit is turned on with the ON-OFF switch, atmospheric pressure is measured with the pressure transducer if the door is open, otherwise the previous measurement is maintained. The R2 heater (band) is not powered for the first three minutes. This allows the Vacuum Test to be performed (this test cycle is performed within 3 minutes of when the unit is switched on or if the PTC2 probe detects a temperature lower than 50°C. See Appendix 6 "Test description" in the instructions manual). After the first three minutes have elapsed, the preheating phase begins during which the R2 heater is powered at 40% with a set point of 110°C. If the unit remains inactive for a certain period of time (the user can select the duration of this period: off, 30 minutes, 2, 4, 6 hours) the preheating phase terminates and the display goes blank. The preheating phase starts again if a button is pressed or if the door is opened.

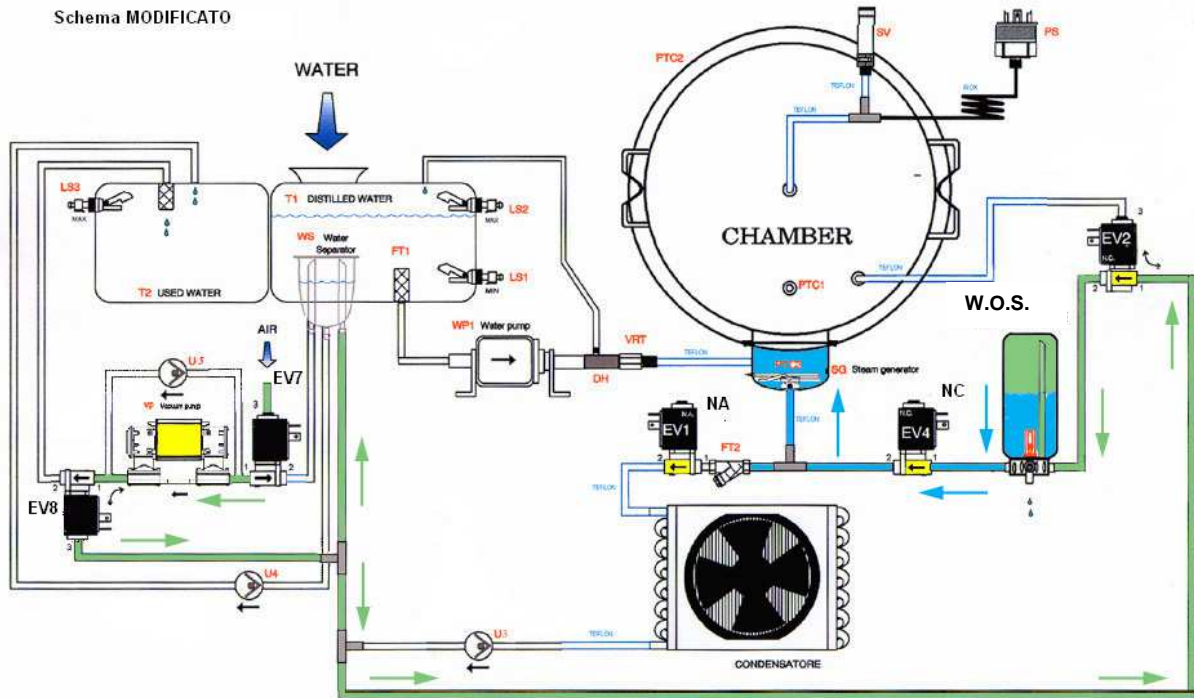
The unit can be filled with water either manually or using the mains water function with the support of a deionizer (see Appendix 10 "Euronda Aquafilter" and Chap. 6.7 "Tanks: instructions for filling and emptying" in the instructions manual). When the minimum water level sensor trips, the deionizer solenoid valve EV6 is powered and opens to let the water flow into the tank until the maximum level sensor trips.

When the door has been closed and the Start Key has been pressed, R2, supplied at 30% and checked by PTC2, is brought to 30°C beyond the set up cycle set-point. If the temperature surveyed by PTC2 at the Start is lower than 110°C, on the display will appear "Cycle in progress, please wait", otherwise the cycle begins.

The following are powered:

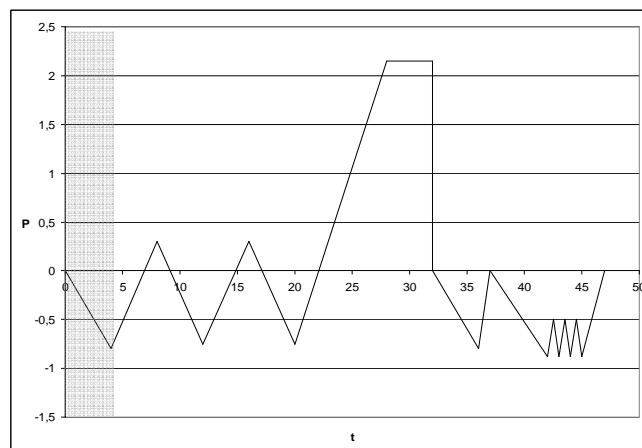
1. mechanical safety electromagnet (electrical safety is provided by the door micro-switch).

5.3.2 Phase 1: Start, water outgas system emptying and steam generator filling (U-234 circuit)

**PHASE 1**

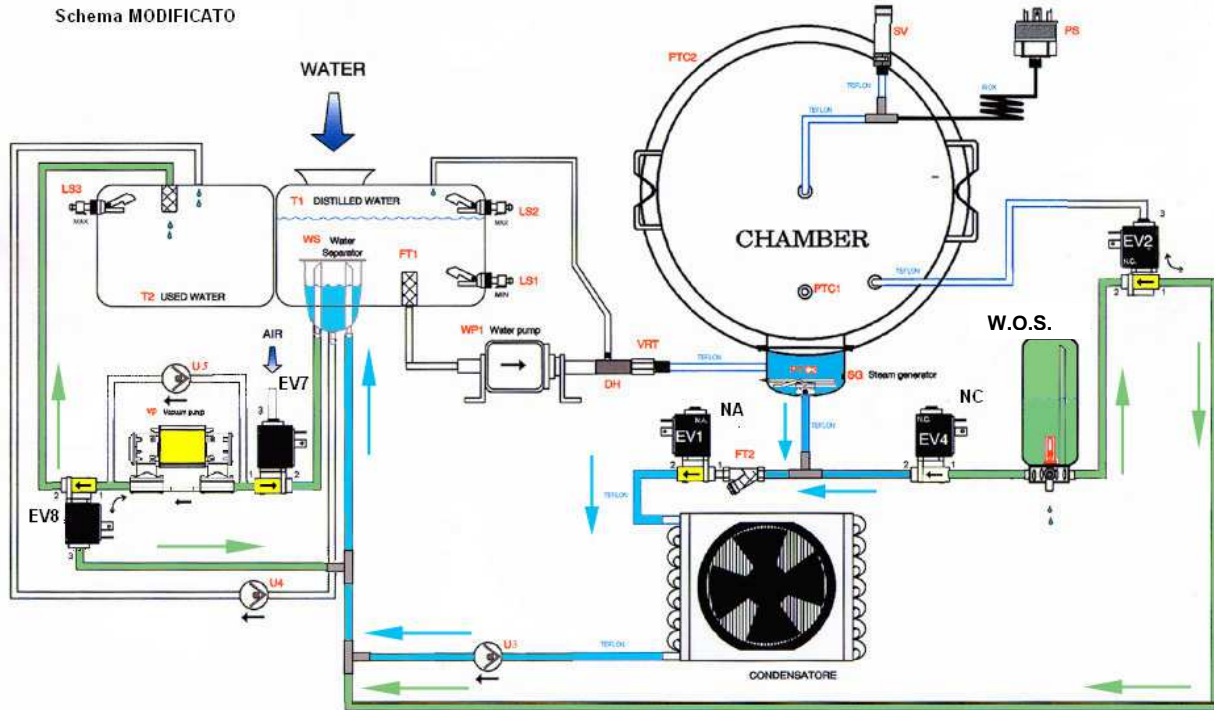
Vacuum pump takes external air from the bacteriological filter and pushes it into the water outgas system (W.O.S.) through EV8 and EV2. Since EV4 is energized (open), residual water from previous cycle is pushed into the steam generator. Energized components:

1. VACUUM PUMP
2. EV1
3. EV2
4. EV4



5.3.3 Phase 2: Steam generator emptying (U-234 circuit)

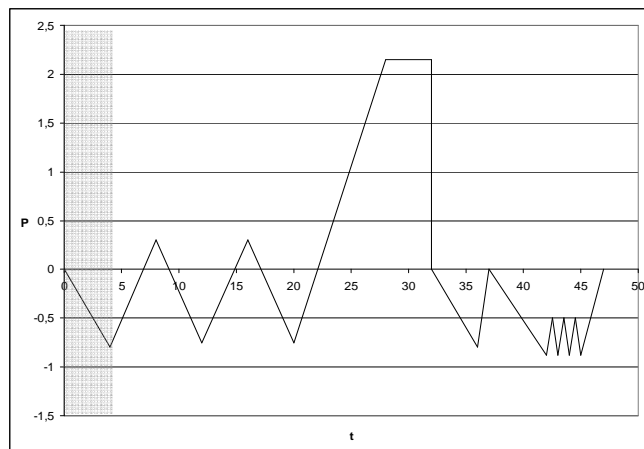
Schema MODIFICATO



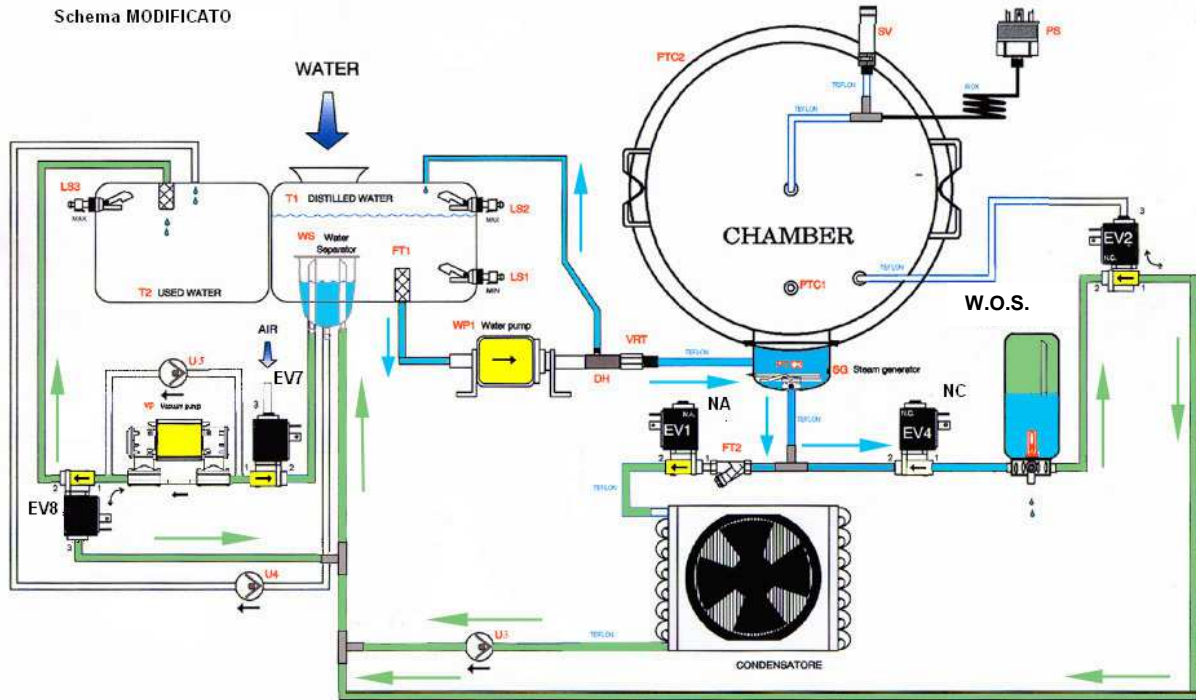
PHASE 2

Vacuum pump reduces pressure in the water outgas system in order to move water from the steam generator to the water separator through EV1. Energized components:

1. VACUUM PUMP
2. EV2
3. EV7
4. EV8



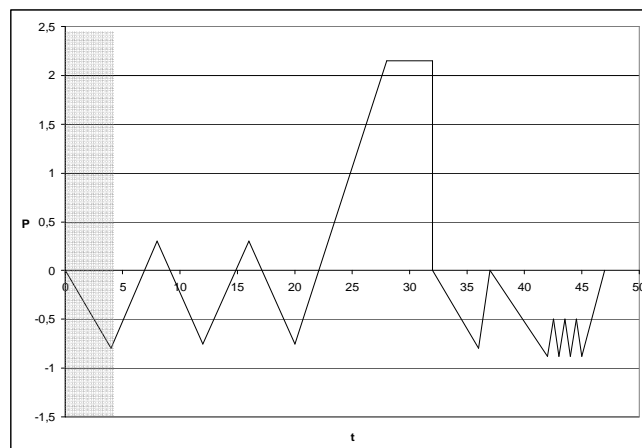
5.3.4 Phase 3: Water outgas system filling (U-234 circuit)



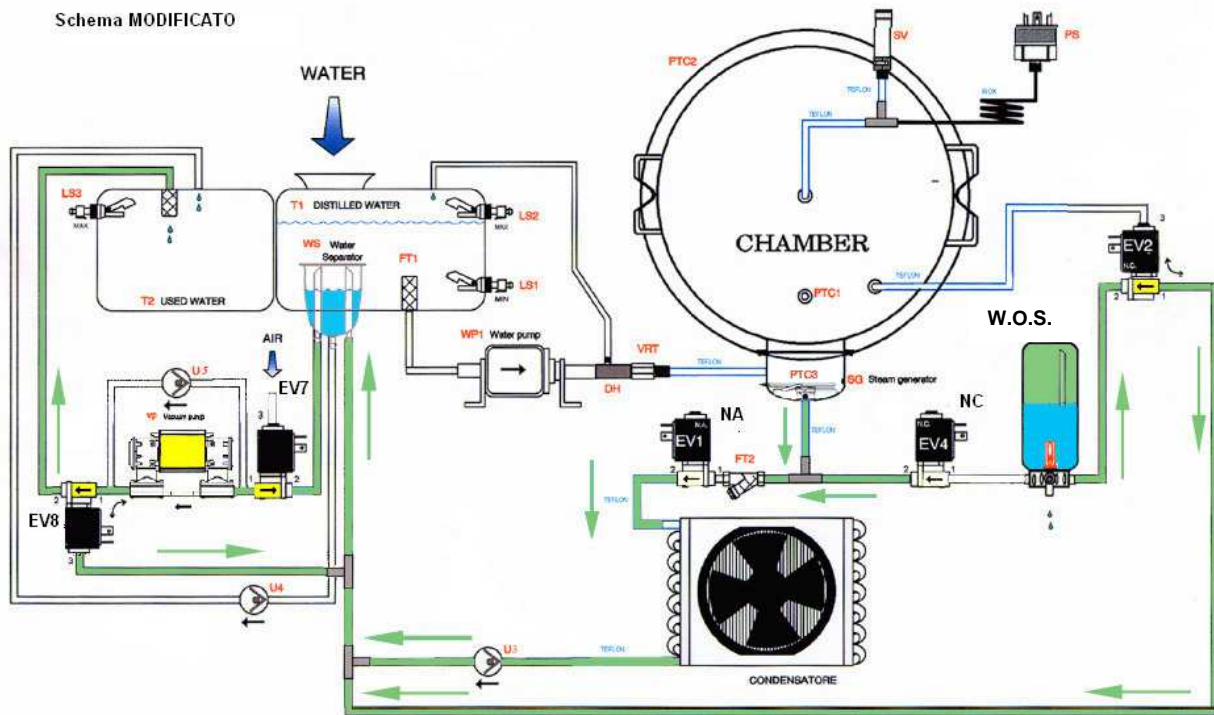
PHASE 3

Vacuum pump begins reduce pressure into the W.O.S. in order to move water (pumped by WP1 for 30 seconds) into the W.O.S. Energized components:

- | | |
|----------------|--------|
| 1. VACUUM PUMP | 6. EV7 |
| 2. WP1 | 7. EV8 |
| 3. EV1 | |
| 4. EV2 | |
| 5. EV4 | |



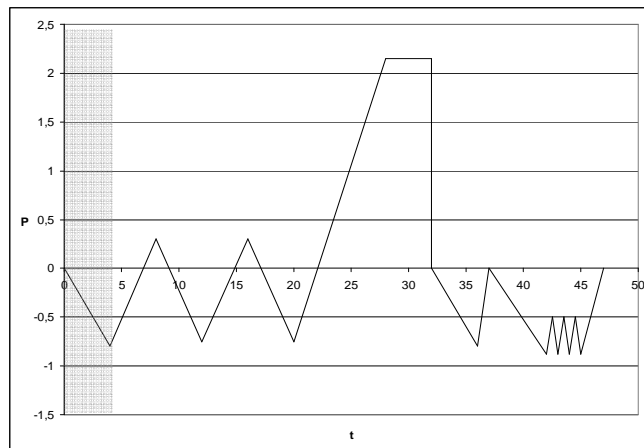
5.3.5 Phase 4: Vacuum into chamber and water outgas system (U-234 circuit)



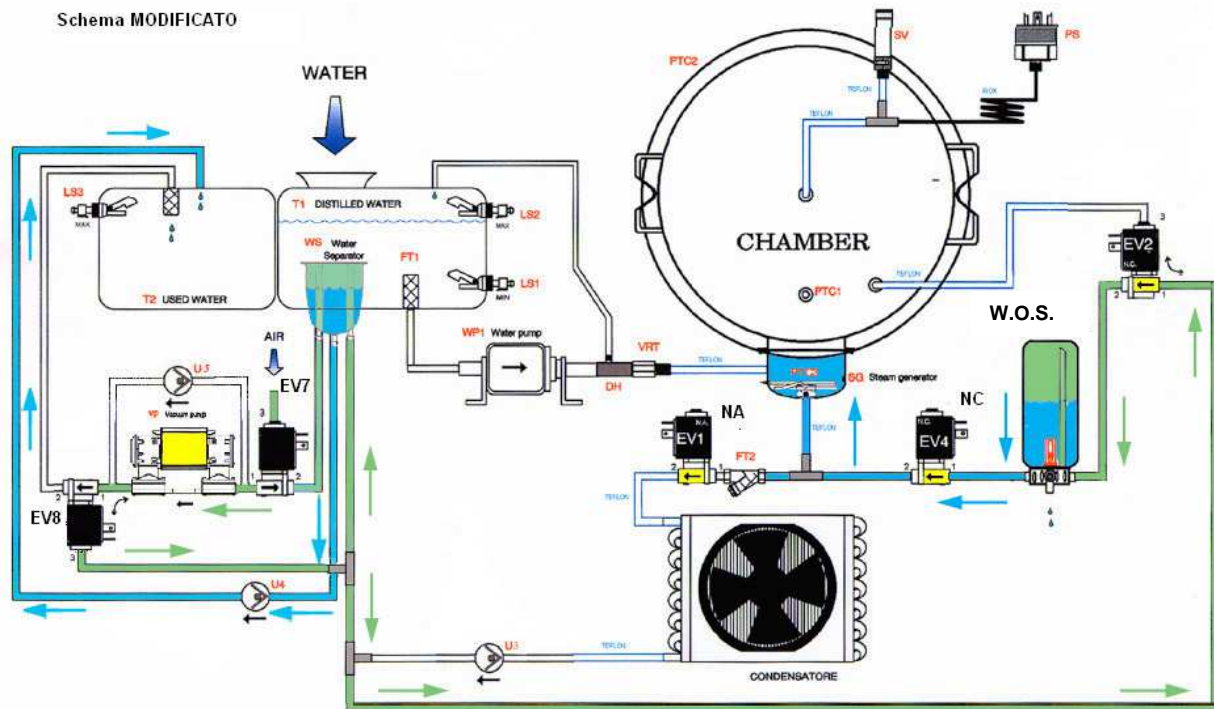
PHASE 4

After 30 seconds, WP1 stops working. Vacuum pump continues in reducing pressure into the chamber (through EV1) and into W.O.S. (so air dissolved in water is pumped out). Energized components:

1. VACUUM PUMP
2. EV2
3. EV7
4. EV8

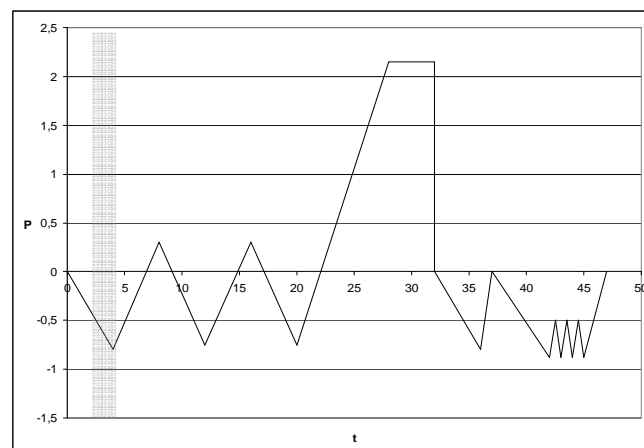


5.3.6 Phase 5: Water separator emptying and steam generator filling (U-234 circuit)

**PHASE 5**

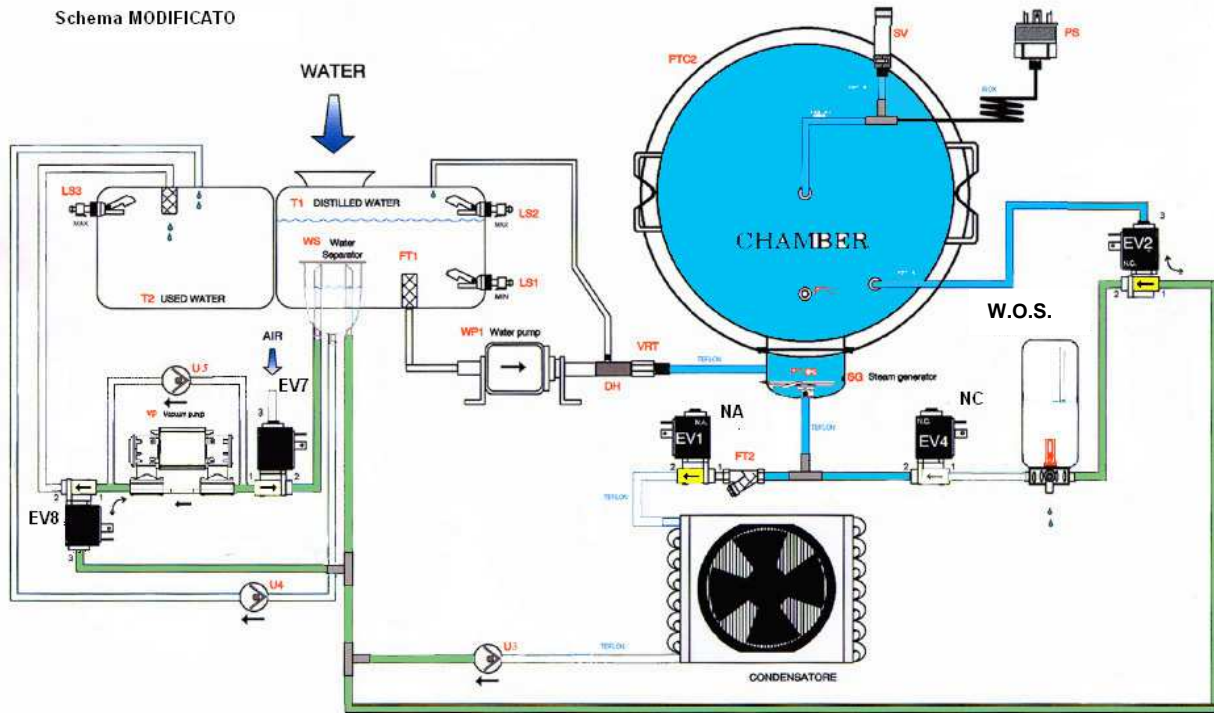
When pressure is lowered down to -0.80 bar (0.2 absolute bar), vacuum pump suction is moved to the bacteriological filter by EV7 switching and so water flows from the W.O.S. to the steam generator. Moreover, rising pressure into the water separator allows its emptying and the residual water it contains is forced to flow to the USED WATER tank. Energized components:

1. VACUUM PUMP
2. EV1
3. EV2
4. EV4



5.3.7 Phase 6: Pressure rise (U-234 circuit)

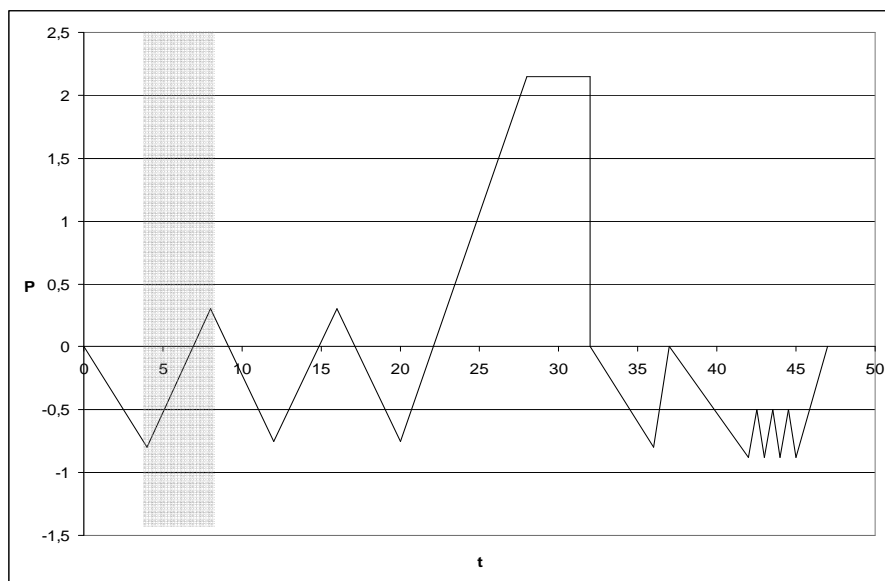
Schema MODIFICATO



PHASE 6

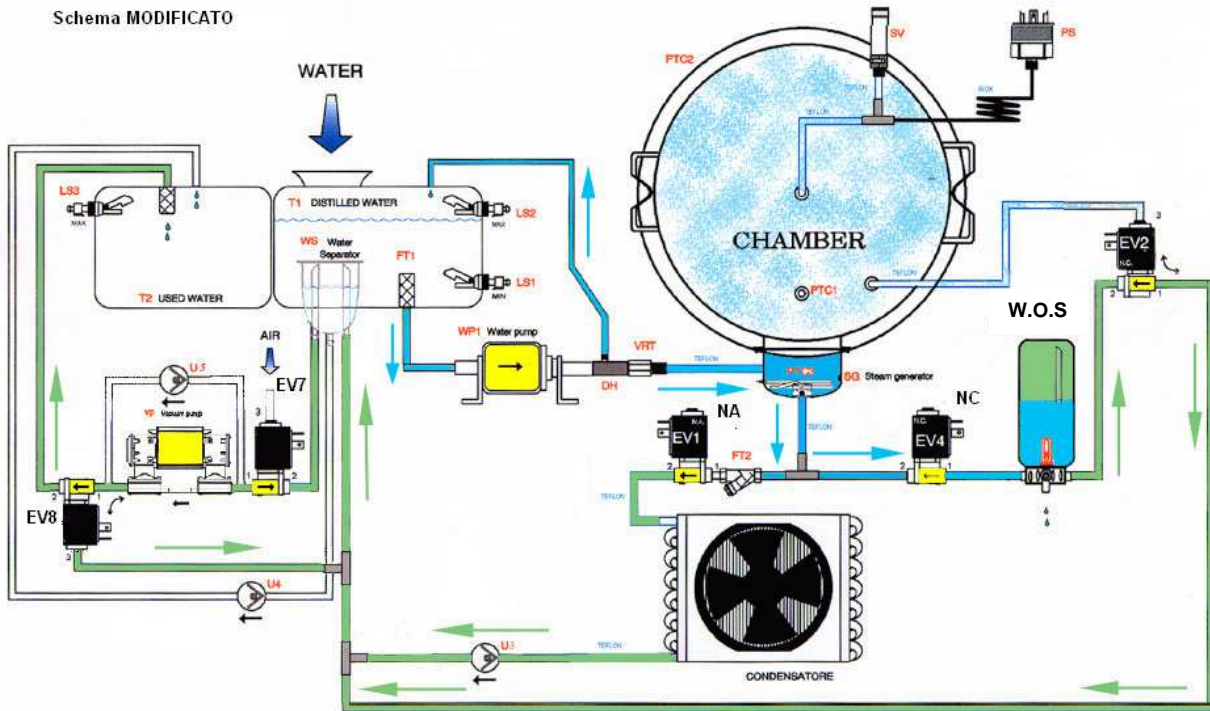
When the steam generator is full, it starts the water heating till the pressure into the chamber reaches the value +0.3 bar (1.3 absolute bar). If necessary, water injections are executed as in the preceding version. Energized components:

- 1. EV1
- 2. EV2



5.3.8 Phase 7: Emptying and vacuum (U-234 circuit)

Schema MODIFICATO



PHASE 7

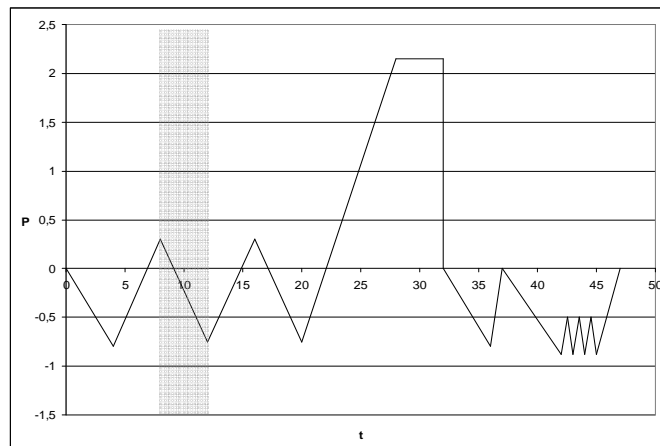
Once the pressure reaches +0.3 bar (1.3 absolute bar), EV4 is opened and water is pushed by pressure to the W.O.S. Vacuum pump starts working and reduces pressure into the chamber till the value -0.75 bar (0.25 absolute bar). Energized components:

1° PHASE:

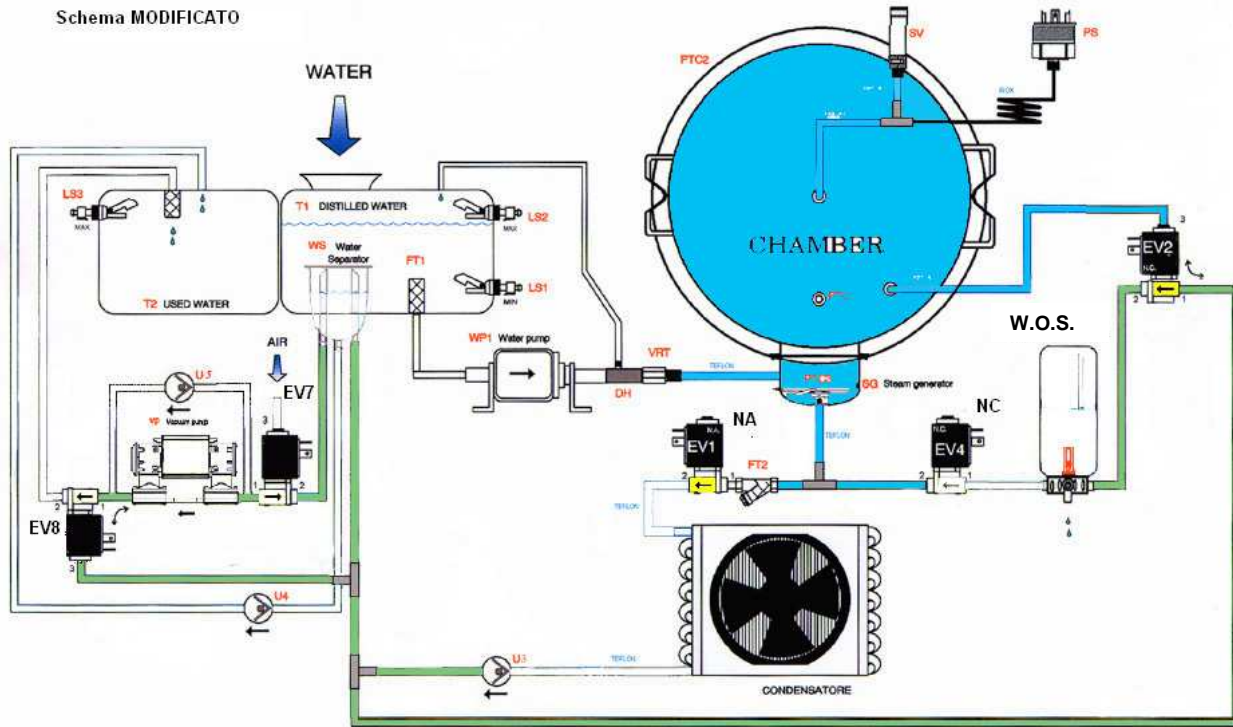
1. WP1
2. EV2
3. EV4

2° PHASE:

1. VACUUM PUMP
2. EV1
3. EV2
4. EV7
5. EV8

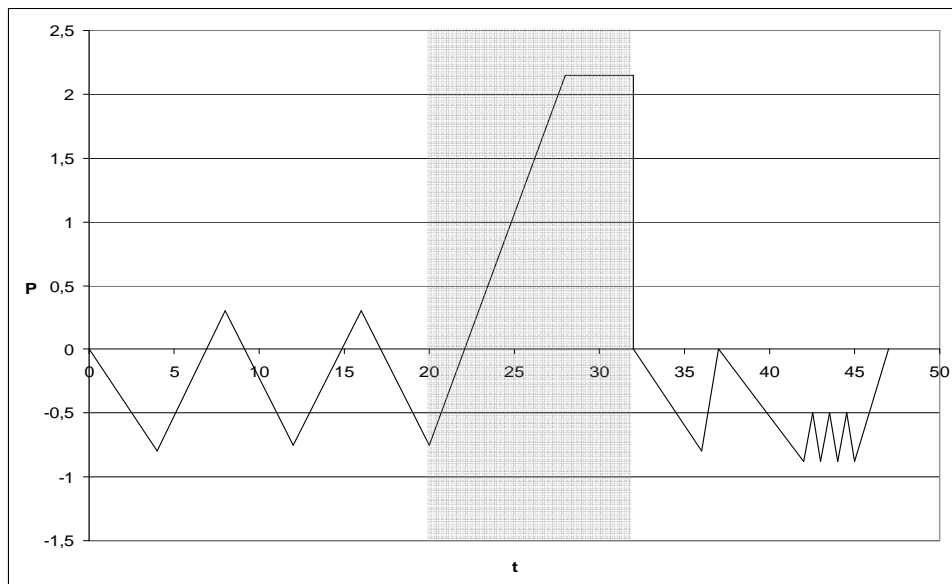


5.3.9 Pressure rise (U-234 circuit)



PHASE P3 – PRESSURE RISE/STERILIZATION

The third pressure rise takes to the sterilization phase. 4 °C before the temperature setpoint the water pump WP1 injects water four times following the procedure 1 second ON, 2 seconds OFF so that the temperature setpoint is reached smoothly. The sterilization phase starts when the pressure or the temperature measured value reaches the setpoint value.



5.4 CYCLE FOR E9 MED (up to EGO090100 18 L and up to EGP090080 24 L)

5.4.1 Turning on the sterilizer

PHASE 0: TURNING ON THE STERILIZER

When the unit is turned on with the ON-OFF switch, atmospheric pressure is measured with the pressure transducer if the door is open, otherwise the previous measurement is maintained. The R2 heater (band) is not powered for the first three minutes. This allows the Vacuum Test to be performed (this test cycle is performed within 3 minutes of when the unit is switched on or if the PTC2 probe detects a temperature lower than 50°C. See Appendix 6 "Test description" in the instructions manual). After the first three minutes have elapsed, the preheating phase begins during which the R2 heater is powered at 40% with a set point of 110°C. If the unit remains inactive for a certain period of time (the user can select the duration of this period: off, 30 minutes, 2, 4, 6 hours) the preheating phase terminates and the display goes blank. The preheating phase starts again if a button is pressed or if the door is opened.

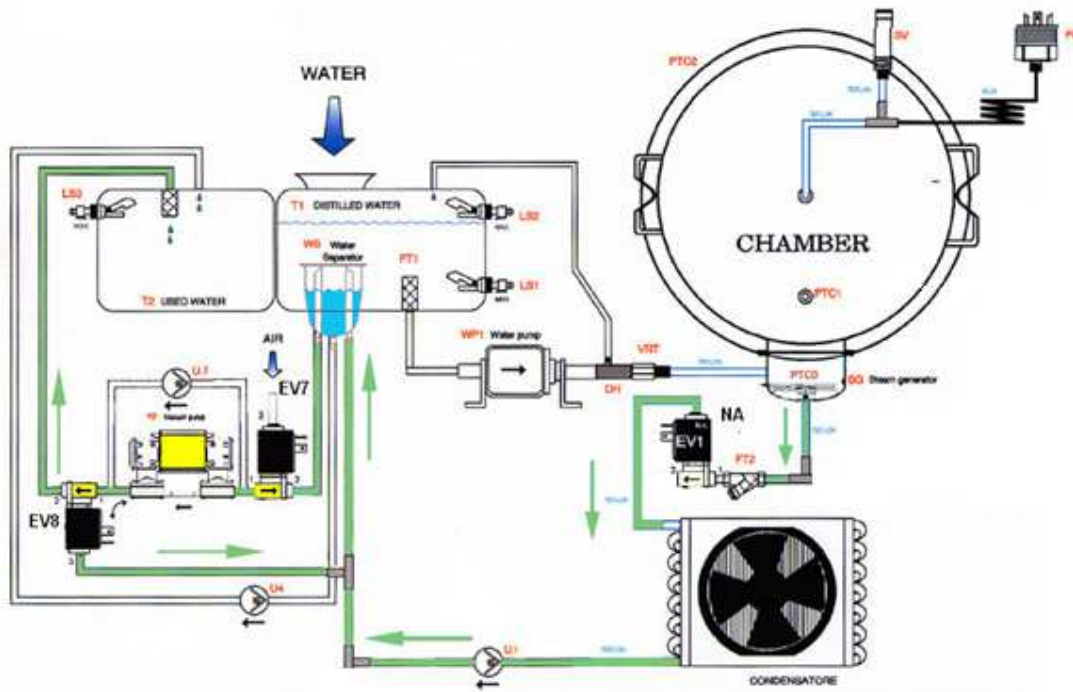
The unit can be filled with water either manually or using the mains water function with the support of a deionizer (see Appendix 10 "Euronda Aquafilter" and Chap. 6.7 "Tanks: instructions for filling and emptying" in the instructions manual). When the minimum water level sensor trips, the deionizer solenoid valve EV6 is powered and opens to let the water flow into the tank until the maximum level sensor trips.

When the door has been closed and the Start Key has been pressed, R2, supplied at 30% and checked by PTC2, is brought to 30°C beyond the set up cycle set-point. If the temperature surveyed by PTC2 at the Start is lower than 110°C, on the display will appear "Cycle in progress, please wait", otherwise the cycle begins.

The following are powered:

2. mechanical safety electromagnet (electrical safety is provided by the door micro-switch).

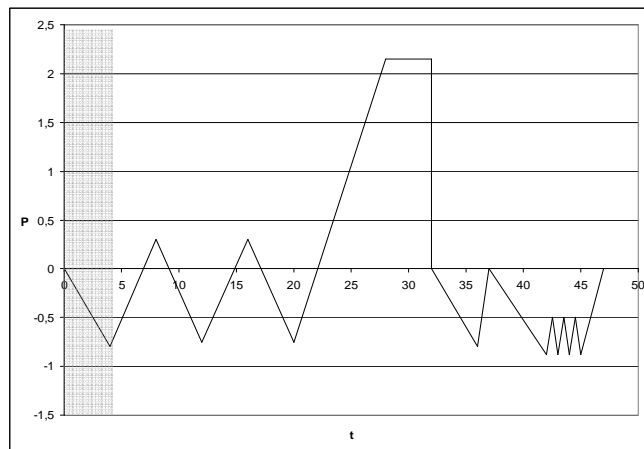
5.4.2 Phase 1: Vacuum into chamber



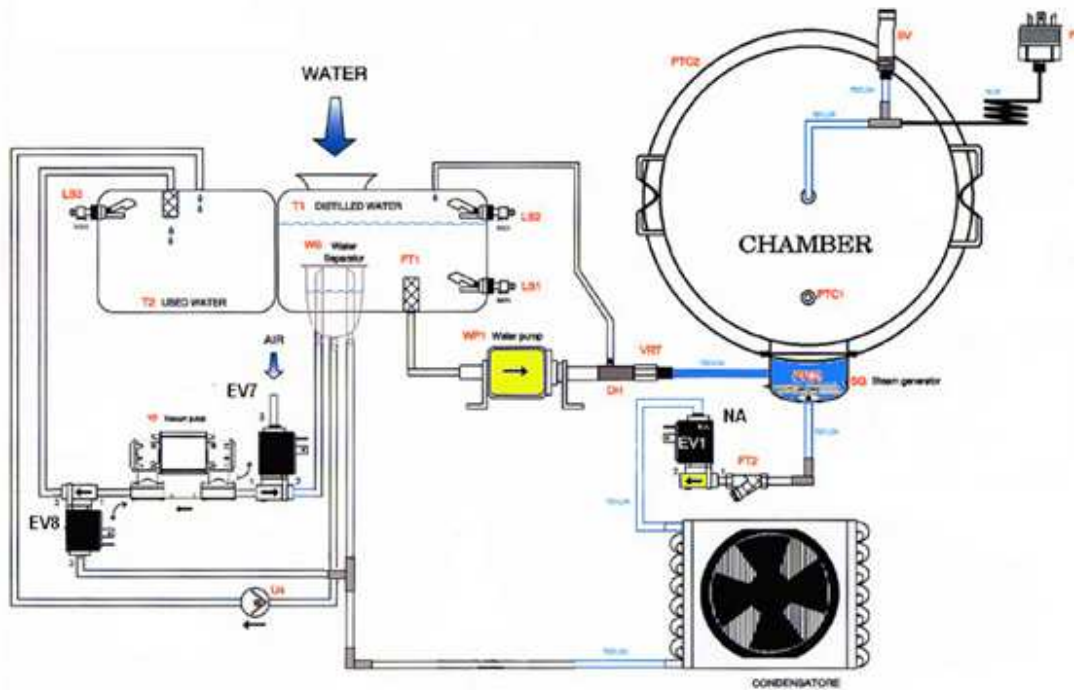
PHASE 1

Vacuum pump continues in reducing pressure into the chamber (through EV1). Energized components:

1. VACUUM PUMP
2. EV7
3. EV8

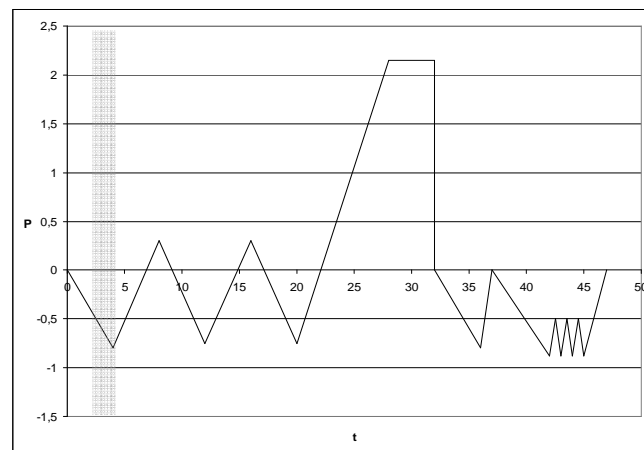


5.4.3 Phase 2: Steam generator filling

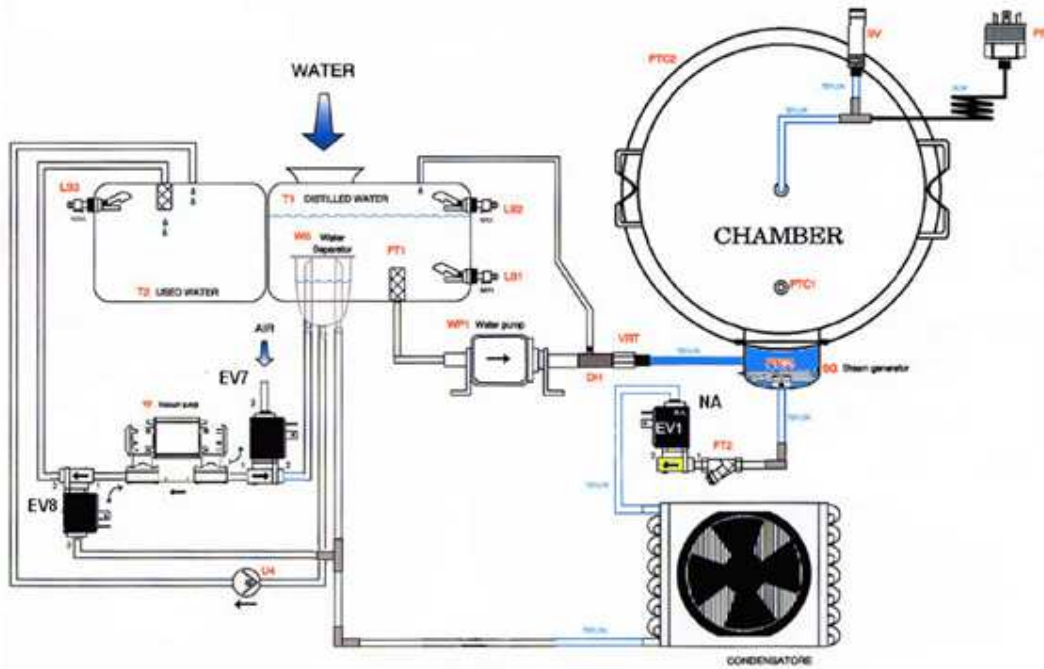
**PHASE 2**

When pressure is lowered down to -0.80 bar (0.2 absolute bar), vacuum pump stops and the water pump injects the water into the steam generator. Energized components:

1. WATER PUMP
2. EV1



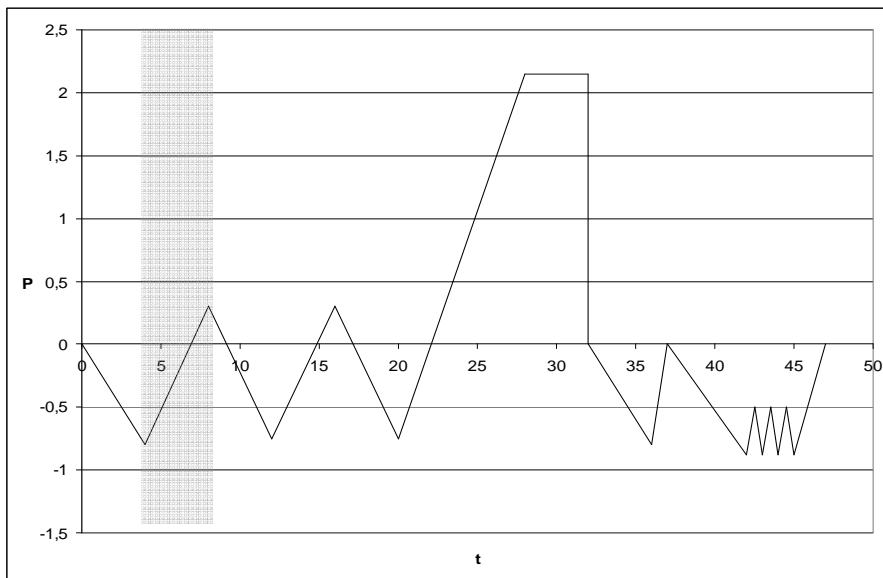
5.4.4 Phase 3: Pressure rise



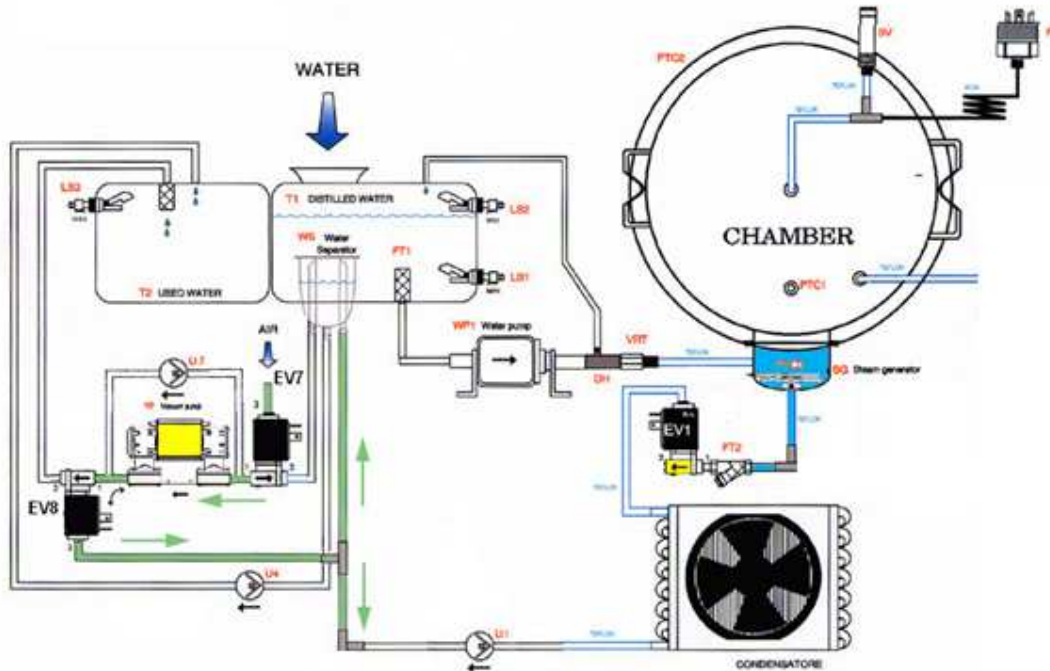
PHASE 3

When the steam generator is full, it starts the water heating till the pressure into the chamber reaches the value +0.3 bar (1.3 absolute bar). If necessary, water injections are executed. Energized components:

1. EV1

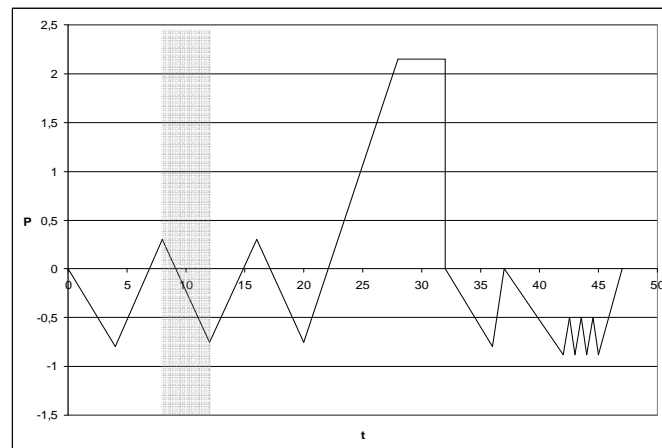


5.4.5 Phase 4: Water separator emptying and vacuum

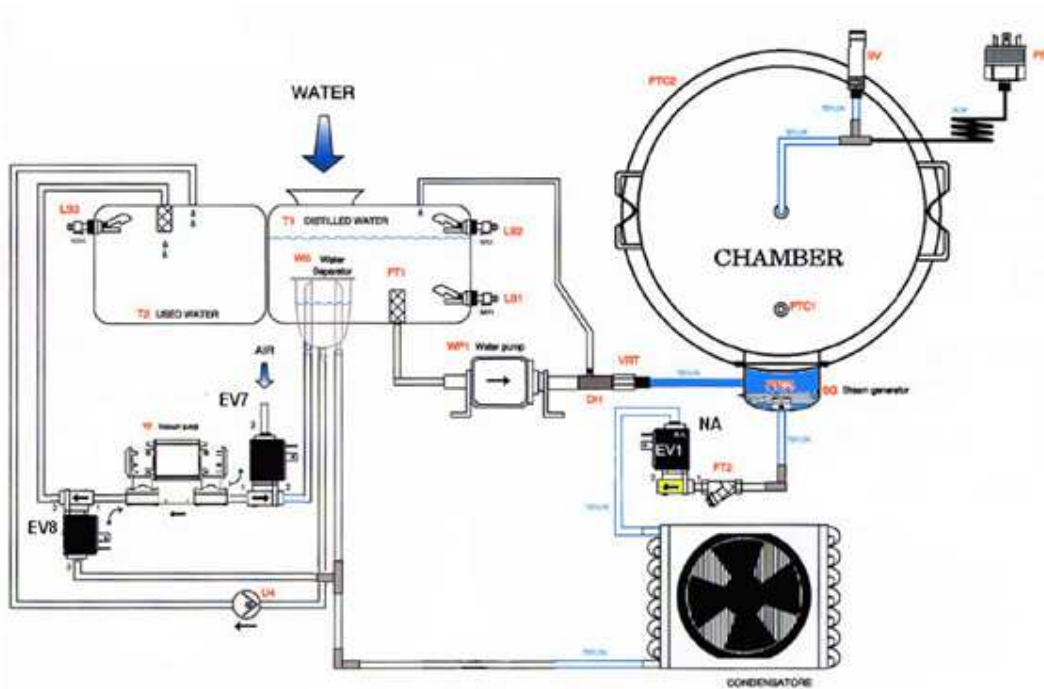
**PHASE 4**

Once the pressure reaches 0 bar (1 absolute bar) the vacuum pump switches on and so pushes the water into the separator to the used water tank. When the pressure reaches +0,3 bar (1,3 absolute bar), EV1 opens and water is pushed by pressure to the separator. Vacuum pump starts working and reduces pressure into the chamber till the value -0.75 bar (0.25 absolute bar). Energized components:

1. VACUUM PUMP
2. EV1
3. EV7
4. EV8

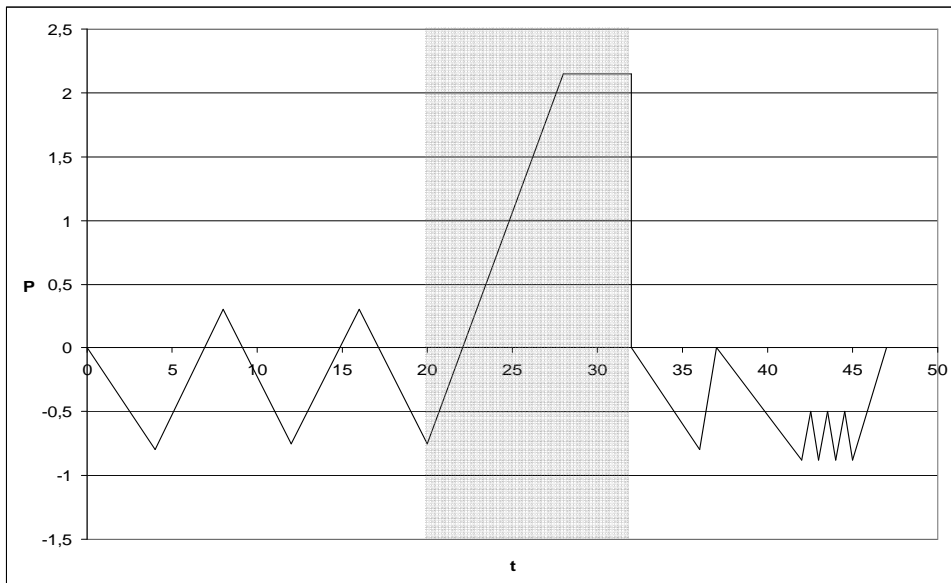


5.4.6 Third pressure rise and sterilisation

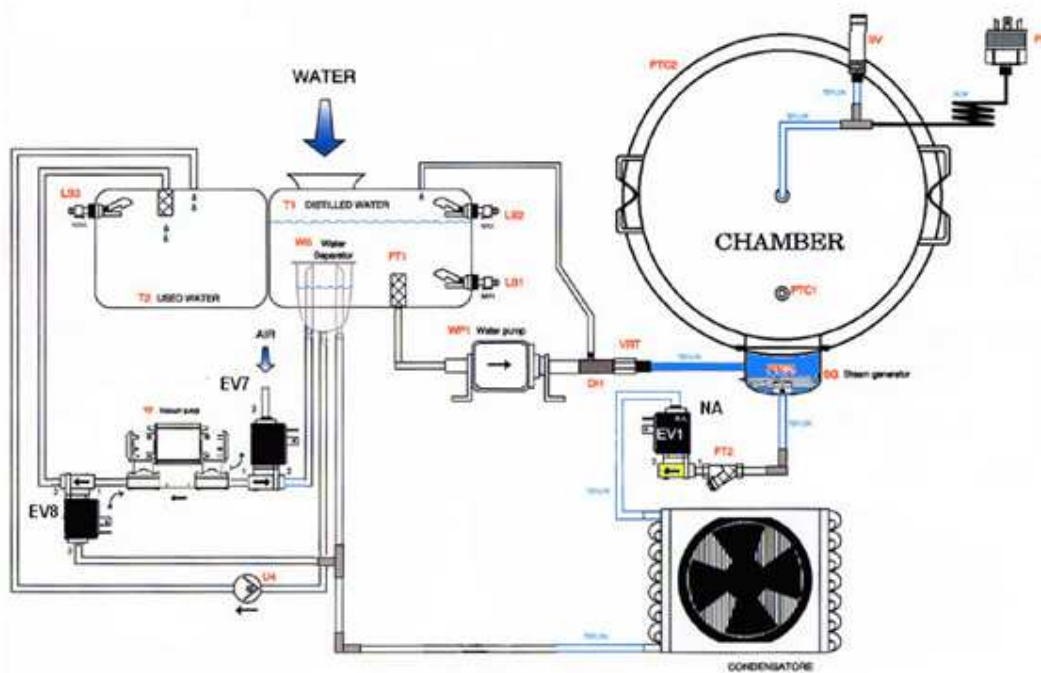


PHASE P3 – PRESSURE RISE/STERILIZATION

The third pressure rise takes to the sterilization phase. 4 °C before the temperature setpoint the water pump WP1 injects water four times following the procedure 1 second ON, 2 seconds OFF so that the temperature setpoint is reached smoothly. The sterilization phase starts when the pressure or the temperature measured value reaches the setpoint value.

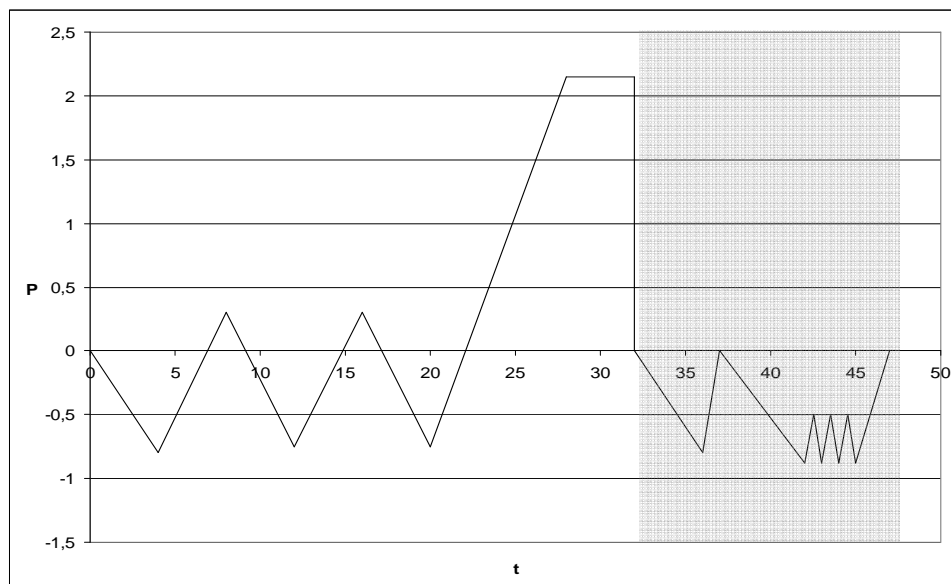


5.4.7 Drying phase

**DRYING PHASE**

When the sterilisation period ends, EV1 opens and the steam flows through the radiator. The vacuum pump keeps working for 15 minutes so to get the complete drying. Energized components:

1. VACUUM PUMP
2. EV7
3. EV8



5.5 CYCLE FOR E9 MED (since EGO090101 18 L and since EGP090081 24 L)

5.5.1 Phase 0: Turning on the sterilizer

PHASE 0: TURNING ON THE STERILIZER

When the unit is turned on with the ON-OFF switch, the atmospheric pressure is measured with the pressure transducer if the door is open, otherwise the previous measurement is maintained. The R1 and R2 (lower and upper) band heaters are not powered for the first 3 minutes. This allows the Vacuum Test to be performed (is possible to perform this test cycle within 3 minutes since the unit is turned on or if the PTC2 probe detects a temperature lower than 50°C. See Appendix 6 "Test description" in the instructions manual). After 3 minutes have elapsed, the preheating phase begins during which the R2 heater is powered at 40% with a set point of 80°C. If the unit remains inactive for a certain period of time (the user can select the duration of this period: off, 30 minutes, 2, 4, 6 hours) the preheating phase terminates and the display goes blank. The preheating phase starts again if a button is pressed or if the door is opened.

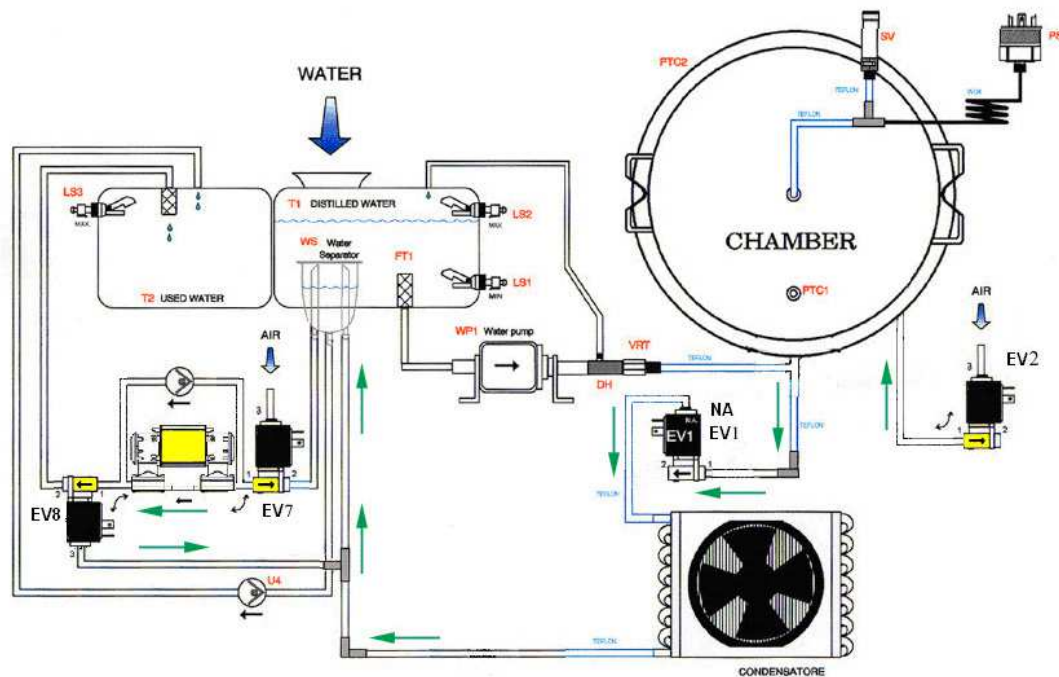
The unit can be filled with clean water either manually or using the mains water function with the support of a deionizer (see Appendix 10 "Euronda Aquafilter" and Chap. 6.7 "Tanks: instructions for filling and emptying" in the instructions manual). When the minimum water level sensor trips, the deionizer solenoid valve EV6 is powered and opens to let the water flow into the tank until the maximum level sensor trips.

When the door has been closed and the Start Key has been pressed, R2 is supplied and checked by PTC2. If the temperature surveyed by PTC2 at the Start is lower than 80°C, on the display will appear "Cycle in progress, please wait", otherwise the cycle begins.

The following are powered:

1. mechanical safety electromagnet (electrical safety is provided by the door micro-switch).

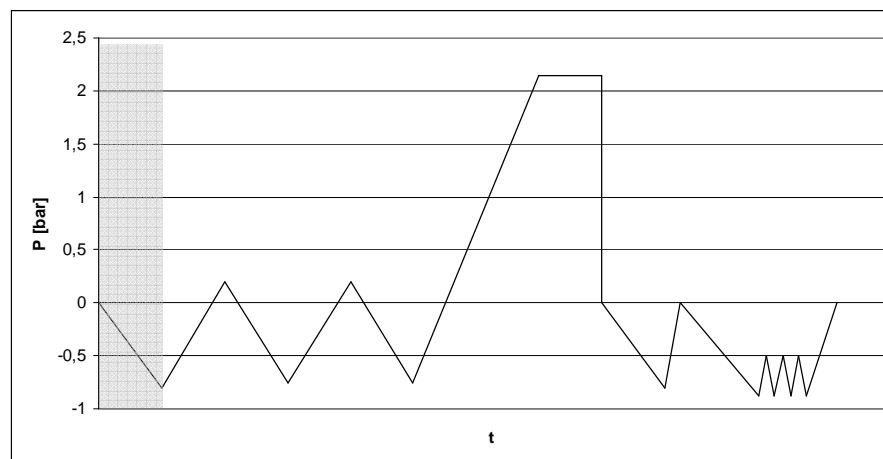
5.5.2 Phase 1: Start and chamber emptying



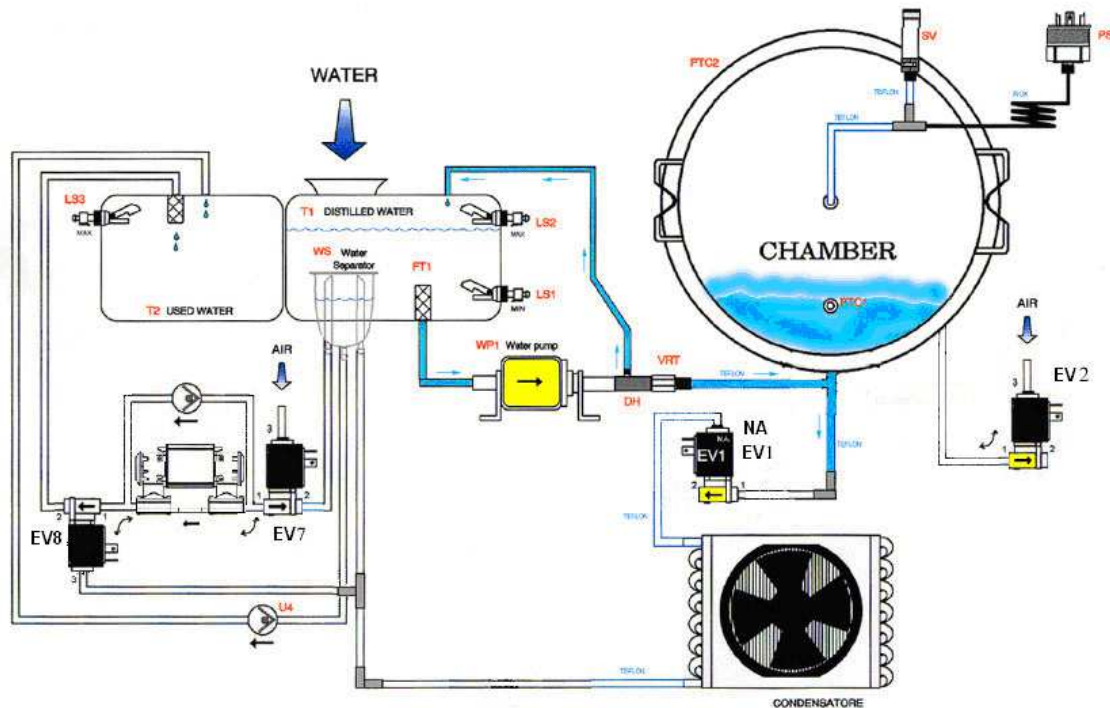
PHASE 1

When the preheating is finished, the vacuum pump begins the air removal from the chamber. The vacuum pump works until the pressure is lowered to -0,80 bar (0,2 bar absolute). Are energized:

1. VACUUM PUMP
2. EV2
3. EV7
4. EV8



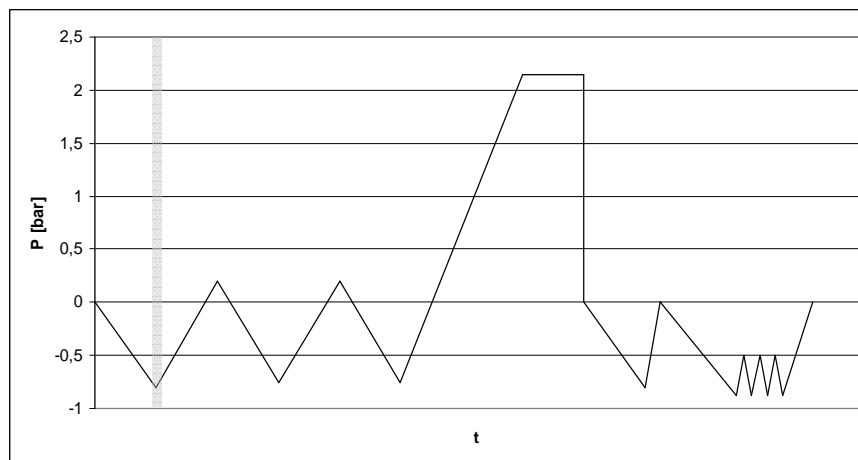
5.5.3 Phase 2: Water injection into the chamber



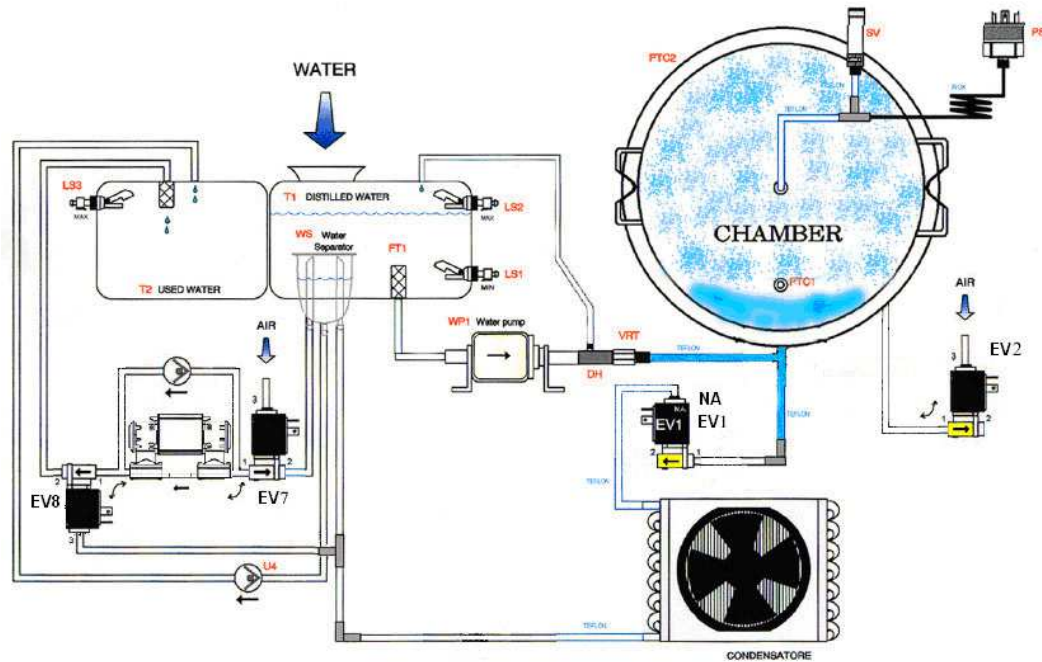
PHASE 2

When the vacuum setpoint is reached ($-0,80$ bar for V_1 and for V_2 e V_3) the water is injected into the chamber. During the injection before P_1 and P_2 the water pump works for 20 seconds, whereas before P_3 water is injected during 35 seconds. Are energized:

1. WATER PUMP
2. EV1
3. EV2

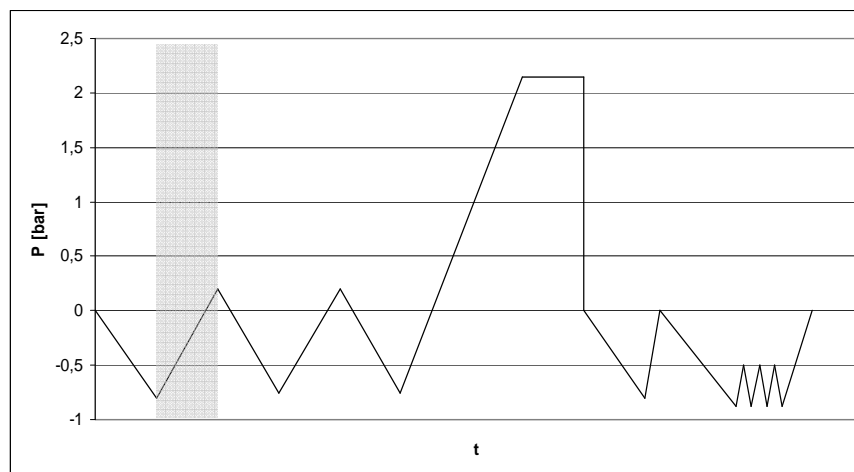


5.5.4 Phase 3: Pressure rise

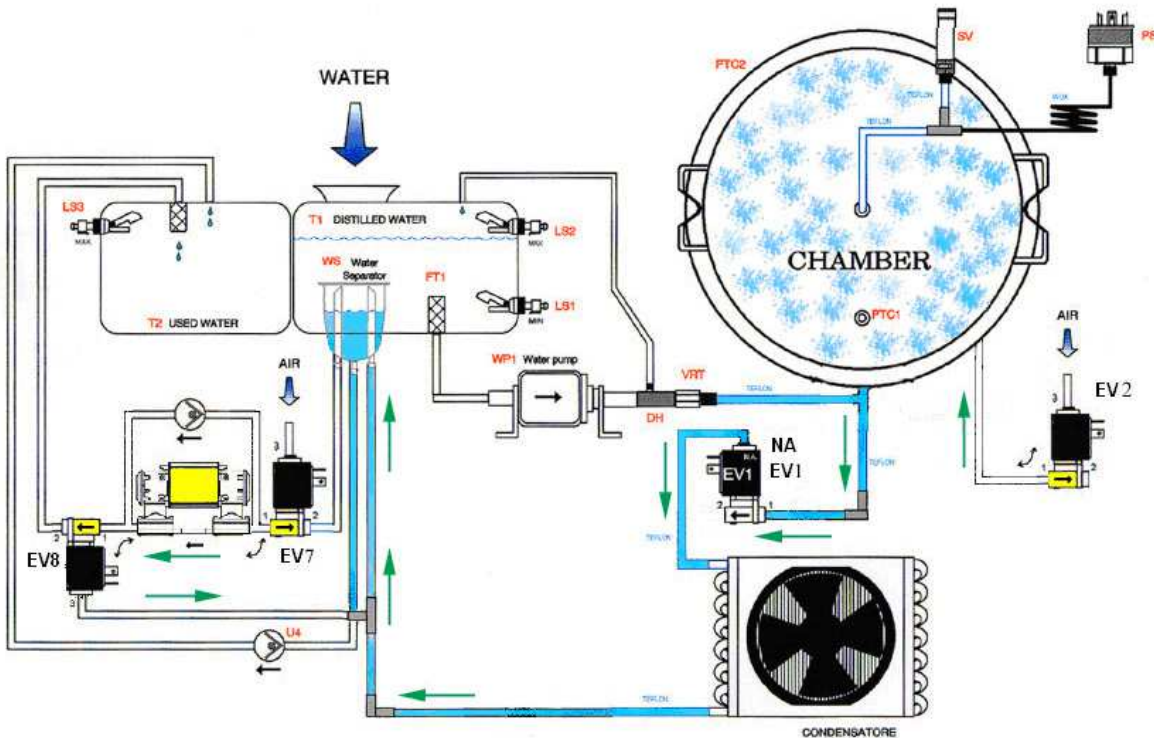
**PHASE 3**

When the chamber is filled with the necessary quantity of water, the band heater is supplied at its maximum in order to vaporize the water. During the pressure rise, differently from E9 INSPECTION and RECORDER, no more water injections are executed. The pressure rises up to +0,2 bar in P_1 e P_2 , whereas P_3 leads to the sterilization phase, in which the setpoint is 135,5°C (corresponding to a pressure of +2,16 bar) for the 134°C cycle and 122,5°C (corresponding to a pressure of +1,13 bar) for the 121°C cycle. Are energized:

1. EV1
2. EV2
3. R1
4. R2



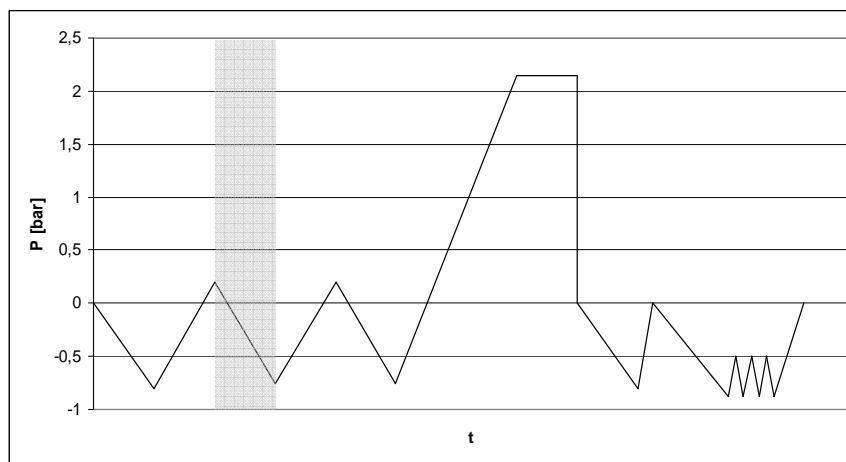
5.5.5 Phase 4: Pressure discharge and emptying



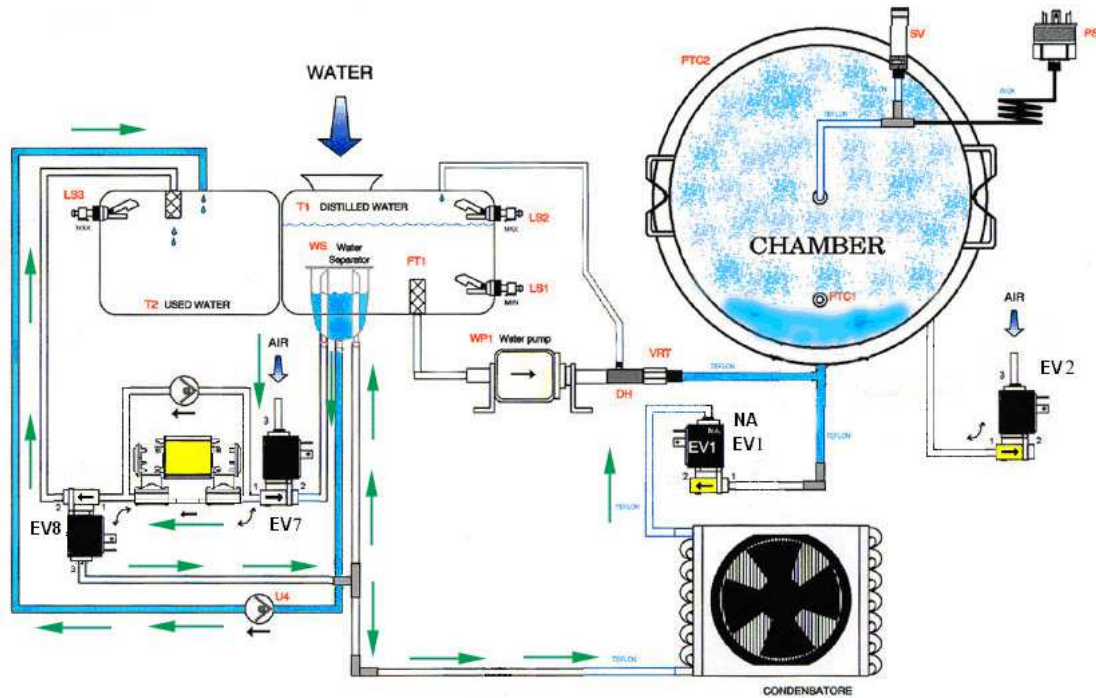
PHASE 4

When the pressure into the chamber reaches +0,2 bar (1,2 bar absolute) at the end of P₁, EV1 switches and the steam is pushed out, condensed into the radiator, then the condensed water is stored into the separator. The vacuum pump works in order to transport the water to the separator and to restart the chamber emptying. Are energized:

1. VACUUM PUMP
2. EV2
3. EV7
4. EV8
5. RADIATOR FAN

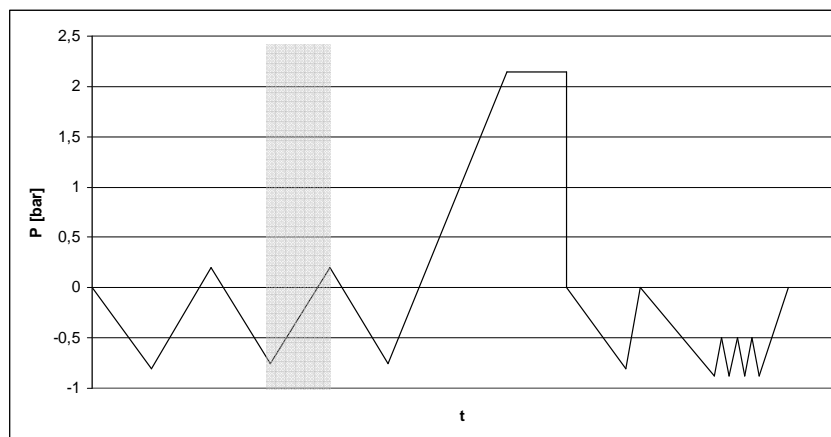


5.5.6 Phase 5: Pressure rise and separator emptying

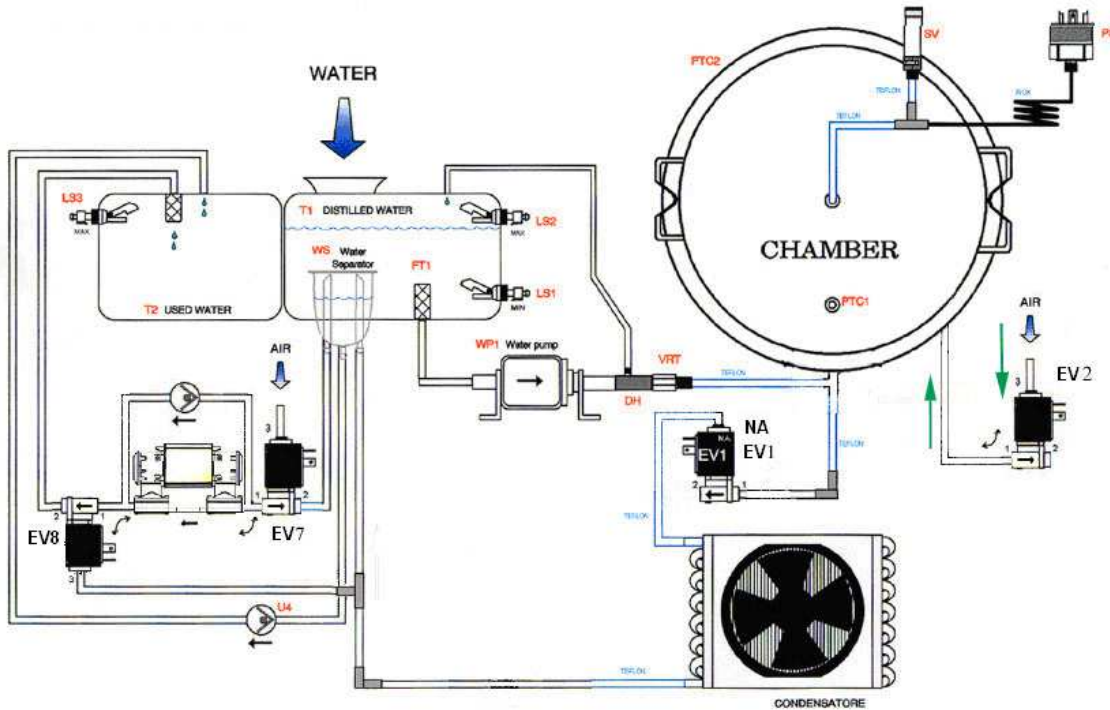
**PHASE 5**

At the end of V_2 and V_3 the pressure is -0,80 bar, the vacuum pump is working and the separator is full of water. Switching EV1 the chamber is sealed and the following pressure rise begins. Switching EV7 the vacuum pump suction is moved to the bacteriological filter and so the external air is pushed into the separator through EV8. Rising the pressure into the separator, the water there stored is pushed to the USED WATER tank. Are energized:

1. VACUUM PUMP
2. EV1
3. EV2
4. R1
5. R2

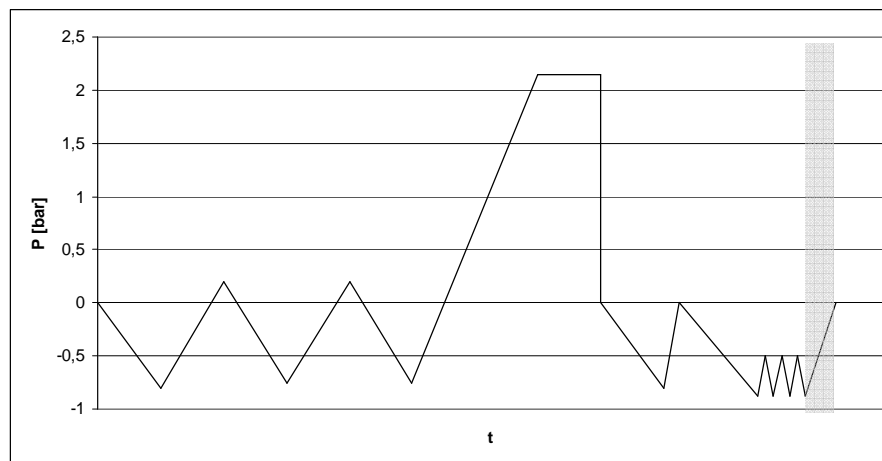


5.5.7 Phase 6: Pressure balancing



PHASE 6

At the cycle end the pressure into the chamber is lower than the external pressure because the drying phase is carried out in vacuum conditions. For the final pressure balancing EV2 opens and the external air flows through the bacteriological filter into the chamber. During this phase no element is energized.



5.6 EXAMPLES OF STERILIZATION CYCLE REPORTS

Firmware: 7.07
SN: PSI 18 EAD

Start cycle: 27/01/2009 21.22.14
Type of cycle: B 134 PRION
Nr cycle: 5445

Phase	Min:sec	°C	bar
Start	00:02	81.9	-0.01
V1	03:52	72.9	-0.80
P1	06:37	106.2	0.30
V2	07:54	75.5	-0.75
P2	09:42	106.9	0.30
V3	11:10	85.6	-0.75
P3	15:28	134.2	2.06
MIN	16:46	135.3	
MAX	32:38	135.5	
MIN	16:28		2.14
MAX	32:17		2.16
STE	34:29	135.4	2.16
DS	34:29	135.4	2.16
DE	49:59	80.0	0.02

Current Pref = 1.00 bar

End cycle: 27/01/2009 22.12.12

Cycle end
Sterile load

Operator:.....

Firmware: 7.07
SN: PSI 18 EAD

Start cycle: 29/01/2009 10.23.44
Type of cycle: B 121
Nr cycle: 5483

Phase	Min:sec	°C	bar
Start	00:02	75.4	0.01
V1	05:15	73.0	-0.80
P1	07:42	106.9	0.31
V2	09:04	73.4	-0.75
P2	11:02	107.1	0.30
V3	12:27	76.7	-0.75
P3	16:10	121.2	1.06
MIN	16:28	122.2	
MAX	19:15	122.5	
MIN	16:10		1.12
MAX	36:10		1.13
STE	36:10	122.4	1.13
DS	36:10	122.4	1.13
DE	51:39	74.9	0.03

Current Pref = 1.00 bar

End cycle: 29/01/2009 11.15.24

Cycle end
Sterile load

Operator:.....

Firmware: 7.07
SN: PSI 18 EAD

Start cycle: 27/01/2009 20.36.27
Type of cycle: B 134
Nr cycle: 5444

Phase	Min:sec	°C	bar
Start	00:02	82.4	-0.01
V1	03:48	70.1	-0.80
P1	06:30	106.1	0.30
V2	07:46	74.6	-0.75
P2	09:35	107.0	0.30
V3	11:01	80.5	-0.75
P3	16:05	134.1	2.05
MIN	16:05	135.3	
MAX	19:06	135.4	
MIN	16:05		2.14
MAX	20:05		2.16
STE	20:05	135.4	2.15
DS	20:05	135.4	2.15
DE	35:34	79.9	0.02

Current Pref = 1.00 bar

End cycle: 27/01/2009 21.12.01

Cycle end
Sterile load

Operator:.....

Firmware: 7.07
SN: PSI 18 EAD

Start cycle: 29/01/2009 13.08.27
Type of cycle: VACUUM TEST
Nr cycle: 5486

Phase	Min:sec	°C	bar
Start	00:03	26.6	0.02
V1	05:20	28.9	-0.80
V2	10:21	29.0	-0.79
V3	20:23	29.5	-0.79
VE	21:11	32.9	-0.00

Current Pref = 1.00 bar

End cycle: 29/01/2009 13.29.58

Test completed
Leakage rate OK

Operator:.....

Firmware: 7.07
SN: PSI 18 EAD

Start cycle: 29/01/2009 11.53.36
Type of cycle: MELIX TEST
Nr cycle: 5485

Phase	Min:sec	°C	bar
Start	00:02	71.2	0.01
V1	04:56	84.8	-0.60
P1	07:31	106.6	0.30
V2	08:51	70.4	-0.75
P2	10:46	107.1	0.30
V3	12:15	76.5	-0.75
P3	17:50	134.1	2.06
MIN	17:50	135.3	
MAX	21:18	135.4	
MIN	17:50		2.14
MAX	21:20		2.16
STE	21:21	135.4	2.16
DS	21:21	135.4	2.16
DE	22:51	104.1	0.02

Current Pref = 1.00 bar

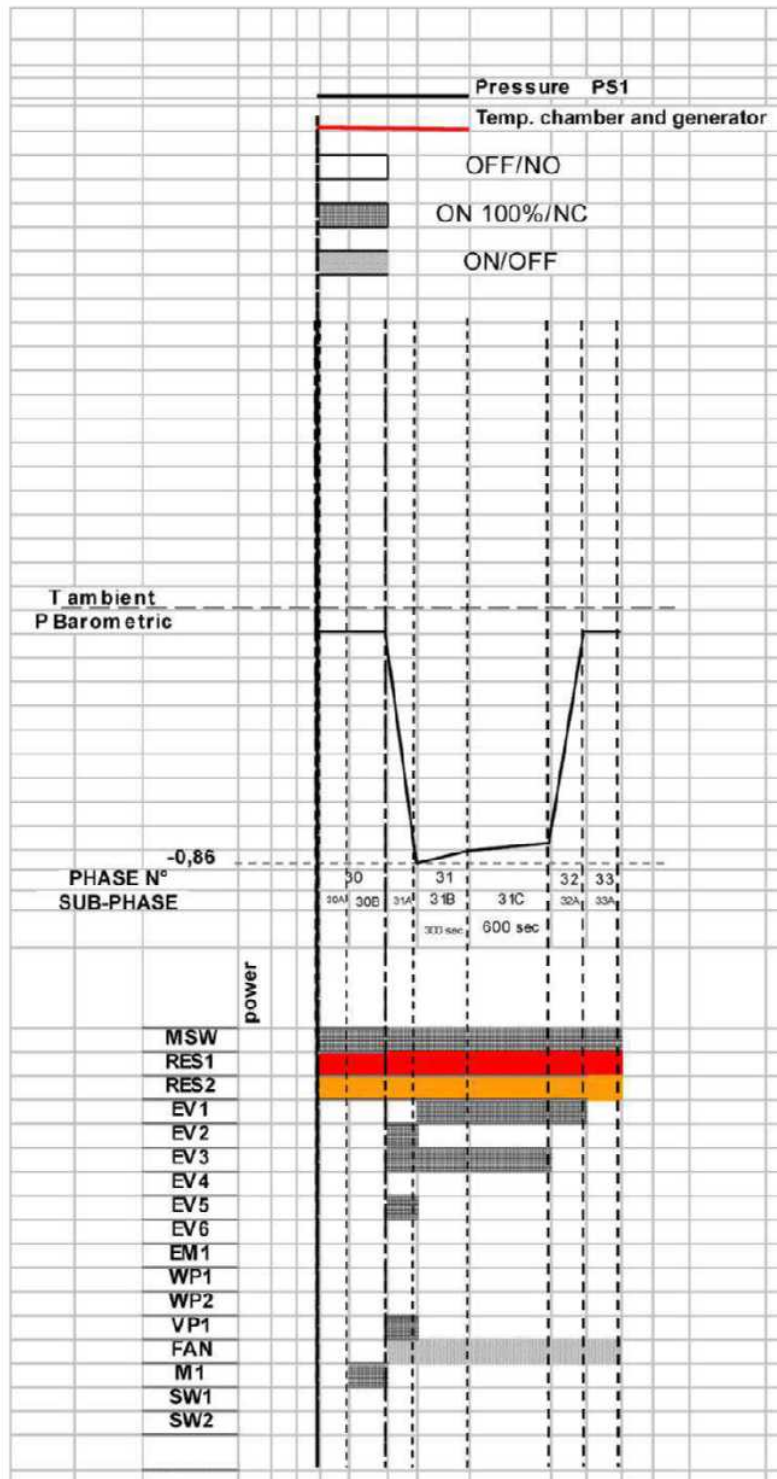
End cycle: 29/01/2009 12.16.27

Test completed

Operator:.....

6 - Description of test and main performance data

6.1 GRAPH OF COMPLETE VACUUM TEST

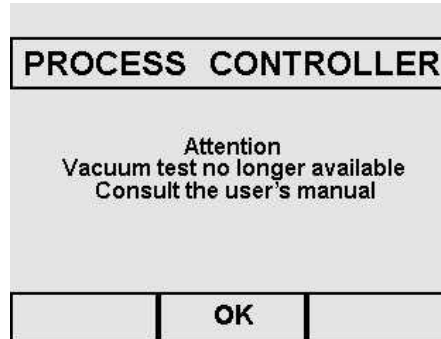


This test is performed in order to check the performance of the unit, in particular:

- the efficiency of the vacuum pump;
- the seal of the pneumatic circuit.



In order to obtain a correct result, the test must be performed “cold”, i.e.: within 3 minutes of switching on the unit. **If the test is selected when PTC2 has reached a temperature greater than or equal to 50°C, or if 3 minutes or more minutes elapse before the test is selected, the display will inform you that the Vacuum test is no longer available.**



The test involves the following:

The time and pressure at the outset of the test are recorded; a vacuum is created to -0.86 bar (P1): this value must be reached within 8 minutes from the start of the test.

Then the pressure levelling phase begins: this lasts five minutes after which the pressure P₂ is recorded.

If (P₂-P₁) ≤ 0.1(P₀-P₁), the pressure is maintained for 10 minutes, after which the pressure P₃ is recorded.

The test is successful if:

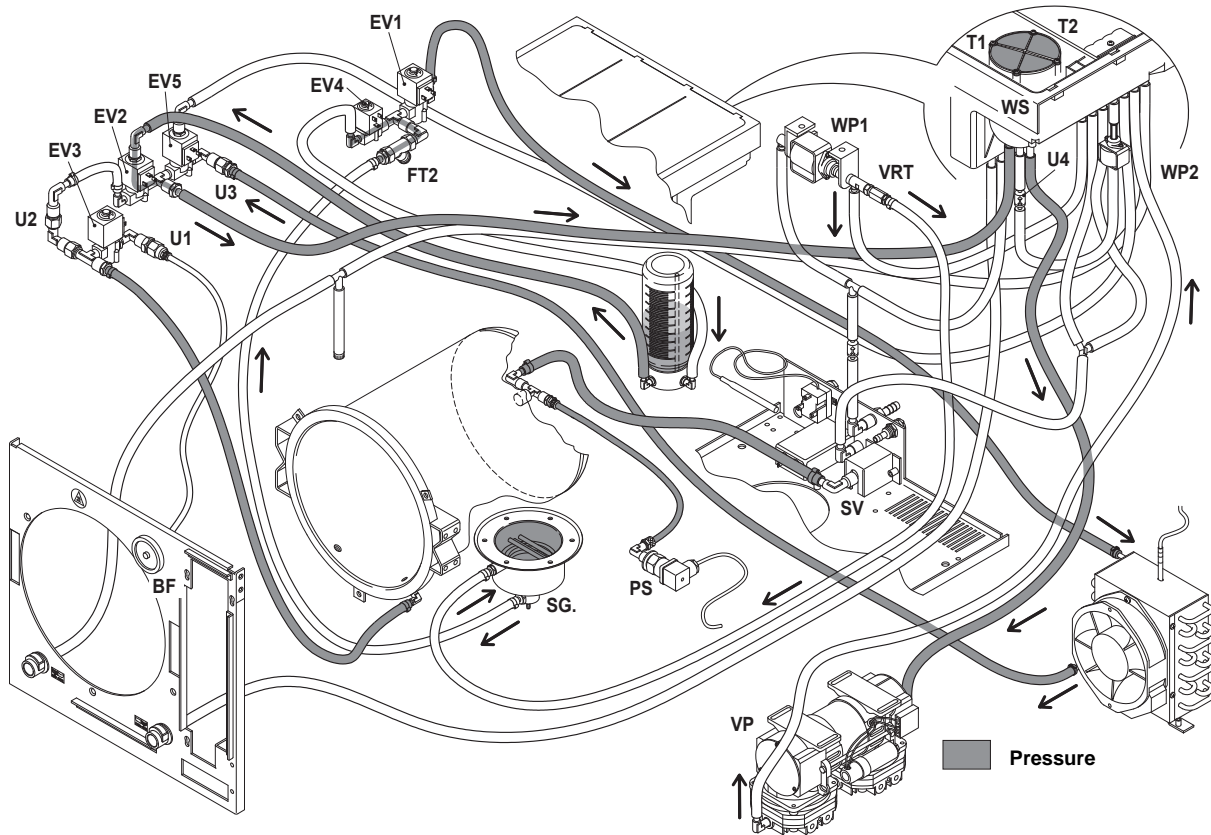
$$\frac{\Delta P}{\Delta t} = \frac{P_3 - P_2}{10} \leq 13 \text{ mbar}$$

6.1.1 Phase 0: Starting

PHASE 0: STARTING

The vacuum test starts after the door has been closed and the Start button pressed (within 3 minutes from switching on and with PTC2 ≤ 50°C).

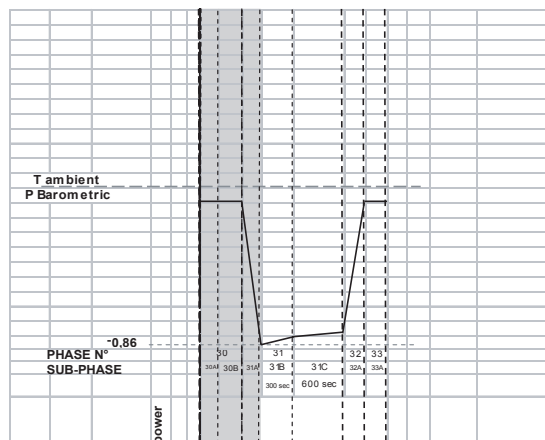
6.1.2 Vacuum phase

**VACUUM PHASE**

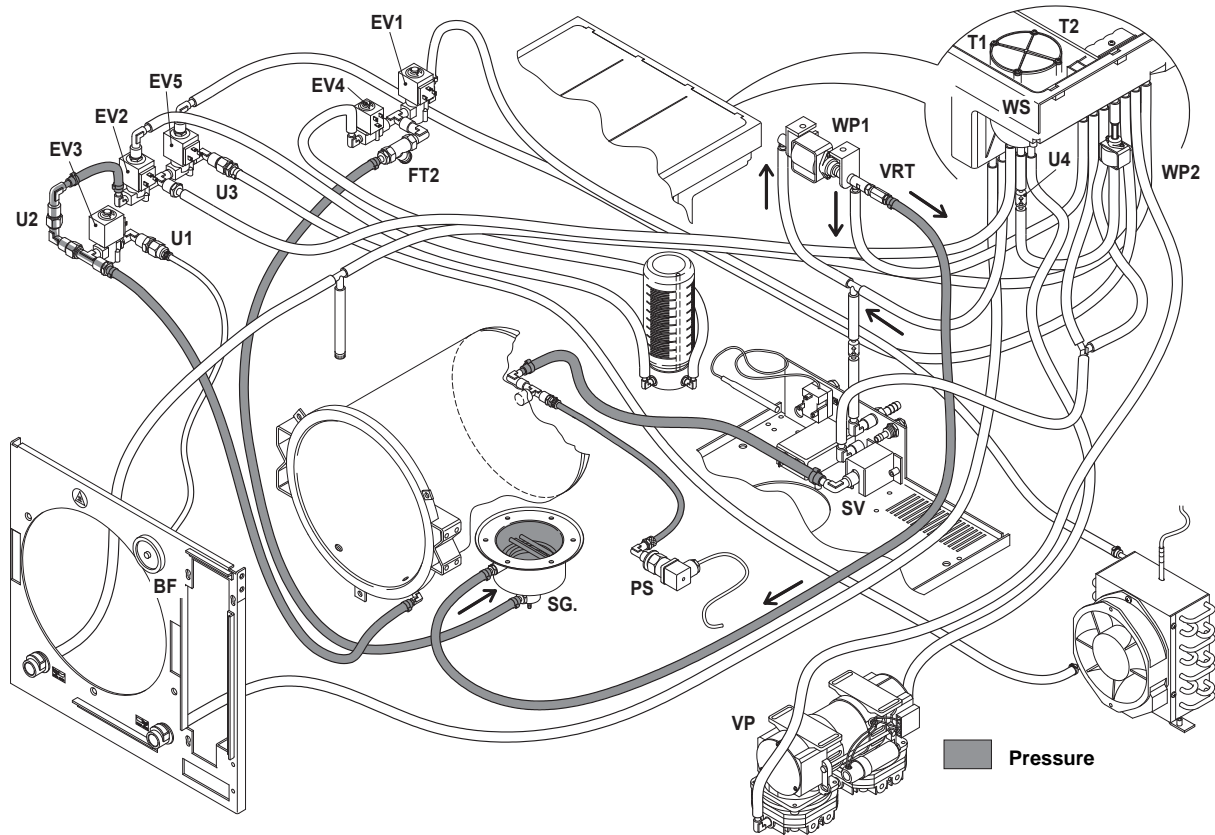
After the START button is pressed, the following are powered:

1. mechanical safety electromagnet
2. EV2: opened to allow the air to be pumped from the chamber
3. EV3: closed to close the bacteriological filter
4. EV5: opened to allow the air to be pumped from the chamber
5. Vacuum pump, to pump the air from the sterilization chamber

The heaters are both switched off, of course. This phase continues until a depression of -0.86 bar is reached.



6.1.3 Pressure levelling/Maintenance phase

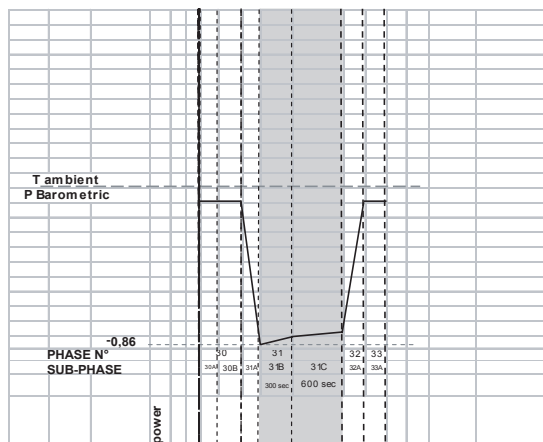


PRESSURE LEVELLING/MAINTENANCE PHASE

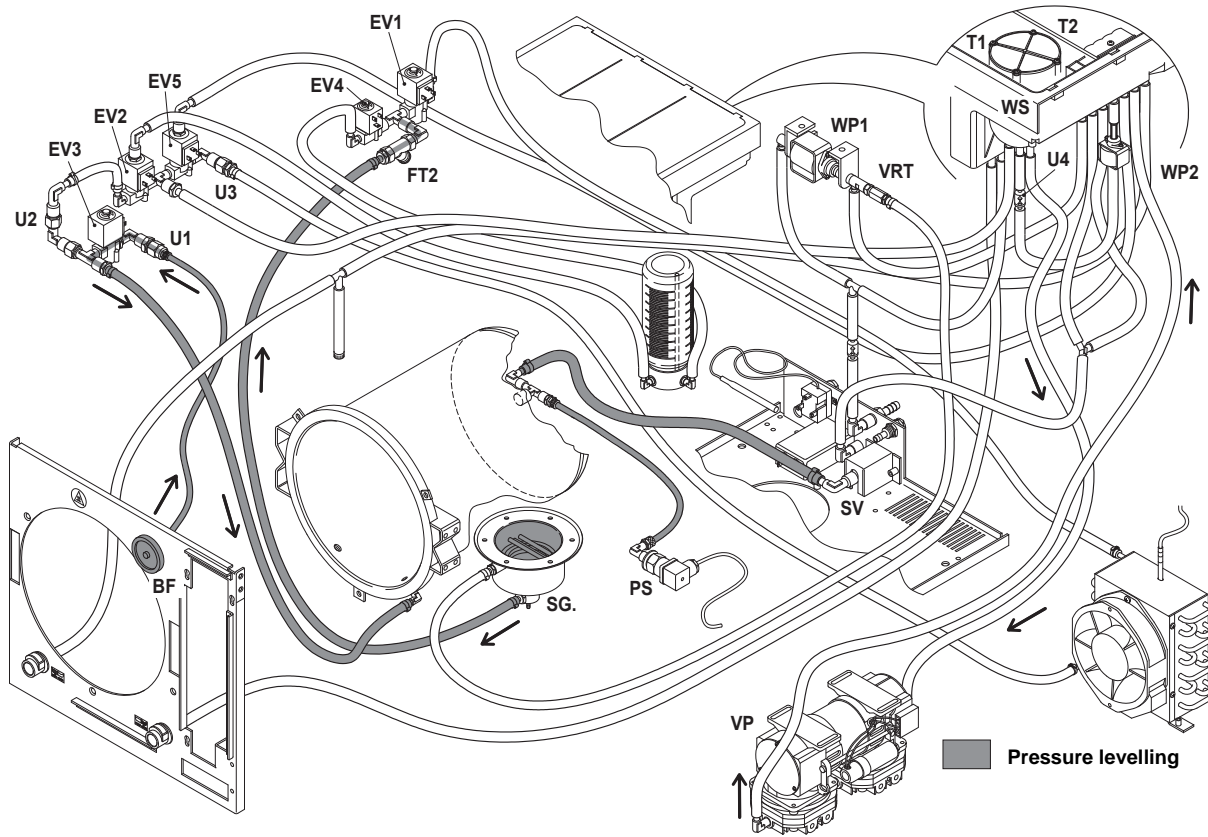
After reaching a depression of -0.86 bar, the following are powered:

1. EV1: to close the pressure discharge circuit
2. EV2 is de-energised
3. EV5 is de-energised
4. The vacuum pump also stops working

During this phase, the pressure is levelled for 5 minutes and then maintained for 10 minutes.



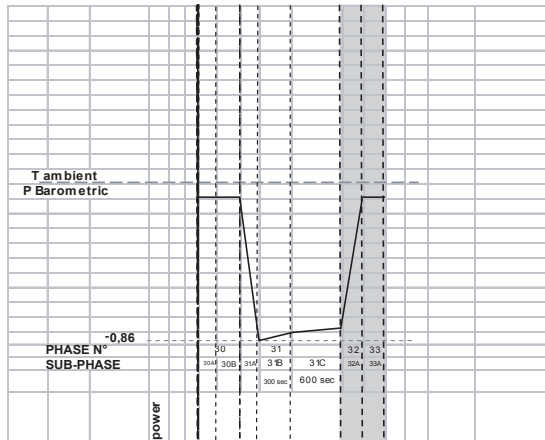
6.1.4 Pressure levelling phase



PRESSURE LEVELLING PHASE

After the vacuum has been maintained for 10 minutes and the system has checked the seal of the pneumatic circuit (otherwise an alarm message is displayed), EV3 is opened: the air enters from the bacteriological circuit and the system returns to its initial pressure.

If an alarm message appears during the test cycle, consult Chapter 12 "Troubleshooting" to discover the reason for the problem and how to eliminate it.



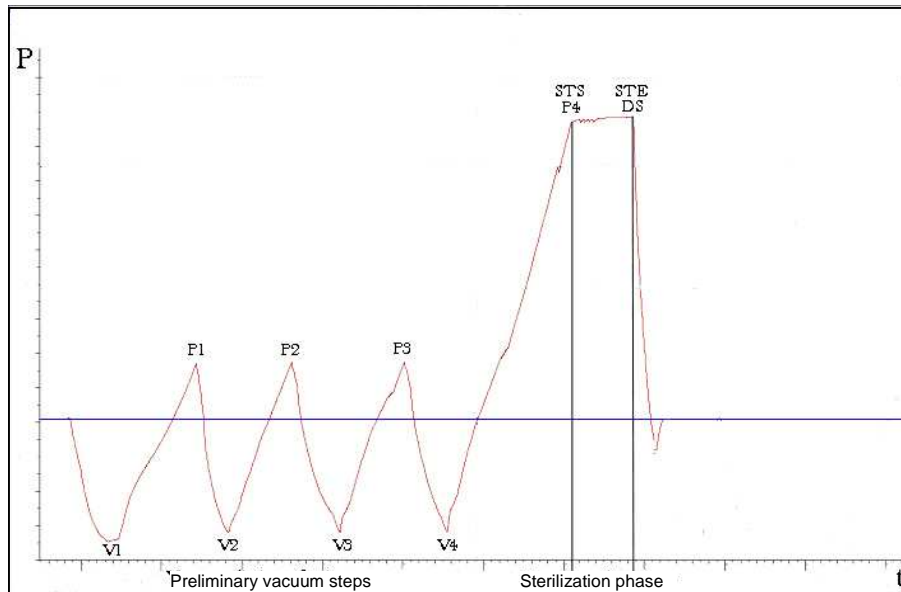
6.2 BOWIE&DICK TEST

This is a chemical-physical test that is also known as the Brown test: the indicator is a heat-sensitive sheet that is placed in the middle of a packet made up of various layers of paper and foam rubber.

The B&D test simulates the performance of the unit with regard to the sterilization of porous loads, in particular:

- the efficiency of the preliminary vacuum and the penetration of steam within the pores;
- the temperature and pressure values of the saturated steam during the sterilization phase.

The various test phases correspond to those of a cycle (e.g.: B134); consult the information indicated in Chapter 5.

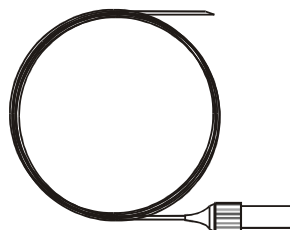


Test results must be assessed on the basis of the instructions provided by the Producer of the test.

6.3 HELIX TEST

The Helix test represents a hollow A-type load, i.e. the load with the most critical characteristics.

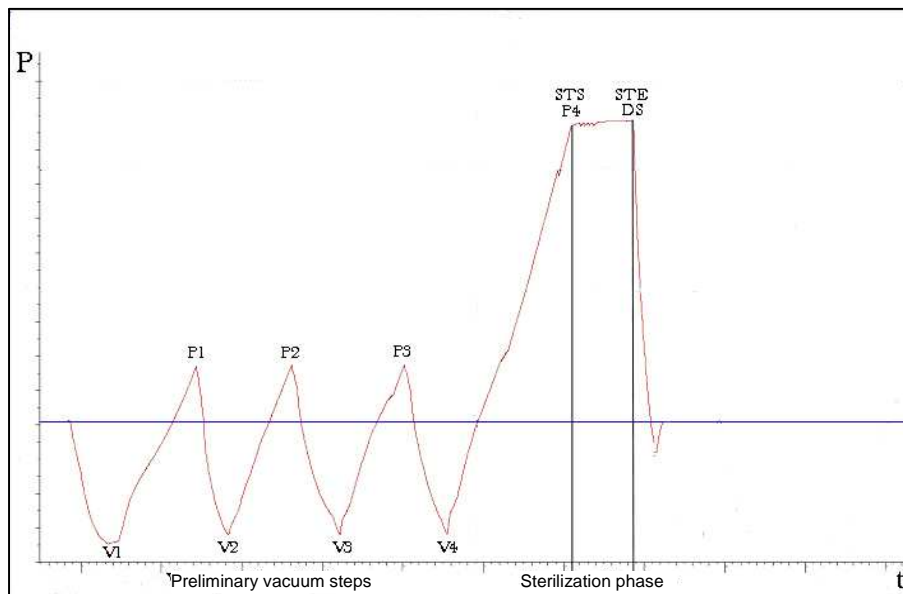
The test consists of a tube in polytetrafluoroethylene (PTFE) with a length of 150mm and internal diameter of 2mm



The Helix test simulates the performance of the unit with respect to the sterilization of hollow loads, in particular:

- the efficiency of the preliminary vacuum and the penetration of steam within the pores
- the temperature and pressure values of the saturated steam during the sterilization phase

The various test phases correspond to those of a cycle (e.g.: B134); consult the information indicated in Chapter 5.



WARNING: only perform the Helix test after a sterilisation cycle.



Test results must be assessed on the basis of the instructions provided by the Producer of the test.



Autoclaves with U-234 circuit have 4 preliminary vacuum phases till the 7.04 firmware version, since version 7.05 the cycle is carried out with 3 preliminary vacuum phases.

7 - Maintenance

7.1 SAFETY WARNINGS



Before performing any maintenance operations, carefully read the following safety instructions and, especially, chap. 2 "Safety".



WARNING: when replacing components that directly or indirectly affect **safety**, it is essential to only use **ORIGINAL SPARE PARTS**.



DANGER: HIGH INTERNAL VOLTAGE.

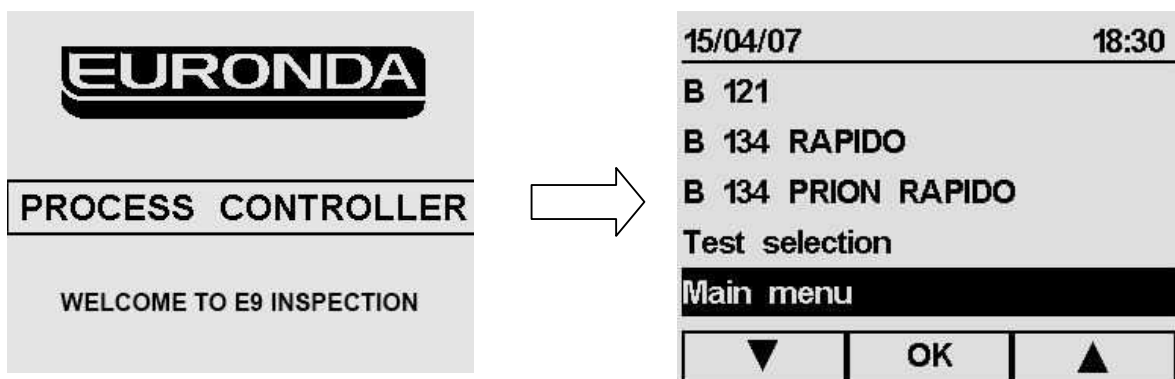
WARNING: DISCONNECT THE POWER SUPPLY BEFORE STARTING WORK. Non-observance may cause serious injury to people and seriously damage the unit.

ALL MAINTENANCE OPERATIONS MAY ONLY BE PERFORMED BY THE RESPONSIBLE AUTHORITY OR BY THE TECHNICIANS AUTHORISED BY THE ASSISTANCE SERVICE OF EURONDA S.p.A.

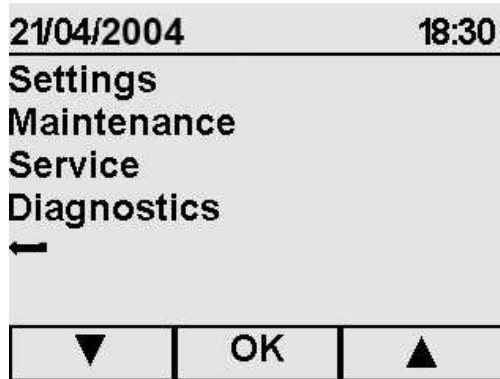
- Observe the intervals prescribed or shown in this manual. The E9 INSPECTION activates memorandum messages to assist the user in performing both the ordinary and the extraordinary maintenance operations.
- It is forbidden to eliminate the safety devices installed on the machine (see chap. 2.2 "Safety devices"). Check them at regular intervals.
- If an effective danger situation arises, press the ON-OFF button (1 of Fig. 4.2.1-3) immediately.
- Unauthorised people must stay at a safe distance from the machine during maintenance operations.

After maintenance and before starting the unit, the responsible authority must make sure that work has been done correctly, that the safety devices are active and that no-one is already working the unit.

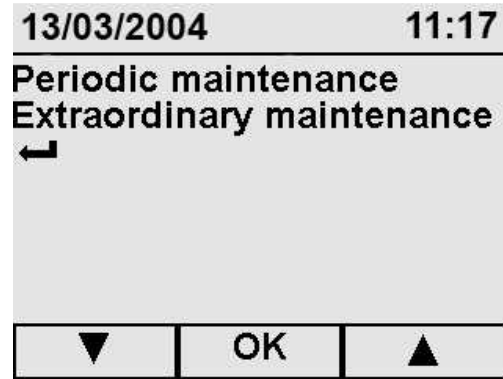
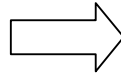
To access the Maintenance page, turn on the unit with the ON-OFF switch and proceed as follows:



After turning on the unit, this welcome message appears. After 5", a menu automatically appears. Select **Main Menu**.



From the **Main Menu**, use the ▼ key to select the item *Maintenance*, then press OK to confirm.



Maintenance

Use the ▲ and ▼ keys to select the item desired, and press OK to confirm.

If *Periodic maintenance*, see chap. 8.2;

If *Extraordinary maintenance*: see chap. 8.3

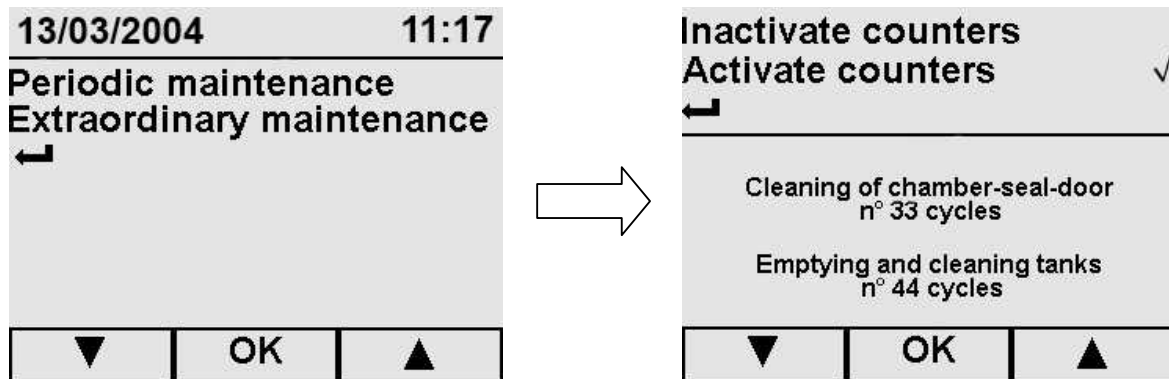
- With ← or OK, you go back to the previous screen.

Periodic maintenance programme

FREQUENCY	OPERATION
DAILY	Cleaning of the door seal. General cleaning of the external surfaces. General cleaning of the internal surfaces.
WEEKLY	Cleaning of the sterilization chamber. Cleaning of the trays and the support.
EVERY 500 CYCLES	Replacement of the bacteriological filter.
EVERY 500 CYCLES	Replacement of the seals.
AFTER 10 YEARS	Request a structural check of the chamber.
WHEN NECESSARY	Adjustment of the closing mechanism.

7.2 PERIODIC MAINTENANCE

Deactivating the counters



From the Maintenance screen, select the item *Periodic maintenance*. This screen shows how many cycles are left before the reminder message appears for the maintenance operation indicated.

Only for periodic maintenance, the cycle counters can be inactivated: in this way, no reminder messages appear (select *Inactivate Counters* using the ▲ and ▼ keys, then press OK to confirm). If you later decide to re-activate the counters, select the item *Activate Counters*: the number of cycles to perform before the message appears begins from the value the counters stopped at. The periodic maintenance operations are described and illustrated in the "E9 INSPECTION" user instruction manual.

- With ← or OK, you go back to the previous screen.

Safety valve maintenance

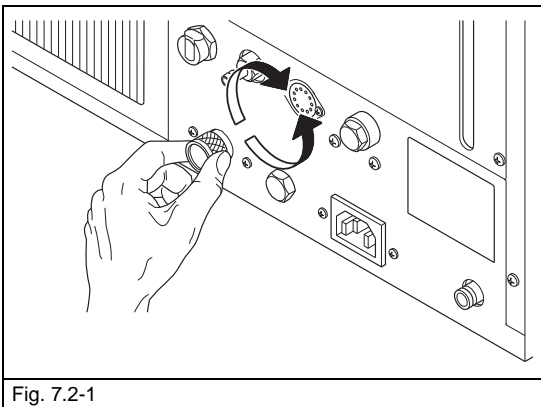


ATTENTION: HIGH TEMPERATURE. Carry out this operation only when the machine is cold.



ATTENTION: DETACH THE POWER CORD BEFORE ANY INTERVENTION ON THE AUTOCLAVE. If this indication is not respected serious injuries may occur on persons and the machine may be seriously damaged.

1. The safety valve is located in the autoclave's back side.
2. Unscrew counter clockwise the cap (Fig. 7.2-1) until it can turn free.
3. Screw in again the cap and repeat the procedure two times more.



ATTENTION: This operation is necessary in order to ensure the safety valve correct functioning. Make sure that the cap is correctly screwed in at the end of the maintenance.

Closing system maintenance

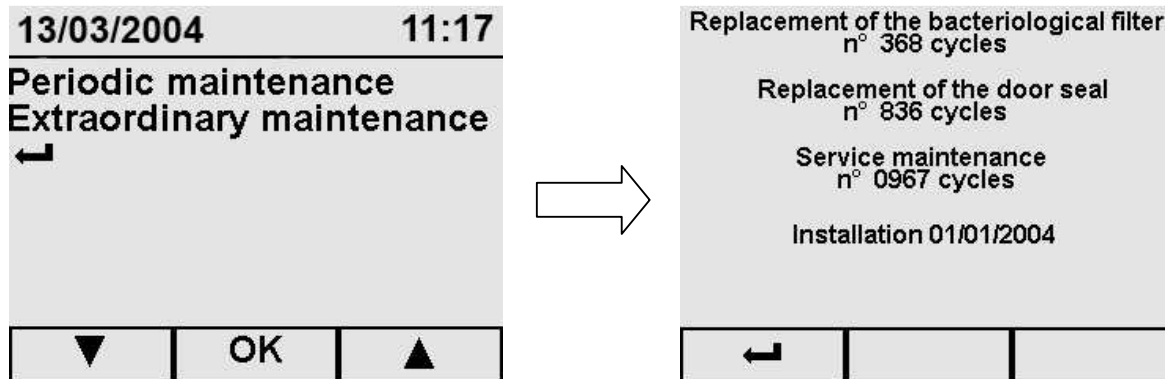
Door blocking system micro-switch: verifies the correct position of the blocking system	Warns fails in door blocking
Door blocking: electro-mechanic system protecting from accidental door opening For verifying see the procedure in the test Items. Verify the correct functioning and positioning of the blocking piston.	Avoid the door to be opened during the cycle.

7.3 EXTRAORDINARY MAINTENANCE



WARNING: extraordinary maintenance must only be performed by specialists authorised by Euronda S.p.A.

Any jobs not included in the periodic maintenance section in the instruction manual provided with the unit are considered as extraordinary maintenance.



Extraordinary maintenance

From the Maintenance screen, select the item *Extraordinary Maintenance*. The number of cycles left to go before the memorandum message for the indicated maintenance operation appears is displayed in this screen.

Contrary to the routine maintenance screen, in this case **the cycle counters cannot be inactivated**.

The memorandum messages appear each time the unit is switched on, until the maintenance operation has been performed.

- With ← you go back to the previous screen.

After all the three operations shown on the screen have been performed, reset the counters by pressing the buttons in a determined sequence (in the extraordinary maintenance template):

Counter to reset	Button sequence
Replacement of the bacteriological filter	Central button three times
Replacement of the door seal	Right-hand button three times
Service maintenance	Central button two times + right-hand button 2 times



The bacteriological filter and the gasket are components that are not covered by the guarantee.

Service maintenance

After 1000 cycles or after two years from installation (the date can be seen at the bottom of the screen), a memorandum message appears recommending a general overhaul of the unit. This can only be performed by specialists authorised by Euronda S.p.A. The reminder message appears each time the unit is switched on, until the overhaul has been performed.

- With OK, you go back to the Program Menu.



Up to EEG060999 Up to EEH060999 Starting EEG061000 Starting EEH061000
1000 Cycles

- replace bacteriological filter;
- replace door seal;
- clean the inside of the chamber, the seal and the door;
- drain the tanks and clean them together with the level sensors;
- check and clean if necessary the power mother board;
- Verify the condition of FT1 and FT2 filters and, if necessary, clean them;
- Verify visually the condition of separator gasket and W.O.S. gasket;
- Oil the door hinge;
- Execute a B134 cycle and verify the calibration of the temperature probe, sending the PIN 5 of the internal serial socket in short circuit,
- Verify the correct functioning of the ULKA pump, (200ml in the W.O.S. in V1 PHASE starting up a cycle) as in the picture 7.4.2.1 (if necessary add water by technical menu);
- Verify the proper functioning and the good condition of the U4 separator one-way valve;
- Verify that the TS1 safety thermostat is adjusted at maximum (4/4) (till EEG 060999 and EEH 060999);
- Verify which software version is set up and, if necessary, update with the latest available one in www.eurondatec.com .
- verify possible maintenance kit in www.eurondatec.com .

2000 Cycles

Same as 1000 cycles but replacing:

- WOS (Water Outgas System);
- WP2 pump (E9 INSPECTION up to EEG060999, up to EEH060999);
- Separator valve U4;
- water pump valve VRT;
- safety valve SV;
- verify EV1 and EV4 dismounting and cleaning them.
- verify possible maintenance kit in www.eurondatec.com .



Remember to update the service booklet (located inside the machine at the rear) whenever the unit is serviced.

Replacing the bacteriological filter

- Unscrew the bacteriological filter (1 of Fig. 8.3 - 1) by turning it anticlockwise;
- Screw on the new filter by turning it clockwise until it is tight.

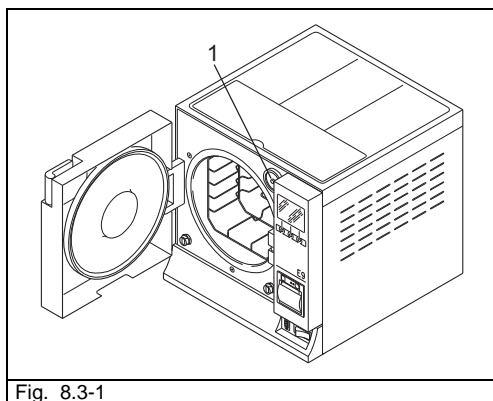


Fig. 8.3-1

Replacing the door seal

- Grip the lip of the seal with two fingers and remove it;
- Clean the seat of the seal with a cloth soaked in alcohol;
- Fit the new seal into the seat located in the door and distribute it evenly around the circumference by applying the same pressure on the entire gasket with your fingers. Then lift up the lip of the gasket to make sure no points have been badly fitted;
- Switch on the unit, close the door making sure the correct closing force is required; if necessary, adjust the closing force with the relative adjustment wrench.

Power board fuse

The fuse on the internal card is of the type: 5x20 F2A.

7.4 TECHNICAL MENU

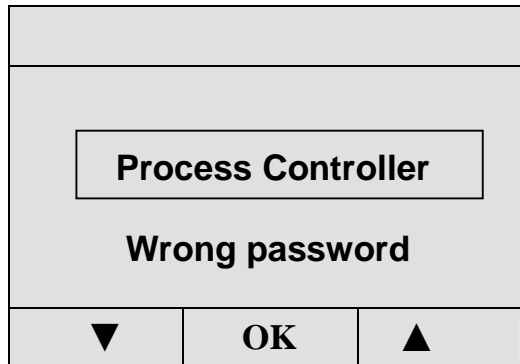
From main menu select diagnosys, and insert password:



If password is correct → 7.4.2 ELSE 7.4.1

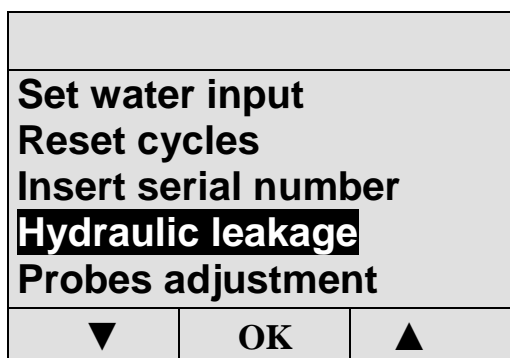
7.4

In case of wrong password:

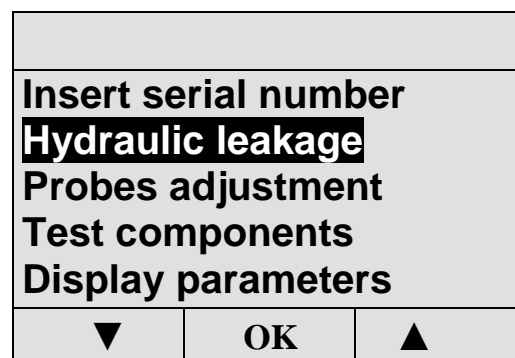


7.4.1

This screenshot disappears after 3 seconds and returns to main Menu

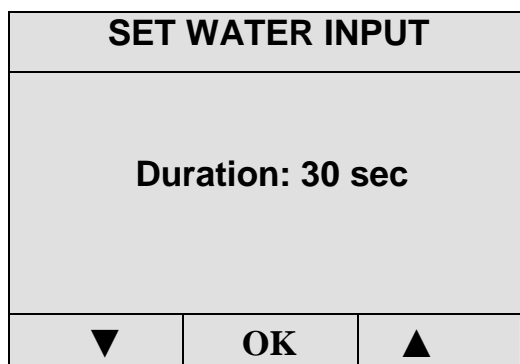


7.4.2



IF you select Set water input and then OK
 IF you select Reset cycles and then OK
 IF you select Insert serial number and then OK
 IF you select Hydraulic leakage and then OK
 IF you select Probes adjustment and then OK
 IF you select Test components and then OK
 IF you select Display parameters and then OK
 IF you select Return button and then OK

→ 7.4.2.1
 → 7.4.2.2
 → 7.4.2.3
 → 7.4.2.4
 → 7.4.2.5
 → 7.4.2.6
 → 7.4.2.7
 → return 7.4



7.4.2.1

With Up and Down arrows, you can modify the WP1 pump intervention time. Setup time for WP1 (water injection pump) is up to 30 seconds.

Aged WP1pumps, may inject fewer water quantity. In this case, calibrate water injection time with 1 second steps, until 200 ml are stored. (which cause alarm E61)

Confirm with OK button and return to 7.4.2

Reset cycles		
Reset cycles counter?		
NO		YES

7.4.2.2

Push YES and return to 7.4.2

This function reset the counter at the first level, it doesn't reset the main counter.

CONFIGURATION.

Push YES and return to 7.4.2 and the cycles will be deleted.

Insert serial number		
EEG 050010		
Return		YES

7.4.2.3

This screenshot shows the current serial number.

If you push YES, a keyboard will appear to set a new serial number. With ENTER, you confirm the operation, and new informations are stored on returning to 7.4.2.3 which shows the new serial number.

Push RETURN to return to 7.4.2



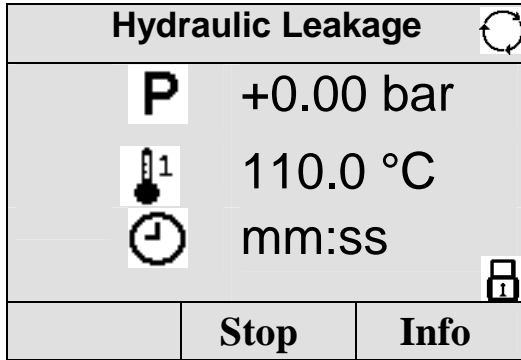
Cycles “Hydraulic leakage” and “Probes adjustment” are counter free.

Hydraulic Leakage		
<p>If vacuum test turns out negative, carry out this cycle in order to verify the hydraulic leakage throughout the circuit, connectors and valves.</p> <p>The autoclave doesn't do the pre-vacuum. Total time 30 min</p>		
Return	Start	

7.4.2.4

Push RETURN to return to 7.4.2

Push START and the machine performs the Hydraulic Leakage test, at the end appears 3.2

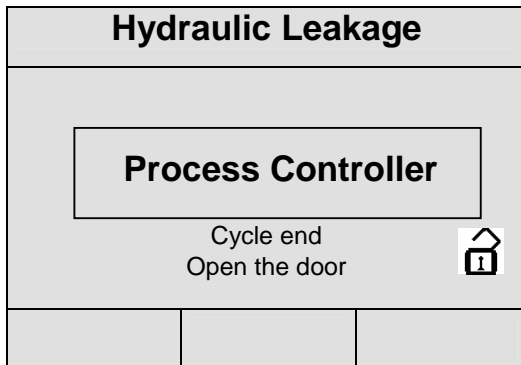


3.2

At cycle end, appears 7.4.2.4.1

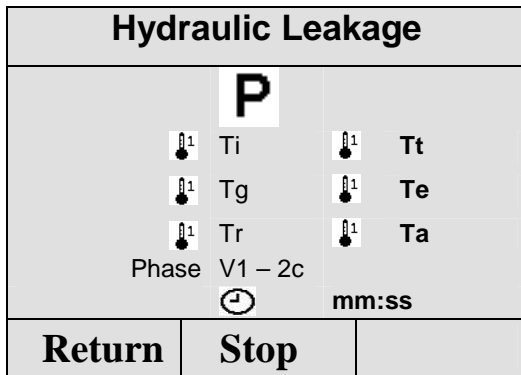
If you push the INFO button → 3.4

If you push the STOP button from 3.2 → 3.3



7.4.2.4.1

Unlock door and go to 7.4.2

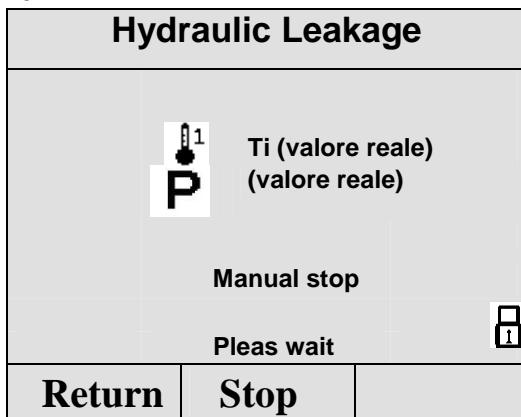


3.4

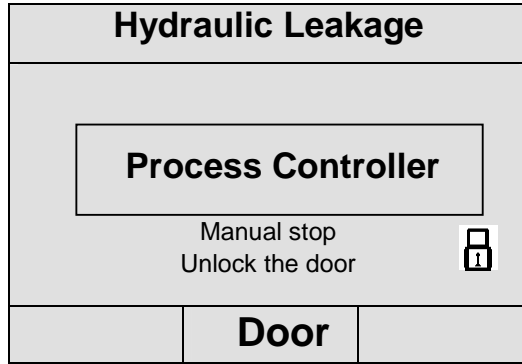
If you push STOP from 3.2 OR 3.4 → 3.3,

If you push NO → 3.2 OR 3.4

Else → 3.8 AND 7.4.2.4.2



3.8

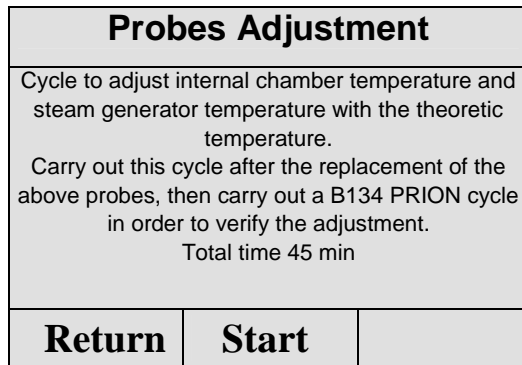


7.4.2.4.2

Push Door → 7.4.2

This test made it possible to increase pressure up to 2,05 bar for 30' without active alarms.

In case of Leakage, perform thist test cycle.



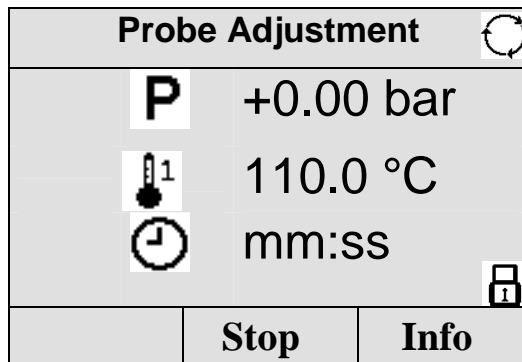
7.4.2.5

On replacing PTC1, OR PTC3, you should perform this test cycle. Allows thermal chain automatic temperature probes calibration: transducer - Internal probe - generator probe.

It is not necessary if you replace PTC2 or PTC4.

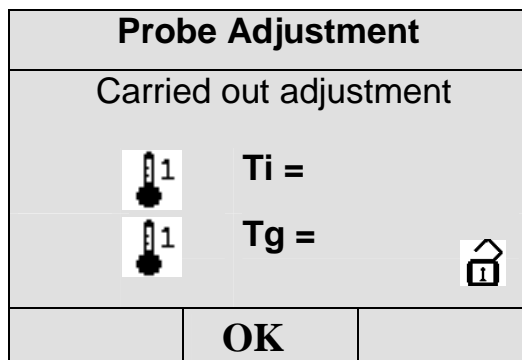
If pushing RETURN → 7.4.2

If pushing START → 3.2



3.2

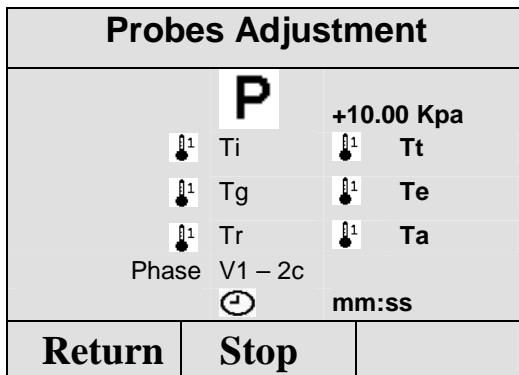
If you push INFO → 3.4



7.4.2.5.1

If you push OK data are stored → 7.4.2

IF in 3.2 you push INFO →3.4

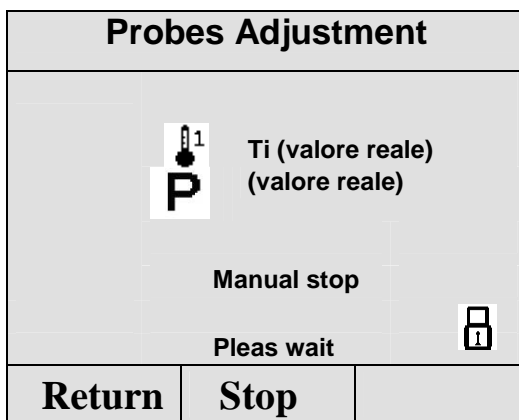


3.4

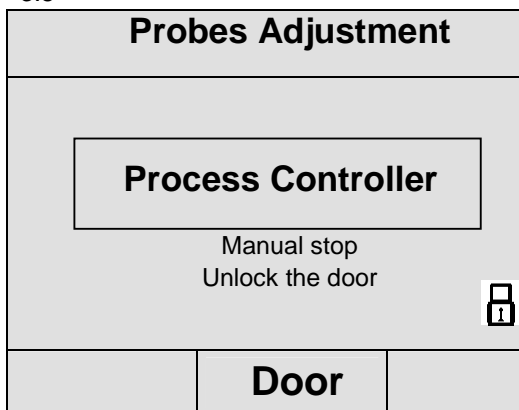
If you push STOP from 3.2 OR 3.4 →3.3,

If you push NO →3.2 OR 3.4

ELSE 3.8 AND 7.4.2.5.2

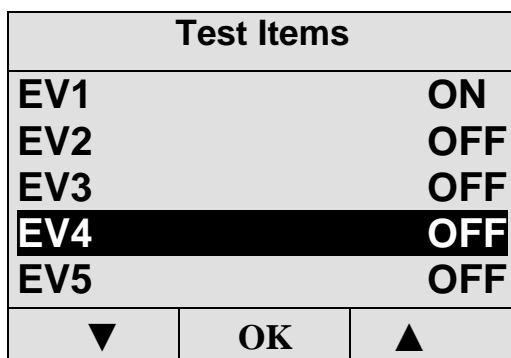


3.8



7.4.2.5.2

Push Door →7.4.2



With Up and Down arrows you can electrically test each component.

At the beginning all components are OFF, selecting the component and pushing OK, it goes to ON.

Test Items	
EV6	ON
EM1	OFF
WP1	ON
WP2	OFF
VP	OFF
▼	OK ▲

Push RETURN → 7.4.2
(all components are set to normal values)

7.4.2.6

Visualize parameters	
P =	P ref
⬇️ ¹ Ti	⬇️ ¹ Tt
⬇️ ¹ Tg	⬇️ ¹ Te
⬇️ ¹ Tr	⬇️ ¹ Ta
RMS +230.6 V	
🕒	mm:ss
Return	

This screenshot shows the machine instant function parameters.
Push RETURN → 7.4.2

7.4.2.7

CONFIGURATION:

this screenshot show how to select and print:

- operators setup
- past cycles parameters
- ordinary and extraordinary maintenance period
- probes correction range
- instant parameters

Cycles stop:

For marketing and law agreements reasons, it is possible to inhibit certain cycles, by factory programming.

In case of blocked cycles push 3 times the right side button.

Machine Info
print time: 29/1/2009 15,6,18

Firmware Info:
Version: 7.07
Date/Time: Nov 27 2008/08:12:01
Author: Oliva D.

Communication Protocol Version = 3

Machine Parameters
SN: PST 18 EAD
Model:

Language: English
Geographic Zone: Europe (RMS 200,264)
Installation Date/Time: 2007/7/31 6,15,-1
Last Switch On Date: 2009/1/29
Standby Time=3
LCDContrast=40 LCOSbackLight=99
Fast Selection=10
Vacuum Promo=4
B&D Promo=4
Helix Promo=4

Pressure Ref: 1.000489
H2O Input Time: 30

Blocked Cycles = 0,0
Super Cycle Number = 5487
Date/Time Last Cycle: 2009/1/29 14,25,-1
Total Cycle Number = 5487
Ok Cycle Number = 5334
Stop Cycle Number = 18
Alarm Cycle Number = 28
Vacuum Number = 78
B&D Number = 0
Helix Number = 30

Cleaning of chamber-seal-door = 46
Emptying and cleaning tanks = 14
Replacement of the bacteriological filter
= 0
Replacement of the door seal = 0
Revisione generale macchina (cycles) = 0
Revisione generale macchina (day) = 496

False State
False: Record Number=70
False: Used Sector=1

Calibration State
PTC1 (ch1)=1000.00 PTC2 (ch2)=1000.00
PTC3 (ch3)=1000.00 NTC (ch4)= 0.00
Pressure 1 (ch1)= 1.00
Pressure 2 (ch1)= 1.00
Calibration Date/Time: 2009/1/29 15,3,52

PTC1=85.8
PTC2=115.1
PTC3=99.6
NTC=64.8
Board=33.0
P=1,01 Bar
RMS 223.5V

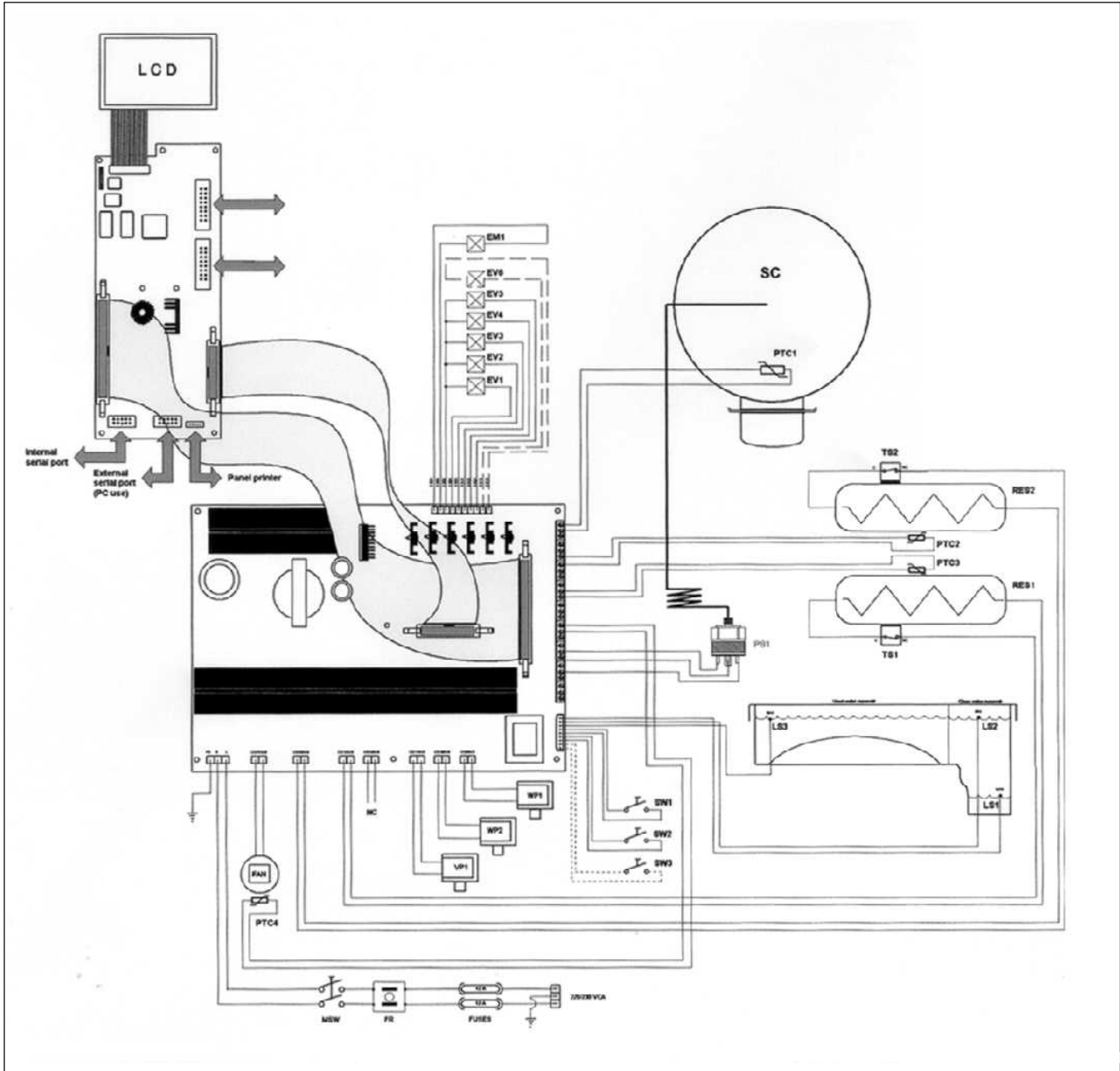
7.5 COMPONENTS LIST E9 INSPECTION (U-234 / RECORDER CIRCUIT)

COMPONENTS	NAME OF SIGNAL	DESCRIPTION	Characteristics
MSW		Main switch	250V 12A
EV1	OD6A/OD6B	Two-way solenoid valve for discharging steam at the end of the cycle, power draw 9 W; normally open (NO)	24 VDC
EV2	OD5A/OD6B	Three-way solenoid valve for air prevacuum and water-air separation, power draw 12 W; normally closed (NC)	24 VDC
EV7	OD4A/OD6B	Three-way solenoid valve for bacteriological filter, power draw 9 W; normally open (NO)	24 VDC
EV4	OD3A/OD6B	Two-way solenoid valve for water exchange (steam gen. ~ drip collector), power draw 6 W; normally closed (NC)	24 VDC
EV8	OD2A/OD6B	Three-way solenoid valve for vacuum pump, power draw 12 W; normally closed (NC)	24 VDC
EV6	OD1A/OD1B	Solenoid valve for connection to water supply	24 VDC (outside unit)
EM1	OD8A/OD8B	Door lock electromagnet, power draw 6 W	24 VDC
WP1	OD9A/OD9B	Boiler water inlet pump, power draw 48 W	230 VAC
VP1	OD11A/OD11B	Vacuum pump, impedance 90 Ohms	230 VAC
RES1	OD14A/OD14B	Heater for steam generator, power draw 1800 W	230 VAC
TS1		Manually resettable safety thermostat for generator heater, calibrated to mid-range, approx. 180°C	230 VAC
RES2	OD15A/OD15B	Stainless steel band heater for chamber, power draw 840 W for the 24 l version and 600 W for the 18 l version	230 VAC
TS2		Manually resettable safety thermostat (band heater for chamber), calibrated to 200°C	230 VAC
FAN1	OD17A/OD17B	Radiator fan, power draw 35 W	230 VAC
PTC1	IA1	PT1000 probe inside boiler (working space inside chamber)	
PTC2	IA2	PT1000 probe outside boiler (mounted on external band heater)	
PTC3	IA3	PT1000 probe for steam generator (located on the steam generator coil heater)	

COMPONENTS	NAME OF SIGNAL	DESCRIPTION	Characteristics
PTC4	IA4	NTC10000 temperature probe mounted on radiator	
PTC5		Temperature probe mounted on CPU card	
PS1	IA5	Pressure sensor	
LS1	ID4	Float sensor for MIN distilled water level, contact normally closed (NC)	
LS2	ID5	Float sensor for MAX distilled water level, contact normally closed (NC)	
LS3	ID6	Float sensor for MAX used water level, contact normally closed (NC)	
SW1	ID7	Door closed micro-switch, contact normally open (NO)	
SW2	ID8	Door lock micro-switch	
SW3	ID9	External Aquafilter signal (indicates the conductivity limit of the water produced by the deionizer)	
SERIAL 1 Software port		Main serial port (cpu flash software update, probe and sensor calibration, etc.)	
SERIAL 2 Printer port		Secondary serial port (external printer, external memory, etc.)	

8 - Components and diagrams

8.1 WIRING DIAGRAM

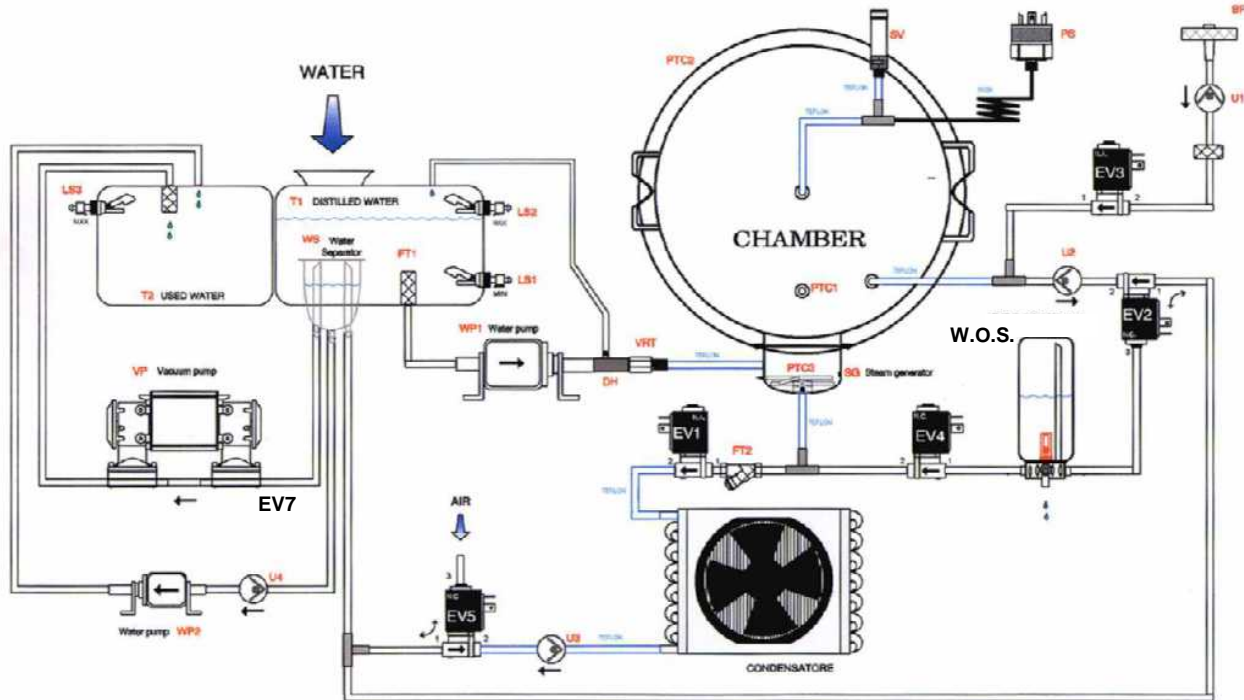


Key

ITEM	DESCRIPTION	ITEM	DESCRIPTION
MSW	Main switch	TS1	Manually resettable safety thermostat (steam generator)
EV1	Solenoid valve for discharging pressure at the end of the cycle	TS2	Manually resettable safety thermostat (band heater on chamber)
EV2	Solenoid valve for air prevacuum and water-air separation	PTC1	Probe inside boiler
EV3	Solenoid valve for bacteriological filter	PTC2	Probe outside boiler
EV4	Solenoid valve for exchanging water	PTC3	Steam generator probe
EV5	Vacuum pump probe	PTC4	Temp. probe mounted on radiator
EV6	Solenoid valve for connection to water supply	PS1	Pressure sensor Pay attention to correct connection: Brown – blank – White – Green/Blue
EM1	Door lock electromagnet	LS1	Float sensor for MIN distilled water level
WP1	Boiler water inlet pump	LS2	Float sensor for MAX distilled water level
VP1	Vacuum pump	LS3	Float sensor for MAX used water level
RES1	Steam generator heater	SW1	Door closed microswitch
RES2	Stainless steel band heater for chamber	SW2	Door lock microswitch
FAN1	Radiator fan	SW3	Microswitch enabling inlet from water supply

8.2 HYDRAULIC DIAGRAM

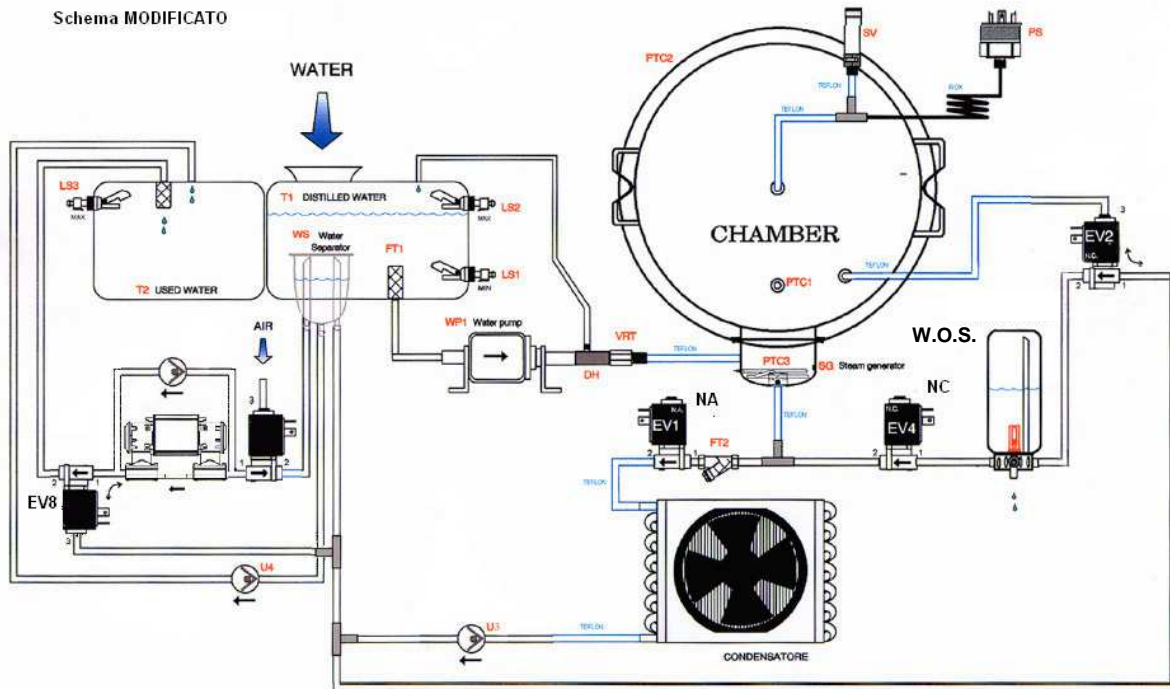
8.2.1 Hydraulic diagram E9



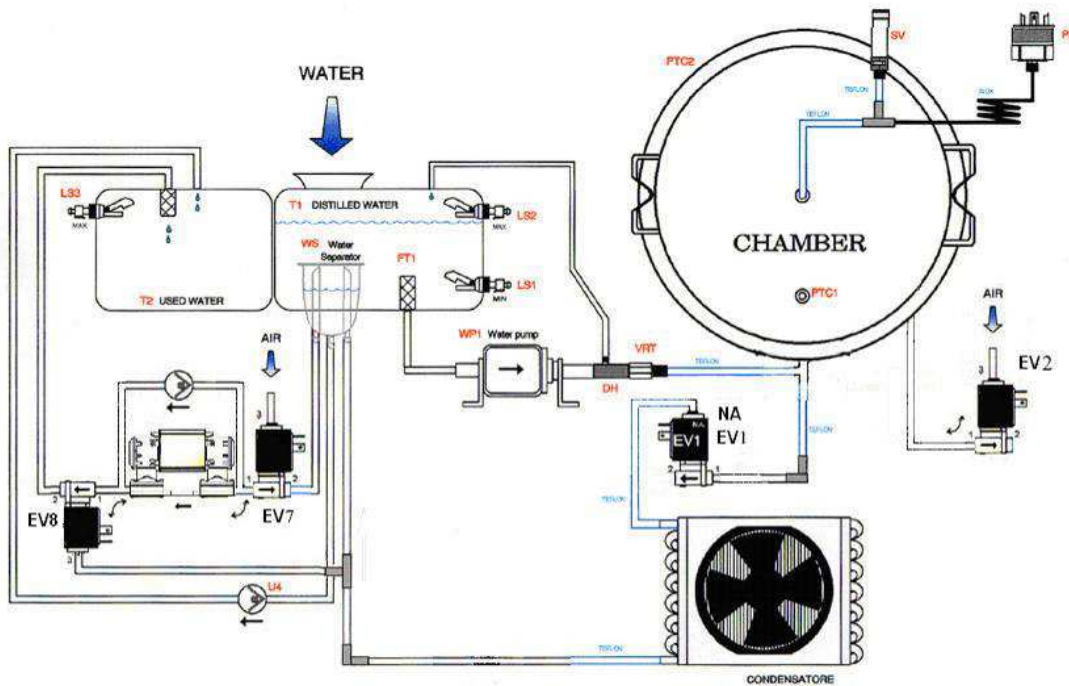
Key

ITEM	DESCRIPTION	ITEM	DESCRIPTION
EV1	Solenoid valve for discharging pressure at the end of the cycle	PS	Electronic pressure sensor
EV2	Solenoid valve for air prevacuum and water-air separation	SV	Safety valve
EV7	Solenoid valve for bacteriological filter.	WP1	Boiler water inlet pump
EV4	Solenoid valve for exchanging water	VP	Vacuum pump
EV8	Vacuum pump solenoid valve	FT1	Water filter
LS1	Float sensor for MIN distilled water level	FT2	Steam filter
LS2	Float sensor for MAX distilled water level	U1	One-way valve
LS3	Float sensor for MAX used water level	U2	One-way valve
PTC1	Probe inside boiler	U3	One-way valve
PTC2	Probe outside boiler	U4	One-way valve
PTC3	Steam generator probe	VRT	Check valve
WS	Water-steam separator	BF	Bacteriological filter
T1	Distilled water tank	SG	Steam generator
T2	Used water tank		

8.2.2 Hydraulic diagram E9 U-234

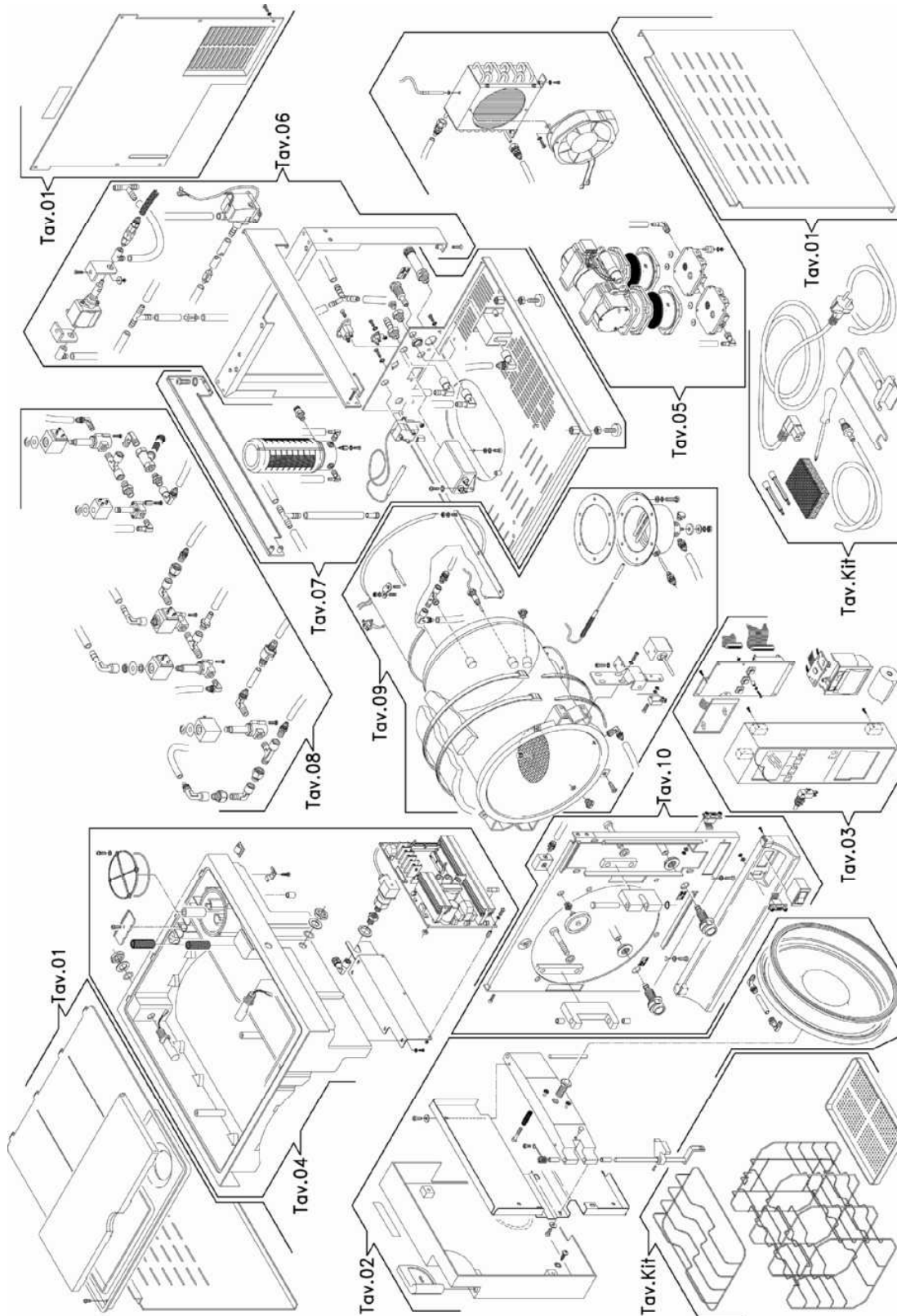


8.2.3 Hydraulic diagram E9 MED (since EGO090101 18 L and since EGP090081 24 L)

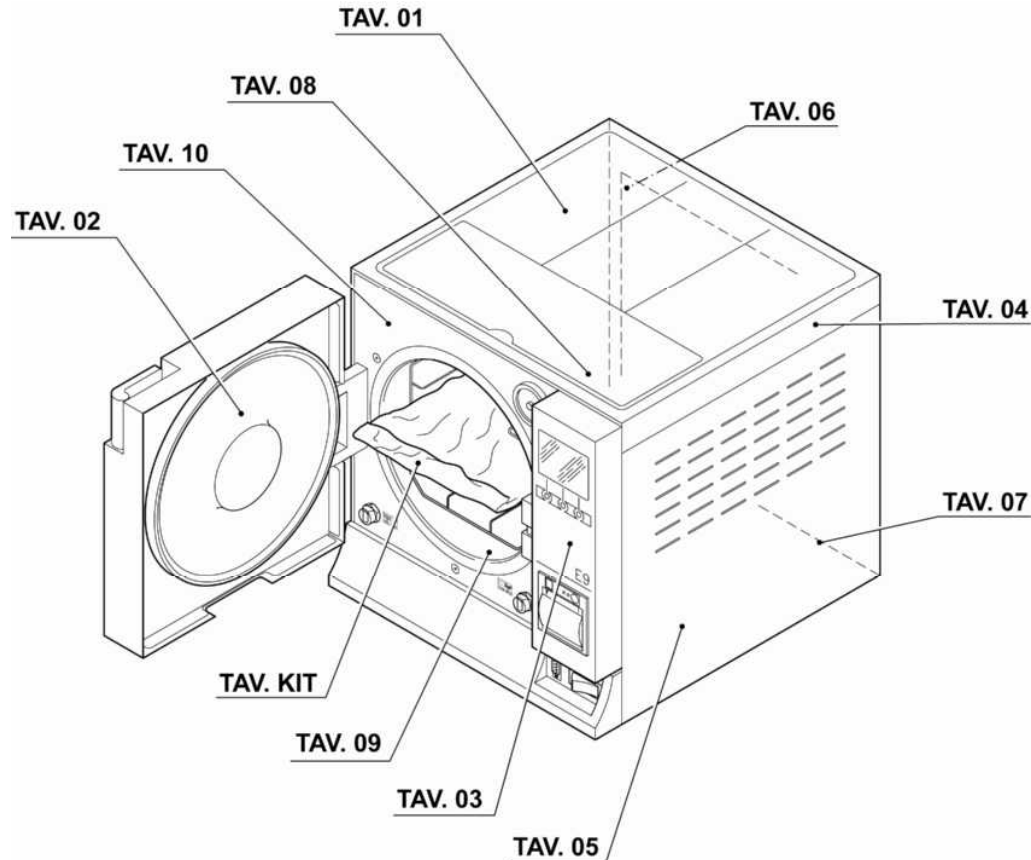


9 - Spare parts catalogue

9.1 EXPLODED GENERAL DIAGRAM OF E9 INSPECTION



9.2 INDEX OF TABLES

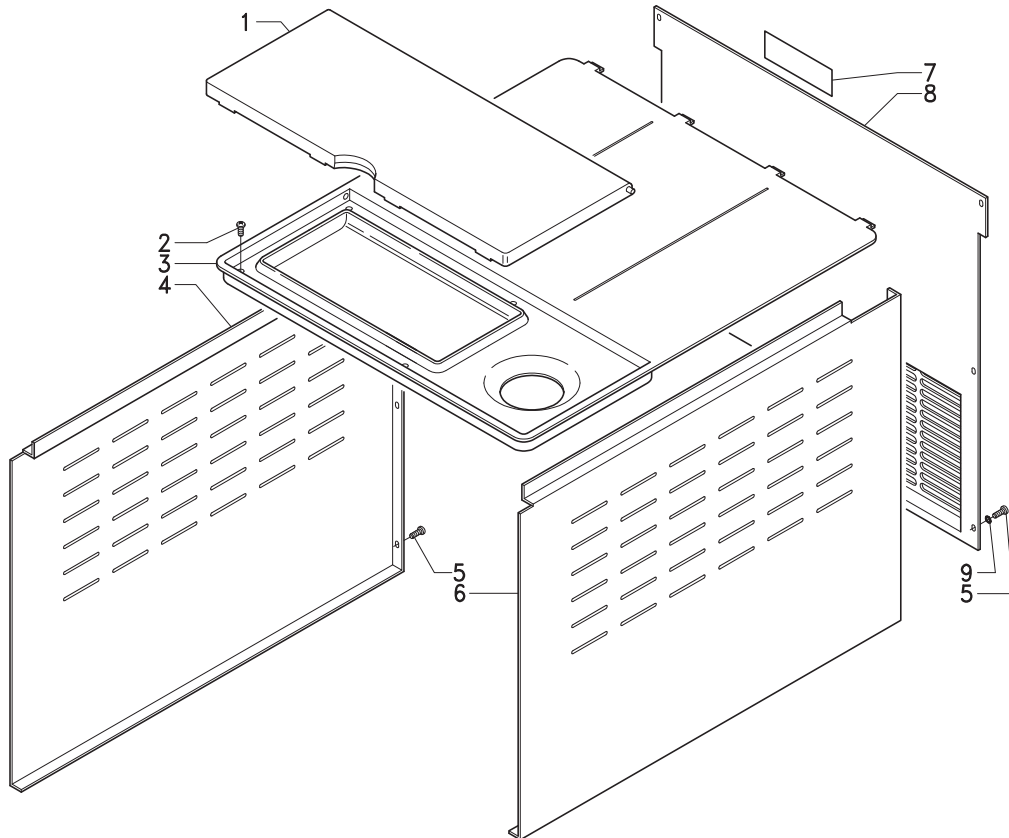
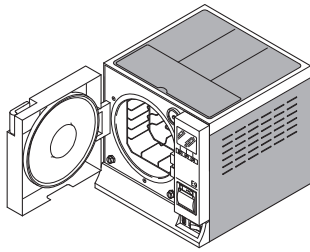


- Tab. 01** Safety housing assembly
- Tab. 02** Door assembly
- Tab. 03** Control panel assembly
- Tab. 04** Tank and power board + pressure transducer
- Tab. 05** Vacuum pump and radiator assembly
- Tab. 06** Tank support and micropump / U-234 circuit assembly
- Tab. 07** Chassis, air-water separator and crosspiece assembly
- Tab. 08** Solenoid valve assembly
- Tab. 09** Boiler/electromagnet assembly
- Tab. 10** Front panel assembly
- Tab. Kit** Accessories kit

HOW TO READ THE SPARE PARTS CODES TABLES

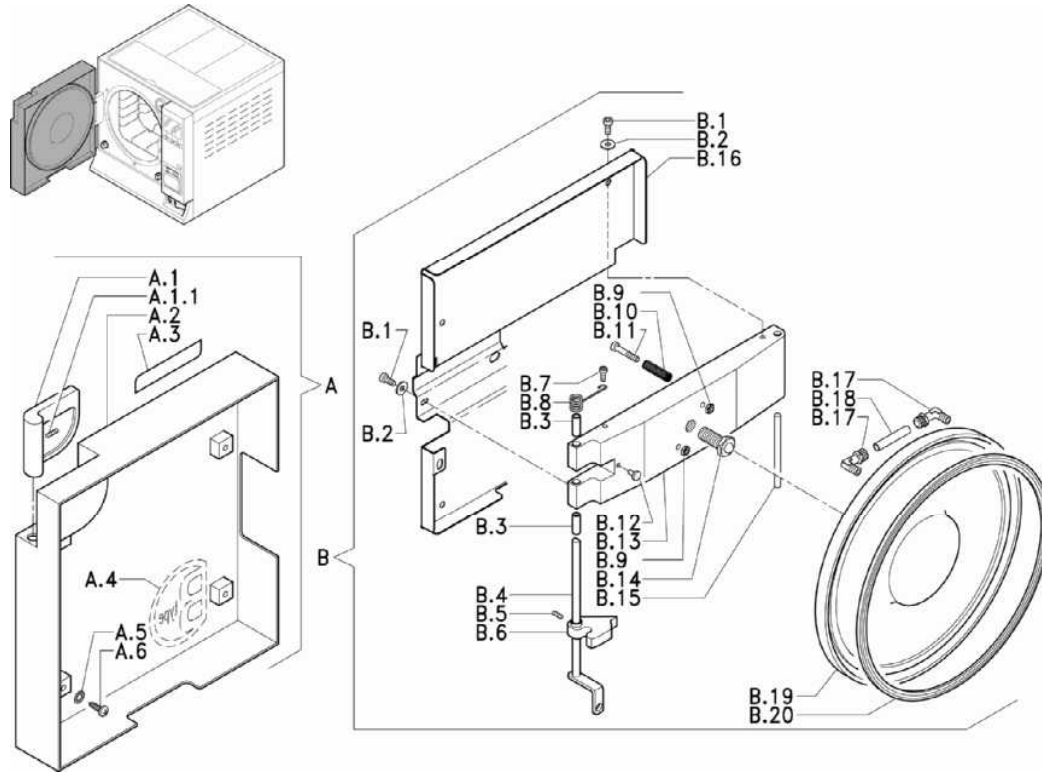
All the various assemblies with the relative tables for ordering spare parts are shown in the following tables. Some pieces are part of a single kit (e.g.: Table 01 item A: kit comprising 5 different pieces) that can also be ordered separately (e.g.: Table 01 item A.1).

9.2.1 TAB. 01: SAFETY HOUSING ASSEMBLY E9



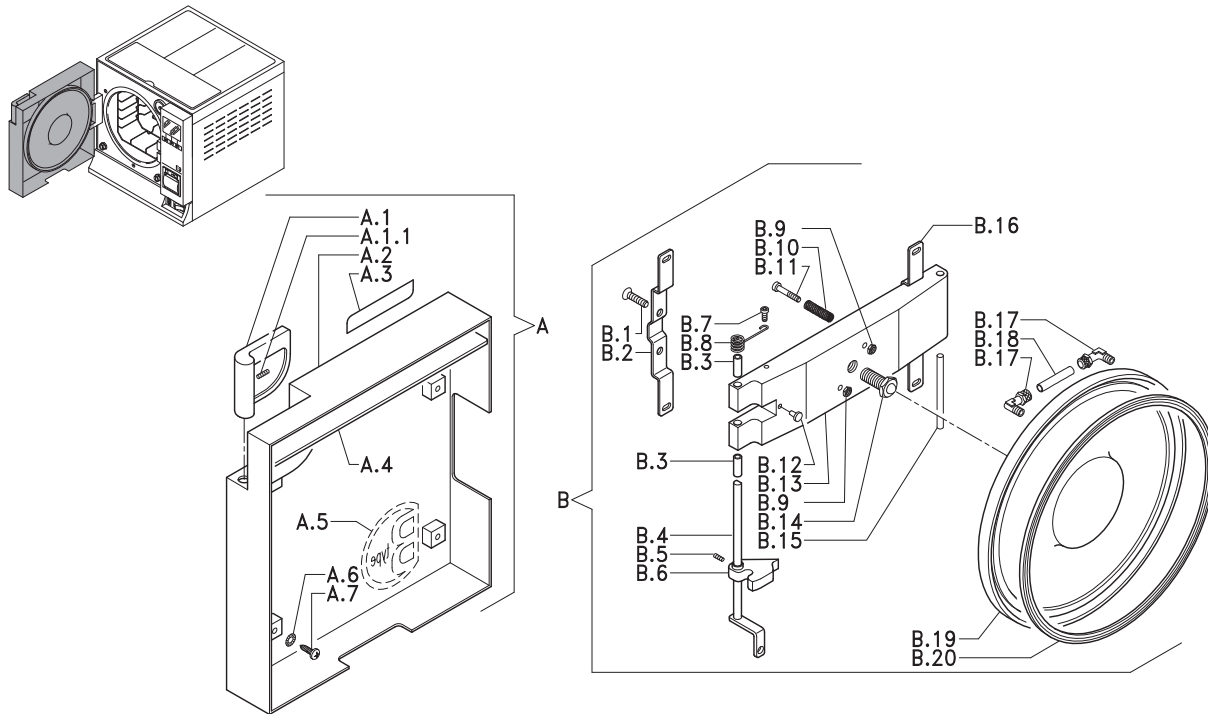
REF.	ITEM N°	DESCRIPTION	QTY
1	533798	tank cover door	1
2	572385	button-head screw 4x6	5
3	531507	tank cover	1
4	524724	painted LH side panel	1
5	572487	button-head screw 4x10	4
6	524722	painted RH side panel	1
7	530668	yellow adhesive warning label	1
8	524726	painted rear panel	1
9	571733	stainless steel washer	4

9.2.2.1 TAB. 02: DOOR ASSEMBLY E9 INSPECTION / RECORDER



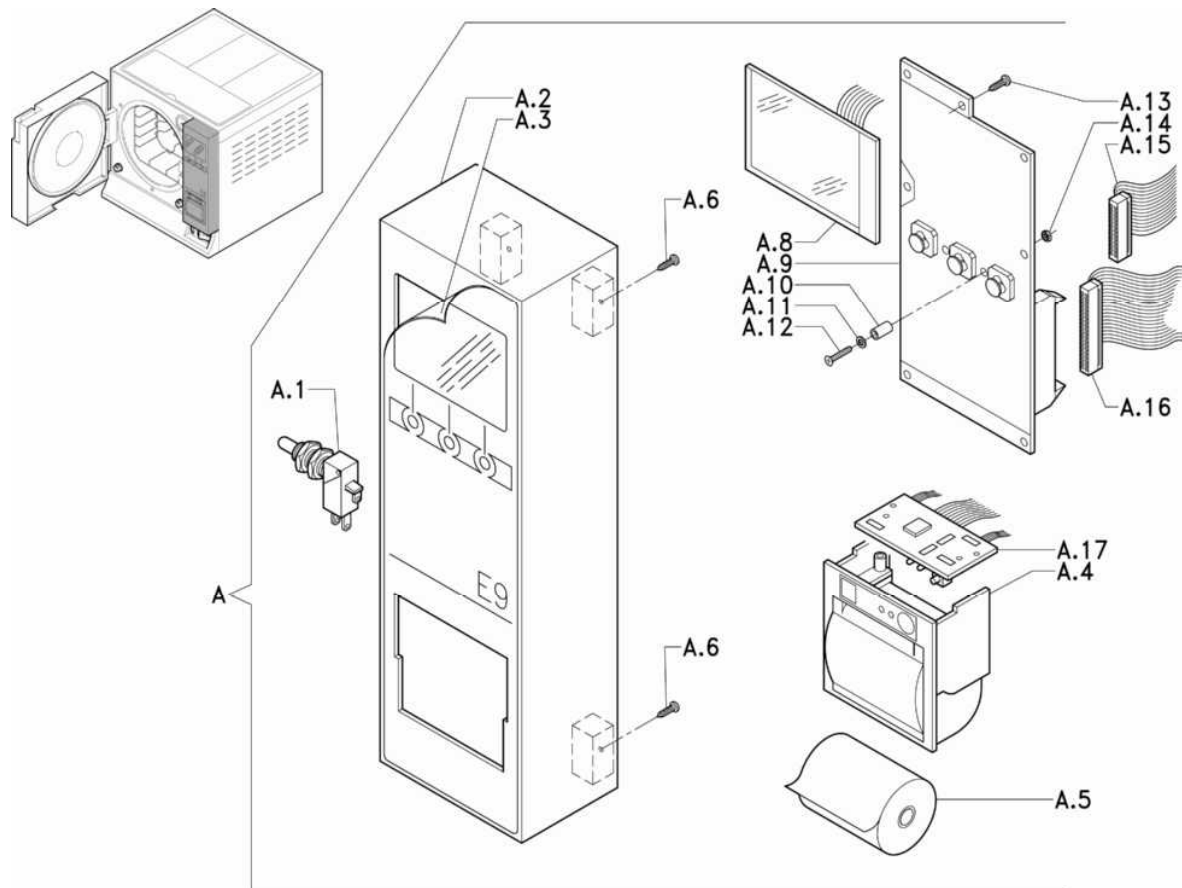
REF.	ITEM N°	DESCRIPTION	QTY
A		door assembly	
A.1	532946	handle	1
A.1.1	570719	dowel 5x10	1
A.2	533480	E9 door	1
A.3	530682	"EURONDA" adhesive label	1
A.4	530669	lagging	1
A.5	571730	"B type inspection" adhesive label	4
A.6	572363	washer 5x15	4
B	320263	arm + porthole assembly	
B.1	572455	screw TCCE 5x10	4
B.2	571730	washer 5x15	1
B.3	570380	cylindrical bushing	4
B.4	521973	shaft for handle	1
B.5	570730	5x6 dowel	1
B.6	524020	catch	1
B.7	572455	screw 5x10	1
B.8	570974	torsion spring	1
B.9	570499	nut M5	2
B.10	570973	compression spring	2
B.11	572454	screw 5x45	2
B.12	540867	rubber foot	1
B.13	522442	arm	1
B.14	524817	fulcrum pin	1
B.15	572069	cylindrical peg	1
B.16	523211	door cover	1
B.17	571176	snap-on union	2
B.18	816046	teflon tube Ø 4/6	1
B.19	524658	porthole	1
B.20	540523	silicone gasket	1

9.2.2.2 TAB. 02: DOOR ASSEMBLY E9 MED



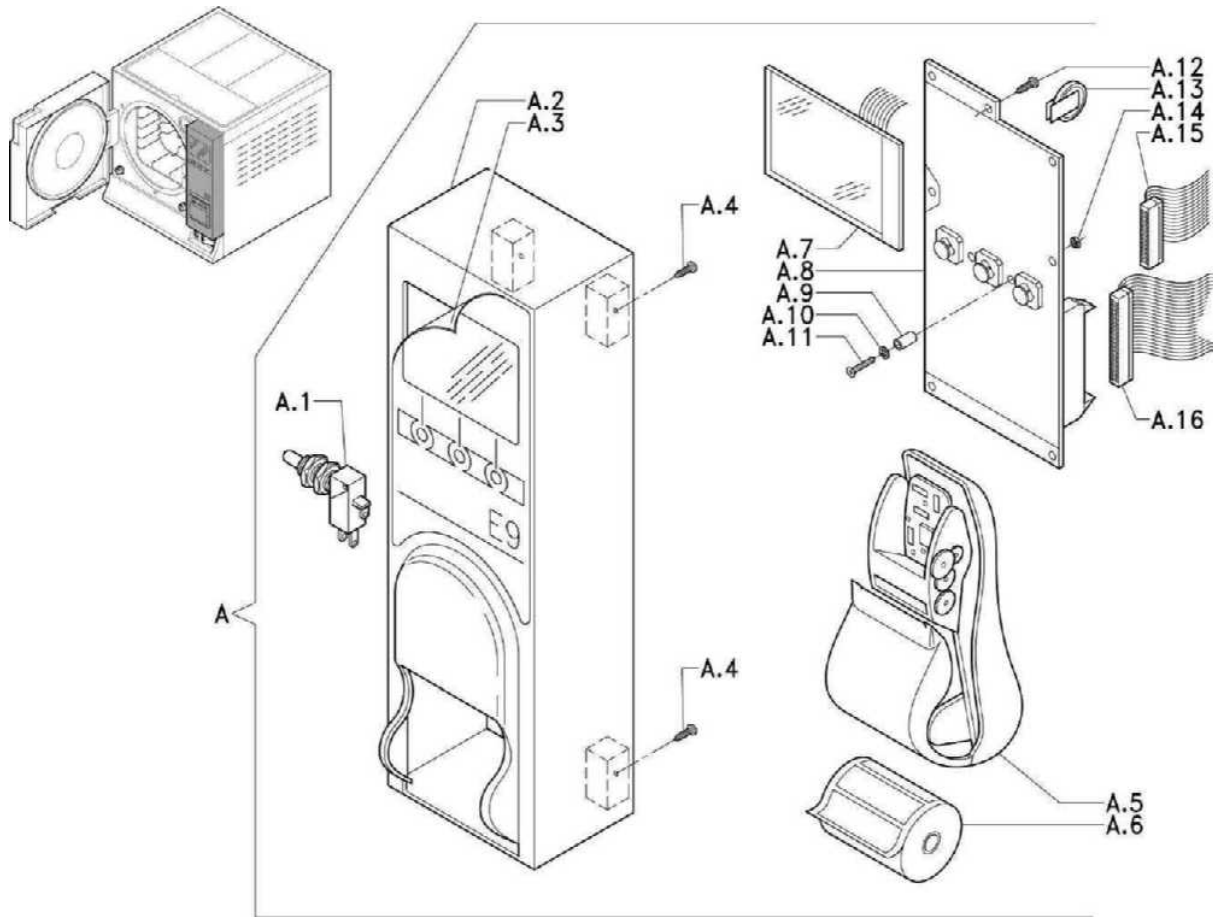
REF.	ITEM N°	DESCRIPTION	QTY
A		910412	door assembly
A.1	532946	handle	1
A.1.1	570719	dowel 5x10	1
A.2	533484	E9 door	1
A.3	530682	"EURONDA" adhesive label	1
A.4	590831	lagging	1
A.5	530669	"B type inspection" adhesive label	1
A.6	571730	washer 5x15	4
A.7	572363	screw 3.5x13	4
B		320263	arm + porthole assembly
B.1	572504	screw 5x12	4
B.2	526393	RH door bracket	1
B.3	570380	cylindrical bushing	4
B.4	521973	shaft for handle	1
B.5	570730	5x6 dowel	1
B.6	524020	catch	1
B.7	572455	screw 5x10	1
B.8	570974	torsion spring	1
B.9	570499	M5 nut	2
B.10	570973	compression spring	2
B.11	572454	screw 5x45	2
B.12	540867	rubber foot	1
B.13	522442	arm	1
B.14	524817	fulcrum pin	1
B.15	572069	cylindrical peg	1
B.16	526394	LH door bracket	1
B.17	571176	snap-on union	2
B.18	541141	silicone tube	1
B.19	524658	porthole	1
B.20	540523	silicone gasket	1

9.2.3.1 TAB. 03: CONTROL PANEL ASSEMBLY E9 INSPECTION



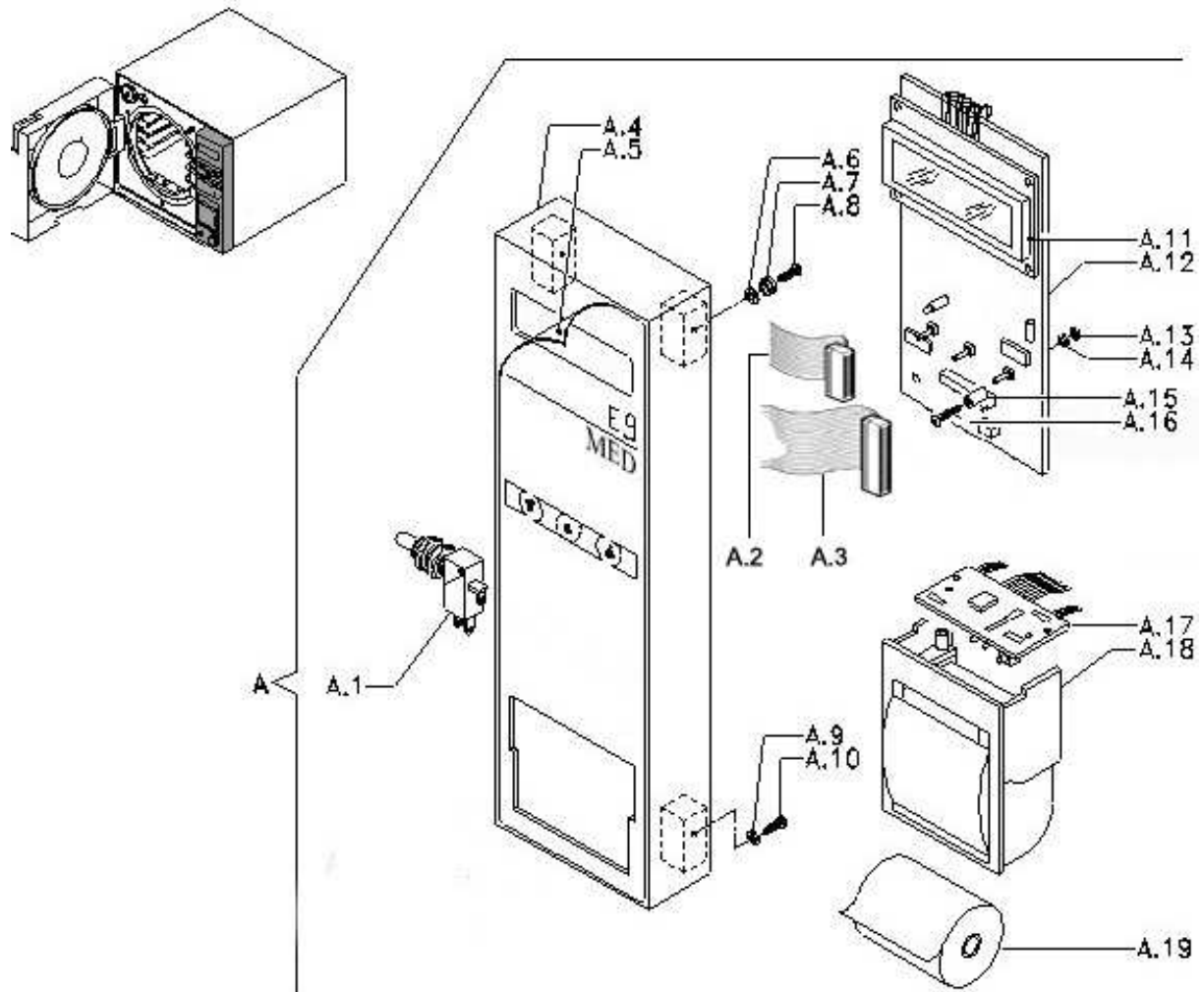
REF.	ITEM N°	DESCRIPTION	QTY
A	330056	complete control panel	
A.1	563240	micro-switch	1
A.2	533153	control panel	1
A.3	532266	adhesive for control panel	1
A.4	564645	complete printer	1
A.5	815002	thermal paper 57 mm	1
A.6	572373	TB screw 3x8	3
A.8	562216	display	1
A.9	564226	panel card	1
A.10	541145	silicone tube Ø 5/8	1
A.11	571729	washer	2
A.12	572491	3x20 screw	2
A.13	572348	self-tapping button-head screw 2.9x12.5 stainless steel	2
A.14	570497	M3 nut	1
A.15	561180	26-way flat cable	1
A.16	561181	40-way flat cable	1
A.17	564645	complete printer	1

9.2.3.2 TAB. 03: CONTROL PANEL ASSEMBLY E9 RECORDER



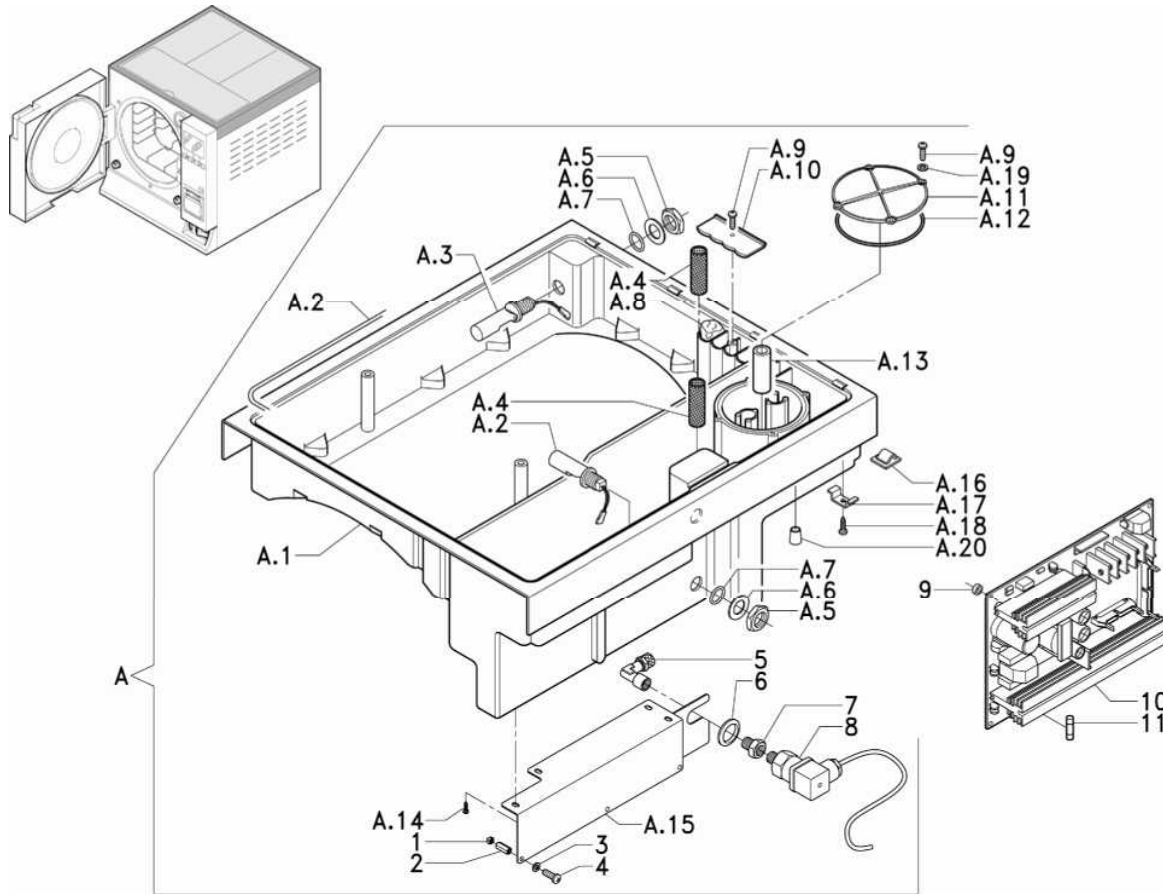
REF.	ITEM N°	DESCRIPTION	QTY
A		complete control panel	
A.1	563240	micro-switch	1
A.2	533165	control panel	1
A.3	532324	adhesive for control panel	1
A.4	572373	3x8 TB screw	3
A.5	564645	complete printer	1
A.6	815005	labels roll (10 rolls pack)	1
A.7	562216	display	1
A.8	564226	panel card	1
A.9	541145	Ø 5/8 silicone tube	1
A.10	571729	washer	2
A.11	572490	3x20 screw	2
A.12	572348	self-tapping button-head screw 2.9x12.5 stainless steel	2
A.13	561038	lithium battery	1
A.14	570497	M3 nut	1
A.15	561180	26-way flat cable	1
A.16	561182	40-way flat cable	1

9.2.3.3 TAB. 03: CONTROL PANEL ASSEMBLY E9 MED



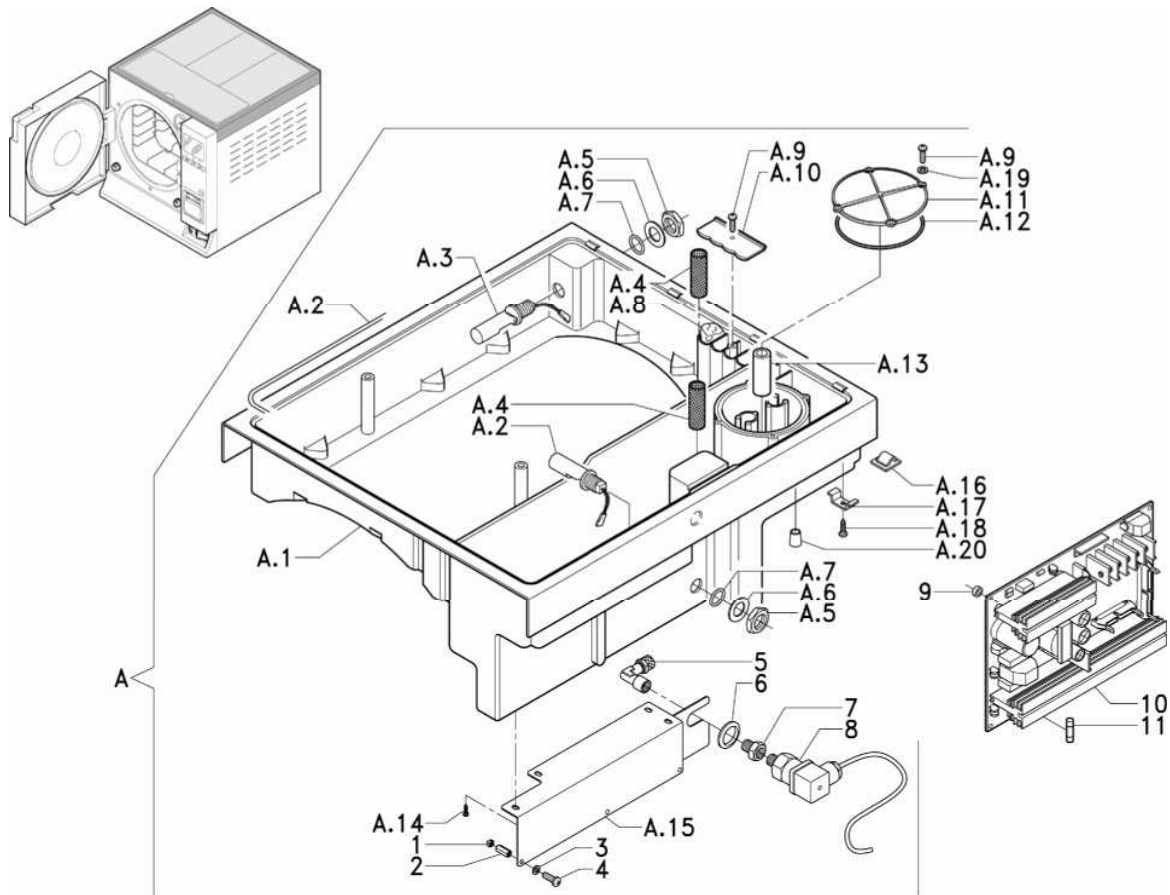
REF.	ITEM N°	DESCRIPTION	QTY
A		complete control panel	
A.1	563240	micro-switch	1
A.2	561180	26-way flat cable	1
A.3	561182	40-way flat cable	1
A.4	533166	E9 MED control panel	1
A.5	532325	E9 MED control panel sticker	1
A.6		(item removed)	
A.7	523524	brass spacer	2
A.8	572348	screw 2,9x12,5	2
A.9		(item removed)	
A.10	572348	screw 2,9x12,5	2
A.11		display (supplied with the panel card)	1
A.12	564260	E9 MED panel card with display	1
A.13	570497	nut M3	4
A.14	571720	notched washer	2
A.15	541145	silicone tube Ø 5/8	2
A.16	572490	screw TS+ 3x20	2
A.17		printer card (supplied with the printer)	1
A.18	564645	KF complete printer (white)	1
	564651	CUSTOM miniplus printer (black)	1
A.19	815002	thermal paper 57 mm	1

9.2.4.1 TAB. 04: TANK AND POWER CARD + PRESSURE TRANSDUCER ASSEMBLY E9



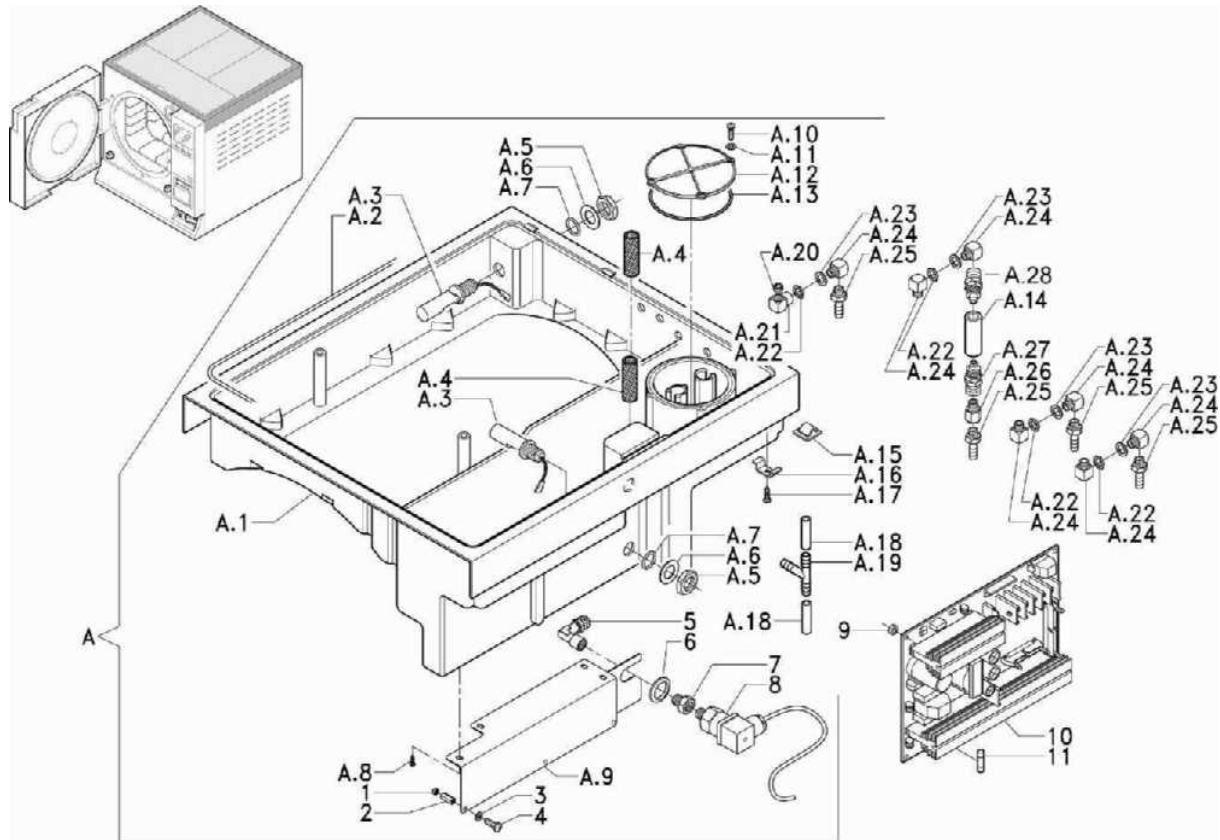
REF.	ITEM N°	DESCRIPTION	QTY	
A		330112	E9 tank assembly	
A.1	533693	tank	1	
A.2	540052	white silicone tank gasket	1	
A.3	564401	level sensor	3	
A.4	523740	tank water supply filter	1	
A.5		fixing nut (supplied with sensor 564401)	3	
A.6		black washer (supplied with sensor 564401)	3	
A.7		O-ring (supplied with sensor 564401)	3	
A.8	590623	sound-absorbing filter	1	
A.9	572363	screw 3.5x13	5	
A.10	531505	tank outlet cover	1	
A.11	531506	air separator cover	1	
A.12	591039	separator O-ring	4	
A.13	541140	separator tube 6 mm	1	
A.14	572339	4x12 screw	4	
A.15	526499	card support	1	
A.16	531987	self-adhesive cable clamps	2	
A.17	521870	tank clip	1	
A.18	572339	4x12 screw	1	
A.19	571729	Ø 4 washer	4	
A.20	531300	Ø 8 H16 PVC cover	1	

(cont. on next page)



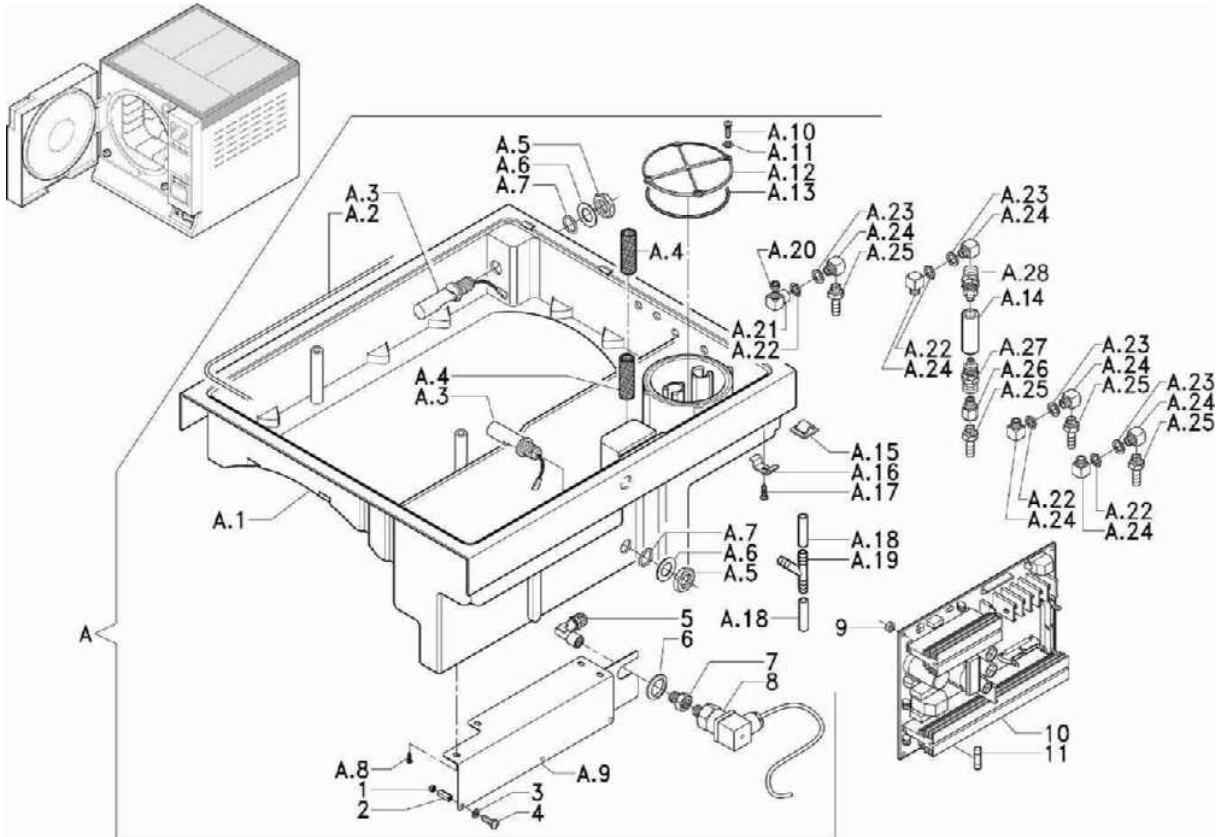
REF.	ITEM N°	DESCRIPTION	QTY
-		card + pressure transducer assembly	
1	570497	nut M3	1
2	523519	spacer for main card	1
3	571728	flat washer M3	1
4	572373	screw 3x8	1
5	571148	elbow union 1/4-6/4	1
6	522026	pressure transducer fixing ring	1
7	571133	union nut 1/4	1
8	527071	pressure transducer	1
9	531824	plastic spacer for power card	4
10	564225	E9 power card	1
11	562669	fuse 5x20 2A (supplied with card A03030700)	1

9.2.4.2 TAB. 04: TANK AND POWER CARD + PRESSURE TRANSDUCER ASSEMBLY E9 U-234 / RECORDER / MED



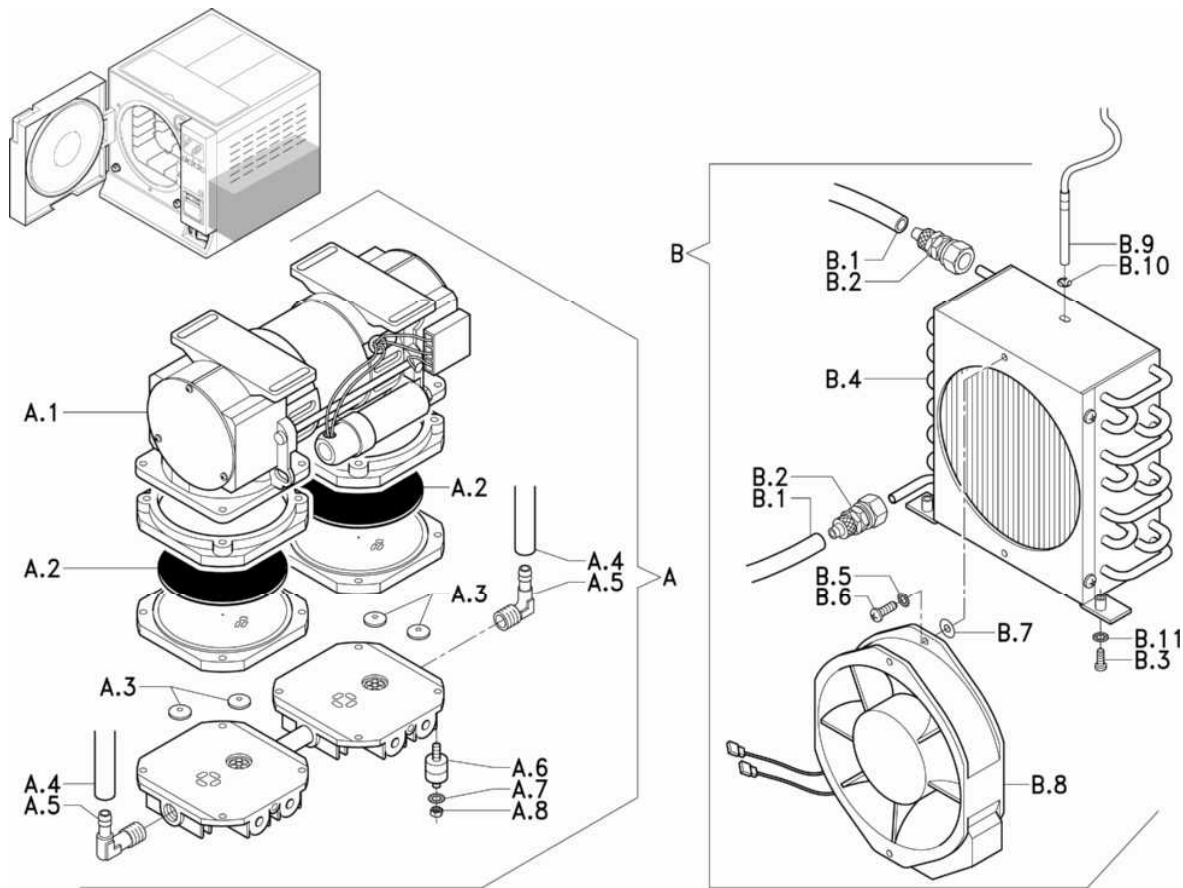
REF.	ITEM N°	DESCRIPTION	QTY
A		tank assembly E9 U-234 / RECORDER / MED	
A.1	533693	tank E9	1
A.2	540528	tank silicone gasket	1
A.3	564401	level sensor	3
A.4	523740	tank water supply filter	1
A.5		fixing nut (supplied with sensor 564401)	3
A.6		black washer (supplied with sensor 564401)	3
A.7		O-ring (supplied with sensor 564401)	3
A.8	572339	screw 4x12	4
A.9	526499	power card support	5
A.10	572363	screw 3,5x13	1
A.11	571729	flat washer Ø 4	1
A.12	531506	separator cover	1
A.13	591039	separator OR	4
A.14	816047	teflon tube Ø 6/8	1
A.15	531987	self-adhesive cable clamps	2
A.16	521870	tank clip	1
A.17	572339	screw 4x12	1
A.18	541148	silicone tube Ø 6/10	1
A.19	571108	T-shaped plastic union	1
A.20	571200	brass silencer	1
A.21	571103	elbow union F/F 1/8	1
A.22	571202	nut 1/8	1

(cont. on next page)



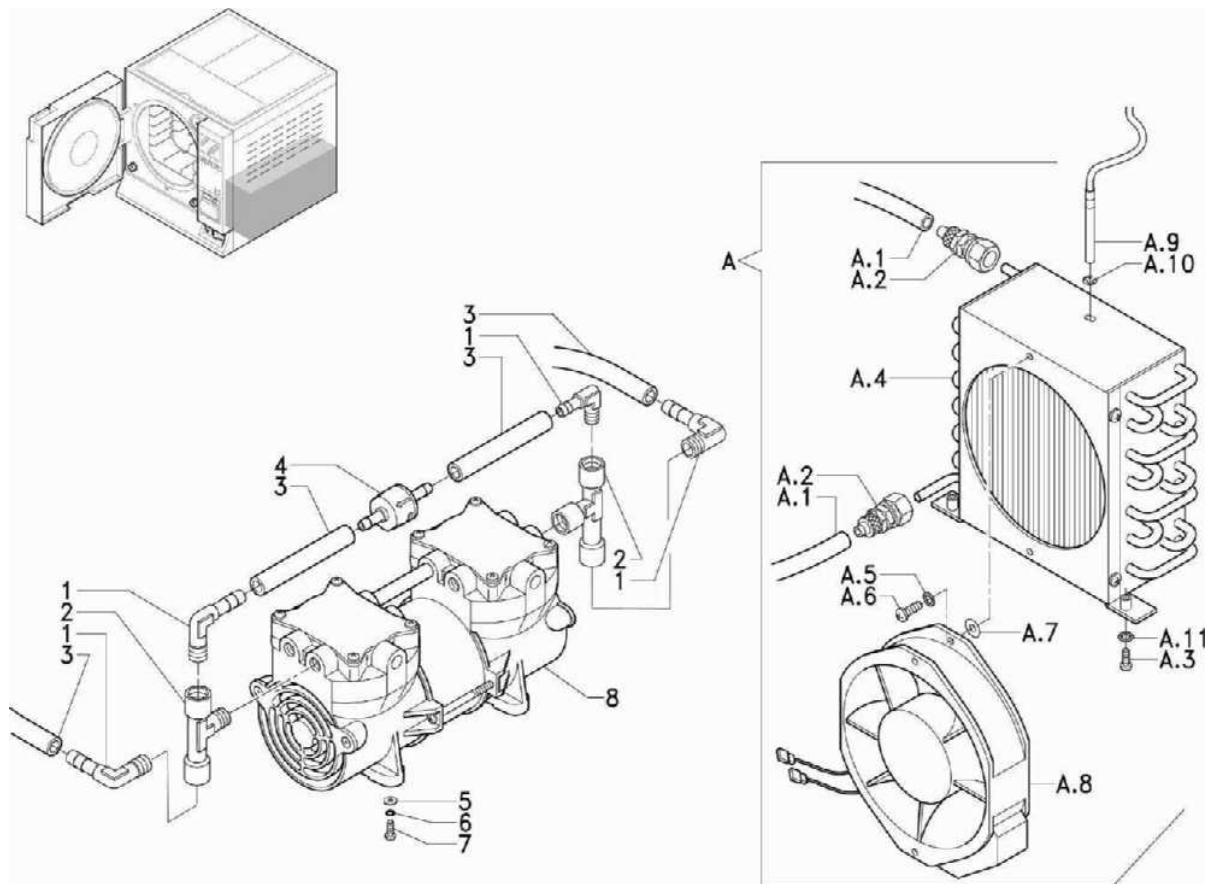
REF.	ITEM N°	DESCRIPTION	QTY
A			
A.23	571743	OR gasket	1
A.24	571199	union M/F 1/8	1
A.25	571165	union M1/8 PG	1
A.26	572286	check valve 1/4	1
A.27	571208	union F1/4 for tube Ø 6/8	1
A.28	571123	union M1/8 for tube Ø 6/8	1
-		card + pressure transducer assembly	
1	570497	nut M3	1
2	523519	spacer for power card	1
3	571728	flat washer M3	1
4	572373	screw 3x8	1
5	571148	elbow union F1/4 for tube Ø 6/4	1
6	522026	pressure transducer fixing ring	1
7	571133	nut union 1/4	1
8	360870	pressure transducer (teflon)	1
9	531824	plastic spacer for power card	4
10	564225	power card E9	1
11	562669	fuse 5x20 2A (supplied with the power card)	1

9.2.5.1 TAB. 05: VACUUM PUMP AND RADIATOR ASSEMBLY E9



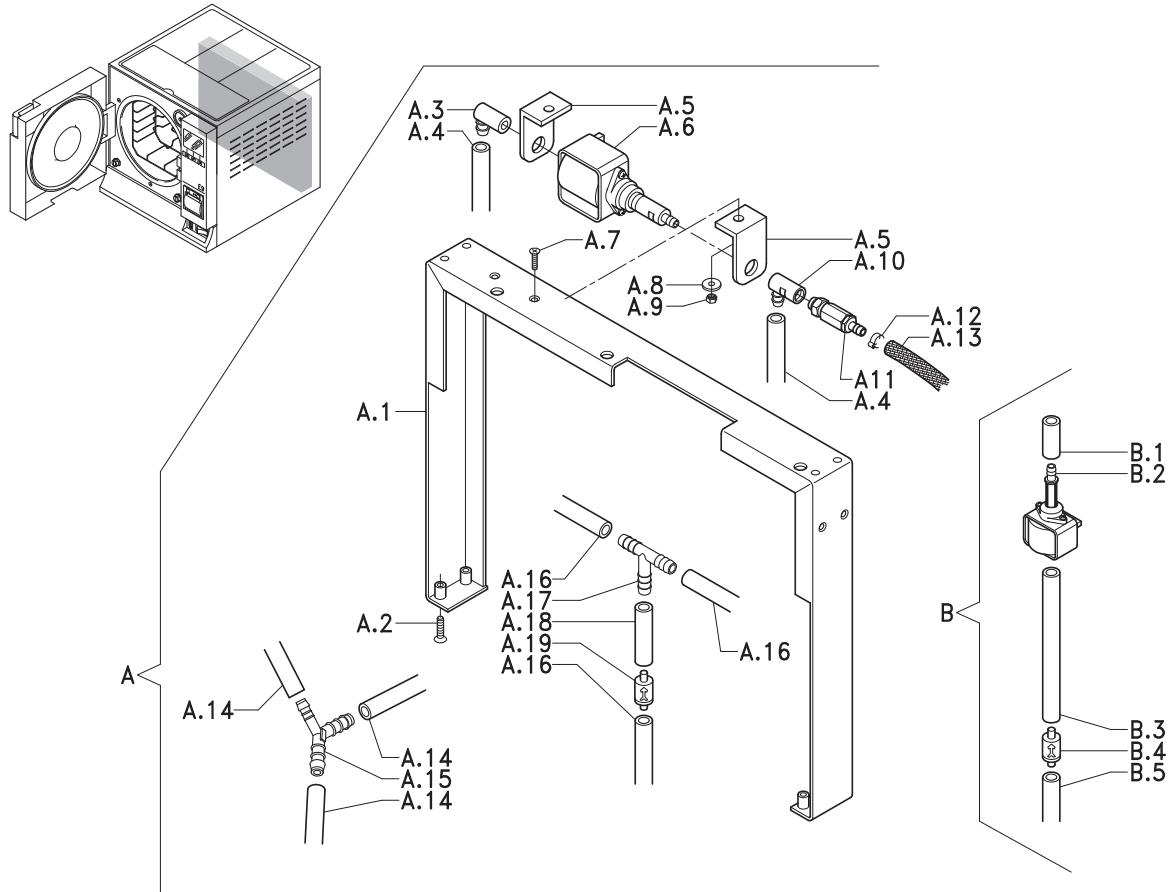
REF.	ITEM N°	DESCRIPTION	QTY
A			
A.1	320829	vacuum pump assembly	
A.2	525099	vacuum pump	1
A.2 + A.3	540655	pump gasket kit	1
A.4	541146	silicone tube Ø 6/10	1
A.5	571119	elbow union M 1/4 7	2
A.6	540871	black adj. foot	4
A.7	571722	notched washer 5 mm	4
A.8	570499	hex nut M5	4
B			
	320912	radiator assembly	
B.1	816047	teflon tube Ø 6/8	2
B.2	571144	union for radiator copper tube Ø 9,5	2
B.3	572374	4x10 screw	2
B.4	525608	radiator	1
B.5	571721	notched washer 4mm	2
B.6	572381	screw 4x16	2
B.7	571743	silicone washer	2
B.8	565274	fan	1
	360998	fan with pre-assembled cable harness	1
	564472	fan temperature probe PTC4	1
B.9		seeger ring for PTC4 probe (supplied with probe)	1
B.10			
B.11	571721	notched washer M4	1

9.2.5.2 TAB. 05: VACUUM PUMP AND RADIATOR ASSEMBLY E9 U-234 / RECORDER / MED



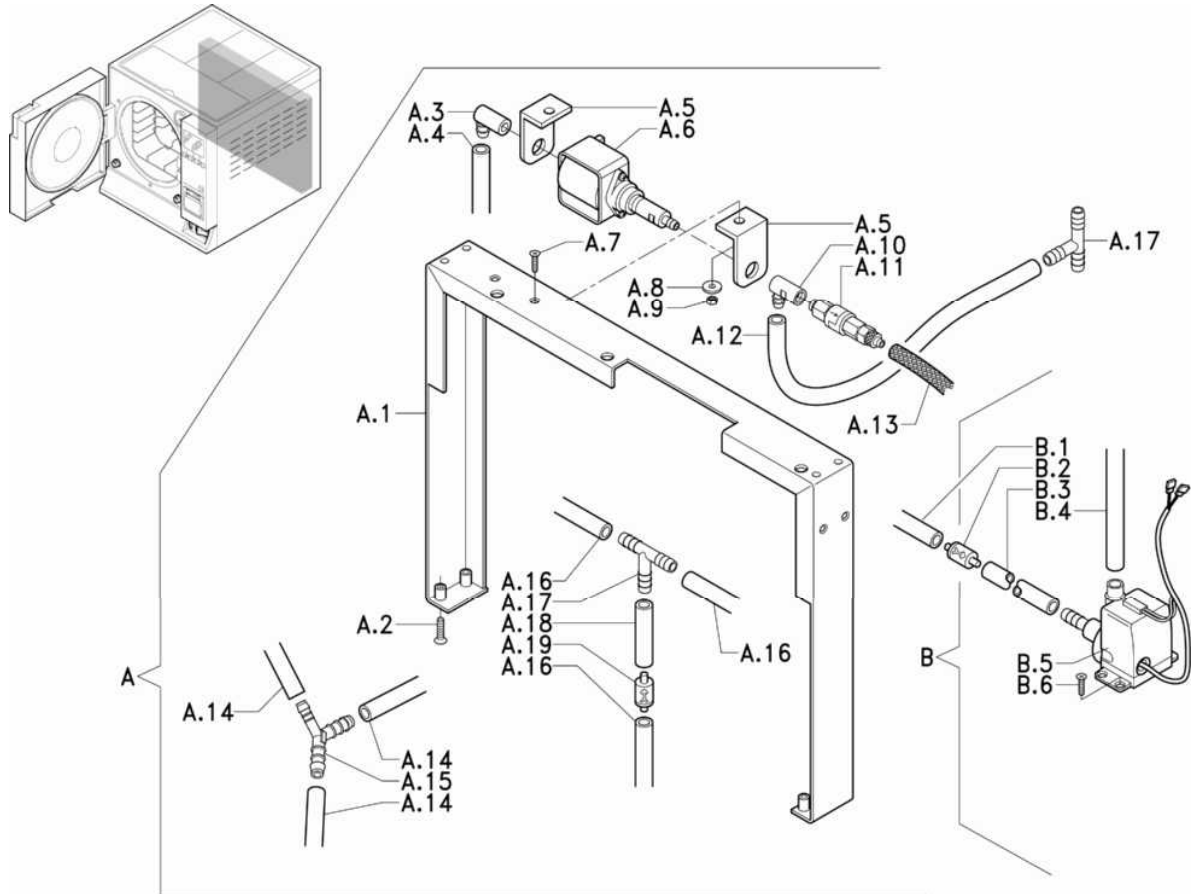
REF.	ITEM N°	DESCRIPTION	QTY	
		vacuum pump assembly		
	1	571119	vacuum pump assembly	
	2	571114	elbow union M1/4 PG7	4
	3	541146	T-shaped union F/M/F (no E9 MED)	2
	4	534134	silicone tube Ø 6/10	1
	5	571729	check valve (no E9 MED)	1
	6	571721	flat washer Ø 4	4
	7	572433	notched washer Ø 4	4
	8	525113	screw TCCE 4x10	4
		525113	vacuum pump	1
A		320912	radiator assembly	
	A.1	816047	teflon tube Ø 6/8	2
	A.2	571144	union for radiator copper tube Ø 9,5	2
	A.3	572374	screw 4x10	2
	A.4	525608	radiator	1
	A.5	571721	notched washer 4 mm	2
	A.6	572381	screw 4x16	2
	A.7	571743	silicone washer	2
	A.8	565274	fan	1
		360998	fan with pre-assembled cable harness	1
		564472	fan temperature probe PTC4	1
	A.9		seeger ring for PTC4 probe (supplied with probe)	1
	A.10		notched washer M4	1
	A.11	571721	notched washer M4	1

9.2.6.1 TAB. 06: TANK SUPPORT AND NME MICROPUMP ASSEMBLY



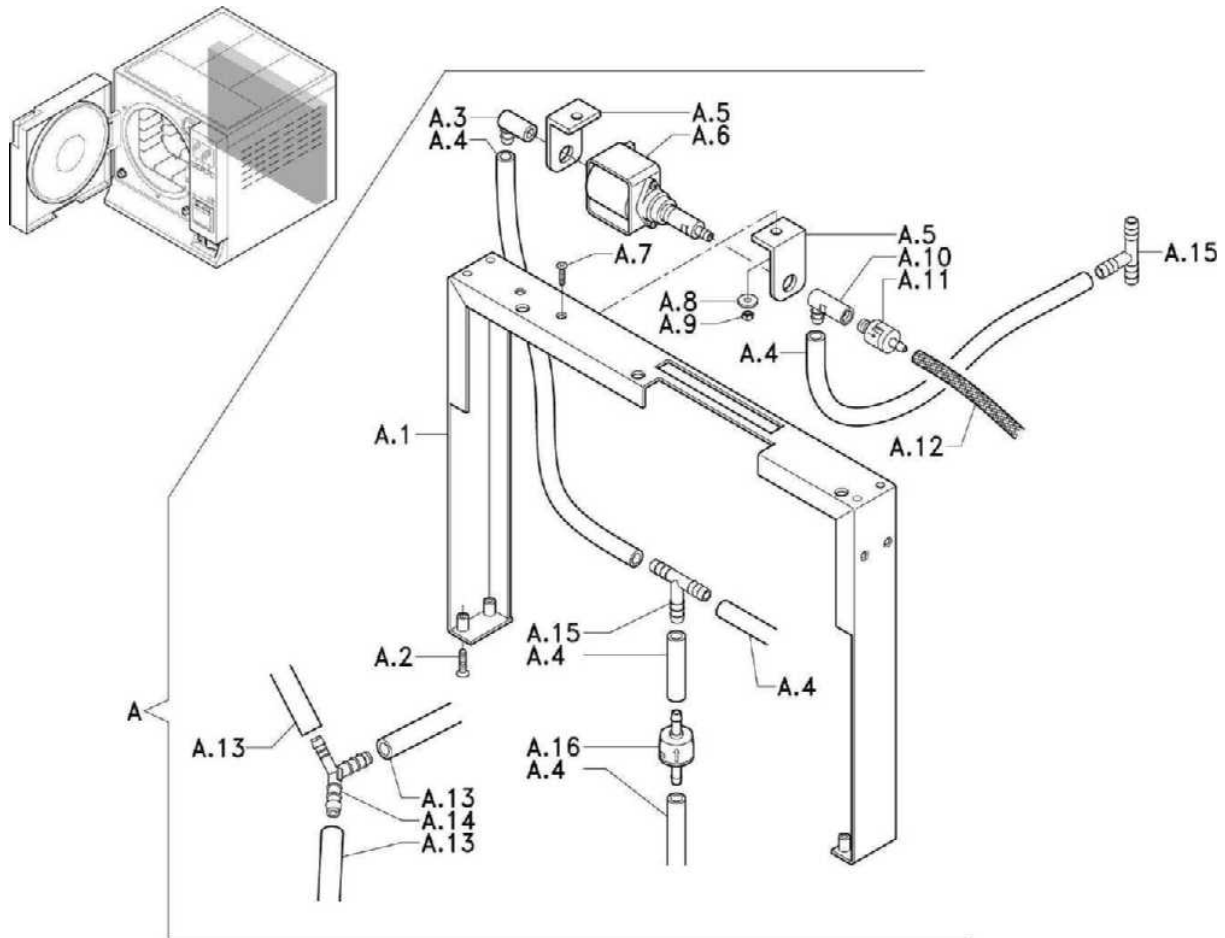
REF.	ITEM N°	DESCRIPTION	QTY
A		321192	tank support assembly
A.1	526289	tank support	1
A.2	572487	screw 4x10	4
A.3	533320	santoprene pipette for vibrating pump	1
A.4	541146	silicone tube Ø 6/10	2
A.5	541080	rubber vibration-proof support for vibrating pump	2
A.6	525104	EX5 220V 50/60 Hz pump	1
A.7	572495	screw 4x12	2
A.8	571730	washer 5/15	2
A.9	570498	nut M4	2
A.10	565222	valve s22	1
A.11	572287	piped discharge valve 1/8	1
A.12	570109	stainless steel hose clip	1
A.13	541141	sheathed black silicone tube Ø 3/5	1
A.14	541147	silicone tube Ø 8/12	3
A.15	571118	Y-shaped union for tube Ø 8/10	1
A.16	541146	silicone tube Ø 6/10	3
A.17	571108	plastic T-shaped union 8 mm	1
A.18	541146	silicone tube Ø 6/10	1
A.19	534134	check valve	1
B		320674	NME micropump assembly
B.1	541144	silicone tube Ø 5/10	1
B.2	524552	NME1 micropump	1
B.3	541145	silicone tube Ø 5/8	1
B.4	534134	check valve	1
B.5	541144	silicone tube Ø 5/10	1

9.2.6.2 TAB. 06: TANK SUPPORT AND SICCE MICROPUMP ASSEMBLY



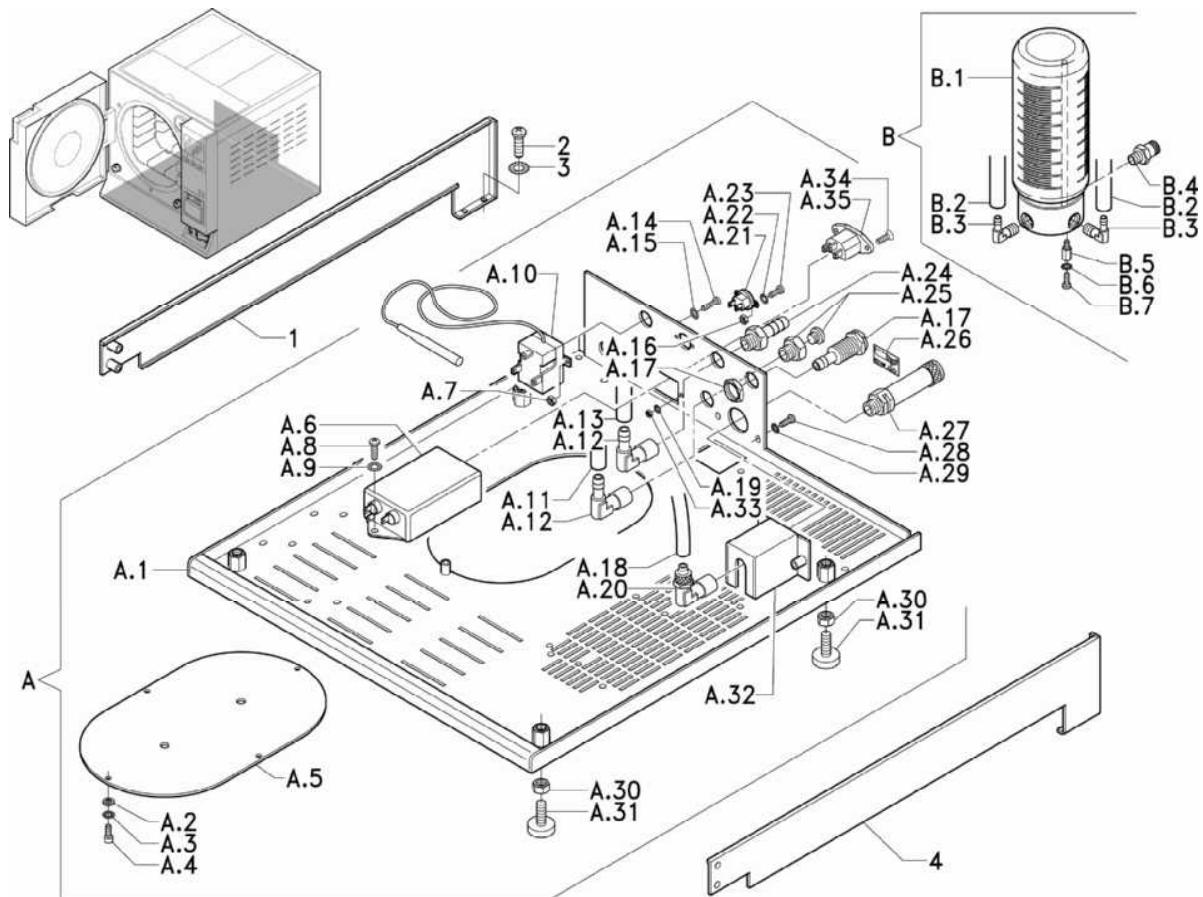
RIF.	CODICE	DESCRIZIONE	Q.TA
A	321192	tank support assembly	
A.1	526289	tank support	1
A.2	572487	TS screw 4x10	4
A.3	533320	santoprene pipette for vibrating pump	1
A.4	541146	silicone tube Ø 6/10	2
A.5	541080	rubber vibration-proof support for vibrating pump	2
A.6	525104	EX5 220V 50/60 Hz pump	1
A.7	572495	screw 4x12	2
A.8	571730	washer 5/15	2
A.9	570498	M4 nut	2
A.10	565222	s22 valve	1
A.11	572287	discharge valve 1/8	1
A.12	541146	silicone tube Ø 6/10	1
A.13	541141	sheathed black silicone tube Ø 3/5	1
A.14	541147	silicone tube Ø 8/12	3
A.15	571118	Y-shaped union for tube Ø 18	1
A.16	541146	silicone tube Ø 6/10	3
A.17	571108	plastic T-shaped union 8 mm	1
A.18	541146	silicone tube Ø 6/10	1
A.19	534134	check valve	1
B		sicce micropump assembly	
B.1	541146	silicone tube Ø 6/10	1
B.2	534134	check valve	1
B.3	541147	silicone tube Ø 8/12	1
B.4	541147	silicone tube Ø 8/12	1
B.5	816044	micropump	1
B.6	572487	TS screw 4x10	4

9.2.6.3 TAB. 06: TANK SUPPORT AND MICROPUMP ASSEMBLY E9 U-234 / RECORDER / MED

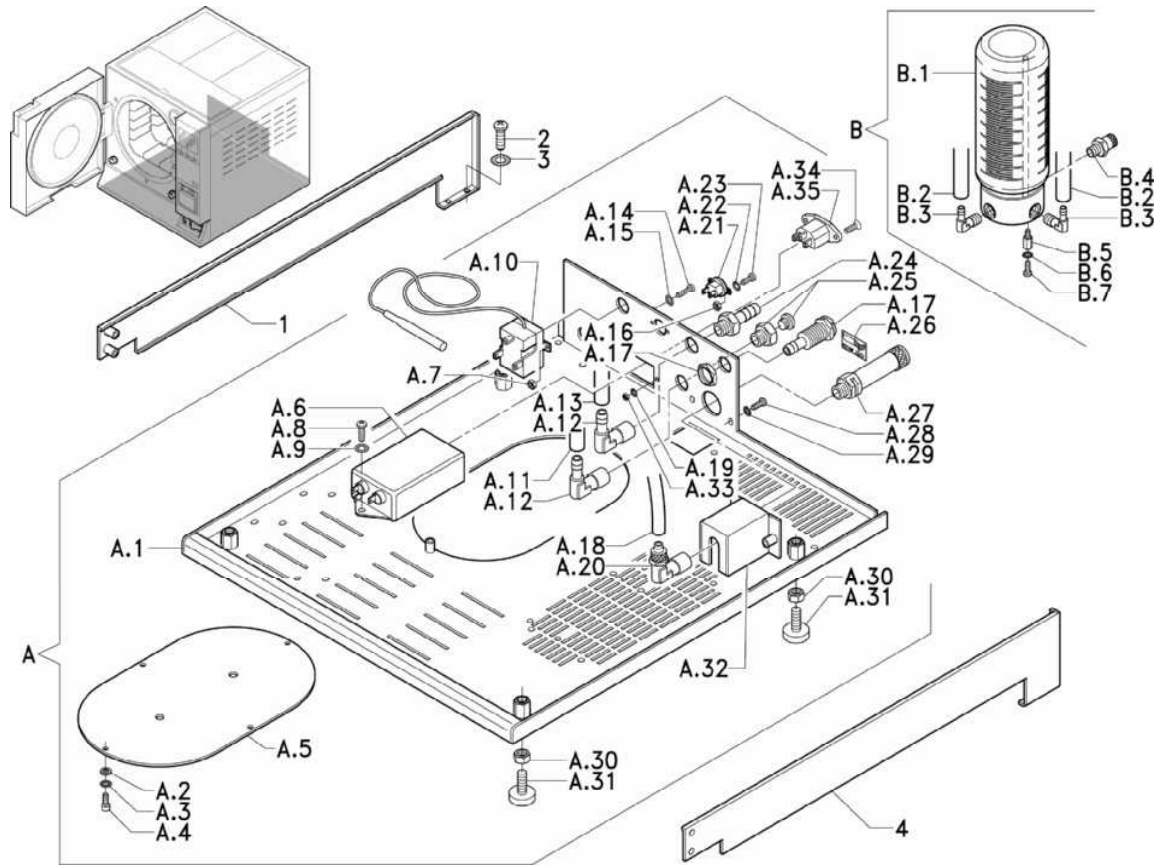


REF.	ITEM N°	DESCRIPTION	QTY
A		tank support assembly	
A.1	526289	tank support	1
A.2	572487	screw TS 4x10	4
A.3	533320	santropene pipette for vibrating pump	1
A.4	541146	silicone tube Ø 6/10	2
A.5	541080	rubber vibration-proof support for vibrating pump	2
A.6	525104	EX5 220V 50/60 Hz pump	1
A.7	572495	screw TS 4x12	2
A.8	571730	washer 5/15	2
A.9	570498	nut M4	2
A.10	565222	s22 valve	1
A.11	572291	check valve	1
A.12	541141	sheathed black silicone tube Ø 3/5	1
A.13	541147	silicone tube Ø 8/12	1
A.14	571118	plastic Y-shaped union	1
A.15	571108	plastic T-shaped union	2
A.16	534134	check valve	1

9.2.7.1 TAB. 07: CHASSIS, WATER OUTGAS SYSTEM AND CROSSPIECE ASSEMBLY E9 INSPECTION / RECORDER

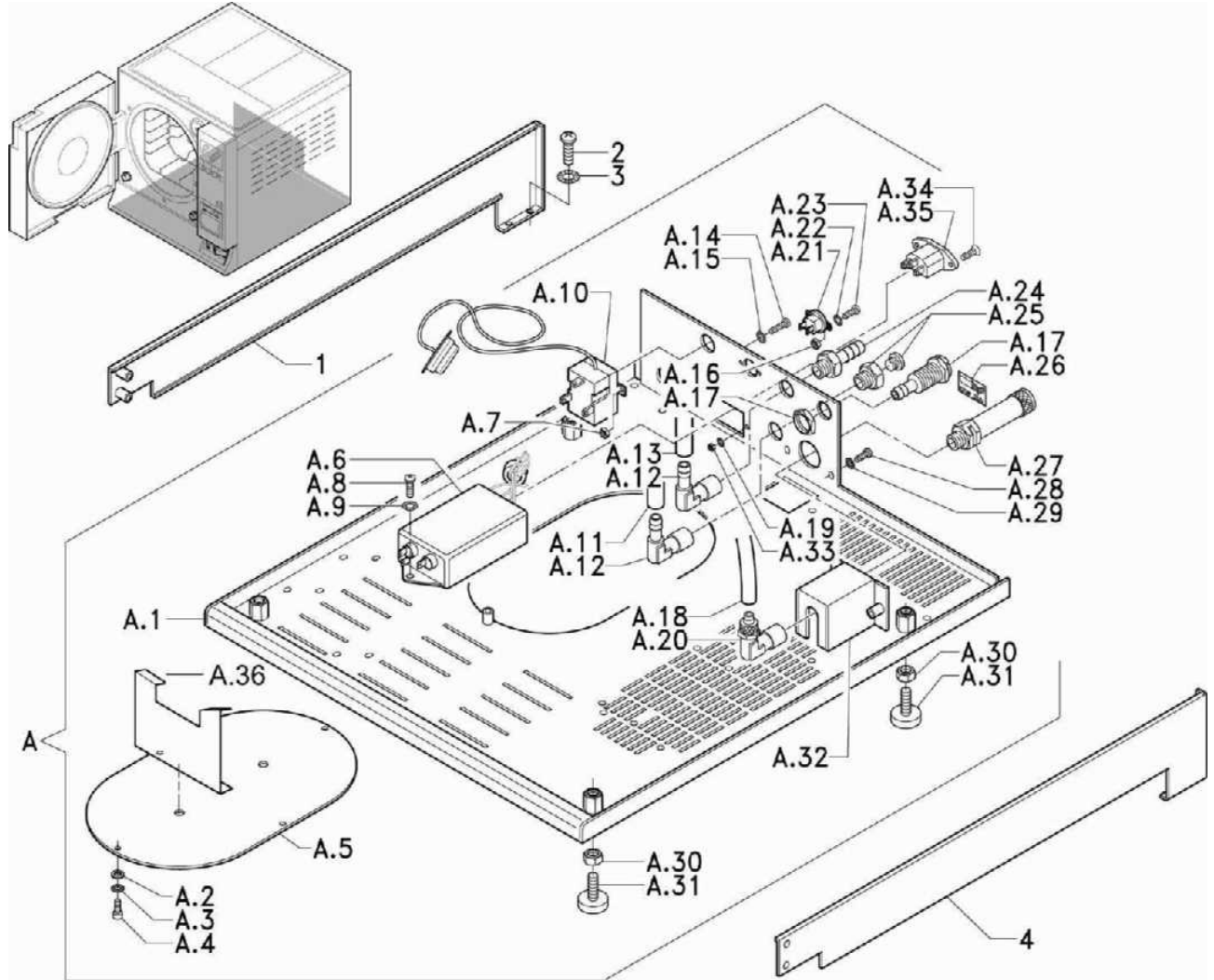


	REF.	ITEM N°	DESCRIPTION	QTY
A			frame assembly	
	A.1	526007	E9 autoclave chassis	1
	A.2	571729	flat stainless steel washer	1
	A.3	571721	notched washer ext. 4 mm	1
	A.4	572432	cheese-head socket screw 4x8	4
	A.5	523262	base-plate SMF 18l	1
		523262	base-plate SMF 24l	1
	A.6	562550	DEM filter	1
	A.7	570498	hex nut M4	2
	A.8	572374	screw TB 4x10	2
	A.9	571720	stainless steel notched washer 3 mm	2
	A.10	564956	manually resettable thermostat	1
	A.11	541146	silicone tube Ø 6/10	1
	A.12	571161	elbow union PG F 1/4	1
	A.13	541146	silicone tube Ø 6/10	1
	A.14	572385	4x6 TB button-head screw	2
	A.15	571721	stainless steel notched washer ext. 4	2
	A.16	570497	hex nut M3	2
	A.17	571131	F CPC Tres union	1

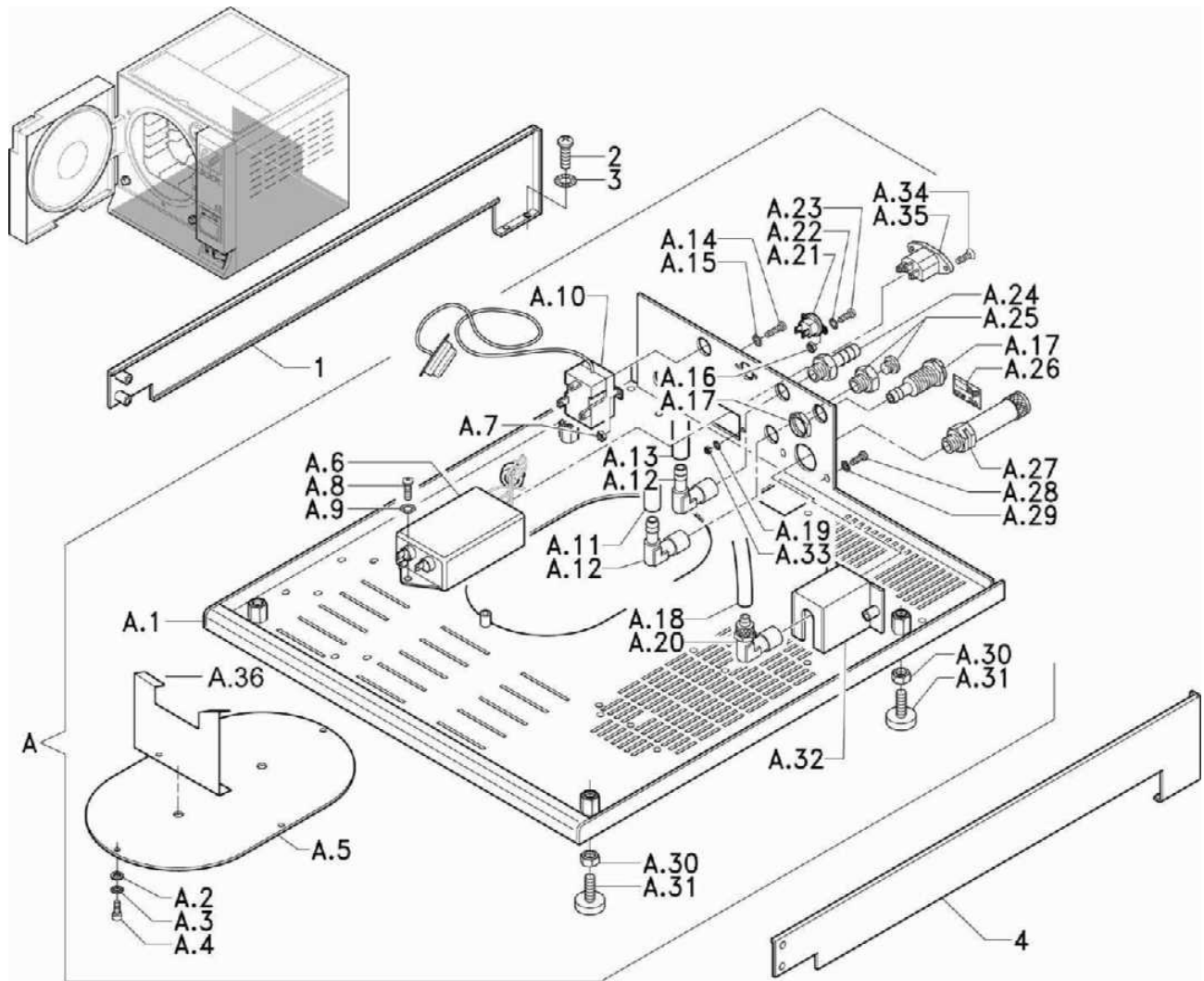


REF.	ITEM N°	DESCRIPTION	QTY
A.18	816047	teflon tube Ø 6/8	1
A.20	571120	elbow union PG F 1/4	1
A.21	816011	Aquafilter socket	1
A.22	571720	stainless steel notched washer 3	2
A.23	572373	button-head screw 3x8	2
A.24	571162	elbow union PG M 1/4	1
A.25	571140	straight cylindrical union M 1/4 - F 1/8	1
	572178	connector cap 1/8 with O-ring	1
A.26	530675	"USED WATER" label	1
A.27	572283	safety valve	1
A.28	572374	button-head screw 4x10	2
A.29	571721	stainless steel notched washer ext. 4	2
A.30	570496	M8 hex nut	4
A.31	540871	black adjustable foot	4
A.32	525553	safety valve guard	1
A.33	570497	M3 Nut	2
A.34	572493	TS 3x8 screw	2
A.35	561957	filter plugin	1
B	330001	air separator assembly	
B.1	531765	E9 air separator	1
B.2	541146	silicone tube Ø 6/10	1
B.3	571157	elbow union PG M 1/8-7 short	2
B.4	571967	condensate drain M1/8	1
B.5	523521	M/F spacer 4x15	1
B.6	571721	stainless steel notched washer ext.	1
B.7	572385	4x6 button-head screw	1
-		crosspiece assembly	
1	527131	LH crosspiece	1
2	572487	button-head screw 4x10	2
3	571721	notched washer Ø 4	2
4	527129	RH crosspiece	1

9.2.7.2 TAB. 07: CHASSIS AND CROSSPIECE ASSEMBLY E9 MED

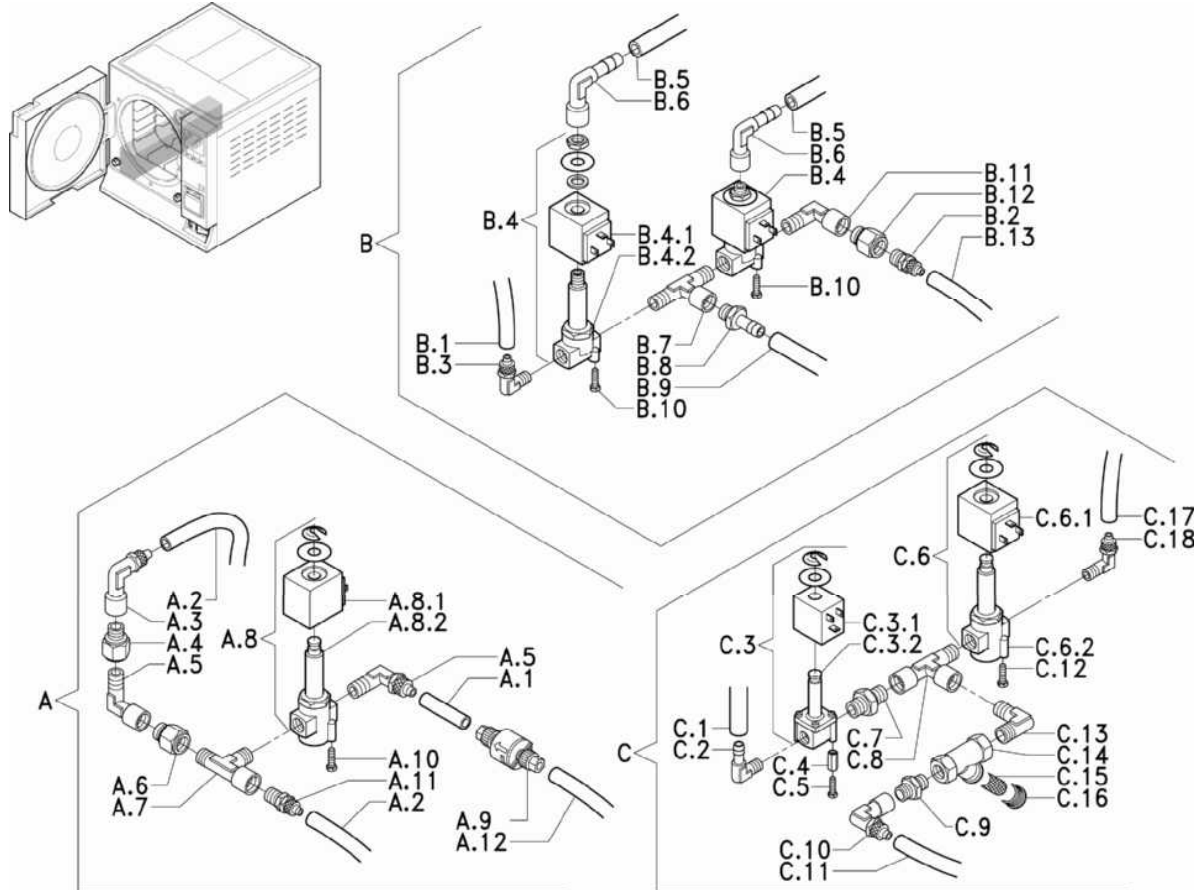


REF.	ITEM N°	DESCRIPTION	QTY
A		frame assembly	
A.1	526007	E9 MED painted chassis	1
A.2	571729	flat washer	4
A.3	571721	notched washer 4 mm	4
A.4	572432	screw 4x8	4
A.5	523262	base-plate SMF 18 litres	1
	523262	base-plate SMF 24 litres	1
A.6	562550	DEM filter	1
A.7	570498	nut M4	2
A.8	572374	screw 4x10	2
A.9	571720	notched washer 3 mm	2
A.10	564956	safety thermostat manually resettable	1
A.11	541146	silicone tube Ø 6/10	1
A.12	571161	elbow union F 1/4 PG	1
A.13	541146	silicone tube Ø 6/10	1
A.14	572385	screw 4x6	2
A.15	571721	notched washer 4	2
A.16	570497	nut M3	2
A.17	571131	CPC union	1

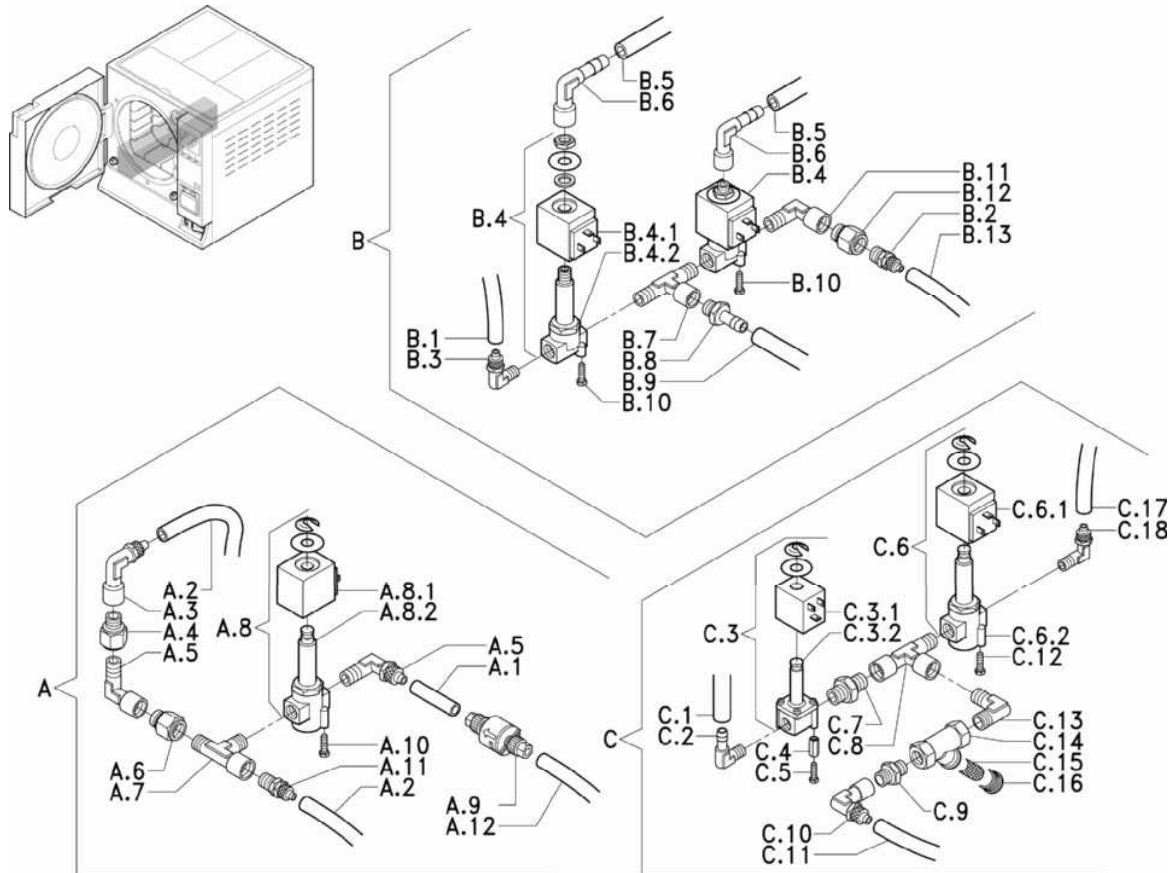


REF.	ITEM N°	DESCRIPTION	QTY
A.18	816047	teflon tube Ø 6/8	1
A.20	571120	elbow union F 1/4 Ø 6/8	1
A.21	816011	Aquafilter socket	1
A.22	571720	notched washer Ø 3	2
A.23	572373	screw 3x8	2
A.24	571162	straight union M 1/4	1
A.25	571140	straight union M 1/4 F 1/8	1
A.26	572178	plug 1/8 with OR	1
A.27	530675	label "USED WATER"	1
A.28	572283	safety valve	1
A.29	572374	screw 4x10	2
A.30	571721	notched washer Ø 4	2
A.31	570496	nut M8	4
A.32	540871	black adjustable foot	4
A.33	525553	safety valve guard	1
A.34	570497	nut M3	2
A.35	572493	screw 3x8	2
A.36	561957	filter plugin	1
A.36	526293	boiler support E9 MED	1
-		crosspiece assembly	
1	527131	LH crosspiece	1
2	572487	screw 4x10	2
3	571721	notched washer Ø 4	2
4	527129	RH crosspiece	1

9.2.8.1 TAB. 08: SOLENOID VALVE ASSEMBLY E9

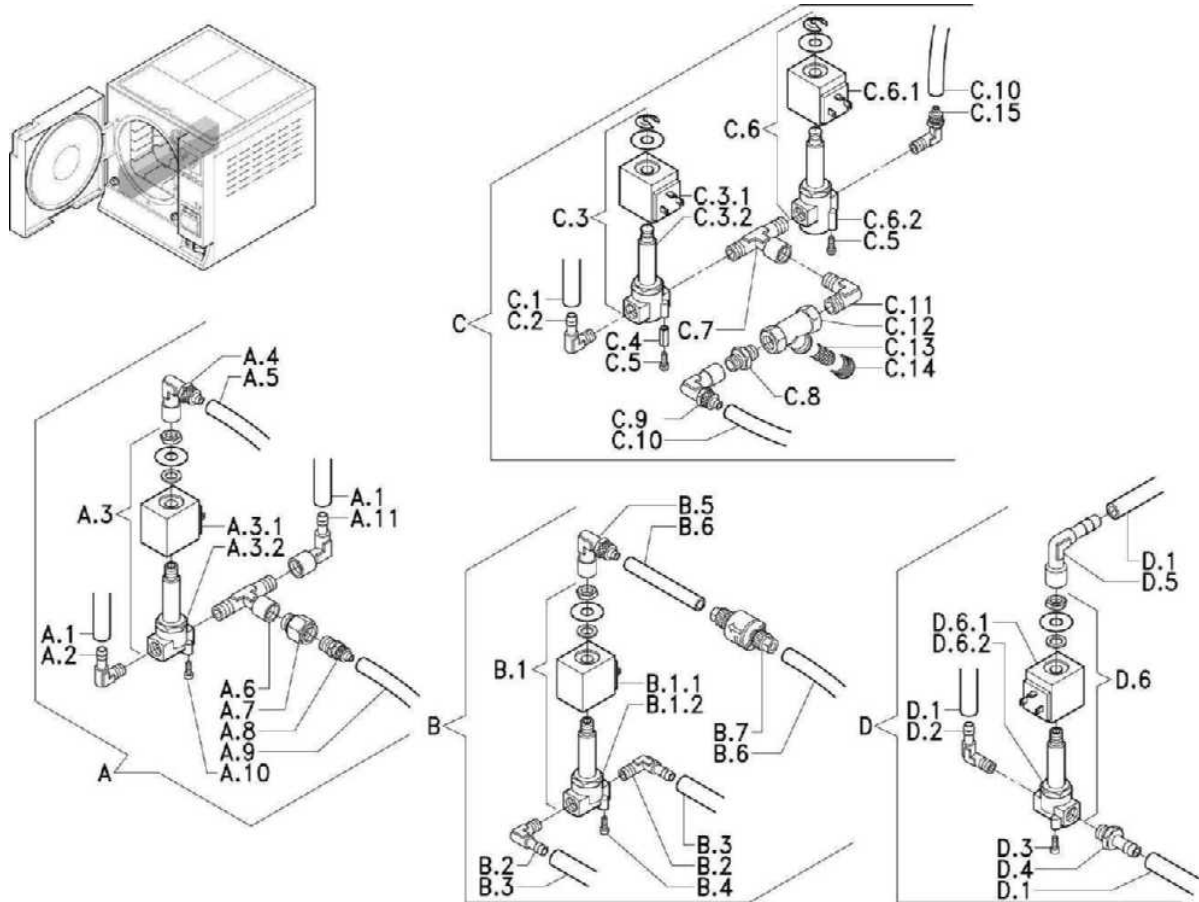


REF.	ITEM N°	DESCRIPTION	QTY	
A		360946	premounted EV3 valve	
	A.1	570109	hose clip	2
	A.2	816047	teflon tube Ø 6/8	2
	A.3	571148	elbow union PG F 1/4-7	1
	A.4	572286	one-way valve M/F 1/4	1
	A.5	571127	elbow union M/F 1/4	2
	A.6	571183	reducer M 1/4 - F 1/4	1
	A.7	571111	T-shaped union M/M/F 1/4	1
	A.8	562322	solenoid valve 1/4x3.2 24V	1
	A.8.1		solenoid valve coil	1
	A.8.2		solenoid valve body	1
	A.9	572281	straight union 1/4 male 1/8 female	1
	A.10	572432	cheese-head socket screw M 4x8	2
	A.11	571124	male elbow union PG 1/4-7	1
	A.12	541151	check valve 6/4 NO	1
	A.13	541141	sheathed black silicone tube Ø 3/5	1
B		360947	EV2-EV5 assembly	
	B.1	816046	teflon tube Ø 4/6	1
	B.2	571124	union Ø 6/8 M 1/4	1
	B.3	571127	elbow union PG M1/4	1
	B.4	562330	3-way solenoid valve	1
	B.4.1		solenoid valve coil	1
	B.4.2		solenoid valve body	1
	B.5	541146	silicone tube Ø 6/10	1
	B.6	571161	elbow union PG F 1/4-7	1
	B.7	571107	T-shaped union F/M/F 1/4	1
	B.8	571124	elbow union PG M 1/4	1



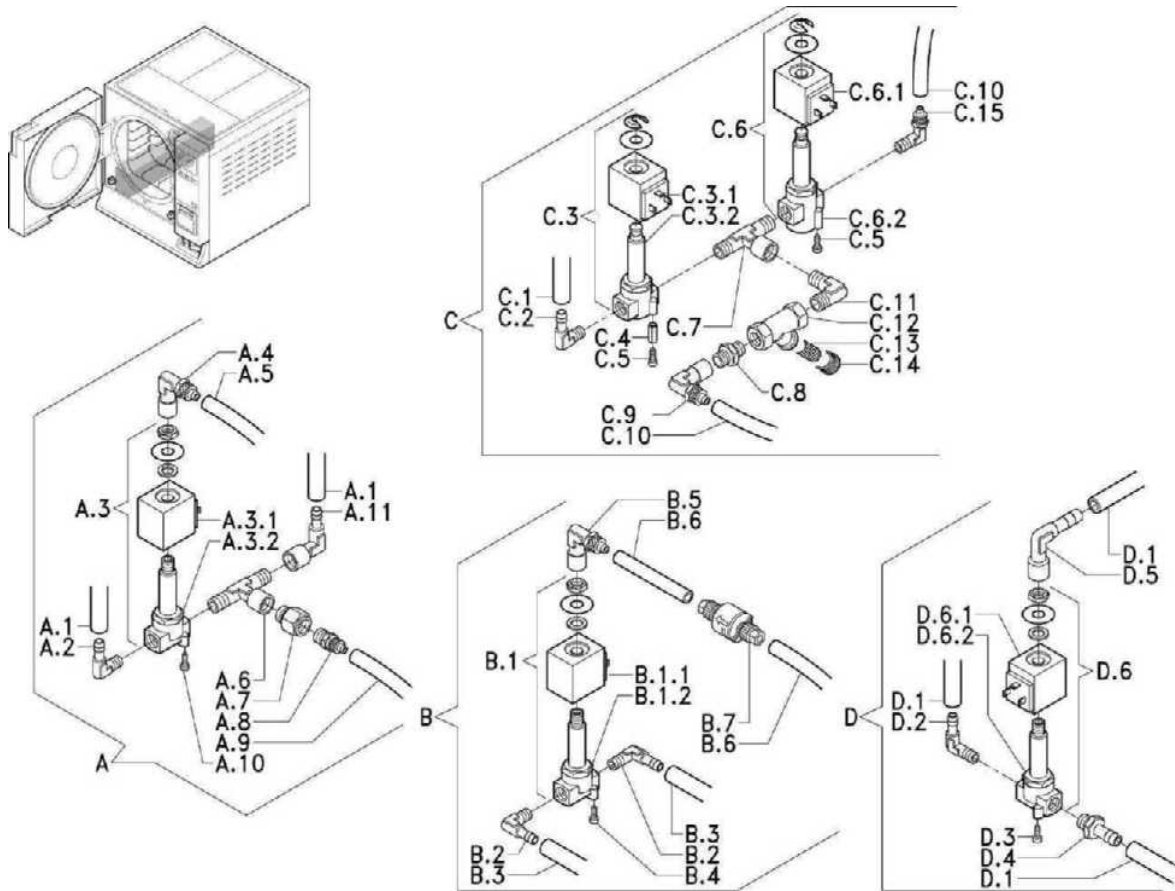
REF.	ITEM N°	DESCRIPTION	QTY
B.9	541146	silicone tube Ø 6/10	1
B.10	572432	cheese-head socket screw M4x8	2
B.11	571146	elbow union M/F 1/4	1
B.12	572286	check valve M/F 1/4	1
B.13	816047	teflon tube Ø 6/8	1
C	360945	EV1-EV4 assembly (serial numer EEG and EEH)	
	360944	EV1-EV4 assembly (serial number EDI and EDK)	
C.1	541146	silicone tube Ø 6/10	1
C.2	571121	elbow union PG M 8/6 short	1
C.3	562331	solenoid valve EV4 (serial number EEG and EEH)	1
	562324	solenoid valve EV4 (serial number EDI and EDK)	1
C.3	C.3.1	solenoid valve body	1
	C.3.2	solenoid valve piston	1
C.4	523519	M/F spacer M3x12	2
C.5	572432	cheese-head socket screw M4x8	2
C.6	562322	EV1 solenoid valve	1
C.6	C.6.1	solenoid valve body	1
	C.6.1	solenoid valve piston	1
C.7	571154	reducer M 1/4 – M 1/8	1
C.8	571106	T-shaped union M/F/F 1/4	1
C.9	571153	elbow union PG M 1/4	1
C.10	571120	elbow union Ø 6/8 F 1/4	1
C.11	816047	teflon tube Ø 6/8	1
C.12	572432	cheese-head socket screw 4x8	2
C.13	571147	elbow connector M 1/4 – M 1/4	1
C.14	523742	steam filter FF 1/4	1
C.15	562552	steam filter net (with filter)	1
C.16		steam filter cap (with filter)	1
C.17	816046	teflon tube Ø 4/6	1
C.18	571127	elbow union Ø 4/6 M 1/4	1

9.2.8.2 TAB. 08: SOLENOID VALVE ASSEMBLY E9 U-234 / RECORDER



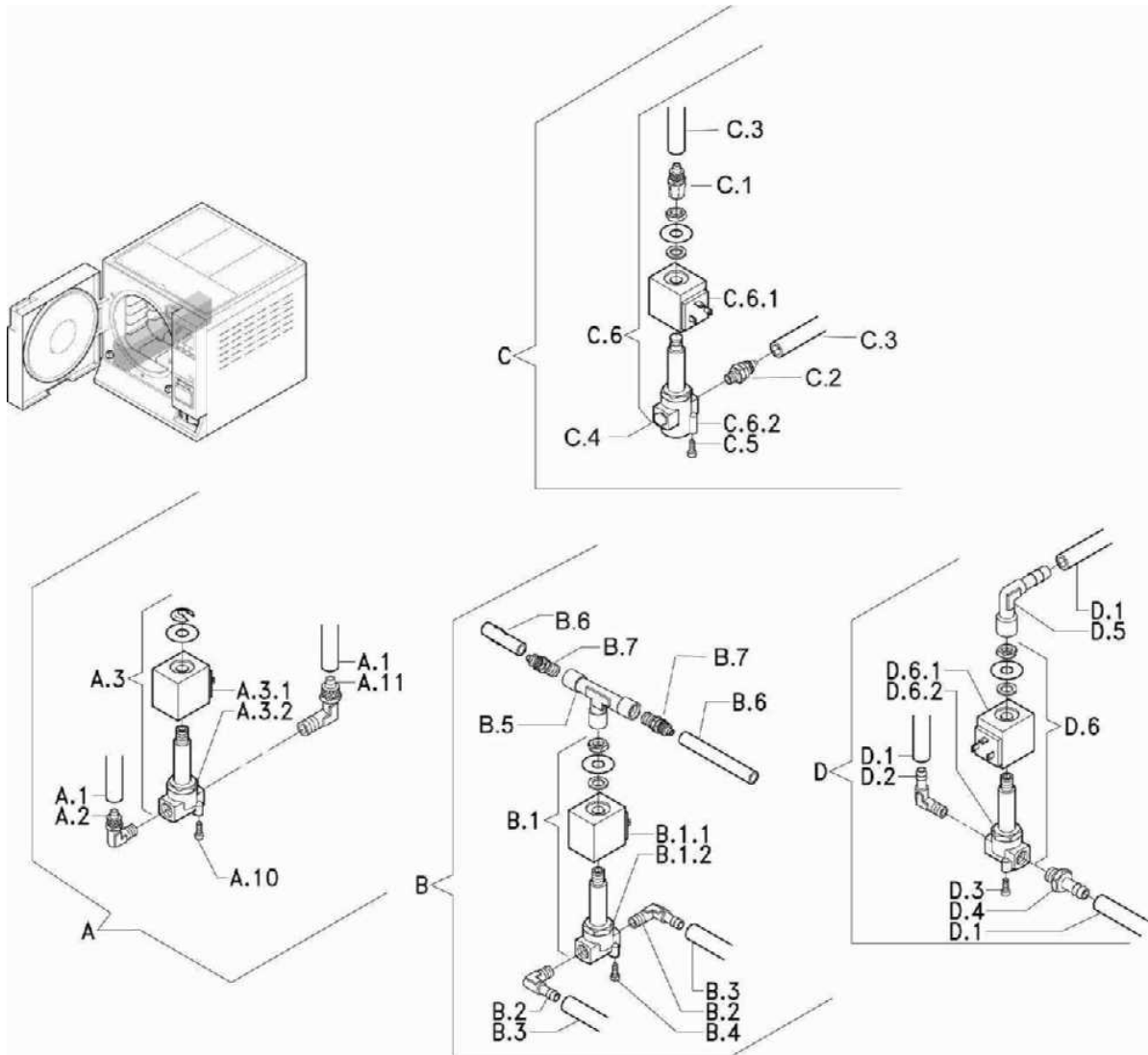
REF.	ITEM N°	DESCRIPTION	Q.TÀ	
A		360943	premounted EV2 valve	
A.1	541146	silicone tube Ø 6/10	2	
A.2	571119	elbow union PG M 1/4	1	
A.3	A.3.1	562330	solenoid valve EV2	1
	A.3.2		solenoid valve body	1
			solenoid valve piston	1
A.4	571125	elbow union Ø 4/6 F 1/4	1	
A.5	816046	teflon tube Ø 4/6	1	
A.6	571106	T-shaped union M/F/F 1/4	1	
A.7	572286	check valve M/F 1/4	1	
A.8	571124	union Ø 6/8 M 1/4	1	
A.9	816047	teflon tube Ø 6/8	1	
A.10	572432	screw TCCE 4x8	2	
A.11	571119	elbow union PG M 1/4	1	
B			premounted EV7 valve	
B.1	B.1.1	562330	solenoid valve EV7	1
	B.1.2		solenoid valve body	1
			solenoid valve piston	1
B.2	571119	elbow union PG M 1/4	2	
B.3	541146	silicone tube Ø 6/10	2	
B.4	572432	screw TCCE 4x8	2	
B.5	571125	elbow union Ø 4/6 F 1/8	1	
B.6	816046	teflon tube Ø 4/6	2	
B.7	572288	check valve	1	

(cont. on next page)

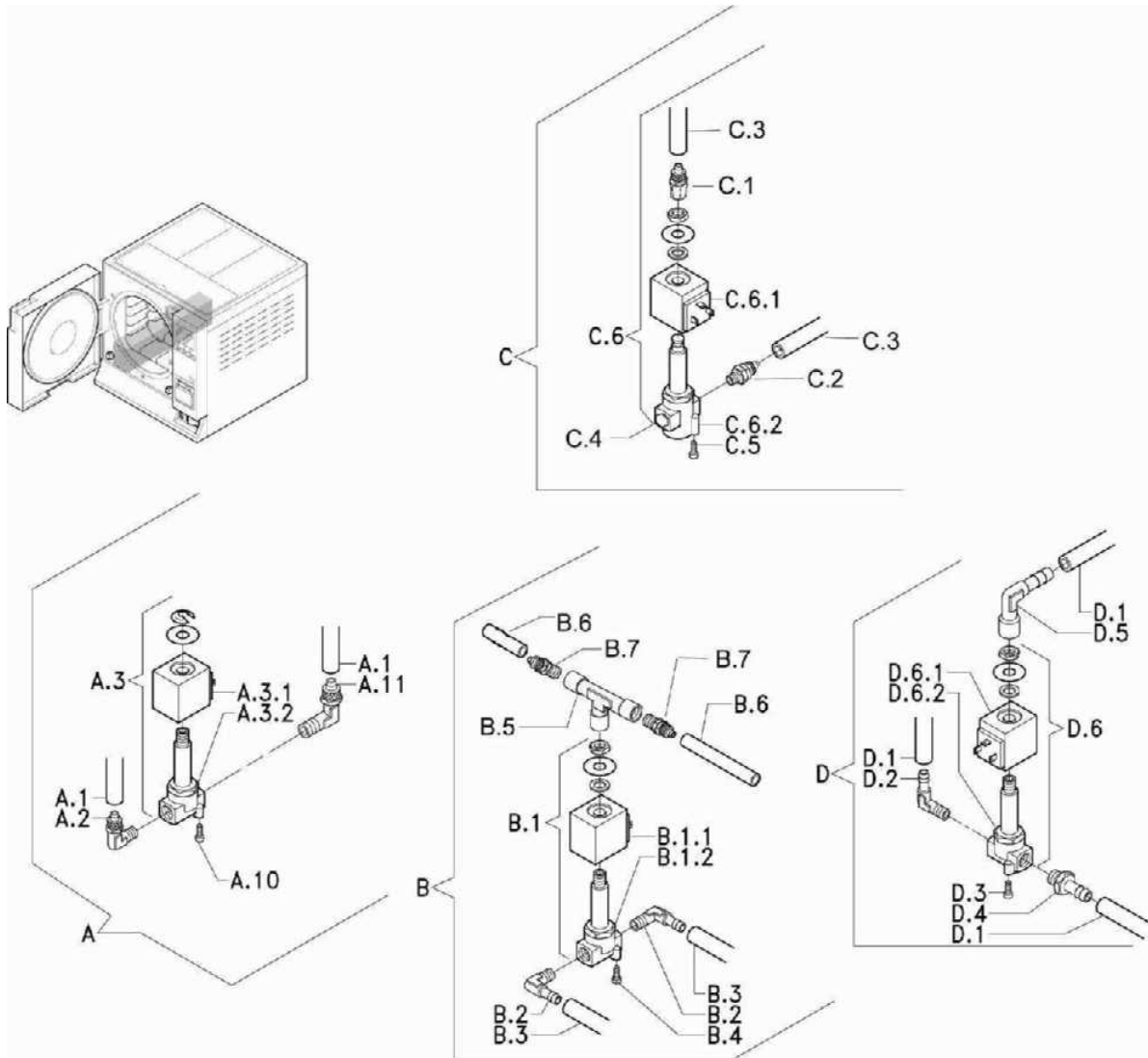


REF.	ITEM N°	DESCRIPTION	Q.TA
C		premounted EV1-EV4 valves	
C.1	541146	silicone tube Ø 6/10	1
C.2	571119	elbow union PG M 1/4	1
C.3	C.3.1	562331 solenoid valve EV4	1
	C.3.2	solenoid valve body	1
		solenoid valve piston	1
C.4	523519	spacer M/F M3x12	2
C.5	572432	screw TCCE M4x8	2
C.6	562322	solenoid valve EV1	1
	C.6.1	solenoid valve body	1
	C.6.2	solenoid valve piston	1
C.7	571107	T-shaped union M/F/F 1/4	1
C.8	571153	union M 1/4	1
C.9	571120	elbow union Ø 6/8 F 1/4	1
C.10	816047	teflon tube Ø 6/8	2
C.11	571147	elbow union M 1/4	1
C.12	523742	steam filter FF 1/4	1
C.13		steam filter net (with filter)	1
C.14		steam filter cap (with filter)	1
C.15	571121	elbow union Ø 6/8 M 1/4	1
D		premounted EV8 valve	
D.1	541146	silicone tube Ø 6/10	3
D.2	571119	elbow union PG M 1/4	1
D.3	572432	screw TCCE M4x8	2
D.4	571166	union PG M 1/4	1
D.5	571156	elbow union PG F 1/8	1
	562330	solenoid valve EV8	1
D.6	D.6.1	solenoid valve body	1
	D.6.2	solenoid valve piston	1

9.2.8.3 TAB. 08: SOLENOID VALVE ASSEMBLY E9 MED

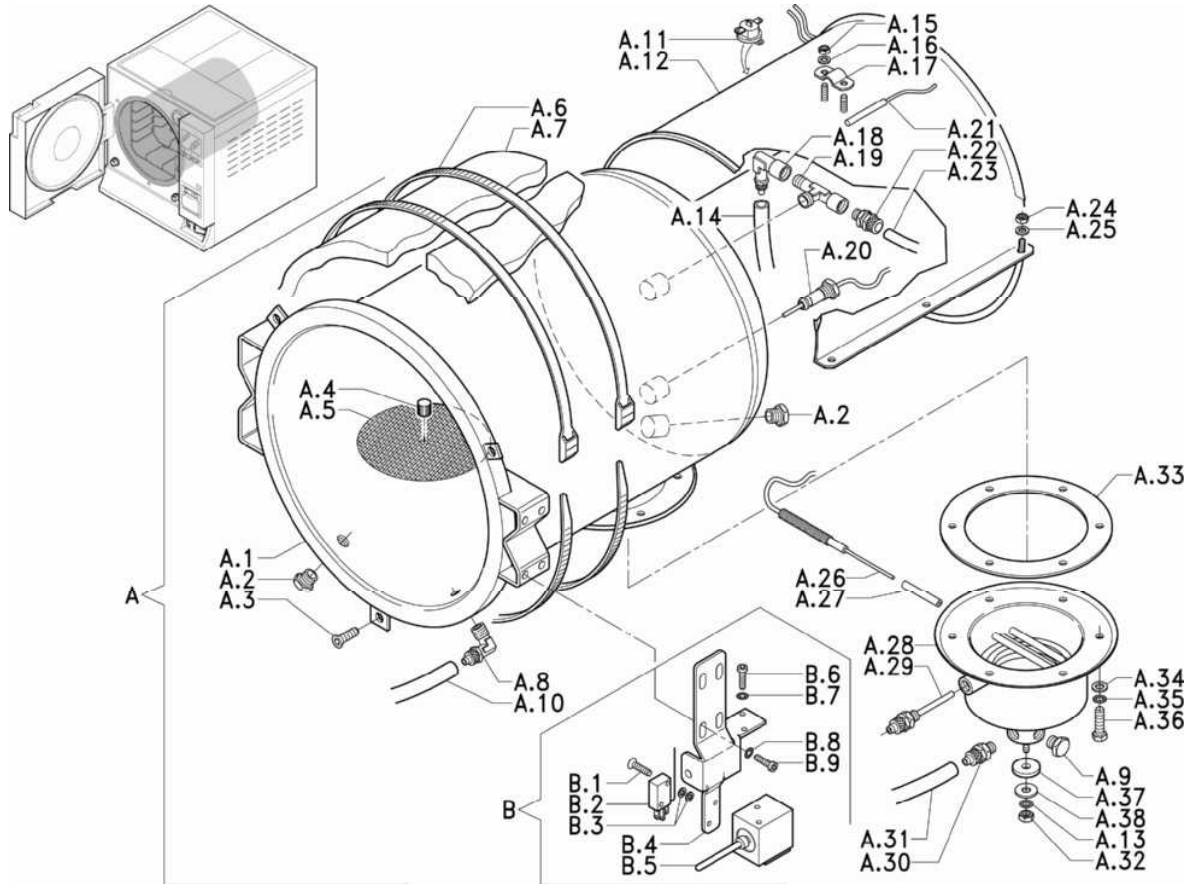


REF.	ITEM N°	DESCRIPTION	QTY	
A		360963	premounted EV2 valve	
A.1	816046	teflon tube Ø 4/6	2	
A.2	571127	elbow union M1/4 for tube Ø 4/6	2	
A.3	A.3.1	562331	solenoid valve EV2	1
	A.3.2		solenoid valve body	1
A.10	572432	screw M4x8	2	
B		360962	premounted EV7 valve	
B.1	B.1.1	562330	solenoid valve EV7	1
	B.1.2		solenoid valve body	1
B.2	571119	elbow union M 1/4 PG	2	
B.3	541146	silicone tube Ø 6/10	2	
B.4	572432	screw M4x8	2	
B.5	571113	T-shaped union F/F/F 1/8	1	
B.6	816046	teflon tube Ø 4/6	2	
B.7	571181	union M1/8 for tube Ø 4/6	2	

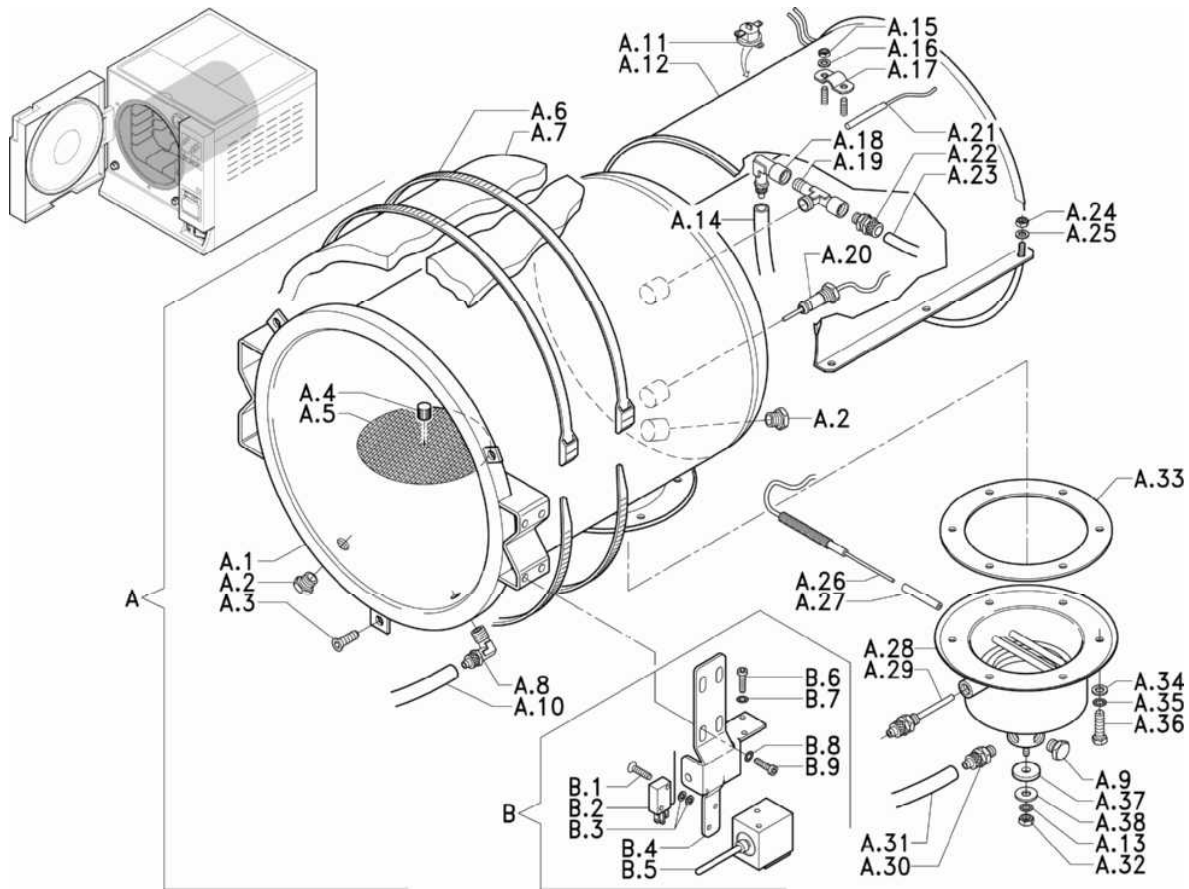


REF.	ITEM N°	DESCRIPTION	QTY		
C		360961	premounted EV1 valve		
	C.1	571207	union F1/8G for tube Ø 6/8	1	
	C.2	571124	union M1/4 for tube Ø 6/8	1	
	C.3	816047	teflon tube Ø 6/8	2	
	C.4	572175	plug M1/4	1	
	C.5	572432	screw M4x8	2	
	C.6	562330	solenoid valve EV1	1	
		C.6.1	solenoid valve body	1	
		C.6.2	solenoid valve piston	1	
D		360960	premounted EV8 valve		
	D.1	541146	silicone tube Ø 6/10	3	
	D.2	571119	elbow union M 1/4 PG	1	
	D.3	572432	screw M4x8	2	
	D.4	571166	straight union M 1/4 PG	1	
	D.5	571156	elbow union F 1/8 PG	1	
		562330	solenoid valve EV8	1	
	D.6		D.6.1	solenoid valve body	1
			D.6.2	solenoid valve piston	1

9.2.9.1 TAB. 09: BOILER/ELECTROMAGNET ASSEMBLY E9 INSPECTION / RECORDER

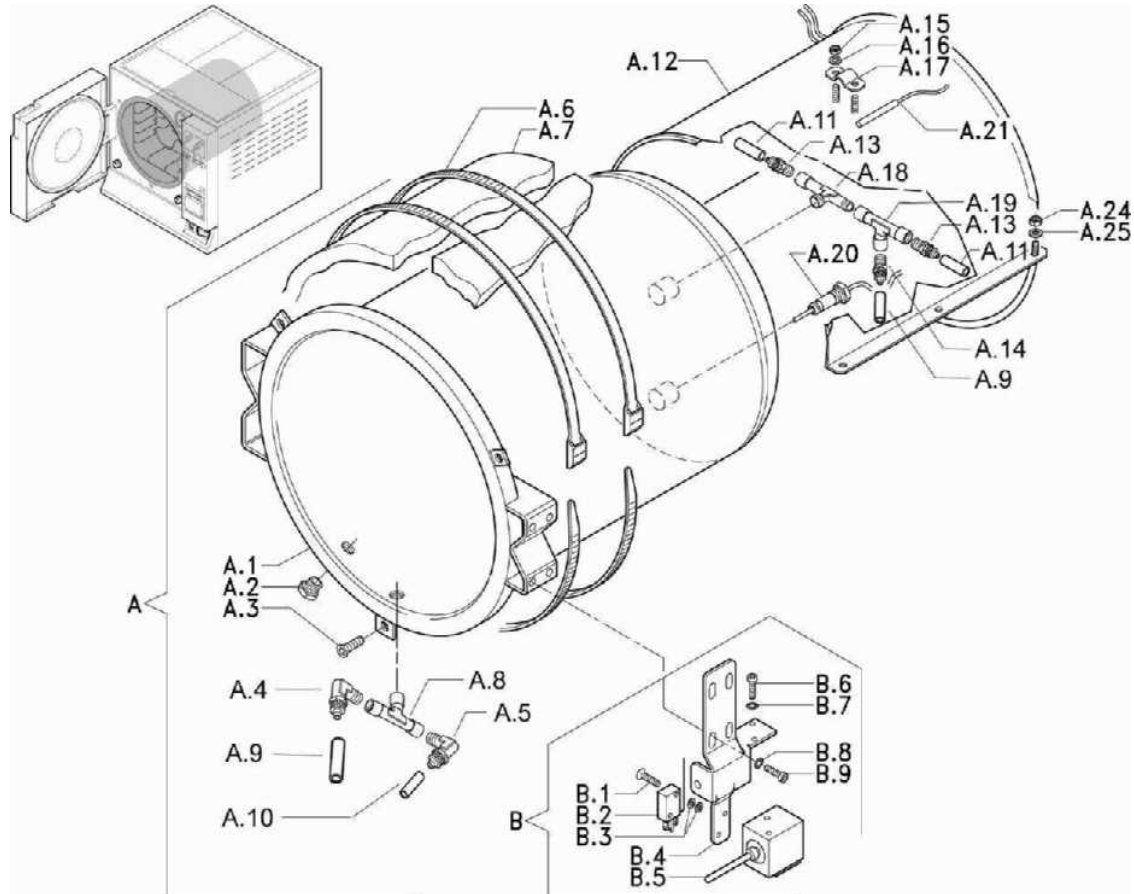


REF.	ITEM N°	DESCRIPTION	QTY
A	320332 (18l) – 320334 (24l)	boiler/electromagnet assembly (s.n. EEG e EEH)	
	320333 (18l) – 320335 (24l)	boiler/electromagnet assembly (s.n. EDI e EDK)	
A.1	522495	aut. boiler w/generator 18l	1
	522496	aut. boiler w/generator 24l	1
A.2	572175	union with male cylindrical cap 1/4	1
A.3	572488	hex socket countersunk head screw 6x18 stainless steel	3
A.4	572371	knurled boiler filter cap	1
A.5	523737	boiler filter	1
A.6	570606	black clamp 9x508	4
A.7	590829	lagging for boiler w/generator 18l	1
	590830	lagging for boiler w/generator 24l	1
A.8	571121	elbow union M 1/4 -7	1
A.10	541142	sheathed black silicone tube Ø 6/12	1
A.11		resettable safety thermostat (with heater)	1
A.12	564053	band heater 18l (serial number EEG)	1
	560724	band heater 18l (serial number EDI)	1
	564057	band heater 24l (serial number EEH)	1
	560725	band heater 24l (serial number EDK)	1
A.14	816047	teflon tube Ø 6/8	1
A.15	570498	stainless steel hex nut M4	2
A.16	571729	stainless steel flat washer 4/9/0.8	2
A.17		racket for PTC2 temperature probe (with heater)	1
A.18	571120	elbow union F 1/4	1
A.19	571111	T-shaped union M/M/F 1/4	1
A.20	564469	temperature probe inside chamber PTC1	1
A.21	564467	temperature probe on band heater PTC2	1
A.22	571180	snap-on union 1/4 6-4	1
A.23	816046	teflon tube Ø 4/6	1

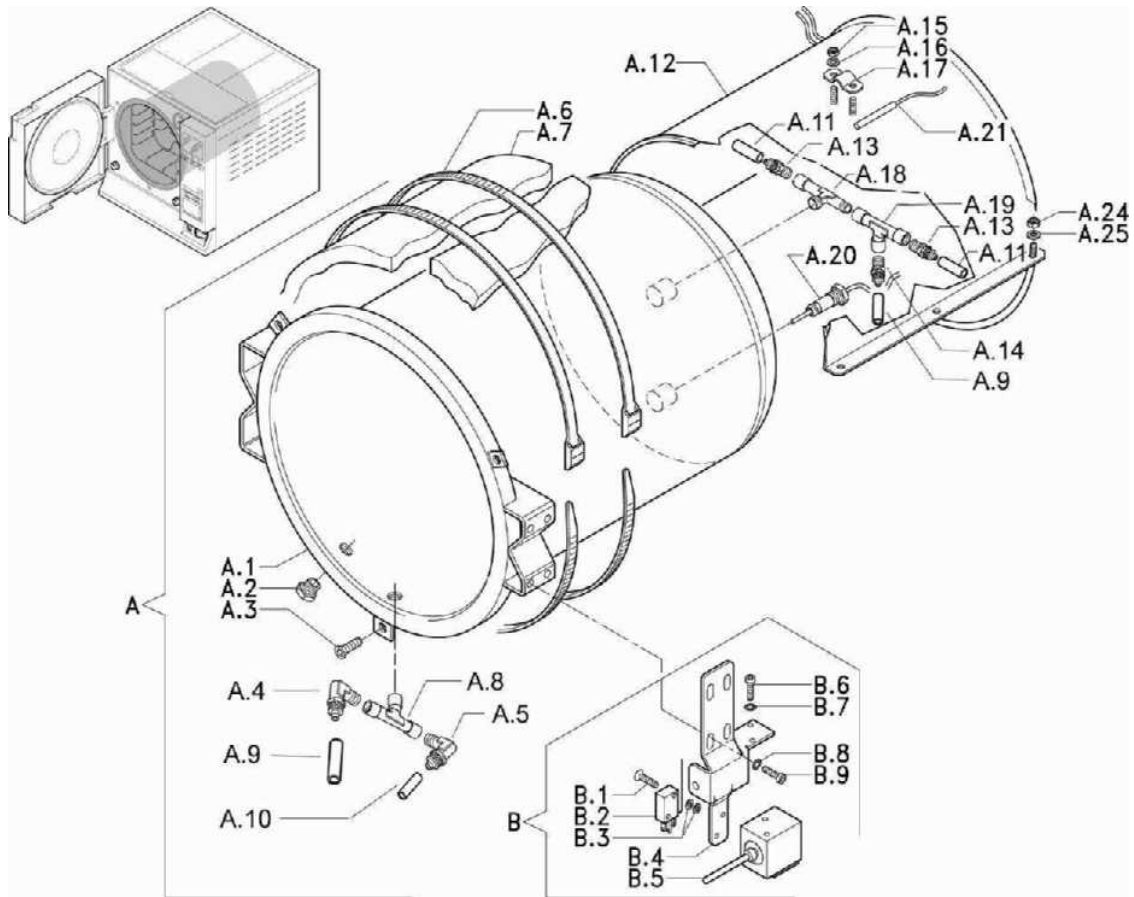


REF.	ITEM N°	DESCRIPTION	QTY
A.24	570498	stainless steel hex nut M4	6
A.25	571729	flat washer 4x9x0.8	6
A.26	564479	generator temperature probe PTC3	1
A.27	527222	copper tube	1
A.28	564059	generator heater w/shell	1
A.29	571188	water inlet union (with generator)	1
A.30	18 l 571123 + 572175	union Ø 6/8 M 1/8-7	1
	24 l 571124 + 572177	union Ø 6/8 M 1/4-7	1
A.31	816047	teflon tube Ø 6/8	1
A.32	570500	nut M6	1
A.33	540517	steam generator gasket	1
A.34	571731	flat washer 6/12/1.5	6
A.35	571723	notched washer ext. 6	6
A.36	572457	cheese-head screw 6x12	6
A.37	523518	spacer	1
A.38	571730	flat washer M5	1
A.39	571722	notched washer M5	1
A.40	570499	nut M5	1
A.41	571183	coupler M/F 1/4	1
B	360266	electromagnet assembly	
B.1	572507	button-head screw 3x16	2
B.2	563238	lever microswitch	1
B.3	531822	plastic spacer	4
B.4	526398	electromagnet bracket	1
B.5	562438	electromagnet	1
B.6	572432	cheese-head socket screw M4x8	2
B.7	571721	stainless steel notched washer ext. 4	2
B.8	571721	stainless steel notched washer ext. 4	4
B.9	572432	cheese-head socket screw M4x8	4

9.2.9.2 TAB. 09: BOILER/ELECTROMAGNET ASSEMBLY E9 MED

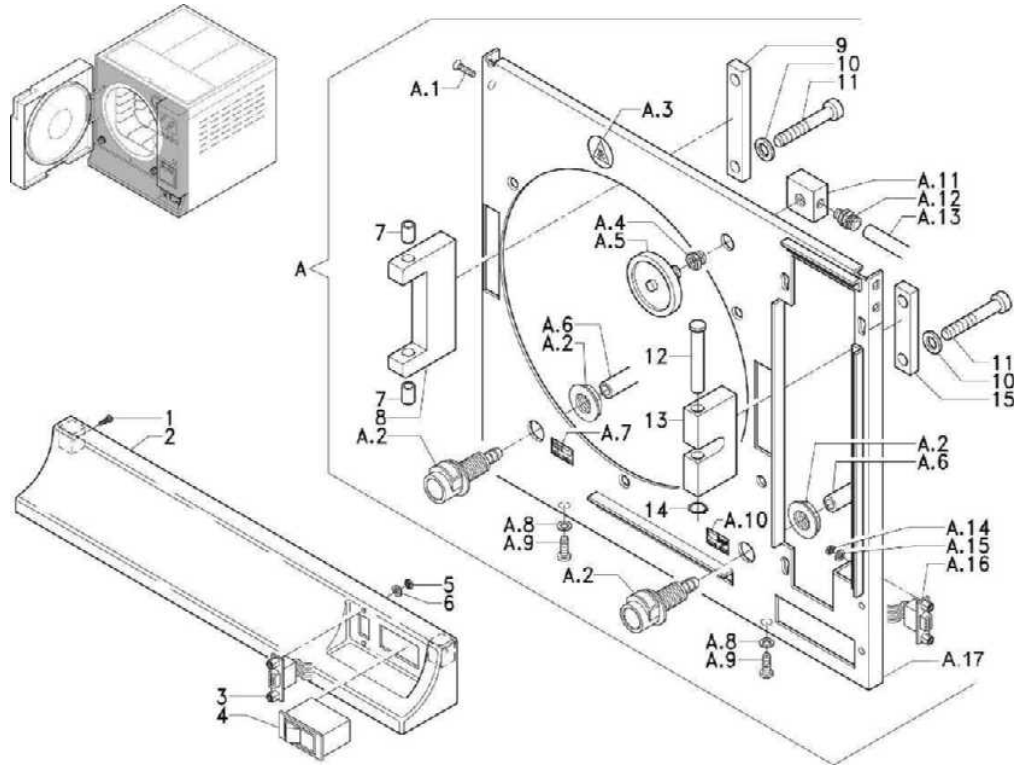


REF.	ITEM N°	DESCRIPTION	QTY
A	320352 (18 litri) – 320353 (24 litri)	boiler/electromagnet assembly	
A.1	522502	boiler E9 MED 18 litres	1
	522503	boiler E9 MED 24 litres	1
A.2	572175	cap M 1/4	1
A.3	572488	screw 6x18	3
A.4	571121	elbow union M1/4 for tube Ø 6/8	
A.5	571127	elbow union M1/4 for tube Ø 4/6	1
A.6	570606	black clamp 9x508	4
A.7	590833	lagging for boiler 18l	1
	590834	lagging for boiler 24l	1
A.8	571206	T-shaped union F/M/F 1/4	1
A.9	816047	teflon tube Ø 6/8	1
A.10	541141	sheathed black silicone tube Ø 3/5	1
A.11	816046	teflon tube Ø 4/6	2
A.12	564069	band heater 18l	1
	564070	band heater 24l	1
A.13	571181	union M1/4 for tube Ø 4/6	2
A.14	571124	union M1/4 for tube Ø 6/8	1
A.15	570498	nut M4	2
A.16	571729	flat washer 4/9/0,8	2
A.17		racket for PTC2 temperature probe (with heater)	1
A.18	571111	T-shaped union M/M/F 1/4	1
A.19	571110	T-shaped union 1/4 F/F/F 1/4	1
A.20	564469	temperature probe inside chamber PTC1	1
A.21	564467	temperature probe on band heater PTC2	1



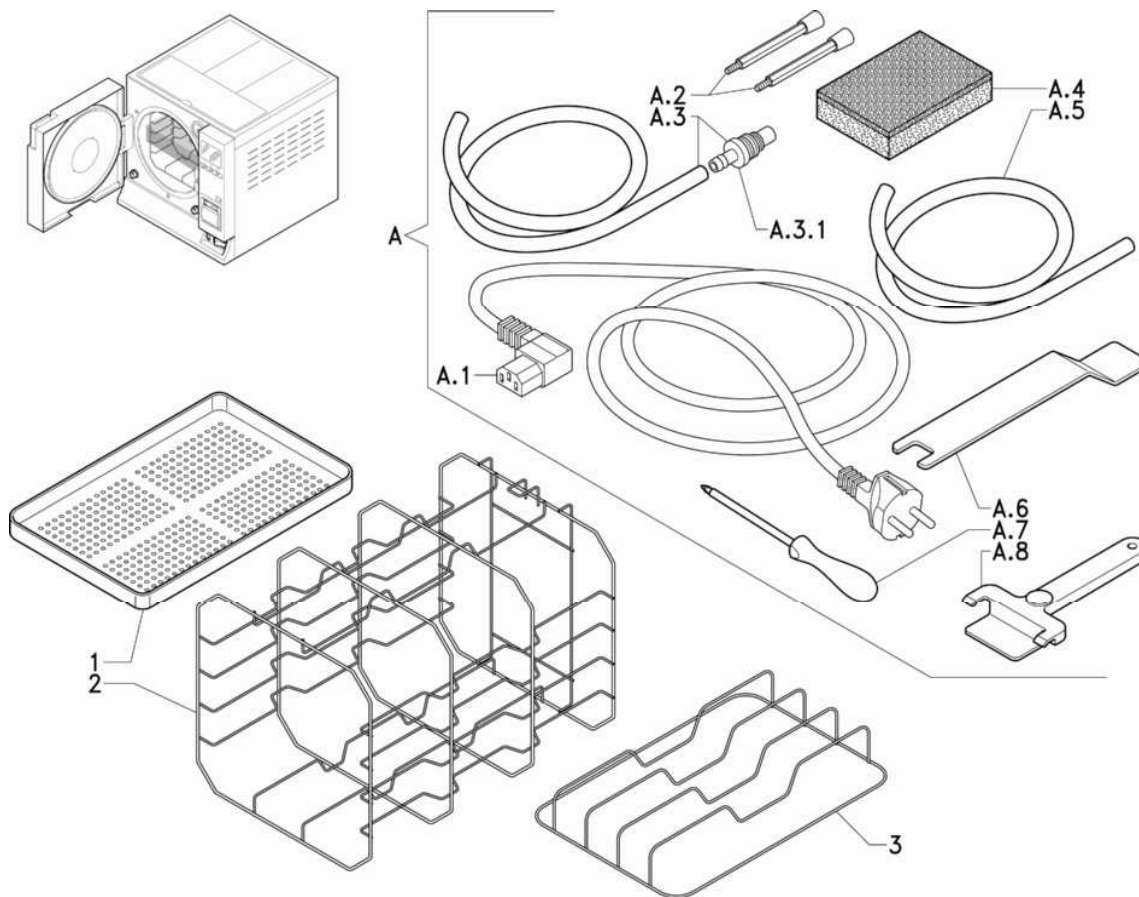
REF.	ITEM N°	DESCRIPTION	QTY
A.24	570498	nut M4	6
A.25	571729	flat washer 4/9/0,8	6
B	360266	electromagnet assembly	
B.1	572507	screw 3x16	2
B.2	563238	lever micro-switch	1
B.3	531822	plastic spacer	4
B.4	526398	electromagnet bracket	1
B.5	562438	electromagnet	1
B.6	572432	screw M4x8	2
B.7	571721	notched washer Ø 4	2
B.8	571721	notched washer Ø 4	4
B.9	572432	screw M4x8	4

9.2.10 TAB. 10: FRONT PANEL ASSEMBLY E9



REF.	ITEM N°	DESCRIPTION	QTY
A		front panel assembly	
A.1	572495	countersunk head screw +4x12	4
A.2	571131	CPC Tres female union	2
A.3	530690	heat symbol adhesive label	1
A.4	571170	bacteriological filter holder union	1
A.5	532199	OEM bacteriological filter	1
	532200	Retail bacteriological filter	1
A.6	541146	silicone tube Ø 6/10	1
A.7	530675	"USED WATER" label	1
A.8	571730	stainless steel flat washer M5	2
A.9	572375	button-head screw 5x16	2
A.10	530671	"CLEAN WATER" label	1
A.11	522389	bacteriological filter holder block	1
A.12	571181	straight snap-on union M 1/8-6/4	1
A.13	816046	teflon tube Ø 4/6	1
A.14 + A.15	572229	turret kit for E9	1
A.16	563723	serial connector	1
A.17	523961	front panel E9 INSPECTION / RECORDER	1
	523972	painted front panel E9 MED	1
1	572339	black 4x12 screw	1
2	533159	lower panel	1
3	563722	serial connector	1
4	562853	double-pole thermal switch E9 INSPECTION /RECORDER	1
	562864	double-pole thermal switch E9 MED	
5 + 6	572229	turret kit	1
7	570380	bushing H15	2
8	522386	hinge block	1
9	524872	LH support plate	1
10	571733	flat washer M10	4
11	572452	screw 10x60	4
12	524814	closing pin	1
13	522442	closing hinge block	1
14	572018	pin safety seeger ring	1
15	524871	RH support plate	1
16	563723	shielded serial port	1

9.2.11 TAB. KIT: ACCESSORIES KIT E9



REF.	ITEM N°	DESCRIPTION	QTY
A		accessory kit E9	
A.1	561727	power cable (Europe)	1
A.2	523526 + 531300	metal spacers with PVC cap Ø 8 H16	1
A.3	340060	CPC M union + PVC tube 1.5 mt	2
A.3.1	571130	CPC M union	1
A.4	591404	sponge for cleaning chamber	1
A.5	541133	tube PVC Ø 8/12 2 m	1
	541133	tube PVC Ø 8/12 1.5 m	1
A.6	524439	adjusting lever	1
A.7	590154	screwdriver	1
A.8	524499	tray lever	1
1	420186	aluminium tray 18l	4
	420185	aluminium tray 24l	4
2	525287	tray holder 18l	1
	525288	tray holder 24l	1
3	241001	vertical pouches holder 18l (optional)	1
	241002	vertical pouches holder 24l (optional)	1

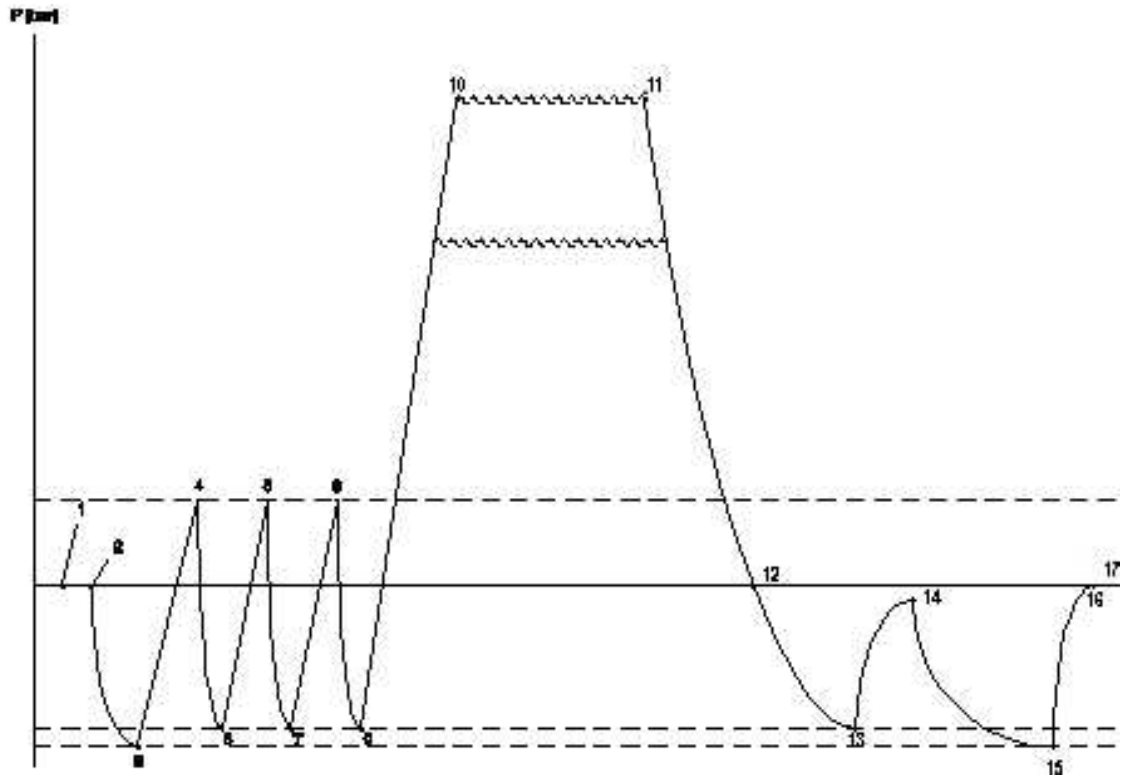
10 - Product versions

10.1 REGISTRATIONS OF MODIFICATIONS TO E9 HARDWARE

Please visit: www.eurondatec.com

11 - Troubleshooting

11.1 SUMMARY OF ALARM SIGNALS



NOTE for reading this chapter.

The following table summarises all the alarms that can appear on the E9 INSPECTION display: the second column (**PHASE**) of the table refers to the above diagram.

CODE	PHASE	DESCRIPTION	POSSIBLE REASON	ACTION	BRIEF
E01	1-17	Main power supply: voltage drop.	Sudden drop in mains voltage of $\pm 10\%$.	Check voltage level	Brief 1
E02	1-17	Blackout	1 Momentary cut-out of mains voltage. 2 Double-pole thermal safety switch tripped. (Please go to www.eurondatec.com)	1 Wait for mains voltage to return. 2 Turn the unit back on again from the main switch. 3 Make sure the main switch is ON.	Brief 2
E11	1-17	Ambient temperature higher than 70°C. Consult the "E9 INSPECTION" instructions manual.	1 Card temperature sensor faulty. 2 Unit not properly ventilated.	1 Replace the control card. 2 Make sure the unit has the minimum ventilation space around it: 20 cm.	Brief 3
E12		Ambient temperature less than 0°C. Wait until heating module starts	1 Card temperature sensor faulty. 2 Stored at low temperatures.	1 Replace the control card. 2 Wait for the ambient temperature to reach the parameters indicated in chap. 5.3 of the instructions manual (+5°C-+40°C).	Brief 3
E21	10-11	High pressure during the sterilization phase P > 0.26 bar compared with sterilization P: (1.31 bar for 121°C, 2.31 bar for 134°C)	1 Probe out of calibration	1 Check the probe and recalibrate if necessary.	Brief 4
			2 EV2 and EV5 not working.	2 Check the solenoid valves and replace if necessary.	Brief 5
E22	10-11	Insufficient pressure during sterilization phase. Min. internal pressure compared with sterilization P (1.05 bar for 121°C, 2.05 bar for 134°C).	1 Pressure leak from hydraulic circuit.	1 Check for leaks	Brief 6
			2 Heater faulty (only in sterilization phase).	2 Check generator heater during sterilization phase and replace if necessary.	Brief 7
E23	10-11	High temperature during sterilization phase, > 3°C.	1 Pressure sensor out of calibration	1 Check and recalibrate pressure sensor if necessary.	Brief 8
			2 Temperature probe out of calibration.	2 Check and recalibrate temperature sensor if necessary.	Brief 4
E24	10-11	Insufficient temperature during sterilization phase. Internal temperature less than sterilization T (121°C for B121 and 134°C for B134).	1 Pressure leak from hydraulic circuit. Insulation of PTC1-PTC3	1 Check for leaks.	Brief 6
			2 Heater faulty. (Please go to www.eurondatec.com)	2 Check generator heater during sterilization phase and replace if necessary.	Brief 7
E25	10-11	Theoretical temperature differs from internal temperature by ± 2 °C.	Water leaks in system. (Please go to www.eurondatec.com) Bad insulation of Ptc1, Ptc3	Perform the vacuum test and check for leaks.	Brief 6

CODE	PHASE	DESCRIPTION	POSSIBLE REASON	ACTION	BRIEF
E26	2-9	Prevacuum time-out if -0.86 (-0,80 form 6.05) bar is not reached in 10' (1st vacuum phase) or if -0.80 (-0,75 from 6.05) bar is not reached in 10' (2nd, 3rd and 4th vacuum phase).	1 Leak from hydraulic circuit. (Please go to www.eurondatec.com)	1 _a Inspect the pneumatic circuit for leaks and check the vacuum pump.	Brief 6
				1 _b Perform the vacuum test.	Brief 9
			2 Vacuum pump not working.	2 Replace vacuum pump	Brief 10
E27	2-9	Steam impulse time-out if set point pressure is not reached in the following conditions: P1=+0.40 bar in 15' P2=+0.40 bar in 10' P3=+0.40 bar in 10' P4=+1.05 (or 2.05 bar) in 15'	1 Safety thermostat tripped.	1 Reset safety thermostat.	Chap. 8
			2 Generator heater not working. (Please go to www.eurondatec.com)	2 Check heater.	Brief 7
E28	2÷16	Pressure variation greater than 10 bar/min during vacuum phase	1 No bacteriological filter.	1 Install bacteriological filter.	Chap. 8
			2 Bacteriological filter badly positioned	2 Move the bacteriological filter to the right position.	Chap. 8
E29	11÷13	Pressure discharge time-out during drying phase; if P> 0.7 bar (in absolute terms) after 4 minutes.	1 Part of the hydraulic circuit is clogged.	1 Check the filter FT2.	Brief 11
			2 EV1 clogged. (Please go to www.eurondatec.com)	2 Check EV1.	Brief 12
E30	13÷14 and 15÷16	Pressure levelling time-out; if the internal pressure is less than -0.03 bar (in absolute terms) after 2 minutes.	1 EV3 solenoid valve faulty.	1 Make sure EV3 opens during the levelling phase.	Brief 13
			2 Bacteriological filter clogged.	2 Replace the bacteriological filter	Chap. 8
			3 Reference atmospheric pressure differs from real atmospheric pressure.	3 Turn off the autoclave leaving the door open and then turn it back on again.	
E31	Vacuum test	Vacuum test: minimum vacuum not reached if P>-0.4 bar after 3 minutes	1 Leak from hydraulic circuit.	1 Check the tubes, unions, porthole and solenoid valves for leaks.	Brief 6
			2 Vacuum pump not working.	2 Replace vacuum pump.	Brief 10
E32	Vacuum test	Vacuum test: maximum vacuum not reached if P= -0.86 bar (-0.80 bar in 7.0.6 firmware version) is not reached after 8 minutes.	1 Leak from hydraulic circuit.	1 Check the tubes, unions, porthole and solenoid valves for leaks.	Brief 6
			2 Vacuum pump not working.	2 Replace vacuum pump	Brief 10
E33	Vacuum test	Vacuum test: leak during balancing phase. If the difference between P1 (-0.86) and the pressure in that moment is > 13 mbar after 5'.	Leak from hydraulic circuit	Check the tubes, unions, porthole and solenoid valves for leaks.	Brief 6

CODE	PHASE	DESCRIPTION	POSSIBLE REASON	ACTION	BRIEF
E34	Vacuum test	Vacuum test: leak during maintenance phase. Rate of leak : If $\Delta P/\Delta t = p_3-p_2/10 \geq 13$ mbar.	Leak from hydraulic circuit	Check the tubes, unions, porthole and solenoid valves for leaks.	Brief 6
E35	Vacuum test	Vacuum test: temperature outside set range. This occurs if the internal temperature probe detects a temperature $\pm 3^\circ\text{C}$ higher than the initial temperature	1 Irregular heating during test due to a sudden change in temperature if the unit was stored at temperatures. 2 PTC1 temperature probe faulty, though neither in an open nor a closed circuit.	1 Turn off the unit, wait for it to adjust to ambient temperature and then repeat the test. 2 Check probe operation and replace if necessary	Brief 14
E41	2-17	Internal boiler temperature sensor not working if the PTC1 sensor measures a full-scale value	PTC1 probe faulty: circuit open, short circuit or false contacts	1 Check contacts with card.	Brief 14
				2 Replace the PTC1 probe.	Brief 14
E42	2-17	External boiler temperature sensor not working if the PTC2 sensor measures a full-scale value	PTC2 probe faulty: circuit open, short circuit or false contacts	1 Check contacts with card. 2 Replace the PTC2 probe.	Brief 15
E43	2-17	Generator temperature sensor not working if the PTC3 sensor measures a full-scale value	PTC3 probe faulty: circuit open, short circuit or false contacts	1 Check contacts with card. 2 Replace the PTC3 probe.	Brief 16
E44	2-17	Cooling system temperature sensor not working if the PTC4 sensor measures a full-scale value	PTC4 probe faulty: circuit open, short circuit or false contacts	1 Check contacts with card. 2 Replace the PTC4 probe.	Brief 17
E45	2-17	Ambient temperature sensor not working if the PTC5 sensor measures a full-scale value	PTC5 probe faulty: circuit open, short circuit or false contacts	Replace the display card.	Brief 3
E46	2-17	Pressure sensor not working if the PS1 pressure transducer measures a full-scale value	Sensor faulty	Replace sensor and check contacts with card.	Brief 18
E47	2-17	Sensor for detecting closed door not working if the SW1 micro-switch fails to detect the closed door during the sterilization cycle.	1 False contact between cables or flat cable disconnected. 2 SW1 micro-switch faulty.	1 Check micro-switch connections. 2 Check and/or replace micro-switch.	Brief 19
E48	2-17	Sensor for detecting door safety not working if the SW2 micro-switch fails to detect the door safety lock during the sterilization cycle.	1 False contact between cables or flat cable disconnected. 2 SW2 micro-switch faulty.	1 Check micro-switch connections. 2 Make sure the electromagnet comes out upon start-up.	Brief 20
				3 Check and/or replace micro-switch SW2.	Brief 21

CODE	PHASE	DESCRIPTION	POSSIBLE REASON	ACTION	BRIEF
E51	2-17	Chamber heater: high temperature is the PTC2 sensor measures a temperature higher than 190°C.	PTC2 temperature probe out of calibration.	Replace temperature probe.	Brief 15
E52	2-17	Boiler heater not working if PTC2 is still less than 50°C ten minutes after the preheating phase begins	1 Safety thermostat tripped.	1 Reset thermostat.	Chap. 8
			2 Band heater faulty.	2 Replace power card.	Brief 22
			3 Power card faulty.	3 Replace heater.	Brief 23
			4 PTC2 temperature probe faulty.	4 Replace temperature probe.	Brief 12
E53	2-17	Steam generator heater: high temperature if PTC3 measures a temperature > 160°C.	1 Water injection pump not working.	1 Replace water injection pump.	Brief 24
			2 LS1 minimum level sensor faulty and therefore no water in tank.	2 Replace level sensor	Brief 25
E54	2-17	Steam generator not working if PTC3 does not measure a temperature increase of at least 10°C 3 minutes after steam injection.	1 Safety thermostat tripped	1 Reset thermostat.	Chap. 8
			2 Steam generator heater faulty.	2 Replace generator.	Brief 7
			3 Power card faulty	3 Replace power card	Brief 22
E61	2-11	Water injection pump not working if the temperature of PTC3 does not decrease after water is injected.	1 Water injection pump not working.	1 Replace water injection pump.	Brief 24
			2 LS1 minimum level sensor faulty and therefore no water in tank.	2 Replace level sensor.	Brief 25
E71	2-17	Fan not working if PTC4 > 95 °C from 2 to 11 or if PTC4 >120°C from 11 to 14, or if PTC4 > 95°C from 15 to 17.	1 Fan faulty.	1 Replace fan.	Brief 26
			2 PTC4 probe out of calibration.	2 Replace PTC4 probe.	Brief 14
			3 No ventilation.	3 Check ventilation around unit.	
E81	Out of cycle	Clean water tank: water supply error if the LS1 level sensor does not detect a change in status within 2 minutes (4 minutes since 7.0.6 firmware version) after EV6 starts.	1 Aquafilter disconnected or water supply tap closed. 2 LS1 level sensor faulty. <u>Only in water supply mode.</u> 3 Aquafilter solenoid valve (EV6) faulty.	1 Check the Aquafilter and relative tubes 2 Replace level sensor. 3 Replace Aquafilter solenoid valve	Brief 25
E82	Out of cycle	Clean water tank: MAX level sensor not working if the LS2 level sensor does not detect maximum level has been reached within 5 minutes (10 minutes since 7.0.6 firmware version).	LS2 level sensor faulty. <u>Only in water supply mode.</u>	Replace level sensor.	Brief 25

CODE	PHASE	DESCRIPTION	POSSIBLE REASON	ACTION	BRIEF
E83	Out of cycle	External memory: data transfer error, data not downloaded to logger.	<ol style="list-style-type: none"> 1 Bad connection between serial port and power card. 2 Bad connection between serial port and external memory. 3 "E-memory" faulty. 	<ol style="list-style-type: none"> 1 Check the connection between the serial port and the power card. 2 Check the connection between the serial port and the external memory. 3 Replace E-memory. 	
E84	Out of cycle	Replace demineralizer filters or select water supply OFF mode.	<ol style="list-style-type: none"> 1 Ionic exchange resins exhausted. 2 Deionizer probe-card faulty 	<ol style="list-style-type: none"> 1 Replace deionizer filters. 2 Check conductivity of outlet water. If it is lower than 15 μS/cm replace the deionizer probe. 	
A51	Vacuum test	<p>Attention</p> <p>Vacuum test not working. Consult the "E9 INSPECTION" instructions manual.</p> <p>Do this if PTC2 > 50°C or if more than 3 minutes have elapsed since the unit was switched on.</p>	Temperature in chamber higher than 50°C.	Turn off the unit, open the door, wait for the chamber to cool and start the cycle.	

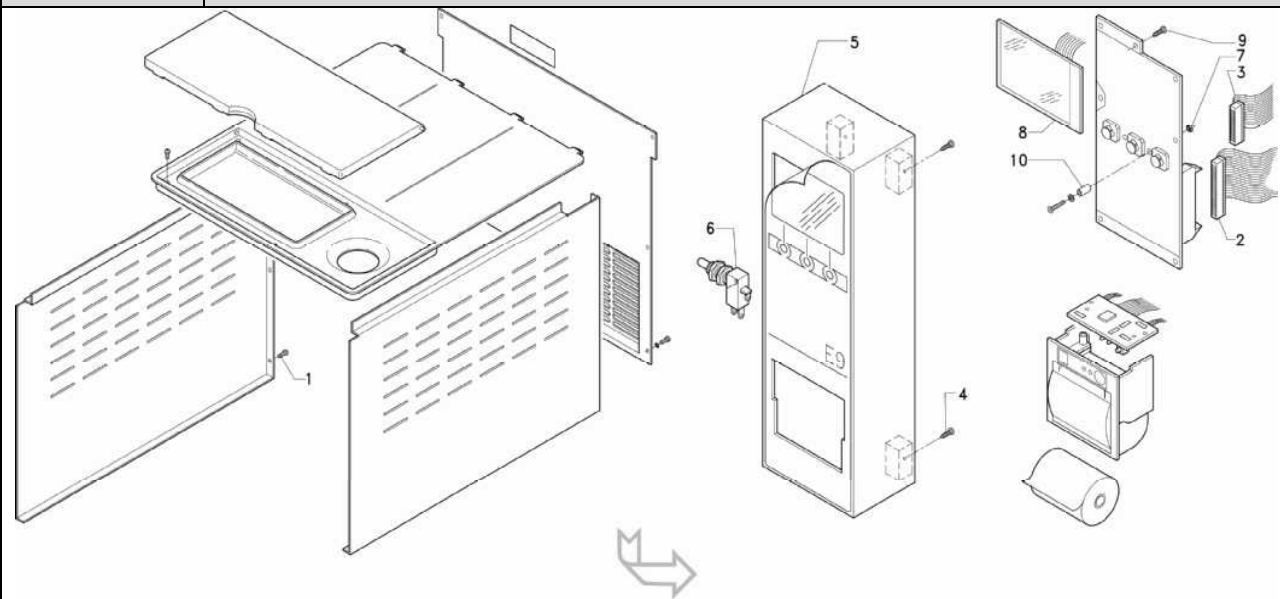
11.2 REPAIR BRIEFS

Index of repair briefs

- 1 : Checking the voltage level
- 2 : Checking the main switch is ON
- 3 : Replacing the display board
- 4 : Calibrating the temperature probe
- 5 : Replacing the EV2 and EV5 solenoid valve coils
- 6 : Checking the hydraulic circuit for leaks
- 7 : Checking and/or replacing the steam generator
- 8 : Calibrating the pressure transducer
- 9 : Performing the Vacuum test
- 10 : Checking and/or replacing the vacuum pump
- 11 : Checking the FT2 filter
- 12 : Checking and/or replacing the EV1 solenoid valve
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- 29 : Removing and replacing the vacuum pump heads
- 30 : Removing and replacing the safety thermostat
- 31 : Replacing the front panel assembly
- 32 : Replacing the safety valve
- 33 : Replacing the integrated printer

brief 1	CHECKING THE VOLTAGE LEVEL
Maintenance tools required	
- Voltmeter	
Procedure	
<ul style="list-style-type: none"> - Connect a voltmeter in parallel to the mains power supply, start a sterilization cycle and check voltage fluctuation: the voltage level must remain within 10% of the rated input voltage. - If the above fluctuations exceed $\pm 10\%$, check that there are no other appliances with high power draws (aspirators, compressors, casting machines, etc.) connected to the same power supply. - If other pieces of equipment are connected, the problem lies in the mains power supply; upgrade the supply or make sure other equipment is not working when you use the machine. 	

brief 2	CHECKING THE MAIN SWITCH IS ON
Procedure	
<p>If the main switch stays ON following a black-out, check the power rating of the switch. The rated current required to power the unit correctly is 10 A, while the differential sensitivity is 0.03 A. If these parameters are not satisfied, get in touch with the system manager.</p> <p>If the main switch is OFF, this is due to a short circuit in the unit: check the internal devices running on 230 V (see table in Chap. 5.3).</p>	

brief **3****REPLACING THE DISPLAY BOARD****Maintenance tools required**

- Socket wrench M3
- Medium Philips screwdriver
- Small Philips screwdriver

Procedure

- Remove the right-hand panel by unscrewing the 3 Philips screws (1) and remove the flat cables (2 and 3) connecting the display to the power card and the micro-switch (6).
- Remove the fixing screw (4) from inside the unit. Grip the display panel (5) with both hands and while pressing in the micro-switch (6) with a finger push the panel into the unit and then slide it up until the three brass spacers come out of the main frame.
- Remove the M3 nuts (7) fixing the card to the display support;
- Remove the LCD (8) by unscrewing the screws (9) and removing the flat cable connecting it to the control card. To do this, lift the white lever fixing the flat cable to the control card.

Mounting the new display card

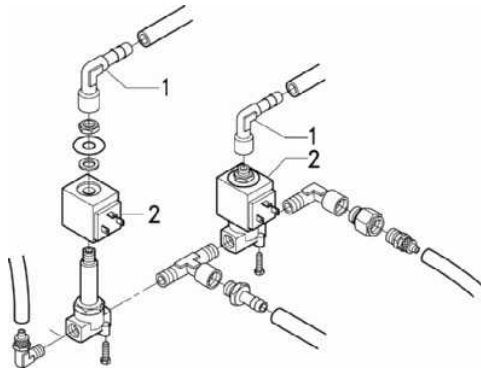
- When fixing the display card, exploit the elasticity of the rubber spacers (10).
- Tighten the M3 nuts (7) until there is sufficient distance between the ON and OFF positions of the buttons on the front panel.



N.B.: If the nuts are overtightened the buttons may remain permanently pressed down.

brief **4****CALIBRATING THE TEMPERATURE PROBE**

- If the temperature probe needs calibrating, get in touch with the Euronda S.p.A. technical assistance service.

brief **5****REPLACING THE EV2 AND EV5 SOLENOID VALVE COILS****Maintenance tools required**

- Tester
- Permanent marker pen
- Medium Philips screwdriver
- Universal wrench
- Loctite thread sealant 542
- Cutting nippers

Procedure

- Disconnect the unit from the mains power supply and remove the left-hand panel.
- Make sure the impedance of the solenoid valves is 50 ohms.
- If a coil has shorted or is open, replace the solenoid valve.
- Mark the electrical connections to the solenoid valves with a permanent marker pen in order to repeat the same connections on the new coil;
- Disconnect the electrical connections.
- Cut the plastic clamp (1) fixing the water tube to the hose connector with the cutting nippers and disconnect it.
- Unscrew the union (2) with the universal wrench. Pull out the coil upwards (3).
- Fit the new coil and seal the union with a few drops of LOCTITE thread sealant 542.
- Restore the electrical and water connections of the solenoid valves and put back the panels.

brief **6****CHECKING THE HYDRAULIC CIRCUIT FOR LEAKS****Maintenance tools required**

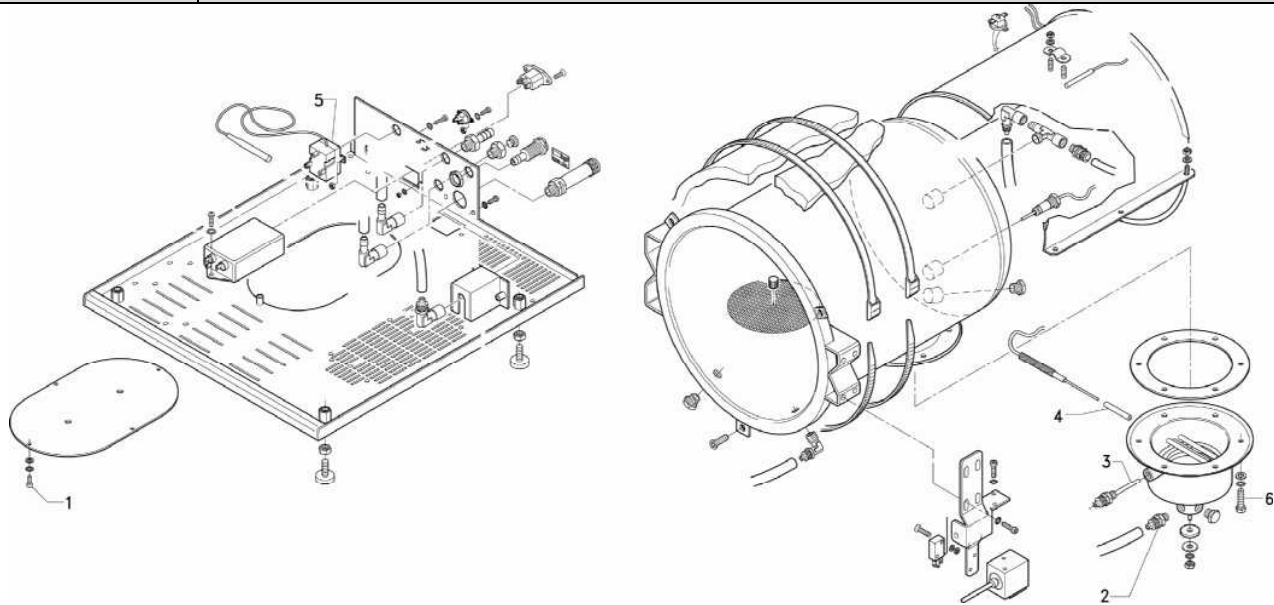
- Medium Philips screwdriver

Procedure

- Remove the left-hand panel.
- Perform the vacuum test as shown in Chap. 4.3..
- Make sure the hydraulic circuit does not leak under pressure (see Chaps. 6.1.2 and 6.1.3) to identify which components are pressurised.
- Use the transparent tubes connected to the solenoid valve to assess any leaks.

brief 7

CHECKING AND/OR REPLACING THE STEAM GENERATOR



Maintenance tools required

- Torque wrench
- Medium Philips screwdriver
- Tester
- 5 mm hex wrench
- Cutting nippers

Procedure

- Disconnect the unit from the mains power supply and remove the left-hand panel.
- Use a tester to check that the impedance of the component is 28 ohms. Replace the generator if it is open or shorted.
- Drain the water tanks.
- Turn the unit upside-down, unscrew the 4 screws (1) and remove the cover.
- Remove the generator terminal clips and the tubes attached to the unions (2) and (3).
- Remove the steam generator probe (4) and the safety thermostat bulb (5).
- Unscrew the 6 hex screws (6) with a hex wrench; check the gasket and replace if necessary.
- Position the new steam generator and centre the gasket.
- Tighten the 6 screws (6) with a torque wrench set to 6 N/m.
- Connect up all the wires.



N.B.: Make sure that the probe (4) enters 55 mm into its housing.

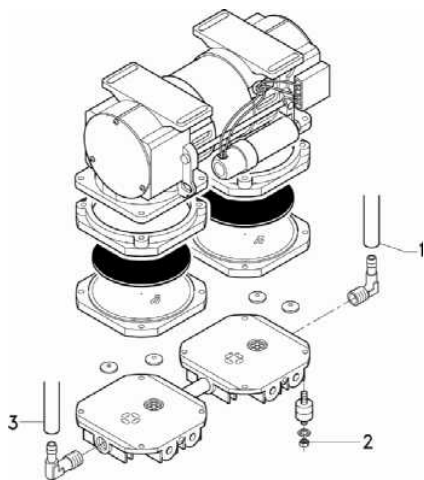
brief 8

CALIBRATING THE PRESSURE TRANSDUCER

- If the pressure transducer needs calibrating, get in touch with the Euronda S.p.A. technical assistance service.

brief **9****PERFORMING THE VACUUM TEST****Procedure**

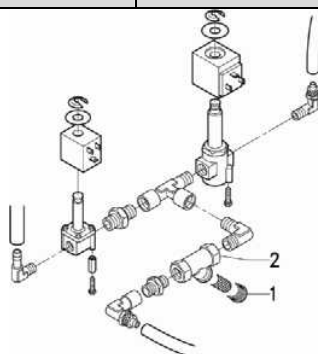
- Disconnect the unit from the mains power supply and remove the left-hand panel.
- Perform a vacuum test as shown in Chap. 6 and make sure that the pressurised components do not leak and that there are no overflows into the tubes or components.

brief **10****CHECKING AND/OR REPLACING THE VACUUM PUMP****Maintenance tools required**

- Medium Philips screwdriver
- 4 mm hex wrench
- Adjustable wrench

Procedure

- Disconnect the unit from the mains power supply and remove the right-hand panel.
- Disconnect the pump from the power card (terminals **OD11A** and **OD11B**).
- Power the pump with a voltage (external) of 220V.
- Disconnect the delivery tube (1) (towards the radiator) at the end of the air-water separator; start the pump and, keeping this tube blocked, check that the pump creates a vacuum inside the tube.
- If a vacuum is not created, replace the pump heads only: to do this, follow the instruction given in **brief 29**.
- If the pump does not work at 220V, replace it.
- Remove the two tubes (1 and 3) from their respective unions.
- Disconnect the two terminal clips. Unscrew the 4 nuts (2) with the relative wrench and then pull out the pump.
- Position the new pump, secure it and restore all the connections.
- Perform a vacuum test can make sure the vacuum pump works correctly.

brief **11****CHECKING THE FT2 FILTER****Maintenance tools required**

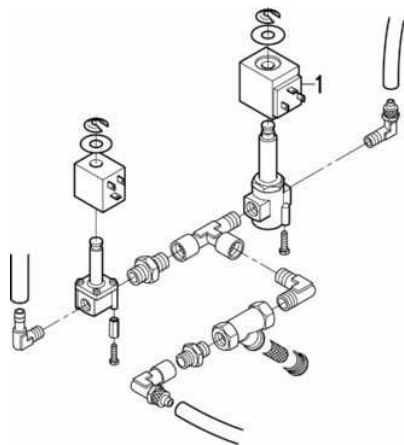
- Adjustable wrench

Procedure

- Disconnect the unit from the mains power supply, drain the tanks and then turn it upside-down.
- Unscrew the cap (1) and remove the filter (2).
- Make sure the filter is not clogged and clean it if necessary.
- Reposition the filter and cap and then put the unit back into working order.

brief 12

CHECKING AND/OR REPLACING THE EV1 SOLENOID VALVE

**Maintenance tools required**

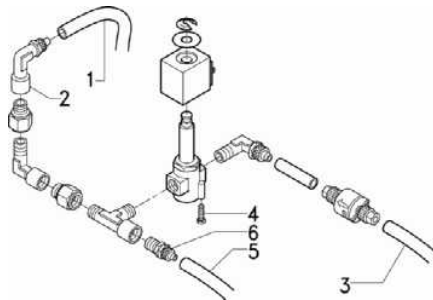
- Medium Philips screwdriver
- Seeger wrench
- Adjustable wrench

Procedure

- Disconnect the unit from the mains power supply and remove the left-hand panel.
- Disconnect the two power input terminal clips and remove the coil (1) with the relative seeger pliers.
- Pull out the coil, unscrew the piston housing, check that the piston slides smoothly and is not clogged by impurities.
- If it is clogged, remove the impurities (use compressed air if necessary).
- Mount the solenoid valve components following the above instructions in reverse order.

brief 13

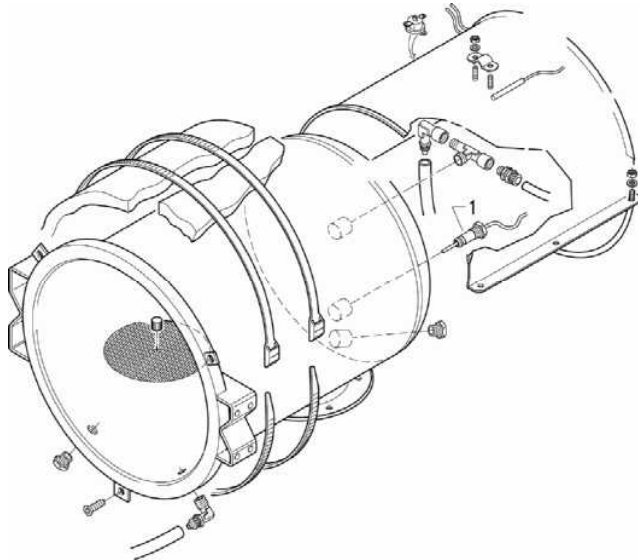
CHECKING AND/OR REPLACING THE EV3 SOLENOID VALVE

**Maintenance tools required**

- Medium Philips screwdriver
- Seeger wrench
- Adjustable wrench
- Tester

Procedure

- Disconnect the unit from the mains power supply and remove the left-hand panel.
- Disconnect the tube (1) from the elbow hose connector (2) and remove the tube (3) (fixed with the ring nut).
- Disconnect the power input terminal clips for the solenoid valve and remove the two screws (4).
- Pull the solenoid valve slightly and remove the tube (5) connected to the union (6) with great care.
- Remove the seeger ring and pull out the coil; unscrew the mechanical part of the solenoid valve and check the stroke of the piston. If the stroke of the piston is incorrect make sure the impedance is 64 Ohms.
- If the impedance is incorrect, replace the EV3 solenoid valve and mount the components following the above instructions in reverse order in order to ensure the connections in the unit are made correctly.

brief **14****CHECKING AND/OR REPLACING THE PTC1 PROBE****Maintenance tools required**

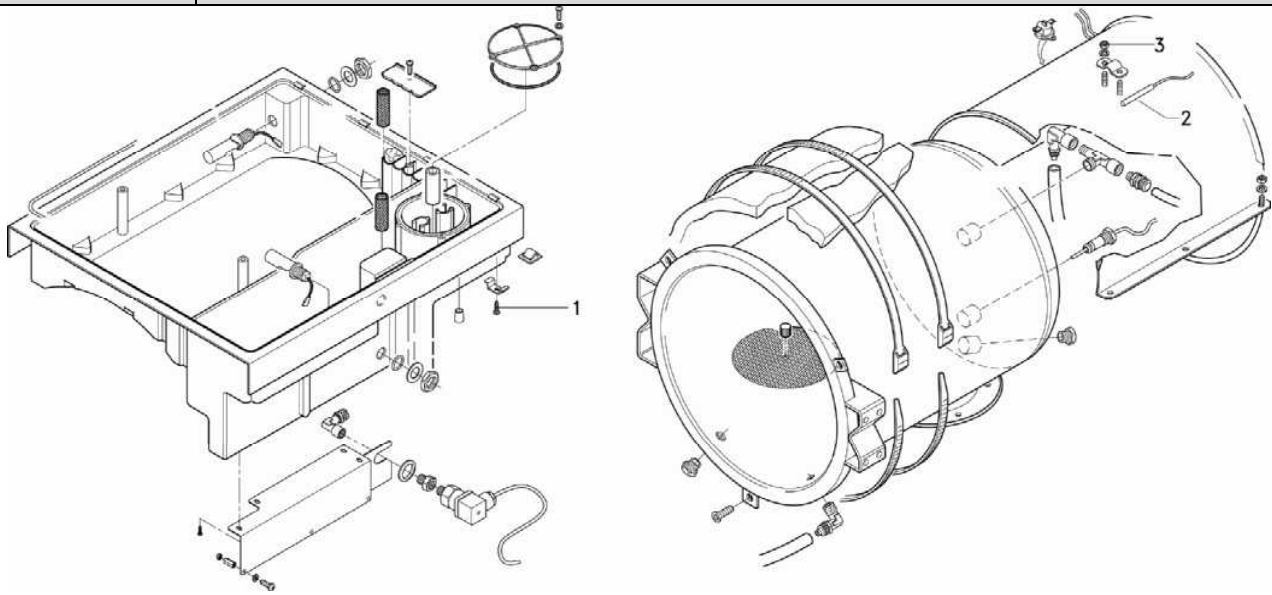
- Small Philips screwdriver
- Adjustable wrench
- Tester
- Loctite thread sealant 542

Procedure

- Disconnect the unit from the mains power supply and remove the right-hand panel.
- Disconnect the probe (1) from the card: the wires are the first two from the top on the terminal board (see wiring diagram Chap. 9.1).
- Use the tester to check that impedance is 1000 Ohms at ambient temperature.
- If there are any fluctuations in impedance, replace the probe.
- To replace the PTC1 probe (1), remove the rear panel and unscrew the probe from the boiler using the relative wrench.
- Position the probe in its housing using LOCTITE thread sealant 542.
- Then connect the probe to the card and put back the panel.

brief 15

CHECKING AND/OR REPLACING THE PTC2 PROBE

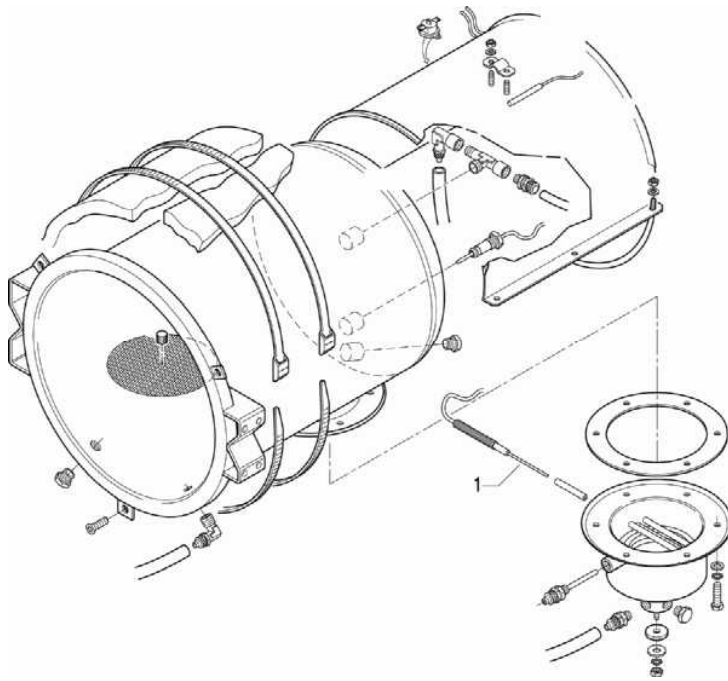


Maintenance tools required

- Permanent marker pen
- Small Philips screwdriver
- Medium Philips screwdriver
- Cutter
- Tester
- Socket wrench

Procedure

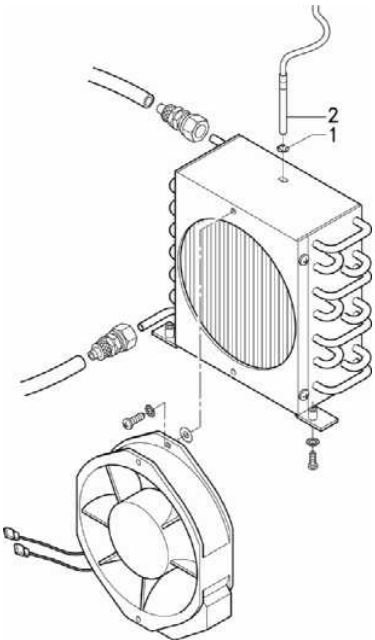
- Disconnect the unit from the mains power supply and remove the right, left and rear panels.
- Disconnect the probe from the power card (wires 3 and 4 from the top, see wiring diagram Chap. 9.1).
- Use a tester to check that the impedance of the ambient temperature probe is approx. 1000 Ohms. If there are any fluctuations in impedance, replace the probe.
- Drain the tank.
- Remove the screw fixing the tank (1).
- Mark the hydraulic connections to the tank drains with a permanent marker pen and then disconnect them.
- Remove the terminal clips connecting the three level sensors to the electronic card after marking them with a permanent marker pen.
- Pull the tank out of the rear door and remove it from the unit.
- Cut out a 3x3 cm square of lagging near the probe (2) taking care not to cut the probe cable.
- Loosen the nuts (3) enough to pull the probe out at the rear.
- Disconnect the probe from the power card (wires 3 and 4 from the top, see wiring diagram Chap. 9.1).
- Position the new probe and fasten sufficiently to ensure an adequate mechanical contact. The tip of the probe must stick out 2 cm from the neck. Connect the probe to the power card.
- Put back the tank and connect up the level sensors.
- Secure the cover with the screw (1) and put back the panels.

brief **16****CHECKING AND/OR REPLACING THE PTC3 PROBE****Maintenance tools required**

- Small Philips screwdriver
- Medium Philips screwdriver
- Tester

Procedure

- Disconnect the unit from the mains power supply and remove the right and left panels.
- Disconnect the probe (1) from the card (wires 5 and 6 from the top on the terminal board, see wiring diagram Chap. 9.1).
- Use the tester to check that impedance is 1000 Ohms at ambient temperature. If there are any fluctuations in impedance, replace the probe.
- To replace the PTC3 probe (1), pull it off the generator.
- Position the new probe in its housing making sure to push it **55 mm into the generator**.
- Then connect the probe to the card and put back the panels.

brief **17****CHECKING AND/OR REPLACING THE PTC4 PROBE****Maintenance tools required**

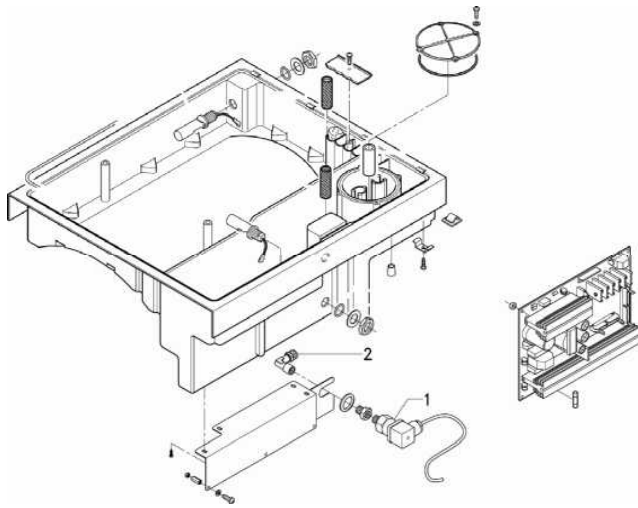
- Small Philips screwdriver
- Medium Philips screwdriver
- Tester

Procedure

- Disconnect the unit from the mains power supply and remove the right and rear panels.
- Check the connection (wires 7 and 8 from the top on the terminal board, see wiring diagram Chap. 9.1).
- Use the tester to check that impedance is 1000 Ohms at ambient temperature. If there are any fluctuations in impedance, replace the probe.
- To replace the PTC4 probe (1), pull it off the radiator.
- Position the new probe in its housing and attach the bushing (2).
- Restore the connections and put back the panels.

brief 18

CHECKING AND/OR REPLACING THE PS1 PRESSURE TRANSDUCER



Maintenance tools required

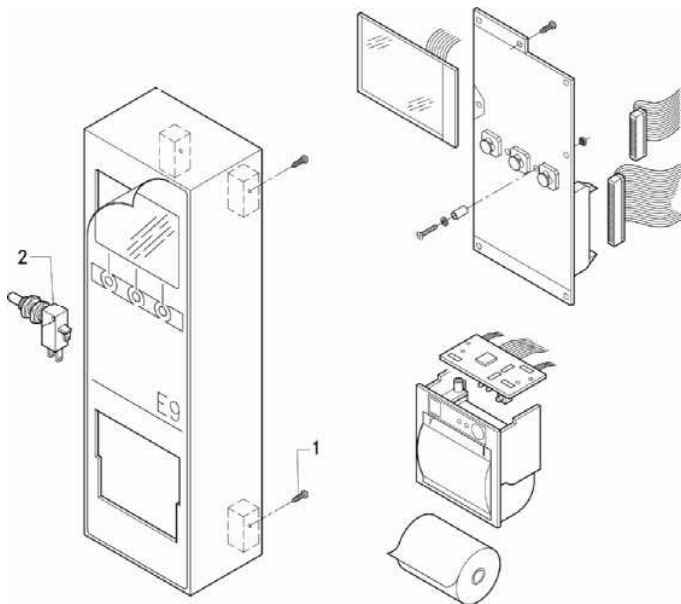
- Small Philips screwdriver
- Medium Philips screwdriver
- Tester

Procedure

- Disconnect the unit from the mains power supply and remove the right and rear panels.
- Check the connections (last three cables from the bottom of the terminal board, see wiring diagram Chap. 9.1).
- Replace the PS1 transducer (1): pull it off its fork gripping it with one hand and disconnect it from the union (2).
- Disconnect the transducer from the power card and install a new one.
- Restore the connections and put back the panels.

brief 19

CHECKING AND/OR REPLACING THE SW1 MICRO-SWITCH

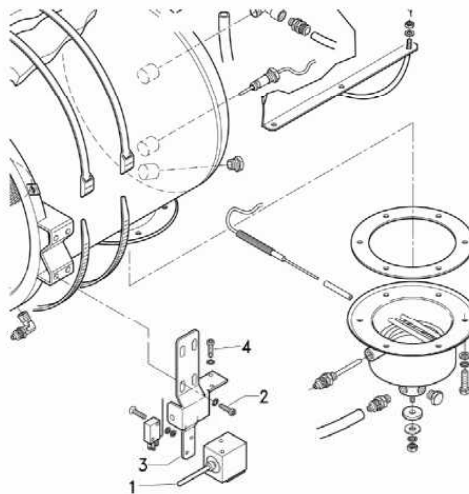


Maintenance tools required

- Small Philips screwdriver
- Medium Philips screwdriver
- Tester
- Adjustable wrench
- Plastic clamp

Procedure

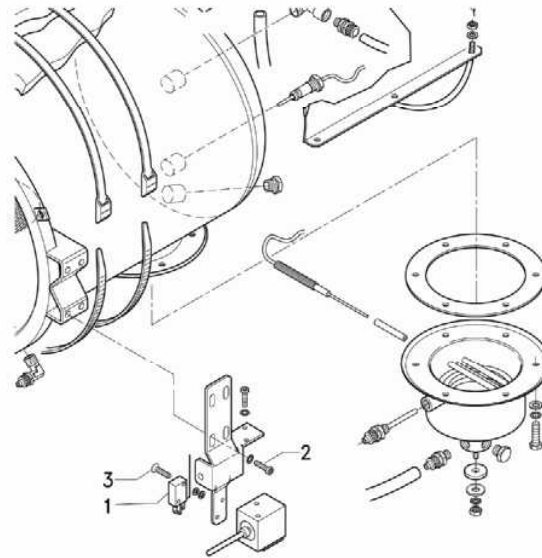
- Disconnect the unit from the mains power supply and remove the right panel and the control panel.
- To remove the control panel, unscrew the screw (1), remove the flat cables from the card and push in the microswitch (2) before pushing up the panel.
- Remove the two flat cables from the power card.
- Close the micro-switch (2) and use the tester to check that the contact is closed.
- If the contact is open, replace the micro-switch.
- Unscrew the nut towards the piston, disconnect the micro-switch and remove it.
- **Take care not to unscrew the internal nut; when installing the new micro-switch keep the internal nut at the same distance** (approx. 3 mm), then position the micro-switch in the control panel and secure it with the other nut. Restore the connections and put back the panels.

brief **20****CHECKING AND/OR REPLACING THE ELECTROMAGNET****Maintenance tools required**

- Allen key n°3
- Medium Philips screwdriver
- Small Philips screwdriver
- Plastic clamp

Procedure

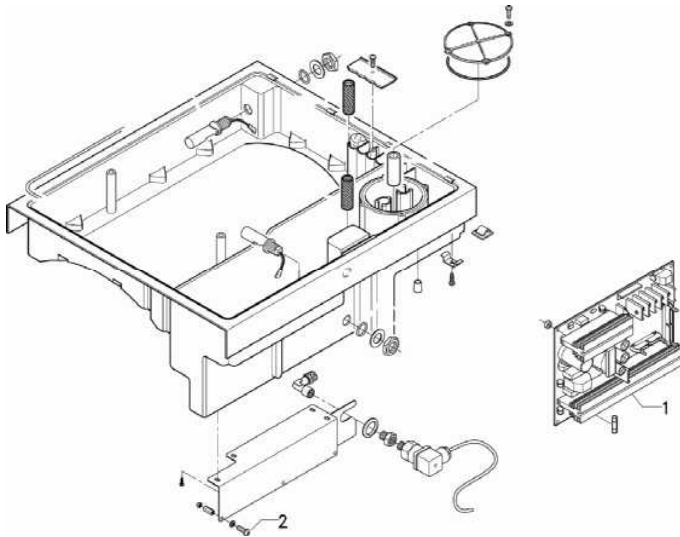
- Disconnect the unit from the mains power supply and remove the right-hand panel.
- Reconnect the unit to the mains and run a cycle: when it starts, check that the pin of the electromagnet (1) leaves its housing, in other words, the tip of the electromagnet must be flush with the coil after the cycle starts. If the electromagnet stays where it is, replace it; if the electromagnet leaves its housing read the instructions in **brief 21**.
- To replace the electromagnet, disconnect the mains power supply and remove the control panel guard (remove the flat cable from the card and push in the micro-switch before pushing up the panel).
- Remove the three screws with an Allen key (2).
- Pull off the electromagnet support (3) and remove it from the front.
- Now remove the electromagnet from the support by unscrewing the two screws (4); remove the power input terminal clips, install the new electromagnet and connect the power input terminal clips.
- ATTENTION: connect the red wire to the positive pin.**
- With the door closed, attach the electromagnet to the bracket with the two screws. Fix the electromagnet to the bracket so that the pin of the electromagnet is perfectly centred with the hole in the L-shaped bracket connected to the closing shaft. If necessary, mark the position of the electromagnet and fully tighten the fixing screws.
- **Check:** after assembly, push the pin of the electromagnet to check that the micro switch makes its characteristic "click", a sign that it works correctly both in its outward and return strokes (about 1 or 2 mm at the end of the stroke).

brief **21****CHECKING AND/OR REPLACING THE SW2 MICRO-SWITCH****Maintenance tools required**

- Allen key n°3
- Medium Philips screwdriver
- Small Philips screwdriver
- Plastic clamp

Procedure

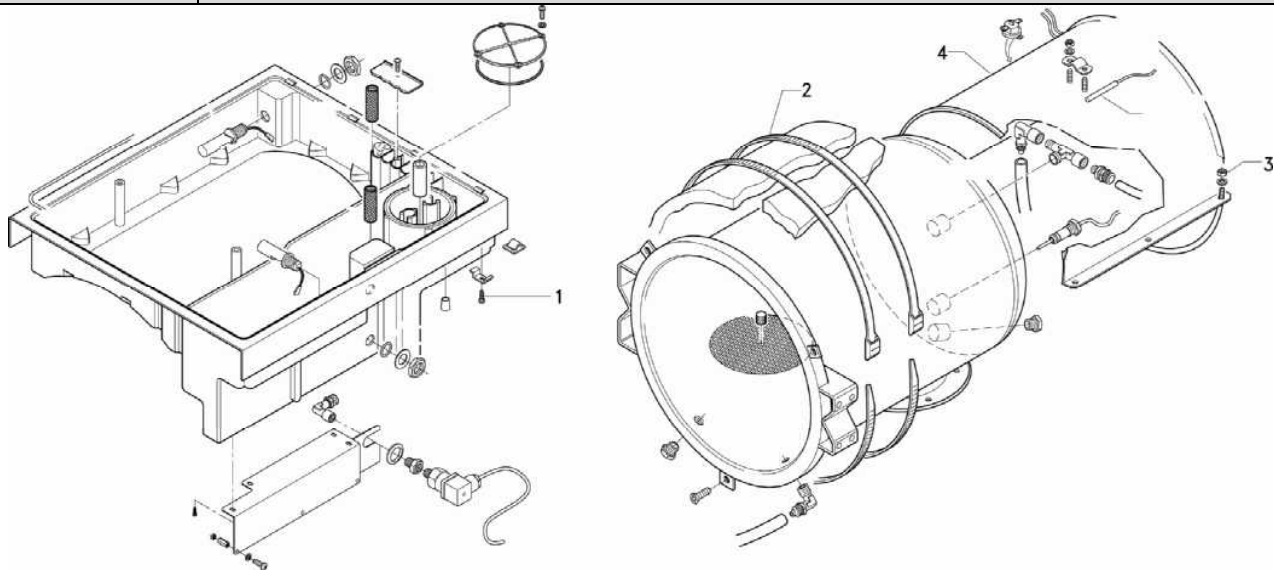
- Disconnect the unit from the mains power supply and remove the right panel and the control panel guard. To do this, remove the flat cables from the card and push in the microswitch before pushing up the panel.
- To replace the SW2 micro-switch (1), disconnect the mains power supply and remove the control panel guard. Remove the three screws with an Allen key (2).
- Remove the micro-switch from the support by unscrewing the two screws (3); remove the power input terminal clips, install the new micro-switch and connect the power input terminal clips. **Make sure** that the lever of the micro-switch is perfectly controlled by the lever of the electromagnet.
- With the door closed, mount the bracket so that the pin is perfectly centred with the hole in the L-shaped bracket connected to the closing shaft. If necessary, mark the position of the electromagnet and fully tighten the fixing screws.
- **Check:** after assembly, push the pin of the electromagnet to check that the micro switch makes its characteristic "click", a sign that it works correctly both in its outward and return strokes (about 1 or 2 mm at the end of the stroke).

brief **22****DISMOUNTING THE MAIN CARD****Maintenance tools required**

- Small Philips screwdriver
- Medium Philips screwdriver
- Plastic clamp
- Cutting nippers

Procedure

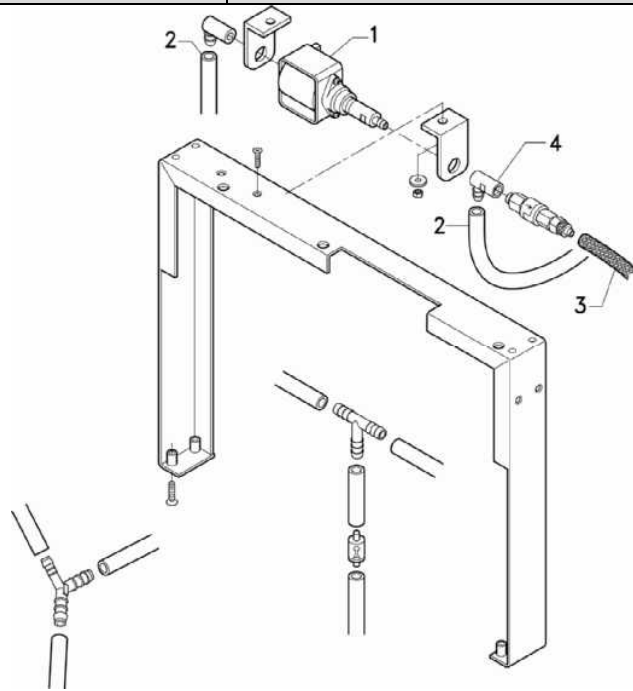
- Disconnect the unit from the mains power supply and remove the right-hand panel.
- Disconnect the mains power supply and remove all the flat cables and electrical connections.
- Mark the position of the connections with a permanent marker pen.
- Unscrew the 5 fixing screws (2) and pull the card towards you; place the new one in its slot, secure it and restore the connections. Consult the wiring diagram in the manual (Chap. 9.1) if necessary.

brief **23****CHECKING AND/OR REPLACING THE RES2 BAND HEATER****Maintenance tools required**

- Permanent marker pen
- Small Philips screwdriver
- Medium Philips screwdriver
- Plastic clamp
- Tester
- Adjustable wrench
- Cutting nippers

Procedure

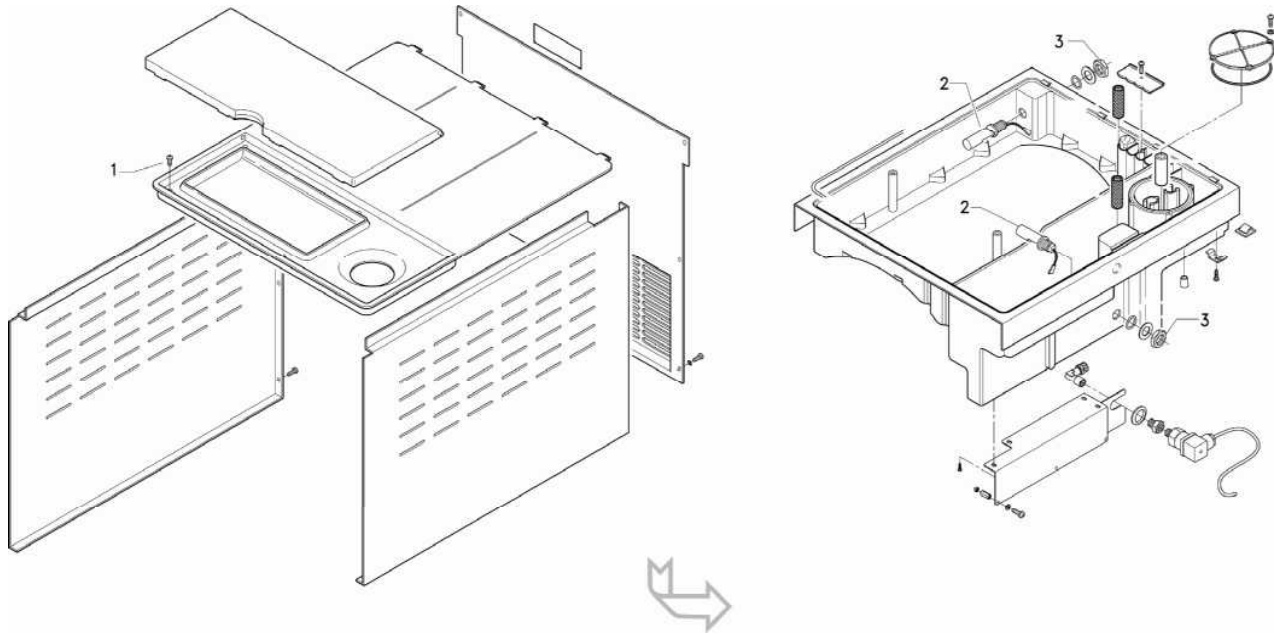
- Disconnect the unit from the mains power supply and remove the right, left and rear panels.
- Drain the tank and tighten the fixing screw (1).
- Mark the hydraulic connections to the tank drains with a permanent marker pen and then disconnect them.
- Remove the terminal clips connecting the three level sensors to the electronic card after marking them with a permanent marker pen.
- Disconnect the cables connecting the band heater to the electronic card (ODB15A and ODB15B) and check the impedance of the heater. This must be 78 Ohms for the 18 litre unit and 58 Ohms for the 24 litre unit. If the measured value does not correspond, replace the band heater.
- Pull the tank out of the rear door and remove it by turning it to the right with respect to the unit.
- Cut the plastic clamps (2) securing the lagging and unwind the lagging.
- Remove the tie-rods securing the band heater to the chamber with the nuts (3).
- Position the new heater (4) on the upper part of the chamber, taking care to put it the right way round: the safety thermostat must be on the LH panel side.
- Clean the upper part of the chamber and the inside of the heater so that the contact between the two parts is as easy and precise as possible.
- Fix and tighten the tie-rods sufficiently to ensure that the heater adheres completely to the sterilization chamber.
- Remount the lagging and secure it with the clamps provided.
- Secure the cover with the screw (1), restore the connections and put back the panels.

brief **24****CHECKING AND/OR REPLACING THE WATER INJECTION PUMP****Maintenance tools required**

- Medium Philips screwdriver
- External power unit (200V)
- Plastic and metal clamps

Procedure

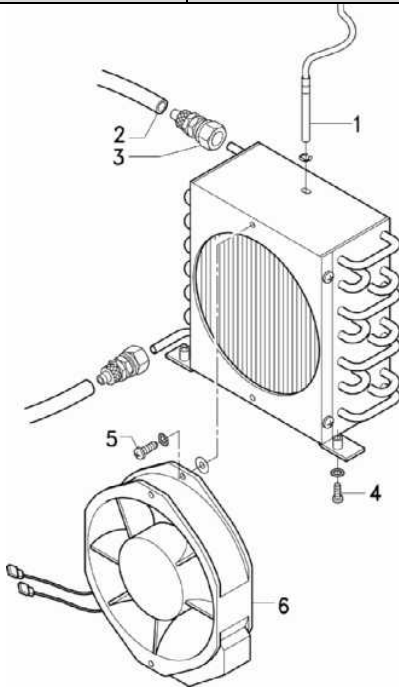
- Disconnect the unit from the mains power supply and remove the rear panel.
- Drain the water tanks.
- Power the pump (1) with 220V from an external source and check whether it works. If the pump does not work, replace it.
- Disconnect the two tubes (2) and the tube (3).
- Remove the two cables and the heat sensor; unscrew the pump (1) from the valve (4), remove it and replace it with a new one.
- Restore the electrical and water connections and put back the panel.

brief **25****CHECKING AND/OR REPLACING THE LEVEL SENSOR****Maintenance tools required**

- Tester
- Medium Philips screwdriver
- Universal adjustable wrench
- Plastic clamp

Procedure

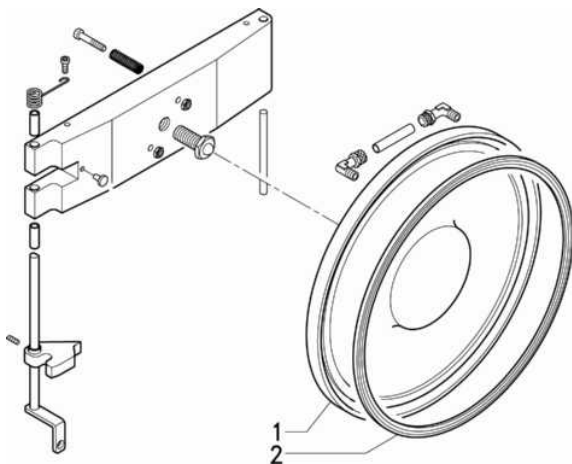
- Disconnect the unit from the mains power supply and remove the right and rear panels.
- Unscrew the 5 screws (1) and remove the cover.
- Disconnect the terminal connecting the float to the circuit and check the contacts with a tester. Enable the sensor (2) manually and check it works properly.
- If the float is faulty, drain the water tank, undo the nut (3) and remove the sensor.
- Place the new sensor in the same position as the old one, restore the connections and close the panel.

brief **26****CHECKING AND/OR REPLACING THE FAN****Maintenance tools required**

- Medium Philips screwdriver
- Plastic clamp

Procedure

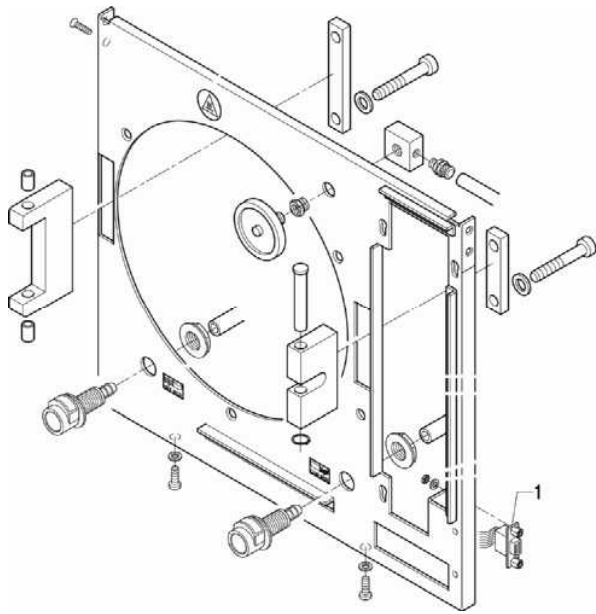
- Disconnect the unit from the mains power supply and remove the right and rear panels.
- Power the unit and makes sure the fan is truly blocked. Disconnect the power supply.
- Remove the PTC4 probe (1), loosen the plastic clamps (2) and disconnect the tubes (3).
ATTENTION: Make sure that the Teflon bushings (4) do not remain inside the tube.
- Disconnect the power supply from the fan (OD17A and OD17B), and unscrew and remove the three screws (5) from under the unit.
- Remove the entire radiator-fan assembly: unscrew the screws (6) and replace the fan (7).
- Put back the assembly, restore the connections and put back the panels.

brief **27****REPLACING THE DOOR GASKET****Maintenance tools required**

- Cloth or absorbent paper soaked in alcohol.

Procedure

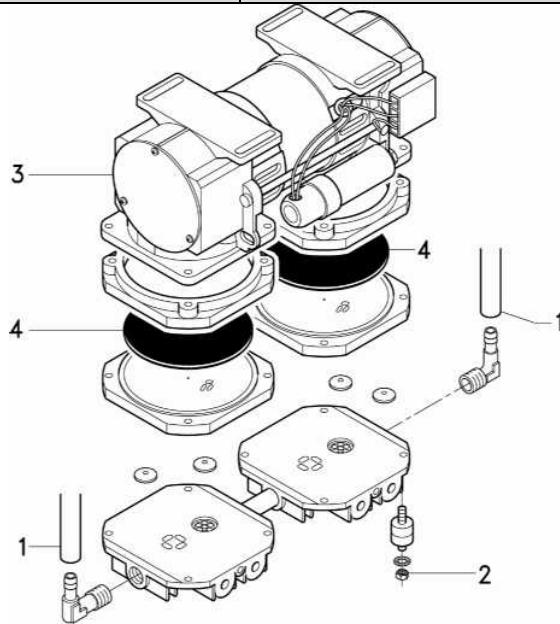
- Disconnect the unit from the mains power supply.
- Grip the lip of the gasket (1) with two fingers and remove it.
- Clean the seat of the gasket with a cloth soaked in alcohol.
- Fit the new gasket into the door bracket (2) and distribute it evenly around the circumference by applying the same pressure on the entire gasket with your fingers.
- Then lift up the lip of the gasket to make sure no points have been badly fitted.
- Turn on the unit, close the door and check the closing force is correct.
- If necessary, adjust the flossing force with the relative door adjustment wrench.

brief **28****UPDATING THE E9 INSPECTION FIRMWARE****Maintenance tools required**

- Medium Philips screwdriver

Procedure

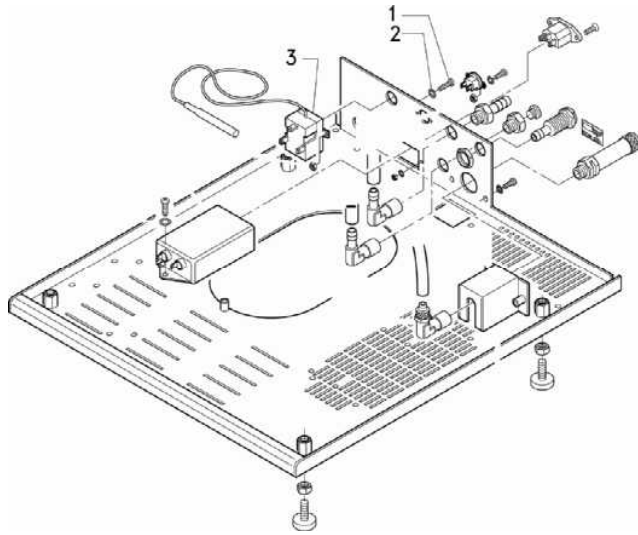
- Disconnect the unit from the mains power supply and remove the right-hand panel.
- Connect the PC to the serial socket inside the autoclave (1) with a 9-way serial cable
- Run the "xc16xflash" programme on the PC and check in the Setting section that the functions are: baudrate=57600, system clock=40, erase mode=sector erase
- Power the unit and start it.
- ATTENTION: within 2 seconds** from switching on (during which the display is completely blank), click on Connect in the programme.
- Check the connection status and in case of faults call in the Euronda technical assistance service.
- Select the updating file and click on the Flash Device programme.
- After the update, disconnect the cable and switch on the unit.

brief **29****REMOVING AND REPLACING VACUUM PUMP HEADS****Maintenance tools required**

- Medium Philips screwdriver
- 4 mm hex wrench
- Plastic clamps

Procedure

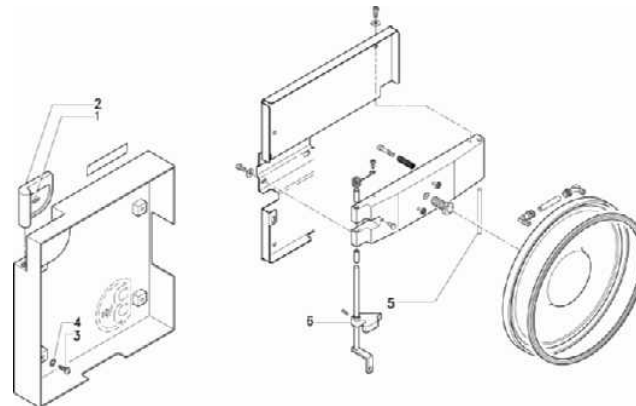
- Disconnect the unit from the mains power supply and remove the panels.
- Remove the two tubes (1) from their respective unions.
- Disconnect the two terminal clips. Unscrew the 4 nuts (2) with the relative wrench and then pull out the pump (3).
- Turn the pump upside-down with the heads facing up, remove the pump heads with the 4x2 hex screws. Remove the heads (4) and then fit the new heads and reset the vacuum pump.
- Tighten the 8 screws well and put back the panels.

brief **30****REMOVING AND REPLACING THE SAFETY THERMOSTAT****Maintenance tools required**

- Medium Philips screwdriver
- Small Philips screwdriver
- Standard pliers

Procedure

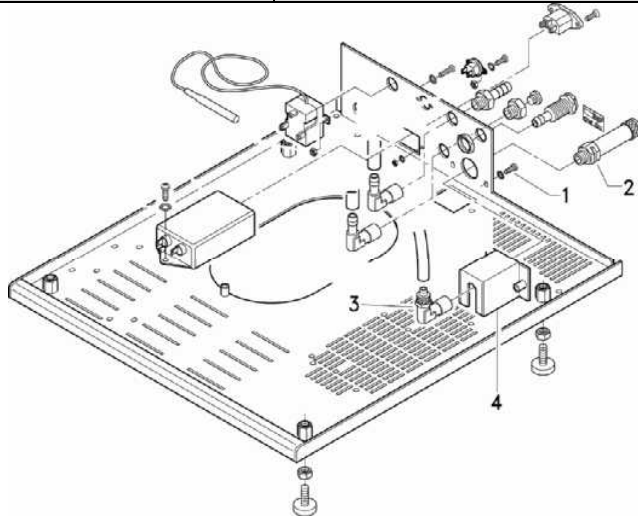
- Disconnect the unit from the mains power supply and remove the right and left panels.
 - Undo the projecting black cap (1), unscrew the two fixing screws (2); take care not to loose the knurled washers (3).
 - Disconnect the cables connected to the thermostat.
 - Remove the copper probe from the bulb with a standard pair of pliers and remove the thermostat (4).
 - Install the new thermostat following the above instructions in reverse order and put back the panels.
- N.B.:** That the thermostat is adjusted to half the available stroke.

brief **31****REPLACING THE FRONT PANEL ASSEMBLY****Maintenance tools required**

- Medium Philips screwdriver
- Hex wrench n°3
- Standard hammer
- Pin pinch D 6 mm

Procedure

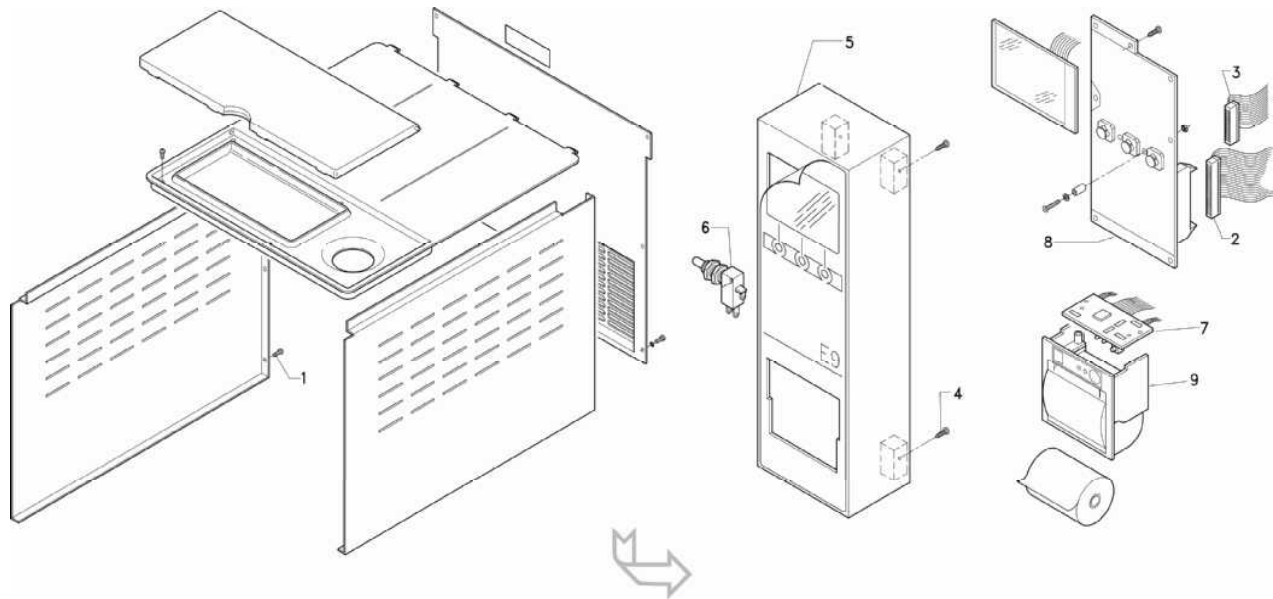
- Disconnect the unit from the mains power supply.
- Unscrew the dowel (1) with the hex wrench and pull the handle (2) up and off;
- Unscrew the 4 screws (3); take care not to loose the knurled washers (4).
- Remove the panel upwards from the closing pin.
- Remove the hinge peg (5) using a pin punch and hammer.
- Mount the new arm/porthole assembly by inserting the peg from above with a hammer.
- Check the catch (6) is correctly centred onto the bracket block and the door micro switch.
- Remount the panel following the above instructions in reverse order.

brief **32****REPLACING THE SAFETY VALVE****Maintenance tools required**

- Pliers for metal clamps
- Open-ended wrench n° 20
- Adjustable wrench
- Loctite thread sealant 542 (red)

Procedure

- Disconnect the unit from the mains power supply and remove the rear and left panels.
- Unscrew the two fixing screws (1), pull out the safety valve (2) mounted on the cover inside the unit.
- Use an adjustable wrench and an open-ended wrench n°21 to loosen the valve of the union (3).
- Remove the protective cage (4), unscrew the valve and install the new one adding a few drops of LOCTITE thread sealant 542.

brief **33****REPLACING THE INTEGRATED PRINTER****Maintenance tools required**

- Socket wrench M3
- Medium Philips screwdriver
- Small Philips wrench

Procedure

- Remove the right-hand panel by unscrewing the 3 Philips screws (1) and remove the flat cables (2 and 3) connecting the display to the power card and the micro-switch (6).
- Remove the fixing screw (4) from inside the unit. Grip the display panel (5) with both hands and while pressing in the micro-switch (6) with a finger push the panel into the unit and then slide it up until the three brass spacers come out of the main frame.
- Disconnect the flat cables connecting the printer to the display card.
- Press in the two plastic tabs of the printer and push out from the panel.
- Fit and connect the new printer and then close the panels.

11.3 REQUIRED MAINTENANCE TOOLS

The following pages show a list of all the tools required by maintenance men together with photos to make it easier to identify the tool or instrument.



- Only use good quality tools.
- Regularly check the tools for wear and replace worn or damaged ones.
- Store tools in suitable containers (e.g. a case).



Take care when handling the electronic validation board as this contains components that are subject to electrostatic discharge; always put the board back into its antistatic bag after use.





Fig.	Description	Figure
1	Set of hex wrenches	
2	Set of combination wrenches	
3	Pliers with straight jaws for retaining rings	
4	Set of slotted screwdrivers	













Fig.	Description	Figure
5	Set of Philips screwdrivers	
6	Standard hammer	
7	Standard pliers	
8	Green Loctite	
9	Cutting nippers	
10	Pin punch D 5	
11	BETA pliers for metal clamps Up to s/n EEG060999 EEH060999	

Fig.	Description	Figure
12	Multimeter	
13	T-wrench D 18	
14	Cutter	
15	Red Loctite 542	
16	Serial – USB adapter	

12 - Demolition

12.1 DEMOLITION INSTRUCTIONS

The E9 INSPECTION unit has been manufactured using ferrous materials, electrical components and plastics. To scrap the unit, separate the various components according to the material they are made of in order to simplify reuse or differentiated disposal.

No particular operations are required after demolition.

Do not dump the unit.

Take it to a disposal company.

Always comply with the current laws governing the scrapping of material in the country of use.

12.2 RESALE

If the unit is sold, hand over all the technical documentation to the new purchaser, inform him/her about any repair work carried out and how to use and service the machine.

Also inform Euronda S.p.A. of the sale and provide it with data about the new purchaser.

Appendix

APPENDIX 1

DESCRIPTION OF OPTIONAL DEVICES

Euronda Aquafilter Deionizer

The Euronda Aquafilter[®] Deionizer is a device that makes it possible to obtain water for feeding the tank of the unit by connecting directly to the main water supply system. The water thus obtained has characteristics that comply with the table shown in Appendix 8. The interface between the E9 INSPECTION autoclave and the Aquafilter[®] deionizer makes it possible for the deionizer to be controlled directly from the autoclave.

The principle on which the system is based is that of ionic exchange: a synthetic matrix is “charged” with groups that are capable of exchanging hydrogen ions (H⁺) and hydroxide ions (OH⁻) with the cations and anions present in the water. The deionizer contains a probe used for reading the specific conductivity and is therefore capable of indicating when the characteristics of the water produced are no longer acceptable for the system. The resins are capable of producing approximately 120 litres of water, but this value is strictly dependant on the salinity of the inlet water, i.e. on the region in which the deionizer is installed. When the active sites of the resin are saturated, and the probe detects that the quality of the outlet water has a higher value than a certain pre-set value, a message for replacing the resins will appear on the display of the E9 INSPECTION autoclave. The quality of the water produced is also indicated by a led on the deionizer; as well as the message on the display of the unit, therefore, the red light in the led also indicates that the quality of the water produced by the deionizer is not suitable.

E-memory external memory

The E9 INSPECTION autoclave is capable of memorizing the last 40 cycles performed. This means that inevitably the initial cycles will gradually be replaced by the last ones performed. The external memory E-memory[®] (supplied with its specific software) makes it possible to memorize a few thousands of cycles and to transfer them to a Personal Computer by means of a USB cable.

With the E-memory[®] software, therefore, it becomes possible to manage the cycles, to print and/or send data that refers to one or more cycles via e-mail.

The connection between the E9 INSPECTION autoclave and the external memory is made using the front serial port.

In the following tables is represented the led lighting during E-memory connection to the E9 autoclave or a PC. A square equals approximately one second (for example, in the standby phase the led is 7 seconds green and 1 second red).

CONNECTED TO THE AUTOCLAVE

	data download at connection
	cycles data download
	standby, disconnect only with green led

CONNECTED TO THE PC

	communication: do not remove
	now possible to disconnect the unit



E-memory works either connected to an E9 autoclave or a PC.

External printer

The external printer is equipped with an 8-needle impact printing mechanism, of the rapid type, that uses plain paper. On the other hand, the printer that is integrated in the E9 INSPECTION uses thermal paper and, therefore, the data on the print reports is destined to fade gradually and to disappear over time.

The external printer makes it possible to print the data regarding the cycle performed on plain paper and, therefore, to avoid the problems mentioned above. The connection between the E9 INSPECTION autoclave and the external printer is made by means of the front serial port (rear if U-234 circuit).



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