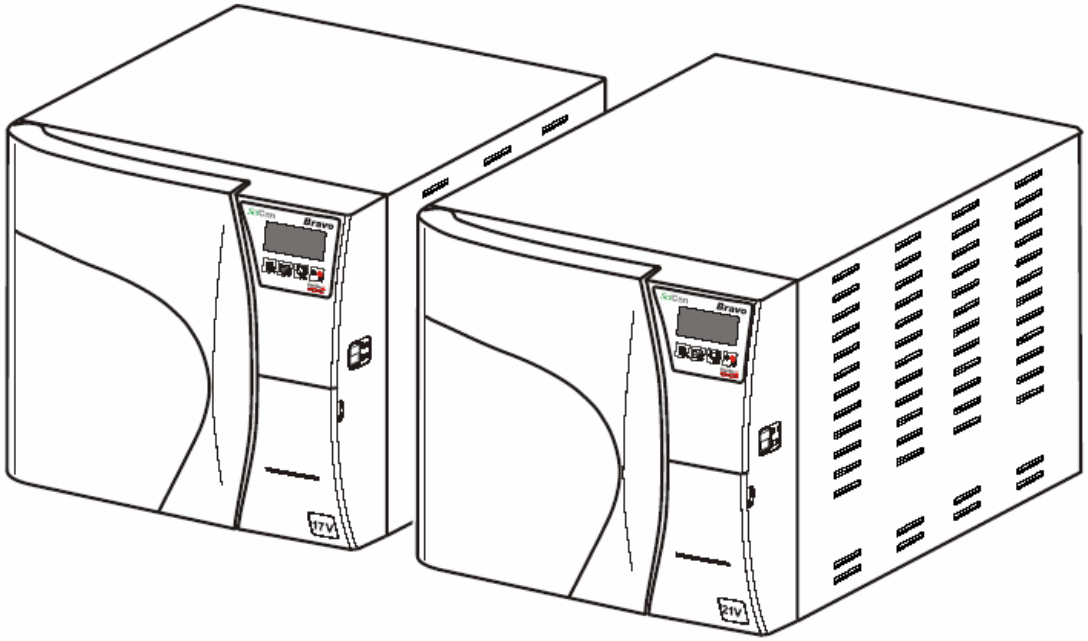
Bravo Autoclaves



Service Manual

SciCan
A HIGHER STANDARD

Bravo Service Manual SD-306/1

1. UTILIZATION

GENERAL

SYMBOLS USED IN THE MANUAL

☞ THIS SYMBOL INDICATES IMPORTANT INFORMATION..

DANGER! THIS SYMBOL INDICATES A POTENTIAL DANGER OF PROPERTY DAMAGE. FOLLOWS THE INSTRUCTIONS IN THE MANUAL TO PREVENT POTENTIAL DAMAGE TO MATERIALS, EQUIPMENT OR OTHER PROPERTY.

WARNING! THIS SYMBOL INDICATES A POTENTIAL DANGER OF INJURY. FOLLOW THE PROCEDURES DESCRIBED IN THE MANUAL TO AVOID INJURING THE USER AND/OR OTHERS.

DANGER! THIS SYMBOL INDICATES A POTENTIAL DANGER DUE TO HIGH TEMPERATURE.

DISCLAIMERS

The Bravo units described in this manual are to be used exclusively for the sterilization of solid and hollow re-usable instruments and porous materials (e.g., textiles).

The product described in this manual is exclusively intended for the sterilization of solid and re-usable hollow instruments and porous materials.

THE DEVICE MUST ONLY BE USED BY QUALIFIED PERSONNEL. IT MAY NOT BE USED OR HANDLED BY INEXPERIENCED AND/OR UNAUTHORIZED PERSONNEL FOR ANY REASON.

This device must not be used for the sterilization of fluids, liquids or pharmaceutical products.

Do not permit any person other than certified personnel to supply parts for, service or maintain your Bravo. SciCan shall not be liable for incidental, special or consequential damages caused by any maintenance or services performed on the Bravo by a third party, or for the use of equipment or parts manufactured by a third party, including lost profits, any commercial loss, economic loss, or loss arising from personal injury.

Never remove the cover of the unit and never insert objects through holes or openings in the cabinetry. Doing so may damage the unit and / or pose a hazard to the operator.

GENERAL WARNINGS

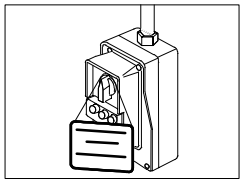
Please observe the following precautions in order to avoid injury or property damage :

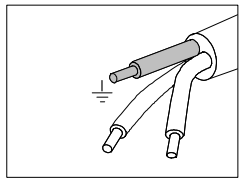
– Use ONLY distilled water of high quality.

–

The use of water of inadequate quality can severely damage the equipment. See ***Characteristics of the feeding water***.

– Do not pour water or other liquids on the equipment;
– Do not pour inflammable substances on the equipment;
– Do not use the equipment in presence of gas, explosive or flammable vapors;
– Before performing any maintenance or cleaning, ALWAYS DISCONNECT the power supply.





Whenever it is not possible to disconnect the unit's power supply, when the external power grid switch (main breaker) is far away or not visible to the unit, place a WORK IN PROGRESS sign on the external power grid switch (main breaker) after turning it OFF.

– Make sure the electrical system is grounded conforming to current laws and/or standards;
– **Do not remove any label or nameplate from the equipment; request new ones, if necessary**.
– Use only original replacement parts.

Failure to observe the warnings listed above releases the manufacturer from all liability.

CUSTOMER SERVICE

For all service and repair inquiries:

Canada	1-800-870-7777
United States:	1-800-572-1211
International:	(416) 446-4500
Email:	techservice.ca@scican.com (Canada) techservice.us@scican.com (USA) techservice.int@scican.com (International)

PRODUCT OVERVIEW

Bravo units are SciCan's revolutionary chamber autoclaves designed with safety, performance, flexibility and ease of use in mind.

They are a sophisticated yet easy-to-use sterilizer with a wide range of configuration options and patented operating devices designed to satisfy every need for sterilizing medical and dental tools, guaranteeing the maximum performance under all conditions.

They also feature user-friendly interface. Rather than having to adapt to the machine and its characteristics, users can configure the unit to their own needs .

Easy-to-use, compact and aesthetically pleasing, Bravo units are the ideal partner for professionals seeking maximum sterilization safety.

Bravo units are completely microprocessor-controlled, and offers a large (17 or 21-liter) sterilization chamber made of stamped stainless steel.

They are characterized by an advanced fractionated vacuum system for the complete removal of air from hollow and porous materials, and an effective final vacuum drying phase capable of effective drying of these loads.

Their exclusive steam generation system, effective plumbing circuit and electronic management (supplemented by high-precision sensors) guarantees high speed in the process execution and excellent stability of the thermodynamic parameter .

Their exclusive steam generation system, effective plumbing circuit and electronic management (supplemented by high-precision sensors) guarantees high process execution speeds and excellent thermodynamic parameter stability. Moreover, their Process Evaluation System constantly monitors all the machine's vital parameters in real-time, guaranteeing absolute safety and perfect results.

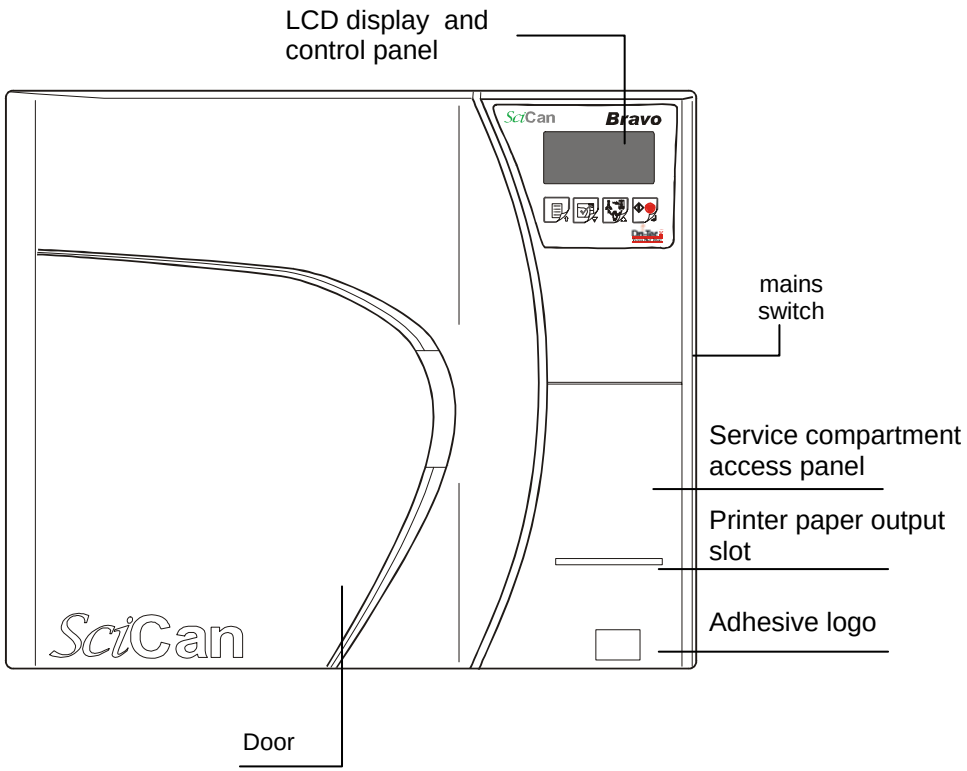
They offer users 10 sterilization programs (one customizable), each equipped with optimized drying for the fast, effective sterilization of the various types of loads (instruments and materials) used in a medical or dental environment. The custom programs have not been validated and have not been cleared in the U.S. by FDA for healthcare use.

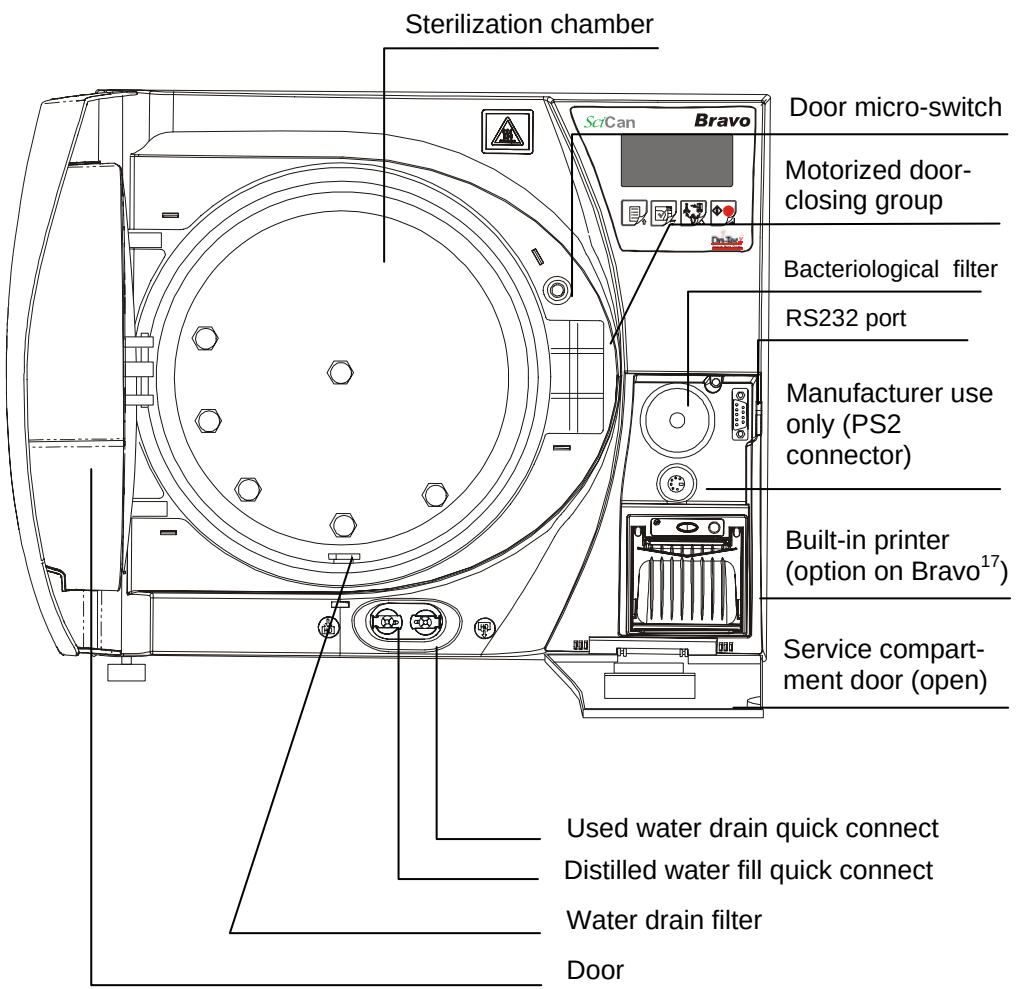
Bravo units also offer a number of interesting options for configuring the preheating mode (based on the sterilizer's frequency of use) and printing the cycle report. Refer to the chapter “Configuration” for more detail.

Bravo sterilizers also have one of the most complete, sophisticated and advanced safety systems available today to protect users in the case of electrical, mechanical, or thermal operating anomaly.

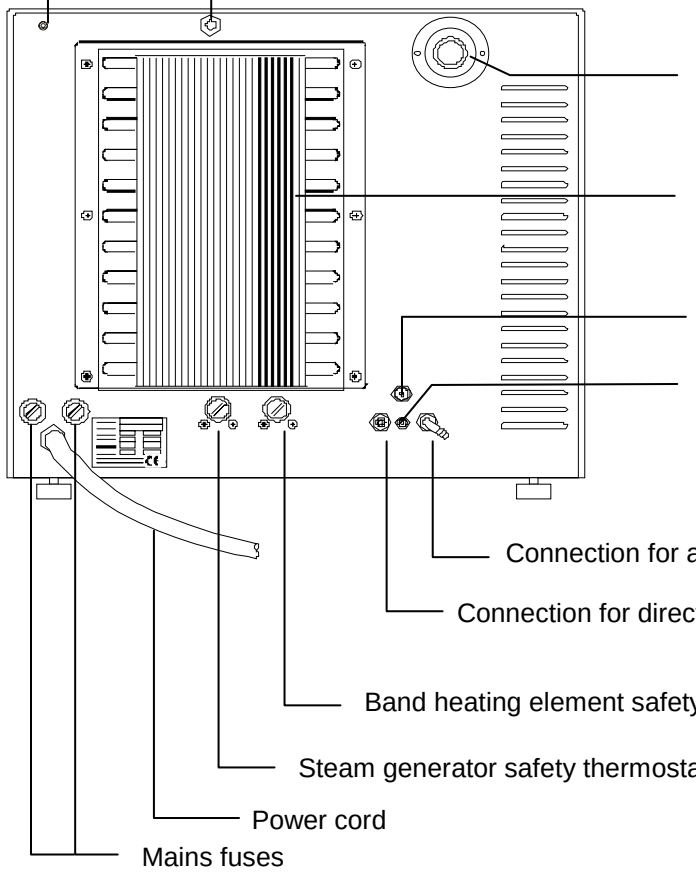
☞ Refer to chapter ***Technical characteristics*** for a description of the integrated safety devices.

FRONT VIEW

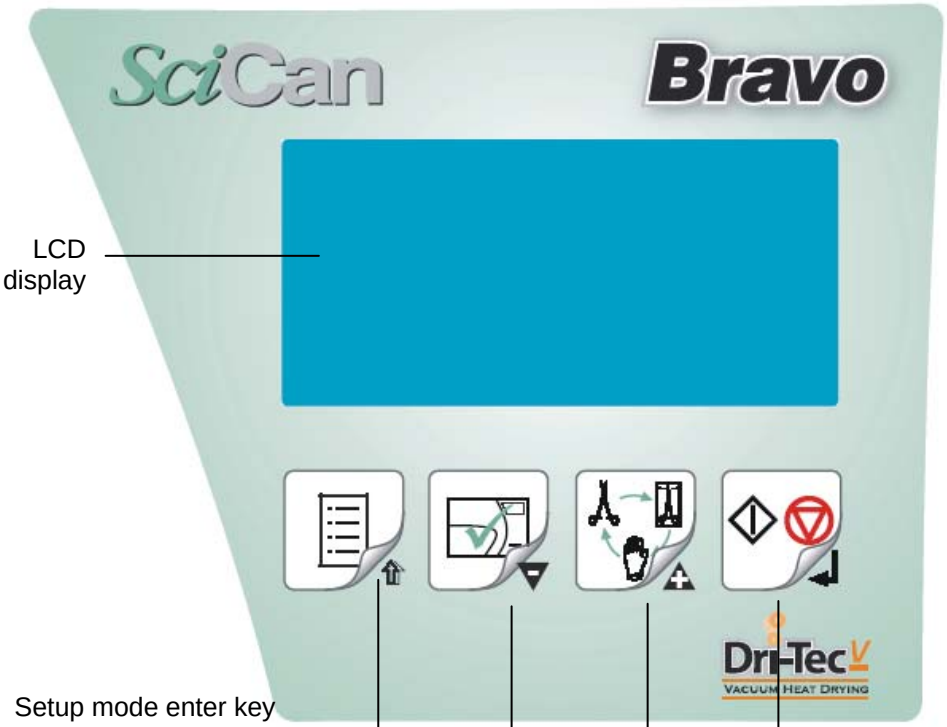

LCD display and control panel
mains switch
Service compartment access panel
Printer paper output slot
Adhesive logo
Door
SciCan
Bravo


Sterilization chamber
Door micro-switch
Motorized door-closing group
Bacteriological filter
RS232 port
Manufacturer use only (PS2 connector)
Built-in printer (option on Bravo17)
Service compart-ment door (open)
Used water drain quick connect
Distilled water fill quick connect
Water drain filter
Door
SciCan
Bravo

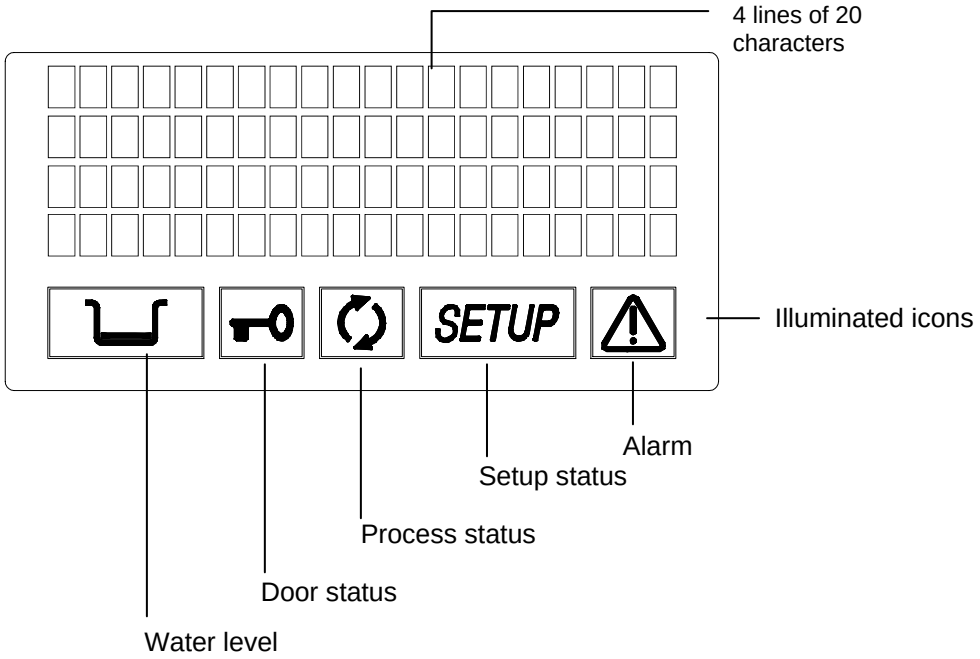
REAR VIEW


Signal input for future Bravo Pure Start/Stop cable
Distilled water tank vent hole
Safety valve
Heat exchanger
Distilled water tank draining point (maintenance)
Jack socket for the external tank level sensor (option)
Connection for automatically filling the distilled water tank
Connection for directly draining the used water tank
Band heating element safety thermostat (manual rearm pushbutton)
Steam generator safety thermostat (manual rearm pushbutton)
Power cord
Mains fuses

CONTROL PANEL



LCD DISPLAY



TECHNICAL CHARACTERISTICS

Equipment		Bravo^{17}, Bravo^{17V}, Bravo^{21V}		
Manufacturer		SciCan Ltd. 1440 Don Mills Road Toronto ON M3B 3P9 CANADA Phone: (416) 445-1600 Fax: (416) 445-2727 Toll free: 1-800-667-7733		
Power supply		120V, 60 Hz	220/230V, 60 Hz	220/240V, 50 Hz
Nominal power		1700 W (15A)	2300 W (10A)	2300 W (10A)
AC fuses *(6,3 x 32 mm)*		F 15A	F 15A	F 15A
On-board fuses (5 x 20 mm)				
pcb "GAM" version	F1 (secondary trafo)	T 5A 250V	T 5A 250V	T 5A 250V
	F2 (primary trafo)	T 4A 250V	T 2A 250V	T 2A 250V
	F3 (door-lock accidental activation)	F 200mA 250V	F 200mA 250V	F 200mA 250V
	F4 (door-lock overload)	F 1.25A 250V	F 1.25A 250V	F 1.25A 250V
pcb "TROLL" version	F1 (Secondary trafo):			T 6,3A 250V
	F2 (Primary trafo):			T 3,15A 250V
pcb Printer Power Supply	F1 PTR (printer protection):	T 5A 250V	T 5A 250V	T 5A 250V
External dimensions *(LxDxH)* *(excluding rear connections)*		Bravo$^{17/17V}$ 480x560x420mm / 18.9 x 22.04 x 16.5" Bravo^{21V} 480x660x420mm / 18.9 x 26 x 16.5"		
Insulation class		Class I		
Installation category		Cat. II		
Environment of use		Internal use		
Noise level		<60 db(A)		
Environmental operating conditions		Temperature: +15°C to +40°C Relative Humidity: max 80%, non condensing Altitude: max 3000 m *(a.s.l.)*		

Net weight:	Bravo^{17}	Bravo^{17V}	Bravo^{21V}
- empty)	~ 50kg/110 lbs	~ 53kg/117 lbs	~ 58kg/128 lbs
- empty with trays & support)	~ 55kg/121 lbs	~ 58kg/128 lbs	~ 63kg/139 lbs
- empty with trays, supports, max water)	~ 59kg/130 lbs	~ 62kg/137 lbs	~ 67kg/148 lbs
Sterilization chamber dimensions *(Diameter x Length)*	Bravo^{17}, Bravo^{17V} D250 x L350 mm / D10" x L14" Bravo^{21V} D250 x L450 mm / D10" x L18"		
Sterilization chamber total volume	Bravo^{17}, Bravo^{17V} ~ 17 L (0.017 m^3 / 0.60 ft^3) Bravo^{21V} ~ 21 L (0.021 m^3 / 0.74 ft^3)		
Distilled water tank capacity *(supply)*	~ 4.6 L / 1.22 USgal *(water at MAX level)* ~ 0.8 L / 0.02 USgal *(water at MIN level)*		
Sterilization programs	Available: 10 Pre-sets: 4 *(direct selection by user)*		
Test programs	Helix/Bowie & Dick Test Vacuum Test		
Preheating time *(from cold)*	~ 10 minutes		
Serial connection	DB-9 pin *(female) connector*		
Bacteriological filter *(PTFE filtering element)*	Porosity: 0.2 µm Connection: male 1/8" NPT connector		

SAFETY DEVICES

The sterilizer is equipped with the following safety devices; follows a brief description of their function:

– **AC mains fuses** (see technical characteristics)
Protects inside the device against a fault (i.e. heating elements short circuit).
Action: cuts the electricity.

– **on-board fuses** (see technical characteristics)
Protects against a fault in the primary transformer circuit and low voltage uses.
Action: cuts power to one or more low-voltage circuits.

– **Thermal circuit breakers on the mains voltage windings**
Protects against overheating of the vacuum pump motor and the primary transformer windings.
Action: temporary cut-off (until cooling) of the winding.

– **Safety valve**
Protects against overpressure in the sterilization chamber.
Action: releases the steam and restores to a safe pressure.

– **Steam generator manual re-arm safety thermostat**
Protects against steam generator overheating.
Action: cuts-off the electricity to the steam generator.

– **Heating element manual re-arm safety thermostat**
Protects against overheating of the heating elements of the container under pressure.
Action: cuts-off the electricity to the chamber heating element.

– **Door position safety microswitch**
Confirms the door is correctly closed when the container is under pressure.
Action: signals incorrect door position.

– **Mechanized door lock mechanism with electromechanical protection (pressure switch)**
Protects against accidental opening of the door (even in a blackout).
Action: locks the door.

– **Door lock mechanism safety microswitch**
Confirms the door lock is operating correctly.
Action: signals the failure or incorrect operation of the door lock mechanism.

– **Self-leveling plumbing system**
Plumbing system structure that allows for the spontaneous leveling of pressure in the case of a manual interruption of the cycle, alarm or blackout.
Action: automatically restores atmospheric pressure in the sterilization chamber.

– **Integrated system for evaluating the sterilization process**
Provides continuous verification of the sterilization process parameters entirely managed by microprocessor
Action: in case of anomaly, immediately interrupts the program and generates alarms.

– **Monitoring of the sterilizer's operation**
Provides real-time oversight of all significant parameters when the machine is on.
Action: in case of anomaly, generates alarm messages with possible interruption of the cycle.

WATER SUPPLY CHARACTERISTICS

DESCRIPTION	WATER SUPPLY VALUES	*VALUES IN CONDENSATE*
DRY RESIDUE	< 10 mg/l	*< 1 mg/l*
SILICON OXIDE SiO_2	< 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 (except iron, cadmium and lead)	< 0,1 mg/l	*< 0,1 mg/l*
CHORIDES	< 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 VALUE	5 - 7	*5 - 7*
APPEARANCE	colorless, transparent, without sediments	*colorless, transparent, without sediments*
HARDNESS	< 0,02 mmol/l	*< 0,02 mmol/l*

☞ When purchasing distilled water, always check that the quality and the characteristics declared by the producer are compatible with those shown in the table.

The use of water containing contaminants in level exceeding those shown in the table, will significantly shorten the sterilizer's life.
In addition, this may increase the oxidation of more sensitive materials and increase lime residues on the generator, boiler, internal supports and instruments.

INSTALLATION

GENERAL

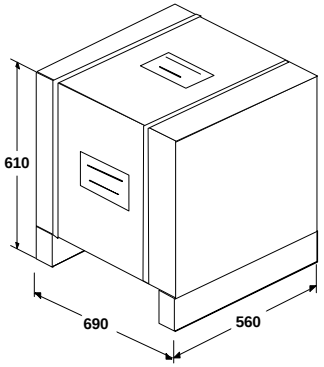
A correct and careful installation is the first and fundamental step to achieve an efficient sterilization and increase the equipment life. Moreover, it will avoid the risk of physical injury and property damage, as well as the equipment malfunction and fail. Follow the instructions of this chapter scrupulously.

☞ The sterilizer has passed all inspections required before being shipped, and does not require any additional calibration before being put in service

PACKAGE CONTENTS

Dimensions and weight

Height	610 mm
Width	690 mm
Depth	560 mm
Total weight	
Bravo^{17}	approx. 126 lbs / 57kg
Bravo^{17V}	approx. 136 lbs / 62 kg
Bravo^{21V}	approx. 150 lbs / 68 kg

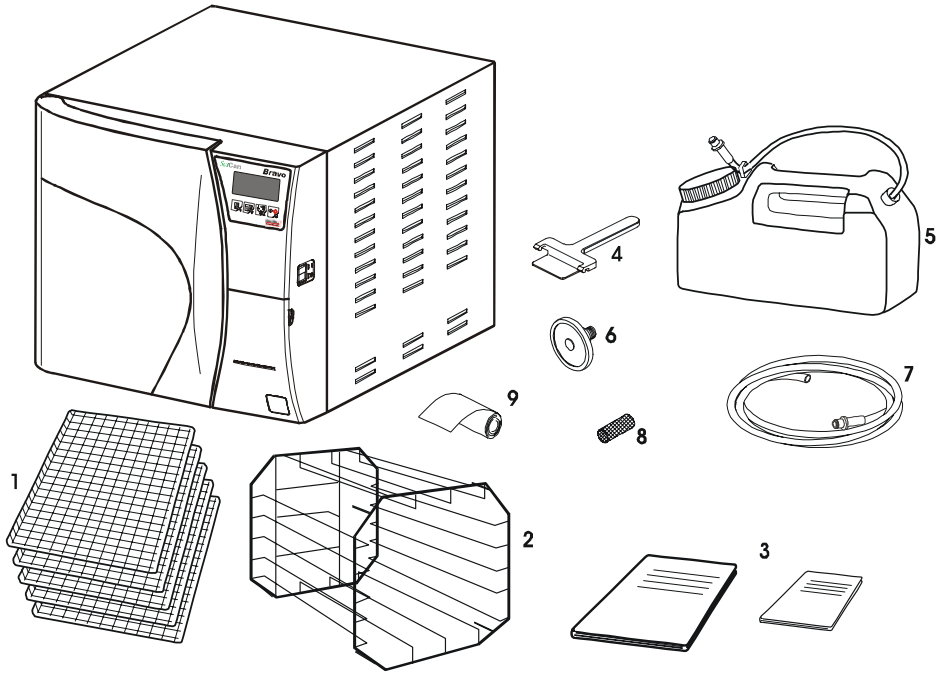


☞ Check the integrity of the package upon receipt.

Confirm that:
- the contents match the specifications of the order (see the accompanying document);
- there is no obvious damage to the contents.

☞ If you have received the wrong product, are missing parts, or if your unit has any type of damage, immediately provide a detailed description to the seller and shipper.

Contents



- Stainless steel wire instrument tray (Ref. 1)
  (5 pc with Bravo^{17V} and Bravo^{21V} models) (3 pc with Bravo^{17} model);
- Stainless steel rack (Ref. 2);
- Instruction/Operators manual and other documents (Ref. 3);
- Tray extractor (Ref. 4);
- Container with quick connect for adding distilled water (about 0.5 US gal / 2 L) (Ref. 5);
- Extra bacteriological filter (Ref. 6).
- Silicone tube (6.5 ft / 2 m) for draining water, with quick connector (Ref. 7).
- Water drain filter (Ref. 8)
- Spare roll of printer paper (Ref. 9) – only for Bravo^{17V} and Bravo^{21V} models .

☞ The customer must keep the purchase receipt for any warranty service.

HANDLING THE UNIT

Where possible, the packaged equipment must be handled using suitable mechanical means (forklift truck, transpallet, etc.) and following the instructions printed on the package.

In case of manual handling, the product must be lifted by two people using the handles cut in the side of the box.

Once removed from the box, the sterilizer must be lifted by two people and transported on a cart or other similar device.

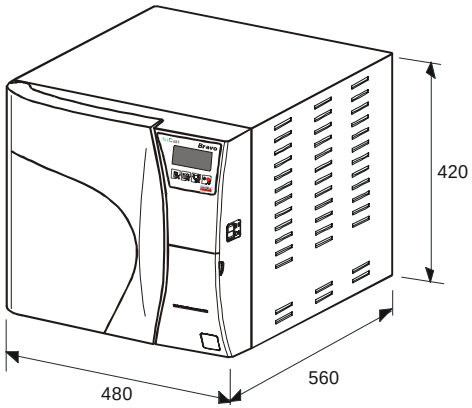
WE RECOMMEND THAT THE UNIT BE TRANSPORTED AND STORED AT A TEMPERATURE NO LOWER THAN 5 °C. PROLONGED EXPOSURE TO LOW TEMPERATURES COULD DAMAGE THE PRODUCT.

Keep the original packaging and use it when the device is transported. Using different packaging could damage the product during shipping.

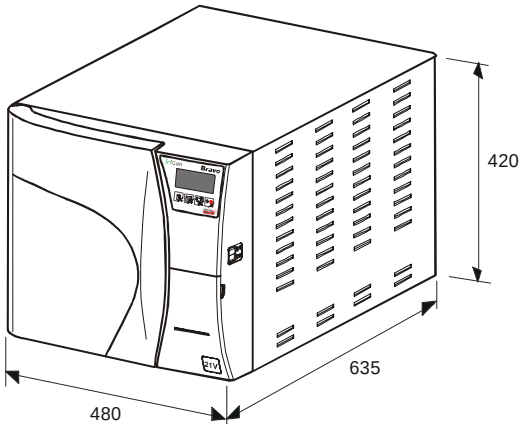
BEFORE SHIPPING, DRAIN THE DISTILLED WATER AND USED WATER TANKS, AND ENSURE THE DEVICE HAS BEEN OFF FOR 30 MINUTES FOLLOWING ITS LAST CYCLE SO THAT THE ALL THE HOT INTERNAL PARTS WILL HAVE TIME TO COOL.

Unit dimensions and weight

- Height (all models) 16.5” / 420 mm
- Width (all models) 19” / 480 mm
- Depths (excluding rear connections)
  - Bravo^{17} 22.0” / 560 mm
  - Bravo^{17V} 22.0” / 560 mm
  - Bravo^{21V} 25.0” / 635 mm
- Total weights (with rack and trays)
  - Bravo^{17} 121 lbs / 55 kg
  - Bravo^{17V} 128 lbs / 58 kg
  - Bravo^{21V} 139 lbs / 63 kg



Bravo^{17} . Bravo^{17V}



Bravo^{21V}

GENERAL INSTALLATION PRECAUTIONS

To ensure operator safety and the correct performance of the device:

- Install the sterilizer on a flat level surface strong enough to support the device's weight, and use the leveling feet to compensate for an irregular surface.
- Leave adequate space for ventilation, at least 2” (50 mm) on both side and top and 4” (100mm) at the back. If the device is installed in a cabinet, be sure to respect the warnings in the preceding paragraph, avoiding any obstructions to the air intake.
- Avoid contact with water or liquids. Do not install the sterilizer near tubs, sinks or similar places, as this could cause short circuits and/or potentially dangerous situations for the operator.
- Do not install the sterilizer in a place that is excessively humid or poorly ventilated;
- Do not install the machine were there is gas or flammable and/or explosive vapors;
- Install the device so that the power cord is not sharply bent or kinked. It must run freely to the electrical connection socket.
- Install the device so that any external fill/drain tubing(s) is/are not sharply bent or kinked. These must run freely to the drain tank.

COMPARTMENT DIMENSIONS FOR BUILT-IN INSTALLATIONS

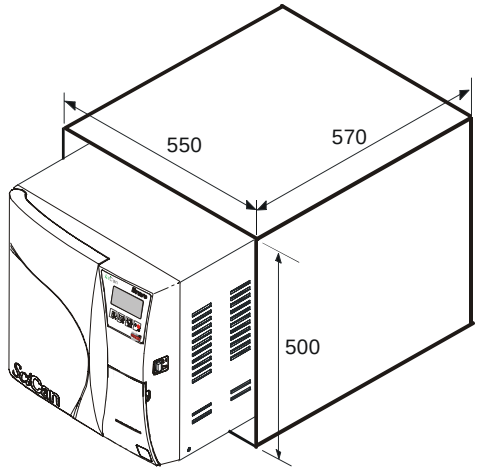
When installing the sterilizer in a cabinet, provide for adequate space all around the device (>10cm, specially in the rear) for the aeration, and a large opening on the back side in order to allow the passage of the power cord as well as an adequate air flow for the cooling of the heat exchanger.
A built-in compartment MUST have the minimum dimensions shown in the figure at right:

COMPARTMENT DIMENSIONS LESS THAN THOSE SHOWN MAY COMPROMISE THE CORRECT CIRCULATION OF AIR AROUND THE DEVICE AND MAY NOT PROVIDE ADEQUATE COOLING. THIS CAN RESULT IN THE DETERIORATION OF PERFORMANCE AND/OR POSSIBLE DAMAGE.

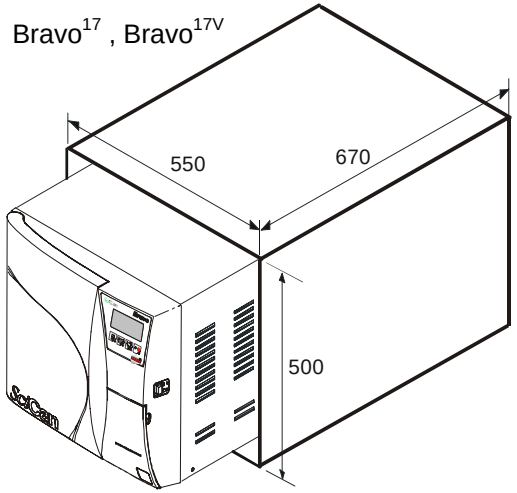
☞ If the power supply switch is not accessible, provide for an external breaker.

DO NOT REMOVE THE UPPER COVER OR ANY OTHER EXTERNAL PART. WHEN INSTALLED IN THE COMPARTMENT, THE DEVICE MUST BE COMPLETE WITH ALL ITS PARTS.

☞ Please refer to ***Technical Characteristics*** for additional data.



Bravo^{17} , Bravo^{17V}



Bravo^{21V}

ELECTRICAL CONNECTIONS

The Bravo must be connected to an outlet that provides adequate capacity for the device's absorption and ground, and which conforms with current laws and/or standards. The outlet must also be protected by suitable breaker.

☞ THE MANUFACTURER WILL NOT BE LIABLE FOR DAMAGES CAUSED BY INSTALLING THE STERILIZER ON AN INADEQUATE ELECTRICAL SYSTEM OR ONE NOT EQUIPPED WITH A GROUND.

If it is necessary to replace the plug on the power cord, use one with equal characteristics or, at any rate, adequate to the device's electrical characteristics. The user is entirely responsible for the selection and replacement of the plug. This replacement should only be performed by a trained service professional.

☞ Always connect the power cord directly to the socket. Do not use extension cords, adapters or other accessories.

CONNECTING A DATA RECORDER

The sterilizer can be connected to external data recorder to allow the recording of the cycle data on to a USB memory stick which can then be downloaded to a PC for archiving and management.

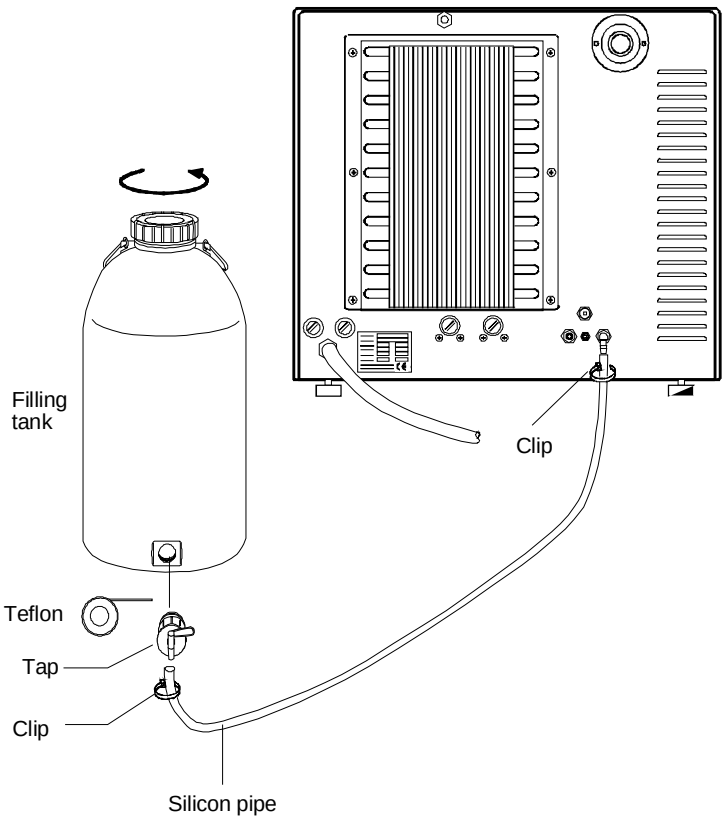
The connectors in the service compartment are used for interfacing; refer to Data Recorder Operating Manual for the installation instructions.

1. Switch off the sterilizer and open the service compartment door;
2. Insert both ends of the 9-pin connector into the serial ports of the data recorder and the Bravo unit and secure them with the screws. The serial port of the autoclave can be found next to the biological filter;
3. Insert the power connector pin in to the data recorder and then plug in the power supply;
4. Fully insert the USB stick in to data recorder.
5. Switch on the sterilizer.

CONNECTING AN EXTERNAL FEEDING WATER TANK

(OPTIONAL, automatic filling function)

To avoid having to regularly fill the internal water tank (see ***First start-up***), it is possible to connect the sterilizer to an optional external tank that the user will less frequently fill, or to a commercially-available, water purification system with accumulation tank.



With this option, the autoclave automatically activates a pump that fills the internal tank when it reaches the MIN level. Be sure to monitor the external tank as the Bravo unit can not monitor the water level in the external tank. To connect the external tank, follow the instructions below:

- Install the tap provided on the tank; use Teflon tape or connector sealant for a perfect seal .
- Use the tank's silicone tube (or other suitable tube) and insert it on the filling connector taking care to push it completely on.
- Lock the tube to connector with the plastic tie provided.
- Insert the other end of the tube on the tap of the tank
- Make sure that the tube runs freely from the device to the tank, without being bent, crushed or obstructed in any way .
- Loosen the cap to facilitate the flow of water;
- Open the tap on the feeding tank.

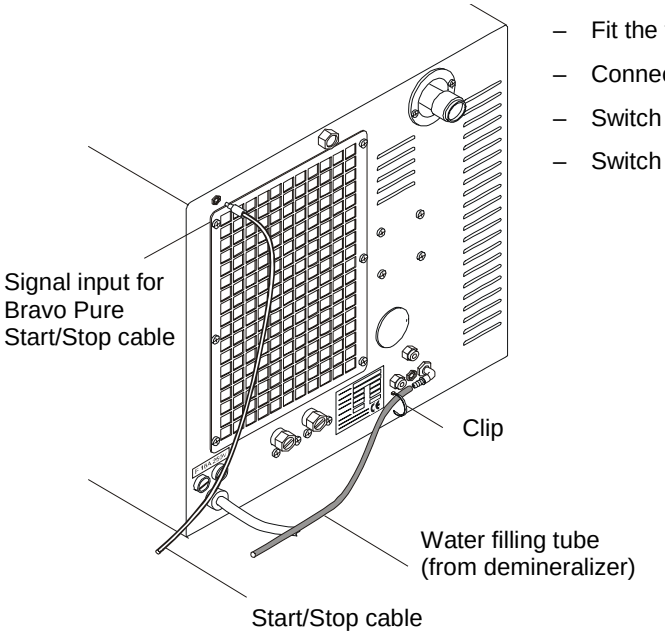
☞ For the setting of this option, refer to "***Setting the tank filling mode***").

CONNECTING DEMINERALIZER

(Optional - automatic filling option)

The sterilizer can be connected to an external clean water source (I,e., Bravo Pure or separate container of distilled water).

Refer to the demineralizer user manual for the installation instructions:



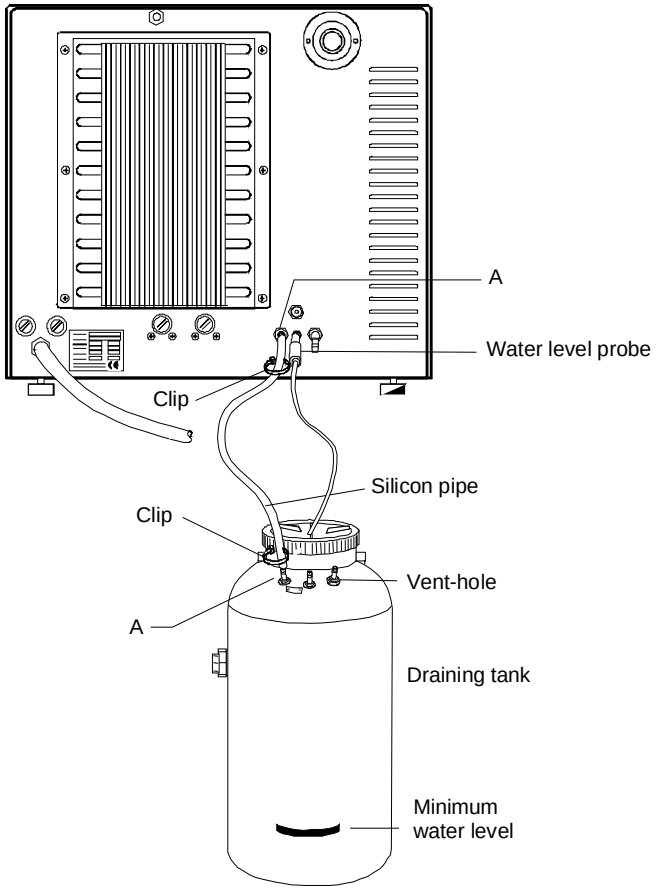
- Fit the filling tube on the rear connector; fix by a clip.
- Connect the START/STOP cable to the rear jack socket.
- Switch on the demineralizer.
- Switch on the sterilizer, enter in setup mode and configure the filling option (see "Setting the tank filling mode".

CONNECTING AN EXTERNAL WASTE BOTTLE

(OPTIONAL, external drain function)

An external optional waste bottle can be used to avoid having to manually empty the internal used water tank manually.

☞ Check that the drain silencer is correctly installed inside the tank, corresponding to connection “A”



Instructions for the correct tank connection:

– Insert the silicone tube (provided with the bottle) on connector A of the machine; push the tube all the way on and lock it with the plastic tie;

– Cut the silicone tube to measure, push the free end on connector A of the waste bottle and lock it with the plastic tie;

☞ Ensure the tube is not bent, kinked or obstructed in any way

– Connect the plug of the level sensor to the jack water level probe jack on the back of the unit. This will advise the user when the external tank needs to be emptied;

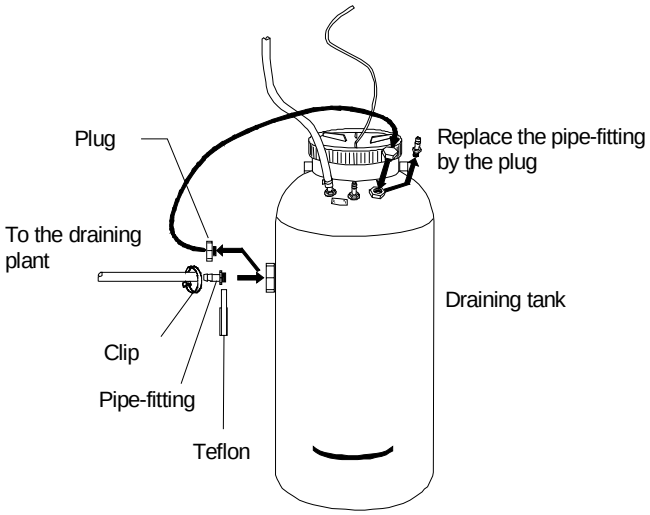
☞ Ensure the plug is correctly inserted. A poor connection will send a MAX level signal to the unit and an alarm will sound whenever you start a cycle.

– Fill the bottle with normal tap water up to the minimum water level marked on the container.

☞ For the setting of the drain option, refer to “Setting the water drain mode”.

HOT WATER AND STEAM UNDER PRESSURE COME OUT OF THE DRAIN CONNECTORS. CONNECT ALL THE ELEMENTS OF THE DRAIN CIRCUIT CAREFULLY TO AVOID PROPERTY DAMAGE AND/OR INJURY.

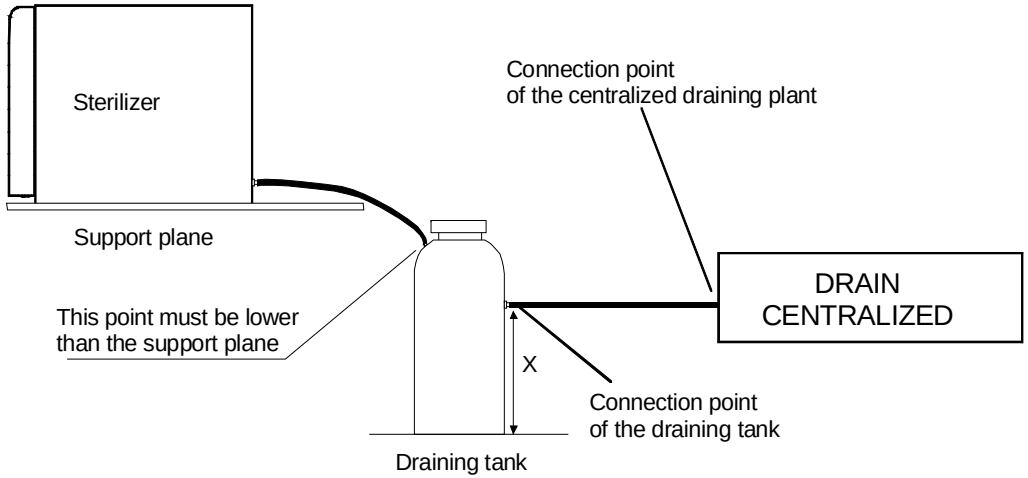
To avoid having to regularly empty the draining tank, it is possible to connect it directly to a central drain.



– Insert the plug in place of the free vent hose union on the side connector of the draining tank;
– Screw the 1/8" hose union, supplied, on the side connector, and use a wrench to hold the connector to be tightened;
– Use Teflon tape or connector sealant for a perfect seal.
– On this tube union, insert a tube of suitable material and dimensions (NOT SUPPLIED); push the tube all the way on and lock with the plastic tie provided.
– Connect the other end of the tube to the centralized draining point, checking the seal.

☞ Make sure the tube is not bent, crushed or obstructed in any way.

The following diagram depicts the ideal arrangement of components:



☞ Dimension **X** is the height of the side connector of the waste bottle above the floor. The connection between the waste bottle and the centralized draining point MUST no higher than x+30 mm (1.2”). ***Higher connections could compromise the correct emptying of the waste bottle***.

DIRECT CONNECTION TO A CENTRALIZED DRAINING POINT

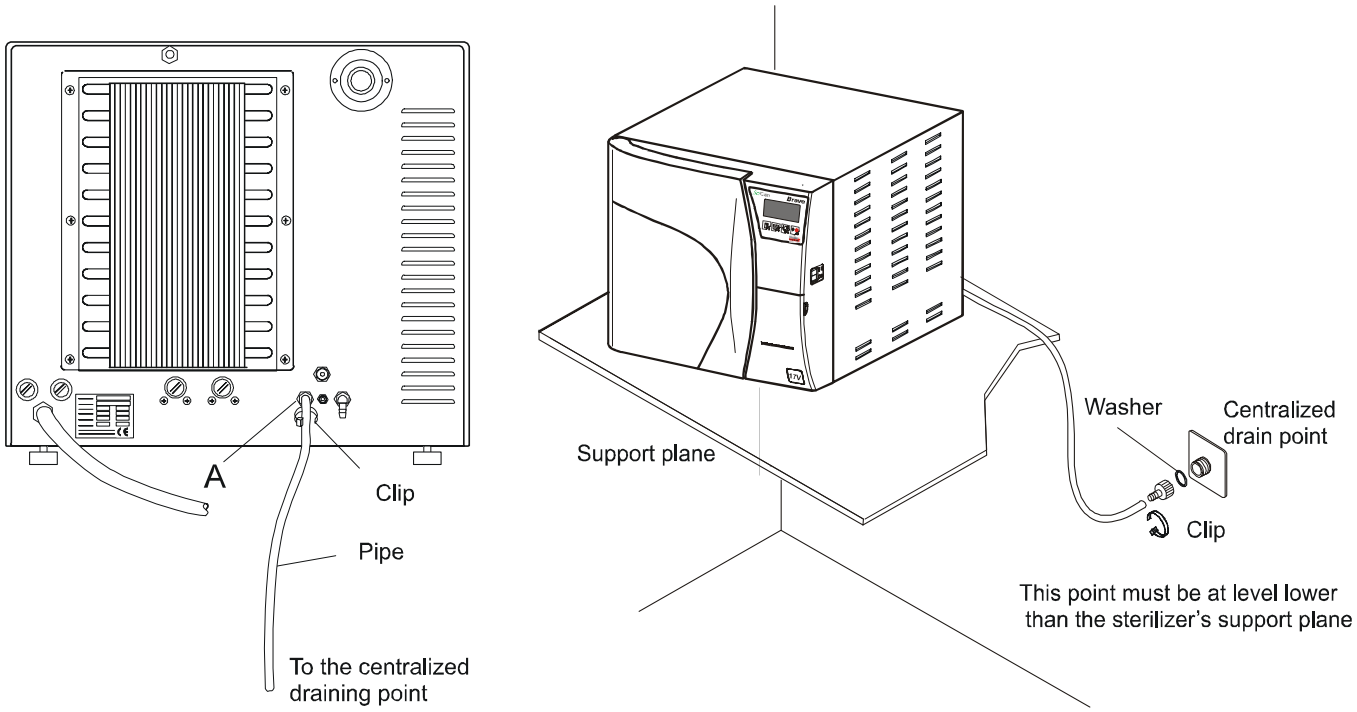
Instructions for a **correct direct connection** to a centralized draining point:

– Insert the silicone tube (provided) or other suitable plastic tube onto hose connection A; push the tube all the way on and lock with the plastic tie or other means;

– Cut the tube to measure, push the free end on the connection provided on the centralized draining point and lock with the plastic tie or other means;

☞ Make sure the tube is not bent, crushed or obstructed in any way.

The following diagram depicts the ideal arrangement of components:



☞ The connection point to the central drain must be lower than the sterilizer's support surface, otherwise the tank may not empty correctly.

ACQUISITION AND UPDATING THE AMBIENT PRESSURE VALUES

The sterilizer measures the ambient pressure for the correct operation of several auxiliary devices. Whenever the difference between the value read and that previously stored is higher than a set value, the system automatically updates the stored value after a brief delay (see **Acquisition the ambient pressure**). Otherwise, the data remains unchanged without updating.

After updating, the device performs the initial automatic test procedure (see above). At the end, the display shows the following message (accompanied by a beep):

Push the key ↵ to put the equipment in ***STAND-BY mode*** .

CONFIGURATION

General

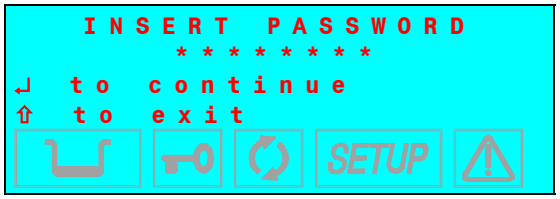
Bravo users can configure the device to meet their specific needs. For example, the device's performance may be adapted on the basis of the type of activity, the type of material to be sterilized or its frequency of use.

The SETUP program allows selecting from several options that users can activate through an easy-to-use menu.

☞ Use the SETUP program when necessary. A correctly personalized device provides the best performance.

Entering the Setup Mode

To enter the **SETUP** mode, hold down the ⇧ key on the control panel for several seconds, until the display reads “INSERT PASSWORD”. Enter the password “- - - - - - - -“ (8 x  then press the ↵ key to enter the SETUP mode,



☞ The icon SETUP of the display lights and stays on for the entire configuration phase.

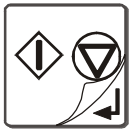
Press the key ↵ to enter the SETUP mode. The screen will show the first level menu (see ***SETUP Flowchart***).

Pressing the ESC key ↑ quits the SETUP program and takes you back to normal operation (stand-by mode).

☞ The SETUP program can only be started in STAND-BY mode. It is not accessible during sterilization or test cycles.

How the keys function in Setup mode

In SETUP mode the control panel keys have different functions than in normal mode.



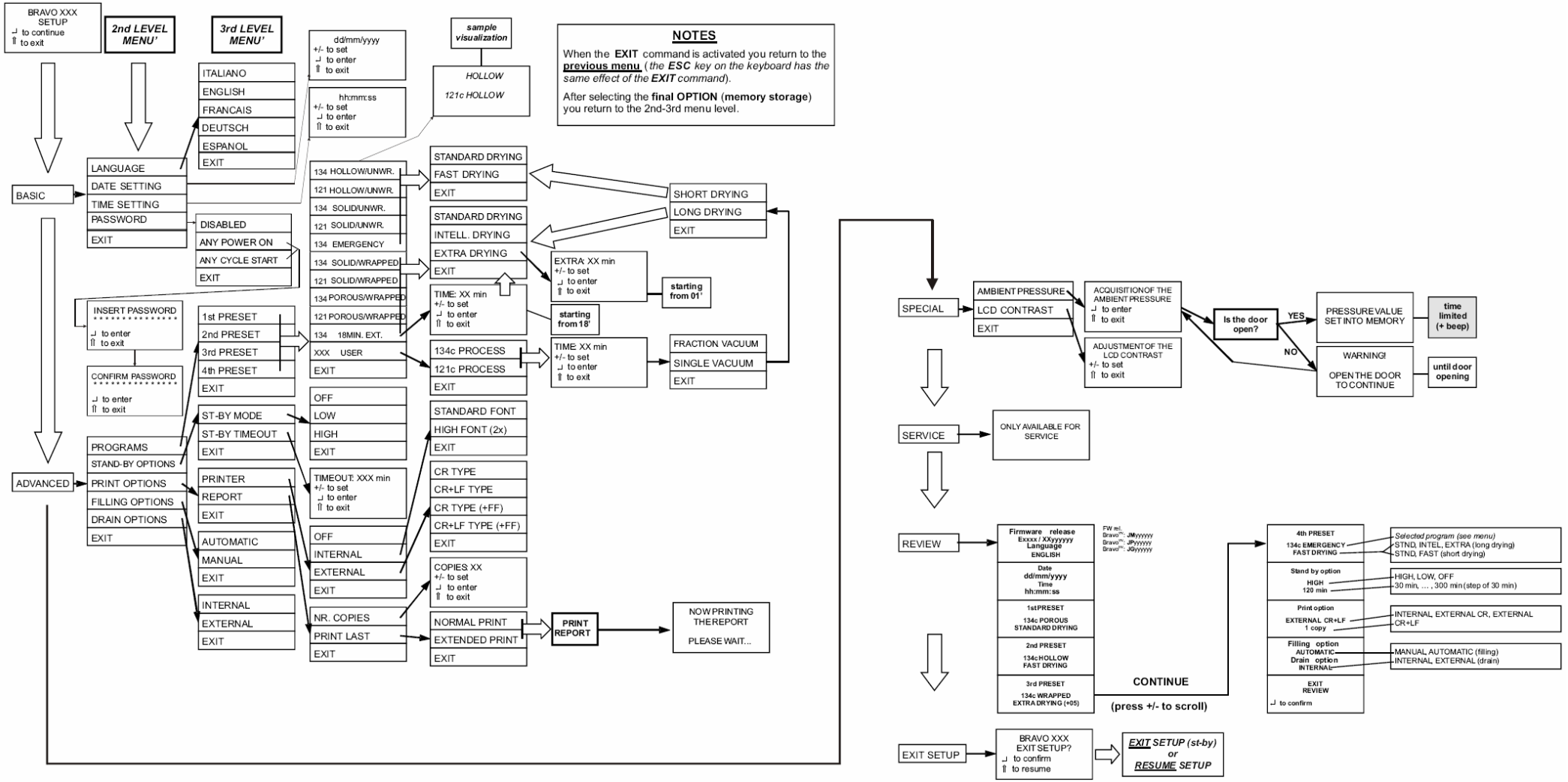
Symbol ↵ ENTER key, to confirm the selected option or value

Symbol **+** Increase the value (or scroll down the cursor)

Symbol **-** Decrease the value (or scroll up the cursor)

Symbol ↑ **ESC** key, to exit the selected menu option

Setup flow diagram



Menu items

Meaning of the main level and second-level menu items

MAIN menu - made up of 6 items:

BASIC
ADVANCED
SPECIAL
SERVICE
DATA REVIEW
EXIT SETUP

BASIC menu - (basic options) consisting of the following second-level menu items:

LANGUAGE
DATE SETTING
TIME SETTING
PASSWORD
EXIT (exit the BASIC menu and return to main menu)

ADVANCED menu - (advanced options) consisting of the following second-level menu items:

PROGRAMMES (setting preselected sterilization programs, shown on the LCD display)
STAND-BY OPTIONS
PRINT OPTIONS (setting printer and printing options)
FILLING OPTIONS (setting modes for filling the distilled water tank)
DRAIN OPTIONS (setting modes for emptying the used water tank)
EXIT (exit the ADVANCED menu and return to the main menu)

SPECIAL menu - (special options) - consisting of the following second-level menu items

AMBIENT PRESSURE (acquisition of the ambient pressure)
LCD CONTRAST (adjusting the contrast of the LCD display
EXIT (exit the SPECIAL menu and return to the main menu)

SERVICE - can be accessed only by the Service - it consists of the following second-level menu items

COMPONENT TEST
TEST CYCLES
MOCOM (only for the manufacturer)
H2O CIRCUIT
COUNTER RESET
FACTORY DATA
TECHNICAL REPORT
PT1 CORRECTION
EXIT

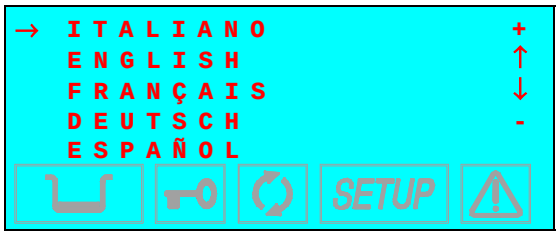
DATA REVIEW menu - displays the summary of the current settings, allowing users to verify their accuracy.

ACTIVATING CONFIGURATION OPTIONS – BASIC MENU

Setting the language

(LANGUAGE of the BASIC menu)

Selecting the LANGUAGE option with the key ↵ , the following screen will appear .



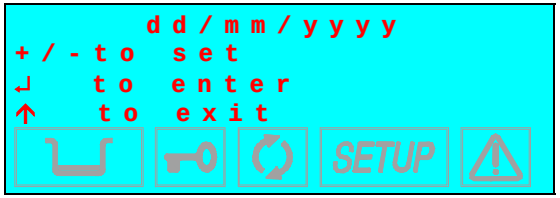
Select the desired language. Move the cursor using the keys + /– and confirm with the key ↵ . After the data is confirmed, return to the second-level menu.

☞ As soon as the selection is confirmed, all the menus of the SETUP program will be displayed in the language set.

Setting the Date

(DATE SETTING of the BASIC menu)

Selecting the DATE SETTING option with the key ↵ , the following screen will appear:



Proceed as follows:

– dd (day) is flashing: set the current day with the keys + /- . Confirm with the ↵.

– mm (month) is flashing: set the current month with the keys + /- . Confirm with the ↵.

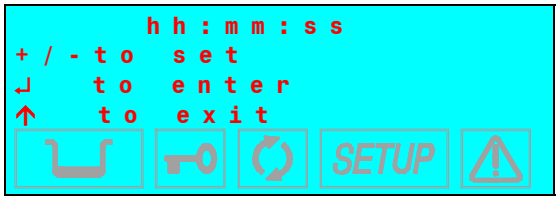
– yy (year) is flashing: set the current year with the keys + /- . Confirm with the ↵.

The date is now stored, and the previous screen returned.

Setting the Time

(TIME SETTING of the BASIC menu)

Selecting the TIME SETTING option with the key ↵ , the following screen will appear



Proceed as follows:

– hh (hours) is flashing: set the current hour value with the keys + /- . Confirm with the key ↵.

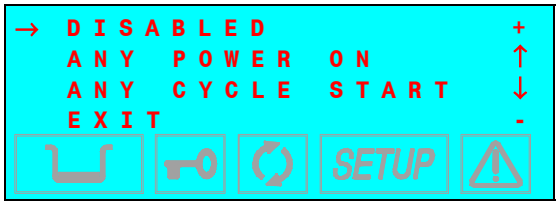
– mm (minutes) is flashing: set the current minute value with the keys + /- . Confirm with the key ↵.

The time is now stored, and the previous screen returned.

Setting the Password

(PASSWORD of the BASIC menu)

Selecting the PASSWORD option with the key ↵ , the following screen will appear:



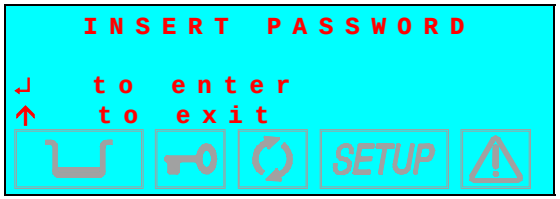
Select **DISABLED** to use the equipment freely, without limiting operator access.

Select **ANY POWER-ON** to password protect the main power switch. This allows only authorized personnel to turn the unit on. Once it is on, it can be used by any operator.

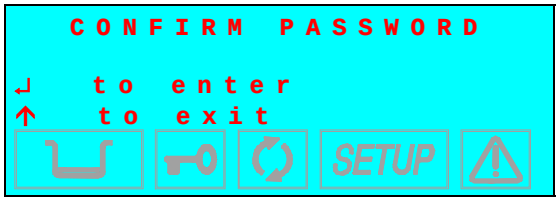
Select **ANY CYCLE START** to password protect the unit both at power-on and at the start of every sterilization program. In this mode, only authorized personnel will be able to use it.

☞ The use of password provides a more controlled utilization of the equipment but, at the same time, makes it more complex. Therefore, we suggest to enable this option only in case of real need.

When the **ANY POWER-ON** or **ANY CYCLE START** options are selected, the following screen is displayed:



Enter the password with the keys + / – (fixed length, 8 characters). Confirm with the key ↵. Then, the following message will appear:



Enter the password again using the keys + / – . Confirm with the key ↵.

☞ To change the password, first select the DISABLE option, which cancels the previous password, and then select the ANY POWER-ON or ANY CYCLE START option, entering the new password as described above.

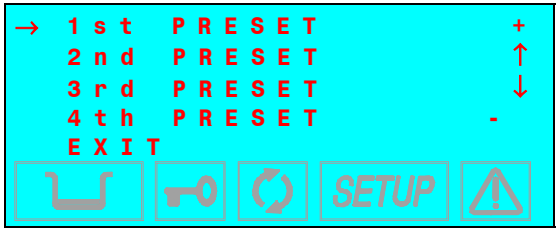
ACTIVATING CONFIGURATION OPTIONS – ADVANCED MENU

Setting the sterilization programs

(PROGRAMMES of the ADVANCED menu)

The program setting and storing under four presets is achieved at steps by using the setting menu.
Each pre-set position can be associated to a standard or user configurable cycle (CUSTOM).
Let's look at the two cases separately.
To associate a **standard program** and define several of its parameters, proceed as follows:

1. Select **PROGRAMS** using the key ↵; the following menu appears:



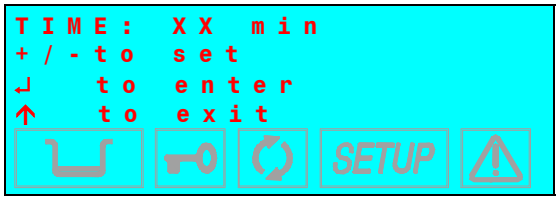
Define the position (**1**, **2**, **3** or **4**) to which the sterilization program will be associated using the **+** and **-** keys. Confirm with the ↵ key.

2. From here, you enter the list of available cycles:

Use the keys + and - to scroll the list and select the sterilization program desired.

3. Confirm the selection with the ↵ key.

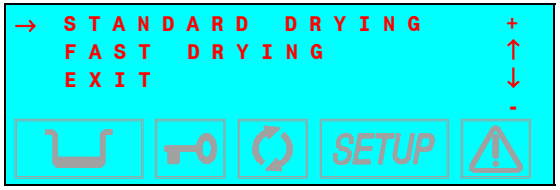
In case of **134 18 MIN: EXT**. selection, the display will show a screen for the setting of the sterilization time.



Set the value, starting from 18 minutes.

As a function of the program selected, two alternative menus are prompted for the selection of the drying type .

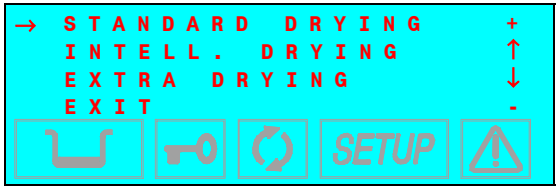
a) Programs with short drying (HOLLOW/UNWRAPPED, SOLID/UNWRAPPED and EMERGENCY):



Types of drying available: STANDARD DRYING (default setting), FAST DRYING (recommended for light loads). Move the cursor with the keys + /- and confirm with the key ↵.

☞ The EMERGENCY program allows only the FAST drying (suitable for a load up to 0.5 kg/1.1 lbs)

b) Programs with long drying (POROUS/WRAPPED, SOLID/WRAPPED and 18 MIN. EXT.)



Types of drying available: STANDARD DRYING (default setting), INTELLIGENT DRYING (automatic drying with duration depending on the load volume and/or load type), EXTRA DRYING (drying time extended by a value selectable, recommended for critical loads).

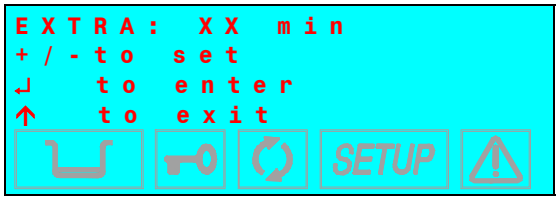
Move the cursor with the keys + /- and confirm with the key ↵ key.

☞ The FAST, INTELLIGENT and EXTRA drying options have NOT been validated.

☞ With large loads or special materials, the STANDARD drying might result not efficient . In this case, extend the drying time by selecting the EXTRA mode.

☞ With types of load particularly complex (such as wrapped instruments in autoclave "container") "INTELLIGENT" drying might result less efficient then expected. In these cases, use the STANDARD or EXTRA options, depending on the need.

In case of EXTRA option selection, the following screen appears:



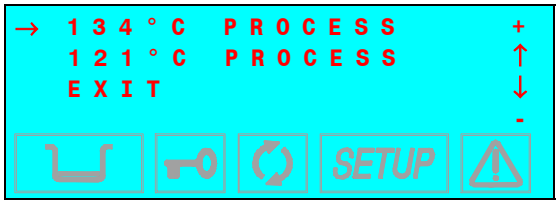
allowing to set the duration from 1 to 15 minutes (in addition to the STANDARD DRYING duration). Set the value with the keys + /- and confirm the with the key ↵.

☞ The choice of the program to be preset can be changed at any time by following the procedure as described above..

☞ If the sterilization program selected is already preset, the procedure result will be not accepted, and the following warning appears on the display, along with a beep:

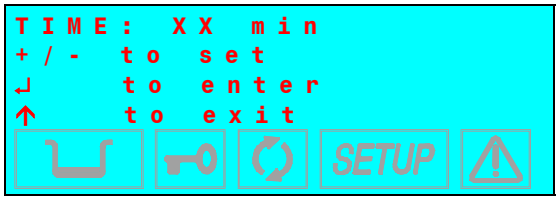
To preset the XXX CUSTOM program (and define the options), proceed as follows:

1. From the **PROGRAMS** menu, select the number to which the program is to be associated (see the previous description) and then select **CUSTOM** in the next screen. The following menu will appear:



   Select the item 121°C or 134°C PROCESS to perform a custom program with sterilization process respectively at 121°C or 134°C. Confirm the choice with the key ↵.

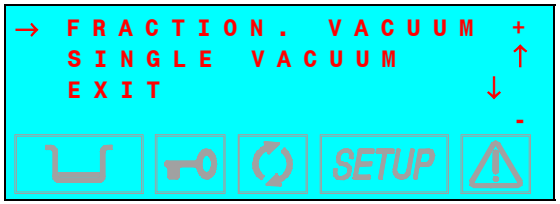
2. Next screen:



   Set the duration of the sterilization process by the keys + /- keys and confirm with the key ↵.

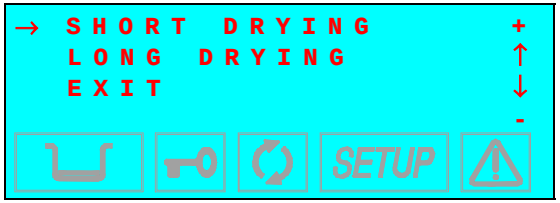
☞ The sterilization time range from 4 to 30 minutes for the 134°C program, and from 20 to 30 minutes for the 121°C program.

3. Then a next screen appears where specify the type of the initial vacuum:



   Select FRACTION. VACUUM for a fractionated vacuum (for hollow and porous materials), or SINGLE VACUUM for a single vacuum pulse (solid instruments). Move the cursor with the keys + /- and confirm with the key ↵.

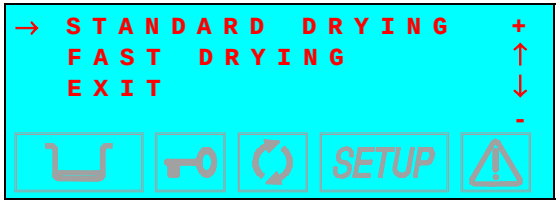
4. Next screen for the setting of the drying mode:



Select LONG DRYING for porous and/or wrapped loads, or SHORT DRYING for solid loose materials (and even hollow materials provided that not wrapped). Move the cursor with the keys + /- , confirm with the key ↵.

5. Depending on the selection (SHORT or LONG DRYING), two different screens will appear (the same as the standard cycles), i.e.

   In **SHORT** mode, the following is displayed:



   In **LONG** mode, the following is displayed :

   For the choice criteria, refer to the instruction for the STANDARD program.

1. If the program selected is already preset, the procedure result will be not accepted, and the following warning appears on the display, along with a beep:

☞ The choice of the program to be preset can be changed at any time by following the procedure as described above.

Please refer to the section **Operation** for the list of available programs, their screens and the characteristics of sterilizable materials (in relation to the programs)

The access to the XXX USER cycle does not require a password. None of the combinations available in the customization phase create any risks or dangers of injury to the operator or damage tot he device.

CUSTOM PROGRAMS HAVE NOT BEEN VALIDATED. THEY SHOULD ONLY BE USED BY EXPERIENCED USERS.

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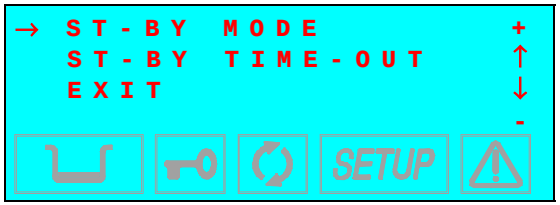
Setting the STAND-BY modes

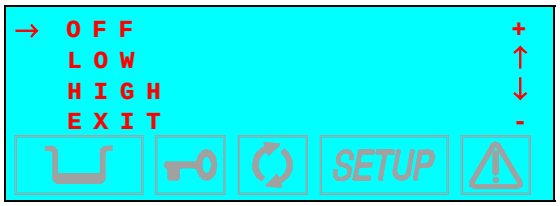
(STAND-BY OPTIONS of the ADVANCED menu)

Based on the equipment's frequency of use, or other considerations, users may want to select a high or low heating level during the STAND-BY (preheating) phase. They may also want to select a STAND-BY time-out mode that determines when the STAND-BY is deactivated.

Selecting the item STAND-BY OPTIONS, the following choice appears:



Selecting the option STAND-BY MODE, a next submenu appears for the heating level setting:



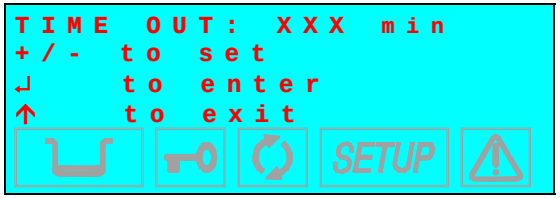
Select **HIGH** (high preheating level) to reduce the wait time between one cycle and the next.

Select **LOW** (low preheating) for normal use, since the wait time will be relatively shorter, in any case.

Select **OFF** (deactivate preheating) for occasional use. In this case, the wait time will be longer (up to about 10-12 minutes for a "cold start").

Move the cursor with the keys ↵.

On the other hand, when the **STAND-BY TIME-OUT** option is selected, it is possible to set the time for deactivating STAND-BY, i.e., how many minutes after the last cycle the heating elements are turned off.
The following screen appears:



It is possible to set a value of between **0** and **300** minutes (in 30-minute increments), after which the heating elements are turned off (a condition similar to STAND-BY OFF), avoiding the useless consumption of electricity.

Set the value with keys + /- ; confirm with the key ↵.

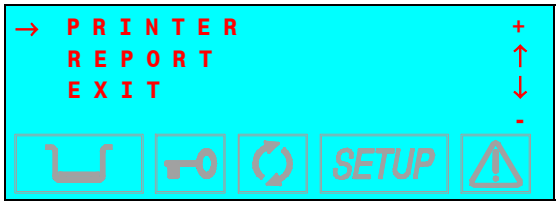
☞ This option is also active with STAND-BY OFF. However, in this condition the timer value has no effect since the heating elements are turned off anyway at the end of the sterilization program.
When any cycle selection key (sterilization or test) is pressed, or the machine is turned off and on with the main switch, the original STAND-BY mode (HIGH or LOW) is immediately reactivated

Setting the Printing mode

(PRINT OPTIONS of the ADVANCED menu)

Bravo^{17V} and Bravo^{21V} sterilizer are equipped with a built-in printer – with Bravo^{17} the printer is an option - (and optionally can be connected to an external printer) to record on paper the sterilization cycle data; to set the parameters for the printout, proceed as follows:

1. Select **PRINT OPTIONS** using the key ↵ , the following menu appears:



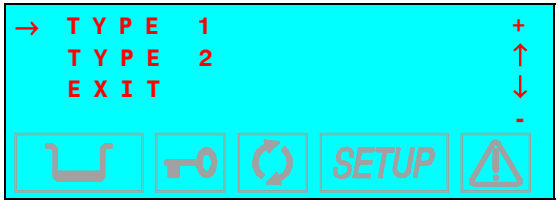
Select **PRINTER** to access the settings for the printer used, or **REPORT** to set the number of copies to print and to reprint data from the last program executed.

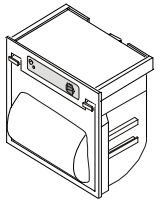
a) **Item PRINTER**

The following screen appears:

Select **OFF** to disable the print of the cycle data (or when the printer is not installed on the unit).

Select **INTERNAL** to enable the built-in thermal printer. In this case, another sub-menu opens:

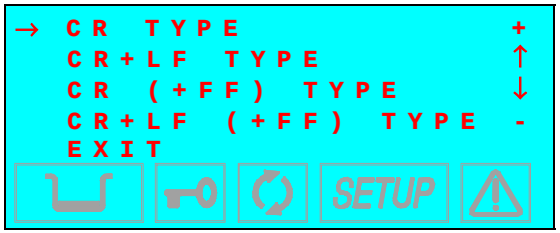




Select Type 1 for printer model 1.

(Type 2 reserved)

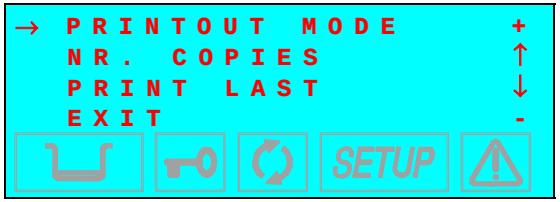
If, on the other hand, you choose **EXTERNAL**, the data will be printed on an external peripheral. Following this selection, another menu opens:



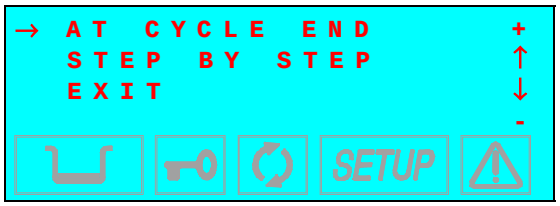
Activate **CR** to use printers that advance the paper only on the CR (*Carriage Return*) command, or **CR+LF** for those that require the CR+LF (*Carriage Return* + *Line Feed*) commands, or with **+FF** (Form-Feed) for printers that require the addition of this command.

☞ Consult the printer manual to determine the type of command used. If this information is not available, try printing with the various options to identify the correct setting.

b) **Item REPORT**
The following screen appears:



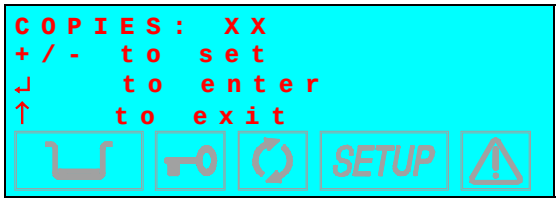
Select item PRINTOUT MODE to choose the mode in which the data is printed: The following options appear:



Select AT CYCLE END to print the report at the end of the cycle e.
Select STEP BY STEP to print the data at each phase of the cycle (see Printed report examples).

☞ The print of the Vacuum and BD Test report is carried out only in mode “At Cycle End”.

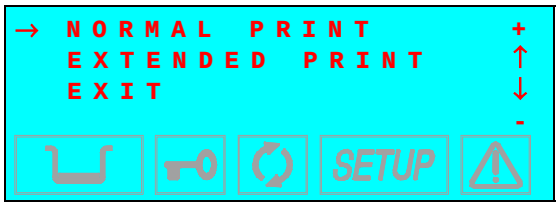
Activate **NR. COPIES** to set the number of cycle report copies to print at the end of the program. The following text appears:



Set the number of copies desired (up to a maximum of **5**). Confirm with the key ↵.

☞ In STEP BY STEP mode only 1 copy is printed.

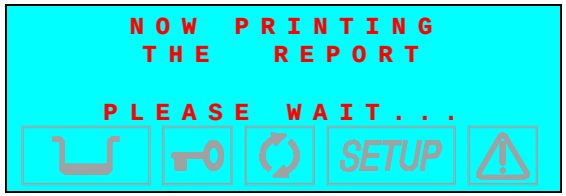
To print a report from the last cycle executed (whether it terminated correctly or was interrupted by an alarm), select **PRINT LAST** . The following screen will appear:



The **NORMAL PRINT** command activates normal printing (showing relevant cycle data and produced at the end of a correctly executed cycle), while **EXTENDED PRINT** activates a more complete print out (including all the data typical of a cycle interrupted by an alarm).

☞ If the last cycle ended correctly or was interrupted by MANUAL STOP, it is possible to reprint the report in either NORMAL or EXTENDED mode. If, however, the last cycle was interrupted by an error and corresponding alarm, only the EXTENDED report will be available. This will facilitate later troubleshooting.

When selecting the reprint command, this message will be displayed:



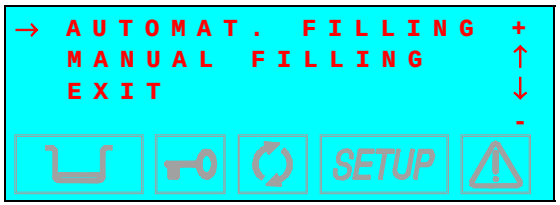
It will remain on the screen until the printing is complete.

Setting the tank filling mode

(FILLING OPTIONS of the ADVANCED menu)

The internal tank can be filled either manually or automatically. Automatic filling would occur from an external device (container or demineralizer) connected to the Bravo (see **Connecting an external water feeding tank** or **Connecting a demineralizer**).

Selecting the FILL OPTIONS, the following screen appears:



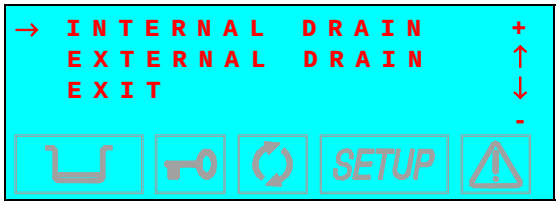
When **AUTOMATIC FILL** is selected, the unit will automatically fill the internal tank until the maximum level (MAX signal) is reached and the MAX icon is displayed.

☞ Only activate the automatic filling mode AFTER the external tank has been filled with high quality distilled water or demineralizer. Also remember to open the tap on the external tank or demineralizer, if required.

When **MANUAL FILL** is selected, the internal tank must be filled manually; see Chapter **"First Start-Up"**).
Move the cursor with the keys + /- ; confirm with the key ↵.

Setting the water draining mode
(DRAIN OPTIONS of the ADVANCED menu)

The water used for the sterilization cycle can be drained into either the **internal** tank (standard configuration) or the **external** SciCan tank of greater capacity (offered as an option, see chapter Installation - Connecting an external draining tank) so as to reduce the frequency of emptying the used water .
Selecting the DRAIN OPTIONS, the following menu appears:



Selecting **INTERNAL DRAIN** enables the reading of the MAX level sensor in the internal tank.

Selecting **EXTERNAL DRAIN** enables the MAX level sensor located in the external tank and in the internal tank.

☞ The level sensor in the internal tank remains active in either mode to prevent a possible malfunction of the external tank or a missing or faulty connection of the optional external drain tank.

☞ IF THE INSTALLATION HAS CONNECTED DIRECTLY TO THE DRAIN, SELECT INTERNAL DRAIN.

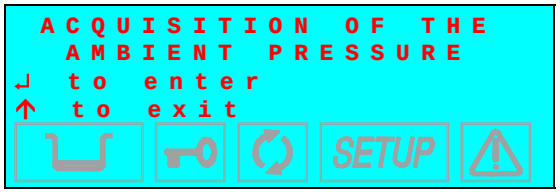
Move the cursor with the keys + /- ; confirm with the key ↵.

ACTIVATING CONFIGURATION OPTIONS – SPECIAL MENU

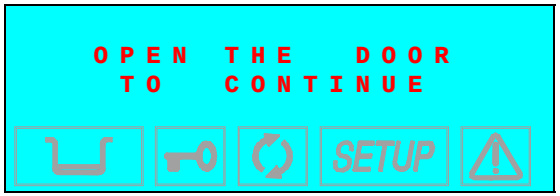
Acquisition of the ambient pressure
(AMBIENT PRESSURE of the SPECIAL menu)

The first time the sterilizer is used and after any reinstallation, the sterilizer must acquire the ambient pressure. This operation is **necessary** for the correct operation of several of the device's auxiliary systems.

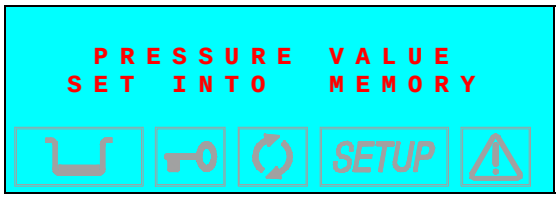
Activating the AMBIENT PRESSURE option, the following screen appears:



☞ Check that the sterilizer door is completely OPEN. If you try to acquire the pressure with the door closed the following message will be displayed:



and will remain until the door is opened. Confirm the acquisition of the data by the key ↵ . The following message will appear:



accompanied by a beep to say that the ambient data pressure has been acquired.

Press the ↑ key to cancel the operation .

Adjusting the contrast of the liquid crystal display

(LCD CONTRAST on the SPECIAL menu)

The LCD contrast function adjusts the screens' readability to compensate for the sterilizer location's lighting. Enabling this option, the following screen appears:

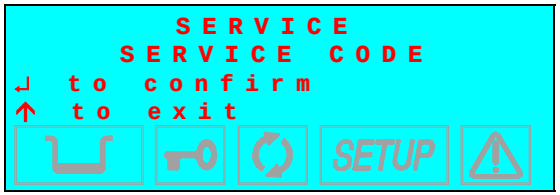
Push the key + to increase the contrast, the key - to decrease.

Adjust the contrast until the display is as clear and readable as possible, based on the location's normal conditions.

ACTIVATING CONFIGURATION OPTIONS – SERVICE MENU

These menu options are only available to the authorized Service Technicians and by entering the service code.

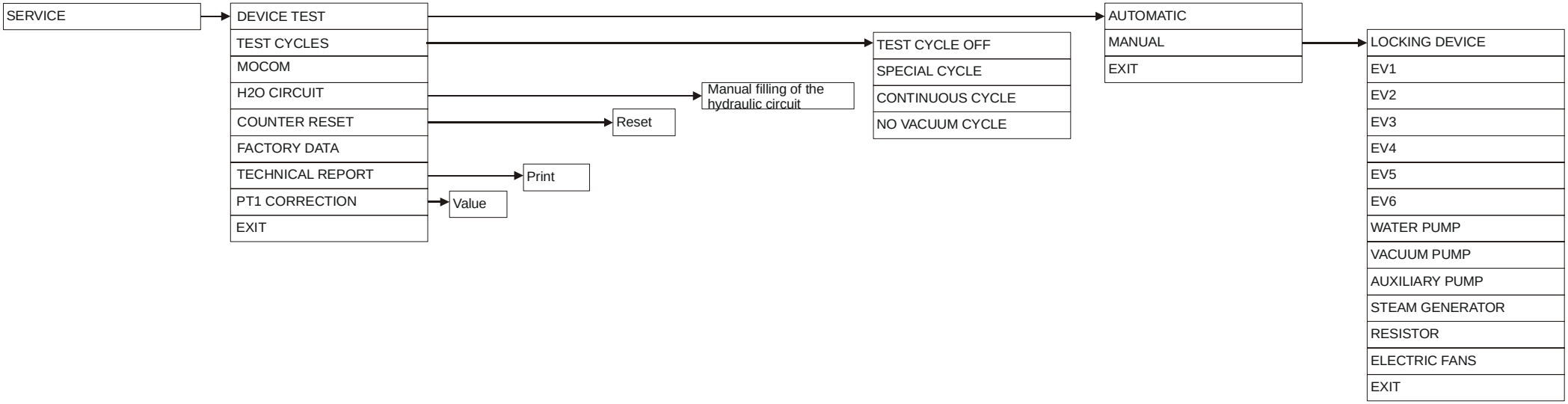
The following display is shown:



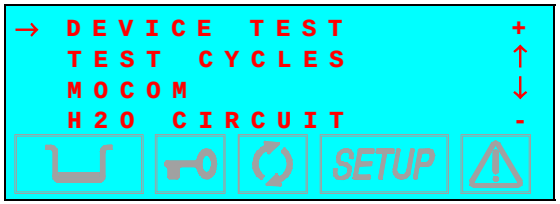
Enter the service code + + + + by using the symbol keys. The SERVICE menu consists of the following options:

DEVICE TEST
TEST CYCLES
MOCOM
H2O CIRCUIT
COUNTER RESET
FACTORY DATA
TECHNICAL REPORT
PT1 CORRECTION
EXIT

The layout of the option tree is shown in the figure.



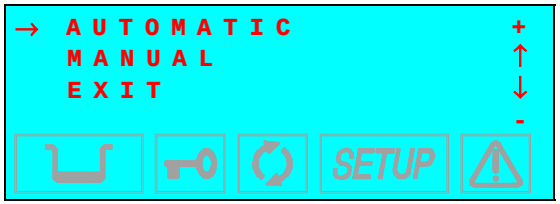
Use the keys + / - to move the cursor on the options; push the key ↵ to open the selected option or the key ↑ to exit.



Device Test

(DEVICE TEST item of the SERVICE menu)

Through this option it is possible to check any internal component of the sterilizer. The following display is shown:



Use key **+** / **-** to select the test mode, push the key ↵ to confirm.

In **AUTOMATIC**, a confirmation is required to start the automatic test of the devices according to the following sequence:

LOCKING DEVICE	WATER PUMP
EV1	VACUUM PUMP
EV2	AUXILIARY PUMP (automatic water feeding)
EV3	STEAM GENERATOR
EV4	RESISTOR (heating)
EV5	ELECTRIC FANS
EV6	

During the automatic test, the display will show **NOW TESTING ….**
and the message **AUTOMATIC TEST COMPLETE** at the end of the procedure.

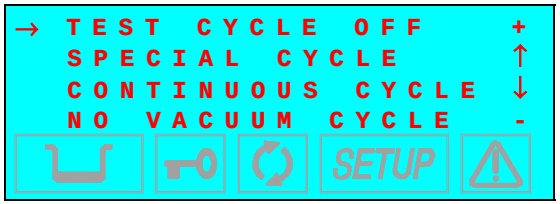
In **MANUAL** mode the display shows the list of the devices; scroll the list and select the item on which carry out the test.

Use the key **+** / **-** to select the device, push the **key** ↵ to confirm the selection.

Test cycles

(TEST CYCLES item of the SERVICE menu)

Through this option it is possible to set different test procedures as for the technician needs. The following display is shown:



Use the key + / - to select the test mode, push the key ↵ to confirm.

TEST CYCLE OFF, this option disables the test mode previously set or stops the current test cycle.

SPECIAL CYCLE , this option enables a full test of the sterilizer. Confirmed the choice and quitted the Setup menu, as you select a cycle and enter the START command, the sterilizer will launch an automatic sequence of any available cycle. At the end of each cycle, the report will be printed.

CONTINUOUS CYCLE , this option enables a test based on the continuous repetition of the cycle selected after the exit from the Setup menu.

NO VACUUM CYCLE , this option enables a test based on the cycle selected after the exit from the Setup menu, but without the pre-vacuum phases and the vacuum drying phase.

☞ See ***Attachment O*** for info about the use of these options.

MOCOM

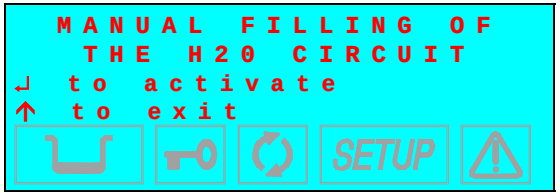
(MOCOM item of the SERVICE menu)

This item is only accessible and available to the manufacturer:

H2O circuit

(H2O CIRCUIT item of the SERVICE menu)

This option allows the check the operation of the plumbing circuit . The following display is shown:

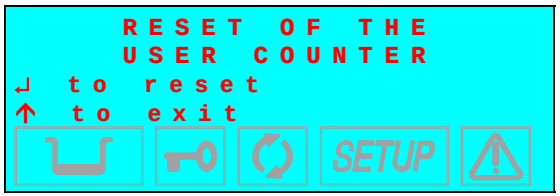


Confirming with the key ↵ , the water pump starts, and you can check the water flow into the plumbing circuit.

Counter reset

(COUNTER RESET item of the SERVICE menu)

This option allows to reset the counter (displayed on LCD) of the launched and completed cycles. The following display is shown:



To confirm the counter reset , push the key ↵.

Use this option only in special case.

Factory Data

(FACTORY DATA item of the SERVICE menu)

This option allows to restore the default data in case of data memory reset or fail.

Technical report

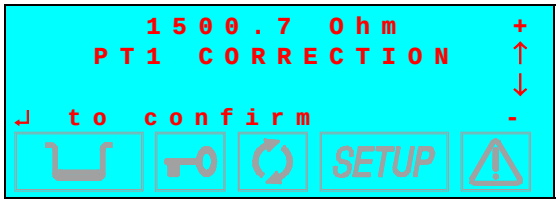
(TECHNICAL REPORT item of the SERVICE menu)

This option allows to print the data content of the history register stored in the sterilizer memory.

PT1 correction

(PT1 CORRECTION item of the SERVICE menu)

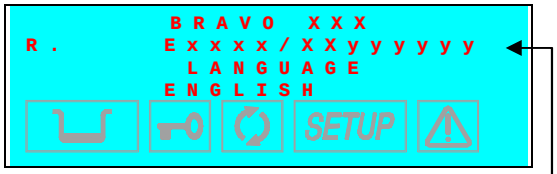
This option allows to set the value (Ohm) of the internal probe after a repair (PT1 replacement). The following display is shown:



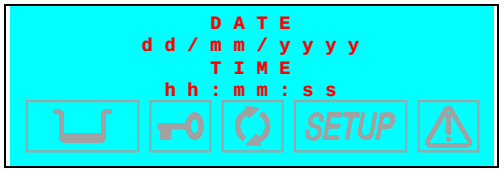
Use the key **+** / **-** to change the value displayed, push the key ↵ to confirm.

DATA REVIEW

The Data Review option displays an overview of the current settings, allowing the user to check their correctness.
The following screens are shown by way of example.

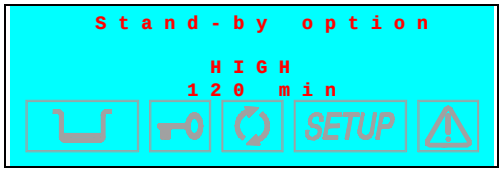


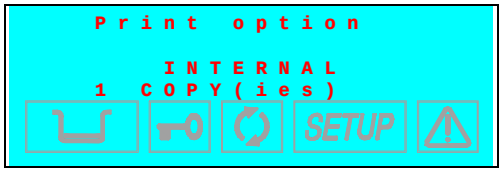
Firmware version

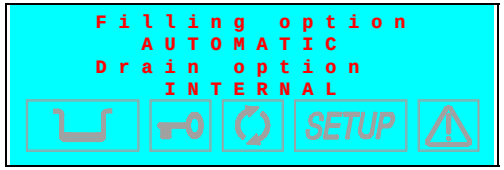


Use the keys **+** / **-** to scroll through the menu

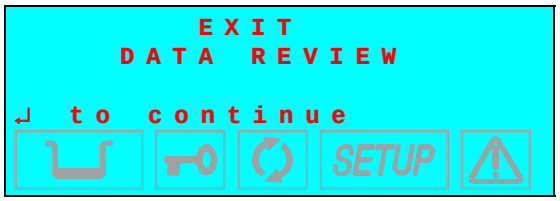
Use the keys **+** / **-** to scroll through the menu







Use the keys **+** / **-** to scroll through the menu



Press ↵ to confirm

EXIT THE SETUP MODE

When you have completed the sterilizer configuration, return to the normal mode by selecting **EXIT** and confirming with the ↵ key.

☞ To return to the first level from any menu, just select EXIT and confirm with the ↵ key. You can also press ⇧ (ESC) key one or more times (see **Flowchart of the setup**)

The display shows:

Confirm with the key ↵ .

After several seconds, the device returns to **normal operation** in **STAND-BY** mode.

DEFAULT SETTING

The sterilizer leaves the factory with the following settings:

DATE: ***current date***
TIME: ***current time***

PROGRAMMES: Preset **1**: ***134 POROUS/WRAPPED*** (***standard*** drying)
Preset **2**: ***134 HOLLOW/UNWRAPPED*** (***standard*** drying)
Preset **3**: ***134 SOLID/WRAPPED*** (***standard*** drying)
Preset **4**: ***134 SOLID/UNWRAPPED*** (***standard*** drying)

☞ This set of programs should be considered as preferential. However, different combinations, based on the destination market, are possible.

ST-BY MODE: ***HIGH*** (pre-heating)
PRINT OPTIONS: ***INTERNAL (1 copy)*** with Bravo^{17V} and Bravo^{21V}
OFF (1 copy) with Bravo^{17}
FILLING OPTIONS: ***MANUAL***
DRAIN OPTIONS: ***INTERNAL***

PREPARING THE MATERIAL FOR STERILIZATION

General

Clean and rinse all instruments before loading them into the sterilizer. Disinfectant residues and solid debris may inhibit sterilization and damage the instruments and the Bravo.

Unwrapped instruments, once exposed to ambient or external conditions, cannot be maintained in a sterile state. If sterile storage is desired, wrap the instruments to be sterilized according to the instrument manufacturer's instructions, select the appropriate wrapped cycle and allow it to run to completion.

☞ **User should use only sterilization wraps that have been cleared by FDA for the sterilization program chosen.**.

To promote drying and enable effective sterilization, wrapped or pouched instruments should not touch each other.

SciCan recommends the final user carefully choose the most appropriate sterilization cycle according to the recommendations of their leading infection control authorities and local regulatory guidelines / recommendations.

☞ Refer to PROGRAM for the list of compatible materials with the sterilizer.

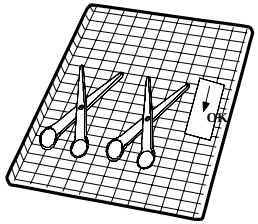
Treating textile material

With regards to **textile material** (or porous materials in general), such as smocks, napkins, caps and other, carefully wash and then dry these before they are treated in the autoclave.

☞ Do not use detergents with a high content of chlorine and/or phosphates. Do not bleach with chlorine-based products. These substances can damage the tray supports, trays and any metal instruments that may be present in the sterilization chamber.

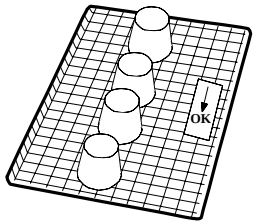
Arranging the load

To ensure proper sterilization and to reduce wear on instruments, follow the instructions below.



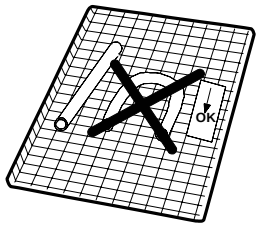
General notes for positioning on tray.

- Arrange instruments made of different metals (stainless steel, tempered steel, aluminum, etc.) on different trays or keep them well separated from each other.
- For instruments **not** made of stainless steel, place a paper sterilization napkin or a muslin cloth between the tray and the tool to avoid direct contact between these two different materials;
- Always arrange objects with some distance between them and so that they will remain so for the entire sterilization cycle;
- Make sure that hinged instruments are sterilized in an open position;
- Position cutting instruments, (scissors, scalpels, etc.) such that they do not come into contact with each other during sterilization; if necessary, use a cotton or gauze cloth to isolate and protect them;



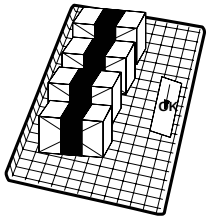
- Arrange receptacles (glasses, cups, test tubes, etc.) on their sides, or upside down to avoid pooling water ;
- **Do not load trays beyond their maximum indicated limit** (see **Technical Characteristics**).
- Do not stack trays or put them in direct contact with the walls of the sterilization chamber.
- Always use the tray support provided.
- To insert and remove trays from the sterilization chamber, always use the extractor provided.

☞ Process the appropriate biological/chemical indicator with every tray to confirm sterilization has occurred. If processing wrapped material, place the indicator inside one of the wrappings. The customer should use only biological indicators that have been cleared in their market. for U.S. customers, only use biological indicators that have been cleared by FDA for the sterilization program chosens.



Notes for rubber and plastic tubing

- Always rinse tubing with clean water before use and do not dry them;
- Arrange the tubing on the tray so that their ends are not obstructed or kinked.
- Do not bend or wind tubes, but allow them to lie as straight as possible.



Notes for packets and packages

- Arrange packages side-by-side, evenly spaced and not piled, and do not allow them to come into contact with the walls of the chamber.
- When it is necessary to wrap an object, always use suitably porous material (sterilization paper, muslin napkins, etc.) and close the wrapping with autoclave adhesive tape.

Notes for wrapped material

- It is best to wrap instruments individually, but if more than one instrument is placed in the same envelope, make sure that they are made of the same metal;
- Seal the wrapping with adhesive tape designed for autoclaves or heat-sealing machines.
- Do not use staples, pins or other fasteners since they can compromise the maintenance of sterility.
- Arrange the envelopes to avoid forming air pockets that obstruct the correct penetration and removal of the steam.
- Orient the envelopes with the plastic side up and the paper side down.
- Always check that envelopes are correctly positioned and turn them over if necessary.
- If possible, place the envelopes on their sides using a suitable support.
- If pouched or wrapped loads are not dry when they are removed from the chamber, the instruments must be used immediately or resterilized.

IF YOU EXPECT TO STORE INSTRUMENTS, ALWAYS WRAP THEM. SEE "*Storing sterilized material*.
THE USER SHOULD USE ONLY STERILIZATION WRAPS THAT HAVE BEEN CLEARED FOR THEIR MARKET.
FOR U.S. CUSTOMERS, ONLY USE STERILIZATION WRAPS THAT HAVE BEEN CLEARED BY FDA FOR THE STERILIZATION PROGRAM CHOSEN.

Sterilization monitoring

Chemical process monitors suitable for steam sterilizers at the indicated cycle temperatures and times should be included in or on each package or load being sterilized. In addition, SciCan recommends the use of biological monitors such as the EZTEST-STEAM indicator or the 3M Attest system for routine monitoring of the sterilizer. It is important to select the correct biological indicator for the cycle being tested.

STORING THE STERILIZED MATERIAL

General

The sterilized material must be adequately treated and stored to maintain its sterility.

Inadequate storage can cause not only the rapid recontamination, with risks for patient and user, but also to must perform a new sterilization cycle, with inevitable waste of time and resources.

For this reason, we provide some tips, leaving to the user the task to investigate the subject in the most suitable way.

Handling

Assuming that the sterilizer is located in a clean, free of dust and not too damp place, the following precautions should be taken when handling and/or carrying the sterile material:

1. Wear gloves and clean or sterilized (better) coat when removing the load from the sterilization chamber . As additional precaution, wear a surgical mask;
2. Put the tray on a dry, clean and disinfected surface. Take care to distance or, at any rate, separate the sterile material from the area where the contaminated material is waiting to be sterilized;
3. Touch the material and/or instruments as little as possible, taking care to not cut or damage the wrappings;
4. Let the instruments to cool before the transport (and subsequent storage). If necessary, transport the material using dry, clean and disinfected containers. The containers must be closed or covered with clean cloths.

Tips for material storage

Sterile material waiting for used must be stored using the appropriate techniques in order to slow significantly the recontamination:

1. Store the material and/or instruments in the protective wrappings that were used during sterilization. Do not wrap the instruments after sterilization since, in addition to being useless and completely senseless, is also potentially damaging;
2. Store the material in a dry, suitably clean and disinfected place, far from the area where infected material passes. If possible, use closed compartments equipped with ultraviolet light;
3. Identify the sterile material by attaching the sterilization data (attaching a copy of the printed report or an adhesive label);
4. First use the material that has been stored the longest (FIFO, "First In First Out"). This results in material that is homogeneously stored, avoiding storing for too long, with the consequent risks.
5. Never store material for too long. In fact, do not overlook the fact that materials will tend to degrade and be recontaminated in a finite time, even when the above instructions are followed.

☞ Consult the specifications provided by the manufacturer of the packaging material about the maximum allowed storage time.

FIRST START-UP

Turning on

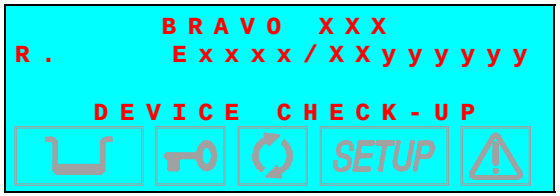
Once the sterilizer has been correctly installed, it may be turned on and prepared for use.

Turn on the Bravo using the main (luminous) switch located on the right side of the unit.

☞ Do this with the sterilizer's door open.

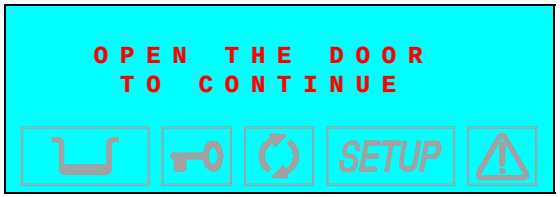
Initial autotest

When turned on, the control panel lights up and beeps so you can visually check its correct operation. The panel then displays the message:

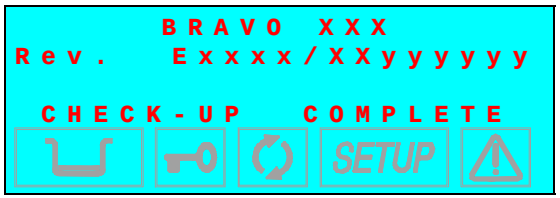


FW release:
- **JM**yyyyyy for Bravo^{21V}
- **JP**yyyyyy for Bravo^{21V}
- **JG**yyyyyy for Bravo^{21V}

☞ If the door is closed, the initial auto-test is interrupted. A warning beep is generated and the following message displayed:

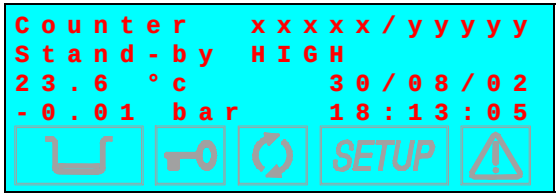


Open the door to allow the test to continue. At the end of the test you will see:



Stand-by mode

Over the initial auto-test, the sterilizer enters in STAND-BY mode and the display shows:



The upper line is the **cycle counter**. It shows the number of sterilizations performed, with the correctly completed cycles on the left and the total number started on the right. The line below shows the Stand-by status and the preheating mode (High-Low-Off). The two lower lines show the temperature and pressure of the sterilization chamber on the left and current **date** and **time** on the right.

☞ A cycle begins with the start of the sterilization cycle (first vacuum phase), excluding the preheating phase. A cycle ends at the end of the program (see Chapter "***Program execution*** ").

☞ To set the date and time as well as select the preheating mode, print the data and fill the tank, please refer to the Chapter "Configation"

At regular intervals, the first two lines on the display alternate with the modes set for printing (OFF/ON) and filling (Manual/Automatic).

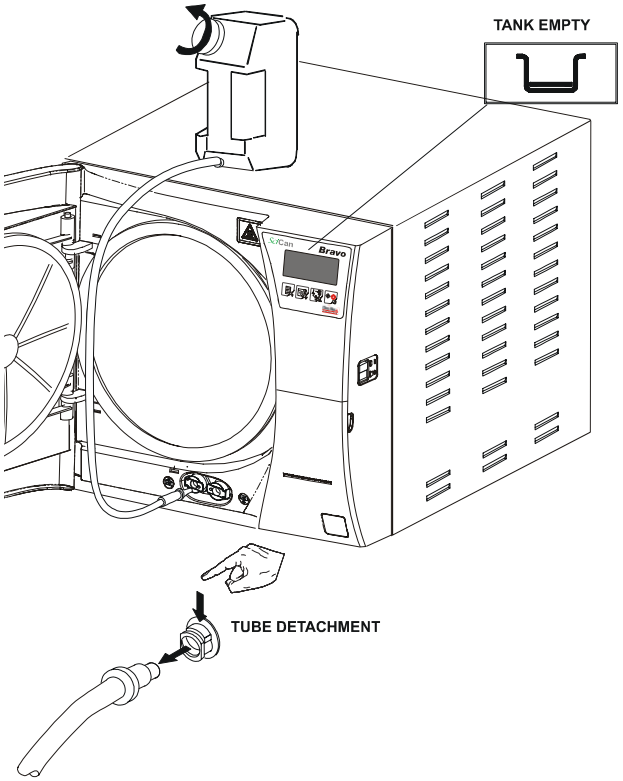
The icons in the lower part of the LCD screen remain off with the exception of the door status and/or water level indicators, which light-up if the door is closed and/or the level in the filling tank reaches its MIN or MAX values (or the MAX value in the drain tank).
During the first start-up, the MIN water level icon in the filing tank is normally on.

The device waits for the selection of the desired sterilization program (see Chapter "***Selecting the sterilization program***").

WHEN THE DOOR IS OPEN IN STAND-BY MODE, A 30-SECONDS BEEP INDICATES THAT THE SURFACES INSIDE THE DEVICE ARE HOT. TO AVOID BURNS, TAKE CARE NOT TO TOUCH THE STERILIZATION CHAMBER, THE SUPPORTS PROVIDED OR THE INSIDE OF THE DOOR WITH YOUR BARE HANDS.

Filling distilled water

Manual filling



The first time the sterilizer is used or when the MIN water level indicator comes on, you will have to fill, or top-off, the internal distilled water tank.
With reference to the figure (and with the door open), follow these steps:

1. Fill the manual container (2 litres/ 0.52 US gal) with distilled water, keeping it horizontal;
2. Connect the tube's quick connector to the corresponding female connector under the chamber entrance (marked H_2O), pushing until you hear a click;
3. Place the container in a vertical position and loosen the cap and taking care not to spill water on the machine.
4. The water will begin to flow into the tank;
5. Continue filling until the MIN level indicator turns off or the MAX level indicator turns on;
6. At this point, lower the bottle below the connection point on the unit, keeping it horizontal;
7. While pinching the tube with your fingers press the metal lever on the side of the connector and detach the quick connector;
8. Refill the container (2 litres/ 0.52 US gal) and repeat steps 2, 3 and 4 a second time until the MAX level icon appears on the display ;
9. When the MAX level icon comes on (accompanied by a beep), stop filling and detach the quick connector as described in steps 6 and 7.

☞ The MAX icon does not have to be on to start a sterilization program. There is sufficient water if the MIN indicator is off . Do not continue to fill once MAX icon appears and you hear a beep. Doing so may cause water to drain from the unit's water tank draining point at the back of the machine.

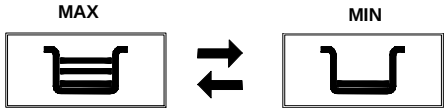
☞ Use ONLY high quality distilled water. For water specifications, see ***Technical Characteristics***.

Automatic filling

If a unit is set up for automatic filling from an external tank, the filling will occur automatically after this automatic filling option has been selected.
To set the automatic filling option, please refer to the chapter "***Setting the tank filling mode***".

THE AUTOMATIC FILLING SYSTEM MUST NEVER RUN DRY. THIS WILL CAUSE PREMATURE WEAR TO THE AUXILIARY WATER-INJECTION PUMP. PERIODICALLY CHECK THE WATER LEVEL IN THE EXTERNAL TANK.

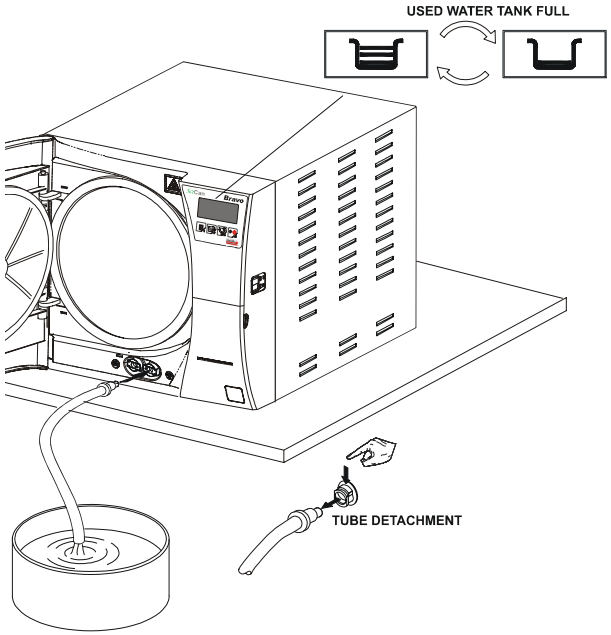
Draining the used water tank



When the water level in the internal or external drain tank reaches the MAX level, the MAX and MIN icons on the LCD display flash alternatively.

☞ If, in this condition, you tray to start a sterilization cycle, the equipment will generate an alarm.
Drain the used water tank before filling the main tank, as the reaching of the maximum level should not be signaled, and extra water spilled from the rear vent hole.

Internal tank



1. Arrange an empty container on the floor near the sterilizer and put the free end of the supplied tube into the container;
2. Connect the quick connector to the corresponding female connector under the chamber entrance (marked H2O), pushing until you hear a click;
3. Wait for the internal tank to drain completely, then while pinching the tube with your fingers, press the metal lever located on the side of the connector and detach the quick connector;
4. Press the push-button on top of the quick connector to dislodge the drain tube.

External tank

To drain the optional external tank, remove the top cap from the external tank and empty water into a sink until it reaches the minimum level.

Do not empty the tank completely, but keep a quantity of water up to the marked level. Otherwise the sound of water draining and the steam escaping from the vent-hole will increase considerably.
Refer to chapter "Connecting an external drain tank" for more details.

MAINTENANCE

GENERAL

Regular maintenance will guarantee safe, efficient operation of the Bravo over the device's entire life .
There are two levels of maintenance:
- Ordinary maintenance performed regularly by the user.
- Preventive maintenance carried out by an authorized service technician.

It is highly recommended users perform a periodic sterilizer calibration or ‘check’ of the thermodynamic parameters of the unit’s processes by comparing them with the reference values provided with suitably calibrated instruments.

☞ Refer to the ***Periodic sterilizer calibration***.

The ordinary maintenance described here is easy to complete and involves simple instruments.

ALWAYS USE ORIGINAL REPLACEMENT PARTS.

MAINTENANCE SCHEDULE

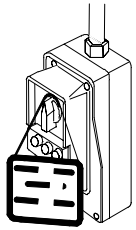
Follow this schedule to keep the sterilizer operating at peak efficiency. If units undergo **very intense use**, we recommend **shortening** maintenance intervals.

DAILY	Clean the door gasket and dish Clean external surfaces
WEEKLY	Clean the sterilization chamber and relative accessories Disinfect external surfaces
MONTHLY	Clean the internal (and external - if installed) distilled water tank Safety valve maintenance Clean (or replace) the drain filter
EVERY 3-6 MONTHS (depending on frequency of use)	Replace bacteriological filter
WHEN NECESSARY	Replace the printer paper roll
EVERY 3 YEARS (by approved personnel only)	Recommended complete maintenance and calibration of the sterilizer

General warnings

- **Do not** wash the sterilizer with direct jets of water, either under pressure or sprinkled. Seepage into electrical and electronic components could damage the functioning of the device or its internal parts;
- **Do not** use abrasive cloths, metal brushes or metal-cleaning products, whether solids or liquids, to clean the device or sterilization chamber;
- **Do not** use chemical products or disinfectants to clean the sterilization chamber. In fact, these products can irreparably damage the sterilization chamber;
- **Do not** allow lime residue or other substances to accumulate in the sterilization chamber or on the door and its gasket. They can damage these parts over time in addition to compromising the operation of the components installed along the plumbing circuit.–

☞ The formation of white spots on the base of the internal walls of the sterilization chamber is an indication that you are using low-quality demineralized water.



BEFORE PERFORMING ORDINARY MAINTENANCE, MAKE SURE THAT THE POWER SUPPLY CORD IS REMOVED FROM THE MAINS SOCKET.

WHEN IT IS NOT POSSIBLE, TURN OFF THE EXTERNAL BREAKER OF THE EQUIPMENT POWER SUPPLY LINE.

IF THE EXTERNAL BREAKER IS FAR AWAY OR, AT ANY RATE, NOT VISIBLE TO THE MAINTAINANCE WORKER, PLACE A WORK IN PROGRESS SIGN ON THE EXTERNAL BREAKER AFTER TURNING IT OFF..

Ordinary maintenance procedures

Clean door gasket and dish

To remove traces of lime, clean the door gasket and dish with a clean, cotton cloth soaked in a weak solution of water and vinegar (or similar product).

Dry the surfaces and remove any residue before using the device.

Clean external surfaces

Clean all the external parts using a clean cotton cloth dampened with water and, if needed, a neutral detergent.

Dry the surfaces and remove any residue before using the device

Clean sterilization chamber and accessories

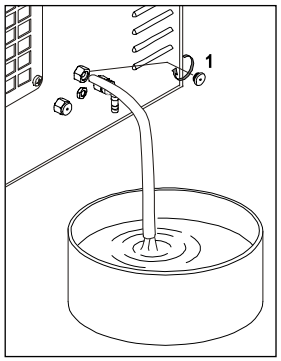
Clean the sterilization chamber, support and trays (and internal surfaces in general) with a clean cotton cloth soaked in water and, if needed, use a small amount of neutral detergent. Carefully rinse with distilled water, taking care not to leave any type of residue in the chamber or on accessories.

☞ Do not use sharp or pointed instruments to remove lime encrustation from the sterilization chamber. When there are visible deposits, immediately check the quality of the distilled water used (see ***Characteristics of the feeding water***).

Disinfect external surfaces

For the occasional disinfection of the external surfaces, you can use either denatured alcohol or detergents with a small percentage of sodium hypochlorite (or equivalent).

Clean internal distilled water tank



1. Arrange an empty container on the floor near the sterilizer and insert the free end of a tube.
2. Unscrew the plug (1) from the rear draining point and plug in the other end of the tube.
3. Wait until the internal tank is completely drained and close the draining point with the plug.
4. Prepare 4 litres / 1.06 US gal of distilled water mixed with 10% of pure alcohol and fill the supplied standard container;
5. Fill the internal tank completely with this solution and allow the solution to sit for 30 minutes.

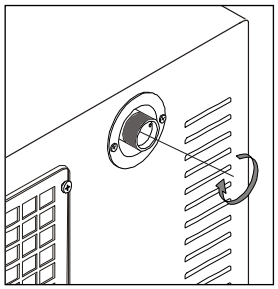
☞ Do not run any cycle during this period.

6. Now drain the internal tank and discard the solution. Close the draining point with the plug.
7. Run one empty cycle of your choice.

Clean external distilled water tank

1. Disconnect the external tank from the sterilizer and recover the distilled water contained in it.
2. Fill the tank with a solution of distilled water and alcohol (10%).
3. Allow the solution to sit for 30 minutes.
4. Drain the tank and discard the solution.
5. Reconnect the tank to the sterilizer.

Safety valve maintenance



Access the safety valve located on the rear of the machine.

Loosen the knurled locking ring with your fingers (or a suitable tool inserted in the two holes of the ring itself), turning counter-clockwise until it reaches the end and turns loosely.

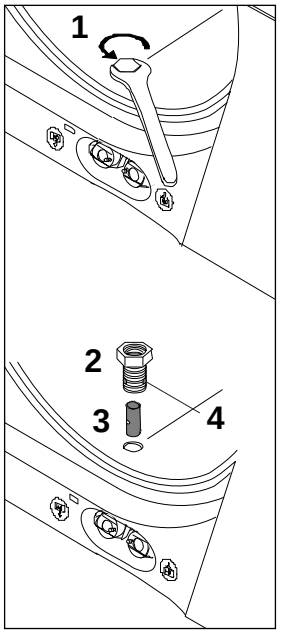
Retighten the locking ring making sure the threads are properly engaged .

Definitively tighten the locking ring all the way down.

THE USER SHOULD PERFORM THIS OPERATION MONTHLY TO GUARANTEE THE CORRECT FUNCTIONING OF THE VALVE OVER TIME..

AT THE END OF THE MAINTENANCE, MAKE SURE THAT THE LOCKING RING IS COMPLETELY SCREWED ON AND TIGHTENED.

Clean/ replace the water drain filter



Over time various residues will accumulate inside the filter, obstructing the lower drain tube.

For cleaning (or replace) the filter, open the door of the sterilizer and remove the nut (**1)** with a hexagonal wrench no. 14.

Then remove the fitting (**2)** and the filter (**3**).

Remove the filter from the support and carefully clean it under running water, using if necessary a pointed tool to remove possible material of greater dimensions.

If the filter cannot be reused, replace it with a new one.

Reassemble all the parts reversing the order in which you removed the parts. Pay attention on screwing down the fitting (**2**) so as to let the draining holes **(4)** at level of the chamber wall.

Replace bacteriological filter

When it is due to be changed, or when you notice visible clogging of the filter (when the filter turns gray) unscrew the bacteriological filter from its support and replace it with a new one by screwing it all the way down on the connector on the front of the machine.

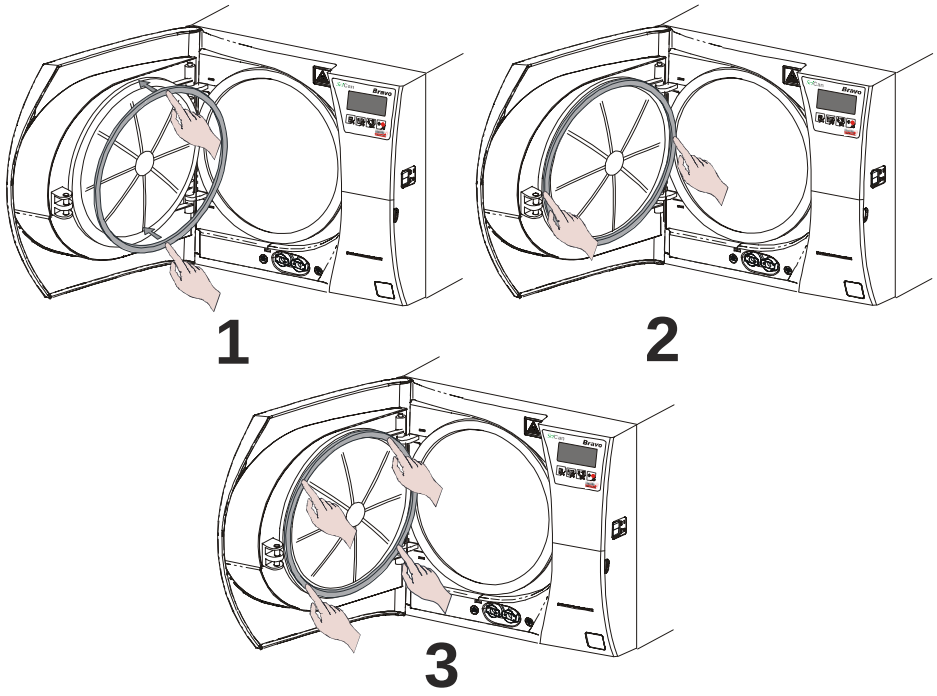
☞ A replacement bacteriological filter is supplied with the device.

Replace door gasket

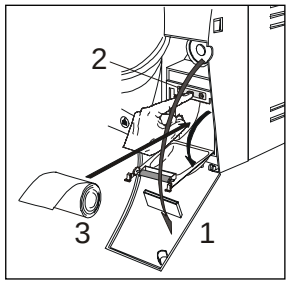
Check the inside of the door to ensure it is not hot and then remove the old gasket by hand.

Clean the door gasket seat to ensure it is debris free.

Install the new door gasket by pressing the gasket into its seat, first on top, then bottom, then both sides. Once seated on 4 sides, continue to press the remaining gasket completely into its seat.



Replace printer paper roll



To replace the printer paper roll:

1. Open the door (1) of the service compartment to access the printer,
2. Push the central button (2) to open the printer door and access the paper compartment ,
3. Remove the empty roll and place a new roll of **thermal paper** so that the paper unrolls from the top;

   Dimensions of the thermal paper roll:
   - width 57 mm (2.24") / diameter max 45 mm (1.77")

4. Unroll about 15 cm (6") of paper and close the printer door,
5. Thread the paper in the service compartment door slot and close.

☞ The central button is lit steady when the paper is regularly present, and flashing when the paper roll is empty.

PERIODIC STERILIZER CALIBRATION

To ensure proper performance of the unit, **calibrate** the **sensors** (pressure and temperature) at least every three years.

Ensuring the sterilizer is properly calibrated over time is the **responsibility of the user**.

The calibration procedure requires the use of special equipment (high-precision reference instruments, calibration tools, dedicated software, etc.) suitably verified and calibrated in addition to specific experience and training. It is therefore necessary to contact Technical Service to perform this maintenance.

☞ *The SciCan customer support department is available to provide any information relative to the periodic calibration of the sterilizer.*

2. OPERATION

THE PROGRAMS AVAILABLE

GENERAL

The steam sterilizer is appropriate for almost all materials and instruments, so long as they are able to tolerate, without damage, a **minimum temperature of 121 °C** (otherwise, you will need to use other low-temperature sterilization systems).
The following material can typically be sterilized with steam:

- Stainless steel surgical/generic instruments;
- Carbon steel surgical/generic instruments;
- Rotating and/or vibrating instruments driven by compressed air (turbines) or mechanical transmission (counter-angles, tooth scalers);
- Glass articles:
- Mineral-based articles;
- Articles made of heat-resistant plastic;
- Articles made of heat-resistant rubber;
- Heat-resistant textiles;
- Medical textiles (gauze, pads, etc.);

☞ To prevent the instruments and/or materials from electrolythic corrosion during the sterilization process, please AVOID direct contact between the following metals.

Aluminum (al) - Nickel (Ni);
Carbon steel – Nickel (Ni);
Nickel (Ni) – Chrome (Cr);
Copper (Cu) – Aluminum (Al);
Carbon Steel – Copper (Cu);
Chrome (Cr) – Copper (Cu);
Stainless steel – Aluminum (Al);
Carbon steel – Stainless steel;
Chrome (Cr) – Stainless steel.

Always separate the instruments and/or materials by metal type and electrolythic compatibility.

☞ Depending on the conformation of the material (solid, hollow or porous), any packaging (paper/plastic envelope, sterilization paper, container, muslin napkin, etc.) and its heat-resistance, it is important that you choose the appropriate program (see **Program summary table**).

The device must not be used for sterilizing fluids, liquids or pharmaceutical products.

SciCan

PROGRAM SUMMARY TABLE - BRAVO[17]

PROGRAM DESCRIPTION	NOMINAL VALUES			BASIC PROGRAM PARAMETERS					STERILIZABLE MATERIAL				NOTES
	Temperature (°C)	Pressure (bar)	Holding time (min)	Pre-vacuum (F=fractionated; S=single)	Standard drying (L=long; S=short)	Total cycle time (average load ÷ max load)	Average consumption H_2O (ml/cycle)	Average energy consumption (kWh/cycle)	TYPE	MAX TOTAL MASS (kg)	MAX MASS PER TRAY (kg)	MAX MASS PER ARTICLE (kg)	
134 POROUS/ WRAPPED	134	2,10	4	F	L	39÷44	525	0.8	Unpackaged porous material	**1.00**	0.30	0.30	For material and instruments in (single and double) packaging, we recommend using the 3-tray configuration
									Porous material in single package	**0.75**	0.25	0.25	
									Porous material in double package	**0.60**	0.20	0.20	
									Solid material / handpieces in single package	**3.00**	1.00	0.25	
									Solid material / handpieces in double package	**1.50**	0.50	0.25	
134 18min. EXT.	134	2,10	>18	F	L	51÷56	550	0.9	Unpackaged porous material	**1.00**	0.30	0.30	
									Porous material in single package	**0.75**	0.25	0.25	
									Porous material in double package	**0.60**	0.20	0.20	
									Hollow instruments in single package	**3.00**	1.00	0.25	
									Solid and hollow instruments in double package	**1.50**	0.50	0.25	
121 POROUS/ WRAPPED	121	1,10	20	F	L	54÷59	550	0.8	Unpackaged porous material	**1.00**	0.30	0.30	
									Porous material in single package	**0.75**	0.25	0.25	
									Porous material in double package	**0.60**	0.20	0.20	
									Solid material / handpieces in single package	**3.00**	1.00	0.25	
									Solid material / handpieces in double package	**1.50**	0.50	0.25	
134 HOLLOW/ UWRAPPED	134	2,10	4	F	S	30÷33	525	0.7	Unpackaged handpieces	**6.00**	1.20	0.50	

PROGRAM DESCRIPTION	NOMINAL VALUES			BASIC PARAMETERS OF THE PROGRAM					STERILIZABLE MATERIAL				NOTES
	Temperature (°C)	Pressure (bar)	Holding time (min)	Pre-vacuum (F=fractionated; S=single)	Standard drying (L=long; S=short)	Total cycle time (average load ÷ max load)	Average consumption H_2O (ml/cycle)	Average energy consumption (kWh/cycle)	TYPE	MAX TOTAL MASS (kg)	MAX MASS PER TRAY (kg)	MAX MASS PER ARTICLE (kg)	
121 HOLLOW/ UNWRAPPED	121	1,10	20	F	S	44÷47	550	0.7	Unpackaged handpieces	**6.00**	1.20	0.50	
134 SOLID/ WRAPPED	134	2,10	4	S	L	33÷36	300	0.6	Solid material in single package	**3.00**	1.00	0.25	We recommend using the 3-tray configuration
121 SOLID/ WRAPPED	121	1,10	20	S	L	47÷50	325	0.6	Solid material in single package	**3.00**	1.00	0.25	
134 SOLID/ UNWRAPPED	134	2,10	4	S	S	25÷28	300	0.5	Unpackaged solid material	**6.00**	1.20	0.50	
121 SOLID/ UNWRAPPED	121	1,10	20	S	S	39÷42	325	0.5	Unpackaged solid material	**6.00**	1.20	0.50	
134 EMERGENCY	134	2,10	3	S	Fast	16	300	0.45	Unpackaged solid material	**0.50**	0.50	0.50	
134/121 CUSTOM	134 or 121	2.10 or 1.10	> 4 or > 20	F/S	L/S	n.d.	n.d.	n.d.	Unpackaged solid material	**6.00 max**	1.20 max	0.50 max	
HELIX/BOWIE & DICK TEST	134	2.10	3.5	F	S	22	-	-	Test pack only *(without any other load)*	-	-	-	
VACUUM TEST	-	-0.80	-	-	-	23	-	-	Empty chamber)	-	-	-	

SciCan

PROGRAM SUMMARY TABLE - BRAVO^{17V}

PROGRAM DESCRIPTION	NOMINAL VALUES			BASIC PROGRAM PARAMETERS					STERILIZABLE MATERIAL				NOTES
	Temperature (°C)	Pressure (bar)	Holding time (min)	Pre-vacuum (F=fractionated; S=single)	Standard drying (L=long; S=short)	Total cycle time (average load ÷ max load)	Average consumption H_2O (ml/cycle)	Average energy consumption (kWh/cycle)	TYPE	MAX TOTAL MASS (kg)	MAX MASS PER TRAY (kg)	MAX MASS PER ARTICLE (kg)	
134 POROUS/ WRAPPED	134	2,10	4	F	L	30÷35	525	0.8	Unpackaged porous material	**1.00**	0.30	0.30	For material and instruments in (single and double) packaging, we recommend using the 3-tray configuration
									Porous material in single package	**0.75**	0.25	0.25	
									Porous material in double package	**0.60**	0.20	0.20	
									Solid material / handpieces in single package	**3.00**	1.00	0.25	
									Solid material / handpieces in double package	**1.50**	0.50	0.25	
134 18min. EXT.	134	2,10	>18	F	L	42÷47	550	0.9	Unpackaged porous material	**1.00**	0.30	0.30	
									Porous material in single package	**0.75**	0.25	0.25	
									Porous material in double package	**0.60**	0.20	0.20	
									Hollow instruments in single package	**3.00**	1.00	0.25	
									Solid and hollow instruments in double package	**1.50**	0.50	0.25	
121 POROUS/ WRAPPED	121	1,10	20	F	L	45÷50	550	0.8	Unpackaged porous material	**1.00**	0.30	0.30	
									Porous material in single package	**0.75**	0.25	0.25	
									Porous material in double package	**0.60**	0.20	0.20	
									Solid material / handpieces in single package	**3.00**	1.00	0.25	
									Solid material / handpieces in double package	**1.50**	0.50	0.25	
134 HOLLOW/ UWRAPPED	134	2,10	4	F	S	24÷27	525	0.7	Unpackaged handpieces	**6.00**	1.20	0.50	

PROGRAM DESCRIPTION	NOMINAL VALUES			BASIC PARAMETERS OF THE PROGRAM					STERILIZABLE MATERIAL				NOTES
	Temperature (°C)	Pressure (bar)	Holding time (min)	Pre-vacuum (F=fractionated; S=single)	Standard drying (L=long; S=short)	Total cycle time (average load ÷ max load)	Average consumption H_2O (ml/cycle)	Average energy consumption (kWh/cycle)	TYPE	MAX TOTAL MASS (kg)	MAX MASS PER TRAY (kg)	MAX MASS PER ARTICLE (kg)	
121 HOLLOW/ UNWRAPPED	121	1,10	20	F	S	38÷41	550	0.7	Unpackaged handpieces	**6.00**	1.20	0.50	
134 SOLID/ WRAPPED	134	2,10	4	S	L	23÷26	300	0.6	Solid material in single package	**3.00**	1.00	0.25	We recommend using the 3-tray configuration
121 SOLID/ WRAPPED	121	1,10	20	S	L	37÷40	325	0.6	Solid material in single package	**3.00**	1.00	0.25	
134 SOLID/ UNWRAPPED	134	2,10	4	S	S	17÷20	300	0.5	Unpackaged solid material	**6.00**	1.20	0.50	
121 SOLID/ UNWRAPPED	121	1,10	20	S	S	31÷34	325	0.5	Unpackaged solid material	**6.00**	1.20	0.50	
134 EMERGENCY	134	2,10	3	S	Fast	12	300	0.45	Unpackaged solid material	**0.50**	0.50	0.50	
134/121 CUSTOM	134 or 121	2.10 or 1.10	> 4 or > 20	F/S	L/S	n.d.	n.d.	n.d.	Unpackaged solid material	**6.00 max**	1.20 max	0.50 max	
HELIX/BOWIE & DICK TEST	134	2.10	3.5	F	S	20	-	-	Test pack only *(without any other load)*	-	-	-	
VACUUM TEST	-	-0.80	-	-	-	18	-	-	Empty chamber)	-	-	-	

SciCan

PROGRAM SUMMARY TABLE - BRAVO^{21V}

PROGRAM DESCRIPTION	NOMINAL VALUES			BASIC PROGRAM PARAMETERS					STERILIZABLE MATERIAL				NOTES
	Temperature (°C)	Pressure (bar)	Holding time (min)	Pre-vacuum (F=fractionated; S=single)	Standard drying (L=long; S=short)	Total cycle time (average load ÷ max load)	Average consumption H_2O (ml/cycle)	Average energy consumption (kWh/cycle)	TYPE	MAX TOTAL MASS (kg)	MAX MASS PER TRAY (kg)	MAX MASS PER ARTICLE (kg)	
134 POROUS/ WRAPPED	134	2,10	4	F	L	40÷44	675	0.8	Unpackaged porous material	**1,25**	0,40	0.30	For material and instruments in (single and double) packaging, we recommend using the 3-tray configuration
									Porous material in single package	**1,00**	0,30	0.25	
									Porous material in double package	**0,75**	0,25	0.20	
									Solid material / handpieces in single package	**4,00**	1,25	0.25	
									Solid material / handpieces in double package	**2,00**	0,60	0.25	
134 18min. EXT.	134	2,10	>18	F	L	52÷56	700	0.9	Unpackaged porous material	**1,25**	0,40	0.30	
									Porous material in single package	**1,00**	0,30	0.25	
									Porous material in double package	**0,75**	0,25	0.20	
									Hollow instruments in single package	**4,00**	1,25	0.25	
									Solid and hollow instruments in double package	**2,00**	0,60	0.25	
121 POROUS/ WRAPPED	121	1,10	20	F	L	54÷58	700	0.8	Unpackaged porous material	**1,25**	0,40	0.30	
									Porous material in single package	**1,00**	0,30	0.25	
									Porous material in double package	**0,75**	0,25	0.20	
									Solid material / handpieces in single package	**4,00**	1,25	0.25	
									Solid material / handpieces in double package	**2,00**	0,60	0.25	
134 HOLLOW/ UWRAPPED	134	2,10	4	F	S	36÷42	625	0.7	Unpackaged handpieces	**7,50**	1,50	0.50	

PROGRAM DESCRIPTION	NOMINAL VALUES			BASIC PARAMETERS OF THE PROGRAM					STERILIZABLE MATERIAL				NOTES
	Temperature (°C)	Pressure (bar)	Holding time (min)	Pre-vacuum (F=fractionated; S=single)	Standard drying (L=long; S=short)	Total cycle time (average load ÷ max load)	Average consumption H_2O (ml/cycle)	Average energy consumption (kWh/cycle)	TYPE	MAX TOTAL MASS (kg)	MAX MASS PER TRAY (kg)	MAX MASS PER ARTICLE (kg)	
121 HOLLOW/ UNWRAPPED	121	1,10	20	F	S	50÷56	700	0.7	Unpackaged handpieces	**7,50**	1,50	0.50	
134 SOLID/ WRAPPED	134	2,10	4	S	L	30÷32	375	0.6	Solid material in single package	**4,00**	1,25	0.25	We recommend using the 3-tray configuration
121 SOLID/ WRAPPED	121	1,10	20	S	L	44÷46	400	0.6	Solid material in single package	**4,00**	1,25	0.25	
134 SOLID/ UNWRAPPED	134	2,10	4	S	S	24÷26	375	0.5	Unpackaged solid material	**7,50**	1,50	0.50	
121 SOLID/ UNWRAPPED	121	1,10	20	S	S	38÷40	400	0.5	Unpackaged solid material	**7,50**	1,50	0.50	
134 EMERGENCY	134	2,10	3	S	Fast	14	375	0.45	Unpackaged solid material	**0,50**	0,50	0.50	
134/121 CUSTOM	134 or 121	2.10 or 1.10	> 4 or > 20	F/S	L/S	n.d.	n.d.	n.d.	Unpackaged solid material	**7,50 max**	1.50 max	0.50 max	
HELIX/BOWIE & DICK TEST	134	2.10	3.5	F	S	22	-	-	Test pack only *(without any other load)*	-	-	-	
VACUUM TEST	-	-0.80	-	-	-	18	-	-	Empty chamber)	-	-	-	

1) **FRACTIONATED** = Pre-vacuum stage completed with a sequence of 3 vacuum pulses + 3 pressure pulses. “Fractionated vacuum” programs are dedicated to the sterilization of porous materials or handpieces
Single = Pre-vacuum stage completed by 1 vacuum + 1 pressure pulse
“Single vacuum” programs are dedicated to the sterilization of solid materials

2) Long = Drying stage for porous material and/or handpieces and/or solid material in single/double package . The validated **LONG** drying time (**STANDARD** option) is **16.5 min**
The **EXTRA** and **INTELLIGENT** options have **not** been validated

Short = Drying stage for unpackaged solid instruments and/or unpackaged handpieces.
The validated **SHORT** drying time (**STANDARD** option) is 7 **min**

The **FAST** option, with a drying time of **2.5 min** (up to a load of **1.0 kg** max) has **not** been validated.

3) The **Total Cycle Time** indicates the approximate time required for the completion of the entire program. It does not include warm up phase initiated when the start button is pressed. Times are dependant on input voltage and load condition.

The program **121°C / 134°C CUSTOM** has holding times of 20 minutes (or more) and 4 minutes (or more) respectively at 121°C and 134°C.

Pre-vacuum type and **Drying type** can be set according to the indications given in the notes **(1)** and **(2)** above

The **121°C / 134°C CUSTOM** programs have **not** been validated

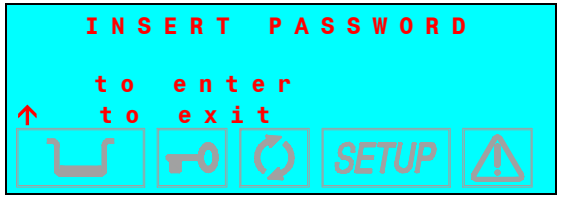
SELECTING THE STERILIZATION PROGRAM

Program selection is key to a successful sterilization process.

Since objects for sterilization can vary in shape, consistency and properties, it is important to identify the most suitable program for it. This will not only preserve its physical characteristics (avoiding or, at any rate, limiting alterations) it will ensure the most effective sterilization.

Power-on the device.

☞ If the password function has been enabled (see Chapter 6 - Configuration - Setting the password), you will be asked to enter it:



Enter the password using the keys + and – . Confirm with the key .

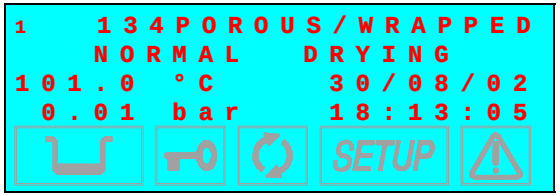
The display does not offer any active pre-selection, and waits for the user to select a program.

Press the key PROGRAM SELECTION one or more times until you reach the desired program (1, 2, 3 or 4, also shown on the upper left of the display).

☞ The first sterilization program proposed is the last cycle performed.

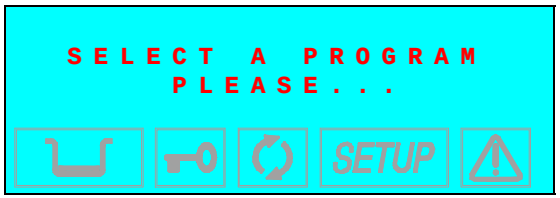
The top two lines of the display show the description of the selected program and the type of drying set. Below are the set-point values for the temperature **(°C)**, pressure (**bar**) and time (**mm:ss**) of the selected cycle. For example.

After a brief interval, the two lower lines of the display will change and show the present temperature and pressure values of the chamber, with the current date and time.



To cancel this selection, press the key ESC ↑ on the control panel.

☞ If no sterilization program is selected, the equipment cannot start a sterilization cycle, and the following message will appear, with a beep:



If you use a program that is inappropriate for the type of material to be sterilized (*see Program summary table*) the effectiveness of the sterilization process is NOT GUARANTEED.

RUNNING THE CYCLE

General

A sterilization cycle consists of a predetermined number of phases. Based on the type of air extraction, sterilization process and drying method, the number and duration of these phases can differ with each programs.

The electronic control system monitors the various phases, while checking that the various parameters are respected. If any type of anomaly is encountered during the cycle, the program is immediately interrupted, an alarm sounds and a code is displayed along with a message explaining the nature of the problem.

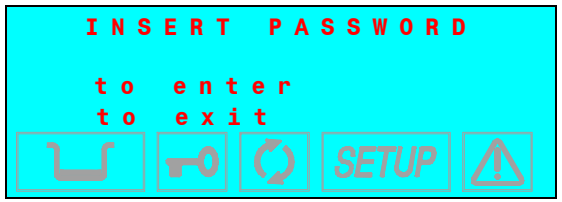
Starting the cycle

After placing the load in the sterilization chamber, select the desired program and close the door until you hear the click .

The door status icon will flash to indicate the door is closed. Press the **START** button.

☞ If the password function has been enabled (see the Chapter Configuration - Setting the password), you will be asked to enter it:,

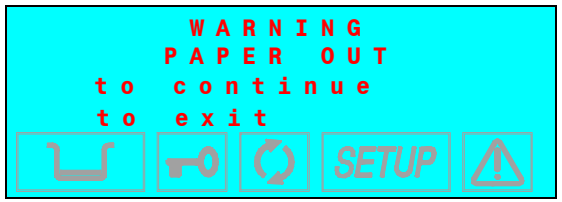
Password check



Enter the password using the **+** and **–** keys and confirm with the key .

Printer paper-out check

The equipment will check for the presence of the paper in the on-board printer (if installed). If it is out of paper the following message will be displayed:



Push key to bypass, but remember to replace the paper during or at the end of the cycle). Push the key to return in Stand-by mode.

If data recorder is connected

The unit will may check for the presence of a data recording device or depending on the type of the device, the presence of a memory card inserted. If not plugged in, the display may shows:

Ensure the data logger is properly connected and the proper memory card is installed then press the key ↵ on the command panel.
Push the key ↑ to interrupt the start command and return in Stand-by mode.

If there is insufficient memory to store the new cycle data, the following message will be displayed:

or

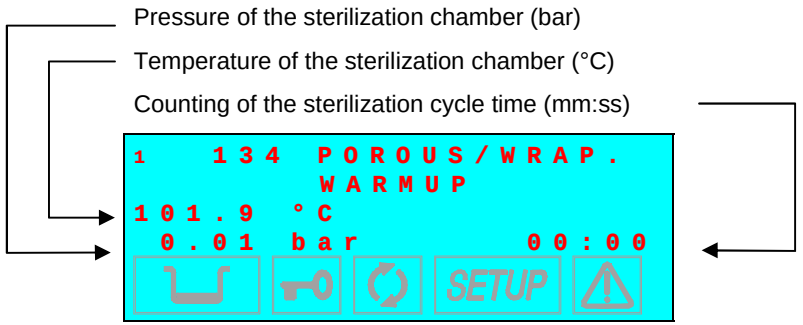
Push the key ↵ to continue without recording the cycle data.
Push the key ↑ to interrupt the start command; download the files onto a PC and delete the memory content according to the instructions of the data recorder operating manual
Repeat the **Start** command.

Door locking

After these checks, the equipment locks the door.

When the door status icon appears without blinking, the door is locked.

After the START command, and during the entire sterilization cycle, the lower lines of the display will show the following parameters:

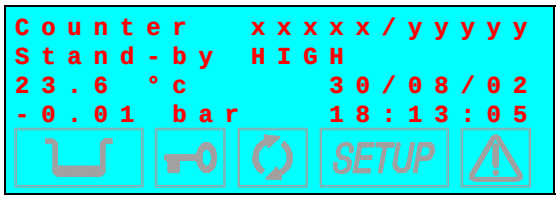


Cycle time is counted from the start of the sterilization cycle (at the first vacuum pulse), excluding the preheating phase.

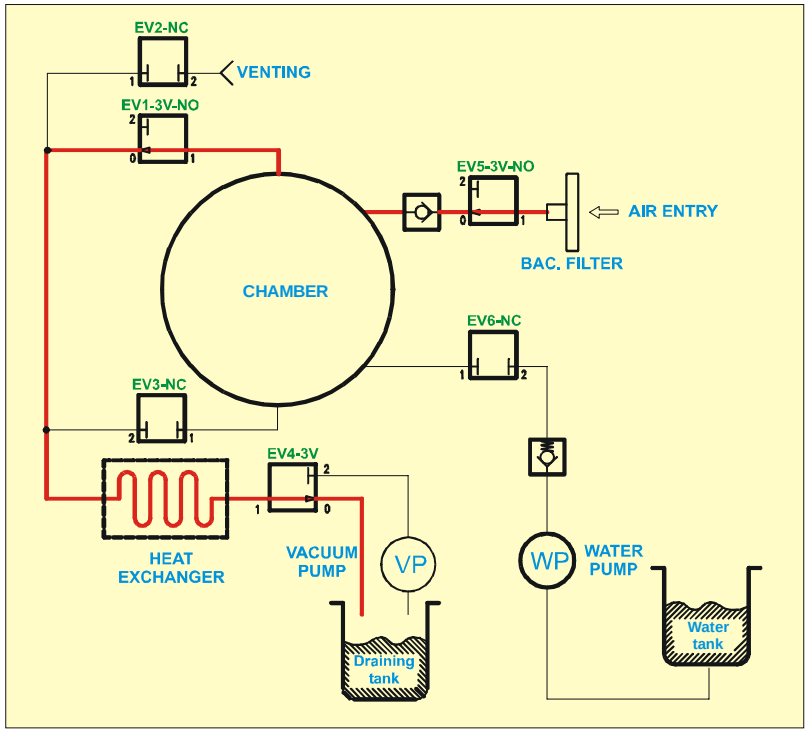
SEQUENCE OF THE PROCESS

It follows the description of the sterilization cycle, phase by phase. As example, we will use the most complete and meaningful cycle, i.e. the cycle relating the program **134 POROUS/WRAPPED** (preset 1 on the control panel), provided with fractionated pre-vacuum.

Standby status

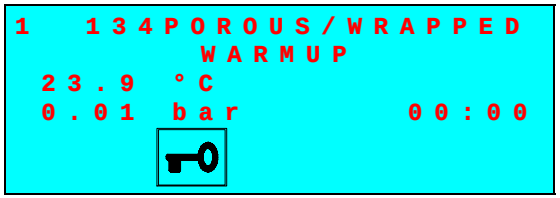


DESCRIPTION	STATUSES	PV	PA	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
STAND-BY	Standby (door closed)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1' ON 6' OFF

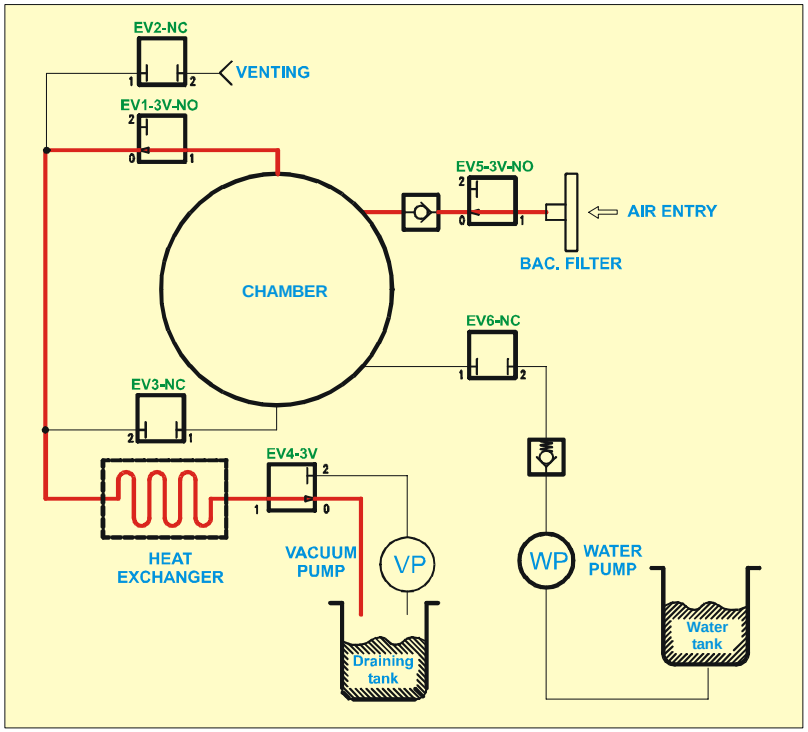


Warmup

After the START command, the first phase is WARMUP, which brings the chamber temperature to the preset value for the cycle starting . The display shows:

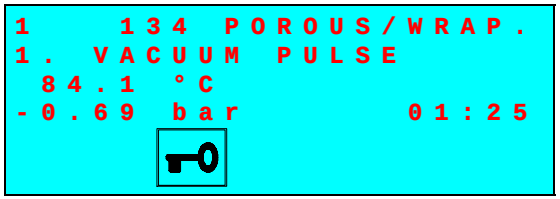


DESCRIPTION	STATUSES	PV	PA	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
WARMUP	Standby (door closed)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1' ON 6' OFF

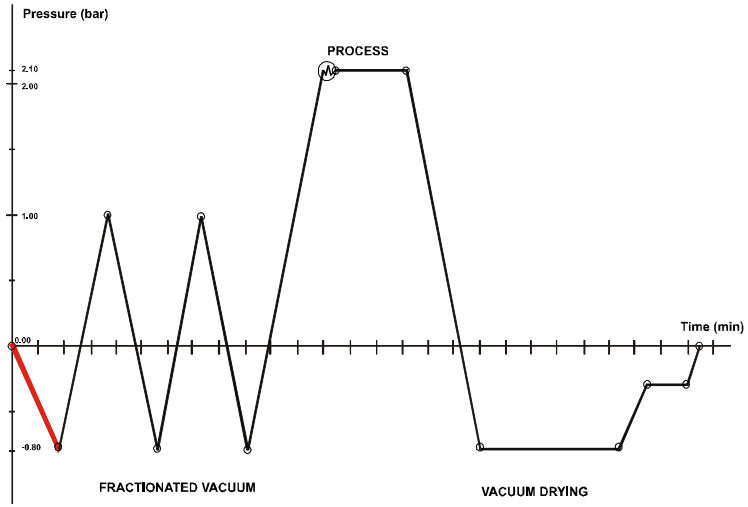


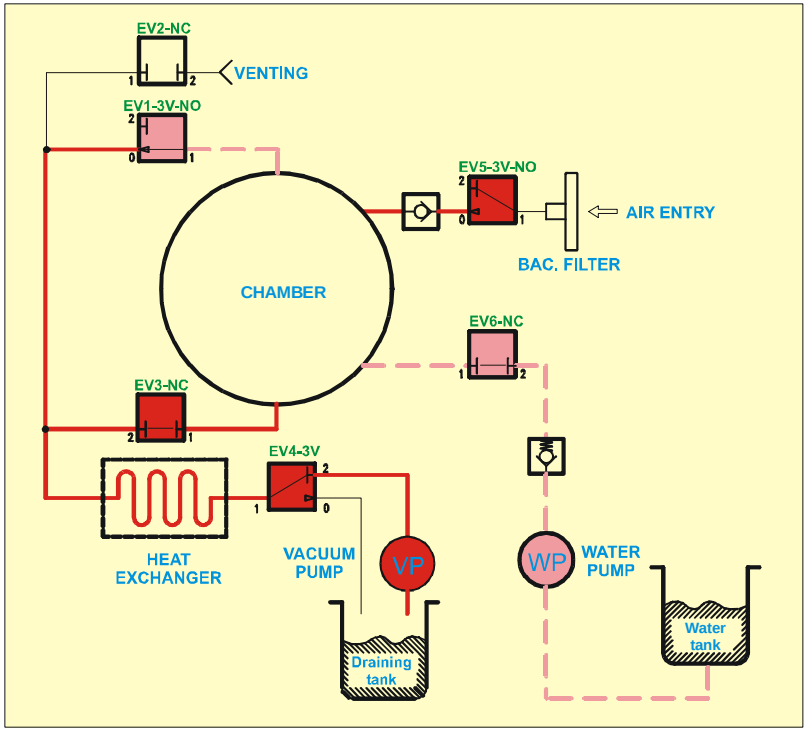
1st vacuum pulse – PV1

Reached the preset temperature, starts the first vacuum phase (1st VACUUM PULSE) with the fall of chamber pressure to the preset value. The display shows :



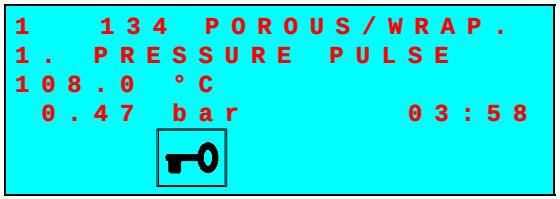
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
1st vacuum pulse	from 0,00 to –0,70 bar	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON
	Water entry at –0,70 bar (0,5" x3)	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	from -0,70 to –0,80 bar	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON
	Water enetry at –0,80 bar (0,3" x1) for P < -0,80 bar	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON



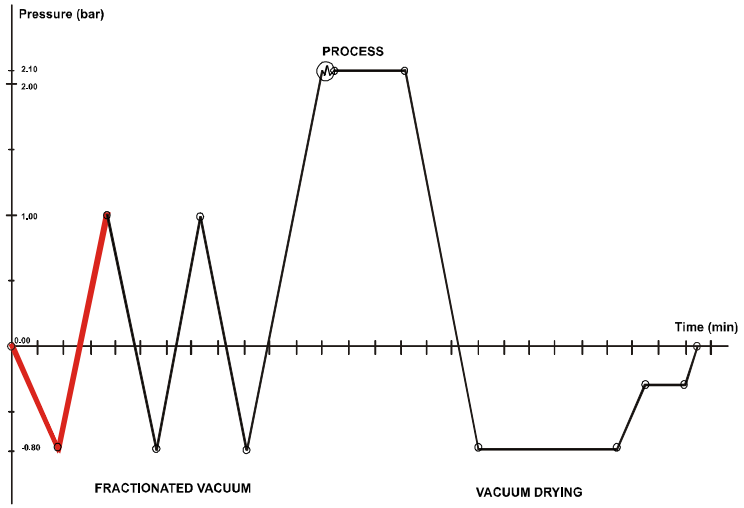


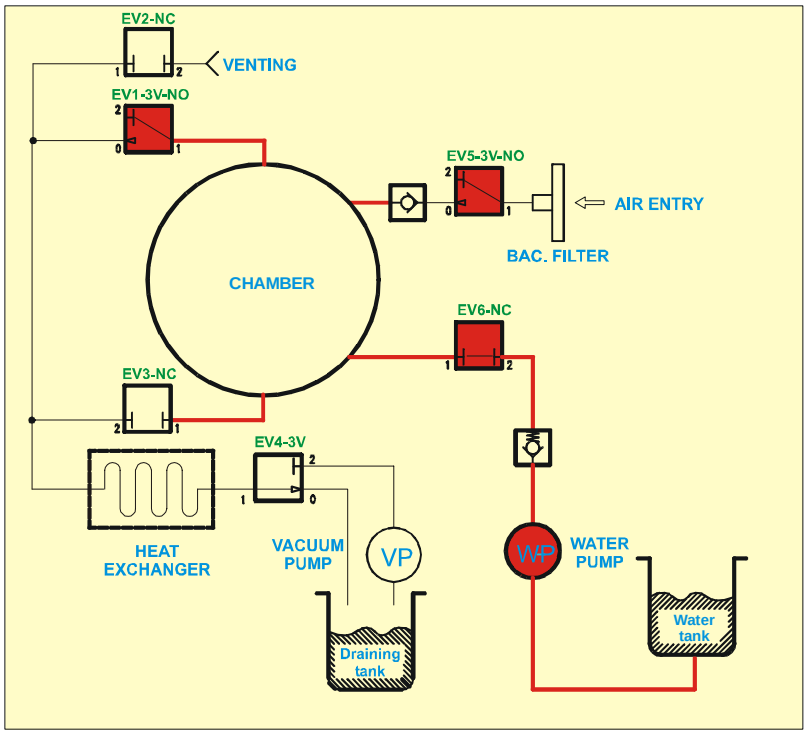
1st pressure pulse – PP1

Reached the pre-set vacuum value, the steam is injected in the chamber and the pressure rises (1st PRESSURE PULSE) until the preset value.



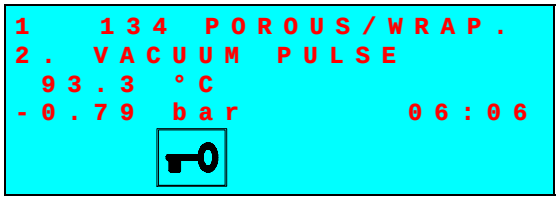
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
1st pressure pulse from –0,88 to +0,50 bar	from –0,80 to 0,00 bar (water entry5" at –0,80 bar) from 0,00 to +0,50 bar	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON
1st pressure pulse from +0,50 to +1,00 bar	from +0,50 to +0,90 bar from +0,90 to +1,00 bar	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON



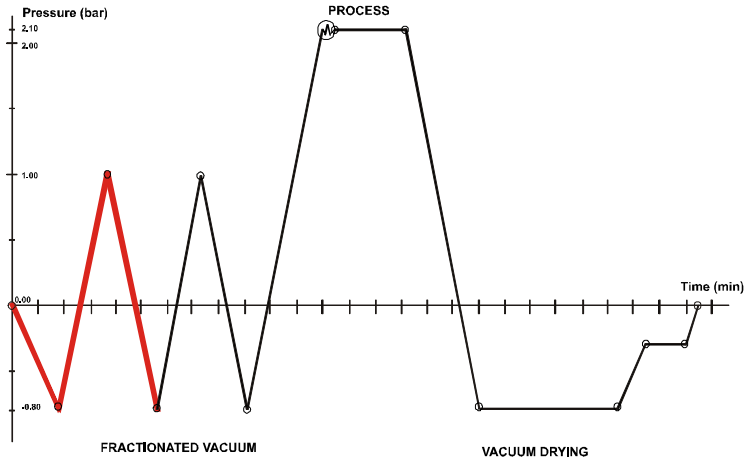


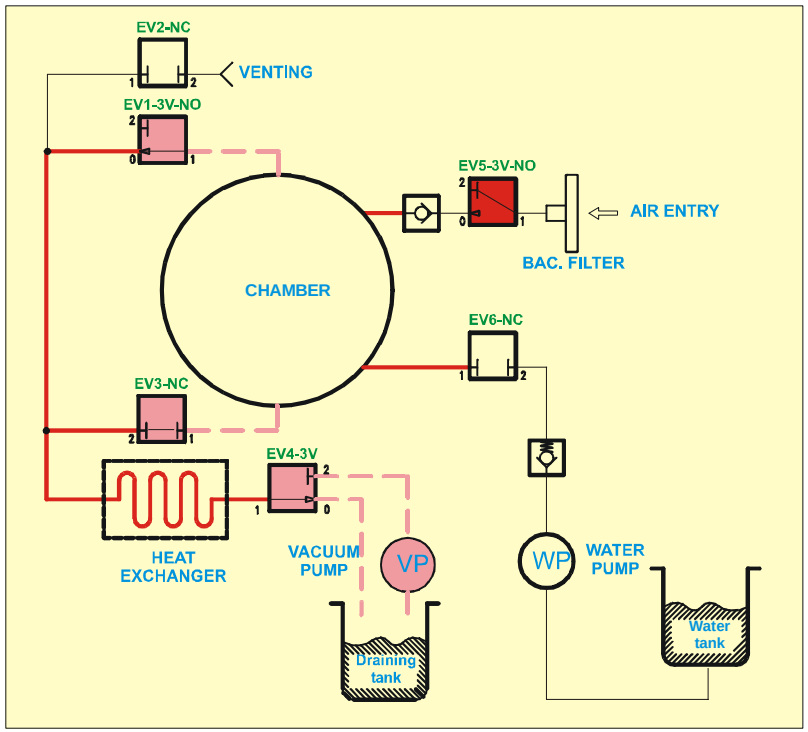
2nd vacuum pulse- PV2

At the end of the first pressure pulse, the steam, mixed with residual air, is discharged, then a second vacuum pulse starts (2nd VACUUM PULSE).



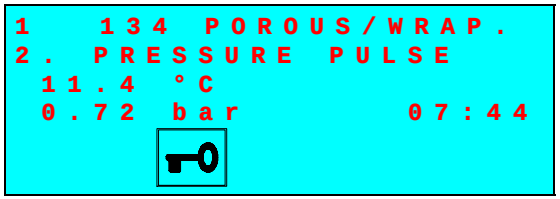
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
2nd vacuum pulse	Steam discharge from +1,00 to +0,22 bar	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
	Transition phase of the charging circuit (1")	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
	Vacuum of the discharge circuit	ON	OFF	ON	OFF	OFF	ON	ON	OFF	ON
	Chamber discharge	ON	OFF	ON	OFF	ON	ON	ON	OFF	ON
	Chamber vacuum (up to -0,80 bar)	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON
	Chamber vacuum (up to PT2 =165°)									



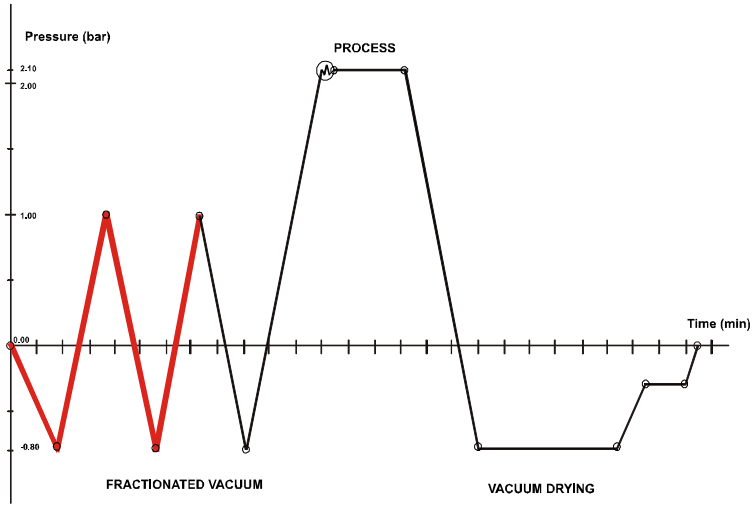


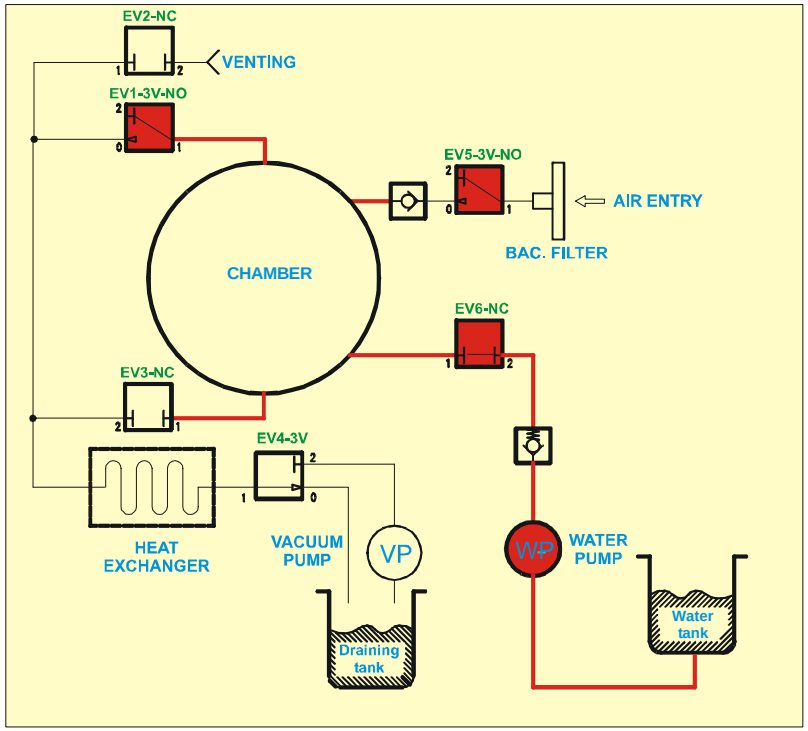
2nd pressure pulse – PP2

After the second vacuum pulse, the steam is again injected into the sterilization chamber, and the pressure rises a second time (**2nd PRESSURE PULSE**.



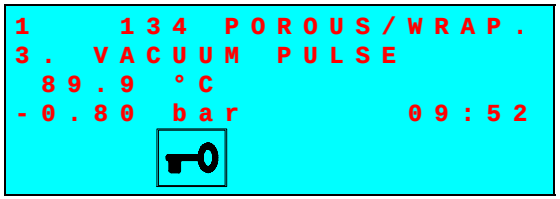
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
2nd pressure pulse	from –0,80 to 0,00 bar (water entry 5" at –0,80 bar)	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON
	from +0,00 to +0,90 bar									
	from +0,90 to +1,00 bar									



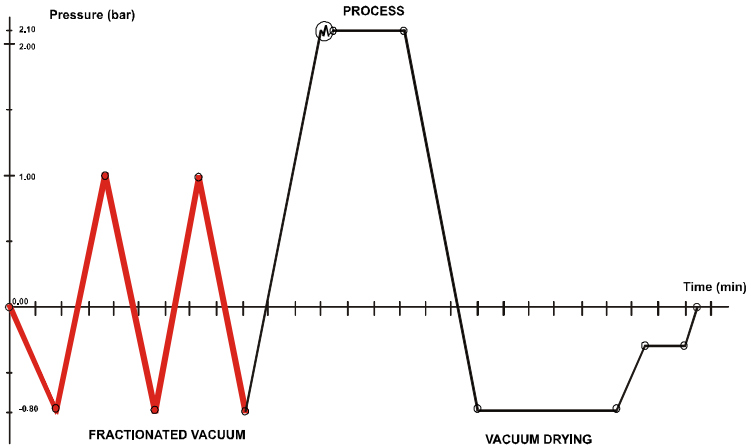


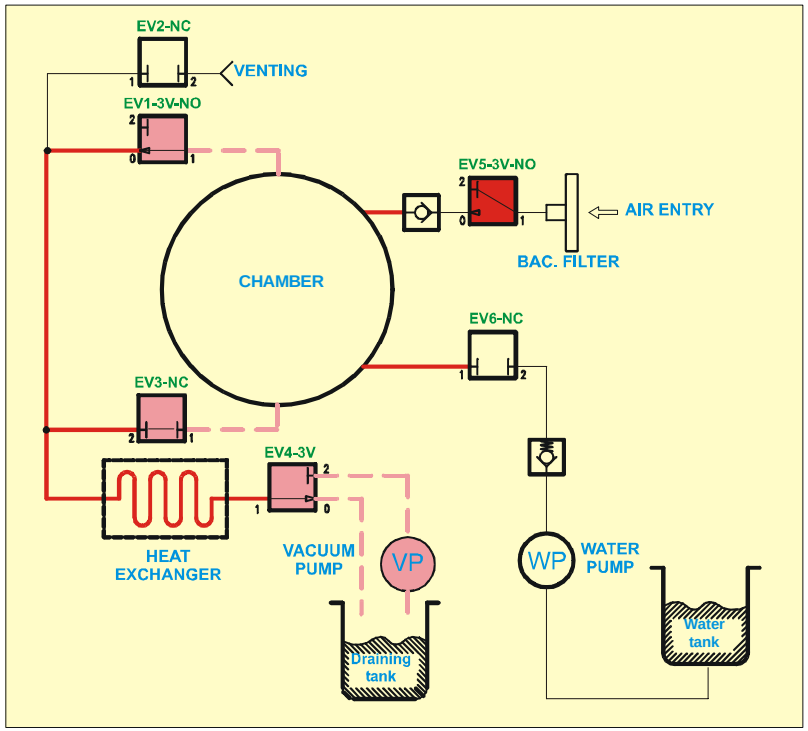
3rd vacuum pulse – PV3

At the end of the second pressure pulse, there is another steam discharge and a new (last) vacuum pulse (**3rd VACUUM PULSE**).



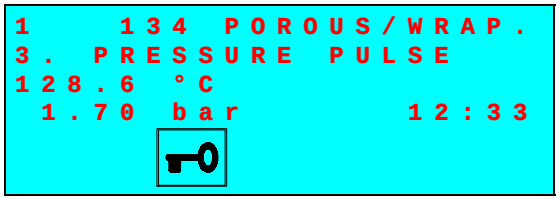
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
3rd ° vacuum pulse	Steam discharge from +1,00 to +0,22 bar	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
	Transition phase of the charging circuit (1")	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
	Vacuum of the discharge circuit	ON	OFF	ON	OFF	OFF	ON	ON	OFF	ON
	Chamber discharge	ON	OFF	ON	OFF	ON	ON	ON	OFF	ON
	Vacuum of the chamber (up to -0,80 bar)	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON
	Chamber vacuum (up to PT2 =165°)									



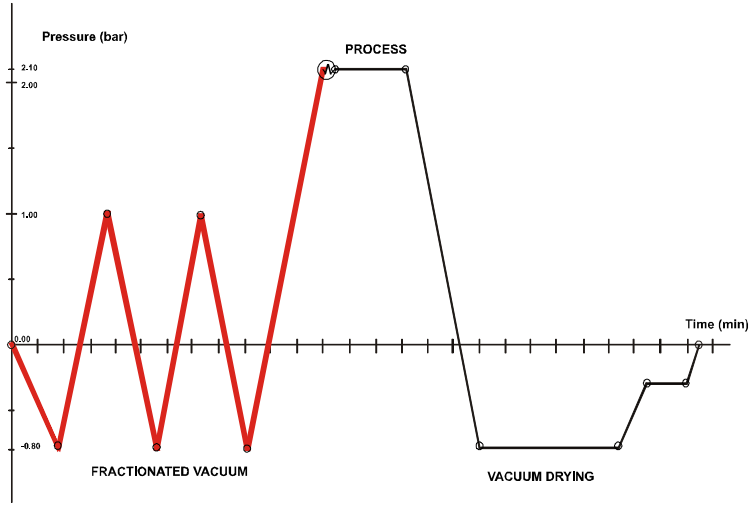


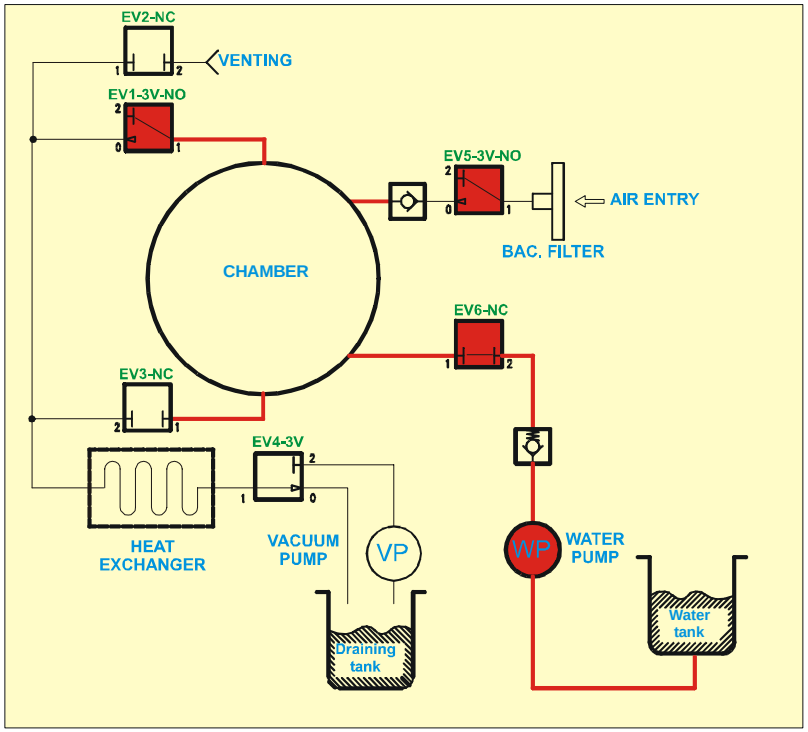
3rd pressure pulse – PP3

After the last vacuum pulse, a new steam injection occurs, and the pressure in the sterilization chamber rises again to the value preset for the sterilization process (**3rd PRESSURE PULSE**).



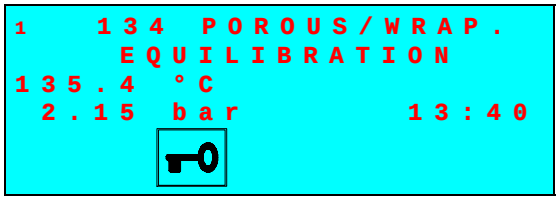
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
3rd pressure pulse	from –0,80 to 0,00 bar (water entry5" at –0,80 bar)	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON
	from +0,00 to +0,90 bar									
	from +0,90 to +1,00 bar									



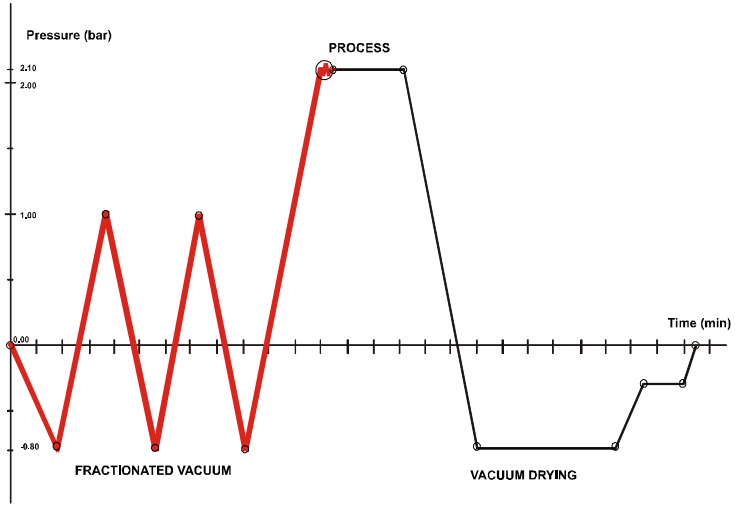


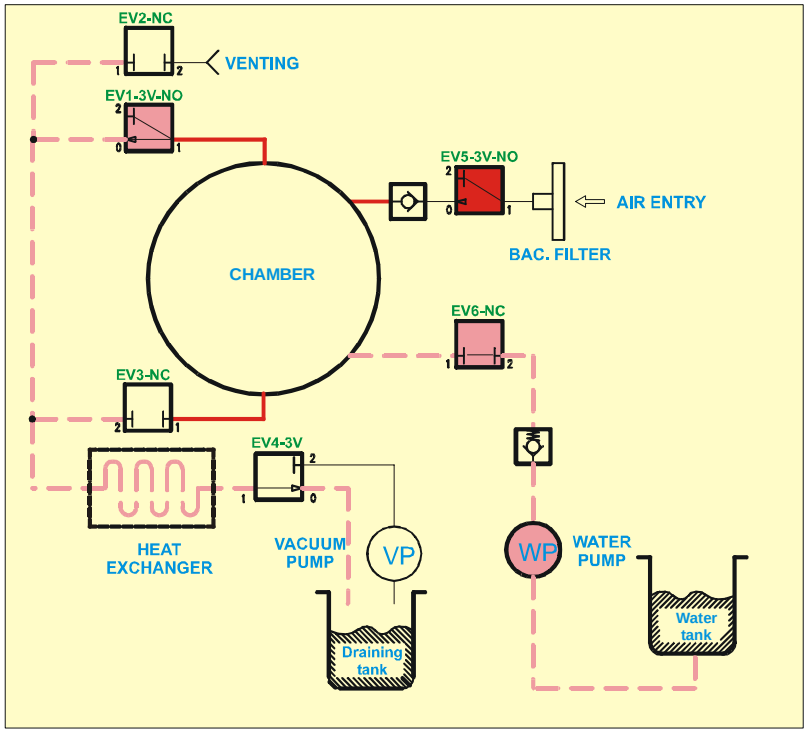
Thermodynamic equilibration

As reached the pressure and temperature set-point values for the selected program, the equipment waits a few seconds to allow the temperature in the chamber and in the load to stabilize (EQUILIBRATION). The display is showings:



DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
Equilibration	P > +2,15 bar x 15” (134°C) P > +1,12 bar x 15” (121°C)	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON

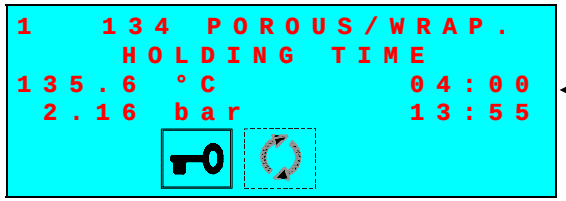




Process

Reached the balancing of the thermodynamic parameters, begins the sterilization phase of the load (HOLDING TIME).
The thermodynamic parameters are continuously monitored and the plumbing circuit controlled in order to maintain the pressure and temperature values constant within the limits preset by the program. The display shows.

Sterilization time countdown.

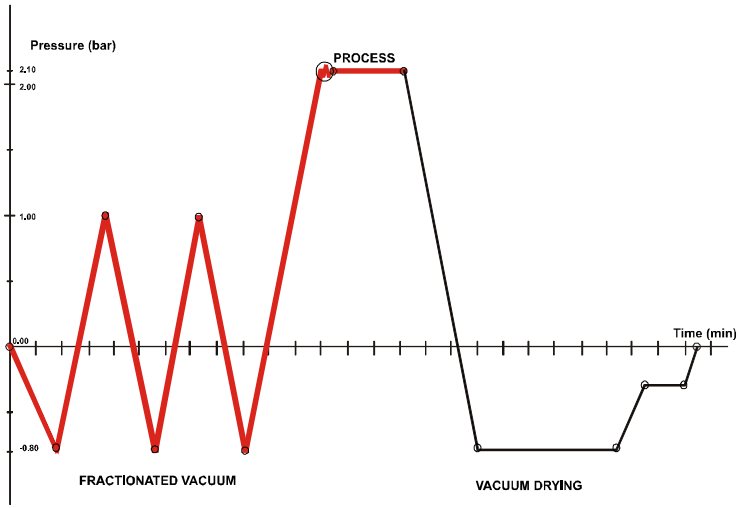


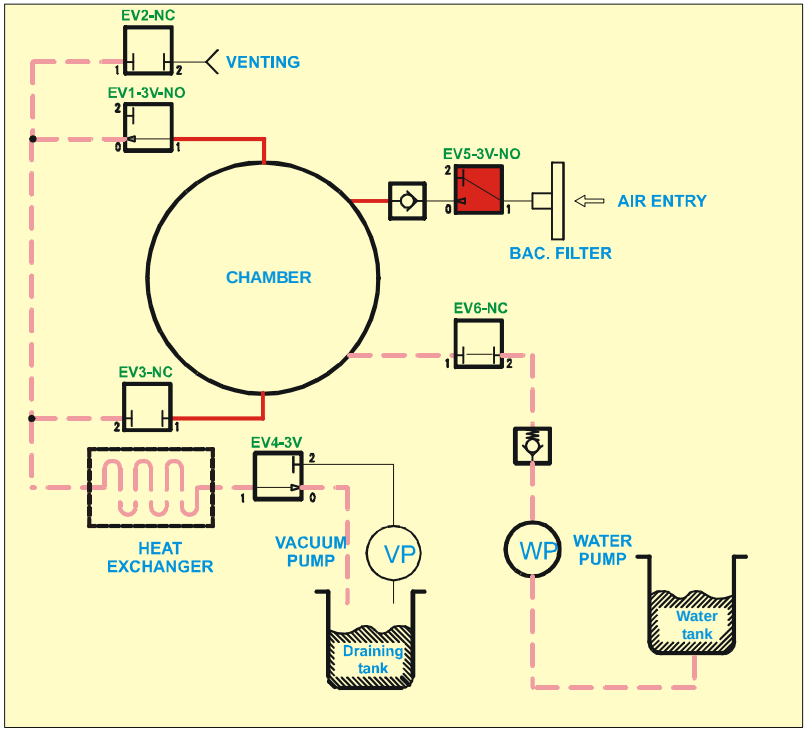
The icon flashes to indicate the progress of the load sterilization process.

At the end of the process phase, the icon remains lit steady to indicate the sterilization status of the load in the chamber.

IF, FOR SOME REASON, THE STERILIZATION CYCLE IS INTERRUPTED BEFORE THE COMPLETION, THE ICON REMAINS FLASHING. IN THIS CASE, THE MATERIAL CANNOT BE CONSIDERED STERILE AND MUST NOT BE USED.

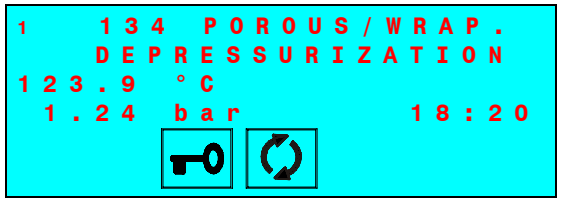
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
Holding time	For the time set by the program	OFF	ON	ON	OFF	OFF	OFF	ON	ON	ON





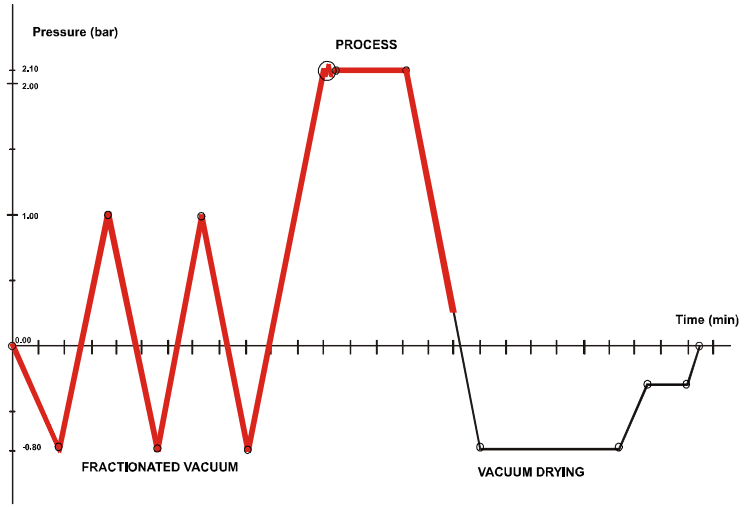
Steam discharge

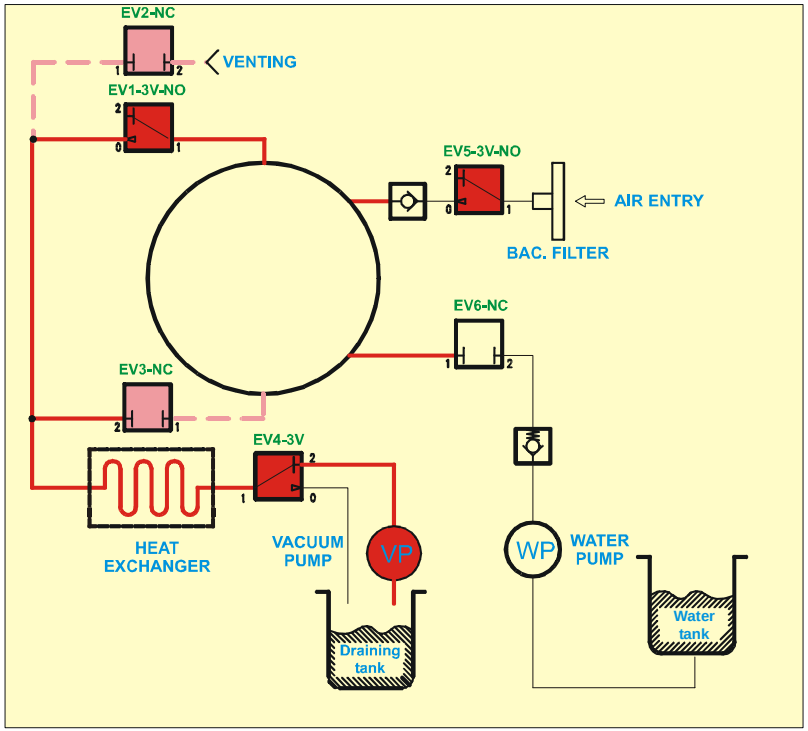
At the end of the sterilization phase, the steam is released from the sterilization chamber (DEPRESSURIZATION). The display shows:



The icon  is **lit steady**.

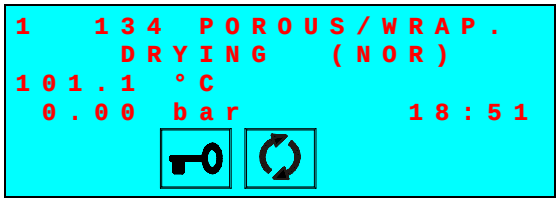
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
Steam discharge	from +2,15/1,12 to +0,10 bar	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
	from +0,10 to +0,10 bar	ON	OFF	ON	OFF	OFF	ON	ON	OFF	ON
	from +0,20 to -0,00 bar	ON	OFF	OFF	ON	OFF	ON	ON	OFF	ON



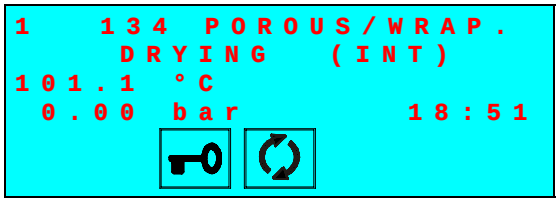


Drying

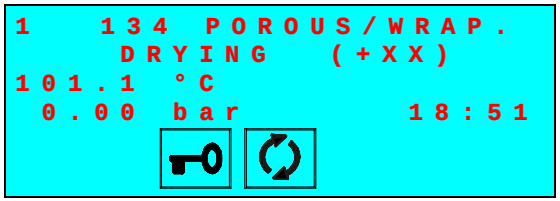
After the steam under pressure is released, its forced removal begins with the vacuum pump (**DRYING**): for this purpose, low pressure is created in the sterilization chamber to facilitate the evaporation of the steam and its consequent elimination. As a function of the type of drying set, one of the following screens will appear:



Standard drying

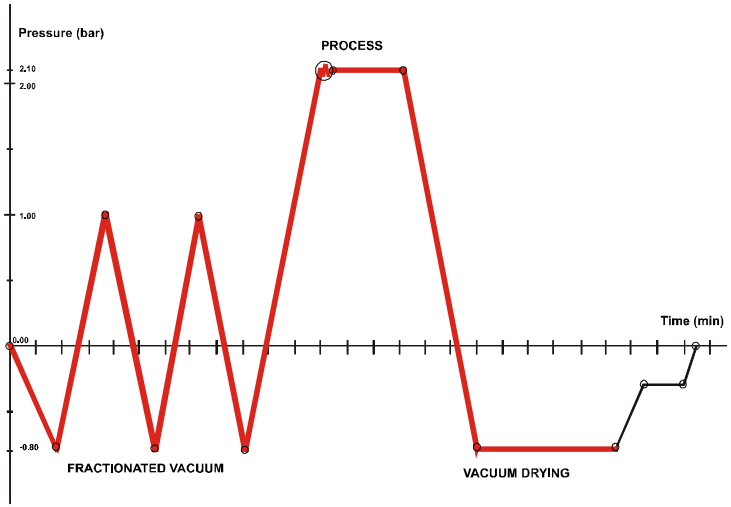


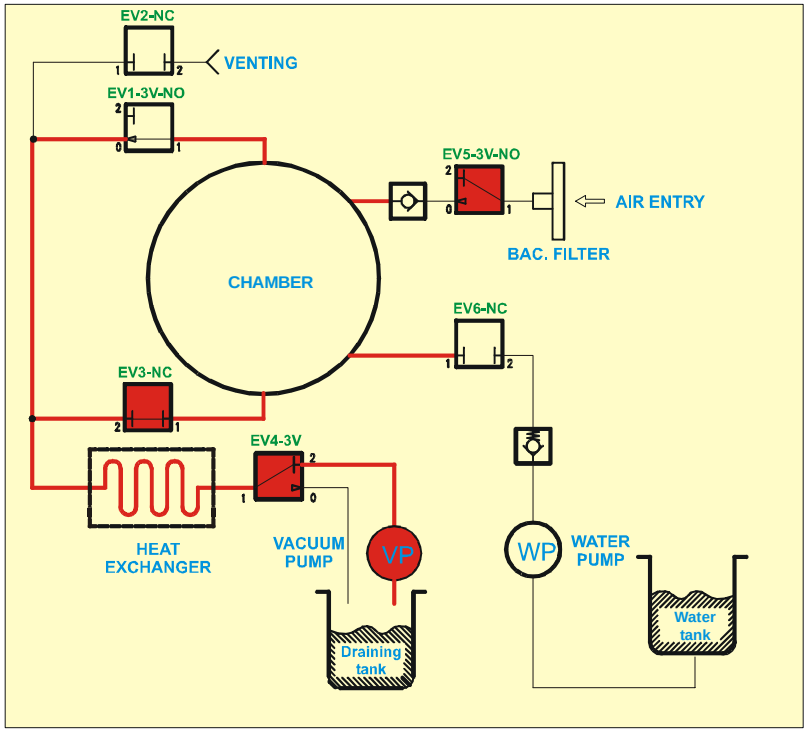
Intelligent drying



Extra drying
(+XX) = time set

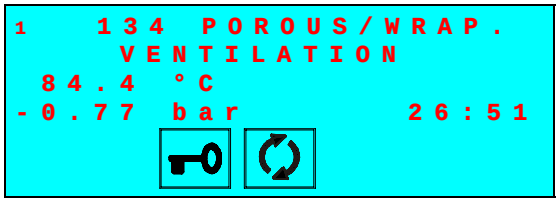
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
Drying	From 0,00 to –0,80 bar	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON
	From -0,80 to –0,50 bar	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON
	From -0,50 to –0,80 bar	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON



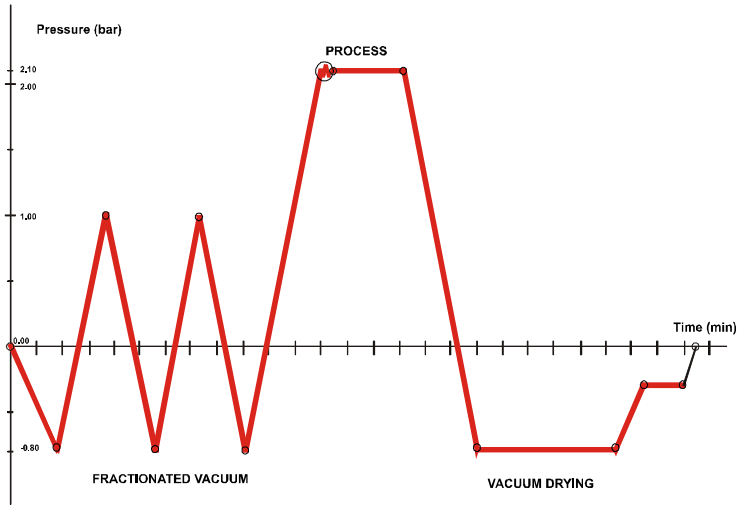


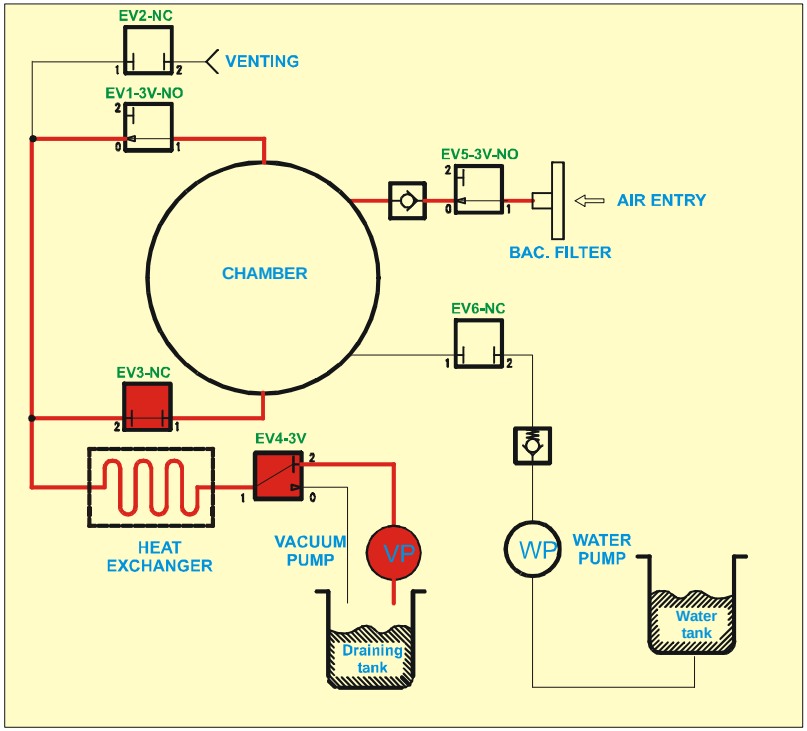
Ventilation

The drying phase is followed by a VENTILATION phase with fresh sterile air entry (vacuum in the chamber maintained) to eliminate the condensate and to cool the load:



DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
Ventilation	from -0,50/0,80 to -0,45 bar	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ON

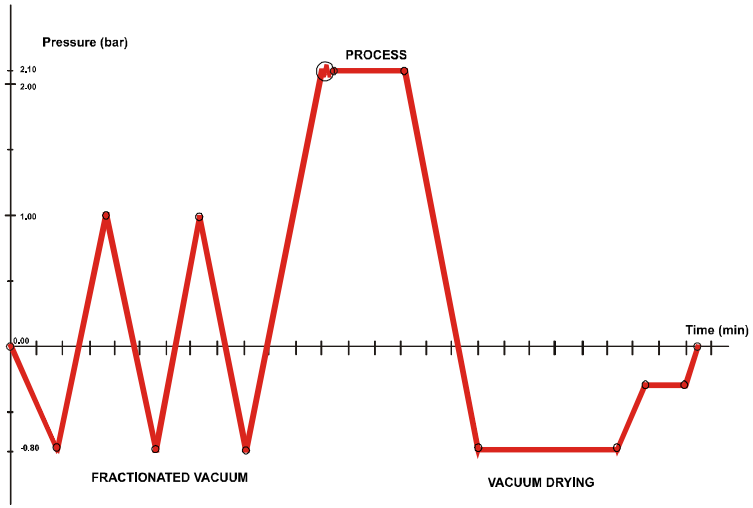


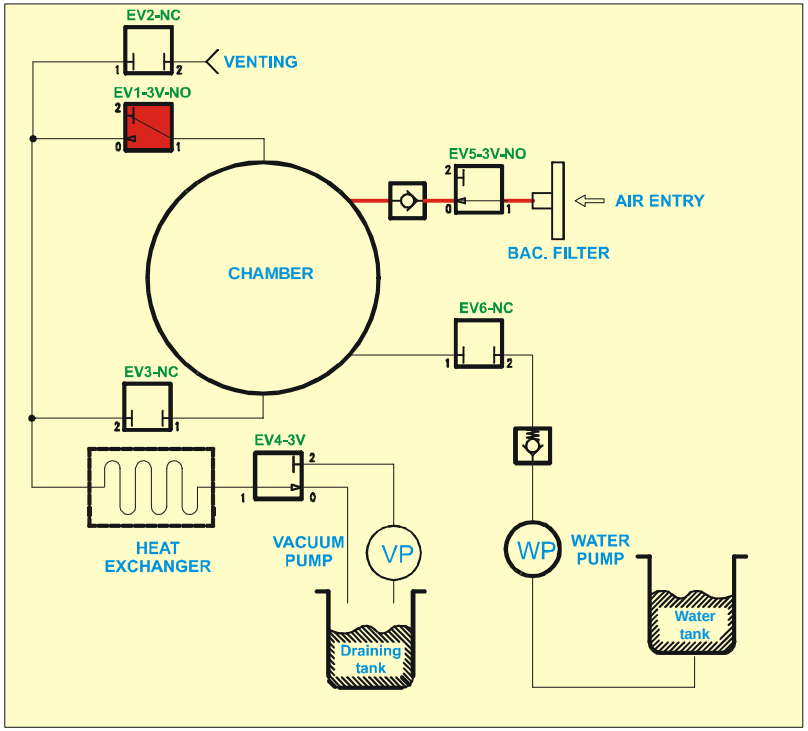


Levelling

At the end of the ventilation phase, the sterilization chamber is levelled up to the atmospheric pressure (LEVELLING) by entering air through the bacteriological filter in order to allow the door opening and the recovery of the sterilized load:

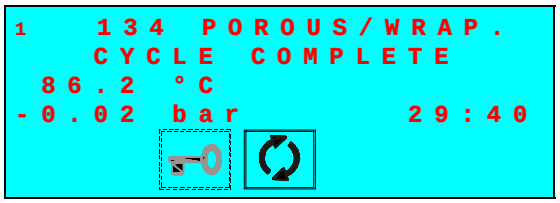
DESCRIPTION	STATUSES (P, t)	VP	WP	EV1 (no)	EV2 (nc)	EV3 (nc)	EV4	EV5 (no)	EV6 (nc)	Fan
Levelling (pressure)	from -0,45 to –0,10 bar (-0,10 bar to the value of 0 bar in the memory)	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Levelling (waiting time for the release of the locking door mechanism)	Waiting time = 15” (counting start from pressure–0,10 bar)	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF





Completion of the cycle

As the pressure value in the sterilization chamber reaches the safety set-point limit, the door lock system is released.
As a consequence, the door status icon **flashes** and a series of beeps is generated.



The icon stays on.

Open the door and retrieve the sterilized material, using the extractor provided.
The icon **goes off**.

☞ At the door opening, the report of the sterilization cycle performed will be automatically printed (if the print mode AT CYCLE END selected). Check, sign and file the report. Refer to the ***Print report examples***.

☞ At the end of the cycle, and until the opening of the door, the heating elements remain disabled. The equipment cools down slowly, regardless the mode STAND-BY set.

Now the equipment is ready to perform a new cycle. Repeat the procedure described in the Chapter "***Selecting the program***".

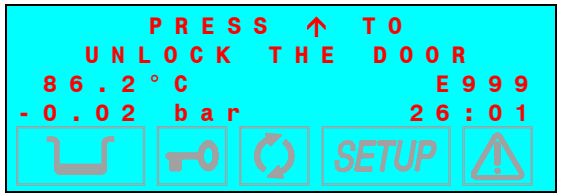
☞ As long as the sterilizer door is not opened, the vacuum pump is periodically enabled in order to remove any traces of condensate from the sterilization chamber. During these periods the display will show:

Push the key ↑ to interrupt the ventilation and open the door.

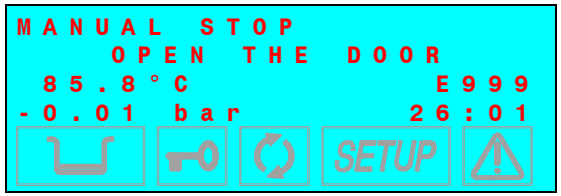
MANUAL INTERRUPTION OF THE CYCLE

The operator can manually interrupt the cycle at any time by pushing the key START/STOP for three seconds.
This command generates the error E999 (cycle not ended correctly) and, until it is safe to open the door, the unit will beep and the display will show:

Reached the safe conditions in the sterilization chamber, the equipment activates a special procedure, first asking the user to manually unlock the door:



Press the key ↑ to unlock the door . The following message is then displayed:



At the door opening, a prompt asks to reset the system:

To **RESET** the system, **hold down** the ***PROGRAM SELECTION*** key **for at least three seconds,** until a confirming beep.

With the door open, the data report, error code (E999) included, of the sterilization cycle performed will be printed. Check, initial in the proper space and file the report in a suitable place.
Refer to the ***Print report examples***.

After the RESET, the equipment will enter in STAND-BY mode, ready to execute a new cycle.

☞ Whenever an alarm is generated at certain phases of the cycle, an automatic procedure is activated to clean the plumbing circuit. For a complete description of the alarms, see "***Alarm indication***".

After an aborted cycle, due to a black-out or a power failure, the user CANNOT access the chamber until to the power returns. At that time, the user must reset the unit according to the procedure described in the Section 3 – Alarm intervention. At the start of the next cycle, an automatic procedure is activated to clean the plumbing circuit.

After a manual interruption of the cycle (MANUAL STOP), always check the status of the icon before using the material processed.

If the icon is ON, the load can be considered STERILE and used. We recommend to use it immediately

If the icon is OFF, the load CANNOT BE CONSIDERED STERILE and MUST NOT BE USED.

RESULT OF THE CYCLE

After the end of the cycle, it is important to check the result of the sterilization process.

Whenever a cycle ends (message CYCLE COMPLETE and icon lit) without being interrupted by an alarm, you are guaranteed that the load is completely aseptic.

The report of the sterilization cycle is an additional verification tool.

CHECKING THE CYCLE DATA REPORT

It is a good practice to check that the print report issued at the end of the sterilization program, also specifies a positive outcome.

At the end of the cycle, the relevant data for the thermodynamic parameters of the sterilization, i.e., temperature and pressure (°C and bar), and time (in minutes) of the sterilization cycle, along with particular attention to the sterilization phase, will print automatically when the door is opened.

Check the values on the print report and any additional indications for further confirmation of sterilization.

The operator should sign in the space provided and file the document for possible future use.

If necessary, copies of the document can be used to identify the load (or parts of it) with the date/time of sterilization and details of the type of cycle performed.

To select the number of the copies to print, refer to ***Setting the printer options***.

☞ The operator can also request an extended printout of the sterilization process data, including the recorded values of all the sensors installed on the machine. To start this print function, hold down the ↑ (ESC) on the control panel while opening the door. For complete details about printing the summary, refer to ***Print report examples***.

PRINT REPORT EXAMPLES

Normal program report

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0007/0015
Selection	134 SOLID/WRAPPED
Temperature	134 °C
Pressure	2.10 bar
Process time	4 min
Stand-by	LOW
Pre-vacuum	SINGLE
Drying	FAST
CYCLE START	19/11/08 12:14

Time		C	bar
00:01	CS	079.4	+0.00
02:02	1PV	093.7	-0.80
05:48	ET	135.6	+2.15
06:02	SS	135.9	+2.17
07:02		135.6	+2.14
08:02		135.5	+2.14
09:02		135.4	+2.14
10:02	SE	135.5	+2.15
10:37	DS	104.1	+0.00
11:41	SPD	047.5	-0.90
16:08	DE	047.6	-0.84
17:12	CE	084.6	-0.04
06:32	MAX	136.0	
09:59	MIN	135.4	

Drying Pulses	01
CYCLE END	19/11/08 12:27
STERILIZATION:	POSITIVE

OPERATOR

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Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0007/0015
Selection	134 POROUS/WRAPPED
Temperature	134 °C
Pressure	2.10 bar
Process time	4 min
Stand-by	HIGH
Pre-vacuum	FRACTIONATED
Drying	STANDARD
CYCLE START	19/11/08 09:52

Time		C	bar
00:01	CS	075.1	-0.00
01:57	1PV	047.S	-0.80
04:53	1PP	120.5	+1.00
07:00	2PV	061.1	-0.80
09:15	2PP	120.4	+0.98
11:22	3PV	061.1	-0.80
15:04	ET	135.5	+2.15
15:19	SS	135.9	+2.17
16:19		135.4	+2.14
17:18		135.5	+2.15
18:19		135.4	+2.14
19:19	SE	135.5	+2.15
19:53	DS	104.4	+0.00
20:57	SPD	048.4	-0.90
26:55	EPD	094.9	-0.86
29:15	DE	112.6	-0.47
29:43	CE	115.8	-0.04
16:20	MAX	135.9	
18:11	MIN	135.4	

Drying Pulses	05
CYCLE END	19/11/08 10:17
STERILIZATION:	POSITIVE

OPERATOR

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Extended program report (required by operator)

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0007/0015
Selection	134 POROUS/WRAPPED
Temperature	134 °C
Pressure	2.10 Bar
Process t ime	4 min
Stand-by	HIGH
Pre-vacuum	FRACTIONATED
Drying	STANDARD
CYCLE START	19/11/08 09:52

Time		T1	P	T2	T3	T4
00:01	CS	075.1	-0.00	130.9	115.2	093.4
00:11		074.9	-0.28	133.3	114.2	094.0
00:21		074.4	-0.46	146.3	113.2	094.5
00:31		074.3	-0.57	152.6	112.2	095.0
00:35	..	074.3	-0.59	154.2	111.9	095.2
00:51	..	078.9	-0.62	152.2	110.4	095.6
01:01	..	074.9	-0.73	146.6	109.6	095.7
01:27	..	047.8	-0.78	149.3	107.7	095.7
01:57	..	047.8	-0.80	155.3	105.8	095.4
02:07	..	076.5	-0.57	149.9	105.2	095.1
02:17	..	081.1	-0.49	142.1	104.6	094.6
		.....				
		.....				
08:15	...	068.4	-0.76	151.8	104.7	102.3
08:22	...	061.1	-0.80	153.6	104.5	101.7
08:32	...	097.4	+0.01	154.7	104.0	100.8
08:42	...	104.6	+0.24	148.9	103.7	101.0
		.....				
		.....				
15:04	...	135.5	+2.15	143.3	111.7	131.7
15:19	...	135.9	+2.17	148.5	113.5	132.6
15:28	...	135.3	+2.16	153.6	115.9	133.0
		.....				
		.....				
19:19	...	135.5	+2.15	157.4	126.5	132.5
19:34	...	134.4	+1.07	157.0	126.8	131.2
19:49	...	108.3	+0.25	156.4	126.8	119.9
19:53	..	104.4	+0.00	156.1	126.6	116.2
20:04	...	094.2	- 0.50	155.1	125.9	112.4
20:19	...	069.2	-0.73	153.7	124.5	112.9
20:34	...	059.2	-0.81	152.3	123.4	113.5
20:49	...	053.8	-0.87	151.2	122.9	113.6
20:57	...	048.4	-0.90	150.9	122.7	113.5
21:04	...	047.1	-0.80	151.0	122.5	113.5
23:31	...	042.3	-0.89	153.3	122.0	112.2
		.....				
		.....				
26:55	...	094.9	-0.90	153.3	121.7	112.3
27:10	...	101.4	-0.67	154.0	121.7	112.3
27:25	...	105.4	-0.57	153.7	121.5	112.3
		.....				
		.....				
29:15	...	112.6	-0.47	149.6	119.1	111.2
29:28	...	115.2	-0.10	143.0	118.4	110.7
29:43	CE	115.8	-0.04	147.4	110.1	110.7
16:20	MAX	135.9				
18:11	MIN	135.4				

Drying pulses	05
CYCLE END	19/11/08 10:17
STERILIZATION:	POSITIVE

OPERATOR

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EXTENDED REPORT
REQUESTED BY THE OPERATOR

Report following a Manual Stop

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0007/0015
Selection	134c POROUS
Temperature	134 °C
Pressure	2.10 bar
Process time	4 min
Stand-by	HIGH
Pre-vacuum	FRACTIONATED
Drying	STANDARD

CYCLE START 19/11/02 11:13

Time		C	bar
00:01	CS	077.6	+0.01
01:40	1PV	088.7	-0.80
04:40	1PP	120.6	+1.00
05:40	2PV	062.9	-0.80
07:10	2PP	135.6	+1.00
08:20	3PV	135.5	-0.80
11:20	ET	135.4	+2.15
11:39	SS	135.5	+2.17
12:39		135.5	+2.14
13:39		104.1	+2.15
14:39		047.5	+2.15

STERILIZATION: NEGATIVE

OPERATOR

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ALARM CODE: E999
DESCRIPTION MANUAL STOP

Report following a Black-out

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0006/0012
Selection	XXX CUSTOM
Temperature	134 °C
Pressure	2.10 bar
Process time	07 min
Stand-by	HIGH
Pre-vacuum	FRACTIONATED
Drying	FAST

CYCLE START 19/11/08 15:31

BLACK OUT 19/11/02 15:45

STERILIZATION NEGATIVE

OPERATOR

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ALARM CODE: E000
DESCRIPTION BLACK-OUT

Report following an Alarm

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0007~0015
Selection	134 POROUS/WRAPPED
Temperature	134 °C
Pressure	2.10 Bar
Process time	4 min
Stand-by	HIGH
Pre-vacuum	FRACTIONATED
Drying	STANDARD

CYCLE START 19/11/08 11:30

Time		T1	P	T2	T3	T4
00:01	CS	075.1	-0.00	130.9	115.2	093.4
00:11		074.9	-0.28	133.3	114.2	094.0
00:21		074.4	-0.46	146.3	113.2	094.5
00:31		074.3	-0.57	152.6	112.2	095.0
00:35 ..		074.3	-0.59	154.2	111.9	095.2
00:51	..	078.9	-0.62	152.2	110.4	095.6
01:01 ..		074.9	-0.73	146.6	109.6	095.7
01:27	..	047.8	-0.78	149.3	107.7	095.7
01:57	..	047.8	-0.80	155.3	105.8	095.4
02:07 ..		076.5	-0.57	149.9	105.2	095.1
02:17	..	081.1	-0.49	142.1	104.6	094.6
		……				
		……				
08:15	…	068.4	-0.76	151.8	104.7	102.3
08:22 …		061.1	-0.80	153.6	104.5	101.7
08:32 ...		097.4	+0.01	154.7	104.0	100.8
08:42	…	104.6	+0.24	148.9	103.7	101.0
		……				
		……				
15:04	…	135.5	+2.15	143.3	111.7	131.7
15:19	…	135.9	+2.17	148.5	113.5	132.6
15:28	…	135.3	+2.16	153.6	115.9	133.0
		……				
		……				
19:19	…	135.5	+2.15	157.4	126.5	132.5
19:34	…	134.4	+1.07	157.0	126.8	131.2
19:49 …		108.3	+0.25	156.4	126.8	119.9
19:53	DS	104.4	+0.00	156.1	126.6	116.2

STERILISATION NEGATIVE

ALARM CODE: A112
DESCRIPTION PTC SHORTCIRCUIT

CAUTION !
PLEASE REFER TO USER MANUAL

HELIX/BD TEST program report

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0011/0019
Selection	HELIX/BD TEST
Temperature	134 °C
Pressure	2.10 bar
Process time	3.5 min

CYCLE START 19/11/08 16:38

Time		C	bar
00:01	CS	076.4	+0.00
02:06	1PV	089.3	-0.89
04:35	1PP	120.4	+0.99
05:45	2PV	062.5	-0.78
07:02	2PP	120.2	+0.97
08:15	3PV	061.1	-0.79
11:00	..	135.6	+2.15
11:14	..	136.0	+2.17
12:14		135.6	+2.14
13:14		135.6	+2.15
14:14		135.5	+2.14
14:45	..	135.4	+2.14
15:20	..	111.5	+0.00
16:34	…	047.8	-0.89
18:21	…	059.5	-0.86
19:21	..	075.4	-0.50
20:06	CE	078.7	-0.04
12:33	MAX	136.0	
14:44	MIN	135.4	

Drying pulses 01
CYCLE END 19/11/08 16:38

HELIX TEST COMPLETE
Please attach the indicator hereunder

OPERATOR

. . . . . .

VACUUM TEST program report

Model	BRAVO 17V
S/N	03 JP 0001
Ver. SW	Exxxx/JPyyyyyy
Counter	0011/0019
Selection	VACUUM TEST

CYCLE START 19/11/08 11:37

Time		C	bar
00:00	CS	035.0	+0.00
01:39	E1F	037.4	-0.80
6:39	E2F	038.4	-0.79
16:39	E3F	042.0	-0.79
17:54	CE	045.5	-0.01

CYCLE END 19/11/08 11:41

VACUUM TEST: POSITIVE

OPERATOR

. . . . . .

TEST PROGRAMS

GENERAL

The Bravo product line offers two test programs to periodically check the unit's effectiveness. The two programs are:

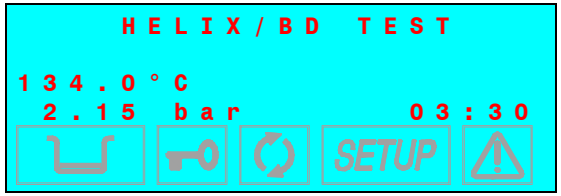
HELIX/BOWIE & DICK Test
Vacuum Test

The HELIX/BOWIE & DICK **Test** program executes a cycle at 134 °C for a duration of 3.5 min. This cycle has a fractionated vacuum phase similar to that used in the POROUS and HOLLOW programs. Using a suitable test pack, it is possible to evaluate the correct penetration of the steam inside porous loads.

The **Vacuum Test** program tests the seal of the sterilizer's entire plumbing system. By measuring the variation in the degree of vacuum in a certain span of time and comparing it with pre-set limit values, it is possible to determine the effectiveness of the seal of the sterilization chamber, the various tubes and the cut-off devices.

HELIX/BD TEST

To select the HELIX/BD Test, push the key Test Selection one or two times until the display shows:



The HELIX test device consists of a PTFE tube (1.5m long, internal diameter 2mm), with a small sealed screw capsule attached to one end and holding a suitable chemical indicator. The other end of the tube is left free to allow the penetration of the steam and evaluate its effectiveness.

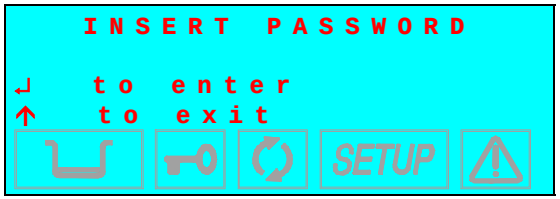
Insert the chemical indicator, consisting of a strip of paper with special reagent ink, into the capsule of the device (to be used perfectly dry). Tighten the capsule so that to avoid any blowing through the gasket seal.
Place the test device approximately on the centre of the middle tray. Do not put any other material inside the chamber..

The **Bowie & Dick** test pack is manufactured according to the applicable standards. Place the test pack horizontally on the device's lowest tray, in the front part of the chamber, near the door. **Do not** put any other material inside the chamber.

☞ The test device and chemical indicators are not supplied with the equipment.

Close the door and start the program by pressing the **START** key.

☞ If the ANY CYCLE START password option has been set (see **Setting the password**), a prompt will request to enter the access code.



In addition, the equipment checks for possible presence of the printer paper roll and if data recorder is connected, the presence of the Flash card and its memory capacity. The warning messages and the consequent actions to carry out are the same as described for a standard sterilization cycle.

☞ The phases of the cycle are the same as described for a standard cycle. See Chapter "***Sequence of the process***".

At the end of the program, pull out the test device, open the capsule/test pack and remove the chemical indicator.

For steam correctly penetrated, the color of the chemical indicator will be completely changed on the entire length of the strip; otherwise (insufficient steam penetration) the color change will be only partial or none at all.

☞ Normally the color changes from light (beige, yellow, etc.) to dark (blue, violet or black). In any case, scrupulously follow the instructions provided by the manufacturer of the test device.

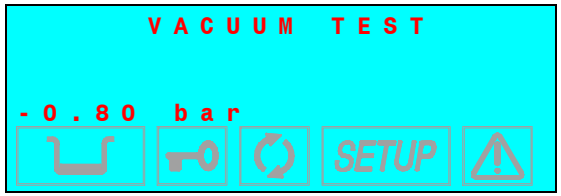
The duration of the test is approx. **23 minutes** (with **Bravo^{17}**), 20 minutes (with **Bravo^{17V}**) or 22 (with **Bravo^{21V}**).

As the door is opened at the end of the cycle, a report will be printed providing relevant data for the test cycle performed.
Attach the chemical indicator on the free space of the report, initial and file it in a suitable place.

For complete details about printing summaries, refer to ***Print report examples***.

VACUUM TEST

To select the VACUUM TEST, press the key Test Selection one or two times until the display shows:



The Vacuum Test program is run with the sterilization chamber empty, except for the trays and their supports.

☞ Run the Vacuum Test as first cycle after powering-on the equipment. To avoid the heating of the sterilization chamber influencing the variation of the vacuum value measured during the Vacuum Test, the system is programmed to prevent running this test when the temperature sensors of the sterilization chamber show a value higher than 50° C.

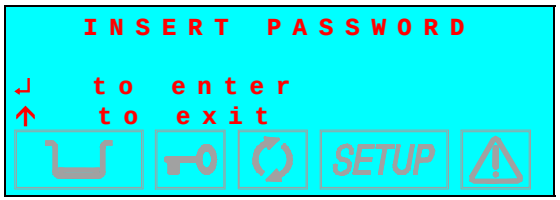
If you try to start the program with a higher temperature than indicated above, the display will read:

and after a short time, the equipment will automatically return in STAND-BY mode, ready for use.

☞ To rapidly lower the temperature of the chamber, and allow the Vacuum Test, leave the sterilizer's door open until the correct temperature is reached.

Close the door and push the key **START**.

☞ In case of password option ANY CYCLE START set (see ***Setting the Password***), a prompt asks to enter the access code.

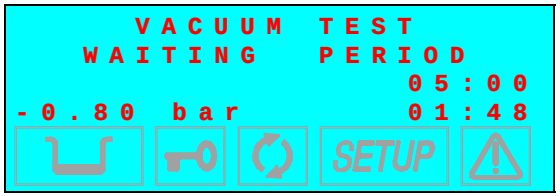


In addition, the equipment checks for possible presence of the printer paper roll and if data recorder is connected, the presence of the Flash card and its memory capacity. The warning messages and the consequent actions to carry out are the same as described for a standard sterilization cycle.

The vacuum phase will begin immediately and the display reads:

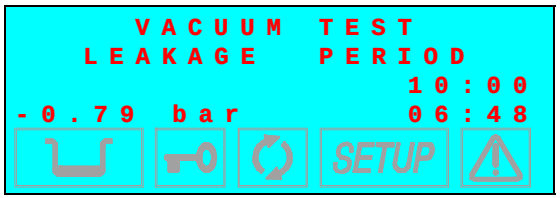
The display shows the pressure (bar), and the total time from the start of the program.

When the pre-set pressure is reached (**-0.80** bar) the pump stops and the pressure stabilization phase begins (**WAITING PERIOD**). This lasts 5 minutes is shown on the display:



During this phase, a variation of not more than 10% of the maximum low pressure is allowed. Beyond this, the test will fail .

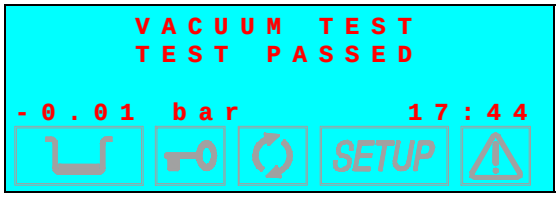
When the waiting phase is complete, the pressure verification phase begins (**LEAKAGE PERIOD**). This will last 10 minutes:



In this phase, a variation of **up to ±0.02 bar** is allowed, compared to the initial phase value. Higher variations, however, will cause the test to fail .

The time is counted down until the phase is completed, after which the pressure is brought back to atmospheric pressure.

When the program finishes, the display will read:



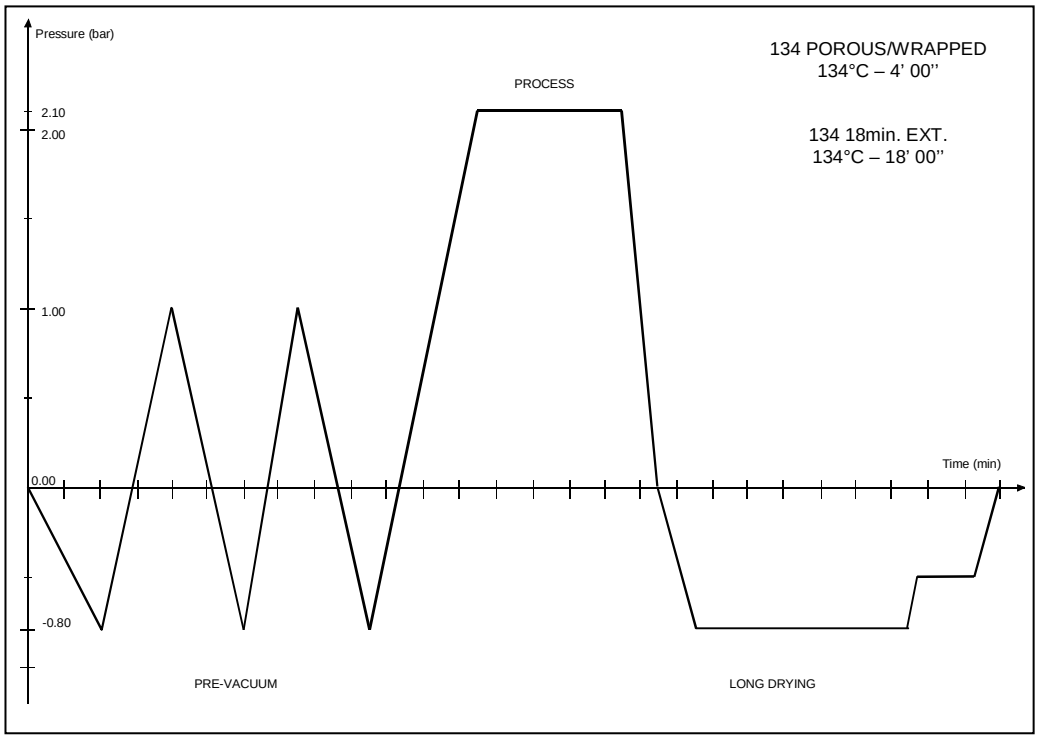
The end of the program is signaled with a beep.

☞ If the pressure change exceeds the pre-set limit, the program is interrupted and alarm message is generated. See the description of the alarms ***Troubleshooting***.

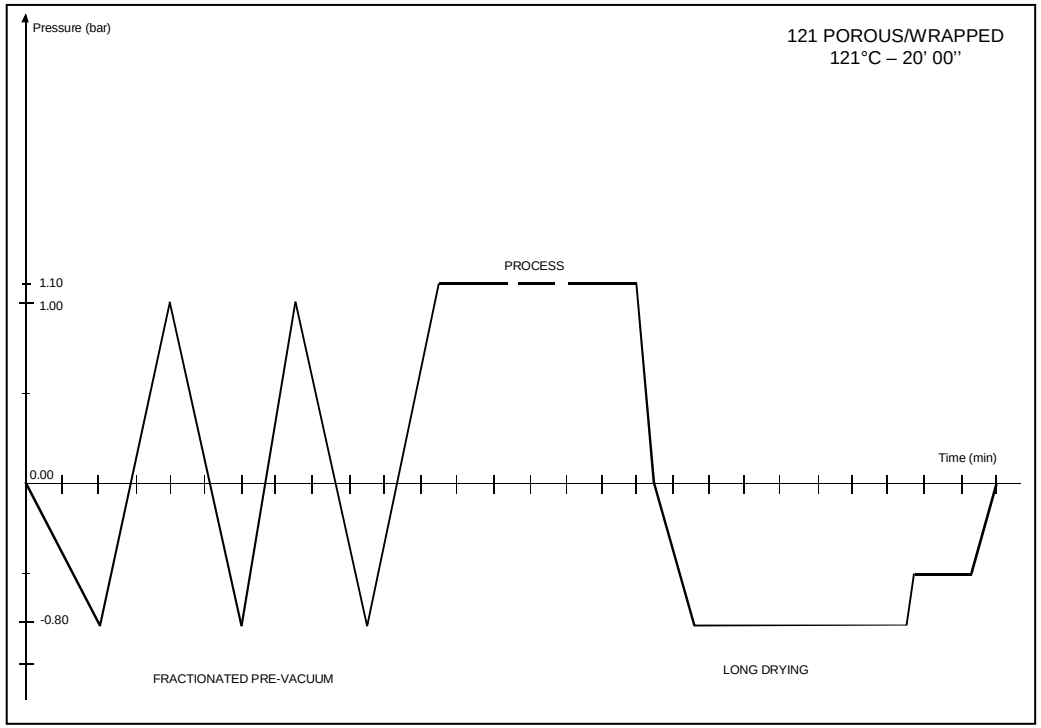
The duration of the test is approx. 18 minutes (with **Bravo^{17V} Bravo^{21V}**) or 23 minutes (with **Bravo^{17}**).
When the door is opened at the end of the program, a report of the test cycle is printed with all the salient data.
For complete details about printed reports, refer to ***Print report examples***.

CYCLE DIAGRAMS

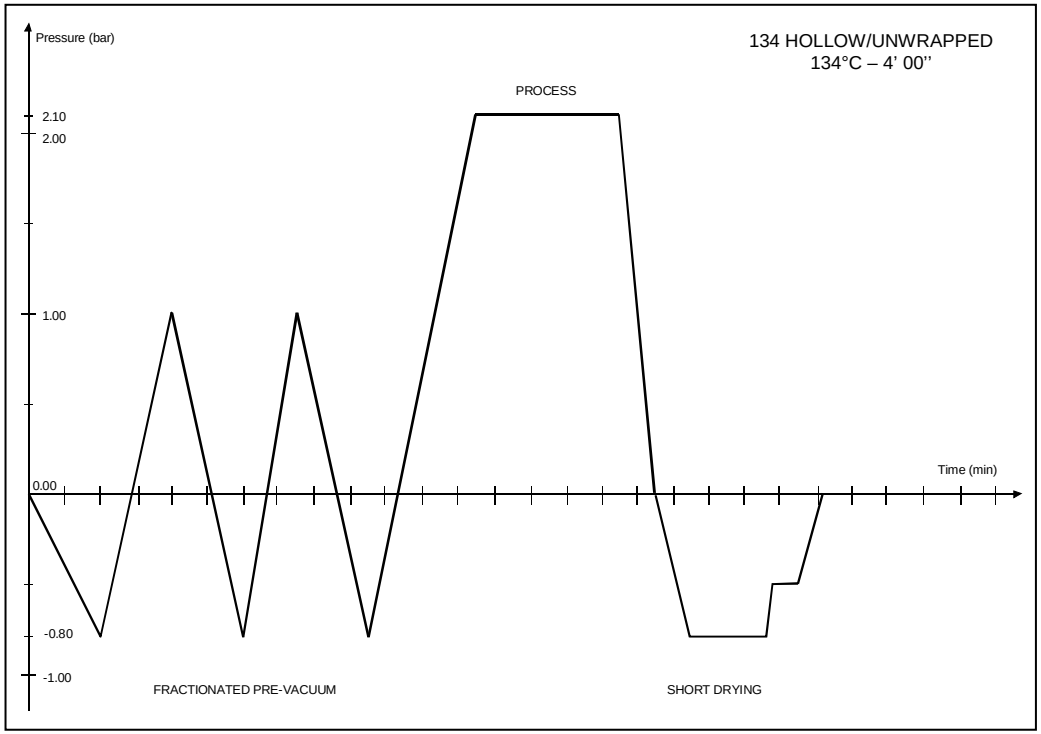
134 POROUS/WRAPPED & 134 18MIN. EXT.



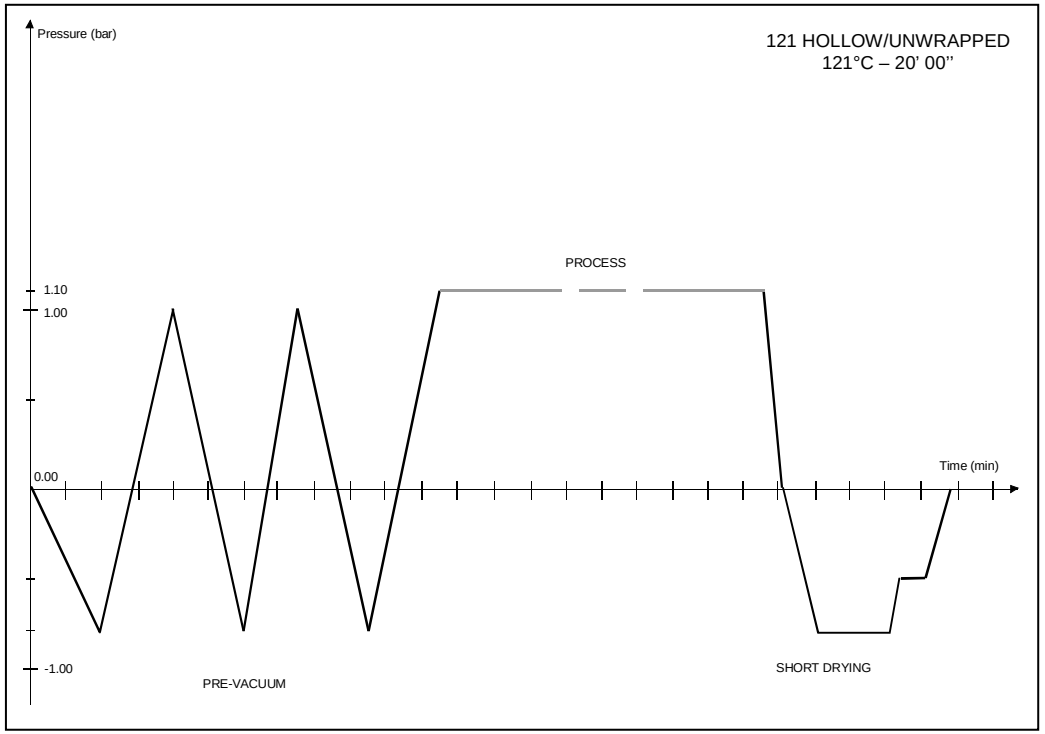
121 POROUS/WRAPPED



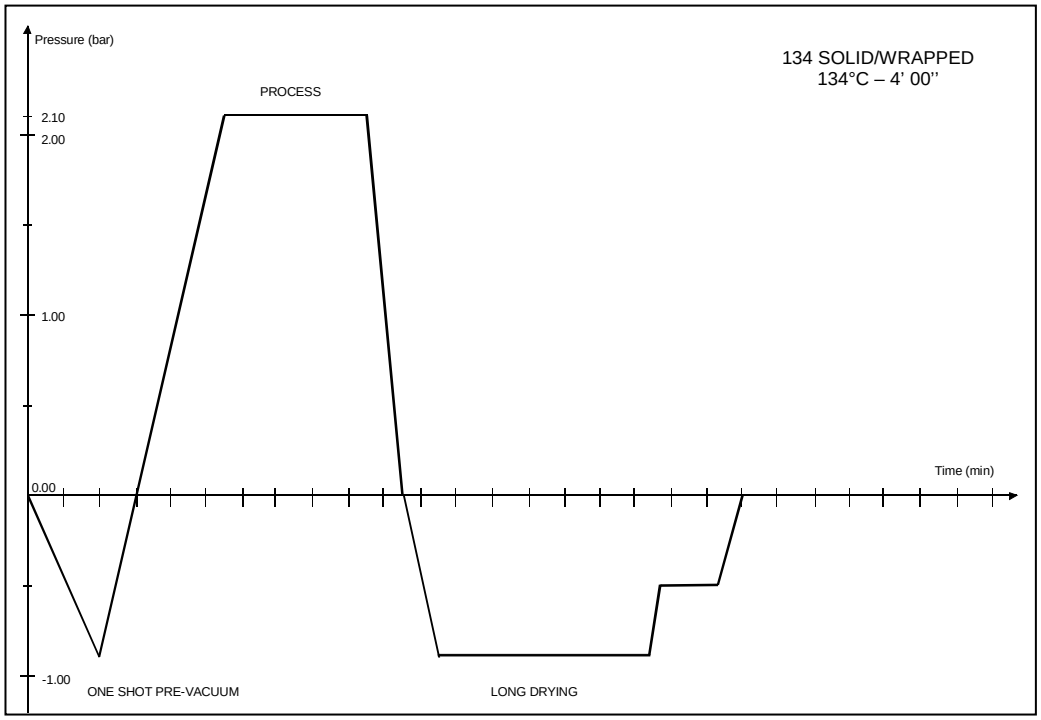
134 HOLLOW/UNWRAPPED



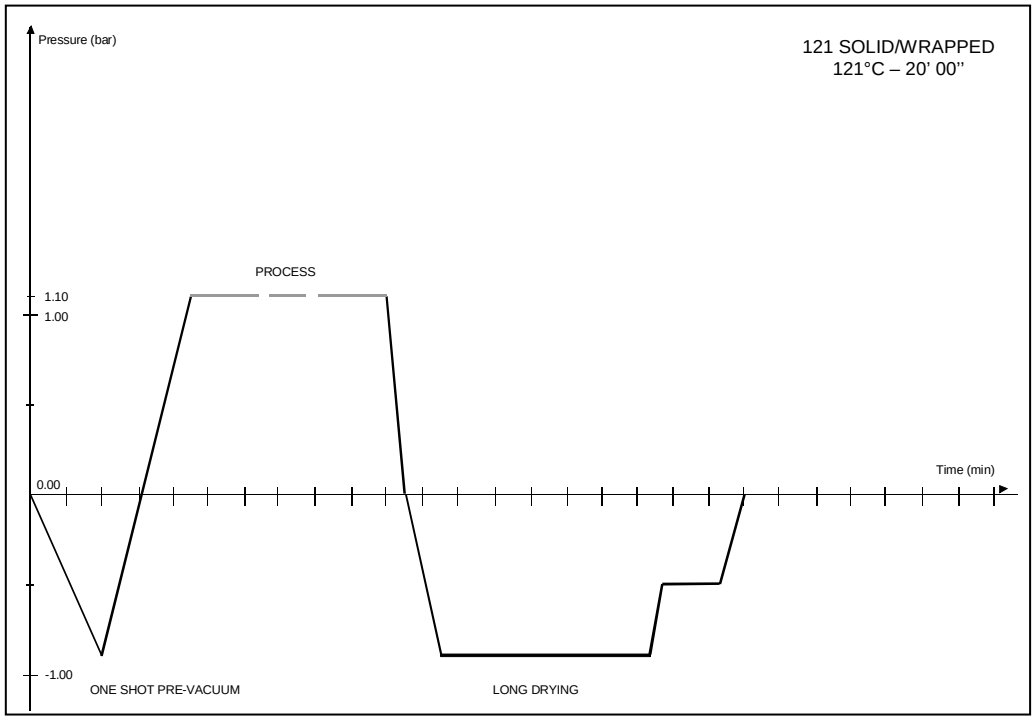
121 HOLLOW/UNWRAPPED



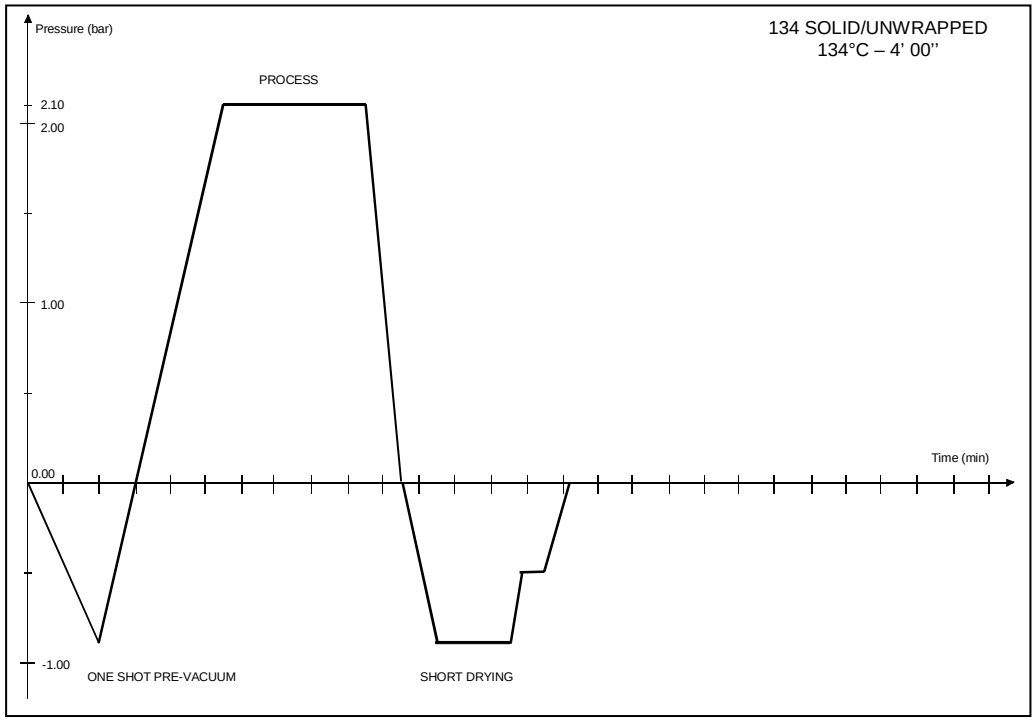
134 SOLID/WRAPPED



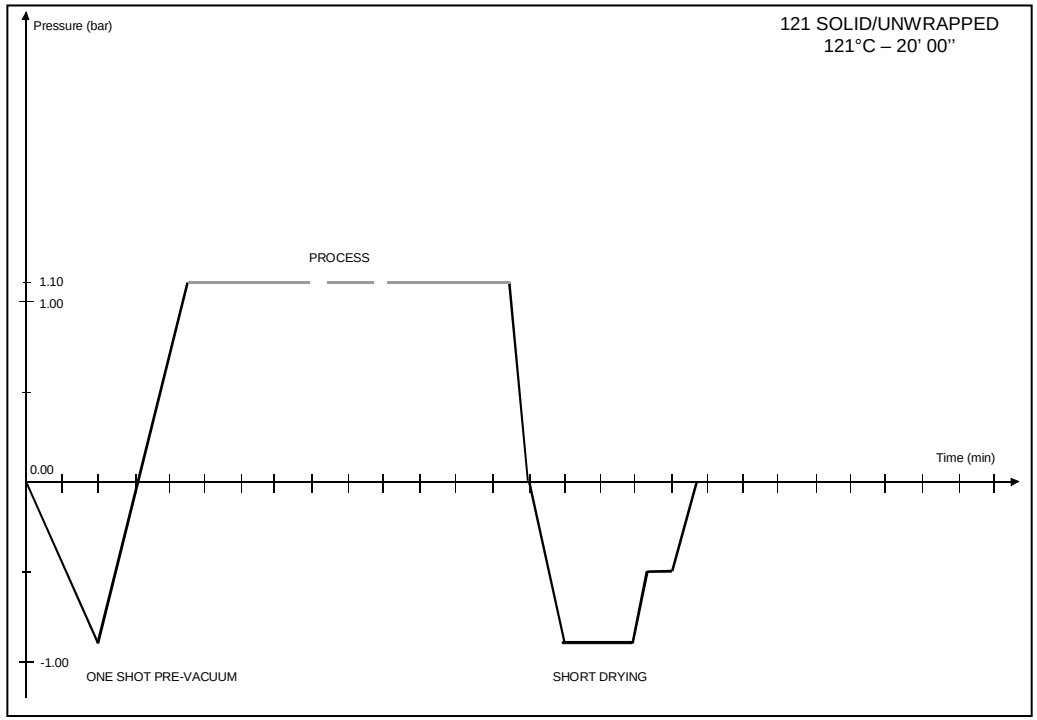
121 SOLID/WRAPPED



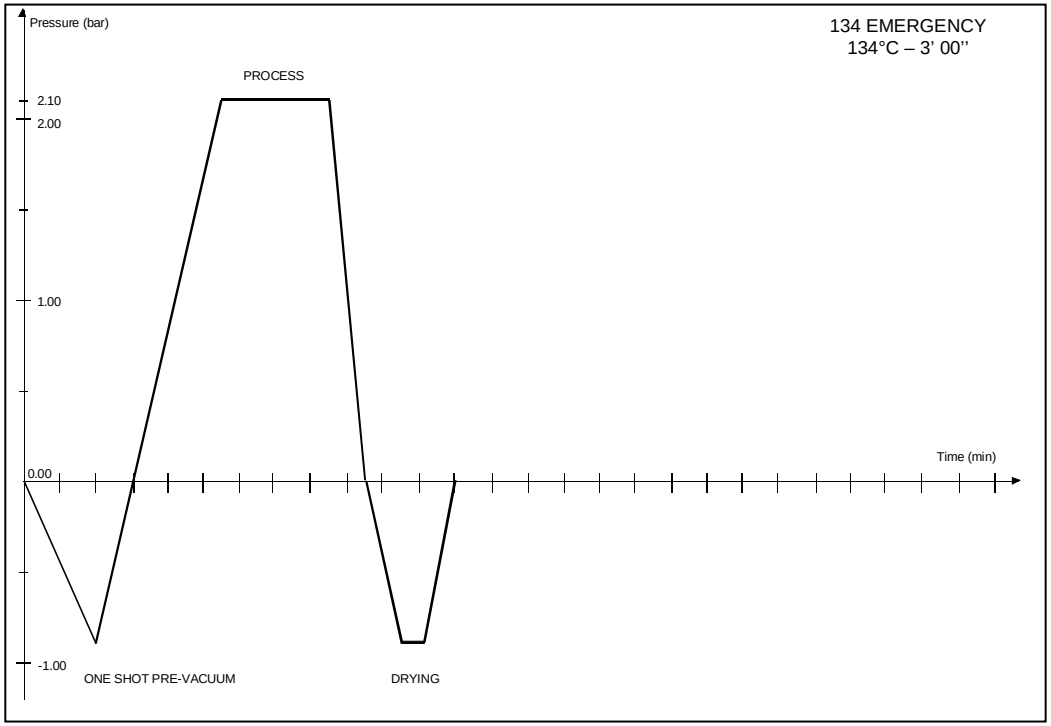
134 SOLID/UNWRAPPED



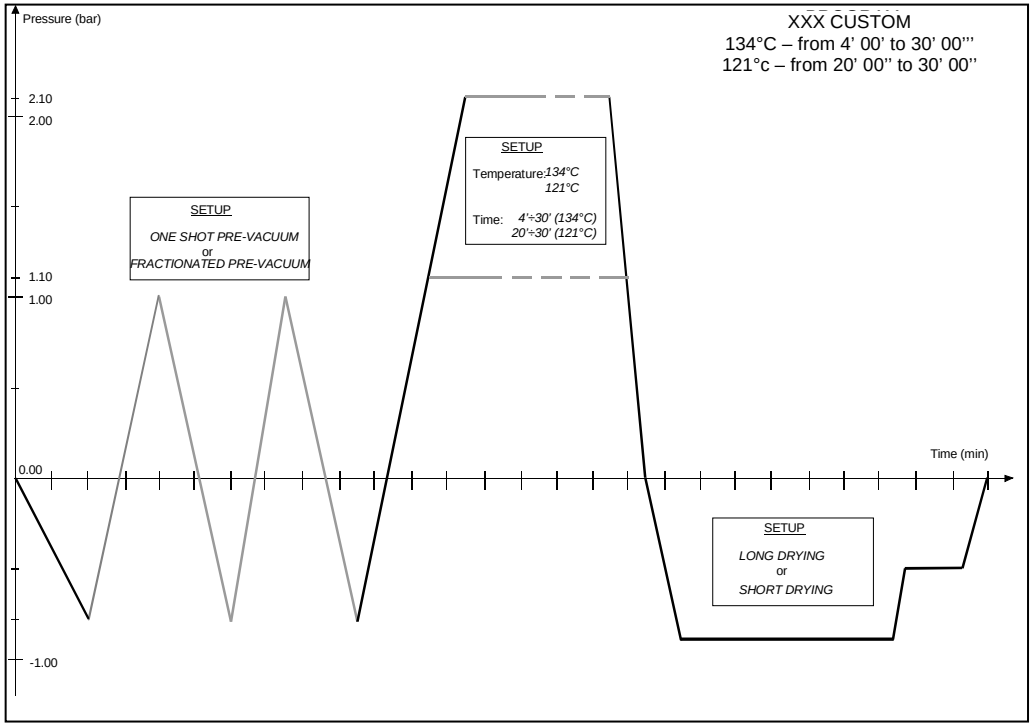
121 SOLID/UNWRAPPED



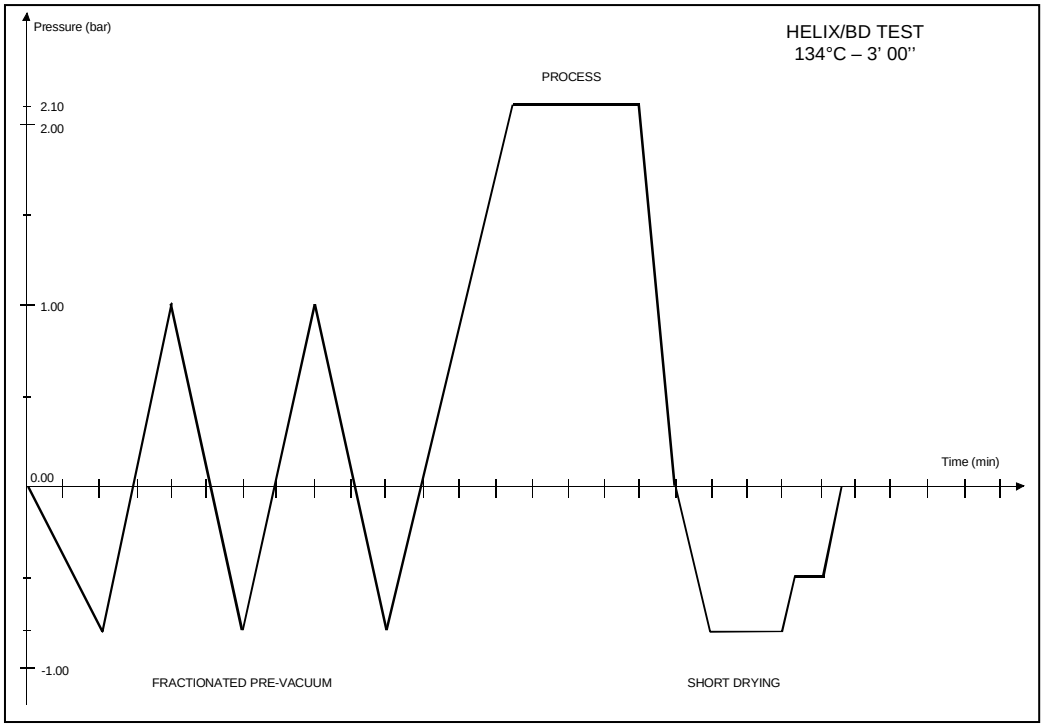
134 EMERGENCY



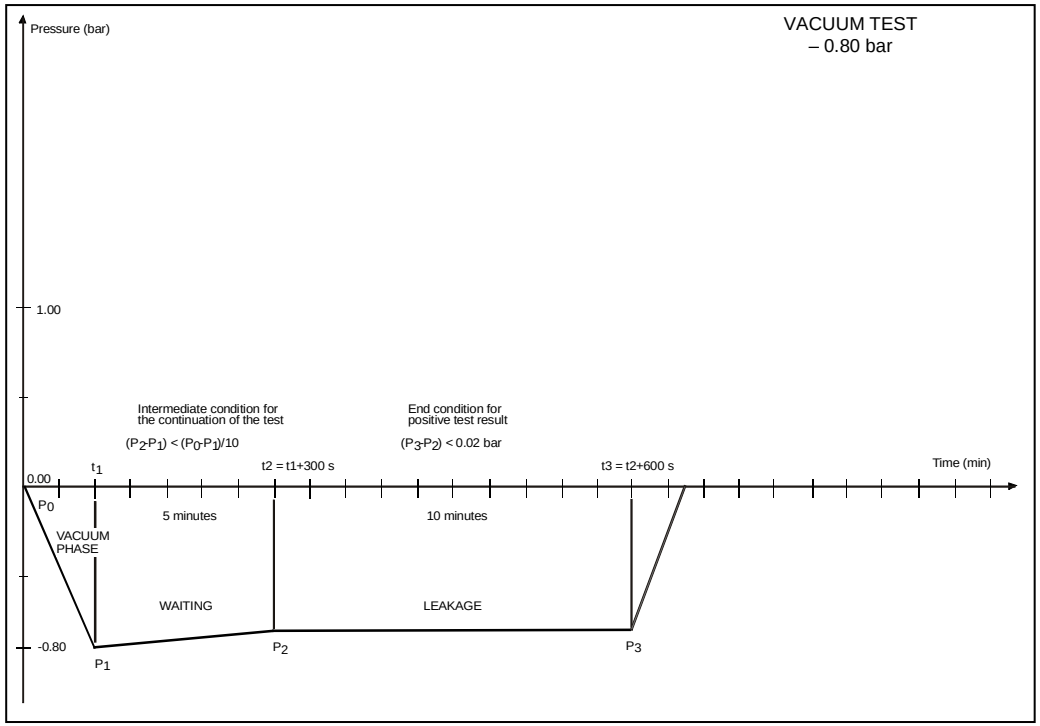
XXX CUSTOM



HELIX/ BD TEST



VACUUM TEST



SciCan

3. TROUBLESHOOTING AND REPAIR

TROUBLESHOOTING

GENERAL

Every time an anomalous condition occurs during the operation of the sterilizer, an alarm is generated and a specific code (consisting of a letter followed by a 3-digit number) is displayed.

The alarm codes are divided into **three categories**:

- **E** = **ERROR**
  Operator error or a cause external to the device.
  Problem normally fixed by the user.
  Code format: **Exxx** **(xxx = identifying number 000 ÷ 999)**

- **A** = **ALARM**
  First-level fault, **not linked** to the safety.
  Problem normally fixed by a specialized technician on-site.
  Code format: **Axxx** **(xxx = identifying number 000 ÷ 999)**

- **H** = **HAZARD**
  Second-level fault, **linked** to the safety.
  Problem normally fixed by the Technical Support Center.
  Code format: **Hxxx** **(xxx = identifying number 000 ÷ 999**

ALARM INTERVENTION

☞ In the case of an alarm, do not power off the unit before you have executed a reset *(see "**System reset**").*

An alarm causes the interruption of the cycle with the relative **alarm code** displayed on the display, accompanied by a **beep** and a flashing **alarm icon.**

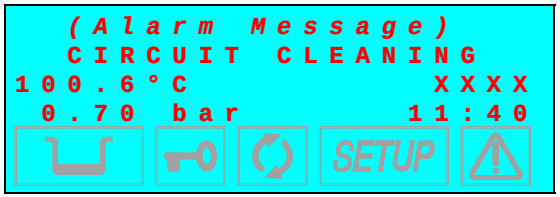
☞ During the alarm procedure, the display always shows the current temperature and pressure in the sterilization chamber..

This procedure is designed to keep the user from mistaking an anomalous cycle for a correctly completed cycle and, as a consequence, involuntarily using non-sterile material.
The alarm procedure is **differentiated** depending on whether it occurs **during** the execution of the program or **outside**, and is structured to guide the user to the necessary **RESET** of the sterilizer .

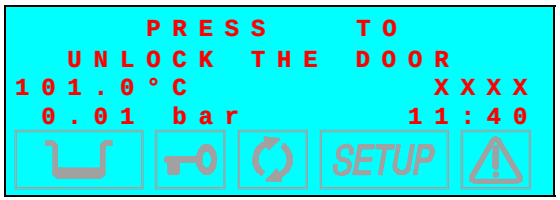
Alarm occurring during a cycle

If the alarm intervenes **during a program**, the display will show the message :

When an alarm is generated in certain phases of the cycle, an automatic procedure is activated to clean the internal water circuit. The display will contain the notice:

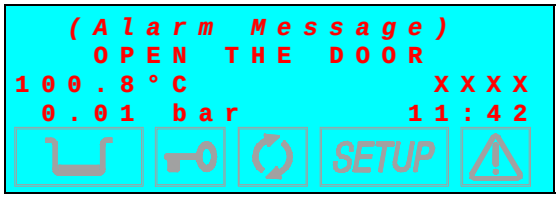


At the end of what has been described and having reached safe conditions, the machine activates a special procedure, that asks the user to manually unlock the door:

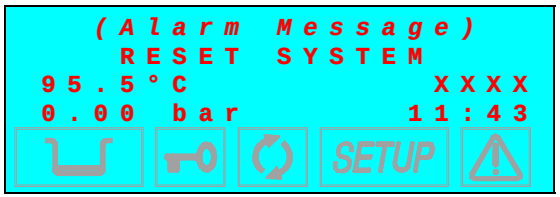


☞ The above indicated message is shown ONLY when the pressure in the chamber is within a safety limit. The release of the locking device is NOT possible when the pressure value is outside this limit.

Press the key to unlock the door lock mechanism; the following message appears:



Once the door is open, the user is asked to **reset** the system:



Perform a **RESET** , then turn-off the equipment, find the problem or make the repair.

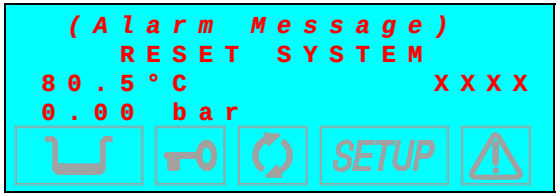
☞ When the door is opened, the report (normal or extended depending on the type of alarm) will be printed for the interrupted sterilization program and the alarm that intervened. Check the document, initial it in the space provided and file it in a suitable place. Refer to ***Print report examples***.

Alarm outside the cycle

If the alarm intervenes **outside the sterilization or test program**, the display will show:

Turn-off the equipment and check the alarm. Or, depending on the type of alarm:

which is automatically transformed to the message:



Perform a **RESET**, then turn-off the equipment and check the problem.

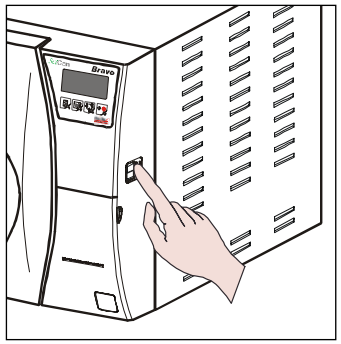
☞ Alarms that intervene outside of a program do not produce a printed report.

SYSTEM RESET

Depending on the alarm, the system must be reset in one of two ways (see the **Alarm Code List**):

1. Press and hold the key *PROGRAM SELECTION* for about 3 seconds.
   A beep confirms the RESET;

Never turn the device off before trying to execute a reset as described above.



2. Turn-off the equipment, then power-on using the main switch.
   Upon power-up, the sterilizer will perform its normal initial test.

After the RESET, and any technical intervention necessary to eliminate the fault, the equipment will go to STAND-BY mode, ready to execute a new program.

ERROR LIST - “E” CODES

CODE	ERROR DESCRIPTION	LCD INDICATION	RESET MODE
E 000	Blackout	BLACK-OUT	Press key  ***(> 3 seconds)***
E 010	Door open	DOOR OPEN	
E 020	Exceeded timeout for activating door lock system ***(closing)***	DOOR UNLOCKED	
E 021	Exceeded timeout for activating door lock system ***(opening)***	DOOR LOCKED	
E 030	Water in the fill tank at minimum (MIN) level	WATER MIN	
E 031	Water in the drain tank at maximum (MAX) level	EXHAUST MAX	
E 041	Filling the tank too frequently or external water source out of water (*automatic filling*)	FILLING PROBLEM	
E 900	Vacuum Test failed (*during the **LEAKAGE PHASE***)	TEST FAILED	
E 901	Vacuum Test failed (*during the **WAITING PHASE***)	TEST FAILED	
E 902	Vacuum Test failed (*vacuum pulse timeout exceeded*)	TEST FAILED	
E 999	Manual cycle interruption	MANUAL STOP	

ALARM LIST - “A” CODES

CODE	ALARM DESCRIPTION	LCD INDICATION	RESET MODE
A 022	System door lock microswitches failed ***(OFF-OFF)***	LOCKING PROBLEM	Turning off the equipment
A 023	System door lock microswitches failed ***(ON-ON)***	LOCKING PROBLEM	
A 024	System door lock microswitches failed ***(ON-OFF)***	LOCKING PROBLEM	
A 032	Sensor-level problem	LEVEL PROBLEM	
A 040	Failure to fill the tank (*automatic filling*)	FILLING PROBLEM	
A 101	PT1 broken (*sterilization chamber*)	PTC BROKEN	
A 102	PT2 broken (*steam generator*)	PTC BROKEN	
A 103	PT3 broken (*heating element*)	PTC BROKEN	
A 104	PT4 broken (*sterilization chamber wall*)	PTC BROKEN	
A 111	PT1 short-circuited (*sterilization chamber*)	PTC SHORTCIRCUIT	
A 112	PT2 short-circuited (*steam generator*)	PTC SHORTCIRCUIT	
A 113	PT3 short-circuited (*heating element*)	PTC SHORTCIRCUIT	
A 114	PT4 short-circuited (*sterilization chamber wall*)	PTC SHORTCIRCUIT	
A 200	Pre-heating not performed within the timeout (*heating resistor problem*).	HEATING PROBLEM	

CODE	ALARM DESCRIPTION	LCD INDICATION	RESET MODE
A 250	1st vacuum pulse not reached within timeout	PV1 TIMEOUT	Press key  ***(> 3 seconds)***
A 251	1st rise to atmospheric pressure not reached within timeout	ATM1 TIMEOUT	
A 252	1st pressure pulse not reached within timeout	PP1 TIMEOUT	
A 253	2nd vacuum pulse not reached within timeout	PV2 TIMEOUT	
A 254	2nd rise to atmospheric pressure not reached within timeout	ATM2 TIMEOUT	
A 255	2nd pressure pulse not reached within timeout	PP2 TIMEOUT	
A 256	3rd vacuum pulse not reached within timeout	PV3 TIMEOUT	
A 257	3rd rise to atmospheric pressure not reached within timeout	ATM3 TIMEOUT	
A 258	3rd pressure pulse not reached within timeout	PPP TIMEOUT	
A 259	Phase of PROCESS not started within timeout	PROCESS TIMEOUT	
A 260	Chamber depressurization not completed within timeout	TIMEOUT PPD	

HAZARD ALARM LIST - "H" CODES

CODE	ALARM DESCRIPTION	LCD INDICATION	RESET MODE
H 150	MPX pressure sensor broken	MPX BROKEN	Turning off the equipment
H 160	MPX pressure sensor short-circuited/not connected	MPX SHORTCIRCUIT	
H 400	Ratio P_{conv}/T not balanced (P_{conv}>T) (*Phase **PROCESS***)	P/T PROBLEM	Hold down  ***(> 3 seconds)***
H 401	Ratio T/P_{conv} not balanced (T>P_{conv}) (*Phase **PROCESS***)	T/P PROBLEM	
H 402	Temperature above MAX limit (*Phase **PROCESS***)	T OVER LIMIT	
H 403	Temperature below MIN limit (*Phase **PROCESS***)	T UNDER LIMIT	
H 404	Temperature fluctuating over the limit (*Phase **PROCESS***)	PT1 FLUCTUATING	
H 405	Pressure above MAX limit (*Phase **PROCESS***)	P OVER LIMIT	
H 406	Pressure below MIN limit (*Phase **PROCESS***)	P UNDER LIMIT	
H 410	Wrong maintenance time *(Phase **PROCESS**)*	TIMER PROBLEM	
H 990	Excessive pressure (*sterilization chamber, MPX*)	OVERPRESSURE	
H 991	Overheating (*sterilization chamber, PT1*)	OVERHEATING PT1	
H 992	Overheating (*steam generator, PT2*)	OVERHEATING PT2	
H 993	Overheating (*band heating element, PT3*)	OVERHEATING PT3	

E 000

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
BLACK-OUT	Black-out	Mains voltage < 160V	Sudden power failure (**black-out**)	Wait for electricity to return, open the door and follow the instructions on the LCD. Reset the alarm and repeat the sterilization cycle.
			Main switch turned off accidentally	Switch on the equipment, open the door and follow the instructions on the LCD. Reset the alarm and repeat the sterilization cycle.
			Plug pulled out the socket accidentally.	Reconnect the plug, open the door and follow the instructions on the LCD. Reset the alarm and repeat the sterilization cycle.
			Mains fuses blown.	Replace the burned fuse (16A), switch on the equipment, open the door and follow the instructions on the LCD. Reset the alarm and repeat the sterilization cycle.
			Pay attention during the occurring of the alarm and find the component causing the fault	Use the repair layout for the involved component
			The alarm occurs each time the equipment is turned on	Check that the operator resets correctly the alarm. Explain the correct procedure to be used. Check the main switch. **Replace the main switch - see card Gr1-17** Check for possible water or steam on electric components. Check the steam generator cartridges. **Replace the steam generator cartridge – see card Gr1-19 .**
			The alarm occurs at the opening of the door and starts the report printout.	Check and replace the fuse on the power supply printer board. **Replace the filter/PS printer board – see card Gr1-1.**

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			One or both the steam generator cartridges failed	Check the steam generator cartridge. **Replace the failed cartridge – see card Gr1-19.**
			Band heater in short-circuit.	Check the band heater. **replace the band heater – see card Gr1-18.**
			Damage during the equipment transport.	**Replace the damaged part.**

E 010

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
DOOR OPEN	Door open	The door micro-switch is not activated and remains in OFF position	Door **not** properly closed.	Explain the proper procedure on closing and opening the door.
			The door does not close completely	Check the positioner. **- Adjust the positioner – see Attachment A** **- Replace the positioner – see card Gr6-4**
			The door opens by oneself	**- Adjust the positioner – see Attachment A** **- Replace the positioner – see card Gr6-4**
			After the door gasket replacement, the door rebounds.	Call the Service, communicate the serial number of the sterilizer and follow the indications suggested. **- Replace the door gasket - see card Gr6-1** **- Replace the door dish- see card Gr6-2**
			Door properly closed but the door icon remains off.	Check the door microswitch. **Unlock the door microswitch.** **Replace the door microswitch – see card Gr6-5.**
			Damage during the equipment transport	**Replace the damaged part.**

E 020

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
DOOR UNLOCKED	Exceeded the timeout for the operation of door locking mechanism (closing)	At the start of the cycle the door locking mechanism exceeds the timeout of 2.5 seconds.	Push on the door micro-switch pin, start the cycle and check the operation of the door locking mechanism.	If the door locking mechanism operates correctly and the LCD displays the message "WARMUP": - Check that the bushes on the fork turn freely. - **Replace the blocked bush - see card Gr6-3** - Explain the operator for the correct procedure to start the cycle. If the mechanism operates correctly and the LCD shows the alarm: - Check the integrity of the release micro-switch . - **Replace the release micro-switch - see card Gr6-5** - Check the integrity of the locking micro-switch. - **Replace the locking micro-switch - see card Gr6-5** - Check on the motherboard the wiring of the release micro-switch (white) and eventually restore the connection. - Unlock the door– **see Attachment H or Attachment I**. If the mechanism blocks at the half of the stroke between locking and release micro-switches: - Check for possible motor failure (noisy during the operation). **- Replace the motor - see card G6-6.** - Check for possible step-running of the locking mechanism. - Replace the pin coupling the motor and locking mechanism **- see card G6-6**.

Continue

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
				- Check for possible loosening of the motor mounting screws. - Fasten the motor. - Replace the motor - see card Gr6-6. - Do not use any sealant on these screws. - Check for the correct power supply during the motor operation. - Replace the motor - see card Gr6-6. - Replace the motor wiring - see card Gr5-3. - Replace the power supply board- see card Gr1-1. If the mechanism does not work and remains in open position: - Check for the correct motor power supply. - Replace F5 fuse 1,25A - see card Gr1-16. - Replace the motor - see card Gr6-6. - Replace the motor wiring - see card Gr5-3. - Check the board connector. - Replace the tip of the motor wiring. - Check the pressure switch. - Disconnect and connect again the pressure switch wiring. - Replace the pressure switch - see card Gr1-5 - Replace the CPU board. - see card Gr1-1
			Close the door, start the cycle and check the operation of the door locking mechanism.	Check as above.
			Check for the correct connection of the wiring on the release micro-switch .	Restore the wiring and try a new cycle. - Replace the wiring - Replace the release micro-switch - see card Gr6-5 .
			Check for the correct connection of the wiring on the locking micro-switch .	Restore the wiring and try a new cycle. - Replace the wiring - Replace the locking micro-switch - see card Gr6-5 .
Continue			Check for possible block of the release micro-switch pin.	- Replace the release micro-switch - see card Gr6-5.

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Check manually the operation of the locking micro-switch pin.	- Adjust the micro-switch. - Replace the micro-switch- **see card Gr6-5**.
			Check with a tester the 1,25 A fuse	- Replace the fuse (same value). - Replace the electronic board **- see card Gr1-1**.
			Check for the correct fastening of the motor mounting screws.	- Restore the correct mounting. - Replace the motor **- see card Gr6-6**. - Replace the motor pin**- see card Gr6-6**.
			Check for the free turning of the fork bushes.	- Replace the blocked bush**- see card Gr6-3**.
			Check that the motor runs normally.	- Replace the pin**- see card Gr6-6**. - Replace the motor**- see card Gr6-6**.
			The locking mechanism is step-working.	
			Check the 2 A fuse on the power board	- Replace the fuse **- see card Gr1-16**.
			Enter the setup, go to SERVICE and then select the option LOCKING DEVICE in order to check the door locking mechanism.	- Replace the burned fuse**- see card Gr1-16**. - Replace the power board**- see card Gr1-1**.
			Door gasket replaced by the user.	- Remove and mount properly the gasket. - **Replace the door gasket - see card Gr6-1** - **Check the door adjustment. - see Attachment B** - **Replace the door dish- see card Gr6-2**

E 021

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
DOOR LOCKED	Exceeded the timeout for the operation of door locking mechanism (opening)	At the end of the cycle the door locking mechanism exceeds the timeout of 2.5 seconds.	Use the procedure to open the door.	The door opens: - Check for the free turning of the fork bushes. - replace the blocked bush **- see card Gr6-3**. - Check for the regular mechanism operation. - Replace the motor pin **- see card Gr6-6**. - Replace the motor **- see card Gr6-6**. The door does not open: - Check the 1,25 A fuse - Replace the fuse **- see card Gr1-16**. - Check the pressure switch. - Disconnect and connect again the pressure switch wiring. - Replace the pressure switch**- see card Gr1-5**. - Disassemble the motor and unlock the mechanism. - Check the locking micro-switch. - Replace micro-switch **- see card Gr6-5**
			Wiring loosen during the operation.	Reconnect the wiring.
			Failure of the locking black micro-switch.	Replace locking micro-switch **- see card Gr6-5**.
			The fuse 1,25 A burns during the cycle.	Replace the fuse **- see card Gr1-16**.
			A fork bush is blocked.	Replace the bush **- see card Gr6-3**.
			The pressure switch reads a wrong pressure and impedes the door opening.	Disconnect and connect again the pressure switch wiring. - Replace the pressure switch **- see card Gr1-5**.

E 030

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
WATER MIN	Water at minimum level in the main tank	The cycle does not start.	Cycle started with water level under the minimum threshold.	Fill-up the tank until the MAX icon comes on (or at least until MIN icon goes off).
			Check for possible failure of the float wiring.	**Replace the float - see card Gr4-2** **Restore the float wiring**
			Failure of the float	**Replace the float - see card Gr4-2**
			Check the wiring of the level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the ground connection of the sterilizer.	**Clean the ground connections.** **Replace the damage ground connection.**
			Sterilizer connected through a power strip.	**Remove the power strip and connect the sterilizer as recommended (see Operating Manual).**
			Check the electrical system of the room	**Conform the ground connection to the standard.** **Conform the electrical system to the standard.**

E 031

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
EXHAUST MAX	Water at maximum level in the recovery tank .	The cycle does not start	Cycle started with water level over the maximum threshold.	Empty completely the recovery tank.
			Check for possible failure of the float wiring.	**Restore the float wiring**
			Failure of the float.	**Replace the float - see card Gr4-2**
			Check the wiring of the water level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the water level sensor connection on the CPU board.	**Restore the connection.** **Replace the float - see card Gr4-2** **Replace the CPU board – see card Gr1-1**
			Sterilizer configuration set on external water drain.	**Restore the connection of the external water level sensor.** **Empty the external used water tank.** **Replace the external water level sensor.** **Replace the wiring of the external water level sensor.**
			Wrong water drain sterilizer configuration.	**Set the proper water drain option in the SETUP menu.**

E 041

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
FILLING PROBLEM	Automatic tank filling too frequent or external water source out of water	Two automatic fillings every 2 cycles.	Check for water in the external tank.	Fill the tank and switch on the sterilizer to enable the automatic water filling.
			Check the correct pipe connection between tank and sterilizer.	Restore the connection and check the correct automatic filling operation.
			Check for possible break of the pipe connecting tank and sterilizer.	**Replace the external pipe**
			Check that the entry filter is not dirty.	**Replace the entry filter**
			Check for possible break of the internal pipe.	**Replace the internal pipe**
			Check that the water pump works regularly.	**Replace the fuse - see card Gr1-16**
			Check for possible failure of the water pump.	**Replace the water pump- see card Gr3-1**
			Check the float (minimum level)	**Replace the float (minimum level) - see card Gr4-2**
			Check the integrity of the pipe from the Bravopure device	**Restore the pipe.**
			Check the START/STOP cable connection between sterilizer and Bravopure.	**Restore the connection.** **Replace the START/STOP cable.**
			Check the Bravopure operation.	**Perform the maintenance on the Bravopure device – See Operating Manual**

E 900

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
TEST FAILED	Vacuum test failed	Pressure change over the limit of 0,02 bar.	Check that the Vacuum test was not launched with chamber too hot.	Advise to carry out the Vacuum test at the beginning of the working day, with chamber empty and temperature lower than 50°C; never just after an alarm occurring .
			Leakage from the door gasket.	Clean carefully the gasket and the parabola's board; try a new Vacuum test. **Replace the gasket - see card Gr6-1**
			Leakage from a valve.	Find the valve and clean it. **Replace the valve causing the leakage - see cards Gr2**
			The pipe of the pressure transducer is loosen.	Disconnect and connect again the pipe.
			Leakage from the heat exchanger	**Replace the heat exchanger - see card Gr4-3**
			Sterilizer not used for a long time.	**Startup the hydraulic circuit of the steam generator – see Attachment G.** **Perform cycles without load.** **Replace the water pump – see card Gr3-1**

E 901

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
TEST FAILED	Vacuum test failed during the waiting time.	Pressure rising over the value -.71 bar.	Too much humidity in the sterilization chamber.	Dry carefully the chamber , reset the alarm, start a new Vacuum test. The chamber temperature must be lower than 50°C.
			Leakage from the door gasket.	Clean carefully the gasket and parabola's board , reset the alarm, start a new Vacuum test. The chamber temperature must be lower than 50°C **Replace the gasket - see card Gr6-1**
			Leakage from a valve.	Find the valve and clean it; reset the alarm and start a new Vacuum test.. **Replace the valve causing the problem - see cards Gr2**
			Check that the Vacuum test was not launched with chamber too hot	Advise to carry out the Vacuum test at the beginning of the working day, with chamber empty and temperature lower than 50°C. Reset the alarm and start a new Vacuum test Never start the Vacuum test just after an alarm occurring .
			Check that the Vacuum test was not launched just after an alarm occurring .	Advise for the correct execution of the Vacuum test
			Check that the transparent pipe of the pressure transducer is nor loosened.	Disconnect and connect again the transparent pipe.
			Leakage from the heat exchanger	**Replace the heat exchanger - see card Gr4-3**
			Sterilizer not used for a long time.	**Startup the hydraulic circuit of the steam generator – see Attachment G.** **Perform cycles without load.** **Replace the water pump – see card Gr3-1**

E 902

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
TEST FAILED	Vacuum test failed as the maximum vacuum is not reached within the set time	Vacuum -.80 not reached within 4'.	Vacuum pump not started regularly.	**Replace the vacuum pump - see card Gr3-3** **Replace the fuse - see card Gr1-16** **Replace the CPU board - see card Gr1-1**
			Vacuum pump wiring broken	Restore the vacuum pump, reset the alarm and try a new Vacuum test.
			Vacuum pump running in irregular way and is very noisy	**Fasten the dowel of the internal rod by a sealant - see card Gr3-3** **Replace the large membranes- see card Gr3-3** Clean the vacuum pump
			The dam filter in the sterilization chamber is clogged	Clean the dam filter and advice the user to clean regularly this filter as described in the Operating Manual (Ordinary operation).
			Leakage from the door gasket.	Clean carefully the gasket and the parabola's board, reset the alarm and try a new Vacuum test. **Replace the gasket - see card Gr6-1**
			Leakage from an internal pipe.	**Replace the pipe causing the problem** Reset the alarm e try a new Vacuum test

Continue

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Leakage from a valve.	Find and clean the valve
				Replace the valve - see cards Gr2
			Leakage from the heat exchanger.	**Replace the heat exchanger - see card Gr4-3**
			Leakage from the pressure transducer pipe.	Remove and connect again the pipe on the pressure transducer, reset the alarm and try a new Vacuum test.
			Pressure transducer uncalibrated.	Calibrate the pressure transducer
			Pressure transducer broken.	**Replace the pressure transducer - see card Gr1-4**
			Load into the sterilization chamber	**Remove any load from the chamber**

E 999

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
MANUAL STOP	Manual interruption of the cycle	START/STOP key pushed for more than 3" during the cycle process	The user pushed the START/STOP key.	Advice the user to do not use the manual stop function when you need to load an additional items to be sterilized. Suggest to use the Emergency cycle.
			The START/STOP key is blocked down.	**Replace the keyboard - see card Gr1-3** **Replace the CPU board - see card Gr1-1**

A 022

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
LOCKING PROBLEM	Failure on the micro-switches (OFF-OFF)	During the initial self test the two micro-switches are ON	At the switching on with door open, the micro-switch is broken.	Replace the micro-switch - see card Gr6-5
			At the switching on with door open, the micro-switch wiring is broken.	Replace micro-switch wiring
			At the switching on with door open, the micro-switch is blocked.	Release the micro-switch Replace the micro-switch - see card Gr6-5
			At the switching on with door closed, the wheel-pin micro-switch is broken.	Replace the micro-switch - see card Gr6-5 Go to Attachment H or Attachment I
			At the switching on with door closed, the micro-switch is blocked.	Release the micro-switch Replace the micro-switch - see card Gr6-5 Go to Attachment H or Attachment I
			Fuse burned during the previous cycle	Replace the fuse - - see card Gr1-16 Go to Attachment H or Attachment I
			Alarm occurred during the previous cycle; sterilizer turned off before completing the safety procedure	Go to Attachment H or Attachment I Advice the user for the correct operation in case of alarm
			The alarm continues to occur	replace the CPU board – see card Gr1-1.

A 023

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
LOCKING PROBLEM	Failure on the micro-switches (ON-ON).	During the initial self test the two micro-switches are OFF	Blackout during the opening	Go to Attachment H or Attachment I
			Power supply problem during the opening .	

A 024

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
LOCKING PROBLEM	Failure on the micro-switches (ON-OFF).	During the initial self test the closing micro-switch is ON and the opening micro-switch is OFF	Locking mechanism fuse burned during a cycle	Replace the fuse - see card Gr1-16
				Go to Attachment H or Attachment I.
			Alarm occurred during the previous cycle; sterilizer turned off before completing the safety procedure	Go to Attachment H or Attachment I
				Advice the user for the correct operation in case of alarm
			Locking mechanism broken	Replace the motor - see card Gr6-6
				Replace the motor coupling pin - see card Gr6-6
			Burned fuse.	Replace the fuse – see card Gr1-16.

A 032

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
LEVEL PROBLEM	Problems of the water level floats on the main tank	Lighting of both MIN and MAX signaling Led's .	Wiring of the water level floats disconnected.	Restore the connection and check the signals on the wires.
			Wiring failure of the water level floats	**Replace the wiring of the water level floats**
			Fault in the water level floats.	**Replace the fault float - see card Gr4-2**
			Connector of the water level floats unplugged from the board.	Restore the right connection.
			The board does not correctly read the signals from the water level floats.	**Replace the CPU board - see card Gr1-1**
			Check the wiring of the level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the ground connection of the sterilizer.	**Clean the ground connections.** **Replace the damage ground connection.**
			Sterilizer connected through a power strip.	**Remove the power strip and connect the sterilizer as recommended (see Operating Manual).**
			Check the electrical system of the room	**Conform the ground connection to the standard.** **Conform the electrical system to the standard.**

A 040

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
FILLING PROBLEM	Fail of the automatic filling from the external tank.	The MIN level signaling is not turned off within 2' from the start command of the automatic filling.	Check for water into the external filling tank.	Fill the external tank, reset the alarm and let the sterilizer's main tank to be filled.
			Check that the tap in the external filling tank is in open position.	Open the tap in the external filling tank.
			Check for possible obstruction in the external filling tank pipe.	Free the external filling tank pipe and shorten it if too long.
			Check for possible dirty in the Saeco filter.	**Replace the filter in the filling pipe path**
			Verify that the water pump works properly.	**Replace the fuse - see card Gr1-16** **Replace the water pump wiring** **Replace the water pump - see card Gr3-1** **Replace the power board - see card Gr1-1**
			Verify that the water pump is not blocked	Beat on the pump body to help the start of water pump. **Replace the water pump - see card Gr3-1**
			Fault of the water pump	**Replace the water pump - see card Gr3-1**

Continue

A 040 (continue)

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
FILLING PROBLEM	Fail of the automatic filling from the external tank.	The MIN level signaling is not turned off within 2' from the start command of the automatic filling.	Water pump not powered.	**Replace the fuse - see card Gr1-16** **Replace the power board - see card Gr1-1**
			Break in the water pump wiring.	**Replace the water pump wiring**
			Error in the water pump wiring connection.	Restore the right connection of the water pump wiring.
			Leak in the internal pipe.	**Replace the broken pipe**
			Perforation in the main tank	**Replace the main tank - see card Gr4-1**
			Disconnection of the level MIN float wiring.	Restore the float wiring connection.
			Fault in the level MIN float.	**Replace the level MIN float - see card Gr4-2**
			Check the integrity of the pipe from the Bravopure device	**Restore the pipe.**
			Check the START/STOP cable connection between sterilizer and Bravopure.	**Restore the connection.** **Replace the START/STOP cable.**
			Check the Bravopure operation.	**Perform the maintenance on the Bravopure device – See Operating Manual**

A 101

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT1 BROKEN	PT1 faulty	The temperature detected by the PT1 is higher than 250°C	PT1 broken	**Replace the PT1 - see card Gr1-8**
			PT1 uncalibrated.	**Perform the calibration – see Attachment N**
			Check the temperature value on the display.	If = the room temperature: **- turn off and on the sterilizer more times;** **- Replace PT1 – see card Gr1-8.** If differs for many °C: **- turn off and on the sterilizer more times;** **- Replace PT1 – see card Gr1-8;** **- Reset and calibrate the CPU board – see Attachment N.**
			Check the calibration.	**Perform the PT1 calibration– see Attachment M.** **Complete sterilizer calibration – see Attachment N** **Replace the CPU board – see card Gr1-1**
			Reset or failure on the data memory.	**Reset and calibrate CPU board – see Attachment N** **Replace the CPU board – see card Gr1-1**

A 102

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT2 BROKEN	PT2 faulty	The temperature detected by the PT2 is higher than 250°C	PT2 broken	Replace PT2 - see card Gr1-9
			PT2 uncalibrated.	Perform the calibration – see Attachment N
			Steam generator clogged.	Replace lower section of the steam generator - see card Gr4-6 Advice the user to change the type of distilled water used for the sterilization.
			No water feeding the steam generator.	Fill the main tank Replace the water pump - see card Gr3-1 Replace valve EV6 - see card Gr3-1
			Check the temperature value on the display.	If = the room temperature: - turn off and on the sterilizer more times; - Replace PT2 – see card Gr1-9. If differs for many °C: - turn off and on the sterilizer more times; - Replace PT2 – see card Gr1-9; - Reset and calibrate CPU board – see Attachment N.

Continue

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Check the calibration.	**Perform the PT2 calibration– see Attachment M.** **Complete sterilizer calibration – see Attachment N** **Replace the CPU board – see card Gr1-1**
			Reset or failure on the data memory.	**Reset and calibrate CPU board – see Attachment N** **Replace the CPU board – see card Gr1-1**

A 103

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT3 BROKEN	Fault in the PT3	The temperature detected by the PT3 is higher than 250°C	PT3 broken	**Replace the PT3 - see card Gr1-10**
			PT3 uncalibrated.	**Perform the calibration – see Attachment N**
			Check the temperature value on the display.	If = the room temperature: **- turn off and on the sterilizer more times;** **- Replace PT3 – see card Gr1-10.** If differs for many °C: **- turn off and on the sterilizer more times;** **- Replace PT3 – see card Gr1-10;** **- Reset and calibrate the CPU board – see Attachment N.**
			Check the calibration.	**Perform the PT3 calibration– see Attachment M.** **Complete sterilizer calibration – see Attachment N** **Replace the CPU board – see card Gr1-1**
			Reset or failure on the data memory.	**Reset and calibrate CPU board – see Attachment N** **Replace the CPU board – see card Gr1-1**

A 104

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT4 BROKEN	Fault in the PT4	The temperature detected by the PT44 is higher than 250°C	PT4 broken	**Replace the PT4 - see card Gr1-11**
			PT4 uncalibrated.	**Perform the calibration – see Attachment N**
			Check the temperature value on the display.	If = the room temperature: **- turn off and on the sterilizer more times;** **- Replace PT4 – see card Gr1-11.** If differs for many °C: **- turn off and on the sterilizer more times;** **- Replace PT4 – see card Gr1-11;** **- Reset and calibrate the CPU board – see Attachment N.**
			Check the calibration.	**Perform the PT4 calibration– see Attachment M.** **Complete sterilizer calibration – see Attachment N** **Replace the CPU board – see card Gr1-1**
			Reset or failure on the data memory.	**Reset and calibrate CPU board – see Attachment N** **Replace the CPU board – see card Gr1-1**

A 111

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT1 SHORTCIRCUIT	Short-circuit in the PT1 probe	The PT1 probe reads a temperature lower than 1°C	Unstable connection of the PT1 wiring.	Restore the wiring connection.
			PT1 wiring out from the board connector.	Restore the wiring connection on the board.
			PT1 probe in short-circuit	**Replace the PT1 probe - see card Gr1-8**
			PT1 probe uncalibrated	**Perform the calibration – see Attachment N**
			Too low environmental temperature in the installation or storage site.	Move the sterilizer in a different installation or storage site with higher environmental temperature.
			Check the wiring of the level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the ground connection of the sterilizer.	**Clean the ground connections.** **Replace the damage ground connection.**
			Sterilizer connected through a power strip.	**Remove the power strip and connect the sterilizer as recommended (see Operating Manual).**
			Check the electrical system of the room	**Conform the ground connection to the standard.** **Conform the electrical system to the standard.**
			Possible data memory fail.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Data memory reset.	**Replace CPU board – see card Gr1-1 -**
			CPU board replaced without performing the calibration.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Lost of calibration	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1 -**

A 112

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT2 SHORTCIRCUIT	Short-circuit in the PT2 probe	The PT2 probe reads a temperature lower than 1°C	Unstable connection of the PT2 wiring.	Restore the wiring connection.
			PT2 wiring out from the board connector.	Restore the wiring connection on the board.
			PT2 probe in short-circuit	**Replace the PT2 probe - see card Gr1-9**
			PT2 probe uncalibrated	**Perform the calibration – see Attachment N**
			Too low environmental temperature in the installation or storage site.	Move the sterilizer in a different installation or storage site with higher environmental temperature.
			Check the wiring of the level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the ground connection of the sterilizer.	**Clean the ground connections.** **Replace the damage ground connection.**
			Sterilizer connected through a power strip.	**Remove the power strip and connect the sterilizer as recommended (see Operating Manual).**
			Check the electrical system of the room	**Conform the ground connection to the standard.** **Conform the electrical system to the standard.**
			Possible data memory fail.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Data memory reset.	**Replace CPU board – see card Gr1-1 -**
			CPU board replaced without performing the calibration.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Lost of calibration	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1 -**

A 113

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT3 SHORTCIRCUIT	Short-circuit in the PT3 probe	The PT3 probe reads a temperature lower than 1°C	Unstable connection of the PT3wiring.	Restore the wiring connection.
			PT3 wiring out from the board connector.	Restore the wiring connection on the board.
			PT3 probe in short-circuit	**Replace the PT3 probe - see card Gr1-10**
			PT3 probe uncalibrated	**Perform the calibration – see Attachment N**
			Too low environmental temperature in the installation or storage site.	Move the sterilizer in a different installation or storage site with higher environmental temperature.
			Check the wiring of the level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the ground connection of the sterilizer.	**Clean the ground connections.** **Replace the damage ground connection.**
			Sterilizer connected through a power strip.	**Remove the power strip and connect the sterilizer as recommended (see Operating Manual).**
			Check the electrical system of the room	**Conform the ground connection to the standard.** **Conform the electrical system to the standard.**
			Possible data memory fail.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Data memory reset.	**Replace CPU board – see card Gr1-1 -**
			CPU board replaced without performing the calibration.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Lost of calibration	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1 -**

A 114

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT4 SHORTCIRCUIT	Short-circuit in the PT4 probe	The PT4 probe reads a temperature lower than 1°C	Unstable connection of the PT4 wiring.	Restore the wiring connection.
			PT4 wiring out from the board connector.	Restore the wiring connection on the board.
			PT4 probe in short-circuit	**Replace the PT4 probe - see card Gr1-11**
			PT4 probe uncalibrated	**Perform the calibration – see Attachment N**
			Too low environmental temperature in the installation or storage site.	Move the sterilizer in a different installation or storage site with higher environmental temperature.
			Check the wiring of the level sensor for the external used water tank.	**Disconnect the wiring on the CPU board**
			Check the ground connection of the sterilizer.	**Clean the ground connections.** **Replace the damage ground connection.**
			Sterilizer connected through a power strip.	**Remove the power strip and connect the sterilizer as recommended (see Operating Manual).**
			Check the electrical system of the room	**Conform the ground connection to the standard.** **Conform the electrical system to the standard.**
			Possible data memory fail.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Data memory reset.	**Replace CPU board – see card Gr1-1 -**
			CPU board replaced without performing the calibration.	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1**
			Lost of calibration	**Perform CPU board calibration – see Attachment N** **Replace CPU board – see card Gr1-1 -**

A 200

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
HEATING PROBLEM	Preheating phase not performed within the preset time	Pre-vacuum phase PV1 not started within 30' from the cycle start	Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle.
			Intervention of the heating resistor safety thermostat	Restore the safety thermostat and repeat the sterilization cycle.
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6**
			Fault in the board	**Replace the board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Software release before E0008 / BP00320	**Update the software – see Attachment K**
			Lack of water during the previous cycle	**Advice the user on the correct water level check**
			Check the cartridges of the steam generator	**Restore the connections** **Replace the failed cartridge – see card Gr1-19** **Replace the CPU board –see card Gr1-1**

A 250

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PV1 TIMEOUT	1st vacuum pulse (from 0.00 to -.88) not performed within the preset time	1st vacuum pulse not completed within 6' timeout	Excessive humidity into the sterilization chamber.	Wipe carefully the chamber, reset the alarm and restart the cycle; verify that the temperature in the sterilization chamber is lower than 50°C.
			Vacuum pump not correctly started	**Replace the vacuum pump - see card Gr3-3**
				Replace the fuse - see card Gr1-16
				Replace the power board - see card Gr1-1
			Break in the vacuum pump wiring	Restore the wiring of the vacuum pump, reset the alarm and repeat the sterilization cycle
			The vacuum pump does not work correctly and is too much noisy	**Fixe by sealant the grain of the connecting rod on the vacuum pump - see card Gr3-3**
				Replace the larger membranes of the vacuum pump - see card Gr3-3
				Clean the vacuum pump
			Clogging in the water stopper filter of the sterilization chamber	Perform the cleaning procedure of the water drain filter; this procedure must be performed regularly by the operator as described in the user manual
			Air leakage from the door gasket	Clean carefully the door gasket and dish, reset the alarm and restart the Vacuum test
				Replace the door gasket - see card Gr6-1
Continue			Air leakage from the internal pipes	**Replace the pipe causing the leakage**
				Reset the alarm and restart the sterilization cycle

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Air leakage from a valve	Identify the valve and clean it **Replace the valve - see cards Gr2**
			Air leakage from the heat exchanger	**Replace the heat exchanger - see card Gr4-3**
			Air leakage from the pipe of the pressure transducer	Unplug and plug again the pipe correctly on the pressure transducer, reset the alarm and restart the Vacuum test
			Pressure transducer uncalibrated	**Send the sterilizer to the Service department**
			Preset values changed	
			Check the water drain hole into the chamber	**Clean by using compressed air.**
			Check the steam generator	**Replace the Saeco filter – see card Gr4-8.** **Replace the water pump – see card Gr3-1.** **Replace valve EV6 – see card Gr3-1.** **Replace the lower section of the steam generator (O-Ring included) – see card Gr4-6.**
			Performed more than 2000 cycles without a overall control or check	**Replace the door gasket – see card Gr6-1** **Replace filter LP1 – see card Gr4-9** **Clean the chamber** **Replace the pipes** **Overhaul of the vacuum pump – see card Gr3-3** **Clean the electric valves** **Replace the Bacteriological filter – see card Gr4-7**
Continue			Check the type and the mass of the load arranged in the chamber	**Advice the user on loading and arranging the material in the chamber as indicated on the Operating Manual**

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Air leakage from fitting	Seal the fitting
			Check the integrity of the chamber	Replace the sterilization chamber

A 251

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
ATM1 TIMEOUT	1st pressure pulse (from -.88 to 0.00) not performed within the preset time	1st pressure pulse not performed within 3' timeout	The water pump of the steam generator does not work properly	**Replace the water pump - see card Gr3-1** **Replace the power board - see card Gr1-1**
			Incorrect operation of the EV6 valve	Clean the valve **Replace EV6 valve - see card Gr3-1**
			Fault in the pipe connecting the steam generator	**Replace the pipe**
			Sterilization chamber overloaded	Advice the operator for properly loading of the sterilization chamber.
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle **Replace the safety thermostat - see card Gr1-12**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the board	**Replace the board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Check the continuity of the steam generator cartridge	**Replace the failed cartridge**

A 252

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PP1 TIMEOUT	1st pressure pulse (from 0.00 to +1.00 bar) not performed within the preset time	First pressure pulse not performed within 3' timeout	Sterilization chamber overloaded	Advice the operator for properly loading of the sterilization chamber.
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle **Replace the safety thermostat - see card Gr1-12**
			Steam leakage from the door gasket	Clean properly the door gasket and dish **Replace the door gasket - see card Gr6-1**
			Steam leakage from a valve	Identify the valve and clean it **Replace the valve causing the problem - see cards Gr2**
			Steam leakage from a pipe	**Replace the pipe causing the problem**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the CPU board	**Replace the CPU board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Check the continuity of the steam generator cartridge	**Replace the failed cartridge - see card Gr1-19**
			Check the maintenance status	**Advice the operator on the proper maintenance**

A 253

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PV2 TIMEOUT	2nd vacuum pulse (from +1.00 to -.80 bar) not performed within the preset time	2nd vacuum pulse not performed within 7' timeout	Excessive humidity into the sterilization chamber.	Wipe carefully the chamber, reset the alarm and restart the cycle; verify that the temperature in the sterilization chamber is lower than 50°C.
			Vacuum pump not correctly started	**Replace the vacuum pump - see card Gr3-3** **Replace the fuse - see card Gr1-16** **Replace the board - see card Gr1-1**
			Break in the vacuum pump wiring	Restore the wiring of the vacuum pump, reset the alarm and repeat the sterilization cycle
			The vacuum pump does not work correctly and is too much noisy	**Fixe by sealant the grain of the connecting rod on the vacuum pump - see card Gr3-3** **Replace the larger membranes of the vacuum pump - see card Gr3-3** Clean the vacuum pump
			Clogging in the water stopper filter of the sterilization chamber	Perform the cleaning procedure of the water drain filter; this procedure must be performed regularly by the operator as described in the user manual
			Air leakage from the door gasket	Clean carefully the door gasket and dish, reset the alarm and restart the cycle **Replace the door gasket - see card Gr6-1**
			Air leakage from the internal pipes	**Replace the pipe causing the leakage** Reset the alarm and restart the sterilization cycle

Continue

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Air leakage from a valve	Identify the valve and clean it **Replace the valve - see cards Gr2**
			Air leakage from the heat exchanger	**Replace the heat exchanger - see card Gr4-3**
			Air leakage from the pipe of the pressure transducer.	Unplug and plug again the pipe correctly on the pressure transducer, reset the alarm and restart the cycle
			Pressure transducer uncalibrated	**Send the sterilizer to the Service department**
			Check the type and the mass of the load arranged in the chamber	**Advice the user on loading and arranging the material in the chamber as indicated on the Operating Manual**
			Check the quality of the distilled water	**Advice the user** **Clean the hydraulic circuit** **Replace the damaged components**
			Check the current arrangement of the equipment	**Change as necessary**
			Check the electric system of the room	**Eliminate any possible power strip** **The equipment must be powered through one's own supply line**
			Check the fan of the heat exchanger	**Clean the fans – see card Gr4-4** **Replace the damaged fan – see card Gr4-4**

A 254

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
ATM2 TIMEOUT	2nd pressure pulse (from -.80 to 0.00 bar) not performed within the preset time	2nd pressure pulse not performed within 3' timeout	The water pump of the steam generator does not work properly	**Replace the water pump - see card Gr3-1** **Replace the power board - see card Gr1-1**
			Incorrect operation of the EV6 valve	Clean the valve **Replace the EV6 valve - see card Gr3-1**
			Fault in the pipe connecting the steam generator	**Replace the pipe**
			Sterilization chamber overloaded	Advice the operator for properly loading of the sterilization chamber.
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle. **Replace the safety thermostat - see card Gr4-6**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the board	**Replace the board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Check the continuity of the steam generator cartridge	**Replace the failed cartridge - see card Gr1-19**

A 255

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PP2 TIMEOUT	2nd pressure pulse (from 0.00 to +1.00 bar) not performed within the preset time	2nd pressure pulse not performed within 3' timeout	Sterilization chamber overloaded	Advice the operator for properly loading of the sterilization chamber
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle. **Replace the safety thermostat - see card Gr1-12**
			Steam leakage from the door gasket	Clean carefully the door gasket and dish, reset the alarm and restart the cycle **Replace the door gasket - see card Gr6-1**
			Steam leakage from a valve	Identify the valve and clean it **Replace the valve - see cards Gr2**
			Steam leakage from a pipe	**Replace the pipe causing the problem**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the board	**Replace the board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Check the continuity of the steam generator cartridge	**Replace the failed cartridge - see card Gr1-19**
			Check the maintenance status	**Advice the operator on the proper maintenance**

A 256

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PV3 TIMEOUT	3rd vacuum pulse (from +1.00 to -.80 bar) not performed within the preset time	3rd vacuum pulse not performed within 7' timeout	Excessive humidity into the sterilization chamber..	Wipe carefully the chamber, reset the alarm and restart the cycle; verify that the temperature in the sterilization chamber is lower than 50°C
Continue			Vacuum pump not correctly started	**Replace the vacuum pump - see card Gr3-3** **Replace the fuse - see card Gr1-16** **Replace the CPU board - see card Gr1-1**
			Break in the vacuum pump wiring	Restore the wiring of the vacuum pump, reset the alarm and repeat the sterilization cycle
			The vacuum pump does not work correctly and is too much noisy	**Fixe by sealant the grain of the connecting rod on the vacuum pump - see card Gr3-3** **Replace the larger membranes of the vacuum pump - see card Gr3-3** Clean the vacuum pump
			Clogging in the water stopper filter of the sterilization chamber	Perform the cleaning procedure of the water stopper filter; this procedure must be performed regularly by the operator as described in the user manual
			Air leakage from the door gasket	Clean carefully the door gasket and dish, reset the alarm and restart the cycle **Replace the door gasket - see card Gr6-1**
			Air leakage from the internal pipes	**Replace the pipe causing the leakage** Reset the alarm and restart the sterilization cycle

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
			Air leakage from a valve	Identify the valve and clean it **Replace the valve - see cards Gr2**
			Air leakage from the heat exchanger	**Replace the heat exchanger - see card Gr4-3**
			Air leakage from the pipe of the pressure transducer	Unplug and plug again the pipe correctly on the pressure transducer, reset the alarm and restart the cycle
			Pressure transducer uncalibrated	**Send the sterilizer to the Service department**
			Check the type and the mass of the load arranged in the chamber	**Advice the user on loading and arranging the material in the chamber as indicated on the Operating Manual**
			Check the quality of the distilled water	**Advice the user** **Clean the hydraulic circuit** **Replace the damaged components**
			Check the current arrangement of the equipment	**Change as necessary**
			Check the electric system of the room	**Eliminate any possible power strip** **The equipment must be powered through one's own supply line**
			Check the fan of the heat exchanger	**Clean the fans – see card Gr4-4** **Replace the damaged fan – see card Gr4-4**

A 257

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
ATM3 TIMEOUT	3rd pressure rising (from -.80 to 0.00 bar) not performed within the preset time	3rd pressure rising not performed within 3' timeout	The water pump of the steam generator does not work properly	**Replace the water pump - see card Gr3-1** **Replace the power board - see card Gr1-1**
			Incorrect operation of the EV6 valve	Clean the valve **Replace the EV6 valve - see card Gr3-1**
			Fault in the pipe connecting the steam generator	**Replace the pipe**
			Sterilization chamber overloaded	Advise the operator for properly loading of the sterilization chamber.
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle. **Replace the safety thermostat- see card Gr1-12**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the CPU board	**Replace the CPU board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Check the continuity of the steam generator cartridge	**Replace the failed cartridge - see card Gr1-19**

A 258

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PPP TIMEOUT	3rd pressure pulse (from 0.00 to +1.12/2.15 bar) not performed within the preset time	3rd pressure pulse not performed within 7' timeout	Sterilization chamber overloaded	Advice the operator for properly loading of the sterilization chamber
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle. **Replace the safety thermostat - see card Gr1-12**
			Steam leakage from the door gasket	Clean properly the door gasket and the door dish **Replace the door gasket - see card Gr6-1**
			Steam leakage from a valve	Identify the valve and clean it **Replace the valve causing the problem - see cards Gr2**
			Steam leakage from a pipe	**Replace the pipe causing the problem**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the board	**Replace the CPU board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**
			Check the continuity of the steam generator cartridge	**Replace the failed cartridge - see card Gr1-19**
			Check the maintenance status	**Advice the operator on the proper maintenance**

A 259

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PROCESS TIMEOUT	Process phase (from PV1 to PROCESS) not reached within the preset time	Process phase not reached within 35' timeout	Sterilization chamber overloaded	Advice the operator for properly loading of the sterilization chamber
			Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle. **Replace the safety thermostat - see card Gr1-12**
			Steam leakage from the door gasket	Clean properly the door gasket and the door dish **Replace the door gasket - see card Gr6-1**
			Steam leakage from a valve	Identify the valve and clean it **Replace the valve causing the problem - see cards Gr2**
			Steam leakage from a pipe	**Replace the pipe causing the problem**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the board	**Replace the CPU board - see card Gr1-1**
			CPU board uncalibrated	**Send the sterilizer to the Service department**

A 260

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PROCESS TIMEOUT	Depressurization not performed within the preset time	Problem on switching the valves during the steam discharge	EV3 interrupted	Replace the EV3 shaft - see card Gr2-3
			EV3 Shaft blocked	Clean or replace the shaft - see card Gr2-3
			EV3 dirty	
			EV3 not powered	Replace the wiring Replace the fuse - see card Gr1-16 Replace the CPU board - see card Gr1-1
			Check the arrangement of the sterilizer (slope)	Change as necessary (adjust the feet for the proper slope)
			Check the water drain filter LP1	Clean/replace the filter (see Section 1 – Maintenance)

H 150

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
MPX BROKEN	Pressure transducer broken	Pressure reading by the transducer higher than 2.35 bar	Fault in the wiring connecting the pressure transducer to board	
			Fault in the pressure transducer	Replace the pressure transducer - see card Gr1-4
			Steam leakage from the pressure transducer	
			Pressure transducer uncalibrated	Send the sterilizer to the Service department

H 160

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
MPX SHORTCIRCUIT	Short-circuit in the pressure transducer	Pressure reading by the transducer lower than –1.01 bar	Fault in the pressure transducer wiring..	Replace the pressure transducer - see card Gr1-4
			Short-circuit in the pressure transducer	
			Steam leakage from the pressure transducer	Seal the pipe fitting Replace the pressure transducer - see card Gr1-4
			Fault in the pressure transducer	Replace the pressure transducer - see card Gr1-4
			Pressure transducer uncalibrated	Send the sterilizer to the Service department
			Check for the jumper X21 on the CPU board	Set the jumper on its position Reset the data memory and calibrate the CPU board – see Attachment N Calibrate the CPU board – see Attachment N

H 400

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
P/T PROBLEM	Ratio P_{conv}/T not correctly balanced (P_{conv} greater than T) during the process phase	The difference value between P_{conv} and T is greater of 2°C	Problem in the water pump of the steam generator	**Replace the water pump - see card Gr3-1**
			EV6 does not open correctly	Clean the valve and repeat the sterilizaztion cycle **Replace EV6 - see card Gr3-1**
			Steam leakage from a valve	Identify the valve causing the problem and clean it **Replace the valve causing the problem - see cards Gr2**
			The discharge valve does not open correctly	**Replace the discharge valve**
			Fault in the board	**Replace the CPU board - see card Gr1-1**
			Stored calibration values changed	**Send the sterilizer to the Service department**
			Steam leakage from the door gasket	**Replace the door gasket - see card Gr6-1**
			Check the quality of the distilled water	**Clean the hydraulic circuit** **Replace the damaged components** **Advice the user**
			Check the PCB filter board	**replace the board – see card Gr1-1**

H 401

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
T/P PROBLEM	Ratio T/P_{conv} not correctly balanced (T greater than P_{conv}) during the process phase	The difference value between P_{conv} and T is greater of 2°C	Problem in the board	**Replace the CPU board - see card Gr1-1**
			Problem in the water pump of the steam generator	**Replace the water pump - see card Gr3-1**
			EV6 valve does not open correctly	**Replace EV6 - see card Gr3-1**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Stored calibration values changed	**Send the sterilizer to the Service department**
			Steam leakage from the door gasket	Clean the gasket **Replace the door gasket- see card Gr6-1**
			Pressure transducer broken	**Replace the pressure transducer - see card Gr1-4**
			Check the type and the mass of the load arranged in the chamber	**Advice the user on loading and arranging the material in the chamber as indicated on the Operating Manual**
			Check the PT1	**Replace PT1 – see card Gr1-8** **Calibrate PT1 – see Attachment N**

H 402

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
T OVER LIMIT	Temperature over the MAX threshold during the process phase	The temperature detected by PT1 probe is +3°C greater than T_{nom} value (PT1 greater than 124/137)	Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Problem in the water pump of the steam generator	**Replace the water pump - see card Gr3-1** **Replace the fuse - see card Gr1-16**
			EV6 valve does not open correctly	**Replace EV6 - see card Gr3-1**
			Water leak from the steam generator circuit	Identify the component and replace it
			Problem in the board	**Replace the CPU board - see card Gr1-1**
			Steam leakage from a valve	Replace the valve causing the problem
			Stored calibration values changed	**Send the sterilizer to the Service department**
			PT1 failure	**Replace PT1 - see card Gr1-8**

H 403

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
T UNDER LIMIT	Temperature under the MIN threshold during the process phase	The temperature detected by PT1 probe is lower than T_{nom} value (PT1 lower than 121/134°C)	Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle. **Replace the safety thermostat - see card Gr1-12**
			Problem in the steam generator	Dismount and replace the O-ring in the steam generator **Replace the lower section of the steam generator - see card Gr4-6**
			Steam leakage from the hydraulic circuit	Identify the component and replace it
			Fault in the board	**Replace the CPU board - see card Gr1-1**
			Steam leakage from the door gasket	Clean properly door gasket and the door dish. **Replace the door gasket - see card Gr6-1**
			Steam leakage from a pipe	**Replace the pipe causing the problem**
			Stored calibration values changed	**Send the sterilizer to the Service department**
			Check the type and the mass of the load arranged in the chamber	**Advice the user on loading and arranging the material in the chamber as indicated on the Operating Manual**

H 404

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
PT1 FLUCTUATING	Temperature fluctuating around the threshold during the process phase	Difference between PT1max and PT1min greater than 2°C	Steam leakage from the door gasket	Clean door gasket and the door dish. **Replace the door gasket - see card Gr6-1**
			Steam leakage from a valve	Identify the valve and clean it **Replace the valve causing the problem - see cards Gr2**
			Steam leakage from a pipe	**Replace the pipe causing the problem**
			Problem in the water pump of the steam generator	**Replace the water pump - see card Gr3-1**
			EV6 valve does not open correctly	**Replace EV6 - see card Gr3-1**
			Problem in the steam generator	Dismount and replace the O-ring in the steam generator **Replace the lower section of the steam generator - see card Gr4-6**
			Fault in the board	**Replace the CPU board - see card Gr1-1**
			PT1 failure	**Replace PT1 - see card Gr1-8**

H 405

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
P OVER LIMIT	Pressure value over the MAX threshold during the process phase	Pressure value greater than 1.24 or 2.31 bar (depending on the cycle type: 121 or 134°C)	Fault in the board	**Replace the CPU board - see card Gr1-1**
			Stored calibration values changed	**Send the sterilizer to the Service department**
			Discharge valve does not open correctly	Clean the valve **Replace the valve - see cards Gr2**
			Pressure transducer uncalibrated	**Send the sterilizer to the Service department**
			Pressure transducer broken	**Replace the pressure transducer - see card Gr1-4**

H 406

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
P UNDER LIMIT	Pressure value under the MIN threshold during the process phase	Pressure value lower than 1.03 or 2.02 bar (depending on the cycle type: 121 or 134°C)	Intervention of the steam generator safety thermostat	Restore the safety thermostat and repeat the sterilization cycle **Replace the safety thermostat - see card Gr1-12**
			Problem in the steam generator	Dismount and replace the O-ring in the steam generator **Replace the lower section of the steam generator - see card Gr4-6**
			Steam generator clogged	**Replace the lower section of the steam generator - see card Gr4-6** Different distilled water must be used
			Fault in the board	**Replace the CPU board- see card Gr1-1**
			Steam leakage from the door gasket	Clean door gasket and the door dish **Replace the door gasket - see card Gr6-1**
			Steam leakage from the hydraulic circuit	**Replace the component causing the problem**
			Stored calibration values changed	**Send the sterilizer to the Service department**
			Special trays in the chamber	Advice the user to use one special tray per cycle and arrange it on the middle area.
			The steam generator cartridges don't heat	**Replace the broken cartridge – see card Gr1-19** **Replace the CPU board – see card Gr1-1** **Replace the power supply board – see card Gr1-1**
			Steam leakage from the pipes	**Replace the pipe**
			Check the wiring connecting the external used water tank	**Remove the wiring**

H 410

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
TIMER PROBLEM	Wrong hold time during the process phase	Countdown time mismatches the setpoint value	CPU board failed	Replace the CPU board - see card Gr1-1

H 990

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
OVER PRESSURE	Overpressure in the sterilization chamber	Pressure value greater than 2.32 bar	Fault in the board	Replace the CPU board - see card Gr1-1
			Fault in the pressure transducer	Replace the pressure transducer - see card Gr1-4
			Stored calibration values changed	Send the sterilizer to the Service department

H 991

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
OVERHEATING PT1	PT1 overheating	PT1 detects a temperature value greater than 138°C	Fault in the board	Replace the CPU board- see card Gr1-1
			Fault in the pressure transducer	Replace the pressure transducer - see card Gr1-4
			Stored calibration values changed	Send the sterilizer to the Service department
			Fault in the PT1	Replace PT1 - see card Gr1-8
			Check the wiring connecting the external used water tank	Remove the wiring

H 992

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
OVERHEATING PT2	PT2 overheating	PT2 detects a temperature value greater than 230°C	Fault in the board	Replace the CPU board- see card Gr1-1
			Fault in the pressure transducer	Replace the pressure transducer - see card Gr1-4
			Steam generator clogged	Replace the lower section of the steam generator - see card Gr4-6
			Stored calibration values changed	Send the sterilizer to the Service department

H 993

LCD INDICATION	Alarm description	Effect/Signaling	Possible cause / Check	Proposed solution
OVERHEATING PT3	PT3 overheating	PT3 detects a temperature value greater than 160°C	Fault in the board	Replace the CPU board- see card Gr1-1
			Fault in the pressure transducer	Replace the pressure transducer - see card Gr1-4
			Stored calibration values changed	Send the sterilizer to the Service department

REPAIR PROCEDURES

The repair procedures consist of cards grouped as follows:

GROUP 1	**ELECTRONIC DEVICES AND ASSEMBLIES**
GROUP 2	**ELECTROVALVES**
GROUP 3	**PUMPS**
GROUP 4	**PLUMBING CIRCUIT**
GROUP 5	**WIRINGS**
GROUP 6	**DOOR LOCKING MECHANISM**
GROUP 7	**COVERS**
ATTACHMENTS	

SciCan

GROUP 1

ELECTRONIC DEVICES AND ASSEMBLIES

ELECTRONIC BOARD ASSEMBLY (GAM VERSION)
A0BP5730000

BASIC BOARD (GAM VERSION)
C5BP5630000

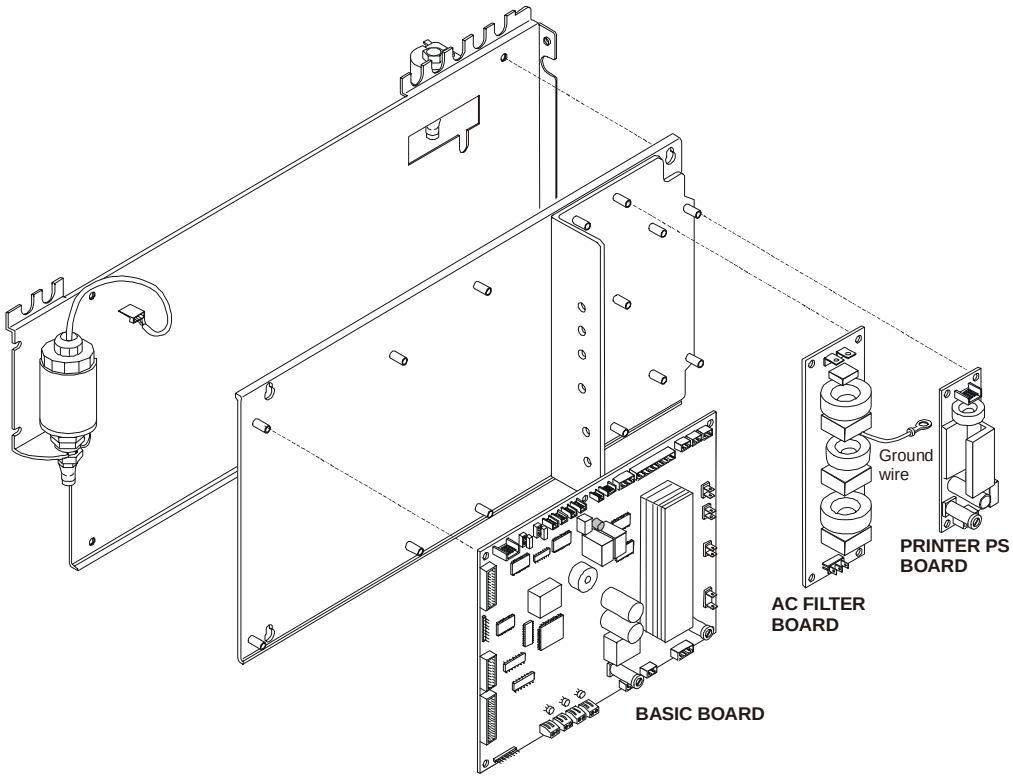
AC FILTER BOARD
120VAC 60Hz - C5BP4350000
220/230VAC 60Hz - C5BP5820000
220/240VAC 50Hz - C5BP1420000

PRINTER POWER SUPPLY BOARD
C5BP1430000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket.

1. Remove the frame cover (see card ***Gr7-1***);
2. Unplug connectors and wirings from the pcb board;
3. Remove the screws and remove the pcb board;
4. Mount the new pcb board, restore connections and reassemble proceeding in reverse order;
5. Check the calibration, see Attachment M
6. Run a sterilization cycle.

Note: in case of printer pcb board replacement, perform a check of the report print by selecting the items Print options/Report/Print last/Normal print of the Setup menu (see **Setting printing mode)**.



ELECTRONIC BOARD ASSEMBLY (TROLL VERSION)
A0BM4760000

BASIC BOARD (TROLL VERSION)
A5BM1400000

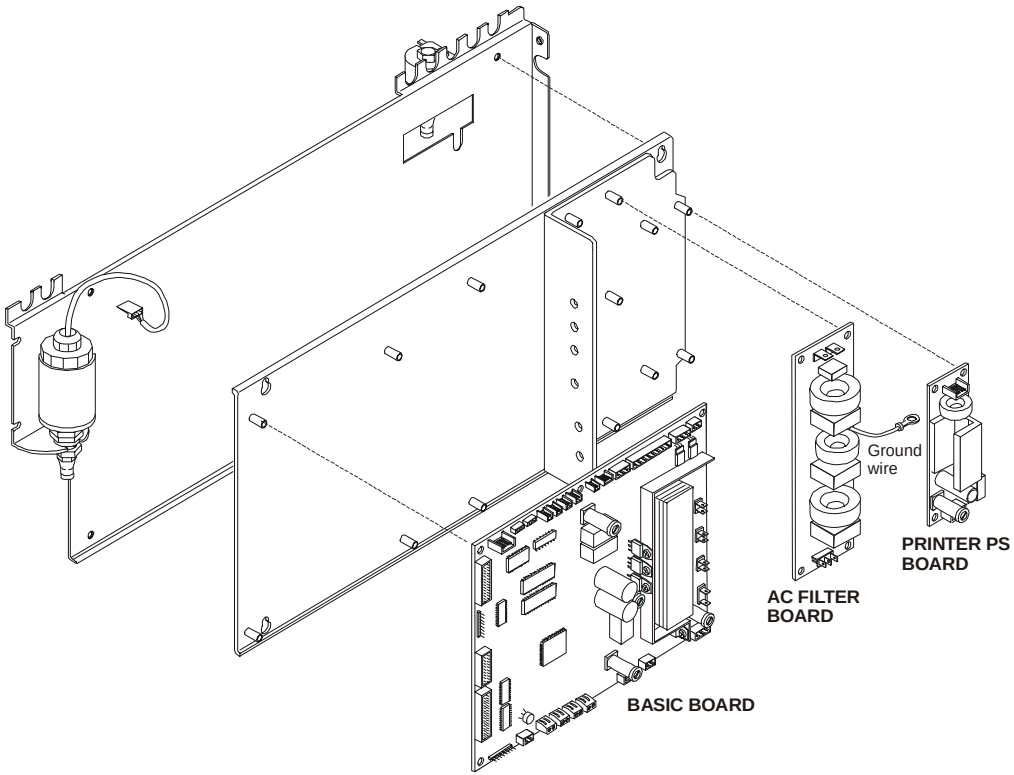
AC FILTER BOARD
120VAC 60Hz - C5BP4350000
220/230VAC 60Hz - C5BP5820000
220/240VAC 50Hz - C5BP1420000

PRINTER POWER SUPPLY BOARD
C5BM1430000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket.

1. Remove the covers (see card ***Gr7-1***);
2. Unplug connectors and wirings from the pcb board;
3. Remove the screws and remove the pcb board;
4. Mount the new pcb board, restore connections and reassemble proceeding in reverse order;
5. Check the calibration, see Attachment M
6. Run a sterilization cycle.

Note: in case of printer pcb board replacement, perform a check of the report print by selecting the items Print options/Report/Print last/Normal print of the Setup menu (see **Setting printing mode)**.

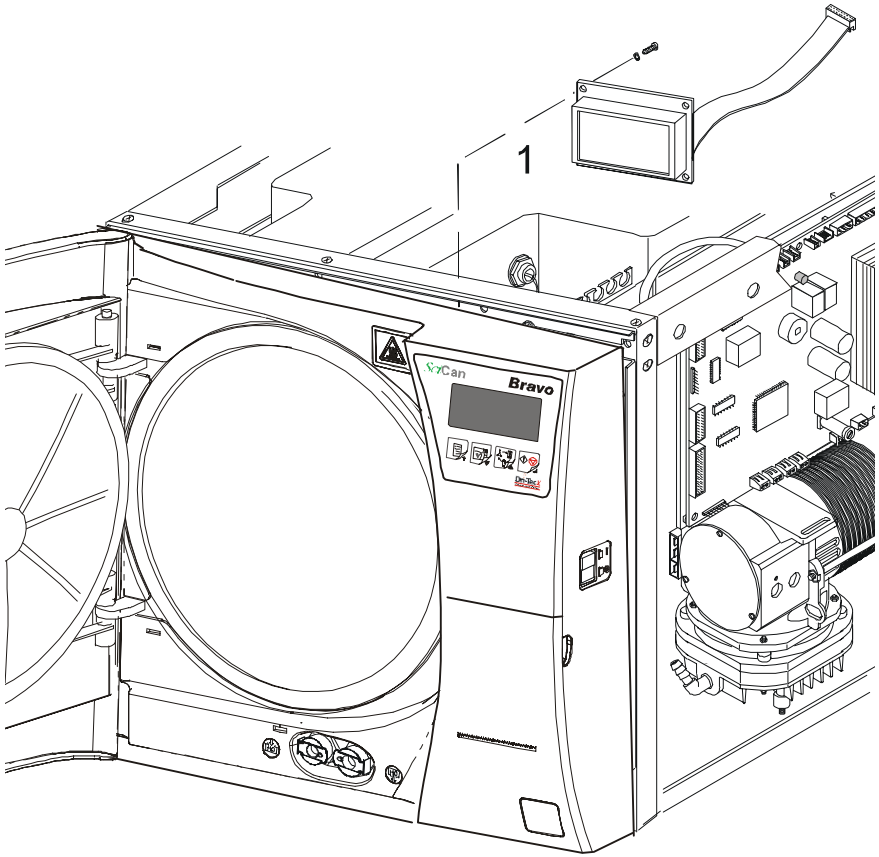


LCD DISPLAY

C5BP1230000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket.

1. Unlock the fixing pins of the front cover and move it as much as possible from the frame (see card ***Gr7-3***);
2. Remove the interface connector from pcb board;
3. Access the fixing screws and remove the LCD assembly (1);
4. Remove the protective film from the new LCD;
5. Mount the new LCD, reassemble and restore connections proceeding in reverse order;
6. Run a sterilization cycle.



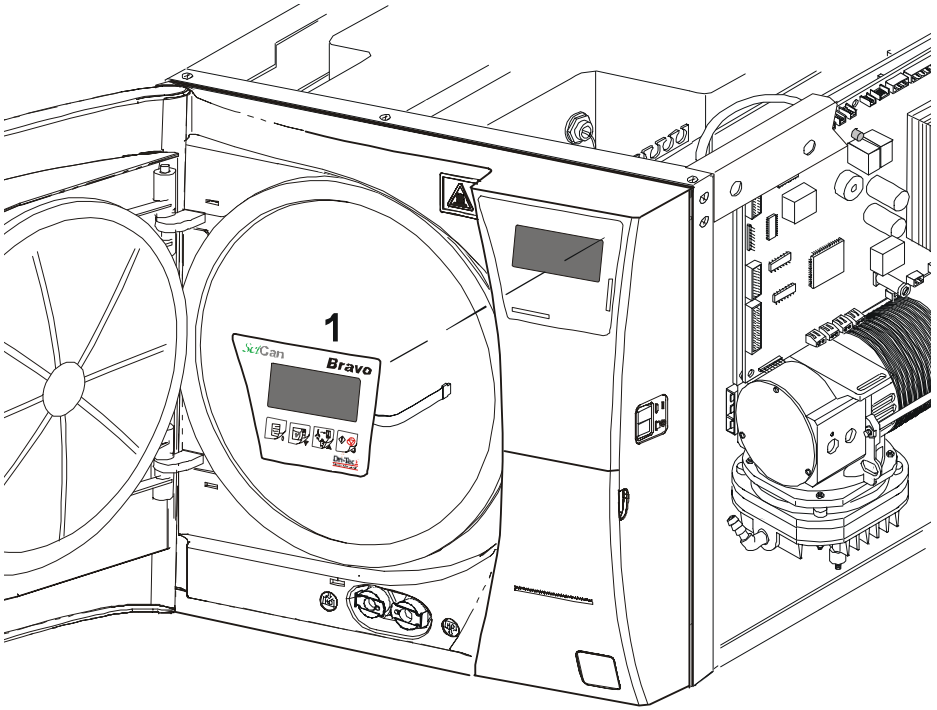
ADHESIVE MEMBRANE KEYPAD

Europe models
C6JP0190000

North America models
C6JP0010000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket.

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the keypad's flat cable from the pcb board;
3. Detach carefully the keypad (1);
4. Remove the protective film from the new keypad;
5. Attach the new keypad;
6. Restore connections and reassemble proceeding in reverse order;
7. Run a sterilization cycle.

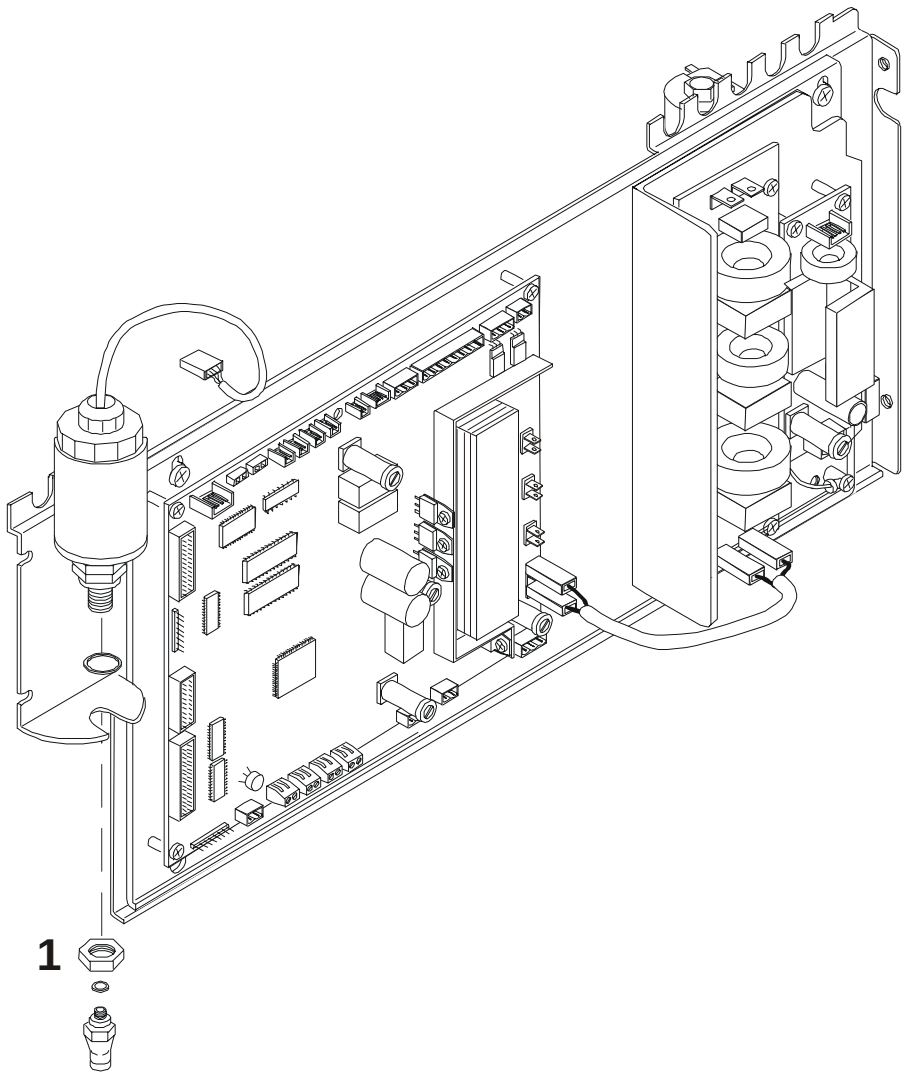


PRESSURE TRANSDUCER

43100090000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket.

1. Remove the frame cover ((see card ***Gr7-1***);
2. Remove the pressure transducer wiring from the pcb board;
3. Withdraw the pipe from the pressure transducer;
4. Remove the nut (1) fixing the pressure transducer to the bracket;
5. Remove the pressure transducer;
6. Mount the new pressure transducer, restore connections and reassemble proceeding in reverse order;
7. Calibrate the pressure transducer –***see Attachment N***
8. Run a sterilization cycle.

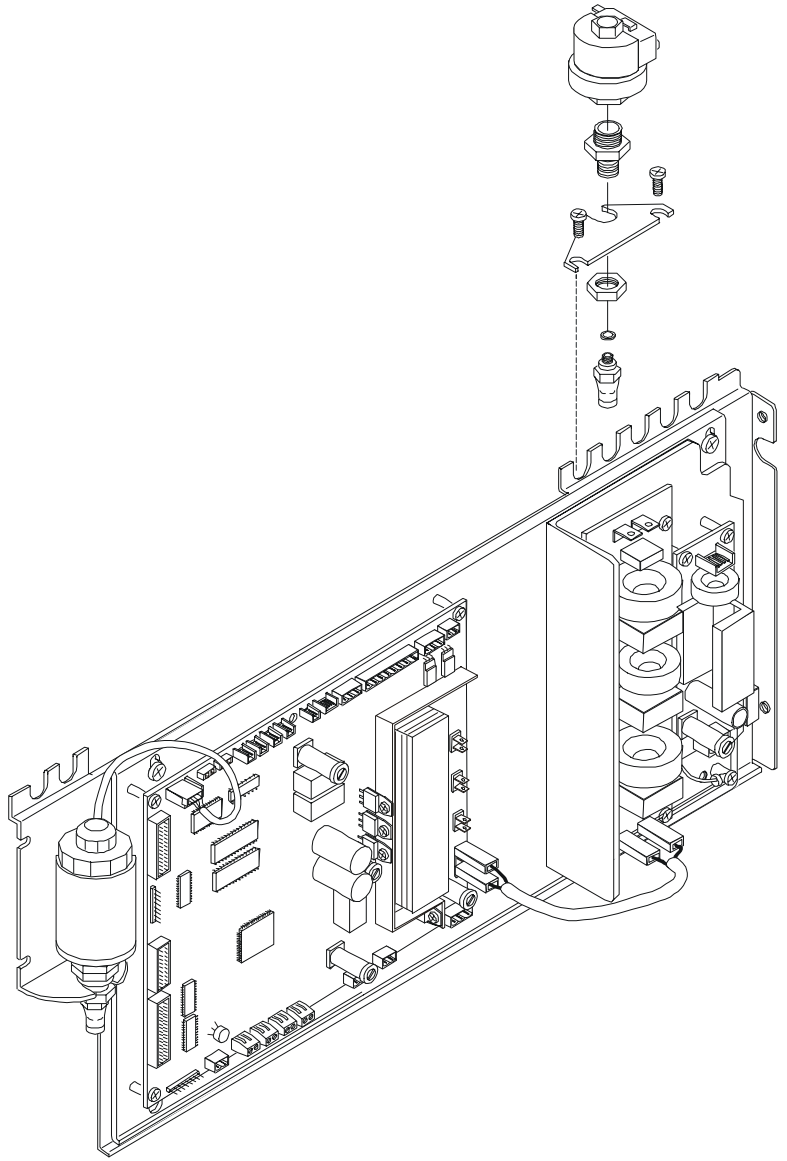


PRESSURE SWITCH

43100060000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring from the pressure switch;
3. Remove the two screws fixing the pressure switch to the plate;
4. Mount the new pressure switch, restore connections and reassemble proceeding in reverse order;
5. Run a sterilization cycle.



AC TRANSFORMER ASSEMBLY

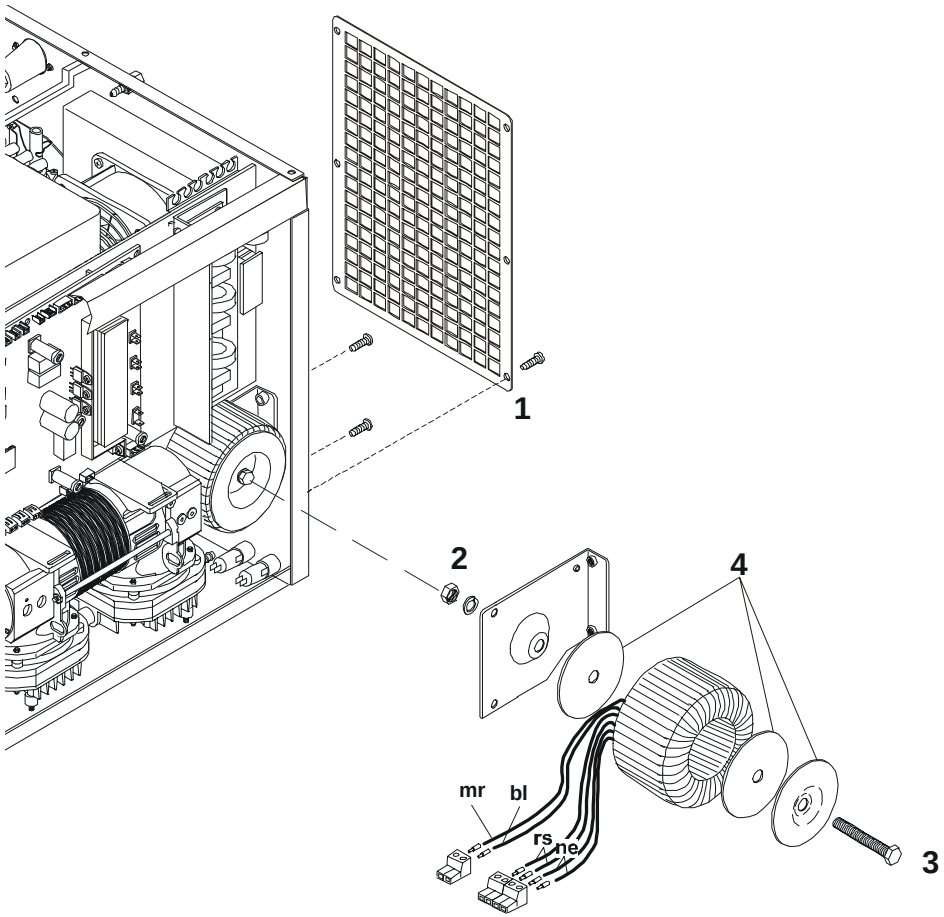
120VAC 60Hz - A9BM5530000
220/230VAC 60Hz- A9BP5260000
220/240VAC 50Hz - A9BP5680000

AC TRANSFORMER

120VAC 60Hz - 41200060100
220/230VAC 60Hz - 41200080000
220/240VAC 50Hz - 41200130000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the transformer wiring from the boards;
3. Remove the grid (1) from the rear frame to access the mounting screws of the transformer bracket;
4. Remove the bracket with the transformer, and unscrew the fixing screw (3) maintaining the rear nut (2) blocked;
5. Remove transformer and disks (4);
6. Arrange the disks on the new transformer;
7. Mount the transformer, restore connections and reassemble proceeding in reverse.
8. Run a sterilization cycle.

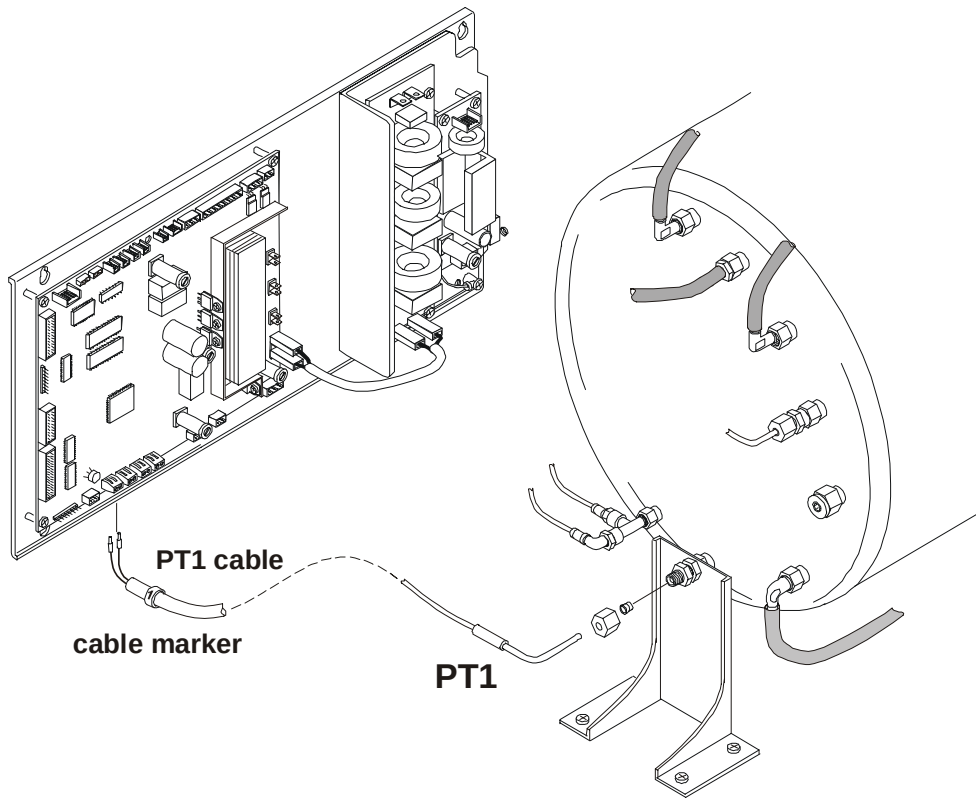


PT1 THERMAL PROBE

43000190000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the PT1 wiring from the pcb board;
3. Remove the cable marker nr. 1 (to be reused with the new probe);
4. Withdraw the wiring up to the thermal probe,
5. Access to the rear side of the chamber;
6. Remove the nut and PT1 from its seat;
7. Measure the ohm value of the new PT1 and write the value on the next row of the label attached on the right rail;
8. Mount the new PT1 device, restore connections and reassemble proceeding in reverse order;
9. Switch on the unit and enter the SETUP mode;
10. Move to SERVICE menu, enter the code “++--++--“ and select the option “PT1 CORRECTION”
11. Enter the new value (Ohm);
12. Exit the SETUP mode;
13. Run a sterilization cycle.

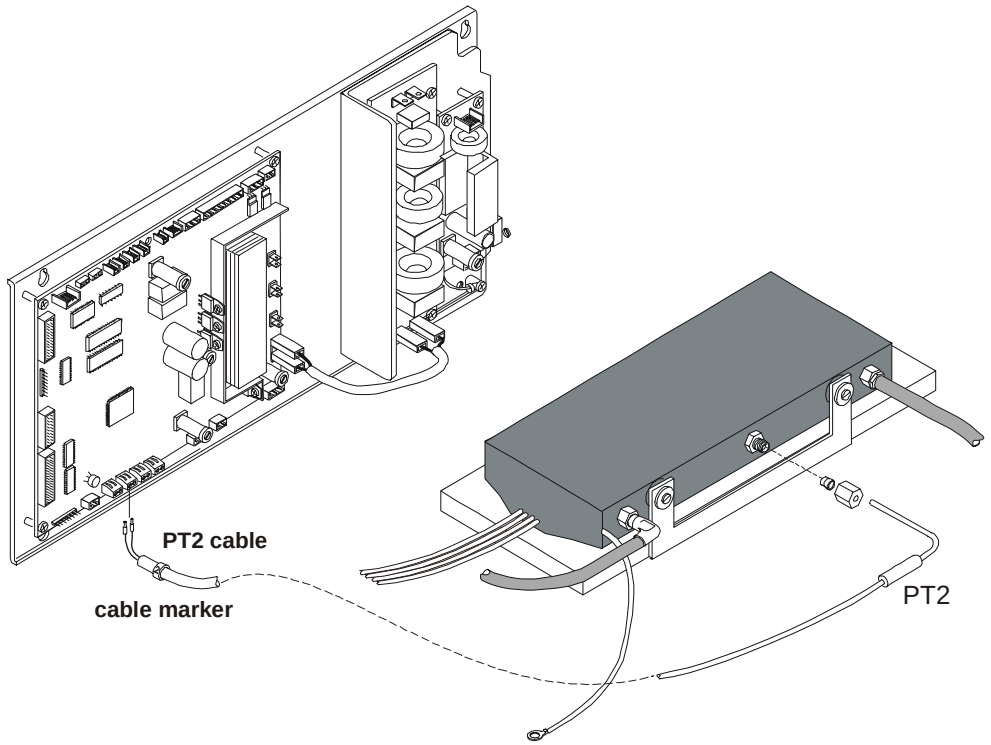


PT2 THERMAL PROBE

43000180000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***)
2. Remove the PT2 wiring from the pcb board;
3. Remove the cable marker nr. 2 (to be reused with the new probe);
4. Access to the left side of the machine and withdraw the wiring up to the thermal probe;
5. Remove the nut and PT2 from its seat;
6. Measure the ohm value of the new PT2 and write the value on the next row of the label attached on the right rail;
7. Mount the new PT2 device, restore connections and reassemble proceeding in reverse
8. Run a sterilization cycle.

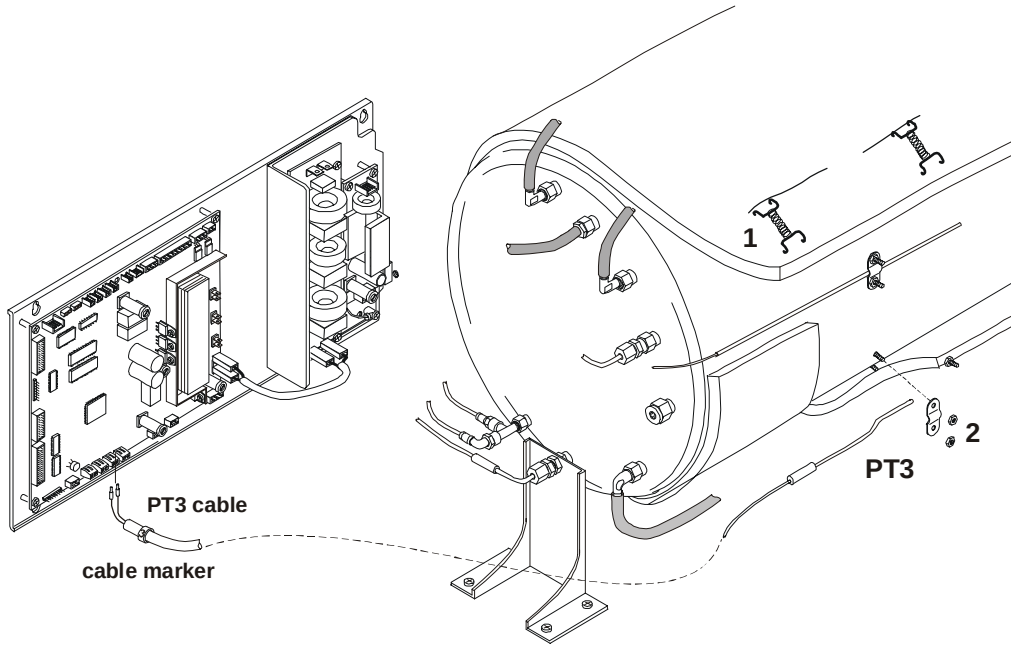


PT3 THERMAL PROBE

43000180000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the PT3 wiring from the pcb board;
3. Remove the cable marker nr. 3 (to be reused with the new probe);
4. Access to the left side of the machine and withdraw the wiring up to the thermal probe;
5. Unlock the spring (1) of the chamber's insulation layer to access the PT3 fixing;
6. Loosen the nuts (2) and withdraw the prove;
7. Shape the new probe as in figure and mount it, restore connections and reassemble proceeding in reverse order;
8. Switch on the unit;
9. Run a sterilization cycle.

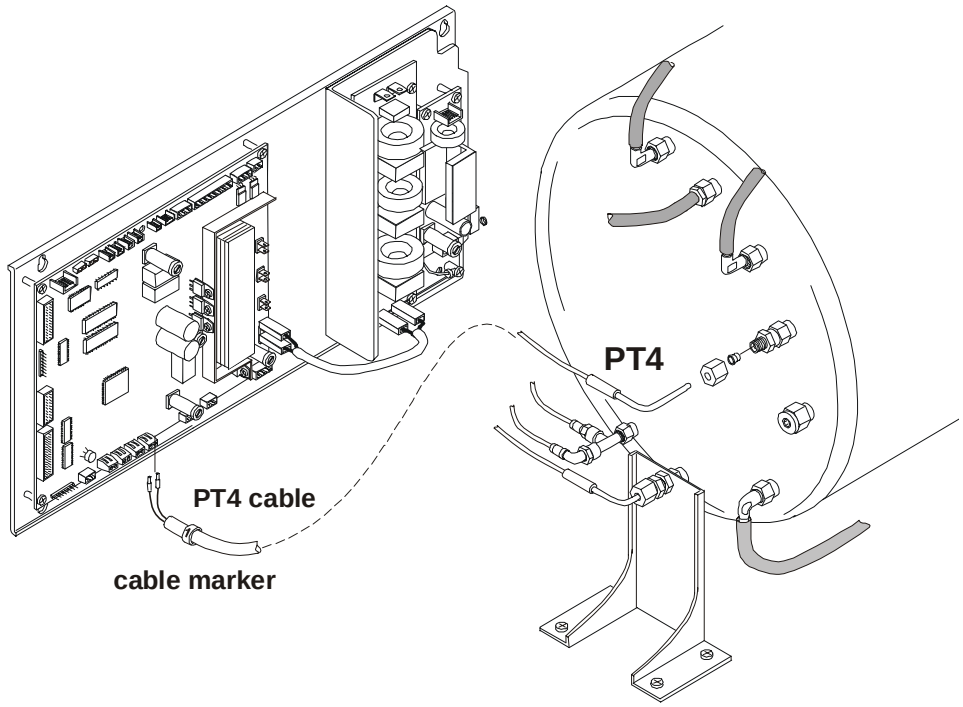


PT4 THERMAL PROBE

43000180000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the PT4 wiring from the pcb board;
3. Remove the cable marker nr. 4 (to be reused with the new probe);
4. Access to the rear side of the chamber;
5. Remove the nut and the PT4, withdraw the probe from the chamber;
6. Shape the new probe as in figure and mount it, restore connections and reassemble proceeding in reverse order ;
7. Switch on the unit;
8. Run a sterilization cycle.

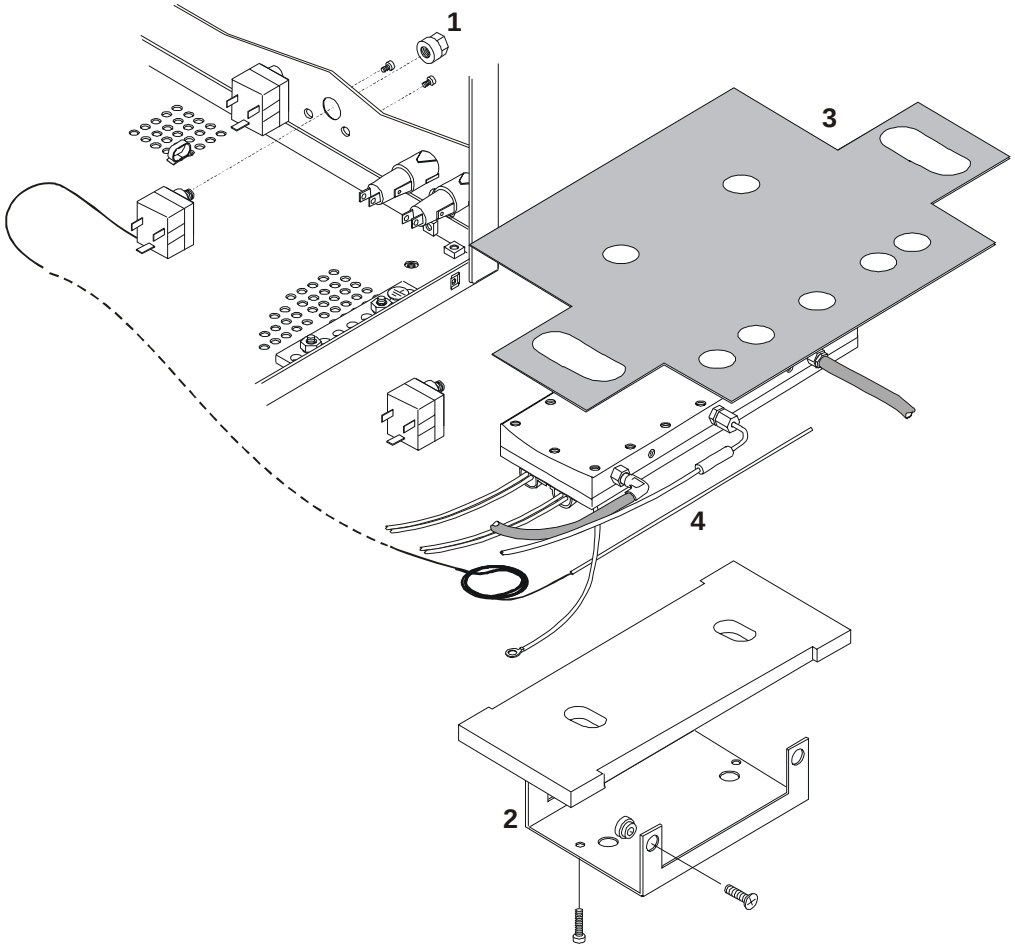


STEAM GENERATOR THERMOSTAT

43000150000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the water pump from the base frame (see card ***Gr3-1***);
3. Remove the steam generator (see card ***Gr4-6***);
4. Unscrew the cap (1) and the screws from the rear frame;
5. Remove the support (2) and thermal insulation layer (3) of the steam generator to access the probe's bulb;
6. Loosen screws and withdraw the bulb (4) with the thermostat;
7. Mount the new thermostat, restore connections and reassemble proceeding in reverse order;
8. Run a sterilization cycle.

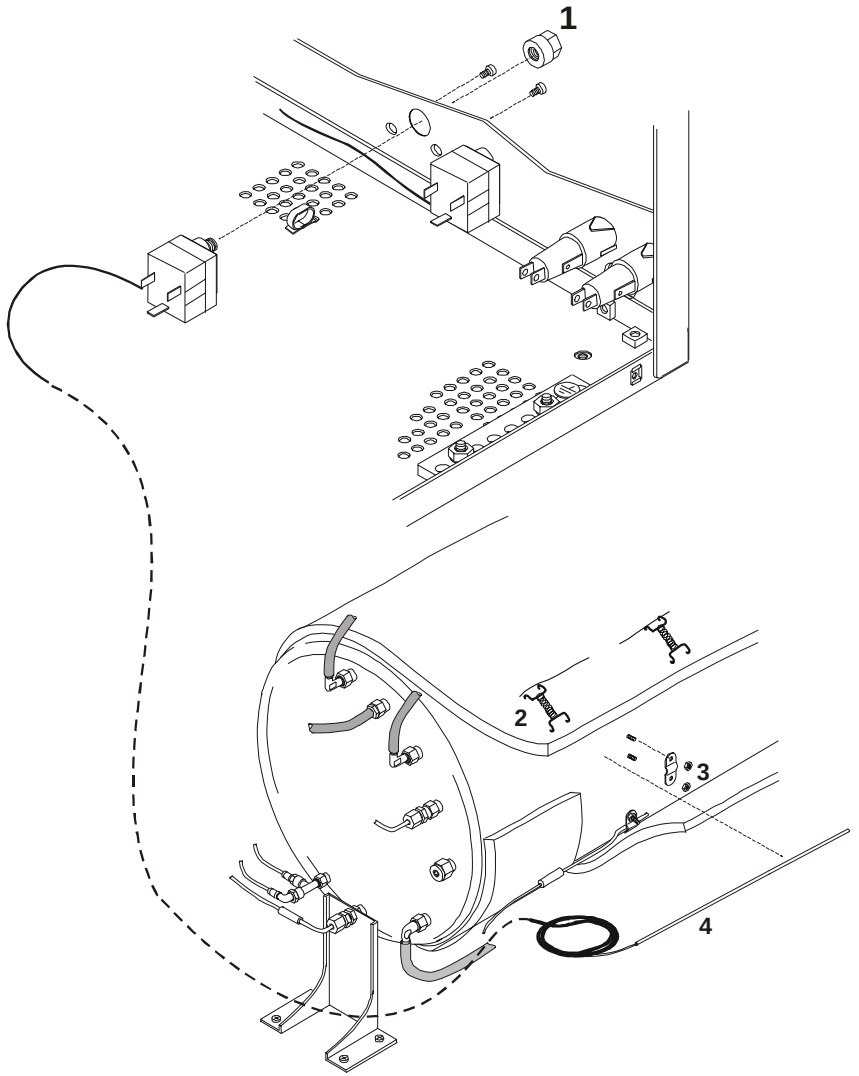


CHAMBER HEATER THERMOSTAT

43000140000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Unscrew the cap (1) and the screws from the rear frame;
3. Access to the left side of the frame and withdraw the cable up to the probe;
4. Unlock the spring (2) on the insulation layer to access the he probe's bulb;
5. Loosen the nuts (3) and withdraw the bulb (4) with the thermostat;
6. Mount the new thermostat, restore connections and reassemble proceeding in reverse order;
7. Run a sterilization cycle.

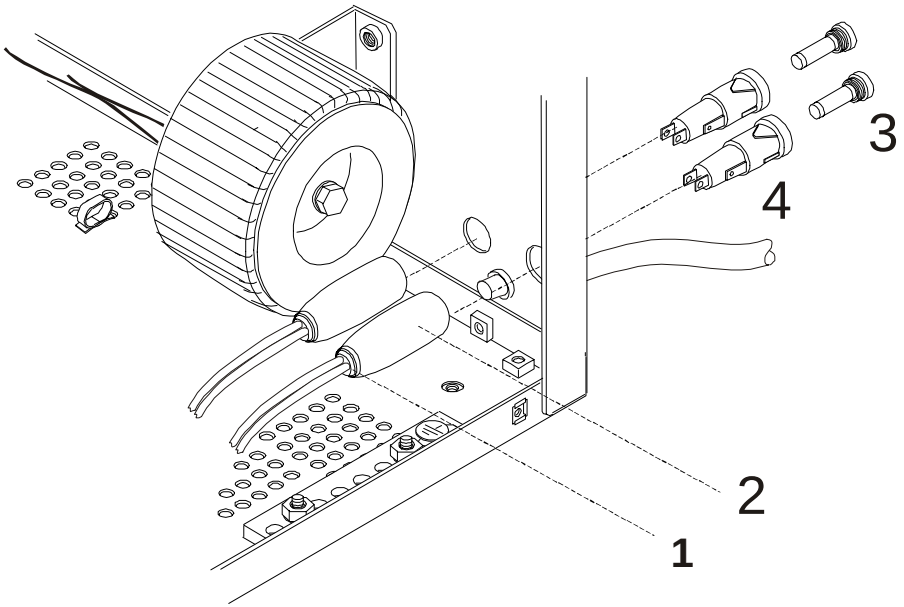


AC FUSE HOLDER

41700260000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the clamp (**1**) from the sheath (**2**) of the fuse holder; move the sheath to access the wiring, then disconnect it from the fuse holder;
3. Unscrew the cap with the fuse (**3**) and remove the fuse holder (**4**);
4. Mount the new fuse holder, restore connections and reassemble proceeding in reverse order;
5. Run a sterilization cycle.

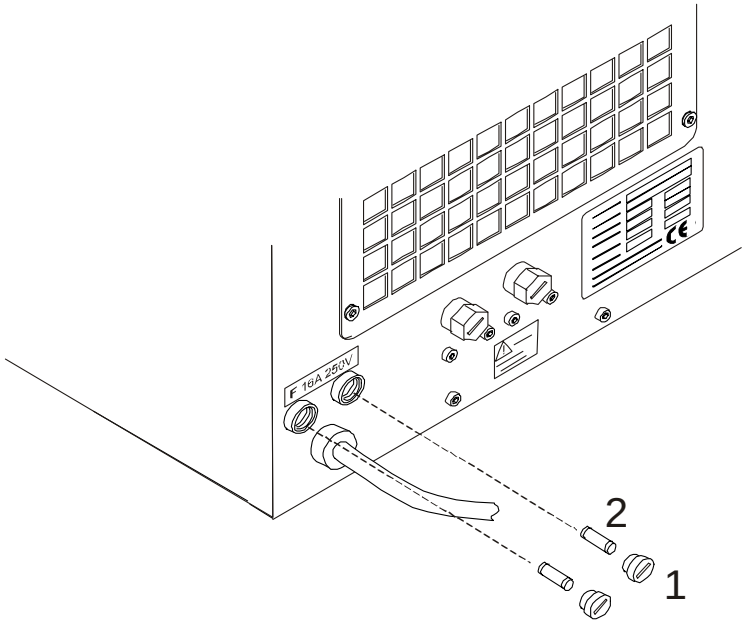


AC FUSE

41700330000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the cap (1) by using a flat screwdriver;
2. Remove the fuse F 15A (2);
3. Replace the fuse (same type and rating);
4. Run a sterilization cycle.



PCB FUSES

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Refer to the figure and remove the burned fuse;
3. Mount the new fuse (same type and rating), reassemble proceeding in reverse order;
4. Run a sterilization cycle.

Basic board: GAM version

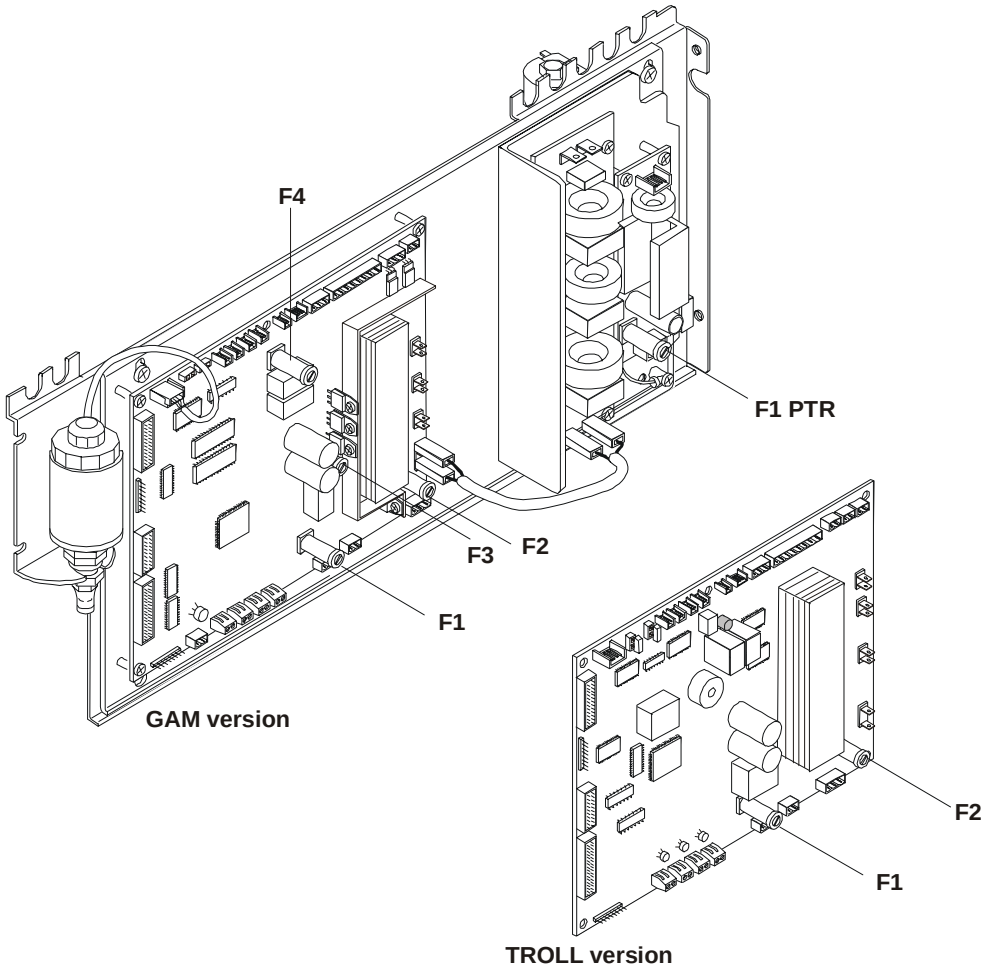
F1: **T 5A 250V**	*(secondary trafo winding)*
F2: **T 4A 250V (120V~)**	*(primary trafo winding)*
F2: **T 2A 250V (220/230V~)**	
F3: **T 200mA 250V**	*(door-lock accidental activation)*
F4: **F 1.25A 250V**	*(door-lock overload)*

Basic board: TROLL version (230V~)

F1: **T 6,3A 250V**	*(secondary trafo winding)*
F2: **T 3,15A 250V**	*(primary trafo winding)*

Printer PS board

F1 PTR: **T 5A 250V**	*(printer protection)*

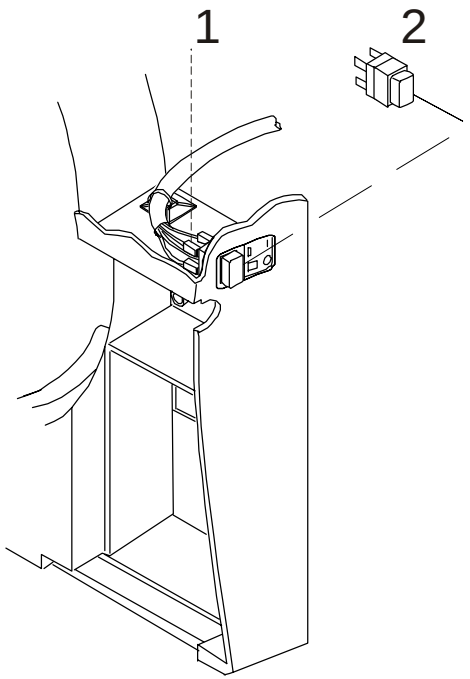


AC SWITCH

42000070000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring (1) from the switch;
3. Remove the main switch (2);
4. Mount the new switch, restore connections and reassemble proceeding in reverse order;
5. Run a sterilization cycle.

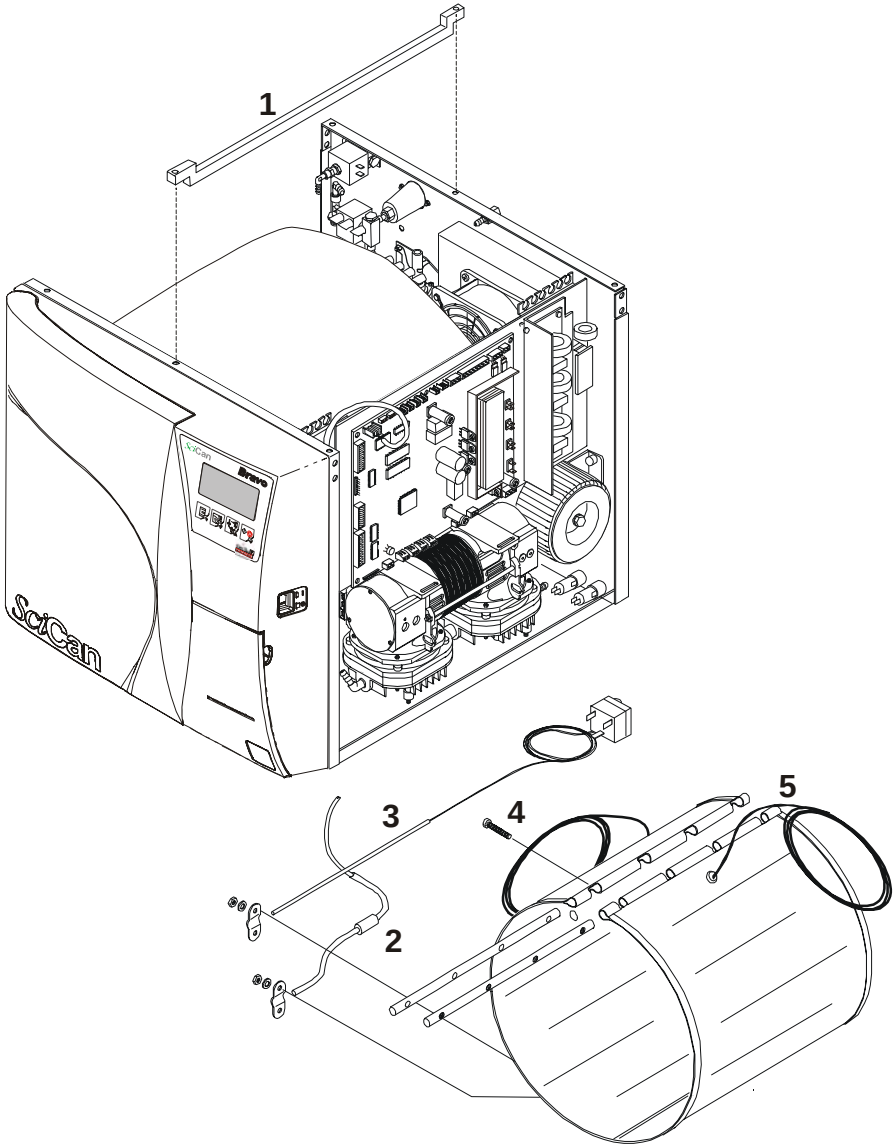


CHAMBER HEATING RESISTOR

Bravo^{17} & Bravo^{17V}	**41000140000 -** 1700W 230VAC **41000180000 -** 1500W 115VAC
Bravo^{21V}	41000290000 -2000W 230VAC 41000190000 - 1500W 115VAC

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the reservoir assembly – see card ***G4-1***;
3. Unscrew the central rail (1);
4. Remove the thermostat probe (2) from the band heater – see card ***Gr1-13***;
5. Remove PT3 probe (3) – see card ***Gr1-10***;
6. Remove the insulation layer covering the band heater;
7. Disconnect the band heater wiring from the pcb board;
8. Remove the screws (4) fixing the heater (5) and carefully remove it from the chamber surface;
9. Mount the new band heater, restore connections and reassemble proceeding in reverse order;
10. Run a sterilization cycle.

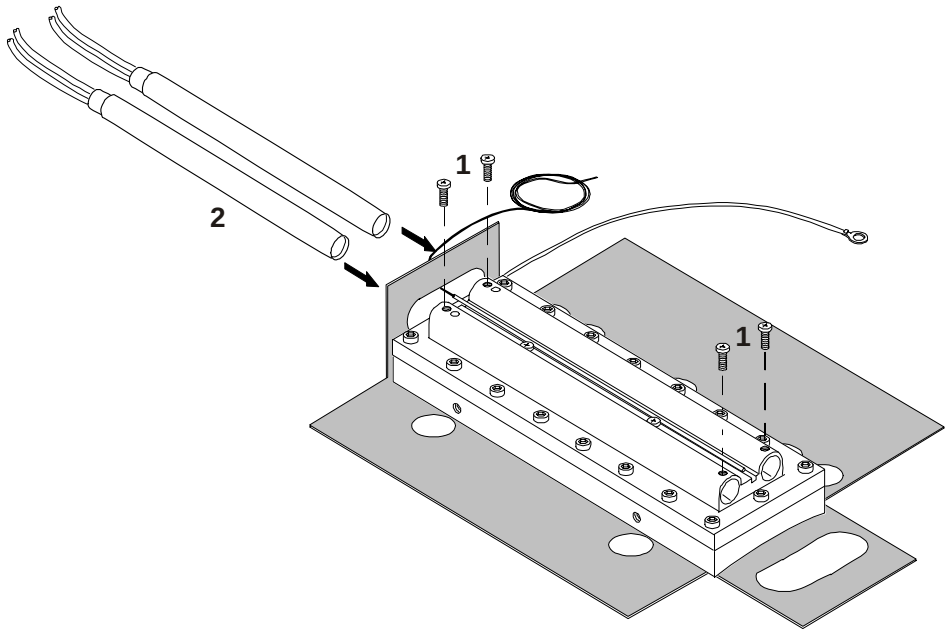


HEATER CARTRIDGE

41000170000 - 115V 850W
41000260000 - 230V 1000W

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the water pump from the base frame (see card ***Gr3-1***);
3. Remove the cartridge wiring from the PCB board;
4. Remove the steam generator (see card ***Gr4-6***);
5. Remove the support and the thermal insulation from the steam generator;
6. Loosen the screws (1) locking the cartridges (2) and take out;
7. Apply the dissipation paste on the new cartridges and mount;
8. Restore connections and reassemble proceeding in reverse order;
9. Run a sterilization cycle.

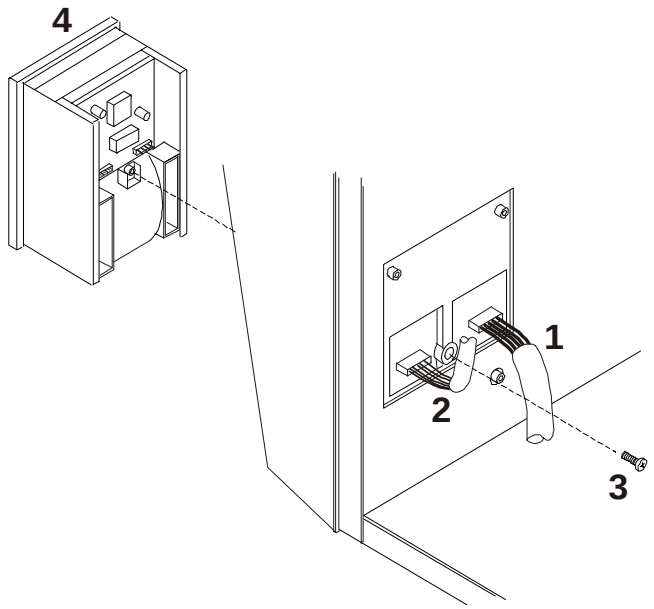


THERMAL PRINTER

C5BP5500000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the power supply (1) and interface (2) wiring from the printer unit;
3. Unscrew the rear fixing screw (3) and remove the printer (4);
4. Mount the new printer unit, restore connections and reassemble proceeding in reverse order;
5. Perform a printout of the last cycle;
6. Run a sterilization cycle.



SciCan

GROUP 2

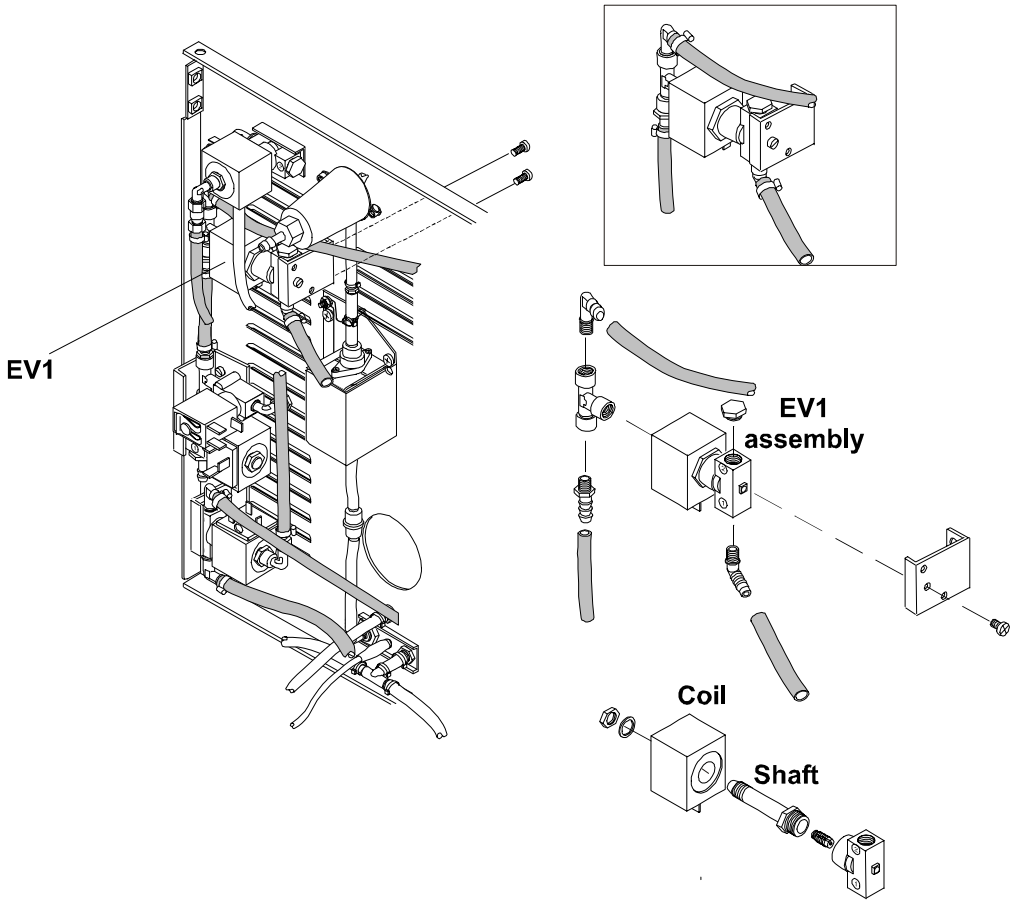
ELECTROVALVES

EV1 GROUP
A0BP2820000

EV PARKER 3-WAY 24V
40100240000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring from the solenoid spool and the sheathed pipe;
3. Remove the mounting screws on the rear panel, shift the group to access the second sheathed pipe and remove it;
4. Remove EV1 group, disassemble as necessary (see figure) and replace the part;
5. Reassemble, and restore the connections proceeding in reverse order;
6. Run a sterilization cycle.

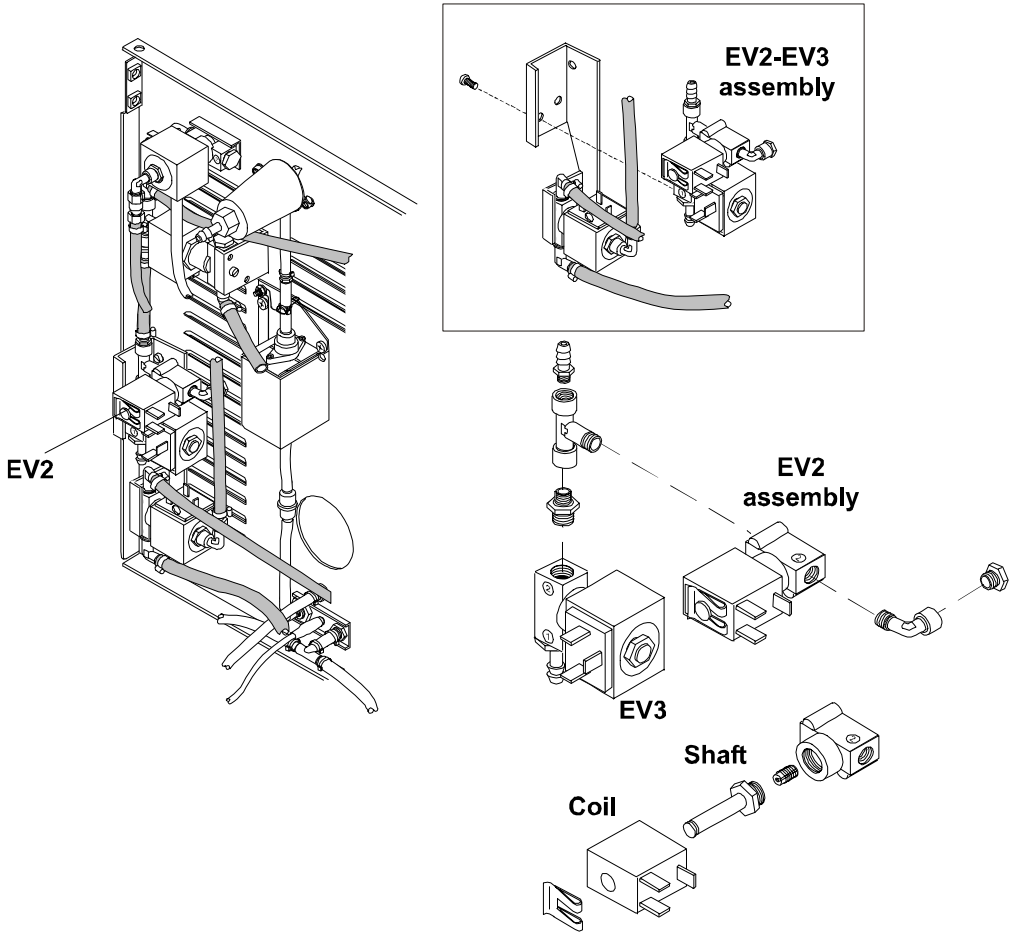


EV2 – EV3 GROUP
A0BP2830000

EV PARKER 2-WAY 24V (EV2)
40100030000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring from the solenoid spool and the sheathed pipe;
3. Remove the EV2/EV3 group from the support;
4. Disassemble the EV2 group as necessary (see figure) and replace the part;
5. Reassemble and restore the connections proceeding in reverse order;
6. Run a sterilization cycle.



EV2 – EV3 ASSEMBLY

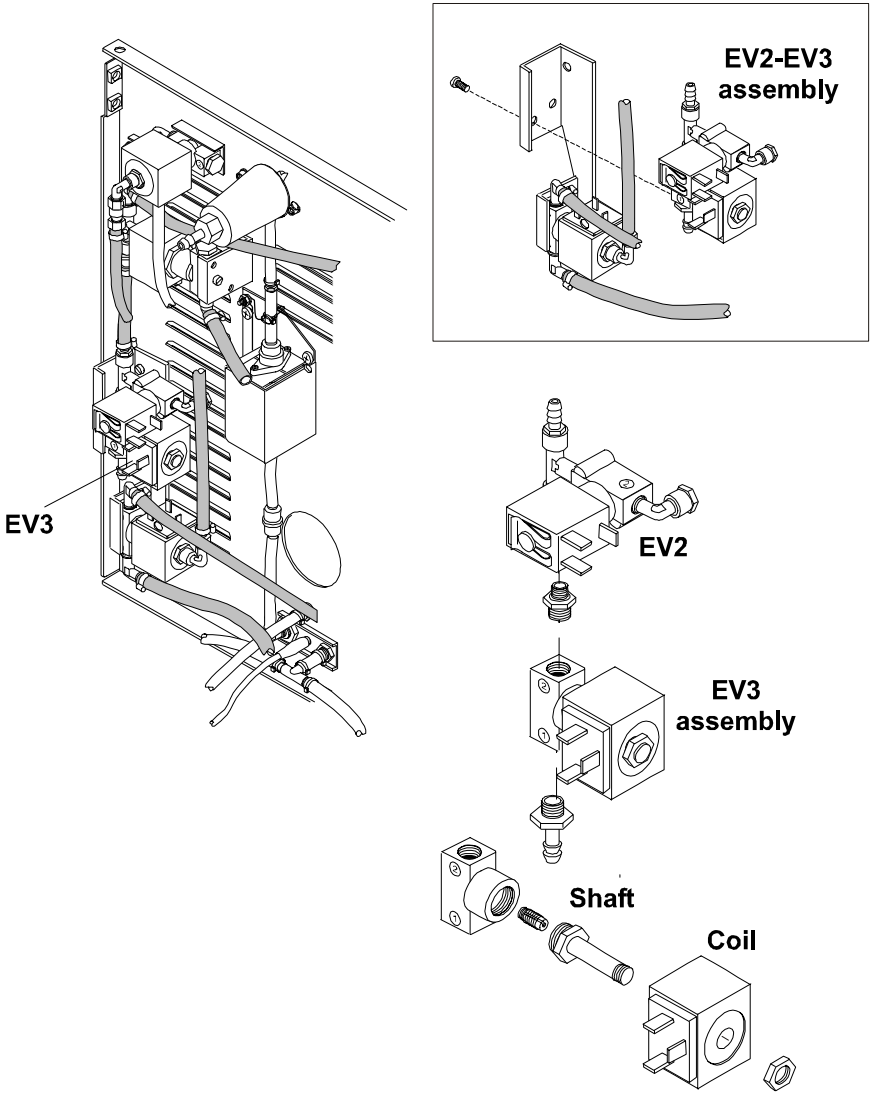
A0BP2830000

EV PARKER 2-WAY 24V (EV3)

40100230000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring from the solenoid spool and the sheathed pipe;
3. Remove the EV2/EV3 group from the support;
4. Disassemble the EV3 group as necessary (see figure) and replace the involved part;
5. Reassemble and restore the connections proceeding in reverse order;
6. Run a sterilization cycle.

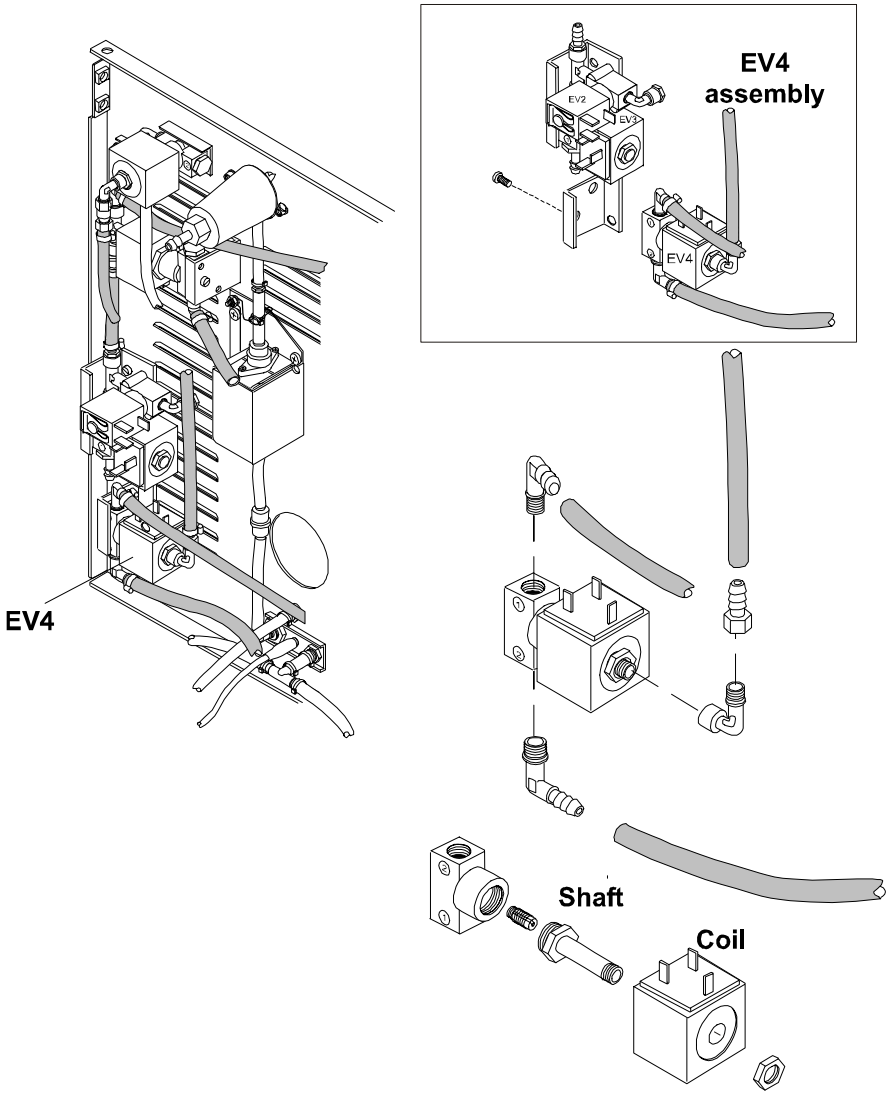


EV4 ASSEMBLY
A0BP2840000

EV PARKER 3-WAY 24V
40100260000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring and the sheathed pipes from the valve;
3. Remove the EV4 group from the support;
4. Disassemble the EV4 group as necessary (see figure) and replace the involved part;
5. Reassemble and restore the connections proceeding in reverse order;
6. Run a sterilization cycle.

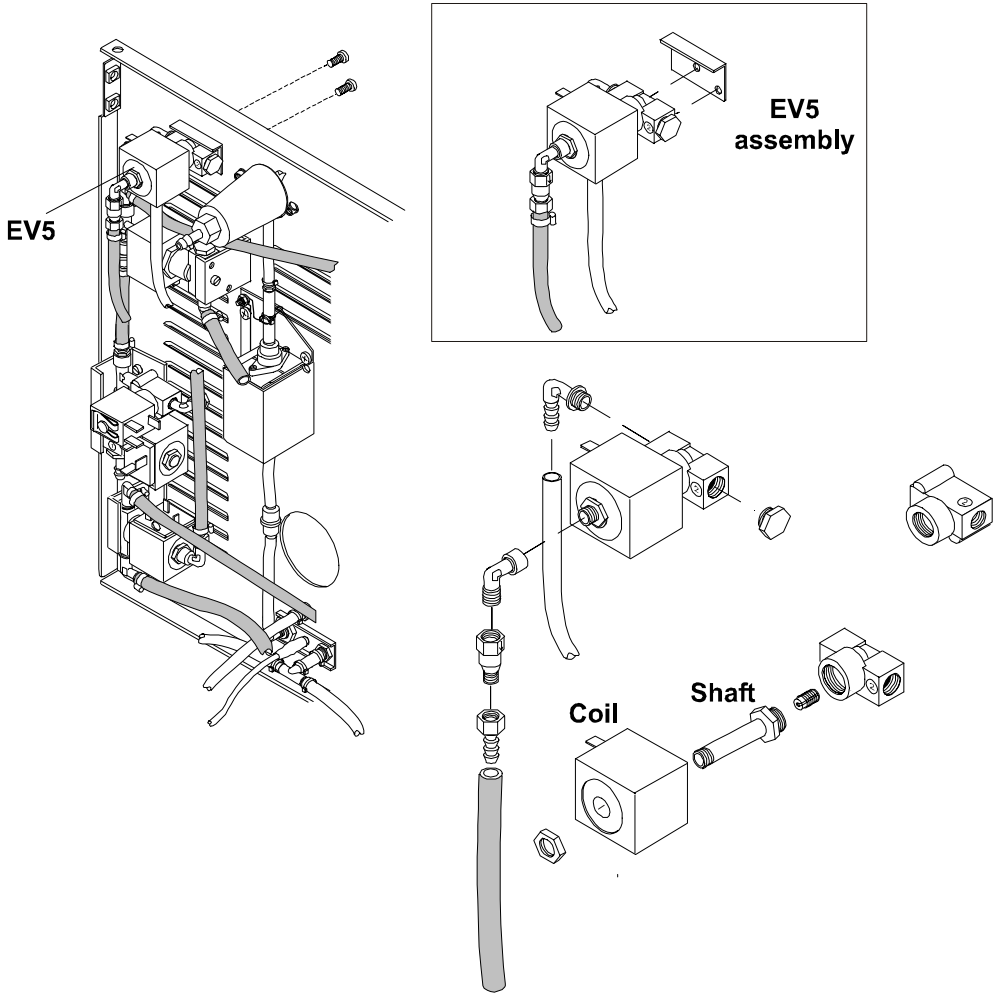


EV5 ASSEMBLY
A0BP2850000

EV PARKER 3-WAY 24V
40100240000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring and the sheathed pipes from the valve;
3. Remove the EV5 group from the rear frame;
4. Disassemble the group as necessary (see figure) and replace the involved part;
5. Reassemble and restore the connections proceeding in reverse order;
6. Run a sterilization cycle.



SciCan

GROUP 3

PUMPS

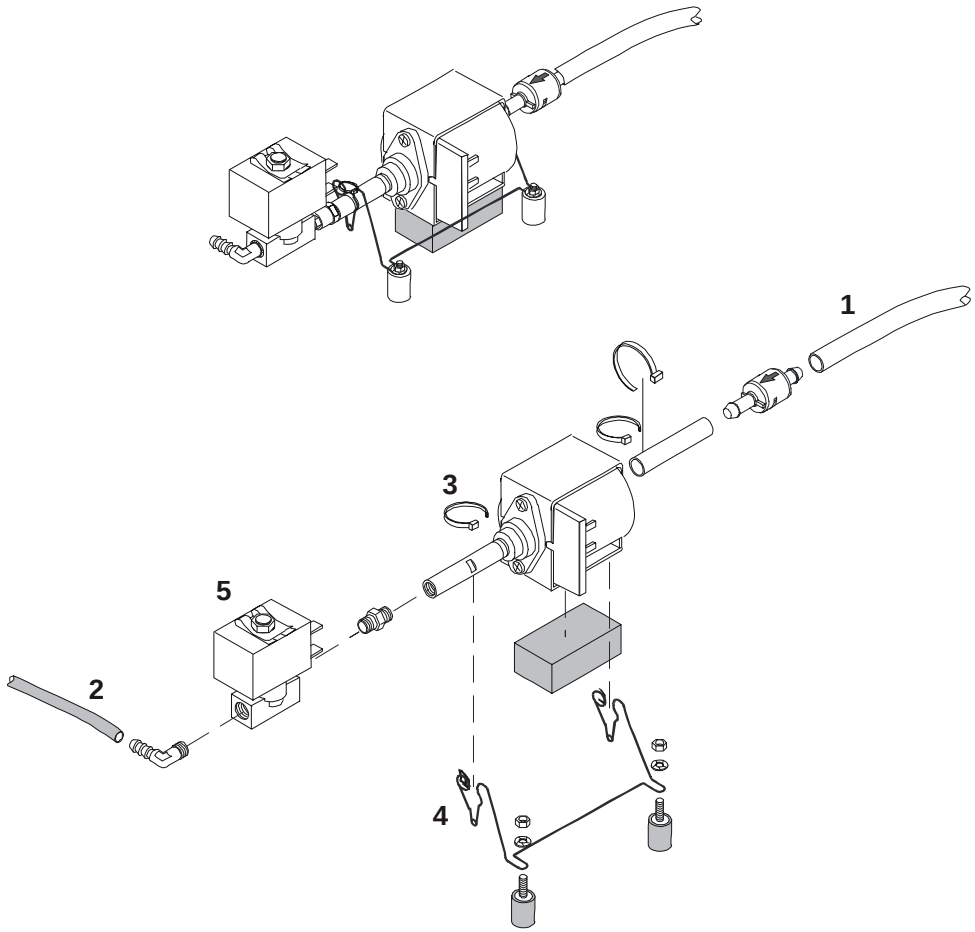
STEAM GENERATOR WATER PUMP GROUP
A0BP2860000

WATER PUMP 24V
40000220000

EV PARKER 2-WAYS 24V
40100370000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Empty the main tank by removing the bottom plug;
3. Remove the transparent and sheathed pipes (1 and 2);
4. Remove the wiring from the pump;
5. Remove the clips (3) fixing the pump to the wire-bracket (4) and remove the pump;
6. Maintain steady the pump shaft, and unscrew the solenoid valve (5);
7. Mount the new part, restore the connections and reassemble proceeding in reverse order;
8. Run a sterilization cycle.

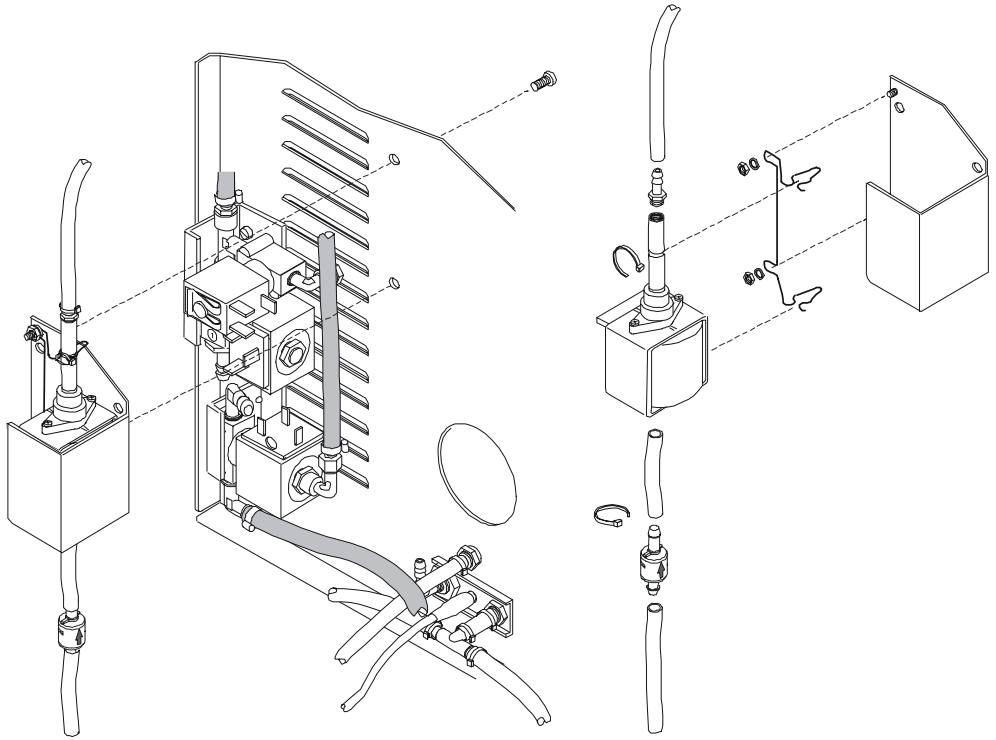


AUTOMATIC WATER FEEDING PUMP GROUP
A0BP2870000

WATER PUMP 24V
40000220000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the pipes and the wiring from the automatic water feeding pump;
3. Remove the screws from the rear frame;
4. Disassemble the water pump as necessary (see figure);
5. Mount the new part, restore connections and reassemble proceeding in reverse order;
6. Perform an automatic water feeding procedure;
7. Run a sterilization cycle.



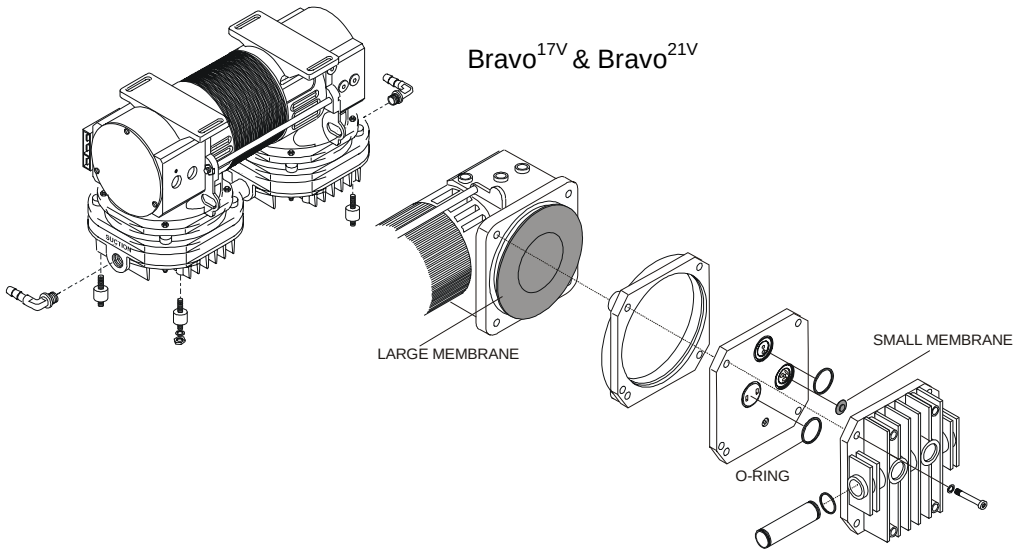
VACUUM PUMP GROUP

Bravo^{17V} & Bravo^{21V}	A9BP5870000 - 120VAC 60Hz
	A9BP5270000 - 220/230VAC 60Hz
	A0BP2890000 - 220/240VAC 50Hz
Spare parts for Bravo^{17V} & Bravo^{21V} vacuum pump	40000260000 - Large membrane
	40000250000 - Small membrane
	48100150000 - O-Ring
Bravo^{17}	A9BM5520000- 120VAC 60Hz
	A9BM5270000 - 220/230VAC 60Hz
	A0BM3100000 - 220/240VAC 50Hz
Spare parts for Bravo^{17V} & Bravo^{21V} vacuum pump	40000150000 - central gasket
	40000170000 - hole membrane
	40000240000 - recessed-screw membrane
	40000180000 - shutters
	40000120000 - head complete

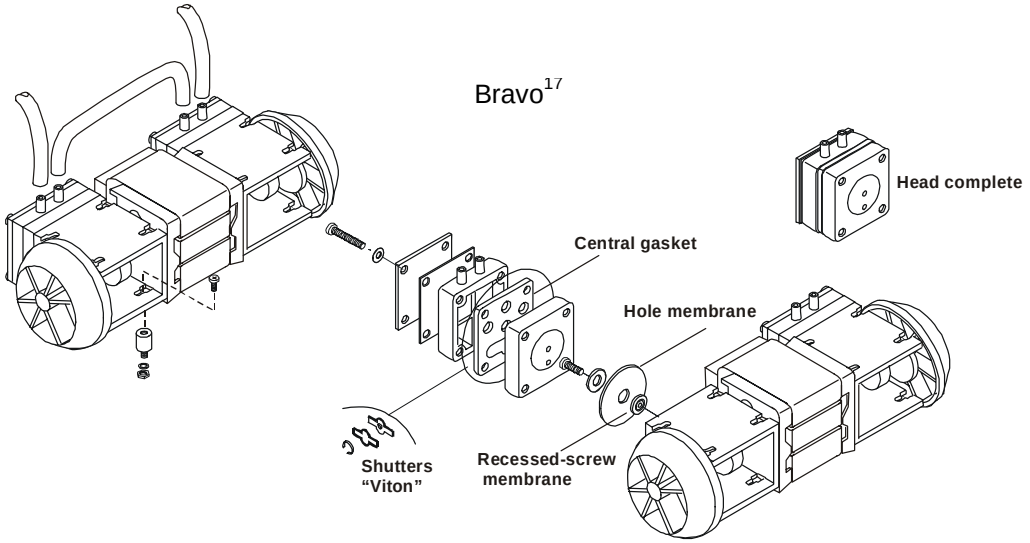
Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the screws, from the bottom frame;
3. Remove the sheathed pipes and the wiring from the pump;
4. Remove the pump and disassemble as necessary (see figure);
5. Replace the part, restore connections and reassemble proceeding in reverse order;
6. Perform a vacuum test;
7. Run a sterilization cycle.

Bravo^{17V} & Bravo^{21V}



Bravo^{17}



SciCan

GROUP 4

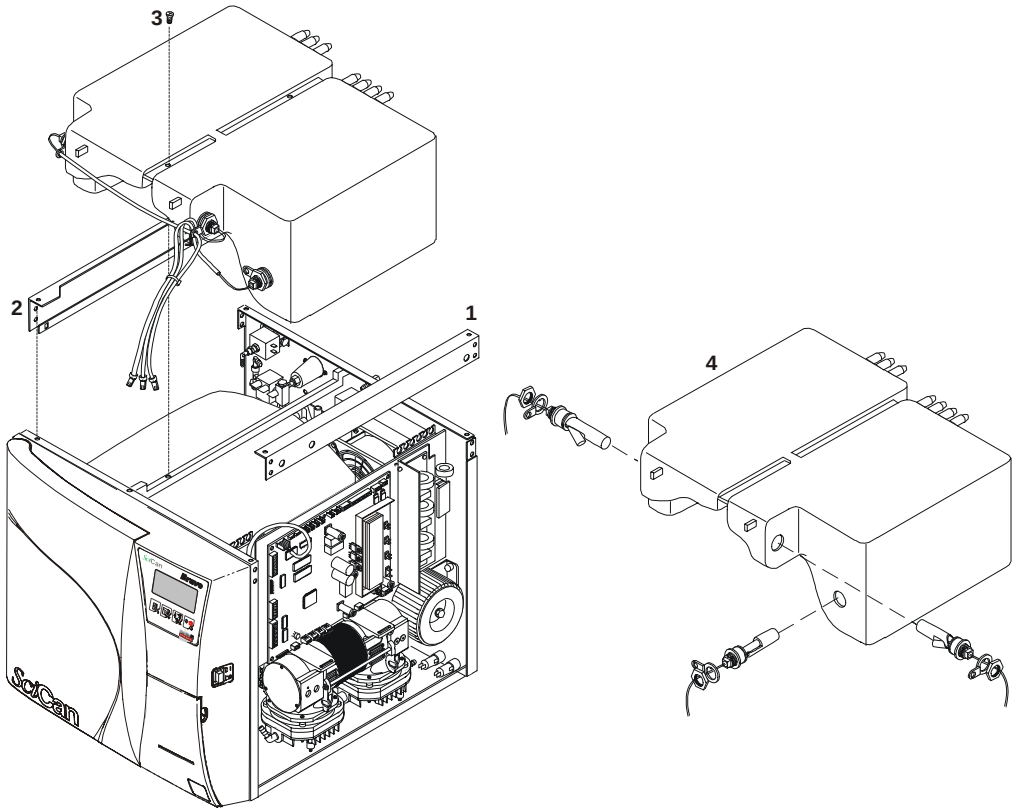
PLUMBING CIRCUIT

WATER TANK GROUP
A0BP2900000

CLEAN AND USED WATER TANK
C3BP1700000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Empty both reservoirs;
3. Remove the wiring from the water level probes and the rear pipes;
4. Remove the right (1) and left (2) rails;
5. Remove the screws (3);
6. Lift the reservoir (4) and remove the bottom pipes;
7. Remove the water level probes (if necessary)
8. Mount the new part, reassemble and restore the connections proceeding in reverse order;
9. Run a sterilization cycle.



MIN/MAX WATER LEVEL SENSORS (CLEAN WATER TANK)
43200050000

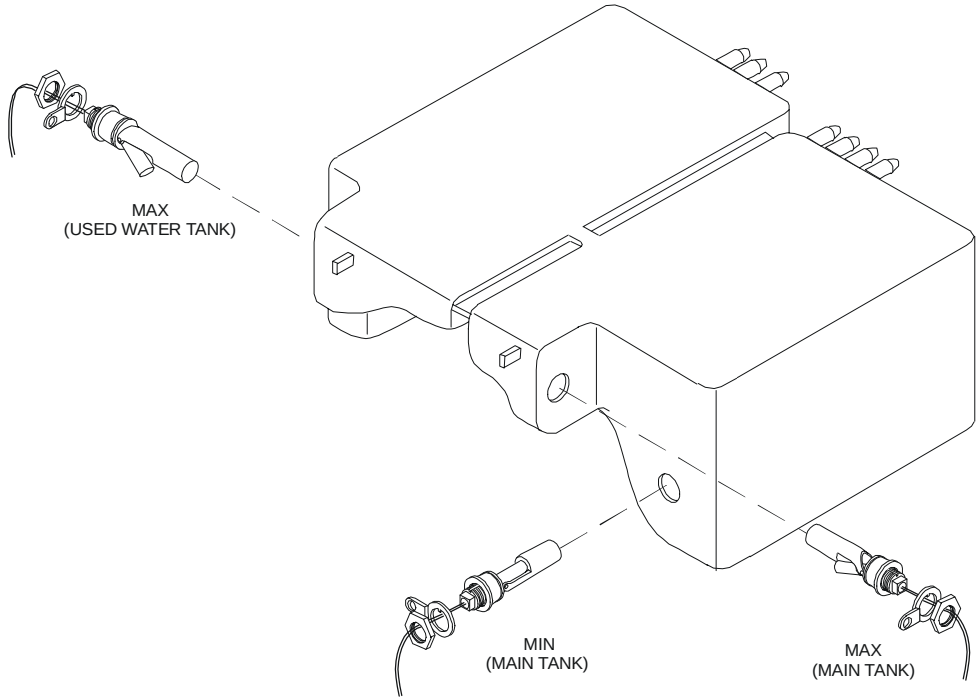
MAX WATER LEVEL SENSOR (USED WATER TANK)
43200060000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring of the water level sensor from the electronic basic board;
3. Maintaining steady the sensor's body, loosen the ring nut and remove the sensor;
4. Mount the new sensor, reassemble and restore the connections proceeding in reverse order;
5. Run a sterilization cycle.

WARNING

When remounting the float, take care to respect the orientation of the groove on the float thread (floats MAX upward, float MIN downward)

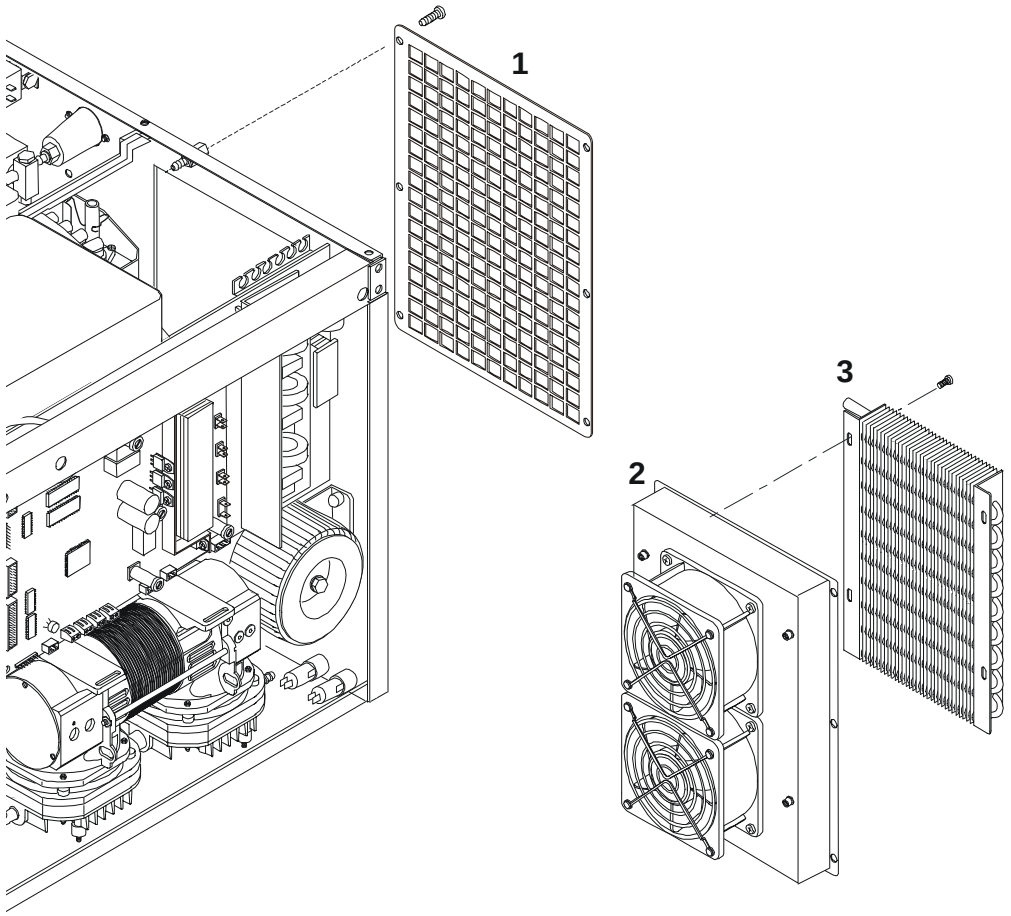


HEAT EXCHANGER

C1BP1600000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the rear grid (1);
3. Move as possible the group out the frame, and remove the sheathed pipes;
4. Separate the heat exchanger (3) from the its frame (2);
5. Mount the new heat exchanger, assembly all items and restore connections proceeding in reverse order as above;
6. Run a sterilization cycle.

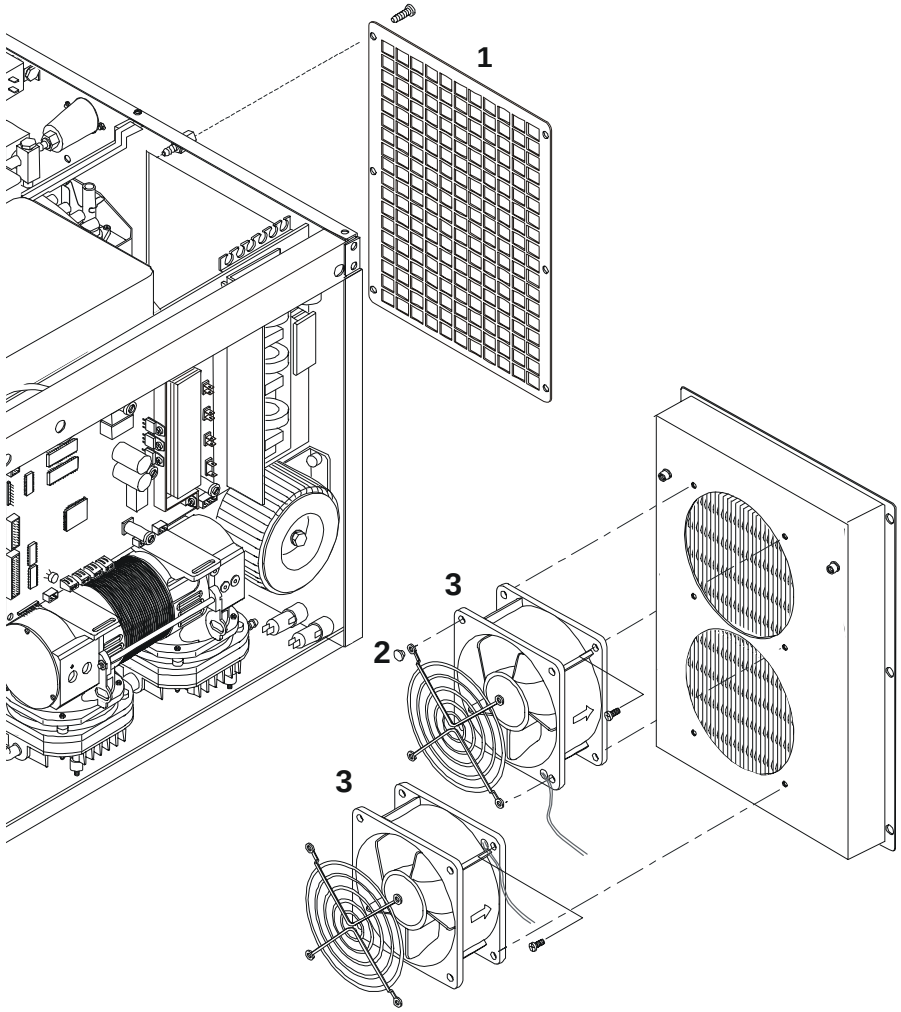


ELECTRIC FAN

40400030000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the rear grid (1);
3. Move as possible the group (2) out the frame, remove the sheathed pipes and remove the fan wiring from the electronic basic board;
4. Remove the cap and the grid (2), remove the fan (3);
5. Mount the new fan, reassemble and restore connections proceeding in reverse order;
6. Run a sterilization cycle.

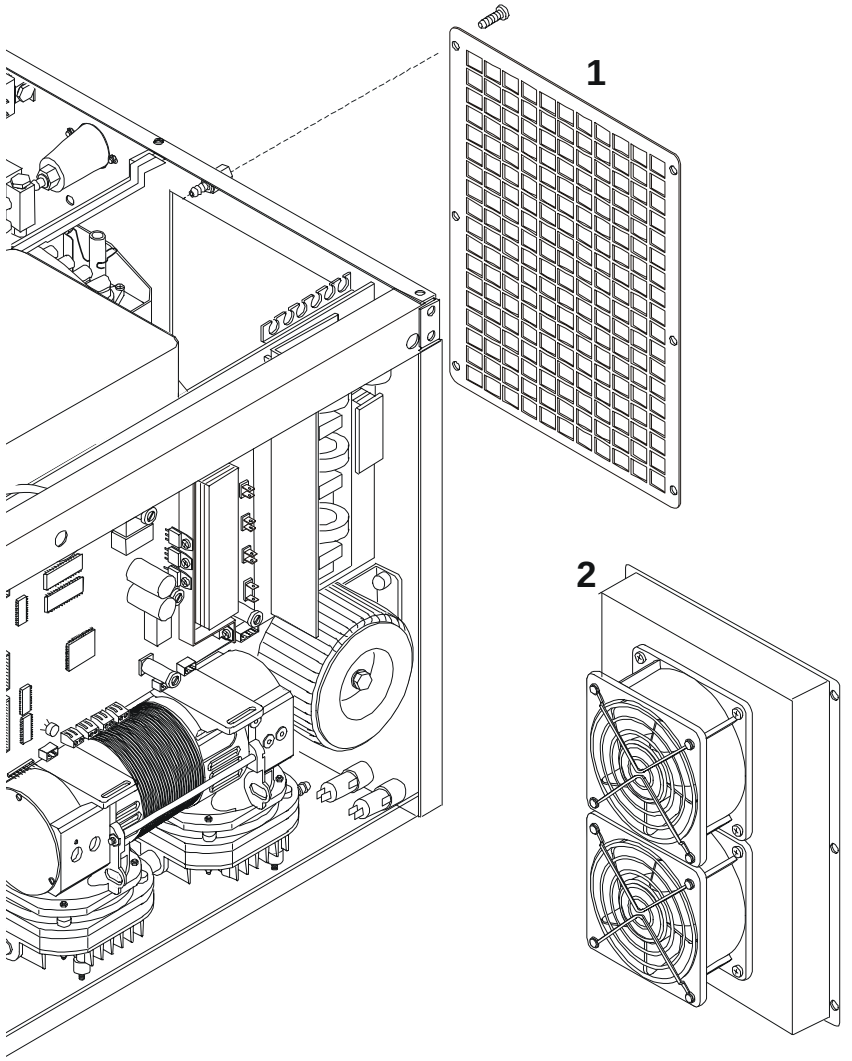


HEAT EXCHANGER GROUP

A1BP1640000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove rear grid (1);
3. Move as possible the group (2) out the frame and remove the sheathed pipes and the fan wiring;
4. Mount the new group, reassemble and restore the connections proceeding in reverse order;
5. Run a sterilization cycle.



STEAM GENERATOR GROUP

120/220-230VAC 60Hz- A9BM5510000
220/240VAC 50Hz - A0BP2810000

UPPER PART

C0BP547000P

LOWER PART

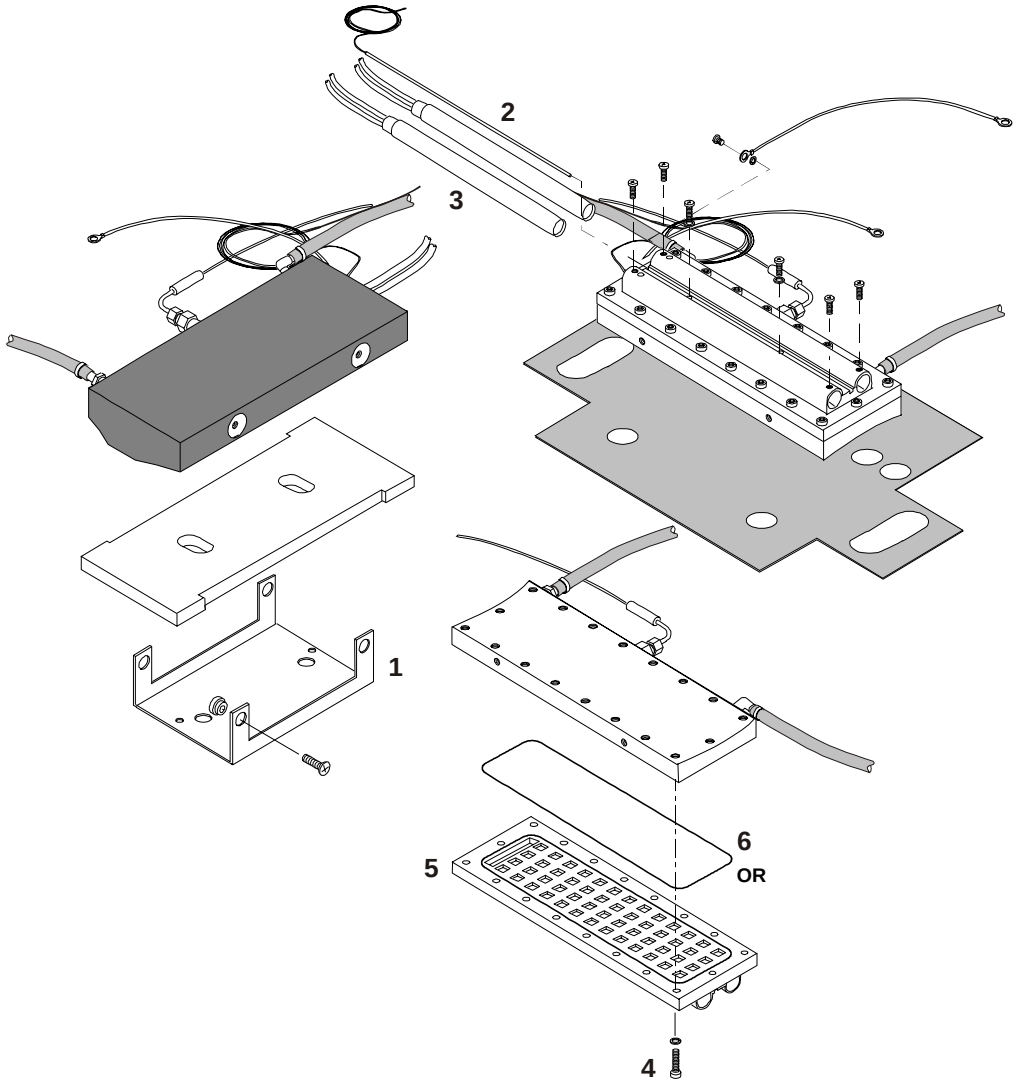
C0BP548000P

O-RING

48100080000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Empty both reservoirs;
3. Remove the water pump group - see card ***Gr3-1***;
4. Remove the screws from the bottom frame, and move as possible the steam generator out the frame;
5. Remove the steam generator from the support (1), and remove the thermo-insulating panel;
6. Remove the bulb of the safety thermostat (2);
7. Loosen the screws and remove the heater cartridges (3);
8. Remove the screws (4) and separate the lower parts (5) from the upper part;
9. Clean the upper part of the steam generator;
10. Replace the lower part, mount a new O-R (6), reassemble and restore the connections proceeding in reverse order;
11. Run a sterilization cycle.

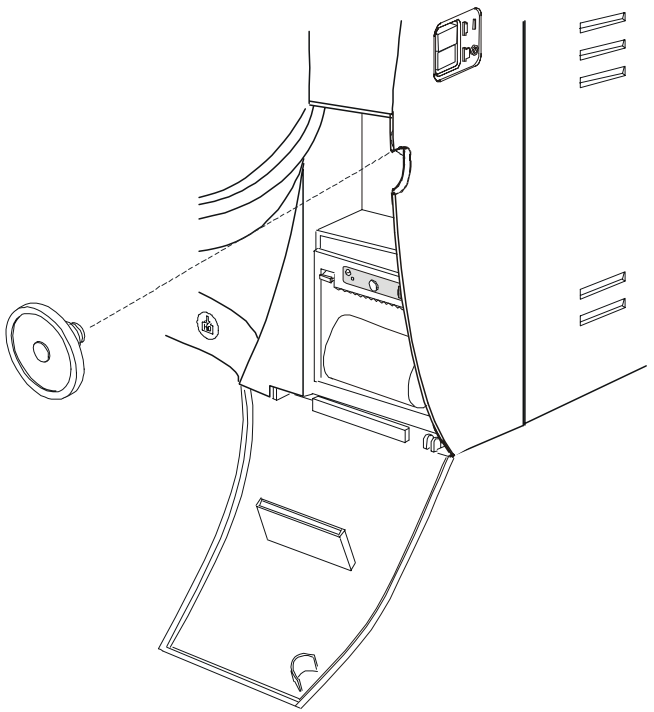


BACTERIOLOGICAL FILTER

47200010000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Open the service door;
2. Unscrew the bacteriological filter;
3. Replace with a new filter.

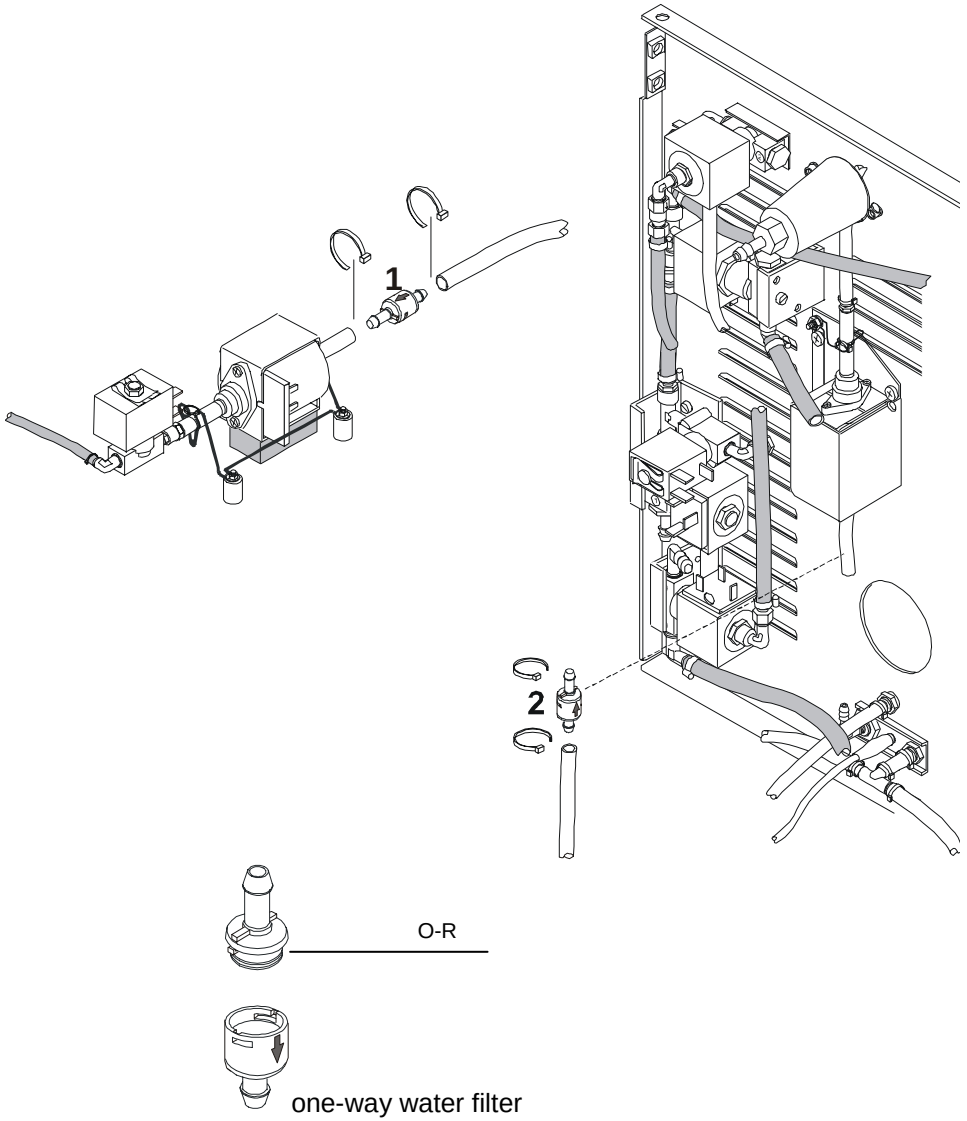


ONEWAY WATER FILTER

47200050000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Empty the distilled water reservoir;
3. Cut the clips fixing the one-way filter (1) of the steam generator water pump, or the clips fixing the one-way filter (2) of the automatic water feeding pump, and remove it;
4. Mount the new filter, reassemble and restore the connections proceeding in reverse order;
5. Run a sterilization cycle.

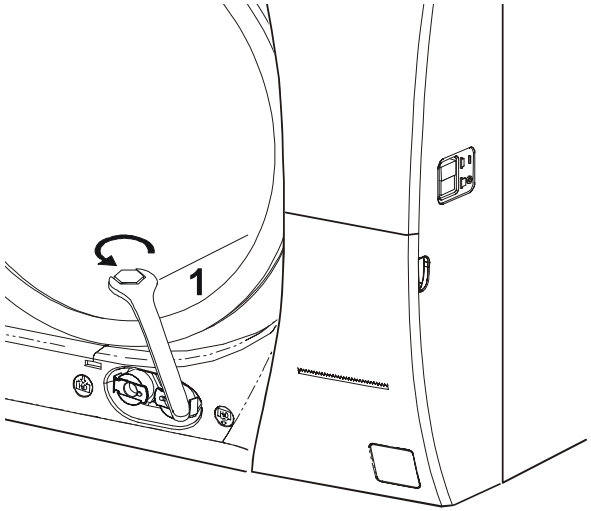


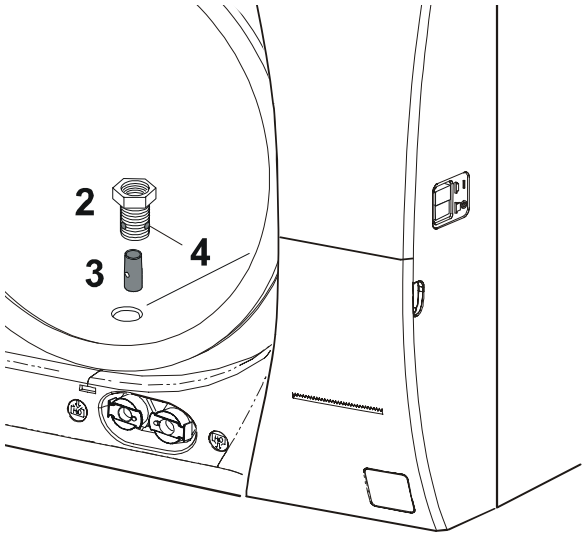
CHAMBER DRAINING FILTER
47200040000

CHAMBER FILTER HOLDER
28600290000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. For cleaning (or replace) the filter, open the door of the sterilizer and remove the nut (**1)** with a hexagonal wrench n. 14.
2. Then remove the fitting (**2)** and the filter (3).
3. Clean carefully the filter with a throw of tap water, use if necessary a pointed tool to remove possible material of greater dimensions.
4. If the filter cannot be reused, replace with a new one.
5. Plug the filter in the fitting , block it with a drop of sealing (if available), having care to not obstruct the holes.
6. Reassemble proceeding in reverse order and paying attention on screwing down the fitting (2) so as to let the draining holes (4) at level of the chamber wall.
7. Run a sterilization cycle





PIPES AND FITTINGS

110000005W0 – silicon pipe Ø6x12 black

110000003W0 – silicon pipe Ø6x10 transparent

110000011W0 – silicon pipe Ø4X7 transparent

110000014W0 – armed pipe Ø6x10

110000002W0 – Teflon pipe Ø4X2,5

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

TRANSPARENT SILICON /TEFLON PIPE

The replacement of transparent pipes should be performed by taking care to maintain the previous pipe path in order to not change its performance.
Fasten the pipe with plastic clips.

ARMED/BLACK PIPE

The replacement of the armed/black pipes should be performed by taking care to maintain the previous pipe path and length.
Fasten the 6x12 pipes by metallic clips.

FITTING/CONNECTOR

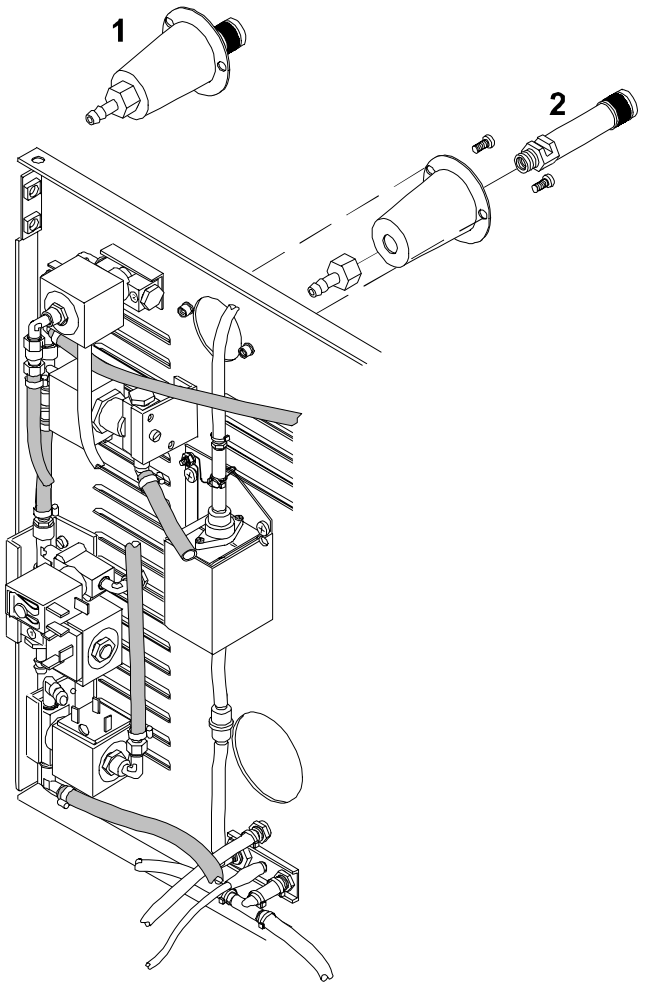
Unplug the pipe from the connector before removing it, then clean the connector body.
Use a sealing product on the connector body before fitting the pipe.

SAFETY VALVE TUV GROUP
A0BS0520000

SAFETY VALVE TUV
47000020000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the covers (see card ***Gr7-1***);
2. Remove the armed pipe from the safety valve connector;
3. Remove the safety valve group (1);
4. Unscrew the safety valve (2);
5. Mount the new valve, reassemble and restore the connections proceeding in reverse order;
6. Run a sterilization cycle.



SciCan

GROUP 5

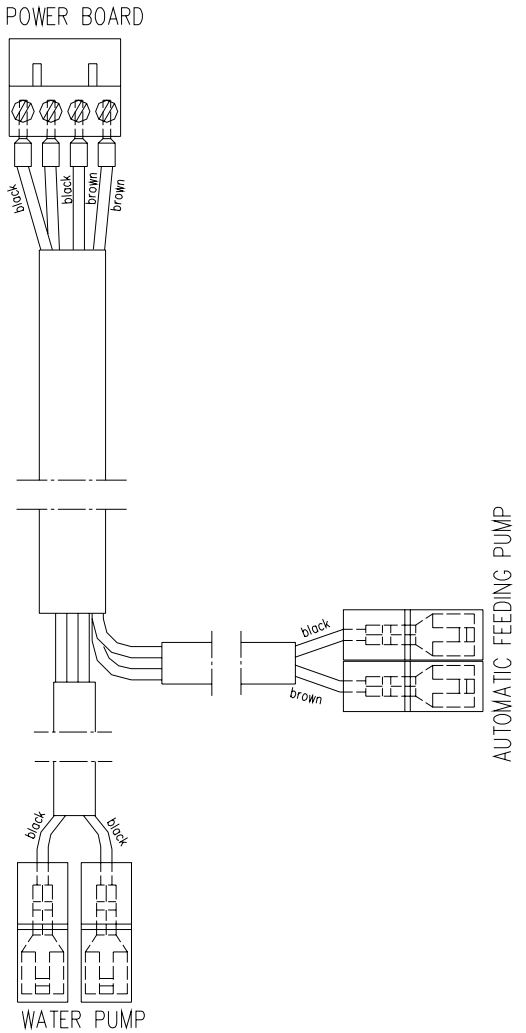
WIRING

WATER PUMPS

A2BP2270000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wiring from the water pumps and pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

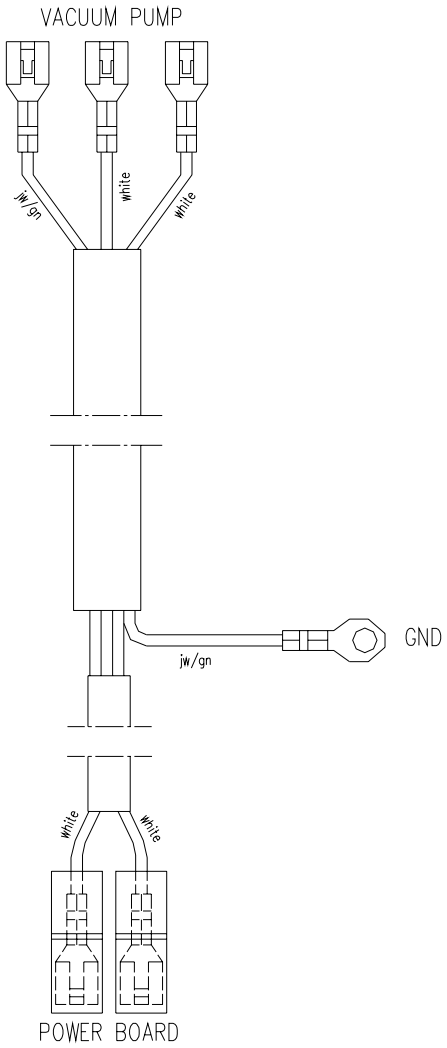


VACUUM PUMP

A2BP4030000 - Bravo^{17V} & Bravo^{21V}
A2BM3390000 - Bravo^{17}

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wiring from the vacuum pump and pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

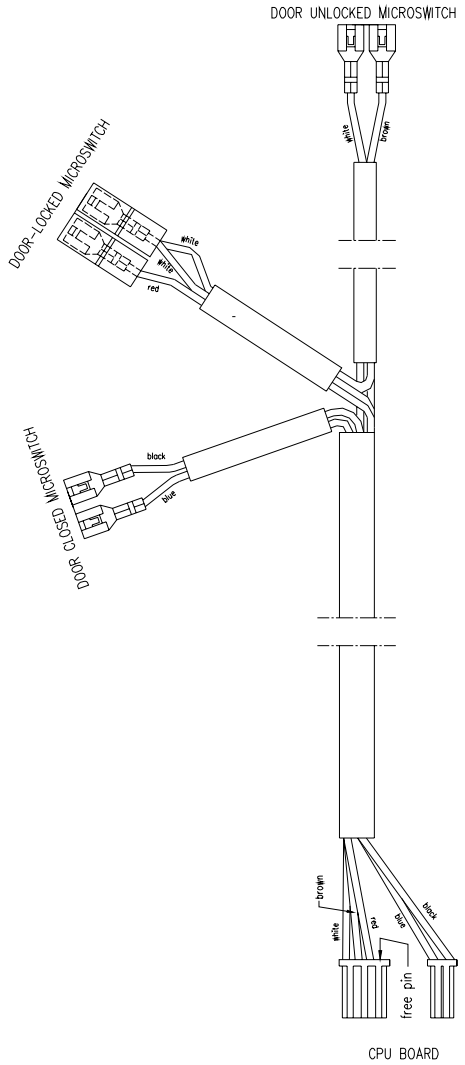


DOOR MICROSWITCH

A2BP2220000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wiring from the micro-switches and pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

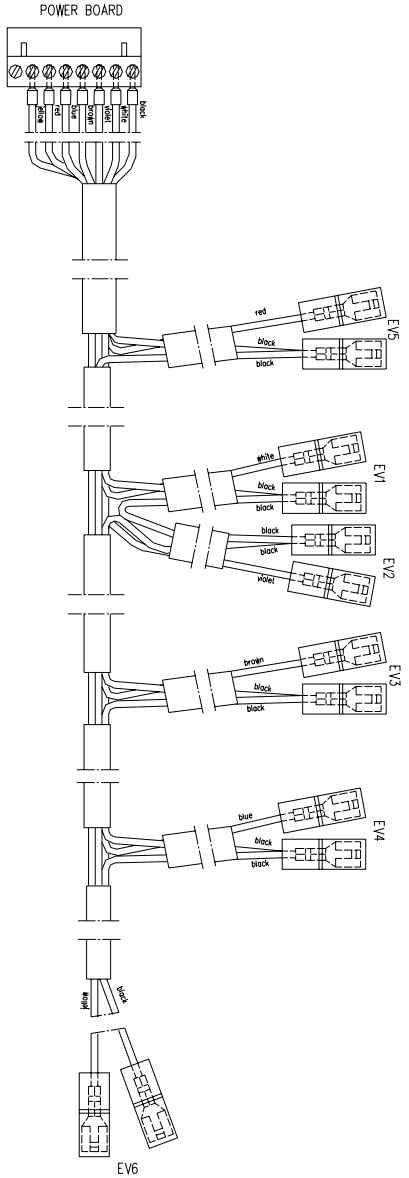


ELECTROVALVES

A2BP2280000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wiring from the electro-valves and pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

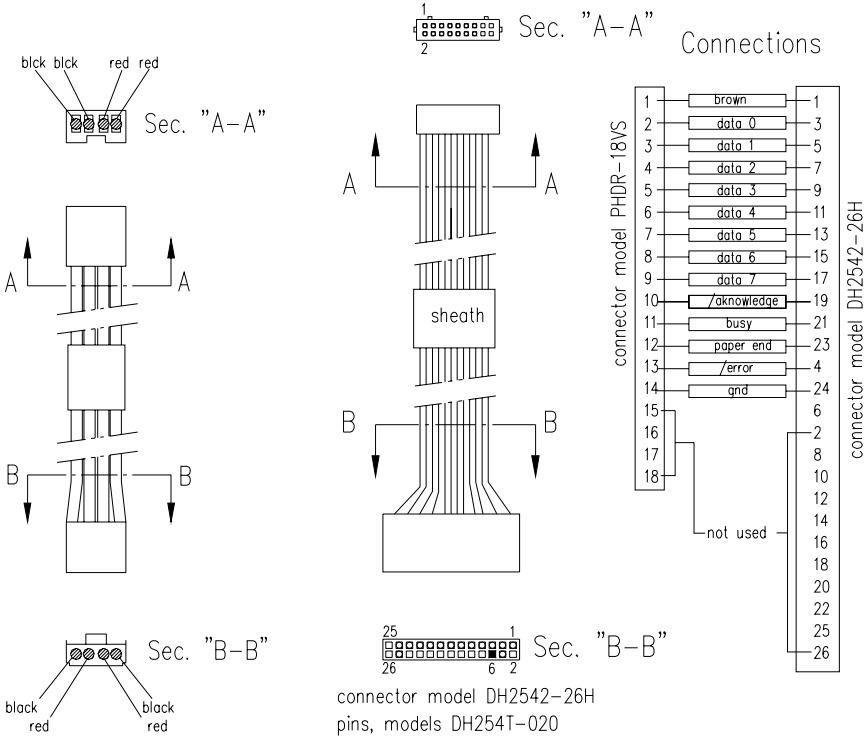


PRINTER SIGNAL CABLE
A2BP4690000

PRINTER POWER SUPPLY CABLE
A2BP4700000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the signal and power supply wirings from the printer and pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

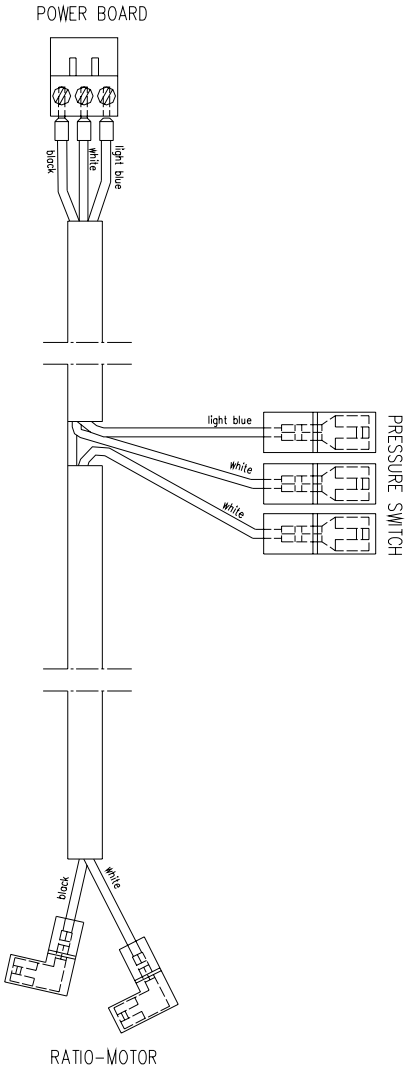


MOTOR AND PRESSURE SWITCH

A2BG3520000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wiring from the ratio-motor and pressure switch;
3. Disconnect the wiring from the pcb board;
4. Replace the wiring, reassemble proceeding in reverse order;
5. Run a sterilization cycle.

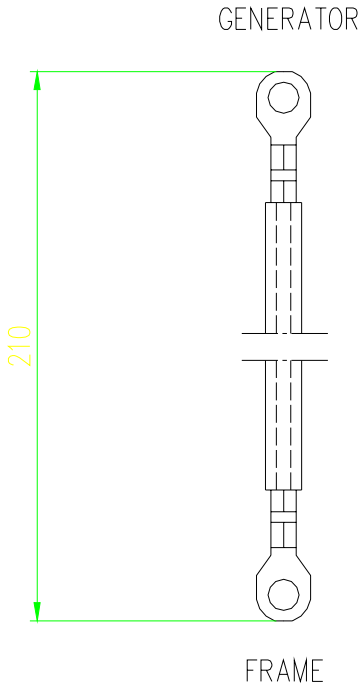


STEAM GENERATOR GROUND CABLE

A2BP4830000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the steam generator (see card ***Gr4-6***);
3. Disconnect the ground wire from the steam generator and frame;
4. Replace the cable, reassemble proceeding in reverse order;
5. Run a sterilization cycle.

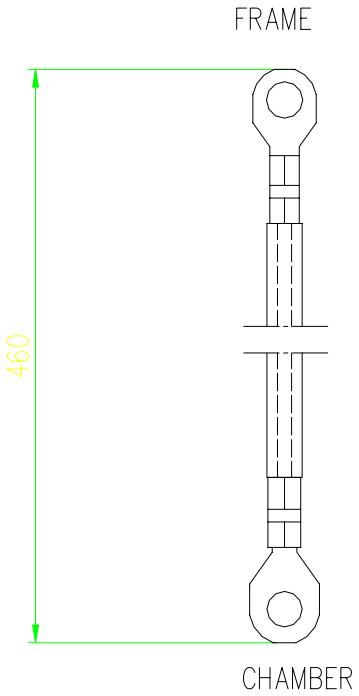


CHAMBER GROUND CABLE

A2BP4820000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Access to the chamber;
3. Disconnect the ground wire from chamber and frame;
4. Replace the cable, reassemble proceeding in reverse order;
5. Run a sterilization cycle.

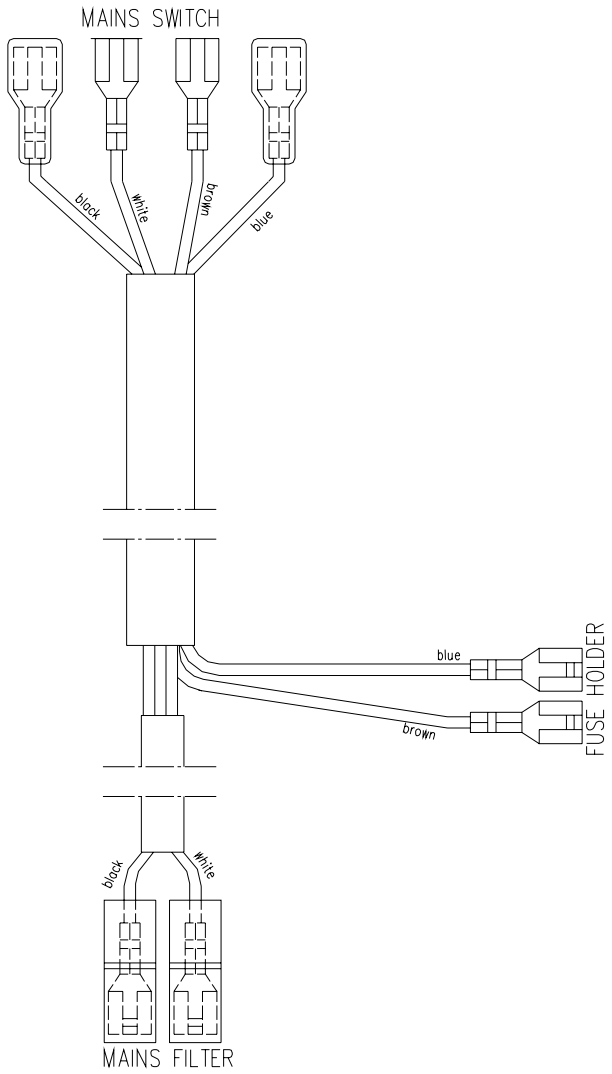


MAIN SWITCH

A2BP40200000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wire from the main switch, and fuse holders;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

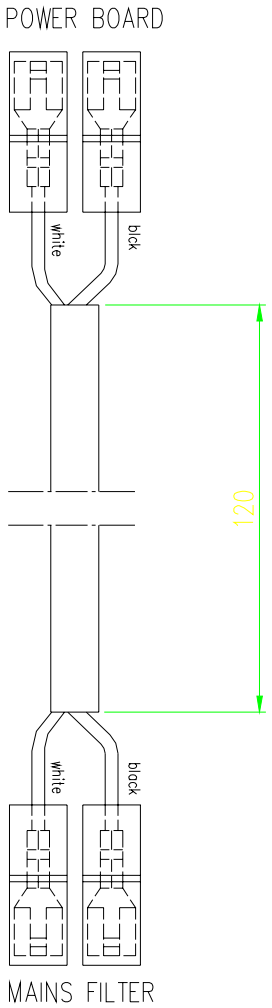


AC FILTER

A2BP40700000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wire from the pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.

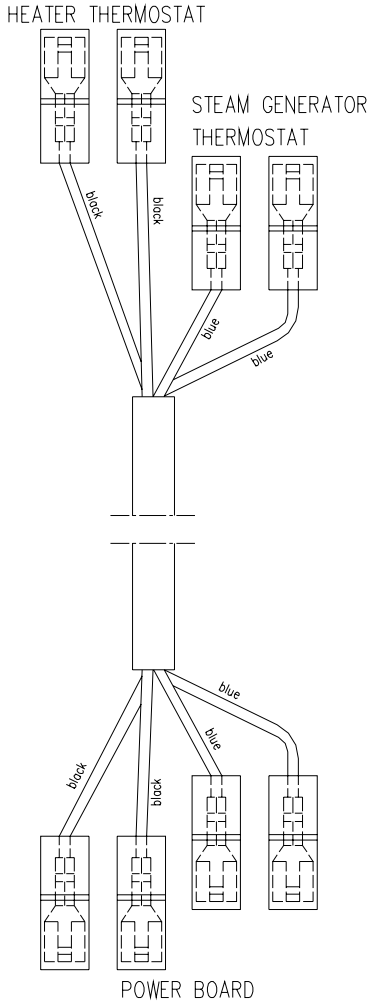


SAFETY THERMOSTAT

A2BP40100000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Disconnect the wire from the safety thermostats and pcb board;
3. Replace the wiring, reassemble proceeding in reverse order;
4. Run a sterilization cycle.



SciCan

GROUP 6

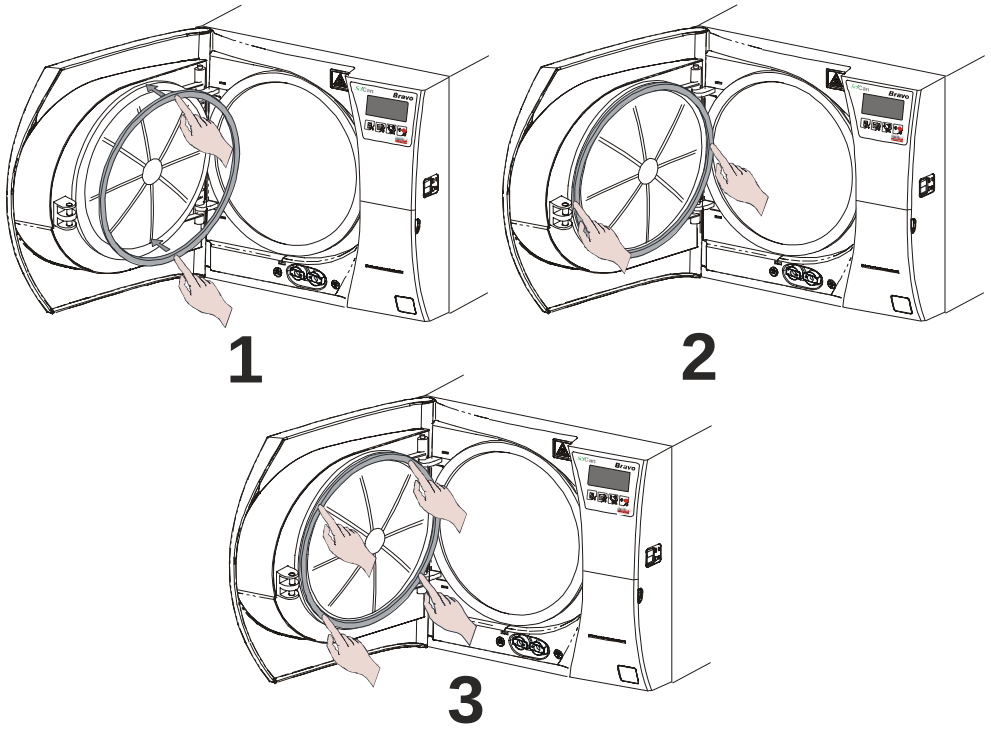
DOOR-LOCKING MECHANISM

DOOR GASKET

48000050000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

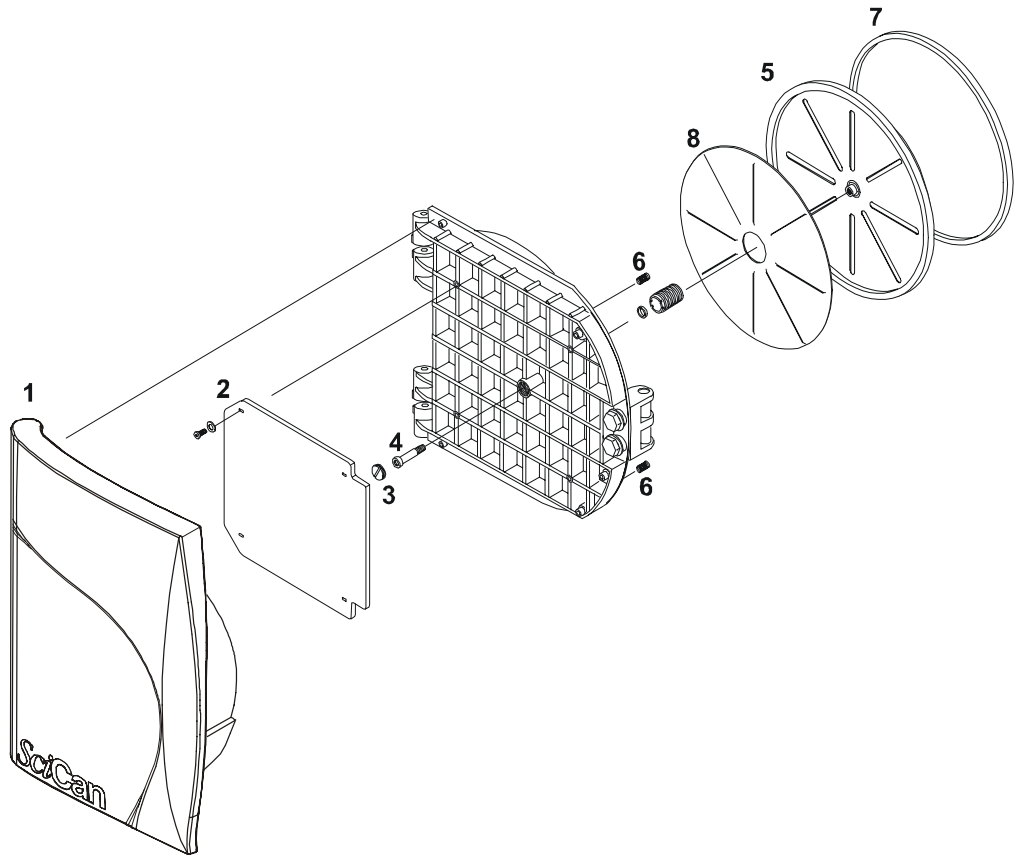
1. Open the door;
2. Remove the old gasket by hand;
3. Clean the door gasket seat to ensure it is debris free;
4. Install the new door gasket by pressing the gasket into its seat, first on top, then bottom, then both sides. Once seated on 4 sides, continue to press the remaining gasket completely into its seat;
5. Perform a sterilization cycle.



DOOR DISH
A1BP027000Y

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Open the door and remove the plastic door cover (1) (see card *Gr7-2*);
2. Remove the thermo-insulating panel (2) from the metallic door;
3. Remove the door gasket (7).
4. Remove the plug (3) and the door dish screw (4);
5. Remove door dish (5) and the thermo-insulating disk (8) taking care of the springs (6);
6. Reassemble any part proceeding in reverse order;
7. Perform a sterilization cycle.



DOOR BUSH
49000050000

DOOR FORK PIN
C0BP0500000

DOOR NITRIDED FORK
C0BP060000Z

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Open the door;

Bushes / Fork pin

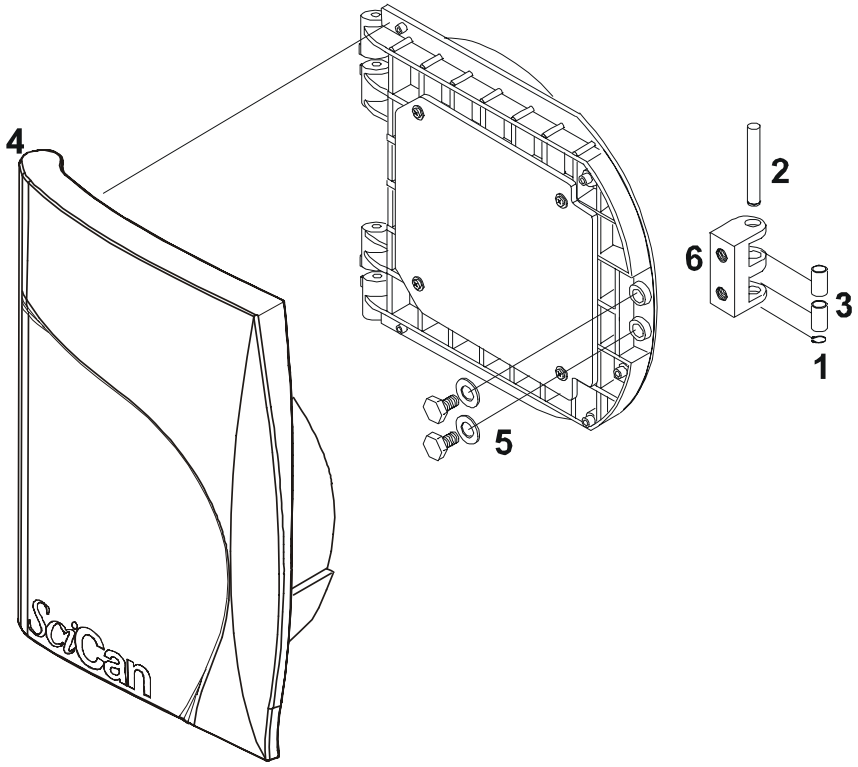
2. Remove the Seiger (1) from the bottom of the fork pin;
3. Withdraw the fork pin (2);
4. Remove the bushes (3);

Nitrided fork

5. Remove the plastic door cover (4) (see card *Gr7-2*);
6. Remove screws and washers (5) and remove the nitrided fork (6);
7. Mount the new part, reassemble proceeding in reverse order;
8. Perform a sterilization cycle.

WARNING

The fork pin must result with the lowered side on top of the nitrided fork.

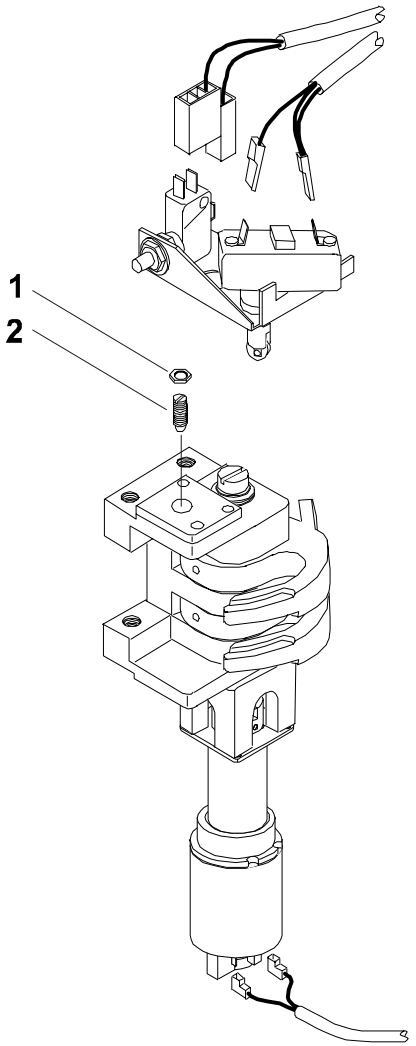


DOOR POSITIONER

251000003K0

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Access from the top and unscrew the nut (1), remove the positioner (2);
3. Mount the new positioner, reassemble proceeding in reverse order;
4. Adjust the positioner, see ***Attachment A***;
5. Perform a sterilization cycle.



OPEN-HOOK MICROSWITCH
43300010000

CLOSED-DOOR MICROSWITCH
43300010000

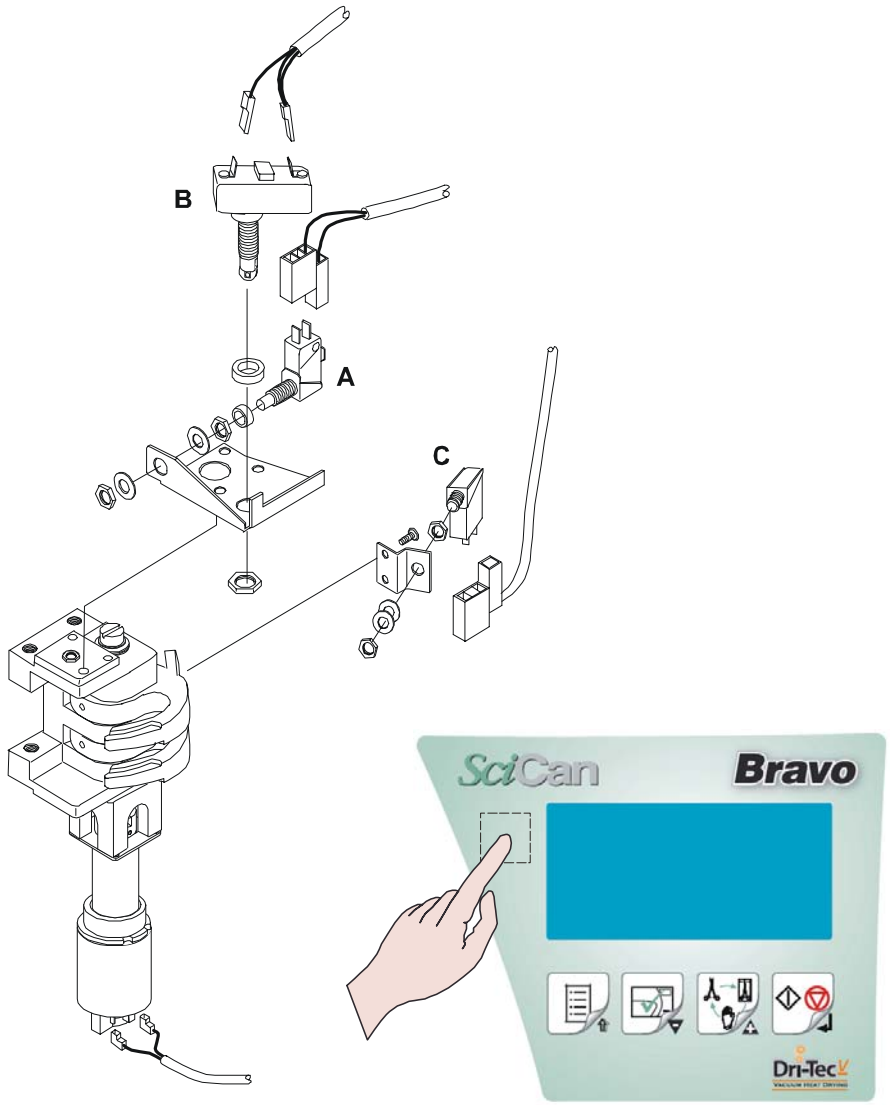
CLOSED-HOOK MICROSWITCH
43300040000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the wiring of the switch involved;
   - A: Door microswitch
   - B: Hook microswitch (close)
   - C: Hook microswitch (open)
3. Remove the bracket screws and the switch involved;
4. Replace the switch, reassemble proceeding in reverse order;
5. Perform a sterilization cycle.

Note: To release the open hook microswitch proceed as follows:

- Enter the **Setup**; **Service**, digit the code "++--++--", go to **Device Test**, **Manual** and **Locking Device**, push key START to enable/disable.
- After the switch replacement, check its correct operation. Remove the jumper X21 from the pcb board, **push the hidden key** on the keypad and switch-on the sterilizer. As the message "LOCKING DEVICE" appears on the display, release the hidden key and push the key Start to enable the unlock of the mechanism; exit the Setup mode, turn-off the sterilizer and restore the jumper X21.



GEAR-MOTOR

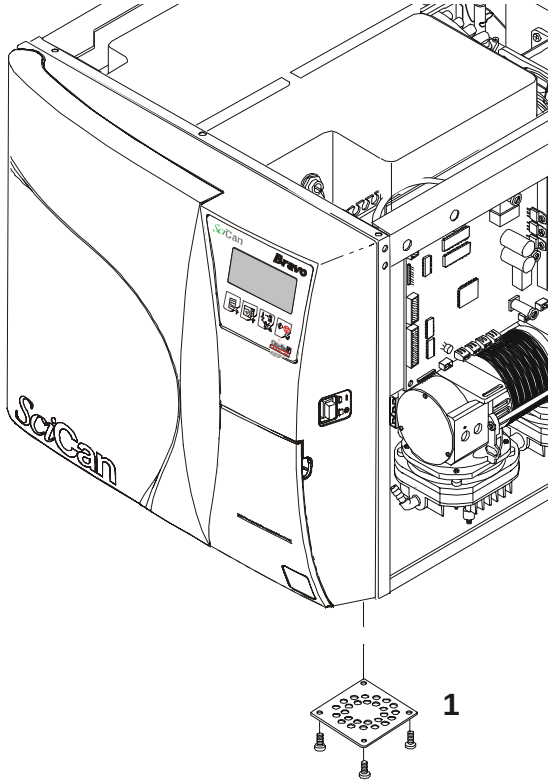
40300010000 - 120/220-230VAC 60Hz -
40300020000 – 220/240VAC 50Hz-

PIN 3X25

232A03L25K0

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Empty both reservoirs;
3. Turn the unit on the left side and remove the motor reducer access plate (1) from the bottom frame;
4. Remove the motor wiring and the motor reducer itself (2);
5. Block the motor in a vise, remove the pin (3) by using proper tools;
6. Mount the new pin, the motor taking care to couple both bushes, connect the wiring (white = + / black = -) and mount the plate (1); reassemble proceeding in reverse order;
7. By means of a large screwdriver, push on the pin (B) of the close hook microswitch (do not release it until explicitly indicated) and turn on the unit;
8. Wait for the end of the auto-test, then enter the SETUP mode;
9. Go to SERVICE option, enter the code “++--++--“, then select DEVICE TEST, MANUAL and LOCKING DEVICE option;
10. Push the key **Start** to enable the locking mechanism, then **release the pin B**;
11. Push again the key **Start** to release the locking mechanism;
12. Switch off/on the unit;
13. Perform a sterilization cycle.

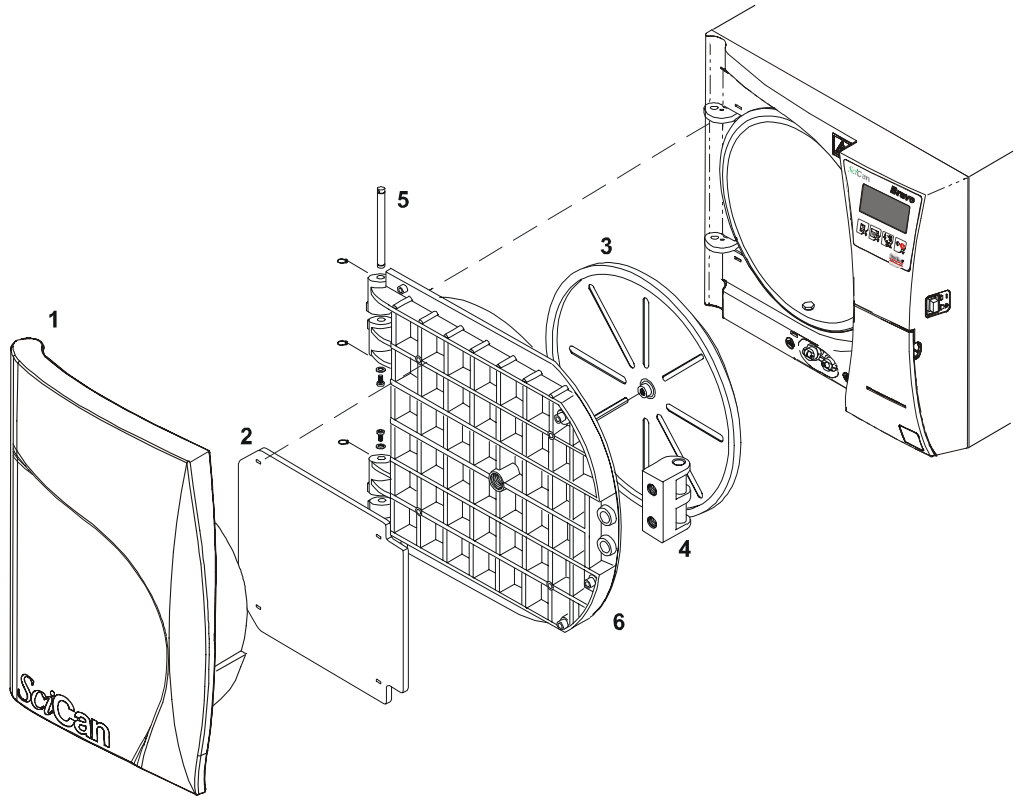


CAST ALUMINUM DOOR

C0BP260000P

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Open the door and remove the plastic door cover (1) (see card *Gr7-2*);
2. Remove the thermal insulating panel (2);
3. Remove the door dish (3) (see card *Gr6-2*);
4. Remove the nitrided fork (4) (see card *Gr6-3*);
5. Remove the hinge pin (5) in order to free the cast aluminum door (6);
6. Mount the new metallic door and reassemble any part proceeding in reverse order;
7. Perform a sterilization cycle.



SciCan

GROUP 7

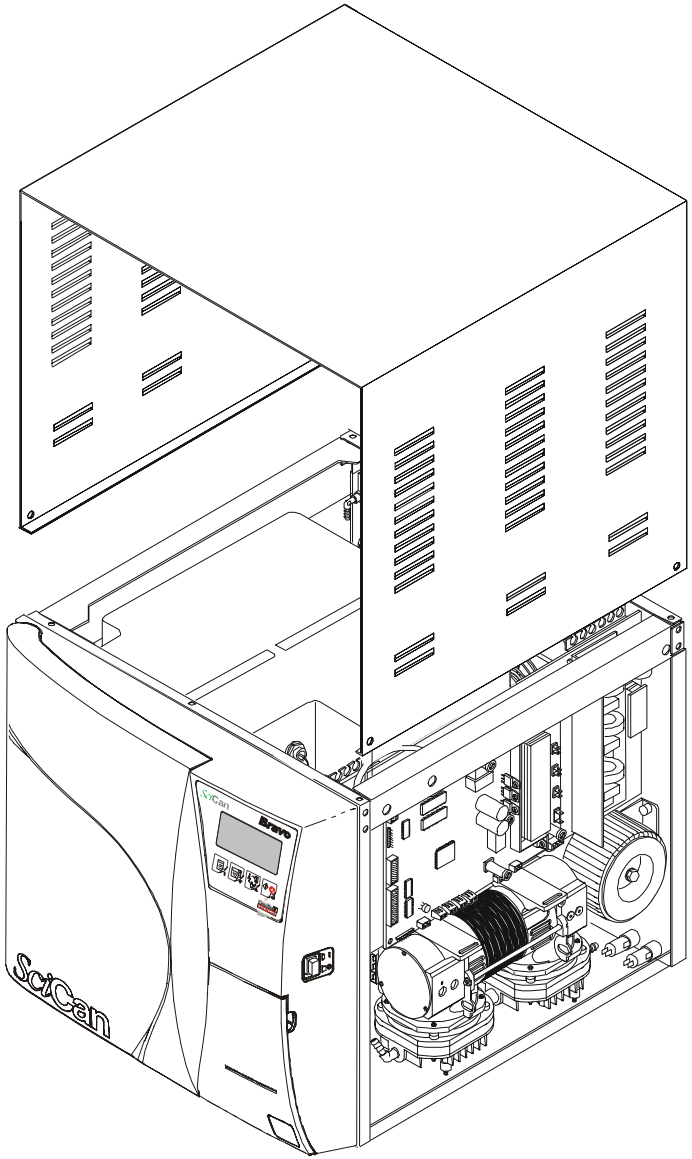
COVERS

METALLIC FRAME COVER

C1BH0060001 - Bravo^{17} & Bravo^{17V}
C1BG4680001 - Bravo^{21V}

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the screws from the base of the metallic cover;
2. Remove the cover;
3. Mount the new cover;
4. Perform a sterilization cycle.



PLASTIC DOOR COVER

Europe models
C3JP0120000 (external)
C3JP0130000 (internal)

North America models
C3BP1850000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

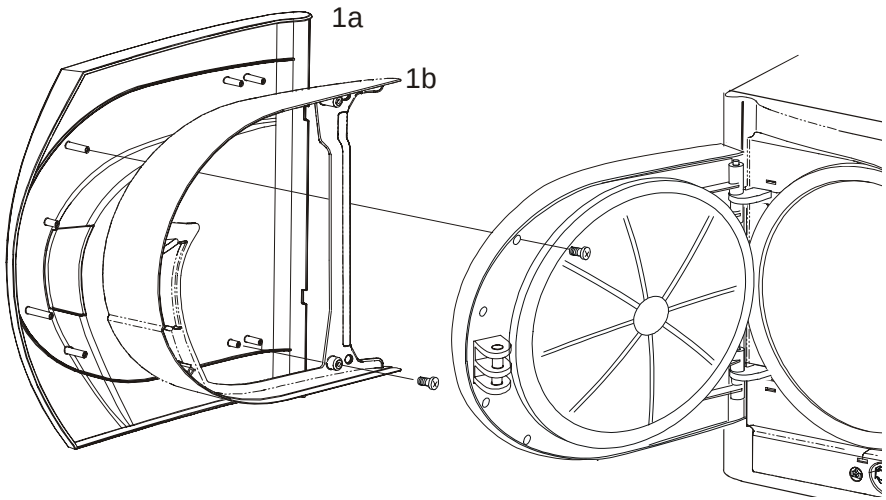
Europe models

1. Open the door;
2. Disassemble the plastic door cover –1a external, 1b internal);
3. Mount the new plastic door cover;
4. Perform a sterilization cycle.

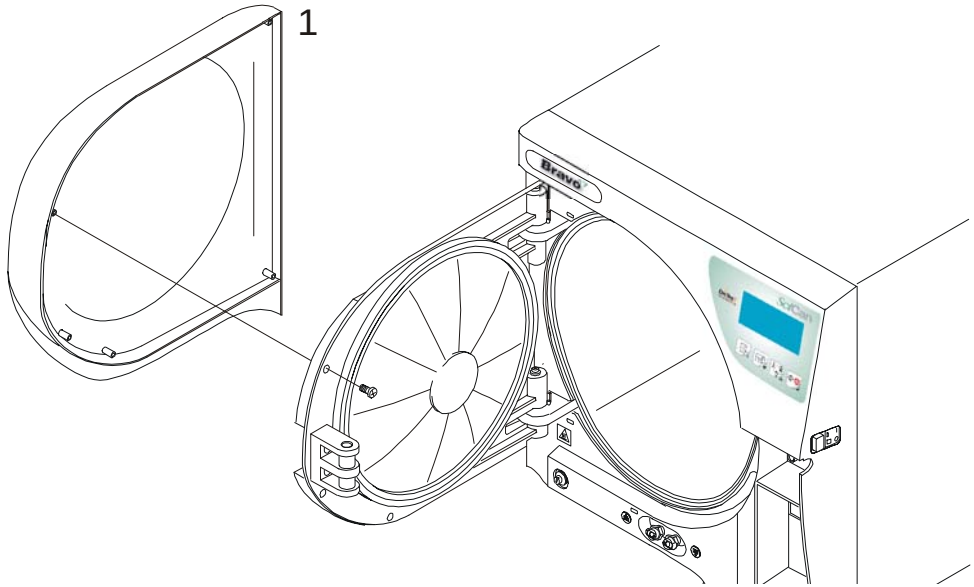
North America models

1. Open the door;
2. Disassemble the plastic door cover (1);
3. Mount the new plastic door cover;
4. Perform a sterilization cycle.

Europe models



North America models



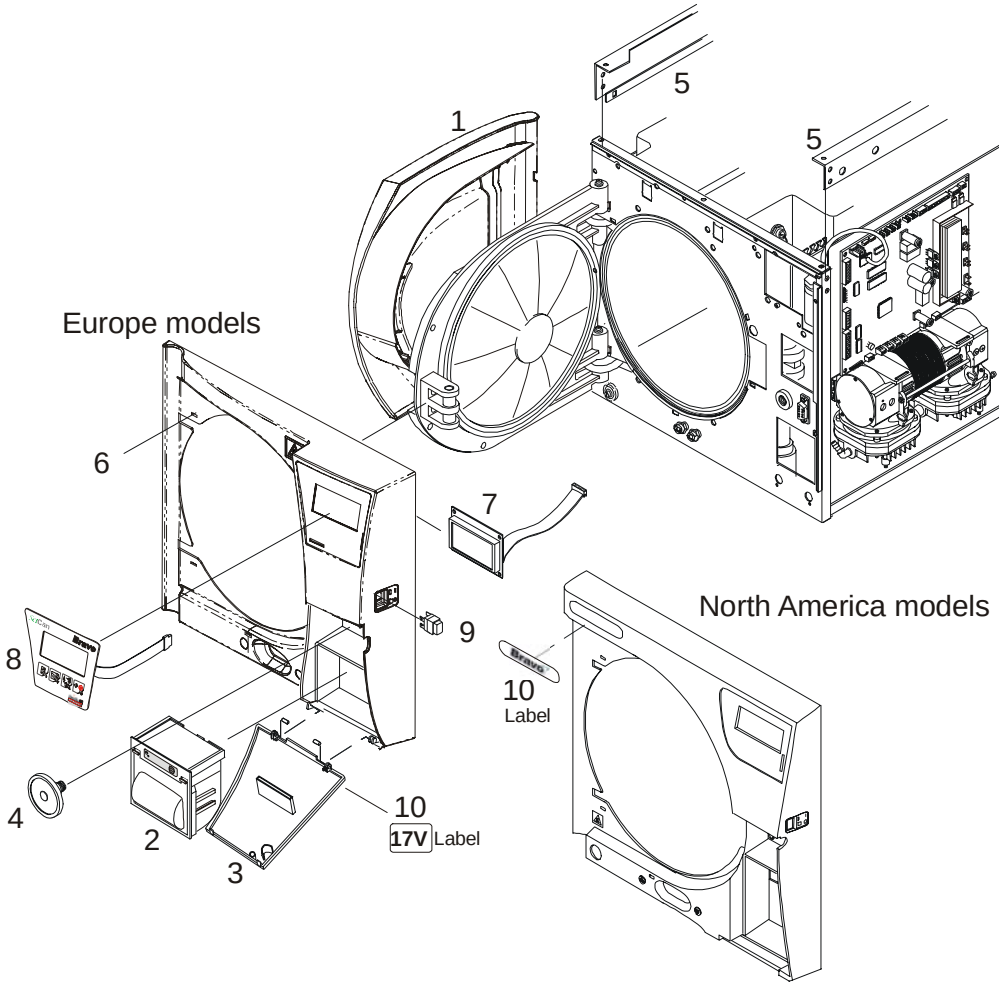
PLASTIC FRONT FRAME

Europe models
C3JP0110000

North America models
C3BP1830000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the metallic frame cover (see card ***Gr7-1***);
2. Remove plastic door cover (1) (see card ***Gr7-2***);
3. Remove the thermal printer unit (2) (see card ***Gr1-20***);
4. Remove the service compartment door (3) (see card ***Gr7-4***);
5. Cut the clips and disconnect the wiring from the main switch;
6. Remove the LCD display and keypad connections from the pcb board;
7. Remove the bacteriological filter (4);
8. Remove left and right rails (5);
9. Remove the screws fix the plastic front frame from the rear of the front frame and printer compartment;
10. Unlock by a screwdriver the four tabs (6) of the plastic front frame from the front frame slots around the chamber circumference;
11. Carefully move left side the front plastic frame and remove it through the door;
12. Remove labels, LCD (7), keypad (8) and main switch (9) and remount on the new plastic front cover;
13. Remove the adhesive label (10);
14. Reassemble and restore the connections proceeding in reverse order;
15. Perform a sterilization cycle.



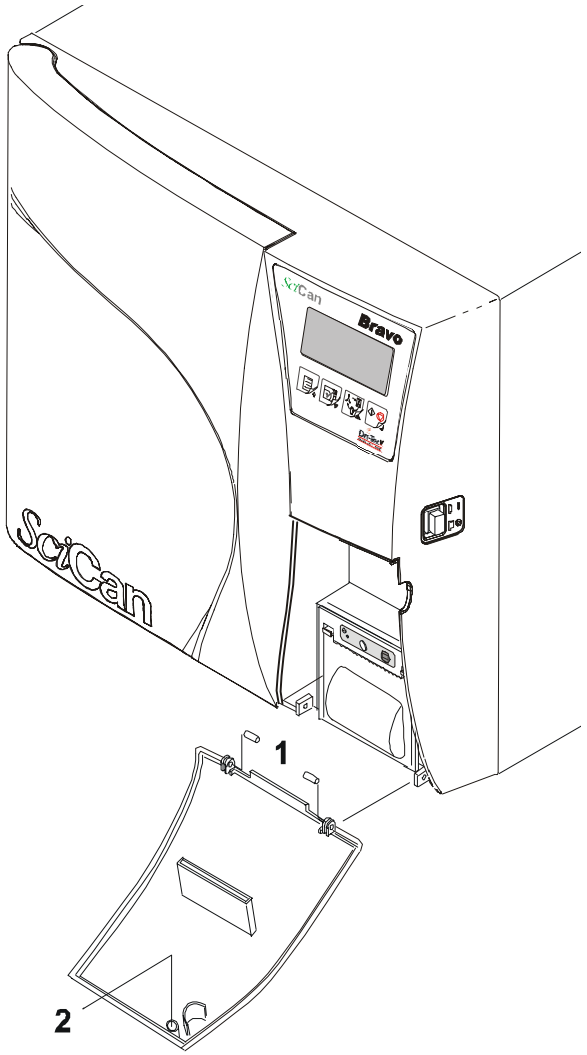
SERVICE COMPARTMENT'S DOOR

Europe models
C3JP0140000

North America models
C3BP1840000

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Open the service cover and remove the two pins (1);
2. Replace the cover, mount the pins;
3. Check the correct closing of the service compartment door - by the provided adhesive magnet button (2);
4. Perform a sterilization cycle.



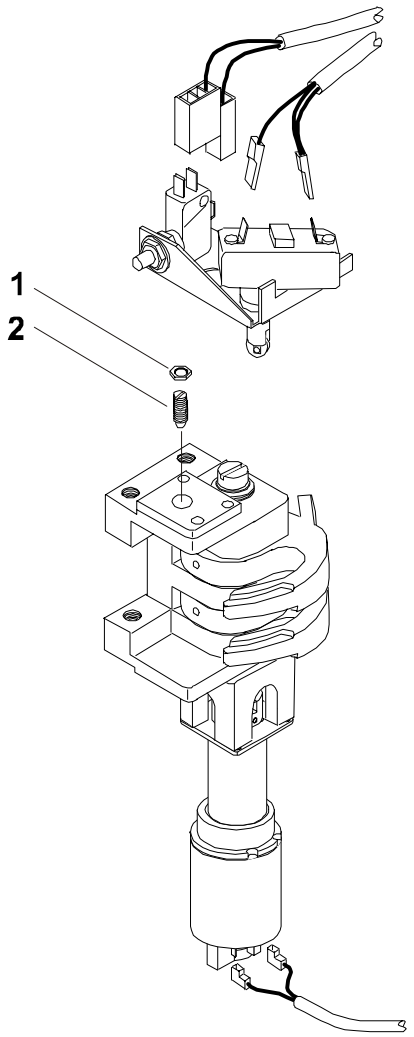
SciCan

ATTACHMENTS

ATTACHMENT A -
DOOR POSITIONER ADJUSTMENT

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

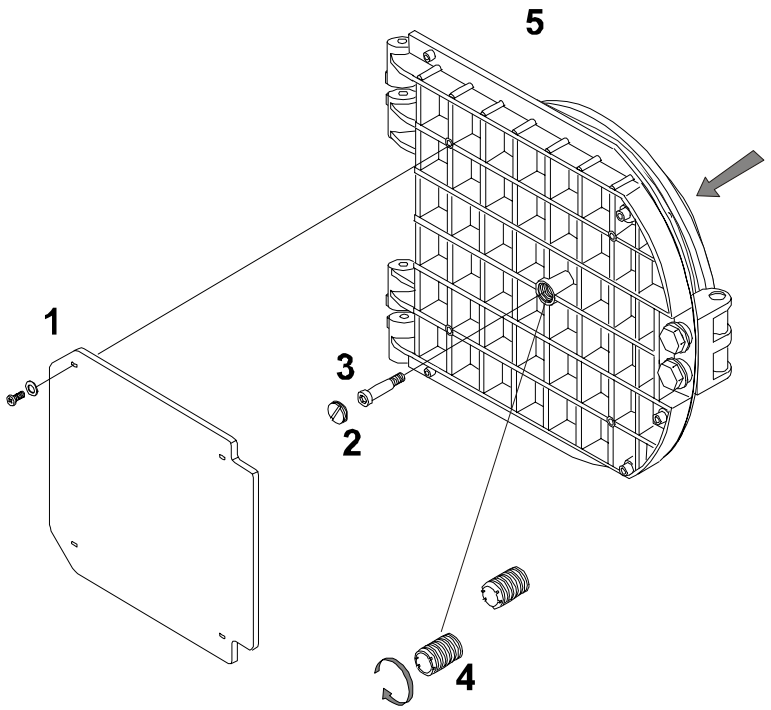
1. Remove the frame cover (see card ***Gr7-1***);
2. Open and close the door to check its operation;
3. In case the door does not remain close (no click at the stroke end), loosen the nut (1) and turn clockwise the positioner (2);
4. In case of resistance on closing/opening the door, loosen the nut and turn anti-clockwise the positioner;
5. Tighten the nut;
6. Perform a sterilization cycle.



ATTACHMENT B -
DOOR ADJUSTMENT

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Open the door;
2. Remove the door cover (see card ***Gr7-2***);
3. Remove the insulating panel (1);
4. Remove the screw-plug (2) at the center of the door;
5. Loosen the threaded bush (4);
6. Maintaining the door dish against the door, turn completely anti-clockwise the central threaded bush (4), then turn it ¾ clockwise;
7. Remount all items proceeding in reverse order as above;
8. Perform a sterilization cycle.



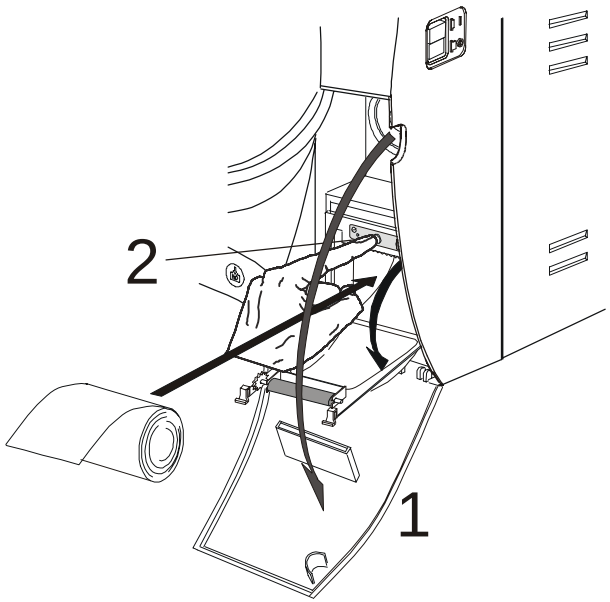
ATTACHMENT C -
PRINTER PAPER ROLL REPLACEMENT

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

Custom type

1. open the service compartment door (1) to access the printer;
2. push the central button (2) to open the printer door and access the paper compartment;
3. remove the empty roll and place a new one so that the paper unrolls off the top;
   use thermal paper roll:
   - width 57 mm / diameter max 45 mm
4. unroll about 15 cm of paper and close the printer door;
5. thread the paper in the slot of the service compartment and close;
6. switch on the equipment;
7. perform a sterilization cycle.

N.B. The central button is lighted steady when the paper is regularly present, and is flashing when the paper roll is empty.



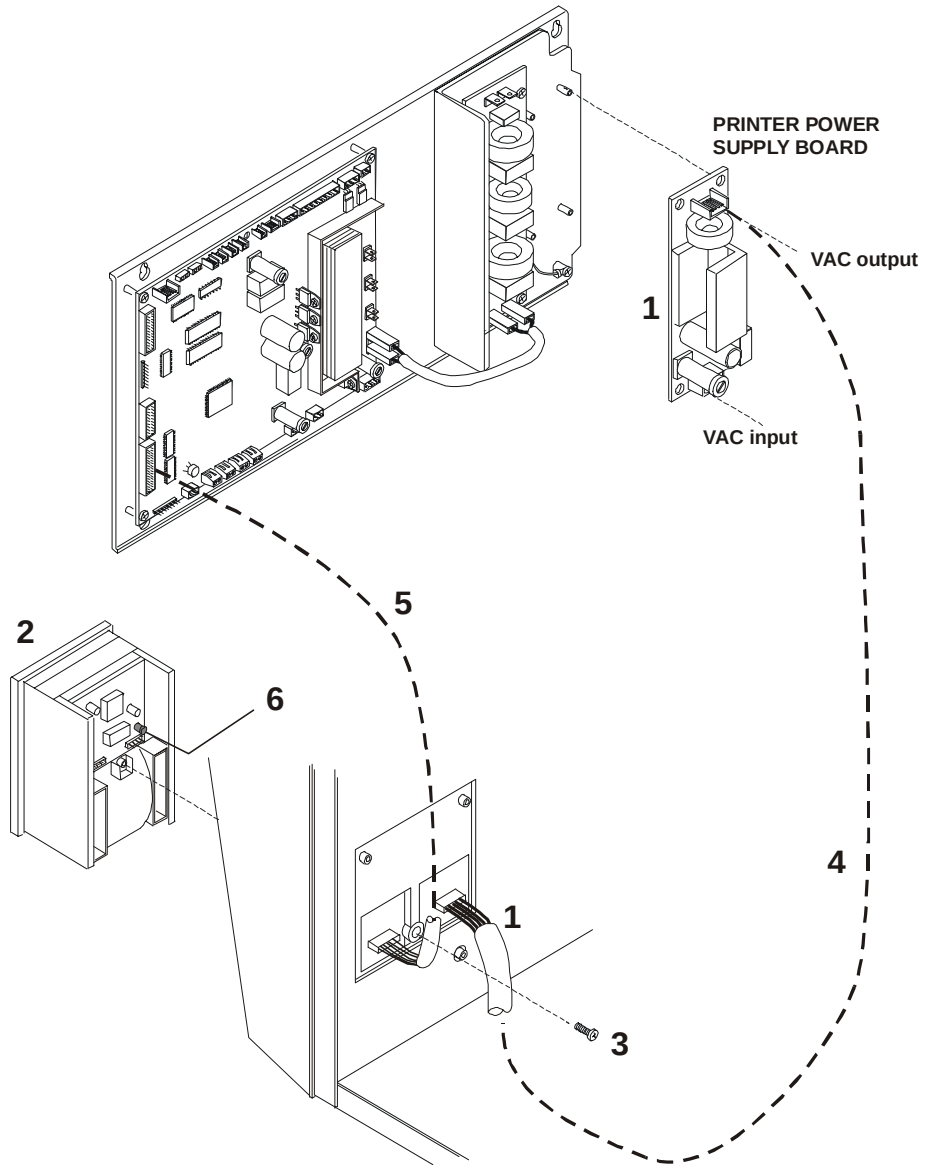
WARNING

- Use only thermal paper;
- Arrange the paper roll in the correct direction (see figure).

ATTACHMENT D -
PRINTER KIT INSTALLATION

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

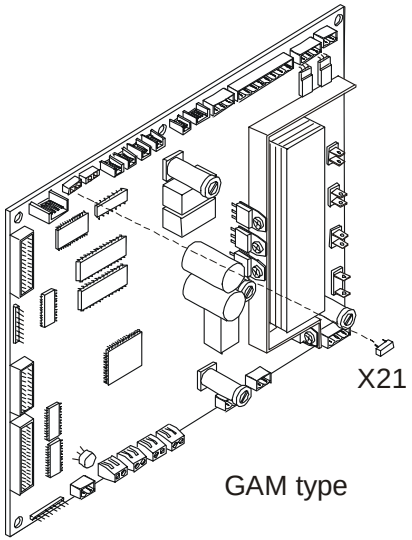
1. Remove the frame cover (see card ***Gr7-1***);
2. Use the printer power supply board (1) of the printer kit and mount it on the support of the electronic boards;
3. Cut the clamp on the transformer wiring and connect the free wiring on the AC voltage input connector;
4. Open the service box cover and mount printer unit (2) on the plastic front cover by means of the screw (3);
5. Connect the printer cable (4) between the ps output connector of the power supply board and the ps connector of the printer unit; arrange the cable path on the top of the support of the electronic boards and lock it by nylon clamps;
6. Connect the signal cable (5) between CPU and printer unit interface connectors;
7. Switch on the sterilizer, and push the red button (6) located on the rear of the printer unit; the paper moves forward from the slot;
8. Enter the SETUP mode, ADVANCED menu, PRINT OPTIONS, PRINTER, and select the option INTERNAL;
9. Exit the SETUP mode;
10. Perform a sterilization cycle; at the end of the cycle check the correct printout.



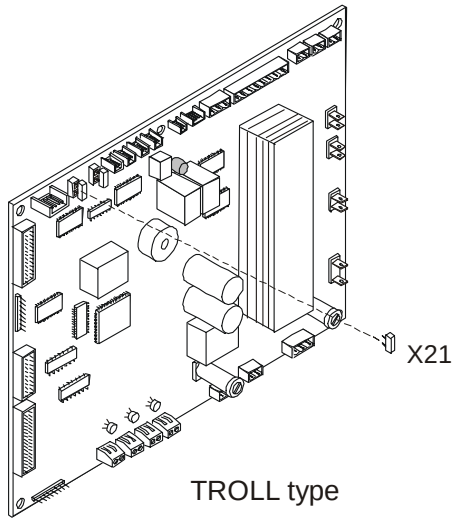
ATTACHMENT E -
PRINT QUEUE RESET

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

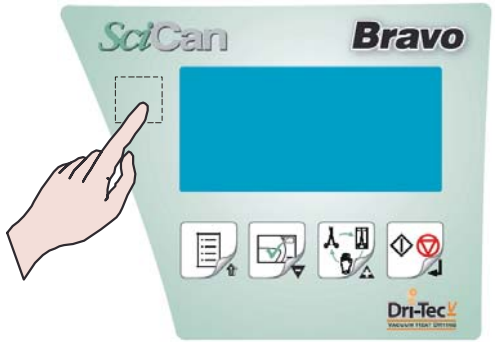
1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the jumper X21 on the CPU board;
3. Press the hidden key on the control panel, switch-on the unit and release the key only when the message "*LOCKING DEVICE*" appears on the LCD display;
4. Press the key  to exit this status and start the auto-test;
5. Turn off the unit at the end of the auto-test, restore the jumper X21 and switch on the unit again;
6. Enter the SETUP mode, ADVANCED menu, PRINT OPTIONS, REPORT, PRINT LAST and select the option NORMAL PRINT;
7. Exit the SETUP mode and check that the printer resumes to operate correctly.



GAM type



TROLL type



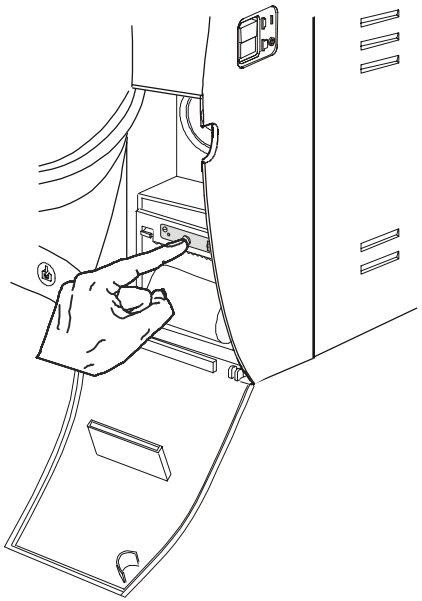
ATTACHMENT F -
CHECKING THE PRINTER PAPER FEEDING

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

- Open the service box;
- Switch on the sterilizer;
- Press the right key of the printer front panel, and check that the paper moves forward the slot;

1. If so, perform a sterilization cycle and check the printout at the end of the cycle;
2. Otherwise, check:
   a. the fuse on the printer power supply board,
   b: the correct connection on the pcb and printer unit,

   or replace the printer unit.



ATTACHMENT G -
STEAM GENERATOR START-UP

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

Perform this procedure in case of:
a. sterilizer unused for more one month;
b. sterilizer stored at a temperature below 0°C;
c. Water pump replaced;
d. Steam generator replaced;
e. Alarm for lack of water in the tank.

Procedure
1. Remove the frame cover (see card ***Gr7-1***);
2. Switch on the unit and enter the SETUP mode, SERVICE menu, type the access code “++--++--“, and select the option H2O CIRCUIT;
3. Press the Start/Stop key and check the operation of the water pump and that the water flows into the chamber;
4. Wipe the chamber and exit the SETUP mode;
5. Perform a sterilization cycle.

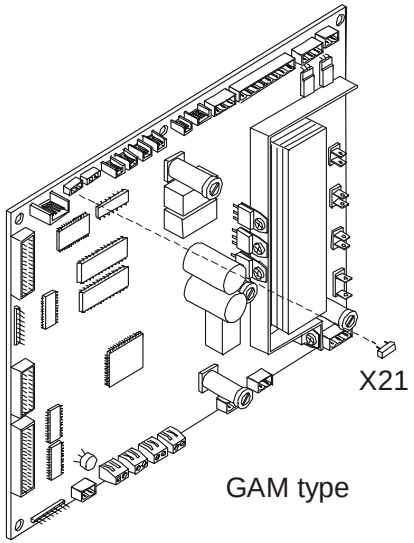
N.B. In case of problem, refer to the repairing card of the component malfunctioning.

ATTACHMENT H -
DOOR LOCKING MECHANISM RELEASE VIA SW COMMAND

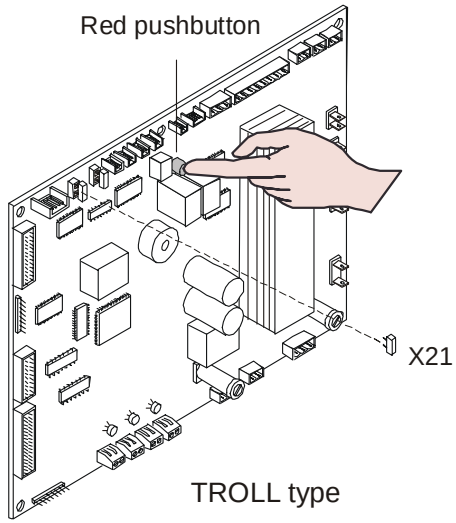
Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Remove the jumper X21 of the CPU board;
3. Press the hidden key on the control panel, switch-on the unit and release the key only when the message "*LOCKING DEVICE*" appears on the LCD display;
4. Press the Start/Stop key to release the door locking mechanism;
5. Open the door, press the key  to exit this status, and start the auto-test;
6. **pcb type GAM**
   At the end of the auto-test, turn off the unit, restore the jumper X21 and switch on the unit again;

   pcb type TROLL
   At the end of the auto-test, push the red button, turn off the unit, restore the jumper X21 and switch on the unit again.
7. Perform a sterilization cycle.



GAM type

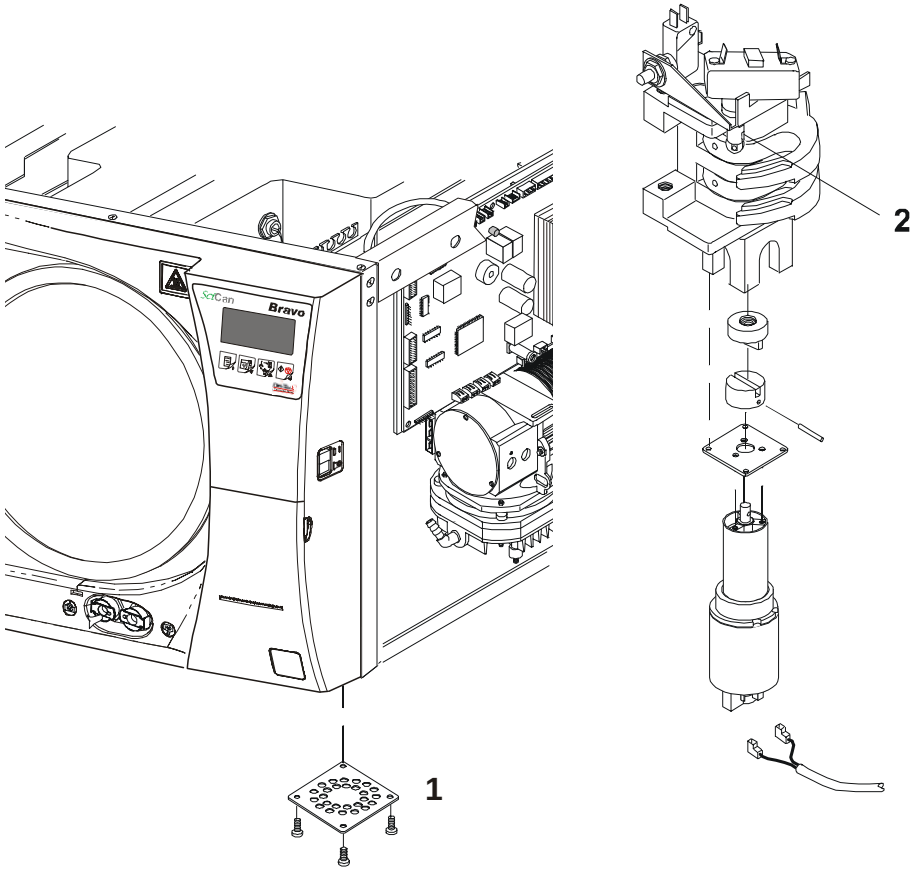


TROLL type

ATTACHMENT I -
MANUAL DOOR LOCKING MECHANISM RELEASE

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Empty both reservoirs, and turn left side the unit
3. Remove the motor access plate (1) from the bottom;
4. Remove the motor wiring and the motor assembly;
5. Now open the door causing the locking mechanism opening;
6. Arrange the motor on its seat, taking care to couple the bushes;
7. Connect the wiring (white = + / black = -) and mount the small plate (1) on the bottom frame, proceeding in reverse order as above ;
8. By means of a large screwdriver, push on the pin (2) of the door-unlocked switch (do not release it until explicitly indicated) and turn on the unit;
9. Wait for the end of the auto-test, then enter the SETUP mode, option SERVICE, enter the code "++--++--", then select DEVICE TEST, MANUAL and the option LOCKING DEVICE;
10. As enabled the locking mechanism, **release the pin (2) of the door-unlocked switch**;
11. Push the Start/Stop key to release completely the locking mechanism;
12. Exit the Setup mode and switch off/on the unit;
13. Perform a sterilization cycle.



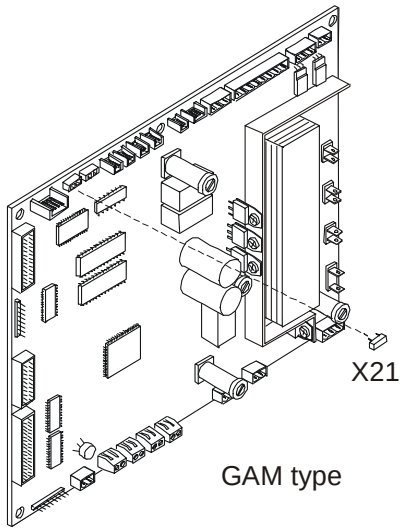
ATTACHMENT J -
DEFAULT DATA RECOVERY

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

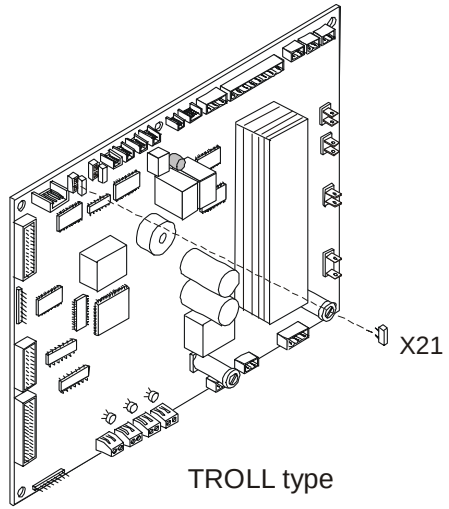
1. Remove the frame cover (see card ***Gr7-1***);
2. Remove jumper X21 from the CPU board;
3. Push on the three left keys and switch-on the unit;
4. LCD appears completely empty;
5. Turn-off and -on the unit;
6. LCD will show now the message “DEFAULT DATA UPDATE”;
7. Wait for the update completion (message “OK”);
8. Turn-off the unit;
9. Restore the jumper X21 and turn on the unit;
10. Perform a sterilization cycle.

WARNING

As consequence of the data recovery operation, the sterilizer must be calibrated; this procedure should be performed starting from the software release **E0008 / BP00350**



GAM type



TROLL type

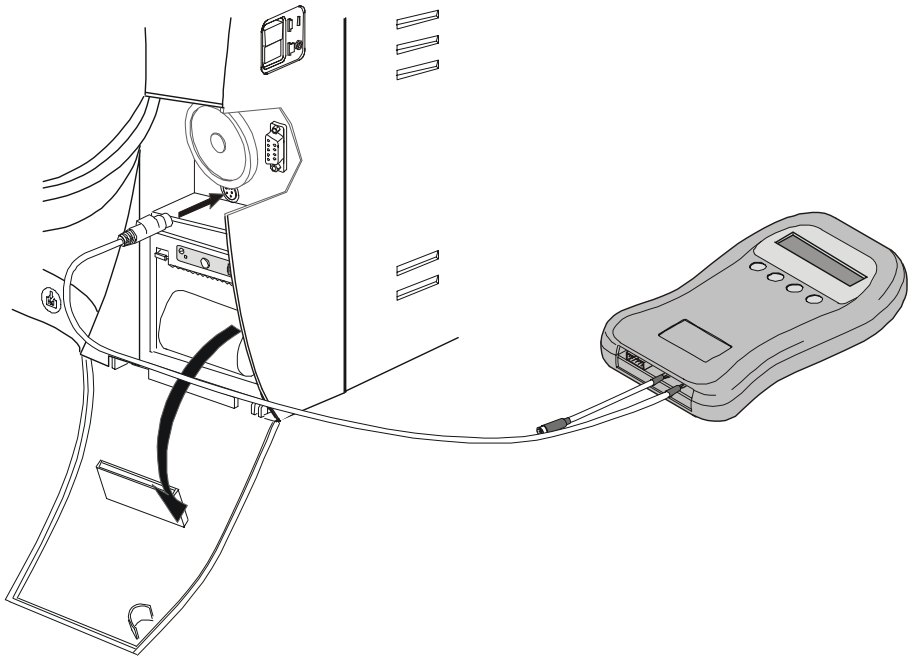
ATTACHMENT K -
SOFTWARE UPDATING

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

Follow the instructions reported on the Operating Manual of the Programmer.

1. Install the BravoProg application on the PC;
2. Connect the BravoProg device to the PC and download the last release software;
3. Connect the BravoProg device to the sterilizer;
4. Perform the sterilizer software upgrade;

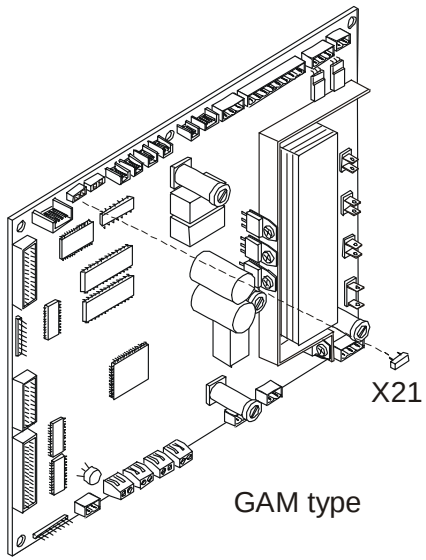
BravoProg - Sterilizer connection



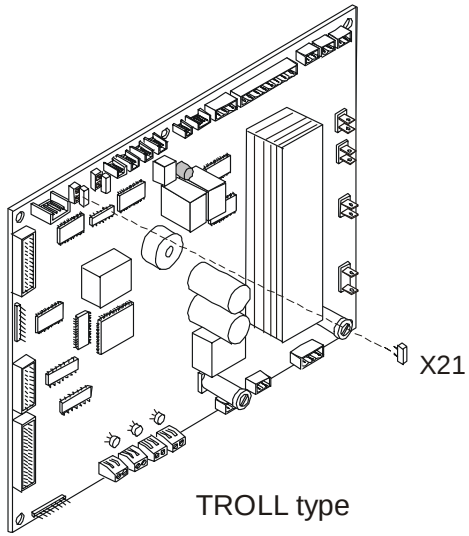
ATTACHMENT L -
RELEASING THE ALARM A022 - DOOR LOCKED

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Unplug jumper X21 from the CPU board;
3. Push the key Start and turn-on the unit;
4. LCD will show the message “SETUP”;
5. Keep pushed the Start key up to the message “SETUP COMPLETE”;
6. Wait for the end of the autotest, then turn-off the unit;
7. Restore the jumper X21 and turn on the unit;
8. Perform a sterilization cycle.



GAM type

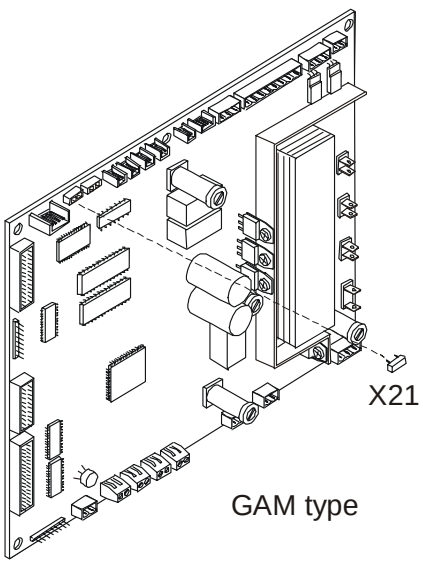


TROLL type

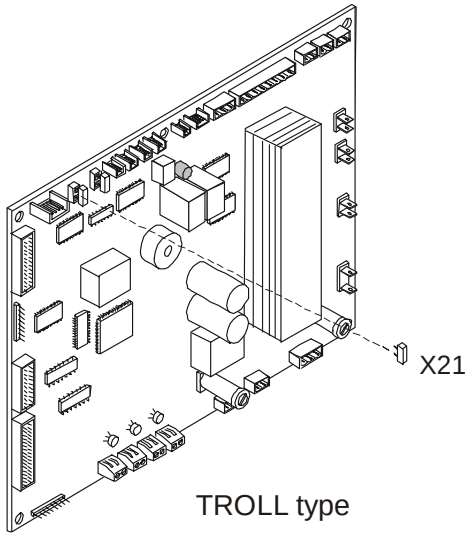
ATTACHMENT M -
CALIBRATION CHECK

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

1. Remove the frame cover (see card ***Gr7-1***);
2. Unplug jumper X21 from the CPU board;
3. Keep pushed the key Start and switch-on the unit; LCD will show the message “CALIBRATION” and then the PT1 value (see figure);
4. Check that PT1 value matches the calibration one, i.e. 000,0;
5. Press the key Start and repeat the check for PT2, PT3 and PT4 on the relating connector;
6. Should any value to be different from the calibration one, use the key **+** and **–** to increase or decrease the value;
7. epeat the check for any PTn as above, and adjust the value in case of mismatch from 130,4;
8. Ended the PTn checks, push again the key Start to continue with the next check, i.e. pressure transducer at the set-points of 0,00 , 2,10 and -.90 bar;
9. Push the key Start, the display will show “CALIBRATION END”;
10. Push again the key Start to exit the calibration mode and launch the auto-test;
11. At the end of the auto-test, switch-off the unit and restore the jumper X21;
12. Switch-on the unit and perform a sterilization cycle;

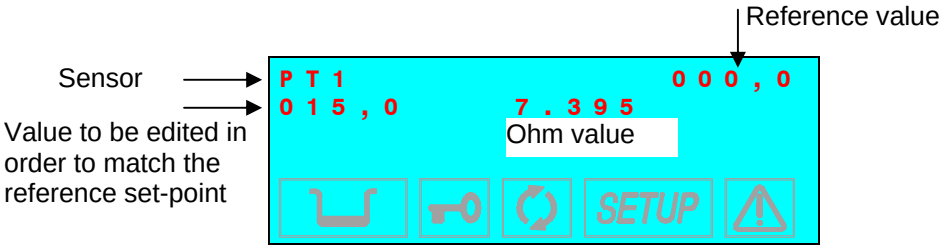


GAM type



TROLL type

Example of LCD display



ATTACHMENT N - CALIBRATION

Before servicing, switch off the equipment and unplug the power supply cable from the mains socket

WARNING

This procedure must be performed by skilled technicians and using the ref connector. Otherwise the manufacturer won't be responsible for wrong servicing.

1. Remove the frame cover (see card ***Gr7-1***);
2. Unplug jumper X21 from the CPU board;
3. Remove the wirings of the probes PT1...PT4, and plug-in the ref. connector (with pins) for checking the value 000,0;
4. Switch-on the unit, enter the SETUP mode, SERVICE menu, enter the access code "++--++--", move to the option PT1 CORRECTION, and check that the PT1 value matches 1500 Ω;
5. Exit SETUP mode, switch-off the unit, then switch-on again keeping pushed the Start key; the display will show the message "CALIBRATION" and then the PT1 value;
6. Push on the first left-side key of the keypad; the value will decrease to 000,0;
7. Should the value to be different, use the key **+** and **–** to increase/decrease the value up to 000,0; wait a few seconds to check its stability;
8. Push on the key Start and repeat the check for any PTn as above, adjusting the value in case of mismatch from 000,0;
9. Press again the Start key to continue the PT calibration with the tests at 130.4; remove the ref. connector, and plug-in it again in reverse direction;
10. Push the first left-side key; the value will increase to the new reference value;
11. Push again the first left-side key to approach the reading value; should the value to be different, use the key **+** and **–** to increase/decrease the value up to the reference one; wait a few seconds to check its stability;
12. Push the key Start and repeat the check for any PTn as above, adjusting the value in case of mismatch;
13. Continue with the **MPx calibration at ambient pressure**; use the left-side key to approach the value to the reference one, and the key **+** to set the value at 0,00; wait a few seconds to check its stability;
14. Push again the key Start for the **MPx calibration at 2,10 bar**; connect the pressure transducer to an external air compressor, set the pressure at 2,10 bar; pushing the first left-side key the read value will approach to the reference one; use key **+** and **–** to increase/decrease the value up to match the reference one; wait a few seconds to check its stability;
15. Push again the key Start for the **MPx calibration at -.90 bar**; remove the air compressor, and connect the pressure transducer to an external vacuum pump; set the value at -.90 bar; pushing the first left-side key the read value will approach to the reference one; use key **+** and **–** to increase/decrease the value up to match the reference one; wait a few seconds to check its stability;
16. Push again the key Start; the display will now show "CALIBRATION END"; press the key Start to confirm, and wait the end of the auto-test;
17. Switch-off the unit; remove the ref. connector; restore the PTn wirings and jumper X21;
18. Switch-on the unit, enter the SETUP mode, SERVICE menu, enter the code "++--++--", go to PT1 CORRECTION option;
19. Use key **+** and **–** to increase/decrease the value up to match the value written on the label attached on the right rail;
20. Push the key Start to confirm the operation; exit the SETUP mode and switch-off the unit;
21. Switch-on the unit and perform a sterilization cycle.

ATTACHMENT O -
TESTING THE UNIT THROUGH CONTINUOUS CYCLES

Use this procedure in case of continuous test of the sterilizer for a lot of time and to be sure that this test ends normally.

Before carrying out a continuous test cycle, the equipment must be properly set:

1. Connect an external tank for the automatic water feeding;
2. Connect an external tank for the draining of the used water;
3. Fill the external water feeding tank with distilled water (or switch-on the external demineralizer unit);
4. Enter SETUP mode, ADVANCED menu and set the FILLING OPTIONS to AUTOMATIC;
5. Move to SERVICE menu and TEST CYCLES, select the option desired;
6. Exit the SETUP mode;
7. Select the cycle and enter the Start command.

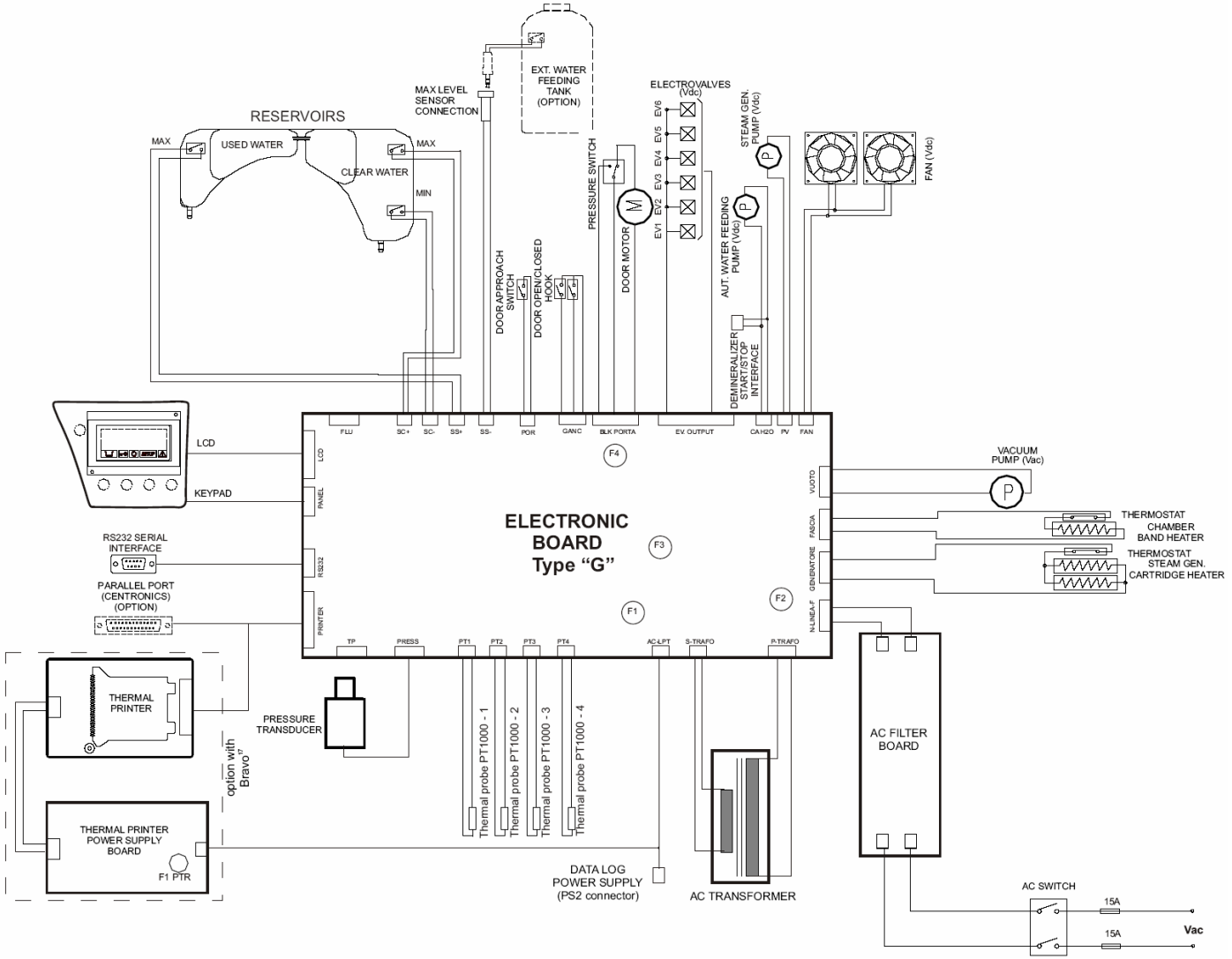
WARNING

At the end of the test, reenter the SETUP menu, SERVICE menu, TEST CYCLES and select the option “TEST CYCLES OFF” in order to reset the sterilizer in standard mode.

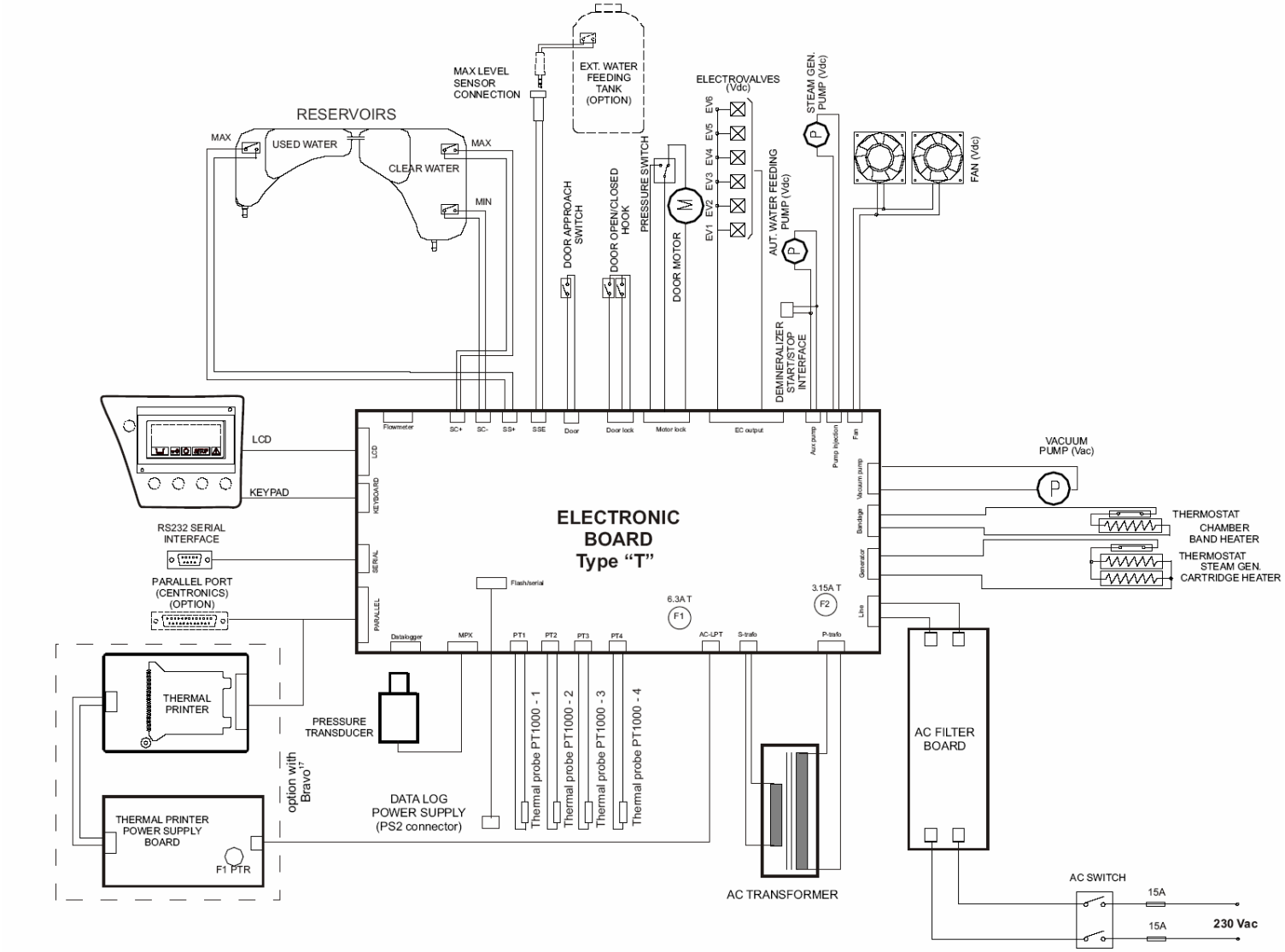
4. DIAGRAMS, ESPLODED VIEWS, SPARE PARTS

DIAGRAMS

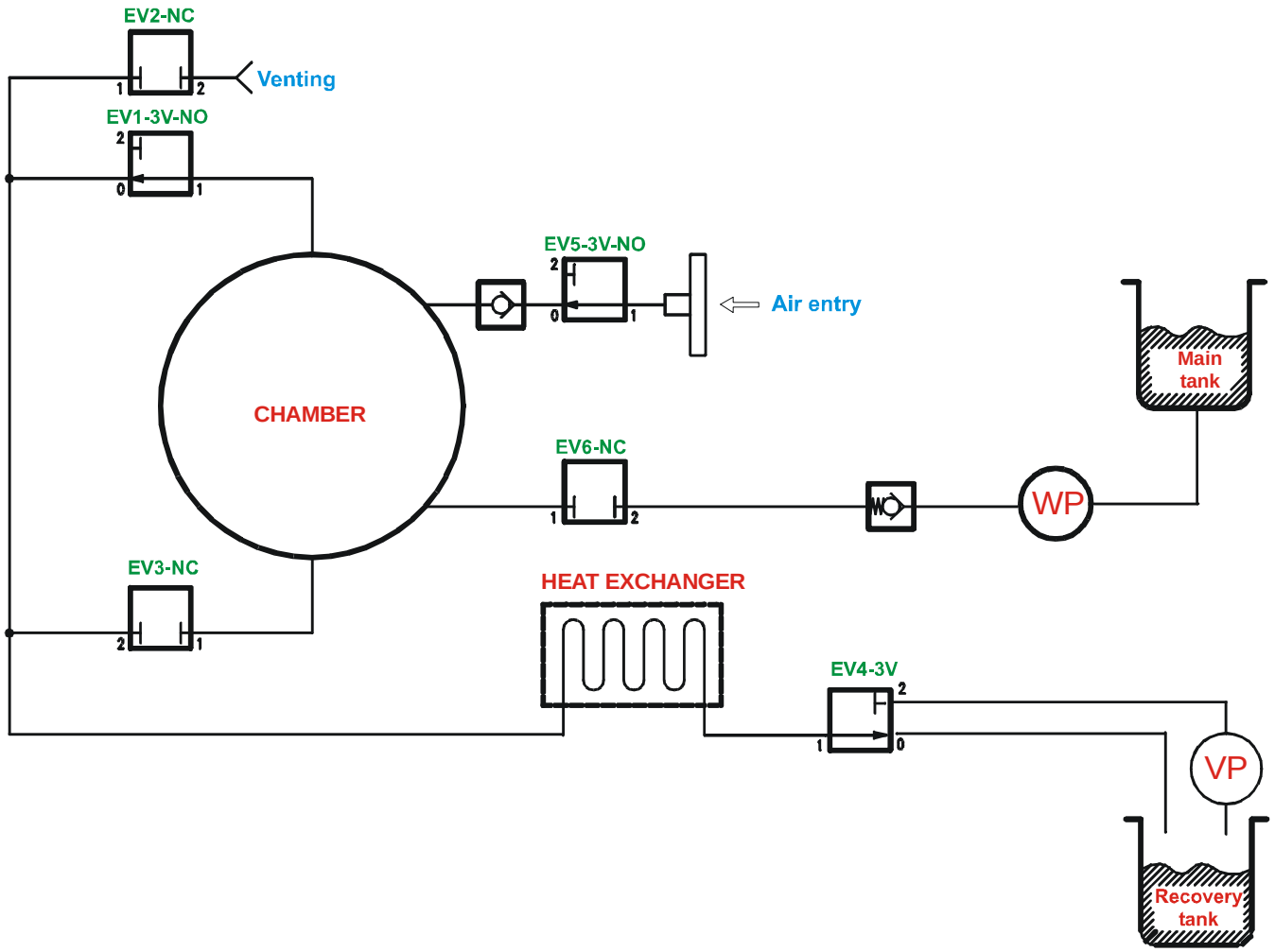
CIRCUIT DIAGRAM (GAM version)



CIRCUIT DIAGRAM (TROLL version)

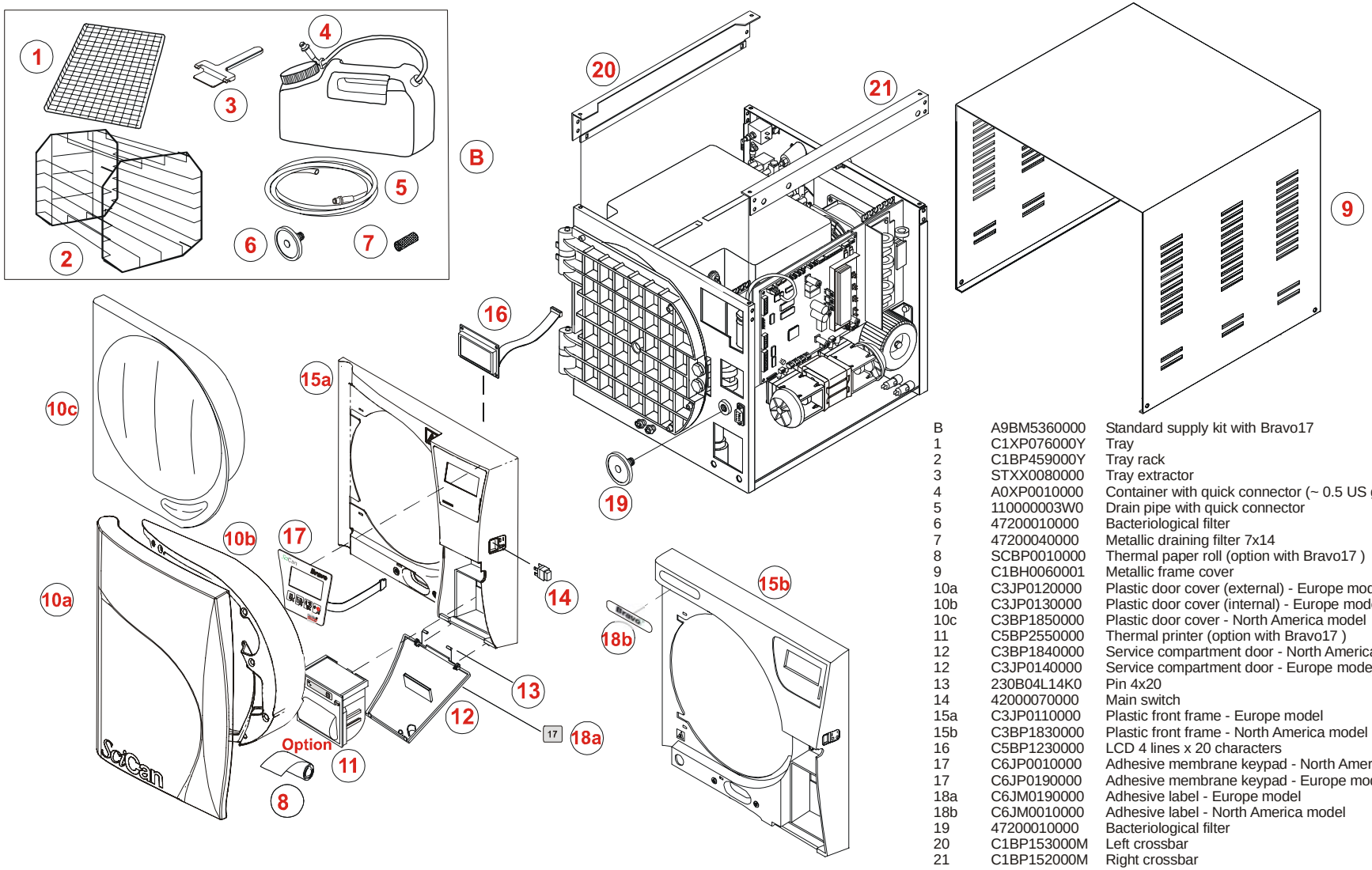


HYDRAULIC DIAGRAM



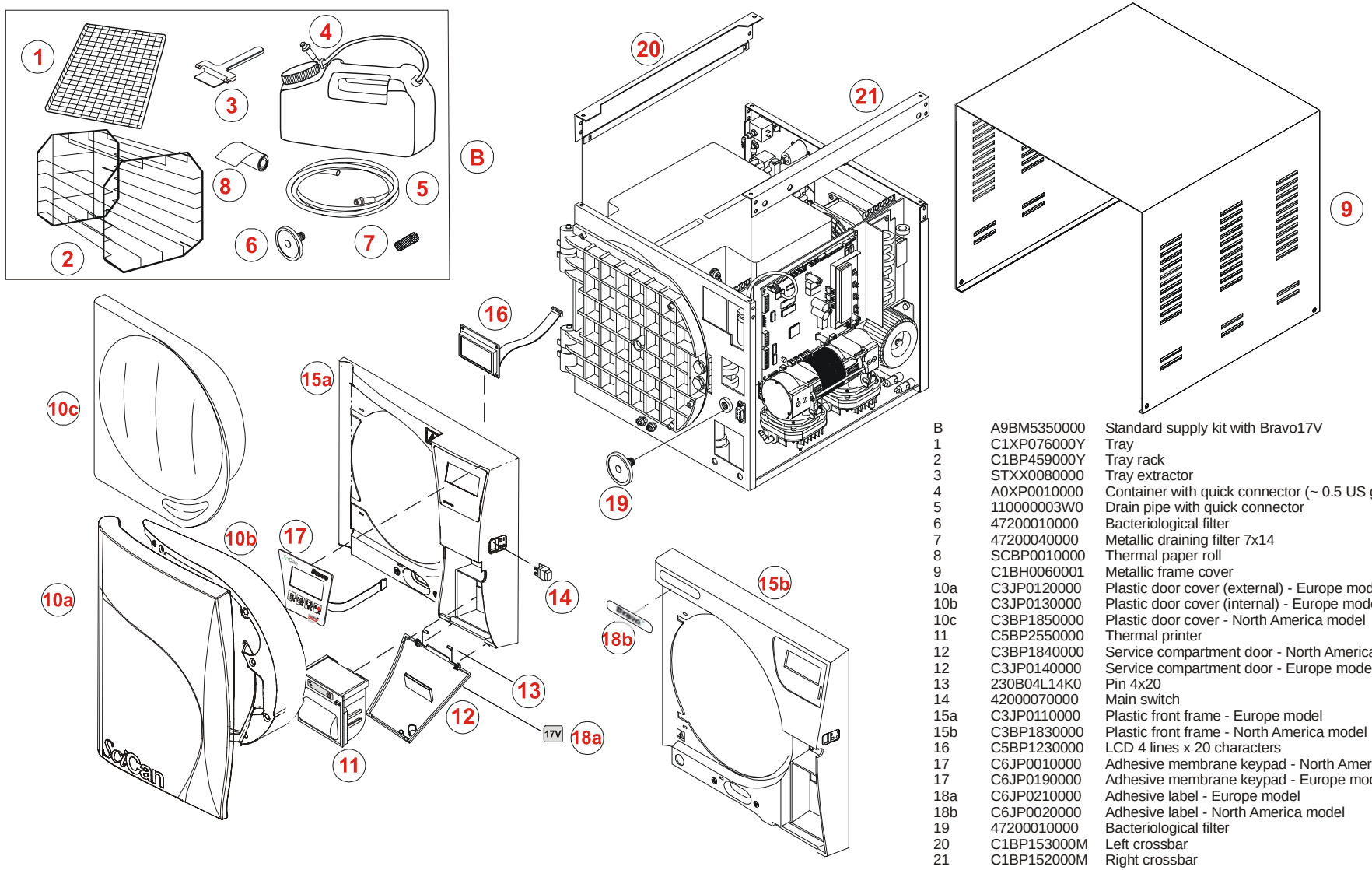
EXPLODED VIEWS

TABLE 1 - BRAVO[17]



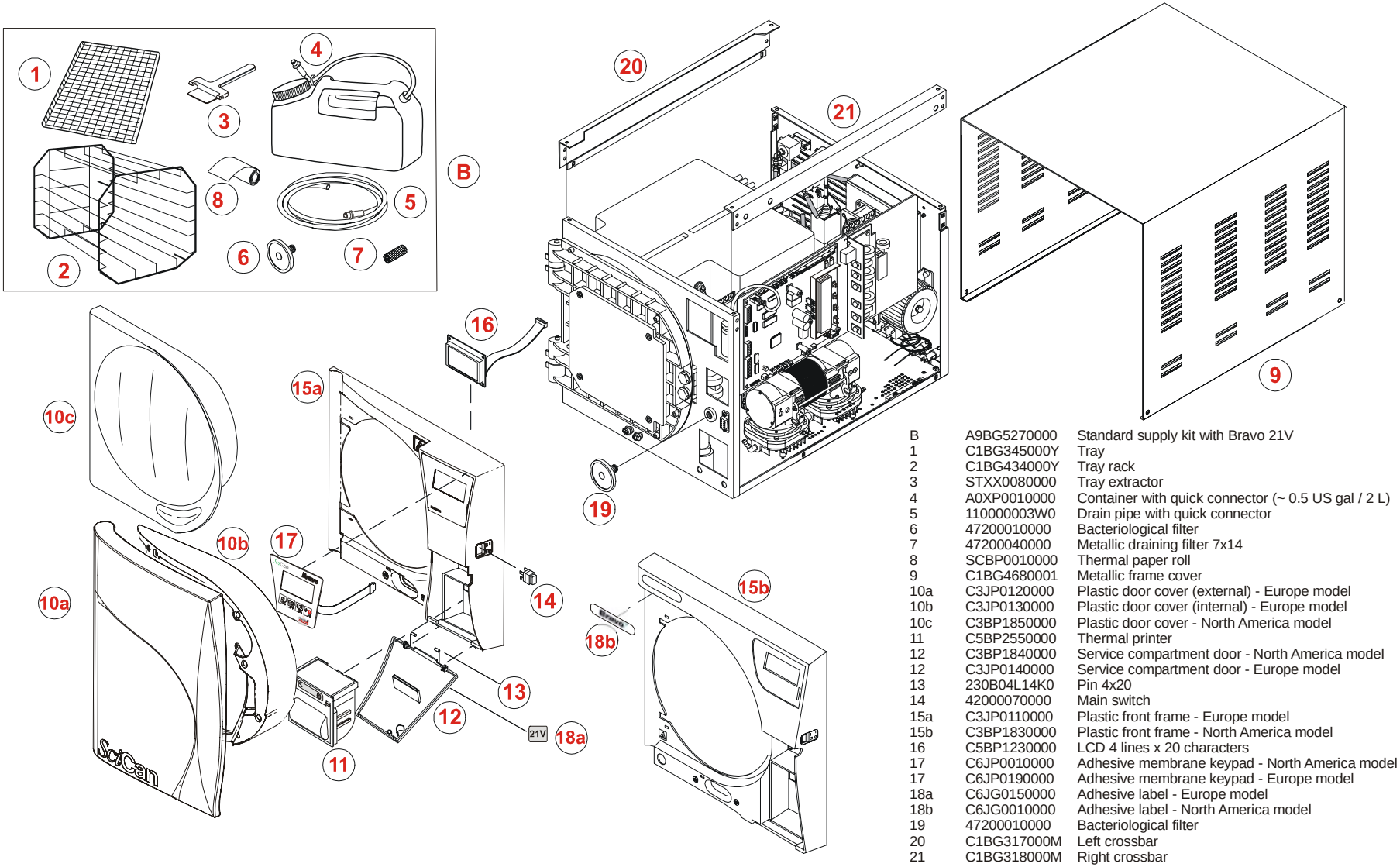
B	A9BM5360000	Standard supply kit with Bravo17
1	C1XP076000Y	Tray
2	C1BP459000Y	Tray rack
3	STXX0080000	Tray extractor
4	A0XP0010000	Container with quick connector (~ 0.5 US gal / 2 L)
5	110000003W0	Drain pipe with quick connector
6	47200010000	Bacteriological filter
7	47200040000	Metallic draining filter 7x14
8	SCBP0010000	Thermal paper roll (option with Bravo17)
9	C1BH0060001	Metallic frame cover
10a	C3JP0120000	Plastic door cover (external) - Europe model
10b	C3JP0130000	Plastic door cover (internal) - Europe model
10c	C3BP1850000	Plastic door cover - North America model
11	C5BP2550000	Thermal printer (option with Bravo17)
12	C3BP1840000	Service compartment door - North America model
12	C3JP0140000	Service compartment door - Europe model
13	230B04L14K0	Pin 4x20
14	42000070000	Main switch
15a	C3JP0110000	Plastic front frame - Europe model
15b	C3BP1830000	Plastic front frame - North America model
16	C5BP1230000	LCD 4 lines x 20 characters
17	C6JP0010000	Adhesive membrane keypad - North America model
17	C6JP0190000	Adhesive membrane keypad - Europe model
18a	C6JM0190000	Adhesive label - Europe model
18b	C6JM0010000	Adhesive label - North America model
19	47200010000	Bacteriological filter
20	C1BP153000M	Left crossbar
21	C1BP152000M	Right crossbar

TABLE 1 - BRAVO[17V]



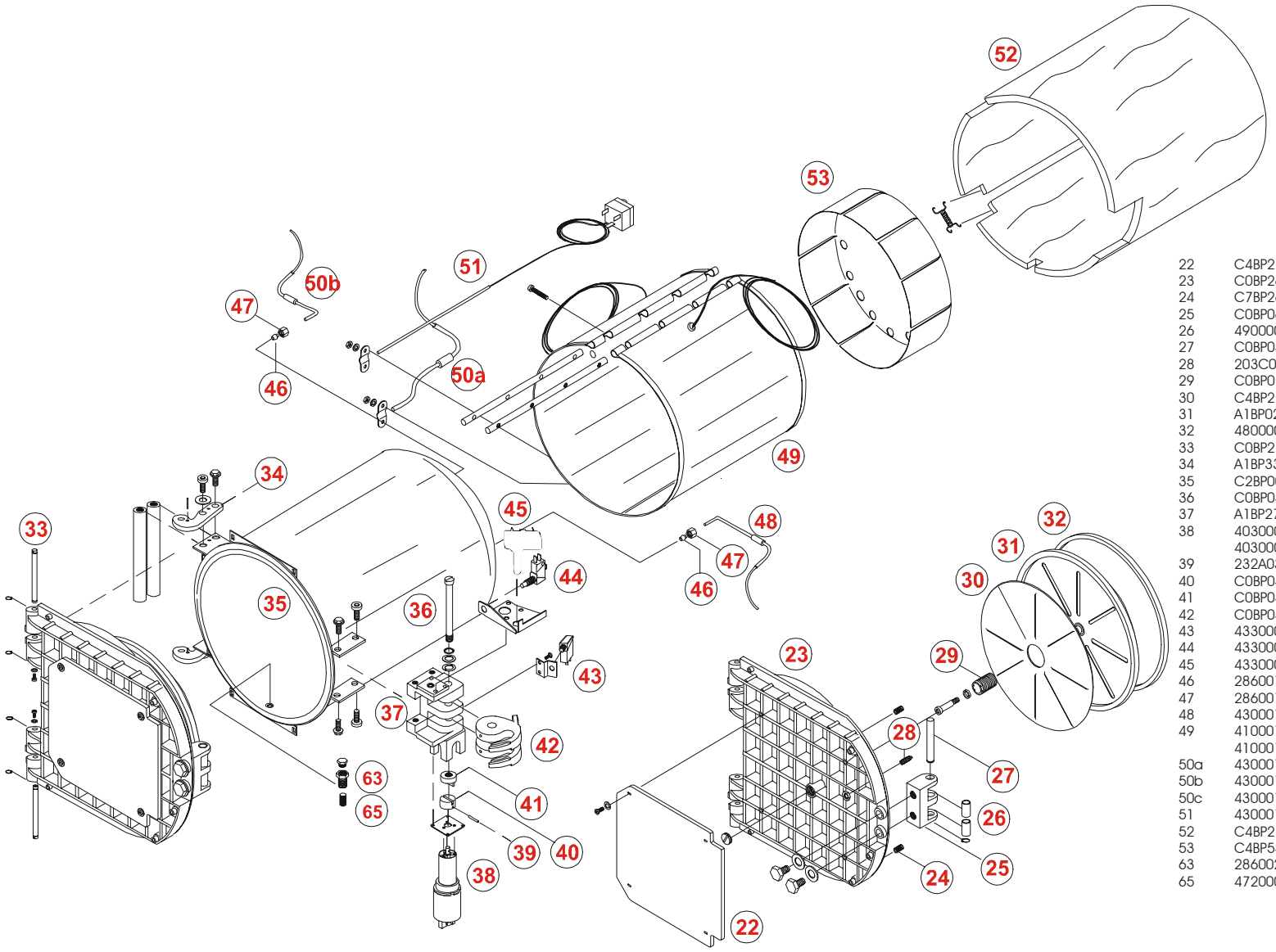
B	A9BM5350000	Standard supply kit with Bravo17V
1	C1XP076000Y	Tray
2	C1BP459000Y	Tray rack
3	STXX0080000	Tray extractor
4	A0XP0010000	Container with quick connector (~ 0.5 US gal / 2 L)
5	110000003W0	Drain pipe with quick connector
6	47200010000	Bacteriological filter
7	47200040000	Metallic draining filter 7x14
8	SCBP0010000	Thermal paper roll
9	C1BH0060001	Metallic frame cover
10a	C3JP0120000	Plastic door cover (external) - Europe model
10b	C3JP0130000	Plastic door cover (internal) - Europe model
10c	C3BP1850000	Plastic door cover - North America model
11	C5BP2550000	Thermal printer
12	C3BP1840000	Service compartment door - North America model
12	C3JP0140000	Service compartment door - Europe model
13	230B04L14K0	Pin 4x20
14	42000070000	Main switch
15a	C3JP0110000	Plastic front frame - Europe model
15b	C3BP1830000	Plastic front frame - North America model
16	C5BP1230000	LCD 4 lines x 20 characters
17	C6JP0010000	Adhesive membrane keypad - North America model
17	C6JP0190000	Adhesive membrane keypad - Europe model
18a	C6JP0210000	Adhesive label - Europe model
18b	C6JP0020000	Adhesive label - North America model
19	47200010000	Bacteriological filter
20	C1BP153000M	Left crossbar
21	C1BP152000M	Right crossbar

TABLE 1 - BRAVO^{21V}



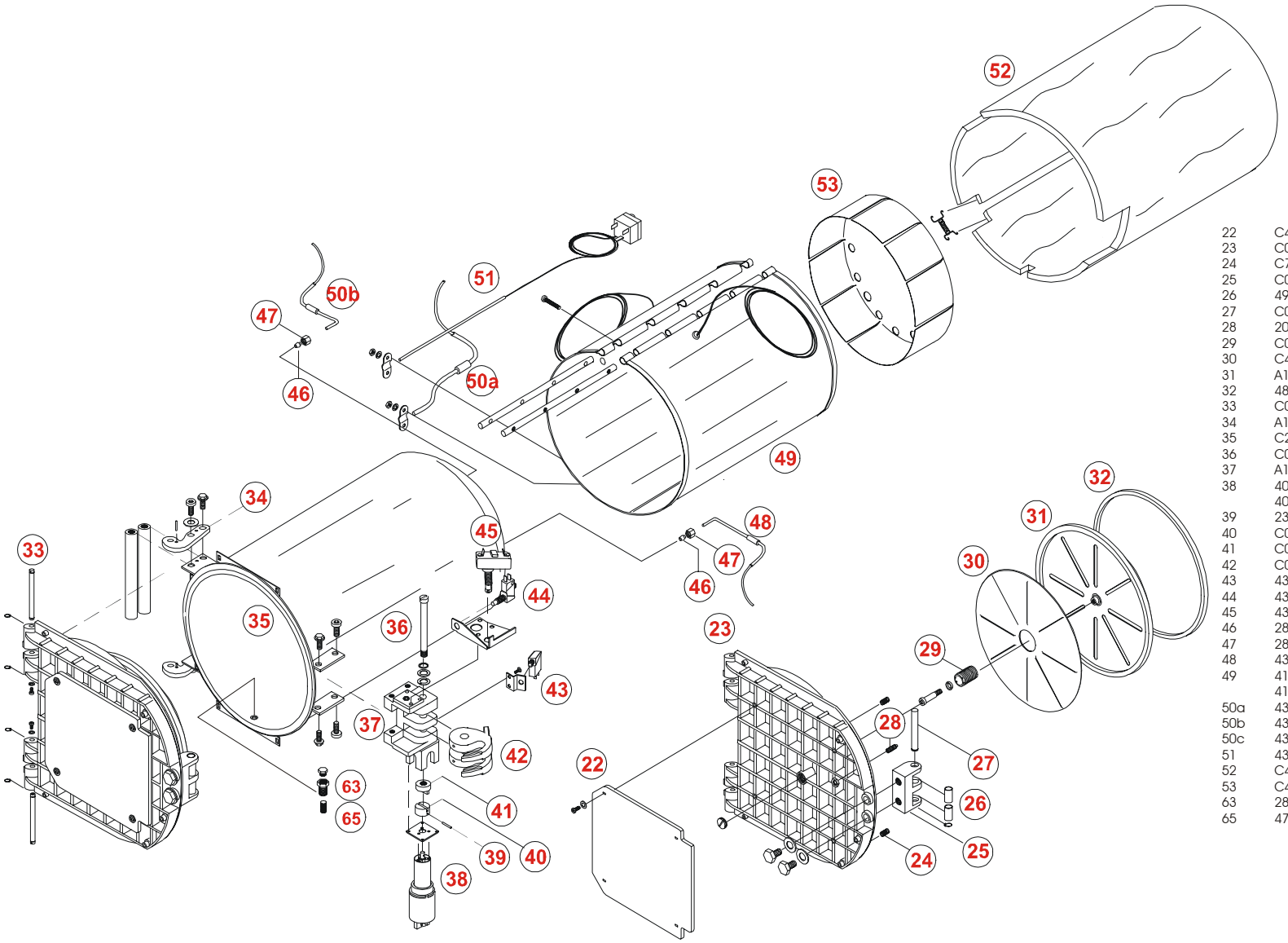
B	A9BG5270000	Standard supply kit with Bravo 21V
1	C1BG345000Y	Tray
2	C1BG434000Y	Tray rack
3	STXX0080000	Tray extractor
4	A0XP0010000	Container with quick connector (~ 0.5 US gal / 2 L)
5	110000003W0	Drain pipe with quick connector
6	47200010000	Bacteriological filter
7	47200040000	Metallic draining filter 7x14
8	SCBP0010000	Thermal paper roll
9	C1BG4680001	Metallic frame cover
10a	C3JP0120000	Plastic door cover (external) - Europe model
10b	C3JP0130000	Plastic door cover (internal) - Europe model
10c	C3BP1850000	Plastic door cover - North America model
11	C5BP2550000	Thermal printer
12	C3BP1840000	Service compartment door - North America model
12	C3JP0140000	Service compartment door - Europe model
13	230B04L14K0	Pin 4x20
14	42000070000	Main switch
15a	C3JP0110000	Plastic front frame - Europe model
15b	C3BP1830000	Plastic front frame - North America model
16	C5BP1230000	LCD 4 lines x 20 characters
17	C6JP0010000	Adhesive membrane keypad - North America model
17	C6JP0190000	Adhesive membrane keypad - Europe model
18a	C6JG0150000	Adhesive label - Europe model
18b	C6JG0010000	Adhesive label - North America model
19	47200010000	Bacteriological filter
20	C1BG317000M	Left crossbar
21	C1BG318000M	Right crossbar

TABLE 2 – BRAVO[17] & BRAVO[17V]



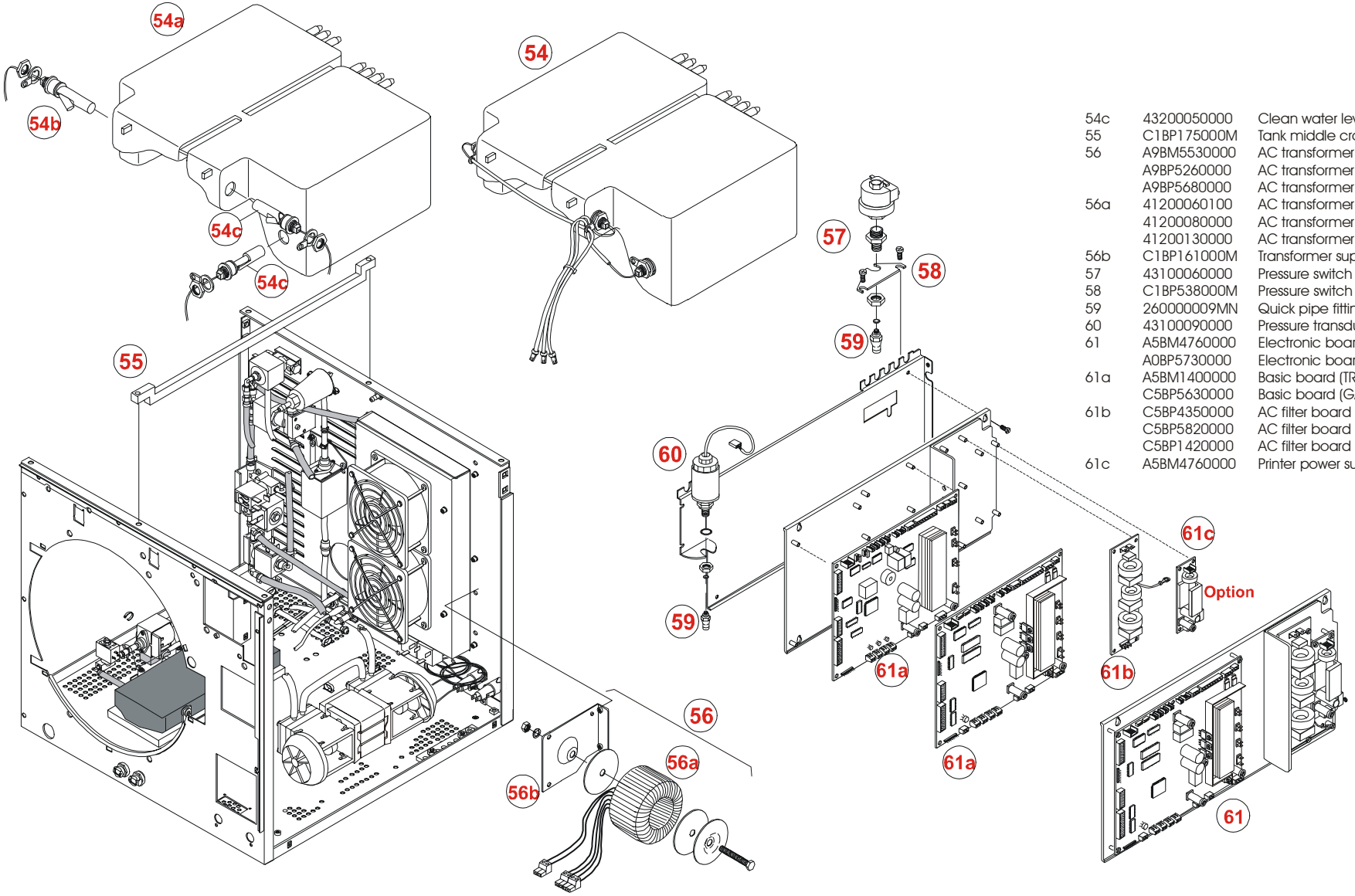
22	C4BP2740000	Thermo-insulating panel (door)
23	C0BP260000P	Cast aluminum door
24	C7BP2640000	Door spring
25	C0BP060000Z	Door nitrided fork
26	49000050000	Door bush
27	C0BP0500000	Door fork pin
28	203C06L30K0	Screw 6x30
29	C0BP079000N	Door adjustment screw
30	C4BP2160000	Door thermo-insulating disk
31	A1BP027000Y	Door dish
32	48000050000	Door gasket
33	C0BP2720000	Door hinge pin
34	A1BP3380000	Door hinge
35	C2BP0010000	Stainless steel chamber
36	C0BP0430000	Pin of the door closing system
37	A1BP2710000	Door closing system group
38	40300010000	Gear-motor 120/220-230VAC 60Hz
	40300020000	Gear-motor 220/240VAC 50Hz
39	232A03L25K0	Pin 3x25
40	C0BP0450000	Gear-motor coupling
41	C0BP0460000	Intermediate join
42	C0BP0590000	Closing hook
43	43300010000	Hook micro-switch (open)
44	43300010000	Door micro-switch
45	43300040000	Hook micro-switch (close)
46	28600160000	Olive for temperature sensor connection
47	2860014000N	Nut for temperature sensor connection
48	43000190000	Thermal sensor PT1000 - PT1
49	41000180000	Chamber heater 1500W 115VAC
	41000140000	Chamber heater 1700W 230VAC
50a	43000180000	Thermal sensor PT1000 - PT3
50b	43000180000	Thermal sensor PT1000 - PT4
50c	43000180000	Thermal sensor PT1000 - PT2
51	43000140000	Safety thermostat TG400
52	C4BP2140100	Thermo-insulating panel (chamber)
53	C4BP5570000	Rear thermo-insulating panel (chamber)
63	28600290000	Chamber drain filter holder
65	47200040000	Chamber drain filter 7 x 14

TABLE 2 –BRAVO^{21V}



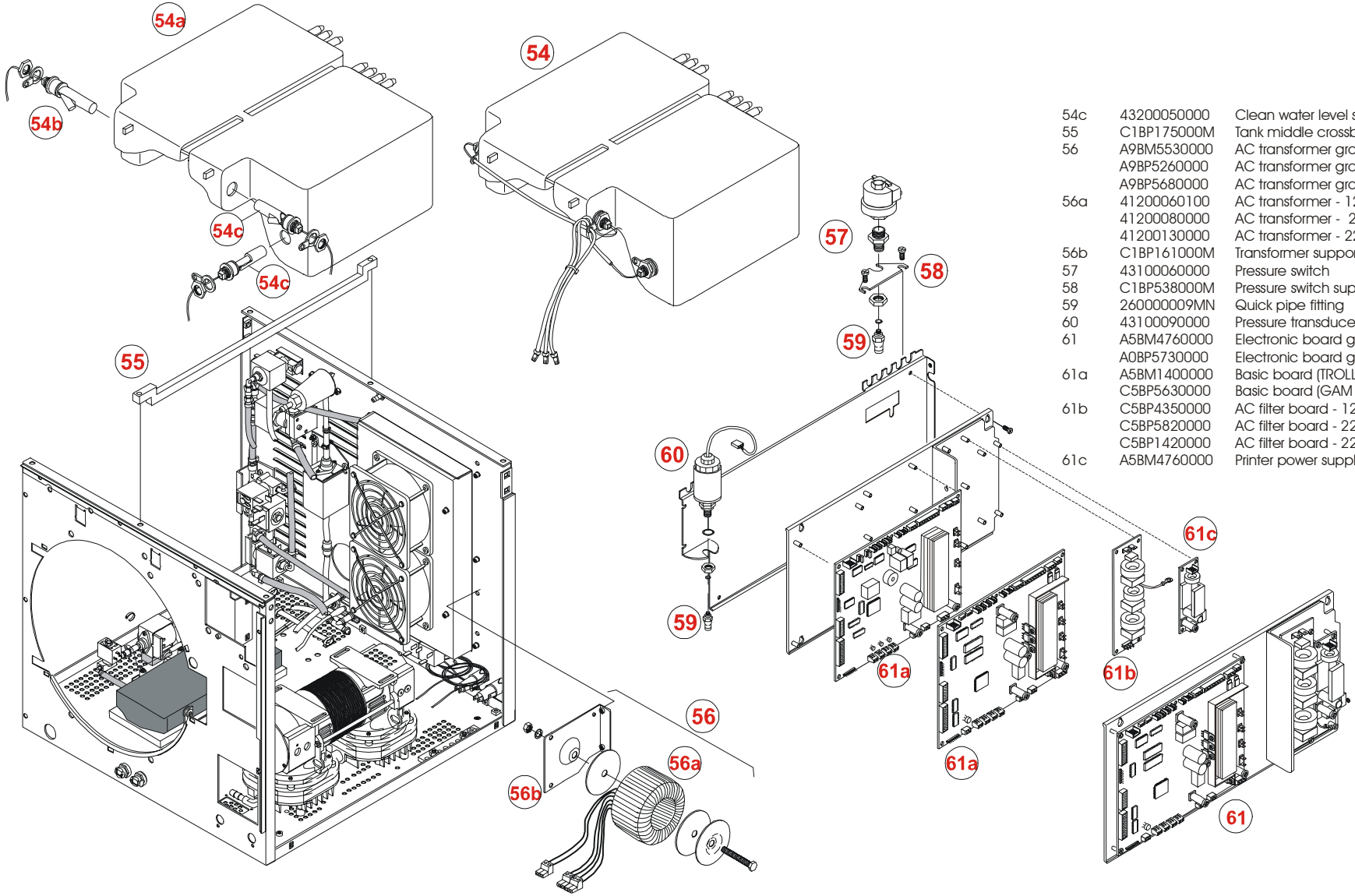
22	C4BP2740000	Thermo-insulating panel (door)
23	C0BP260000P	Cast aluminum door
24	C7BP2640000	Door spring
25	C0BP060000Z	Door nitrided fork
26	49000050000	Door bush
27	C0BP0500000	Door fork pin
28	203C06L30K0	Screw 6x30
29	C0BP079000N	Door adjustment screw-
30	C4BP2160000	Door thermo-insulating disk
31	A1BP027000Y	Door dish
32	48000050000	Door gasket
33	C0BP2720000	Door hinge pin
34	A1BP3380000	Door hinge
35	C2BG5300000	Stainless steel chamber
36	C0BP0430000	Pin of the door closing system
37	A1BP2710000	Door closing system group
38	40300010000	Gear-motor 120/220-230VAC 60Hz
	40300020000	Gear-motor 220/240VAC 50Hz
39	232A03L25K0	Pin 3x25
40	C0BP0450000	Gear-motor coupling
41	C0BP0460000	Intermediate join
42	C0BP0590000	Closing hook
43	43300010000	Hook micro-switch (open)
44	43300010000	Door micro-switch
45	43300040000	Hook micro-switch (close)
46	28600160000	Olive for temperature sensor connection
47	2860014000N	Nut for temperature sensor connection
48	43000190000	Thermal sensor PT1000 - PT1
49	41000190000	Chamber heater 1500W 115VAC
	41000290000	Chamber heater 2000W 230VAC
50a	43000180000	Thermal sensor PT1000 - PT3
50b	43000180000	Thermal sensor PT1000 - PT4
50c	43000180000	Thermal sensor PT1000 - PT2
51	43000140000	Safety thermostat TG400
52	C4BG3280000	Thermo-insulating panel (chamber)
53	C4BP5570000	Rear thermo-insulating panel (chamber)
63	28600290000	Chamber drain filter holder
65	47200040000	Chamber drain filter 7 x 14

TABLE 3- BRAVO[17]



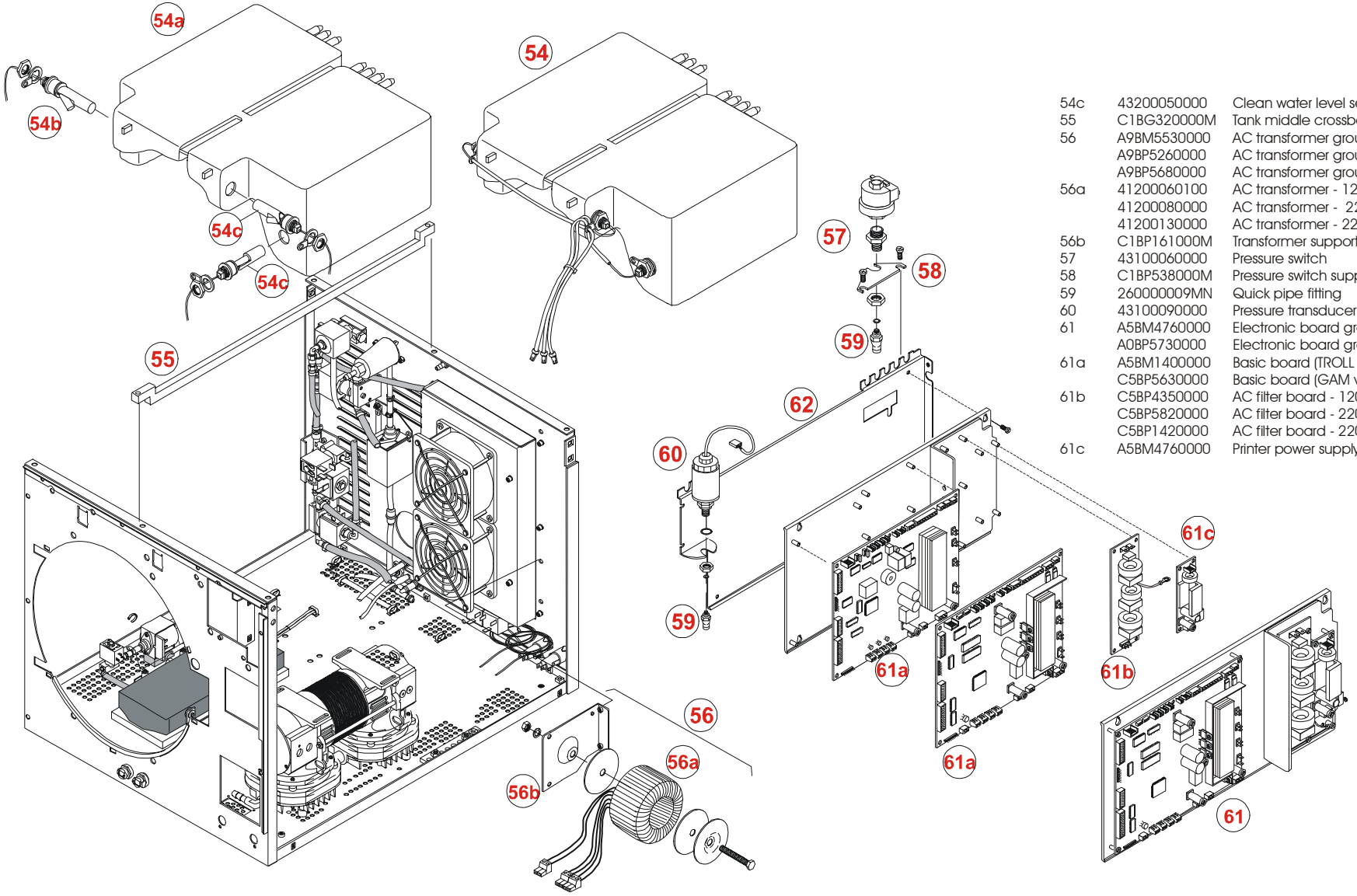
54c	43200050000	Clean water level sensor (MIN/MAX)
55	C1BP175000M	Tank middle crossbar
56	A9BM5530000	AC transformer group - 120V 60Hz
	A9BP5260000	AC transformer group - 220/230V 60Hz
	A9BP5680000	AC transformer group - 220/240V 50Hz
56a	41200060100	AC transformer - 120V 60Hz
	41200080000	AC transformer - 220/230V 60Hz
	41200130000	AC transformer - 220/240V 50Hz
56b	C1BP161000M	Transformer support
57	43100060000	Pressure switch
58	C1BP538000M	Pressure switch support
59	260000009MN	Quick pipe fitting
60	43100090000	Pressure transducer
61	A5BM4760000	Electronic board group (TROLL version)
	A0BP5730000	Electronic board group (GAM version)
61a	A5BM1400000	Basic board (TROLL version)
	C5BP5630000	Basic board (GAM version)
61b	C5BP4350000	AC filter board - 120V 60Hz
	C5BP5820000	AC filter board - 220/230V 60Hz
	C5BP1420000	AC filter board - 220/240V 50Hz
61c	A5BM4760000	Printer power supply board

TABLE 3- BRAVO^{17V}



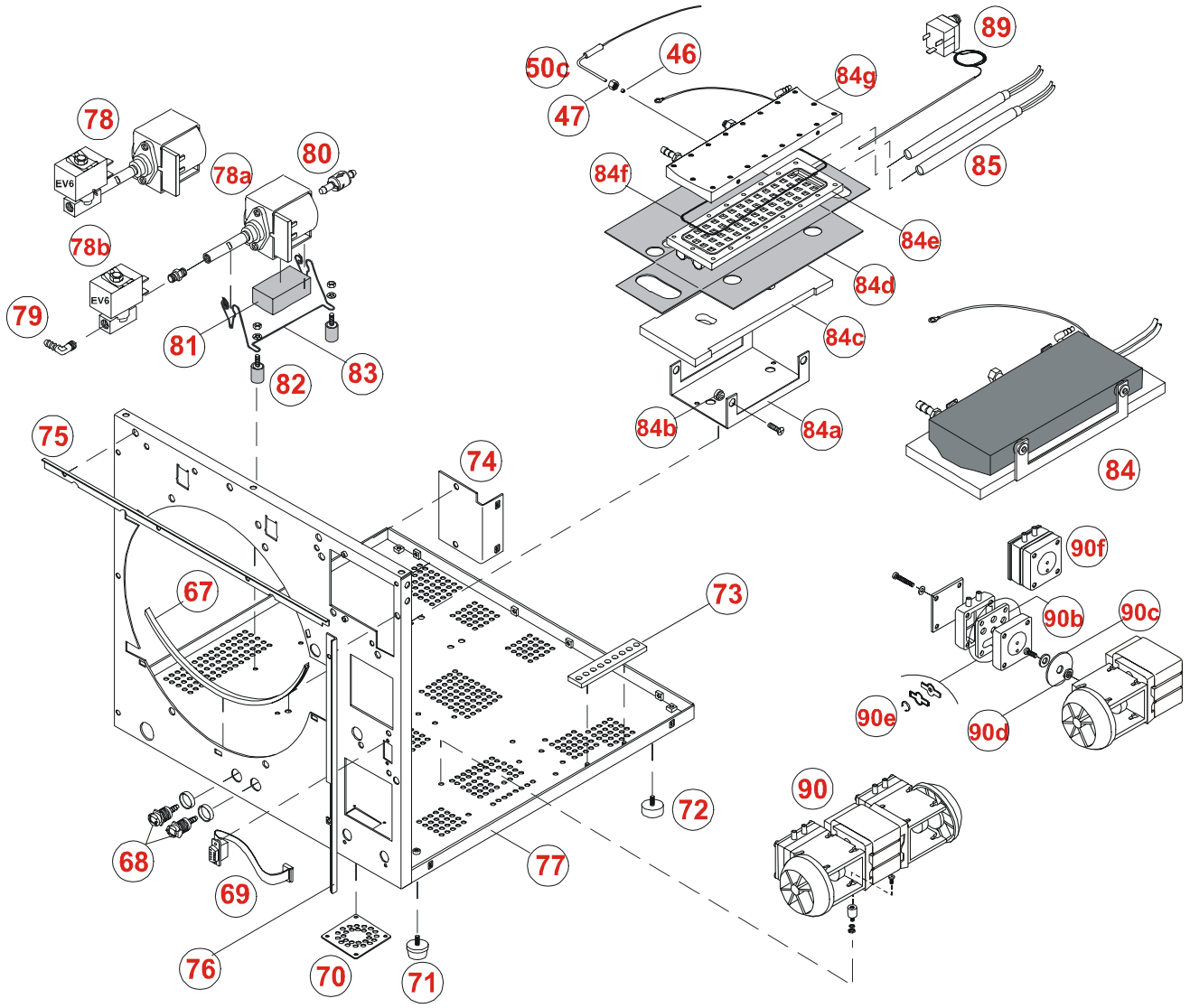
54c	43200050000	Clean water level sensor (MIN/MAX)
55	C1BP175000M	Tank middle crossbar
56	A9BM5530000	AC transformer group - 120V 60Hz
	A9BP5260000	AC transformer group - 220/230V 60Hz
	A9BP5680000	AC transformer group - 220/240V 50Hz
56a	41200060100	AC transformer - 120V 60Hz
	41200080000	AC transformer - 220/230V 60Hz
	41200130000	AC transformer - 220/240V 50Hz
56b	C1BP161000M	Transformer support
57	43100060000	Pressure switch
58	C1BP538000M	Pressure switch support
59	260000009MN	Quick pipe fitting
60	43100090000	Pressure transducer
61	A5BM4760000	Electronic board group (TROLL version)
	A0BP5730000	Electronic board group (GAM version)
61a	A5BM1400000	Basic board (TROLL version)
	C5BP5630000	Basic board (GAM version)
61b	C5BP4350000	AC filter board - 120V 60Hz
	C5BP5820000	AC filter board - 220/230V 60Hz
	C5BP1420000	AC filter board - 220/240V 50Hz
61c	A5BM4760000	Printer power supply board

TABLE 3- BRAVO^{21V}



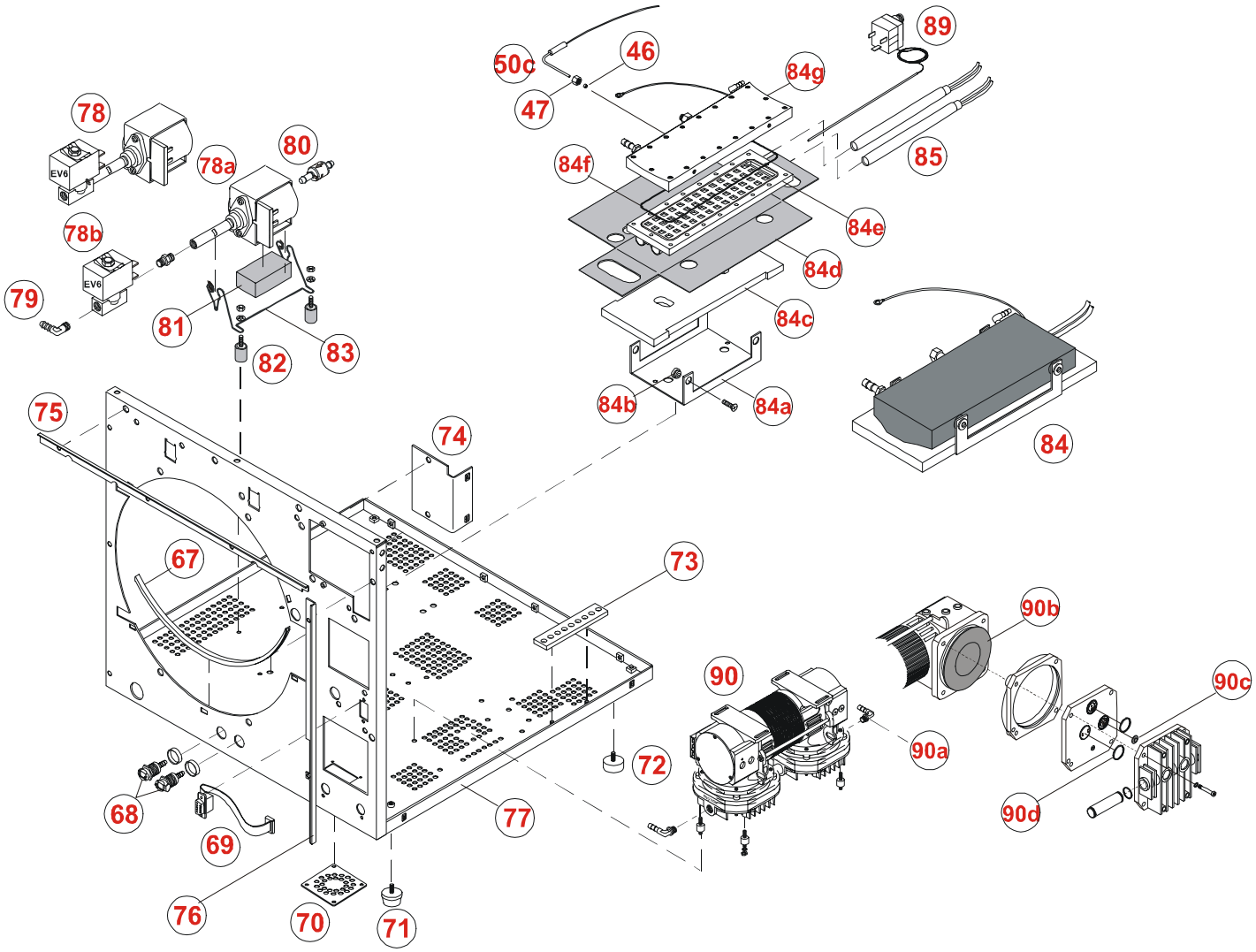
54c	43200050000	Clean water level sensor (MIN/MAX)
55	C1BG320000M	Tank middle crossbar
56	A9BM5530000	AC transformer group - 120V 60Hz
	A9BP5260000	AC transformer group - 220/230V 60Hz
	A9BP5680000	AC transformer group - 220/240V 50Hz
56a	41200060100	AC transformer - 120V 60Hz
	41200080000	AC transformer - 220/230V 60Hz
	41200130000	AC transformer - 220/240V 50Hz
56b	C1BP161000M	Transformer support
57	43100060000	Pressure switch
58	C1BP538000M	Pressure switch support
59	260000009MN	Quick pipe fitting
60	43100090000	Pressure transducer
61	A5BM4760000	Electronic board group (TROLL version)
	A0BP5730000	Electronic board group (GAM version)
61a	A5BM1400000	Basic board (TROLL version)
	C5BP5630000	Basic board (GAM version)
61b	C5BP4350000	AC filter board - 120V 60Hz
	C5BP5820000	AC filter board - 220/230V 60Hz
	C5BP1420000	AC filter board - 220/240V 50Hz
61c	A5BM4760000	Printer power supply board

TABLE 4 – BRAVO[17]



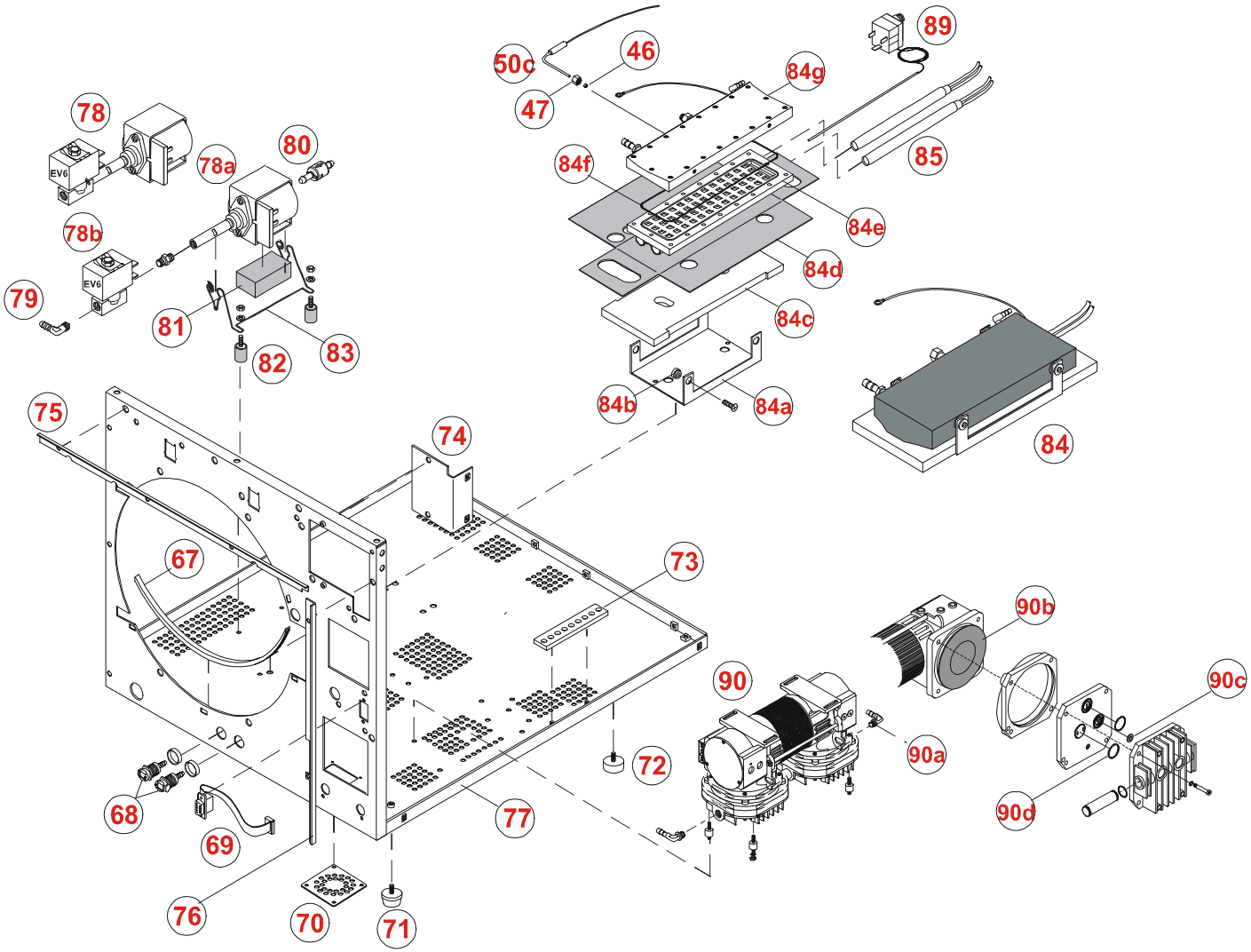
46	28600160000	Olive for temperature sensor connection
47	2860014000N	Nut for temperature sensor connection
50c	43000180000	Thermal sensor PT1000 - PT2
67	111000009W0	Rubber profile
68	260000006V0	Drain connection
69	A2BP2380000	Serial port flat cable
70	C3BP5610000	ABS plate
71	25600000400	PVC foot
72	25600001000	Rear plastic foot
73	55V702016000	Ground plate
74	C1BP147000M	Electronic board angle support
75	C1BP269000M	Top angle bar
76	C1BP270000M	Side angle bar
77	C1BP150000M	Chassis with Bravo17 & Bravo17V
77	A1BG350000M	Chassis with Bravo21V
78	A0BP2860000	Steam generator water pump group
78a	40000220000	Water pump 24V
78b	40100370000	EV parker 2way 24V (EV6)
79	261000009MN	Angle pipe fitting
80	47200050000	One-way water filter
81	111000006W0	Adhesive mousse
82	25600000800	Vibration absorber
83	40000050000	Water pump wire-support
84	A9BM5510000	Steam generator group - 120/220-230Vac 60Hz
	A0BP2810000	Steam generator group - 220/240Vac 50Hz
84a	C1BP136000M	Steam generator support
84b	C0BP1310000	Thermo-insulating spacer
84c	C4BP2360000	Thermo-insulating panel (bottom)
84d	C4BP2390000	Thermo-insulating sheet
84e	C0BP548000P	Steam generator lower section
84f	48100080000	Steam generator O-Ring
84g	C0BP547000P	Steam generator upper section
85	41000170000	Heater cartridge 115V 850W
	41000260000	Heater cartridge 230V 1000W
89	43000150000	Safety thermostat TG400
90	A9BM5520000	Vacuum pump group 120V 60Hz
	A9BM5270000	Vacuum pump group 220/230V 60Hz
	A0BM3100000	Vacuum pump group 220/240V 50Hz
Vacuum pump group		
90b	40000150000	Central gasket Bravo17
90c	40000170000	Hole membrane
90d	40000240000	Rcessed-screw membrane
90e	40000180000	Shutters
90f	40000120000	Head complete

TABLE 4 – BRAVO^{17V}



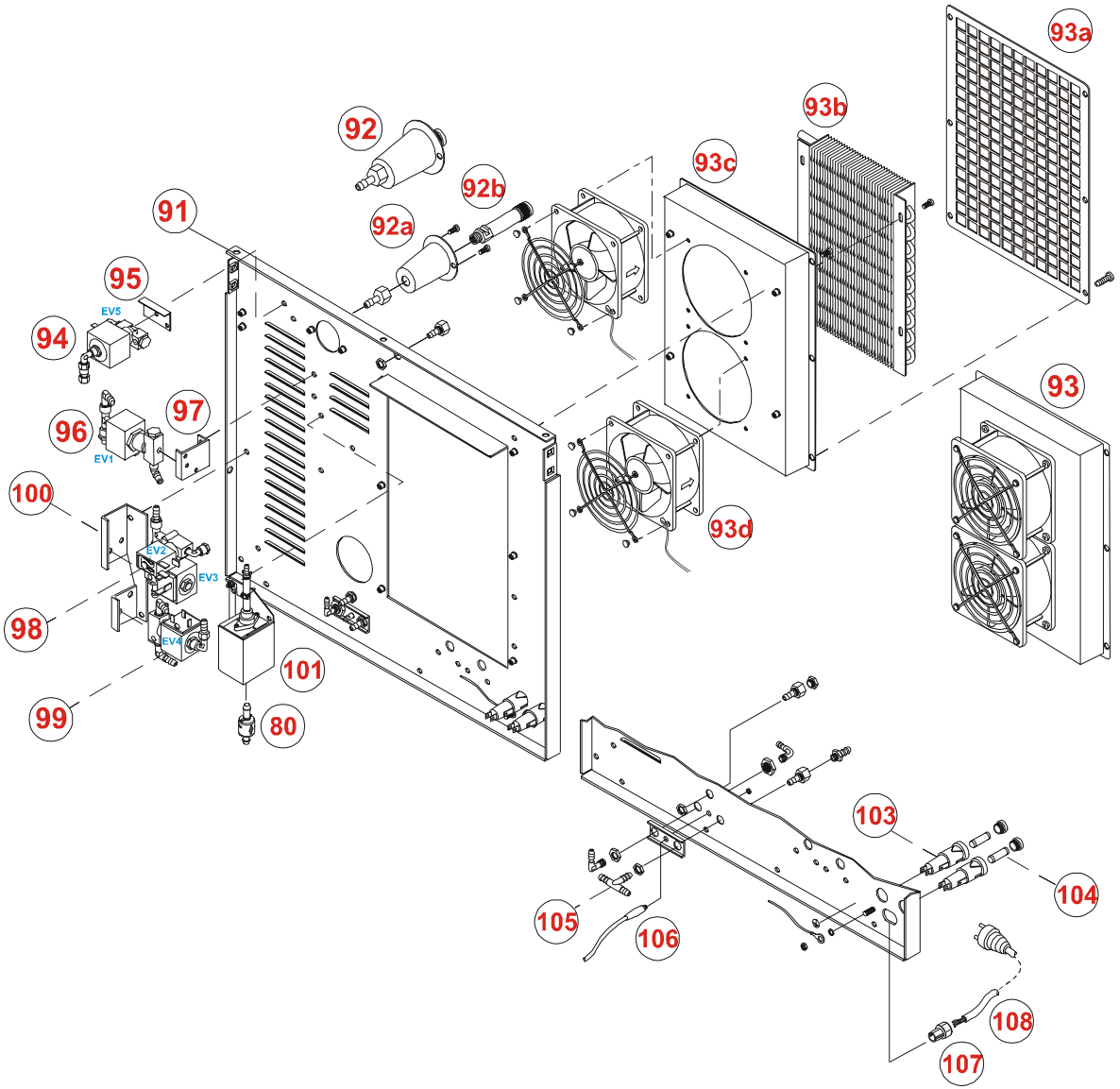
46	28600160000	Olive for temperature sensor connection
47	2860014000N	Nut for temperature sensor connection
50c	43000180000	Thermal sensor PT1000 - PT2
67	111000009W0	Rubber profile
68	260000006V0	Drain connection
69	A2BP2380000	Serial port flat cable
70	C3BP5610000	ABS plate
71	25600000400	PVC foot
72	25600001000	Rear plastic foot
73	55V702016000	Ground plate
74	C1BP147000M	Electronic board angle support
75	C1BP269000M	Top angle bar
76	C1BP270000M	Side angle bar
77	C1BP150000M	Chassis with Bravo17 & Bravo17V
77	A1BG350000M	Chassis with Bravo21V
78	A0BP2860000	Steam generator water pump group
78a	40000220000	Water pump 24V
78b	40100370000	EV parker 2way 24V (EV6)
79	261000009MN	Angle pipe fitting
80	47200050000	One-way water filter
81	111000006W0	Adhesive mousse
82	25600000800	Vibration absorber
83	40000050000	Water pump wire-support
84	A9BM5510000	Steam generator group - 120/220-230Vac 60Hz
	A0BP2810000	Steam generator group - 220/240Vac 50Hz
84a	C1BP136000M	Steam generator support
84b	C0BP1310000	Thermo-insulating spacer
84c	C4BP2360000	Thermo-insulating panel (bottom)
84d	C4BP2390000	Thermo-insulating sheet
84e	C0BP548000P	Steam generator lower section
84f	48100080000	Steam generator O-Ring
84g	C0BP547000P	Steam generator upper section
85	41000170000	Heater cartridge 115V 850W
	41000260000	Heater cartridge 230V 1000W
89	43000150000	Safety thermostat TG400
90	A9BP5870000	Vacuum pump group 120V 60Hz
	A9BP5270000	Vacuum pump group 220/230V 60Hz
	A0BP2890000	Vacuum pump group 220/240V 50Hz
Spare parts for vacuum pump		
90a	261000010MN	Angle pipe fitting
90b	40000260000	Large membrane
90c	40000250000	Small membrane
90d	48100150000	Head O-Ring

TABLE 4 - BRAVO^{21V}



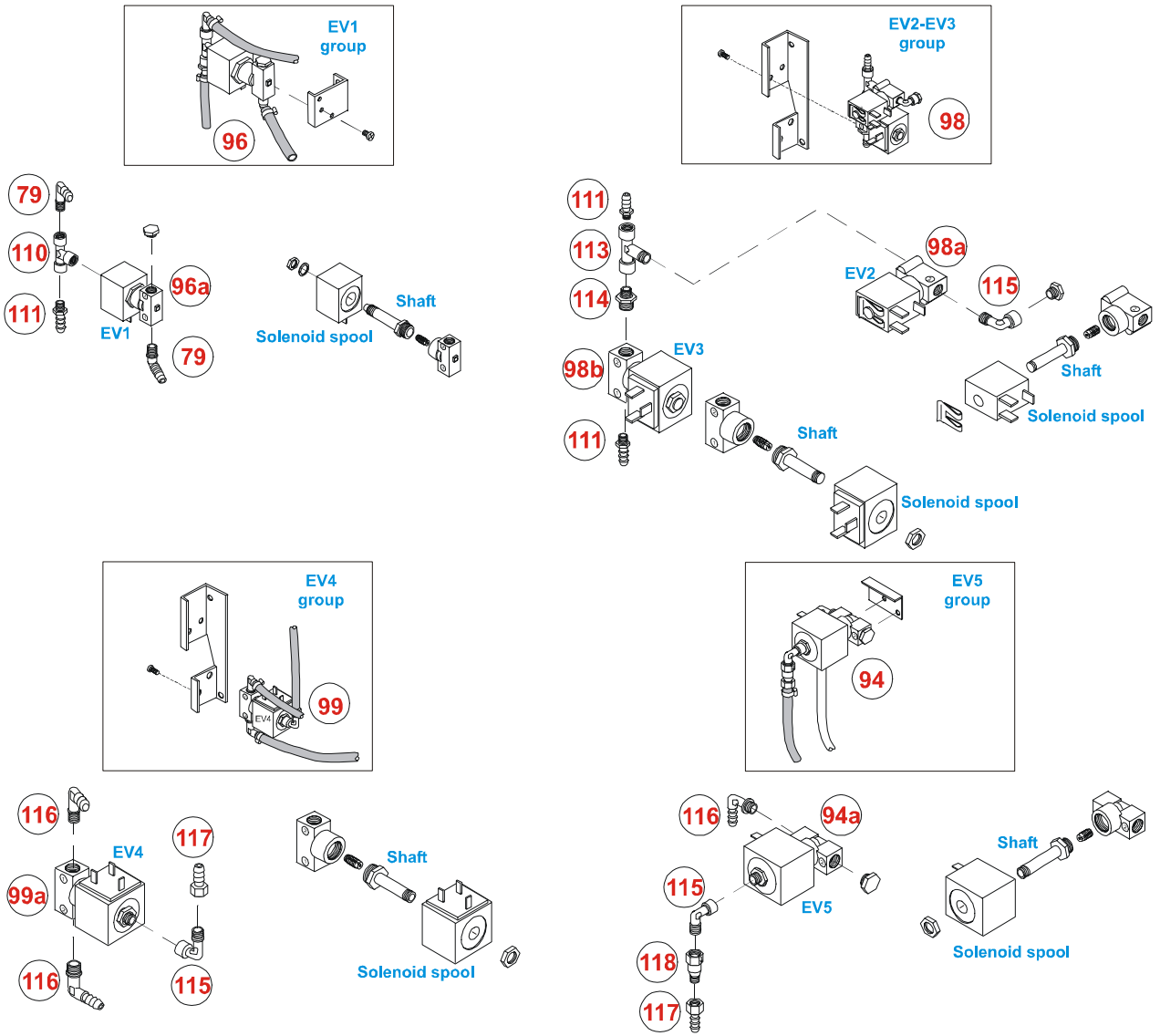
46	28600160000	Olive for temperature sensor connection
47	2860014000N	Nut for temperature sensor connection
50c	43000180000	Thermal sensor PT1000 - PT2
67	111000009W0	Rubber profile
68	260000006V0	Drain connection
69	A2BP2380000	Serial port flat cable
70	C3BP5610000	ABS plate
71	25600000400	PVC foot
72	25600001000	Rear plastic foot
73	55V702016000	Ground plate
74	C1BP147000M	Electronic board angle support
75	C1BP269000M	Top angle bar
76	C1BP270000M	Side angle bar
77	C1BP150000M	Chassis with Bravo17 & Bravo17V
77	A1BG350000M	Chassis with Bravo21V
78	A0BP2860000	Steam generator water pump group
78a	40000220000	Water pump 24V
78b	40100370000	EV parker 2way 24V (EV6)
79	261000009MN	Angle pipe fitting
80	47200050000	One-way water filter
81	111000006W0	Adhesive mousse
82	25600000800	Vibration absorber
83	40000050000	Water pump wire-support
84	A9BM5510000	Steam generator group - 120/220-230Vac 60Hz
	A0BP2810000	Steam generator group - 220/240Vac 50Hz
84a	C1BP136000M	Steam generator support
84b	C0BP1310000	Thermo-insulating spacer
84c	C4BP2360000	Thermo-insulating panel (bottom)
84d	C4BP2390000	Thermo-insulating sheet
84e	C0BP548000P	Steam generator lower section
84f	48100080000	Steam generator O-Ring
84g	C0BP547000P	Steam generator upper section
85	41000170000	Heater cartridge 115V 850W
	41000260000	Heater cartridge 230V 1000W
89	43000150000	Safety thermostat TG400
90	A9BP5870000	Vacuum pump group 120V 60Hz
	A9BP5270000	Vacuum pump group 220/230V 60Hz
	A0BP2890000	Vacuum pump group 220/240V 50Hz
Spare parts for vacuum pump		
90a	261000010MN	Angle pipe fitting
90b	40000260000	Large membrane
90c	40000250000	Small membrane
90d	48100150000	Head O-Ring

TABLE 5 - ALL MODELS



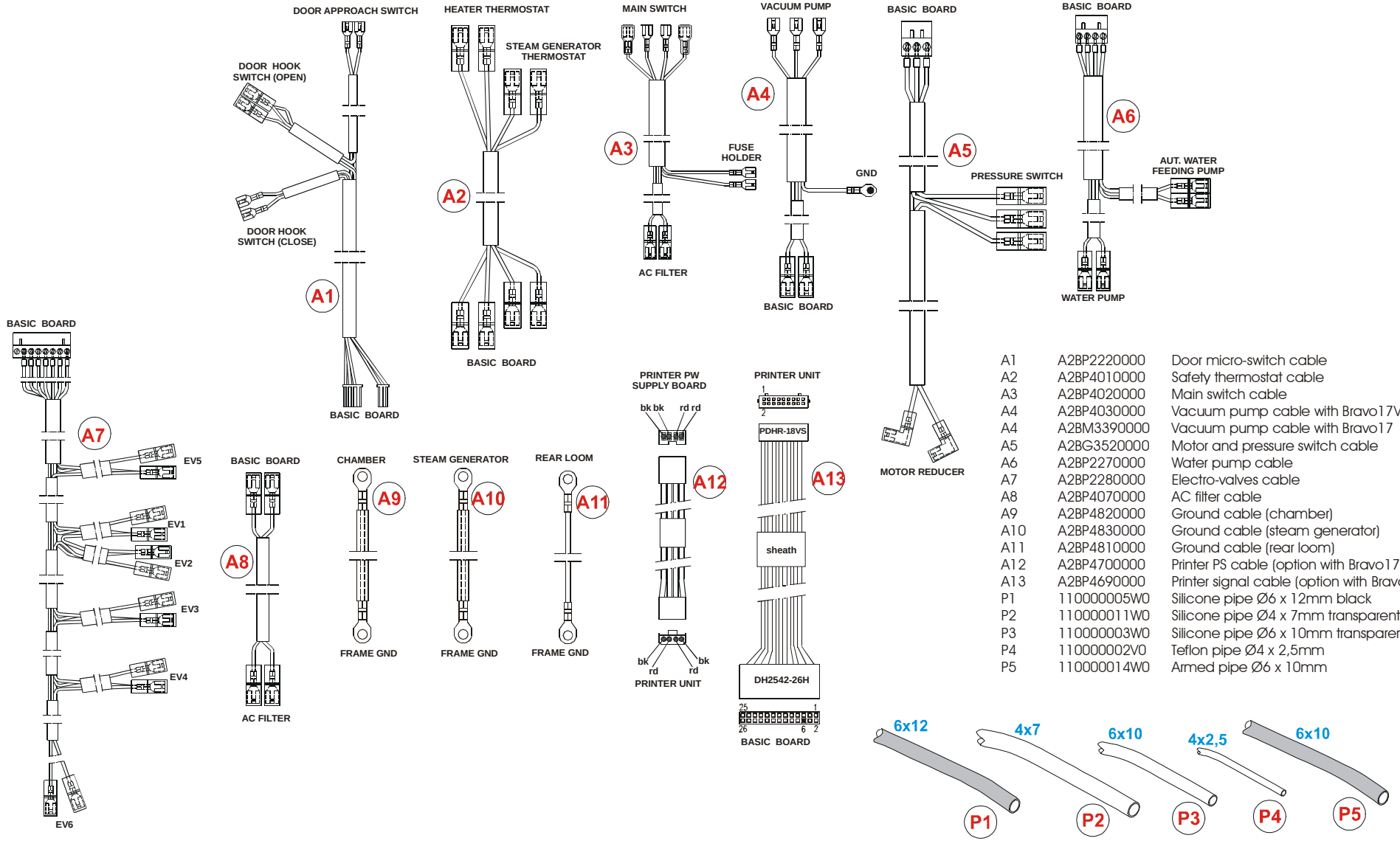
91	C1BP151000M	Rear chassis
92	A0BS0520000	Safety valve TUV group
92a	C1BS020000P	Safety valve support
92b	47000020000	Safety valve
93	A1BP1640000	Heat exchanger group
93a	40400040000	Protection grid
93b	C1BP1600000	Heat exchanger
93c	C1BP159000M	Heat exchanger support
93d	40400030000	Electric fan 120 x 120 x 38 mm
94	A0BP2850000	EV5 group
95	55V432011000	EV5 support
96	A0BP2820000	EV1 group
97	C1BP241000M	EV1 support
98	A0BP2830000	EV2/EV3 group
99	A0BP2840000	EV4 group
100	C1BP173000M	EV2/EV3/EV4 support
101	A0BP2870000	Automatic water feeding pump group
101	40000220000	Water pump 24V
103	41700260000	Fuse holder
104	41700330000	Fuse F15A 6,3x32
105	261000014V0	Pipe fitting T
106	A2BP2630000	Cable for external tank level sensor connection
107	27700001400	Cable tight
108	A2BP5890000	Power cable - 120/220-230V 60Hz
	A2XP0160000	Power cable - 220/240V 50Hz

TABLE 6 - ALL MODELS



79	261000009MN	Angle pipe fitting
94	A0BP2850000	EV5 group
94a	40100240000	EV parker 3-way 24V
96	A0BP2820000	EV1 group
96a	40100240000	EV parker 3-way 24V
98	A0BP2830000	EV2/EV3 group
98a	40100030000	EV parker 2-way 24V (EV2)
98b	40100230000	EV parker 2-way 24V (EV3)
99	A0BP2840000	EV4 group
99a	40100260000	EV parker 3-way 24V
110	263000002MN	Pipe fitting T - FFF
111	261000001MN	Pipe fitting
113	263000003MN	Pipe fitting T - FMF
114	265000009MN	Coupling
115	262000003MN	Angle pipe fitting - FM
116	261000010MN	Angle pipe fitting
117	261000004MN	Pipe fitting

TABLE 7 – ALL MODELS



A1	A2BP2220000	Door micro-switch cable
A2	A2BP4010000	Safety thermostat cable
A3	A2BP4020000	Main switch cable
A4	A2BP4030000	Vacuum pump cable with Bravo17V & Bravo21V
A4	A2BM3390000	Vacuum pump cable with Bravo17
A5	A2BG3520000	Motor and pressure switch cable
A6	A2BP2270000	Water pump cable
A7	A2BP2280000	Electro-valves cable
A8	A2BP4070000	AC filter cable
A9	A2BP4820000	Ground cable (chamber)
A10	A2BP4830000	Ground cable (steam generator)
A11	A2BP4810000	Ground cable (rear loom)
A12	A2BP4700000	Printer PS cable (option with Bravo17)
A13	A2BP4690000	Printer signal cable (option with Bravo17)
P1	110000005W0	Silicone pipe Ø6 x 12mm black
P2	110000011W0	Silicone pipe Ø4 x 7mm transparent
P3	110000003W0	Silicone pipe Ø6 x 10mm transparent
P4	110000002V0	Teflon pipe Ø4 x 2,5mm
P5	110000014W0	Armed pipe Ø6 x 10mm

SPARE PARTS

P/N	Description	Ref.	Exploded view
A9BM5360000	Standard supply kit with Bravo^{17}	B	1
A9BP5350000	Standard supply kit with Bravo^{17V}	B	1
A9BG5270000	Standard supply kit with Bravo^{21V}	B	1
C1XP076000Y	Tray with Bravo^{17} & Bravo^{17V}	1	1
C1BG345000Y	Tray with Bravo^{21V}	1	1
C1BP459000Y	Tray rack with Bravo^{17} & Bravo^{17V}	2	1
C1BG434000Y	Tray rack with Bravo^{21V}	2	1
STXX0080000	Tray extractor	3	1
A0XP0010000	Container with quick connector (~ 0.5 US gal / 2 L)	4	1
110000003W0	Drain pipe with quick coupling	5	1
47200010000	Bacteriological filter	6	1
47200040000	Metallic draining filter 7x14	7	1
SCBP0010000	Thermal paper roll (option with Bravo^{17})	8	1
C1BH0060001	Metallic frame cover with Bravo^{17} & Bravo^{17V}	9	1
C1BG4680001	Metallic frame cover with Bravo^{21V}	9	1
C3JP0120000	Plastic door cover (external) – Europe models	10a	1
C3JP0130000	Plastic door cover (internal) – Europe models	10b	1
C3BP1850000	Plastic door cover - North America models	10c	1
C5BP2550000	Thermal printer (option with Bravo^{17})	11	1
C3BP1840000	Service compartment door – North America models	12	1
C3JP0140000	Service compartment door – Europe models	12	1

P/N	Description	Ref.	Exploded view
230B04L14K0	Pin 4x20	13	1
42000070000	Main switch	14	1
C3JP0110000	Plastic front frame – Europe models	15a	1
C3BP1830000	Plastic front frame –North America models	15b	1
C5BP1230000	LCD 4 lines x 20 characters	16	1
C6JP0010000	Adhesive membrane keypad – North America models	17	1
C6JP0190000	Adhesive membrane keypad – Europe models	17	1
C6JM0010000	Adhesive label Bravo^{17} – North America model	18a	1
C6JP0020000	Adhesive label Bravo^{17V} – North America model		
C6JG0010000	Adhesive label Bravo^{21V} – North America model		
C6JP0210000	Adhesive label Bravo^{17} – Europe model	18b	1
C6JP0210000	Adhesive label Bravo^{17V} – Europe model		
C6JG0150000	Adhesive label Bravo^{21V} – Europe model		
47200010000	Bacteriological filter	19	1
C1BP153000M	Left crossbar with Bravo^{17} & Bravo^{17V}	20	1
C1BG317000M	Left crossbar with Bravo^{21V}	20	1
C1BP152000M	Right crossbar with Bravo^{17} & Bravo^{17V}	21	1
C1BG318000M	Right crossbar with Bravo^{21V}	21	1
C4BP2740000	Thermo-insulating panel	22	2
C0BP260000P	Cast aluminum door	23	2
C7BP2640000	Door spring	24	2
C0BP060000Z	Door nitrided fork	25	2
49000050000	Door bush	26	2

P/N	Description	Ref.	Exploded view
C0BP0500000	Door fork pin	27	2
203C06L30K0	Screw 6x30	28	2
C0BP079000N	Door adjustment screw-	29	2
C4BP2160000	Door thermo-insulating disk	30	2
A1BP027000Y	Door dish	31	2
48000050000	Door gasket	32	2
C0BP2720000	Door hinge pin	33	2
A1BP3380000	Door hinge	34	2
C2BP0010000	Stainless steel chamber with Bravo^{17} & Bravo^{17V}	35	2
C2BG5300000	Stainless steel chamber with Bravo^{21V}	35	2
C0BP0430000	Pin of the door closing system	36	2
A1BP2710000	Door closing system group	37	2
40300010000	Gear-motor 120/220-230VAC 60Hz	38	2
40300020000	Gear-motor 220/240VAC 50Hz		
232A03L25K0	Pin 3x25	39	2
C0BP0450000	Gear-motor coupling	40	2
C0BP0460000	Intermediate join	41	2
C0BP0590000	Closing hook	42	2
43300010000	Hook micro-switch (open)	43	2
43300010000	Door micro-switch	44	2
43300040000	Hook micro-switch (close)	45	2
28600160000	Olive for temperature sensor connection	46	2
2860014000N	Nut for temperature sensor connection	47	2

P/N	Description	Ref.	Exploded view
43000190000	Thermal sensor PT1000 – PT1	48	2
41000180000	Chamber heater 1500W 115VAC with Bravo^{17} & Bravo^{17V}	49	2
41000140000	Chamber heater 1700W 230VAC with Bravo^{17} & Bravo^{17V}		
41000190000	Chamber heater 1500W 115VAC with Bravo^{21V}	49	2
41000290000	Chamber heater 2000W 230VAC with Bravo^{21V}		
43000180000	Thermal sensor PT1000 – PT3	50a	2
43000180000	Thermal sensor PT1000 – PT4	50b	2
43000180000	Thermal sensor PT1000 – PT2	50c	4
43000140000	Safety thermostat TG400	51	2
C4BP2140100	Thermo-insulating panel (chamber) with Bravo^{17} & Bravo^{17V}	52	2
C4BG3280000	Thermo-insulating panel (chamber) with Bravo^{21V}	52	2
C4BP5570000	Rear thermo-insulating panel (chamber)	53	2
A0BP2900000	Clean and used water tank group	54	3
C3BP1700000	Clean and used water tank	54a	3
43200060000	Used water level sensor (MAX)	54b	3
43200050000	Clean water level sensor (MIN/MAX)	54c	3
C1BP175000M	Tank middle crossbar with Bravo^{17} & Bravo^{17V}	55	3
C1BG320000M	Tank middle crossbar with Bravo^{21V}	55	3
A9BM5530000	AC transformer group - 120V 60Hz	56	3
A9BP5260000	AC transformer group – 220/230V 60Hz		
A9BP5680000	AC transformer group – 220/240V 50Hz		
41200060100	AC transformer - 120V 60Hz	56a	3
41200080000	AC transformer - 220/230V 60Hz		

P/N	Description	Ref.	Exploded view
41200130000	AC transformer - 220/240V 50Hz		
C1BP161000M	Transformer support	56b	3
43100060000	Pressure switch	57	3
C1BP538000M	Pressure switch support	58	3
260000009MN	Quick pipe fitting	59	3
43100090000	Pressure transducer	60	3
A5BM4760000	Electronic board group (TROLL version)	61	3
A0BP5730000	Electronic board group (GAM version)		
A5BM1400000	Basic board (TROLL version)	61a	3
C5BP5630000	Basic board (GAM version)		
C5BP4350000	AC filter board - 120V 60Hz	61b	3
C5BP5820000	AC filter board - 220/230V 60Hz		
C5BP1420000	AC filter board - 220/240V 50Hz		
A5BM4760000	Printer power supply board	61c	3
28600290000	Chamber drain filter holder	63	2
47200040000	Chamber drain filter 7 x 14	65	2
111000009W0	Rubber profile	67	4
260000006V0	Drain connection	68	4
A2BP2380000	Serial port flat cable	69	4
C3BP5610000	ABS plate	70	4

P/N	Description	Ref.	Exploded view
25600000400	PVC foot	71	4
25600001000	Rear plastic foot	72	4
55V702016000	Ground plate	73	4
C1BP147000M	Electronic board angle support	74	4
C1BP269000M	Top angle bar	75	4
C1BP270000M	Side angle bar	76	4
C1BP150000M	Chassis with Bravo^{17} & Bravo^{17V}	77	4
A1BG350000M	Chassis with Bravo^{21V}	77	4
A0BP2860000	Steam generator water pump group	78	4
40000220000	Water pump 24V	78a	4
40100370000	EV parker 2way 24V (EV6)	78b	4
261000009MN	Angle pipe fitting	79	4/6
47200050000	One-way water filter	80	4
111000006W0	Adhesive mousse	81	4
25600000800	Vibration absorber	82	4
40000050000	Water pump wire-support	83	4
A9BM5510000	Steam generator group - 120/220-230Vac 60Hz	84	4
A0BP2810000	Steam generator group – 220/240Vac 50Hz		
C1BP136000M	Steam generator support	84a	4
C0BP1310000	Thermo-insulating spacer	84b	4
C4BP2360000	Thermo-insulating panel (bottom)	84c	4
C4BP2390000	Thermo-insulating sheet	84d	4
C0BP548000P	Steam generator lower section	84e	4

P/N	Description		Ref.	Exploded view
48100080000	Steam generator O-Ring		84f	4
C0BP547000P	Steam generator upper section		84g	4
41000170000	Heater cartridge 115V 850W		85	4
41000260000	Heater cartridge 230V 1000W			
43000150000	Safety thermostat TG400		89	4
A9BM5520000	Vacuum pump group with Bravo^{17}	120V 60Hz	90	4
A9BM5270000		220/230V 60Hz		
A0BM3100000		220/240V 50Hz		
40000150000	Spare parts for Bravo^{17} vacuum pump	central gasket	90b	4
40000170000		hole membrane	90c	
40000240000		recessed-screw membrane	90d	
40000180000		shutters	90e	
40000120000		head complete	90f	
A9BP5870000	Vacuum pump group with Bravo^{17V} & Bravo^{21V}	120V 60Hz	90	4
A9BP5270000		220/230V 60Hz		
A0BP2890000		220/240V 50Hz		
261000010MN	Spare parts for Bravo^{17V} & Bravo^{21V} vacuum pump	Angle pipe fitting	90a	4
40000260000		Large membrane	90b	
40000250000		Small membrane	90c	
48100150000		Head O-Ring	90d	

P/N	Description	Ref.	Exploded view
C1BP151000M	Rear chassis	91	5
A0BS0520000	Safety valve TUV group	92	5
C1BS020000P	Safety valve support	92a	5
47000020000	Safety valve	92b	5
A1BP1640000	Heat exchanger group	93	5
40400040000	Protection grid	93a	5
C1BP1600000	Heat exchanger	93b	5
C1BP159000M	Heat exchanger support	93c	5
40400030000	Electric fan 120 x 120 x 38 mm	93d	5
A0BP2850000	EV5 group	94	5
40100240000	EV parker 3-way 24V	94a	6
55V432011000	EV5 support	95	5
A0BP2820000	EV1 group	96	5
40100240000	EV parker 3-way 24V	96a	6
C1BP241000M	EV1 support	97	5
A0BP2830000	EV2/EV3 group	98	5
40100030000	EV parker 2-way 24V (EV2)	98a	6
40100230000	EV parker 2-way 24V (EV3)	98b	6
A0BP2840000	EV4 group	99	5
40100260000	EV parker 3-way 24V	99a	6
C1BP173000M	EV2/EV3/EV4 support	100	5
A0BP2870000	Automatic water feeding pump group	101	5
40000220000	Water pump 24V	101	5

P/N	Description	Ref.	Exploded view
41700260000	Fuse holder	103	5
41700330000	Fuse F15A 6,3x32	104	5
261000014V0	Pipe fitting T	105	5
A2BP2630000	Cable for external tank level sensor connection	106	5
27700001400	Cable tight	107	5
A2BP5890000	Power cable - 120/220-230V 60Hz	108	5
A2XP0160000	Power cable – 220/240V 50Hz		
263000002MN	Pipe fitting T - FFF	110	6
261000001MN	Pipe fitting	111	6
263000003MN	Pipe fitting T - FMF	113	6
265000009MN	Coupling	114	6
262000003MN	Angle pipe fitting - FM	115	6
261000010MN	Angle pipe fitting	116	6
261000004MN	Pipe fitting	117	6
47000010000	One-way valve connector	118	6
A2BP2220000	Door micro-switch cable	A1	7
A2BP4010000	Safety thermostat cable	A2	7
A2BP4020000	Main switch cable	A3	7
A2BP4030000	Vacuum pump cable with Bravo^{17V} & Bravo^{21V}	A4	7
A2BM3390000	Vacuum pump cable with Bravo^{17}	A4	7

P/N	Description	Ref.	Exploded view
A2BG3520000	Motor and pressure switch cable	A5	7
A2BP2270000	Water pump cable	A6	7
A2BP2280000	Electro-valves cable	A7	7
A2BP4070000	AC filter cable	A8	7
A2BP4820000	Ground cable (chamber)	A9	7
A2BP4830000	Ground cable (steam generator)	A10	7
A2BP4810000	Ground cable (rear loom)	A11	7
A2BP4700000	Printer power supply cable (option with Bravo^{17})	A12	7
A2BP4690000	Printer signal cable (option with Bravo^{17})	A13	7
110000005W0	Silicone pipe Ø6 x 12mm black	P1	7
110000011W0	Silicone pipe Ø4 x 7mm transparent	P2	7
110000003W0	Silicone pipe Ø6 x 10mm transparent	P3	7
110000002V0	Teflon pipe Ø4 x 2,5mm	P4	7
110000014W0	Armed pipe Ø6 x 10mm	P5	7