Instructions manual
Operating manual

WASHER DISINFECTOR

DS 500 C
DS 500 SC
DS 500 CD
DS 500 SCD

Serial N°:

CE 0051

Via Balegante, 27
31039 Riese Pio X (TV)
ITALY

Manufacturer:

STEELCO S.p.A.
Via Balegante, 27
31039 Riese Pio X (TV)
ITALY

CONTENTS

Thank you for purchasing this appliance.

The installation, maintenance and operating instructions given in the following pages have been prepared to ensure the long life and good performance of the appliance.

Following the instructions carefully.

The appliance was designed and constructed using the latest technological innovations available.

Please take good care of it.

Your satisfaction is our best reward.

WARNING:
NON OBSERVANCE, EVEN IN PART, OF THE RULES INDICATED IN THIS MANUAL WILL CAUSE THE PRODUCT GUARANTEE TO BECOME INVALID AND RELIEVES THE MANUFACTURER OF ANY RESPONSIBILITY.

1. GENERAL RULES

1.1 Limits of manufacturer's liability

The manufacturer shall not be held liable for failures or problems which arise due to tampering and/or incorrect applications and/or improper use of the machine.
The purchaser must comply with all instructions set forth in the user's manual, and he must in particular:

- Always work within the allowable limits for the use of the machine;
- Always carry out constant and diligent maintenance;
- Allow use of the machine by persons with proper skills and abilities for their role and purpose who have been properly trained and instructed;
- Use only manufacturer original spare parts.

Any modifications, adaptation or the like which may be made to machines which are subsequently placed on the market do not oblige the manufacturer to intervene on previously supplied machines, nor to consider the machine and the related user's manual lacking and inadequate.

The installation, maintenance and operating instructions given in the following pages have been prepared to ensure the long life and outstanding performance of the appliance.

For some especially demanding programming or maintenance operations, this manual serves as a memorandum of the main operations to be carried out.
Education on these topics can be obtained by attending training course held by the manufacturer

The instructions in this manual do not replace but rather are in addition to employer requirements to adhere to current legislation on standards of prevention and safety.

The machine is guaranteed for 15 months as from the time of shipment.

1.2 Manual validity, contents and conservation

- This manual reflects the state of the art at the moment of manufacture and delivery of the appliance and is valid for its entire life cycle.
- The manufacturer is at clients' disposal for further information or to receive suggestions for making the manual more compliant with the needs for which it was prepared.
- The translation of the contents into the client's language has been carefully prepared.
- In order to prevent possible accidents to persons or property due to in correct translation of the instructions, the client must:
  - Not perform operations or manoeuvres with the machine if there are any doubts or uncertainties about the operation to be performed;
  - Ask technical service for clarification of the instruction.
- If lost, ask for a new copy from the manufacturer.

It is important to keep this instruction manual with the machine for future reference.
If the machine is sold or transferred, the manual must be handed over to the new owners or user in order for them to become acquainted with its functioning and the relative warnings.

Read the warnings carefully before installing and using the machine.

This is a translation of the Italian text, which prevails in case of doubts.

1.3 Regulations

The purpose of the warnings is to safeguard the user in compliance with following Regulations and “Technical Product Standards”:

EUROPE:

- 93/42/EEC and s.m.i. (Medical Devices Directive);
- 2006/95/EC (Low Voltage Directive);
- 2014/30/EU (EMC - Electromagnetic compatibility directive);
- EN 61010-1 (Safety);
- EN 61010-2-040 (Safety);
- 2011/65/EC (RoHS II);
- 2012/19/EC (WEEE);

and recognized international standards:

- IEC 61000 (Electromagnetic compatibility);
- ISO 14971 (Medical devices risk analysis);
- IEC 61326-1 (Electromagnetic compatibility);
- ISO 15883-1 (Cleaning efficacy);
- ISO 15883-2 (Cleaning efficacy);
- ISO/TS 15883-5 (Cleaning efficacy);
- IEC 60529 (IP Grade).

2. SAFETY INFORMATION

Compliance with safety standards allow the operator to work productively and calmly, without the danger of harming himself or others.

Before starting work, the worker must be completely familiar with the functions and proper operation of the machine. He must know the precise function of all command and control devices of the machine.

2.1 Intended use, improper use

INTENDED USE:

Use is permitted of this machine only and exclusively for the washing and thermal disinfection of medical instruments, trays and objects normally used in medical studios, hospital wards, assisted living centres, like:

- **Scissors**
- **Clogs**
- **Glass works**
- **Laboratory instruments**

IMPROPER USE:

The improper use of this device is any use other than that for which the machine is intended.

	WARNING
	Any use other than the one intended is forbidden.
	Improper use of this unit may be hazardous to the operator and may seriously damage the machine itself.
	If the appliance is used in a manner not specified by the manufacturer, protection of the appliance may be compromised.

Advisory note: under ISO 17664:2004, it is the instrument manufacturer's responsibility to provide instructions for the processing of their instruments including how instruments should be prepared prior to use, cleaned, disinfected, dried, inspected, maintained, tested packaged, sterilized and stored. If medical devices have been used in any way such as being exposed to blood or compromised tissues, such devices must be terminally processed in accordance with the instrument manufacturer's guidelines, observing international and local standards as well as good hospital practices before each use with human patients. Washer disinfectors are part of the process for reprocessing reusable medical devices.
This washer disinfector device is not intended to be used for terminal disinfection or sterilization.

2.2 Important warnings and suggestions

For proper use of the machine, and in order to safeguard employed staff, carefully comply with the following general and specific standards.

THE OPERATOR MUST:

- **Carefully adhere to the provisions and instructions** provided by the employer, managers and supervisors for individual and group safety.
- **Use safety devices appropriately and with care**, as well as group and individual safety gear provided by the employer.
- **Immediately inform the employer,** the manager and the supervisor of deficiencies in the aforementioned devices and means, as well as any hazardous conditions which he may become aware of, taking action directly in urgent cases within their scope of responsibilities and abilities to eliminate or reduce the deficiencies or hazards.

THE OPERATOR MUST NEVER:

- **Remove or modify, without authorization, the safety devices**, nor those for signalling and measuring, nor the individual and group safety gear.
- **Undertake on his own initiative operations or manoeuvres which are not his responsibility** which may compromise safety.
- **Insert foreign objects into the electrical parts.**
  Do not insert foreign bodies into the covers of the electrical motors or into the moving parts of the machine.
- **Provide power to the machine by tampering with the main switch and the safety devices.**

2.3 Safety recommendations

- If the new machine appears to be damaged, contact the retailer before starting it.
- Any modification of electrical and hydraulic systems necessary to install the machine must be carried out by qualified, authorised persons only.
- This machine must be operated by trained persons only;
- The machine must be used for treatment and thermo disinfection of instruments for medical use and for laboratory glasses.
- Any use other than that for which the machine was intended is forbidden.
- The user is forbidden to carry out any work or repairs on the machine
- Technical Assistance for this washer disinfector should be carried out by qualified and authorised operators only.
- The equipment should be installed by authorised persons only.
- Do not install the equipment in rooms where there is the risk of explosion.
- Do not expose the equipment to intense cold.
- The electrical safety of this washer disinfector is only guaranteed if it is connected to an efficient earth system.
- Take great care when handling detergents and additives: avoid contact, wear gloves and act in compliance with the safety recommendations indicated by the manufacturer of the chemical products.
- Do not inhale the fumes produced by chemical products.

WARNING:
The chemical products are an irritant for the eyes, in case of contact rinse thoroughly with plenty of water and consult a doctor.If these products come into contact with the skin, rinse with plenty of water.

- The water in the tank is not drinking water.
- Do not lean on the door and do not use it as a step.
- The machine reaches a temperature of 93 °C during the work cycle: take great care to avoid burns.
- Do not wash the machine using high-pressure jets of water.
- Disconnect the machine from the electrical supply before carrying out maintenance work.
- The acoustic pressure of the machine is below 70 dB(A).
- The operator always has to verify before starting of the cycle the presence of the filters water in the sump and their correct positioning.

2.4 Recommendations to ensure high quality performance

- **The user must oversee the machine during the cycle.**
- **The injection tube for washing water must always be connected with the appropriated basket.**
- **When the machine is running do not interrupt the cycle since this jeopardises disinfection.**
- **Check periodically using chemical indicators to ensure correct disinfection.**
- **Use recommended detergents and chemical additives only.**
  The use of other products may damage the machine.
- **During the manipulation of treated objects, it is required the use of appropriated PPE to prevent contact with infected material and the risk of contamination.**
- **Do not introduce dirty instruments of substances that must not be discharged in sewage system (in accordance with current legislation) but must be disposed in specific way.**
- **Recommending chemical additives does not make the manufacturer responsible for any damage to the materials and objects treated.**
- **Check that type of chemical product is suitable for the specific washing program used.**
- **Follow the manufacturer's indications when using chemical products and use them for the foreseen use only.**
- **The machine was designed for use with water and chemical additives.**
  Do not use organic or other types of solvent as this may result in the risk of explosion or the rapid deterioration of certain machine parts.
- **Residues of solvents or acids, particularly "hydrochloric acid", can damage steel.**
  Contact should be avoided.
- **Use original accessories only.**
- **Do never use soap powder.**
- **Do never use foaming detergent.**
- **The machine is to be used only with the baskets and or accessories included by the manufacturer.**
- **Accessories which are not approved by the manufacturer may compromise the results achieved as well as user safety.**
- **Do never use chemical products based on chlorides (bleaches, sodium hypochlorite, hydrochloric acid and so on).**
- **These kinds of chemical detergents irreparably damage the machine and jeopardise the integrity of materials and objects treated.**

The taps of the water feeding must be always turned off, as the safety and diagnosis system will be deactivated, in the following situations:

- **if the machine is left unused;**
- **if the machine is disconnected from the electrical connection.**

The manufacturer declines all responsibility for personal injury or material damage resulting from the non-observance of the above rules.

The non-observance of these rules produces the total and prompt cancellation of the guarantee.

2.4.1 Inlet water quality

The quality of the water used in all stages of cleaning is important for good results.

The water used in each stage must be compatible with:

- The material of which the washer disinfector is made.
- The chemicals used in the process.
- Process requirements for the various stages of the process.

The main factors for good inlet water quality in relation to the washing efficacy are:

HARDNESS	The high hardness of the water generates a detergent inactivation, reducing its efficacy. It also causes limescale deposits in the machine, jeopardizing the clean of the instruments and the machine, especially on hot parts (ex. heating elements).
IONIC CONTAMINANTS	A high concentration of ionic contaminants may cause corrosion of steel, manganese or copper instruments.
MICROBIAL CONTAMINANTS	Microbial contaminants can increase the microbial contamination of the instruments at the end of the wash.

The manufacturer therefore recommends that:

- water used in the pre-rinsing and washing phases should be of drinkable quality in accordance with the "Guidelines for drinking water quality 3rd edition" published by WHO.
- demi water is used for the rinsing phase.
  A typical specification for demi water is:

Ion concentration H+	4.5…7 pH
Conductivity	< 30 µs.cm^{-1}
TDS	< 40 mg/l
Maximum hardness ($CaCO_3$)	< 10 mg/l
Chlorine	< 10 mg/l
Heavy metals	< 10 mg/l
Phosphates	< 0.2 mg/l as P_2O_5
Silicates	< 0.2 mg/l as SiO_2
Endotoxins	< 0.25 EU/ml
Colony-forming unit (CFU)	< 100 per 100 ml (*)

(*) for rinsing after disinfection phase, the maximum limit changes to 0.

Further advice should also be obtained from the manufacturers of chemical and medical equipment.
Where local standards are stricter than provided recommendations, they should be followed.
Note: that it is the user's responsibility to supply the machine with suitable water.

2.5 Residual risks

The appliance includes a series of fixed guards to prevent access to hazardous internal parts or zones.

It is however considered that the **WASHER DISINFECTOR** includes some residual risks.
Hereunder for each phase or significant work intervention are useful measures to be taken:

PHASE	BASKET LOADING
RISK	**Contusions and cuts to the upper limbs,** due to accidental contact with due to falling or striking against tools, objects and instruments, mainly while loading and handling the basket.
MEASURE	Assign staff that is instructed and equipped with work equipment (e.g. basket with protections, transport carts) and appropriate clothing and individual protection gear (e.g. shirts and protective gloves).

PHASE	OBTAINING DETERGENTS/CHEMICAL ADDITIVES
RISK	**Contact with body parts with chemical washing products.**
MEASURE	Assign staff that is instructed and equipped with appropriate clothing and individual protection gear. Wear clothing, gloves and goggles and act in compliance with the safety recommendations indicated by the manufacturer of the chemical products.
FIRST AID MEASURE	• Immediately take off/remove clothing which has been contaminated or soaked by the product. • If the substances come into contact with the skin, wash off affected skin areas immediately and rinse with water.
RISK	**Inhalation of vapours of chemical wash products.**
MEASURE	Assign staff that is instructed and equipped with appropriate clothing and individual protection gear. Comply with the safety instructions provided by the manufacturer of the chemical products and if there are none, wear a mask for the protection of the respiratory airways.
RISK	**Accidental release of chemical wash product**.
MEASURE	Do not flush concentrate into drains, surface or ground waters. Collect spillage with adsorbent material (e.g. sand, earth, vermiculite, diatomaceous earth). Flush away minor amounts with plenty of water.
	**IN CASE OF CONTACT WITH BODY OR RELEASE OF CHEMICAL PRODUCT LOOK ALWAYS AT THE SAFETY MEASURES INDICATED IN THE CHEMICAL TECHNICAL DATASHEET.**

PHASE	MAINTENANCE OF INTERNAL EQUIPMENT
RISK	**Burns of body parts by hot parts of the appliance.**
MEASURE	Allow maintenance to be performed only by trained personnel, equipped with appropriate clothing and individual protection gear. Wear suitable clothing and protective gloves.

PHASE	EMISSION OF HAZARDOUS GAS
RISK	**Inhalation of vapours of hazardous gas.**
MEASURE	With a correct installation, concurring with the manufacturer prescription, using the authorized chemical product and concurring with the rules in force in your country, the machine don't generate hazardous gas. However the machine is supplied with vapours discharge, that have to be connected concurring with the instruction in chapter 3.

2.6 Safety signals used

To inform personnel operating on the machines of obligations of behaviour and residual risks, adequate safety signals (as set forth by 92/58 EEC) are applied to the machine and near the work place.

GENERIC SAFETY SIGNALS:
In particular, labels with signals of obligation, prohibition and danger contained in this manual and pertinent to this machine and most commonly used are:

Electrical risk

Warning!
See annex documentation

Caution hot surface

INDIVIDUAL SAFETY WEAR:
The evaluation of risks for the health and safety of workers carried out in the workplace and on any equipment used, as well as the evaluation of residual risks as indicated, allow the employer to evaluate the need to adopt the individual protection gear which is most suitable and appropriate to be provided to workers.
Considering the type of machine, it is felt that the individual protection gear should be provided to staff.

2.7 Training

Instructions for use of the machine will be provided by the STEELCO INSTALLATION TECHNICIAN during the start-up phase to MACHINE OPERATORS and MAINTENANCE TECHNICIANS for their areas of responsibility, who will be thus instructed and trained.
It will be the duty of the EMPLOYER to check that the degree of staff training is suitable for assigned duties.

2.7.1 Staff qualification

Depending on the difficulty of certain installation operations, and of the operation and maintenance of the system, professional profiles are identified as follows:

IS ***INSTALLATION and REPAIR TECHNICIAN:***

Specialized installation and maintenance staff capable of carrying out all machine positioning and installation operations, connection of various systems and machine start-up at the client's place of business, as well as all routine and special maintenance operations.
This operator is responsible for training staff for machine operation and for testing the machine.

AS ***RESPONSIBLE AUTHORITY FOR THE MACHINE IN THE WORKPLACE:***

Specialized staff assigned to the verification of safety devices and procedures for proper use of the machine in complete absence or hazards.

The *responsible authority* is personally responsible for training courses for staff assigned to machine operation and maintenance.
He must ensure that staff assigned to operation have acquired all information required for use and routine maintenance of the machine, registering attendance and documenting comprehension tests.
The *responsible authority* must have a perfect understanding of all command, control and safety devices of the machine.

He must inform all personnel assigned to machine operation and maintenance of the instructions concerning *safety standards*, the *actions to be avoided* and the *first aid interventions* connected with use of the machine and the chemical wash agents it contains.

The *responsible authority* must be aware of all correct procedures for carrying out in absolute absence of danger all operation and maintenance of the machine, as well as all procedures for disposal of any residual pollutants and manufacturing wastes.
He must always be present during extraordinary or routine maintenance and give his *approval to proceed* to staff assigned to operation or to personnel assigned to routine or special maintenance.

The *responsible authority* will be responsible for operation of all command, control and safety devices in the machines of the system.
He shall carry out scheduled verification of those devices in order to ensure their continued operation over time.

AC ***MACHINE OPERATOR:***

Skilled personnel assigned to machine operation.
The *machine operator* must be perfectly aware of all of the machine's command and control devices.

Only after approval by the *safety supervisor, the machine operator* must be capable of using the assigned commands to do the following:

- Commissioning and start-up of the machine;
- Loading and unloading of material to be washed in the baskets;
- Operation of the machine in the various possible working modes, such as the start of various programmed wash cycles.
- Programming and setting data from the operator panel, adjustment of single control devices during working phases, starting or resetting of work functions.
- In addition, the *machine operator* must, by making use of all required individual protection gear and following adequate safety measures, be capable of performing some routine maintenance such as cleaning inside the machine, cleaning clogged filters, and disposing of pollutant waste materials produced during working.

2.8 Indication of sound level

The value shown refers to the measurement obtained on a machine of the same type as that covered herein and measured with an instrument at a height of 1,5 m at a distance of 1 m from the machine.

AVERAGE SOUND PRESSURE LEVEL: < 70 dB (A)

2.9 Transport and storage

Environment conditions:

- Temperature range -5 ... +50 °C;
- Relative Humidity range 20…90% without condensation;
- Ventilation: Air exchange not required (required only if chemical tanks are installed).

3. INSTALLATION (FOR THE INSTALLER ONLY)

3.1 Activity prior to installation

PREPARATION OF INSTALLATION SITE:
Arrangements for connections to the electrical and plumbing systems must be provided by the client prior to machine installation.
Connections must be compliant with current directives in the country of installation.
They must comply with the instructions contained in the documentation (provided on request) prior to machine installation.

Environment conditions:

- Temperature range +5…+40°C;
- Relative Humidity range 20…90% without condensation.
- Maximum altitude: 2.000 m SLM (for higher altitudes are available special versions of the device).

3.2 Positioning

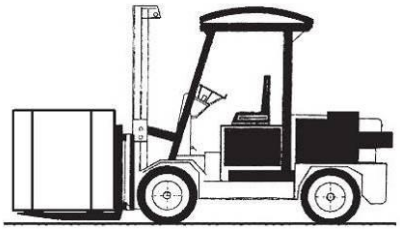
3.2.1 Movement, unpacking and placing

The machine is delivered to the client fully packed, resting on a wood base and completely protected by cardboard covering.

LIFTING AND MOVEMENT:
Movement of the machine is provided using transport and lifting equipment and must be observed the following indications:

- The lifting capability of the forklift must be greater than the total weight of the machine to be moved.
- The machine must be kept as close as possible to the ground during movement.
- Stack up: not allowed.
- Rotation: do not turn upside down.

The forklift operator must perform movement only when there are no persons or objects in the movement area.



UNPACKING AND PLACING:
Near the place of installation, unpack the machine.
Carefully follow these steps:

- All the packaging materials can be recycled.
- Open the packaging carefully.
- Do not overturn the machine as this may cause irreparable damage.
- Cut the strap or open the box and remove the expanded polystyrene corner guards.
- Remove the box followed by the nylon bag.
- **Caution: the bag represents a serious hazard for children and should be disposed of immediately.**
- Place the machine on the work surface and level it by adjusting the feet.
- The machine must be placed horizontally with a maximum inclination of 1÷2°.
- Do not position the machine on surface which could cause a fire or fume hazard.

3.2.2 Maximum floor load

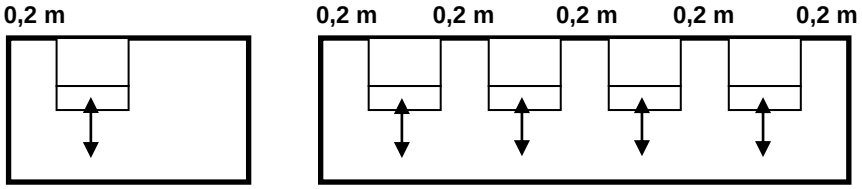
For the installation of the machine, the floor must be able to sustain a minimum load of:

150 daN/m^2

3.2.3 Positioning of the machine

In normal conditions, the minimum dimensions are suggested for the use of the machine in a single installation or with the coil nearby.
For different installation ask for the distributors.

Minimum room ceiling height: HEIGHT MACHINE (in m) + 0,3 m



3.3 Water connection (for the installer only)

To perform proper installation, account of following regulations:

- The machine has been connected to the water distribution network following the in force rules;
- Use only the tubes supplied with the machine;
- Don't cut short the rubber tubes supplied with the machine;
- Make sure that mains water pressure is between 100 kPa (1 bar g) and 800 kPa (8 bar g);
  If it is below 100 kPa (1 bar g) dynamic pressure, you will need to install a pressure increase pump.
  If the pressure is higher than 800 kPa (8 bar g) a pressure reducer must be installed.
- For machines equipped with steam condenser or water softener, the minimum pressure of water must be increased to 200 kPa (2 bar g) to ensure the correct functioning in terms of performance.
- If the average hardness of the water is higher than 7 °f, decalcified water must be used;
- For connection use cocks with an attachment of ¾", located in an easily accessible location as near as possible to the machine;
- Make sure that the general feeding tube is sufficient for the flow rate required from the machine and equipped with a general closing valve.

ATTENTION

For the specifications for water connections, refer to the plant installation.

During the machine installation, the installer must take the following step:

1. Identify the tubes supplied with the machine and make sure they are free from damages;
2. Identify the correspondence of the connection of flexible tubes to the water supply taps arranged in site, according to the references of the following chart.

CONNECTION	COLOUR
HOT WATER	RED
COLD WATER	BLUE
DEMI WATER	WHITE

3. Screw and tighten up the pipe sleeve to the connection arranged in site.
4. Remove any debris in the pipes or in the taps. To perform this operation open the tap and let the water flow in a pail.
5. Check the water temperature according to the specifications of the installation diagram.
6. Identify the correspondence of the connection of flexible tubes to the solenoid valve water supply of the machine.
7. Screw and tighten up the pipe sleeve to the connection arranged in site.
8. Open gradually the water supply taps and check the connections seal.
9. Terminated the connection, in case of water leaks repeat the procedure.

ATTENTION

The threaded connections can be easily damaged, therefore before to apply the maximum clamping, screw manually the locking sleeve for some threads.

Information:

- The back syphonage prevention system is already installed inside the machine concurring with IEC 61770;
- If it isn't available the double connection to hot and cold water, the two supply pipes must be connected together;
- The manufacturer declines all responsibility for damage or injury caused by noncompliance of the rules relating the supply installations.
- If you don't comply with the conditions above, the deriving damages will not warranty.
- **In case of lack of demi and warm water set the parameter P90 and P87 to 0.**

ATTENTION

When the machine is not in operation, always close the supply cocks.

3.4 Electrical connection

Connection of the machine to the electrical mains must be made by qualified, skilled personnel.

- Power supply cable: It is compulsory for the retailer - installer to adapt the insulation class of the power supply cable to suit the working environment in compliance with Current Technical Regulations.
- The machines are normally equipped with a three-phase 220/230/240 vac - 60hz power supply and three-phase with neutral 380/400/415 vac - 60hz power supply.
  For the specific voltage, please refer to the label on the machine.
- Check that the electric specifications match those shown in the label.
- The electrical connection must be carried out in compliance with current technical regulations.
- Make sure that the mains voltage reading corresponds to the voltage indicated on the machine plate.
- Check that the power supply voltage does not differ by more than 10% from its nominal value.
- The frequency of the power supply voltage must not differ by more than 1% of its value.
- Connection of the machine to the mains must be provided with an earth connection and an equipotential circuit as set forth by current standards.
- Make sure that the electrical systems are efficiently earthed.

- The earth conductor is to be connected to the earth terminal identified by the standard symbol.

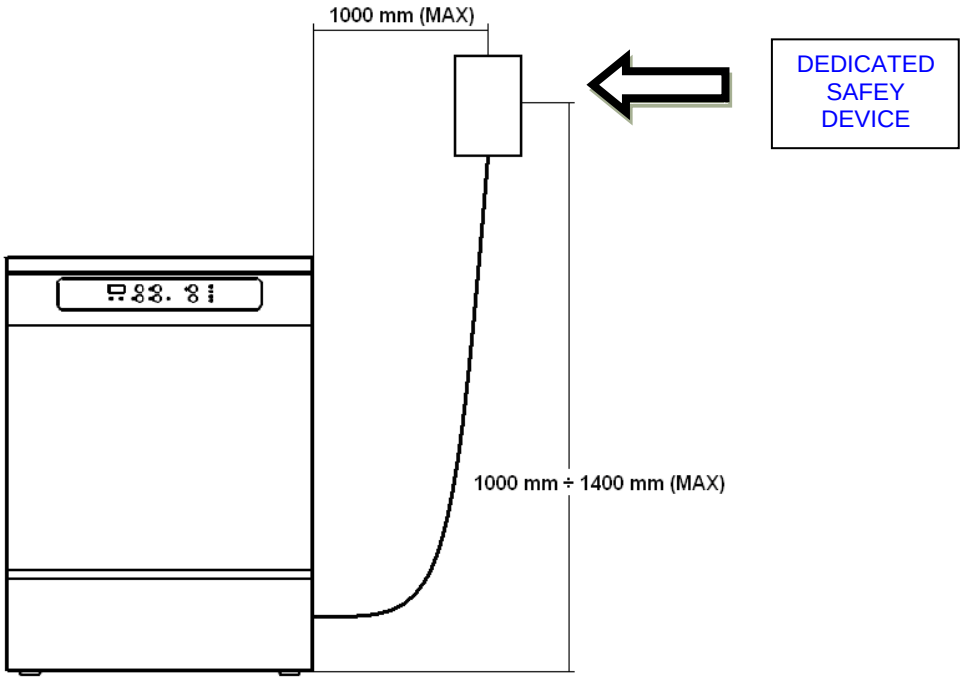
- The machine is equipped with a terminal identified by the relative symbol for equipotential connections between appliances (see rules for electrical plants).

- Connect the machine and the relative dedicated safety device (not supplied) by using a power cable compatible with the electrical characteristics of the machine.
- In case of prolonged unused of the machine is recommended that you execute the disconnection procedure of the electrical connection by placing the dedicated safety device in "**OFF**" state.
- The upstream electrical power line must be dimensioned and protected in accordance with current local regulations.

The dedicated safety device must be positioned in an accessible place, free and not covered from other machine or anything that could obstruct the switch control.

- The dedicated safety device must be provided with quality markings and must be indicated as an electrical shut-off device for the machine.
- Near the dedicated safety device, a sign must be placed which reads:

EXAMPLE OF DEDICATED SAFETY DEVICE POSITIONING



3.5 Fuse

The fuses are used to protect the electrical circuits of machine from possible failure as overload or short circuits.
If fuse takes action the downstream connections and their function are no longer available.
The fuses must respect the characteristics (size, dimensions and tripping characteristic) indicated in the wiring diagram.

3.5.1 Replacement of fuse

ATTENTION

The replacement of fuse must be done from authorized operators only.
Before making the replacement procedure of fuse, establish and remove the cause of the fault.
If necessary, contact our technical assistance service.

Replacement procedure of fuse:

- Log off the machine in safety condition by dedicated safety device
- Access at the electrical panel.
- Identify the fuse subjects to replacement, based on the wiring diagram.
- Remove the related fuse from electrical panel.
- Replace failure fuse with another fuse with same characteristics. The correct value of fuses are in the wiring diagram.

If at the reactivation of electrical devices the new fuse intervene repeat the diagnosis and replacement procedure as described previously.

ATTENTION

Use only fuses with the amperage and characteristics indicated in the wiring diagram.
The use of fuses other than those specified in the wiring diagram, void the warranty and can cause the risk of damage the machine.

3.6 Chemical products connections

The dosing system of chemical products is composed of:

- Dosing pump for chemical products.
- Presence sensor chemical product.
- The system can be equipped with meter quantity of dispensed product.

Further dosing pumps and accessories can be ordered as optional.
Each pump is combined with a corresponding type of chemical, according with the references on the table below.

PRODUCT	NOTE
ALKALINE / NEUTRAL	
ACID	
RINSE AID / LUBRICANT	
PRODUCT 4 (DISINFECTANT, SODA…)	

ATTENTION

In order to guarantee the right treatment of the objects, we suggest the use of specific products. In the case of necessity, ask for advises to the seller or the producer.

3.6.1 Presence sensor of chemical product

Each dosing pump is combined with a sensor that confirm the presence of chemical product inside the container. If the product is scarce, the electronic control system of the machine send a message on video of lack of product.

3.6.2 Meter quantity of chemical product

Each dosing pump can be combined with a volumetric sensor for the quantity measurement of dispensed product. The electronic control system manages the value of required minimum quantity and, if necessary, stops the cycle.

3.6.3 Replacement of chemical product container

To replace the chemical product container perform the following procedure:

- Take the new product container.
- Switch off the machine.
- Open the compartment and remove the chemical product container.
- Replace the chemical product container removing the level sensor from the empty tank and put into the new one.
- Close the topper of the chemical product container and place it in the area for the storage of chemical substances.
- Close the technical compartment and switch on the machine.

ATTENTION

The used chemical product can be dangerous if touched or inhaled. Before the use, read carefully the safety information supplied by the manufacturer of the chemical product and the label on the package.

During the operations of replacement of chemical product container, use the appropriate tools for individual protection (chemical protective gloves, face masks for breathing, etc.).

The access to the technical compartment, where are located the chemical product containers, is permitted only with keys and to the authorized personal.

3.6.4 Warning

- For the maximum amount of product which can be used for washing cycle, follow the instructions for the product you are using.
- To ensure the efficiency of the chemical dosing system it is recommended to perform the calibration procedure every 6 months.
- To ensure the efficiency of the dispenser pumps for chemical products it is important to service them regularly as described in chapter 16.
- Use liquid chemical products only machine cannot function with powder detergent.
- For the dispose of the chemical detergent and his tank follow the instruction indicated on the technical and safety data sheet provided by the manufacturer.
- Check that type of chemical product is suitable for the specific washing program used.
- Don't place the chemical tank on the machine.

ATTENTION

Before undertaking any sort of special maintenance or movement of machine, empty tanks and chemical dosing circuit from the chemical. It is advised to execute a treatment cycle without chemical.

This procedure must be carried out in order to prevent contact of the chemical product with body parts and machine components that can be damage.

3.6.5 Information

- The machine has been validated in accordance with the provisions of Standard UNI EN ISO 15883.
- The type test was carried out using the most widely known chemical products on the market, concerning the type of chemical products, the concentrations and the cycle parameters used you can ask the Manufacturer for details.

3.7 Connecting the discharge pipe

- The discharge pipe connection should be checked carefully.
- Use a discharge pipe suitable for organic and chemical materials and hot liquids.
- The machine is equipped with a drain pipe with a diameter indicated on the installation plant.

CAUTION:
if the discharge pipe is clogged take great care when processing the water and avoid contact with hands, eyes, etc. In the case of contact rinse the parts concerned with plenty of water.

CONNECTING DRAIN PIPE:
The drain pipe is connected to the sewer network in the following manner:

- Identify the drain pipe and relative fittings, and assemble them.
  Make sure the seal gasket is installed correctly.
- Identify the drain manifold and connect the hose via the union and ring nut. Tighten the ring nut firmly.
- Insert the drain hose and clamp it in place.
- Insert the other end of the hose into the drain unit, fitting it properly and locking it in position.

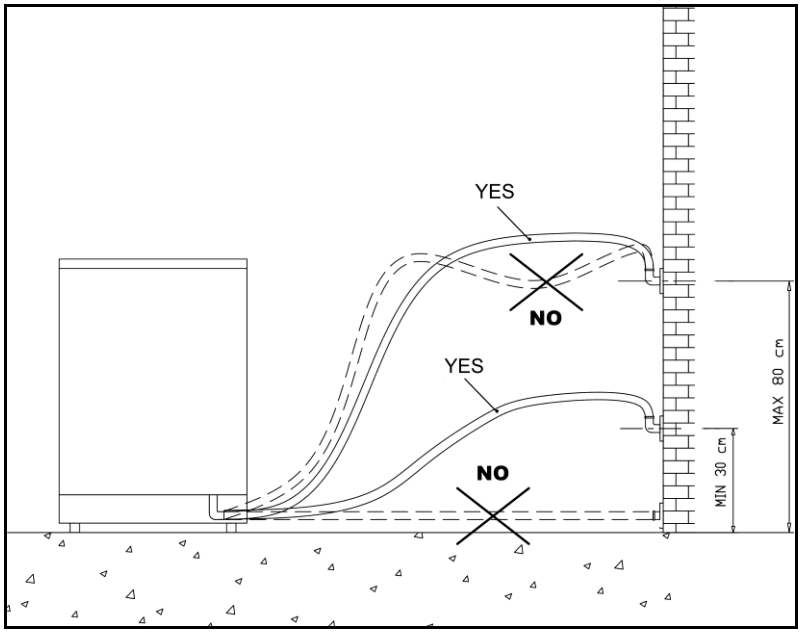
IT IS NECESSARY TO FOLLOW THESE INSTRUCTIONS FOR DRAIN CONNECTION:

- Drain pipe must be connected by using a clamp.
- Drain pipe must not present angles or irregular curving in its course.
- Drain point must be placed at the same height of the machine drain point or on the floor.

Follow carefully these instructions as a wrong drain connection can cause the block of machine.

- The diameter of main drain must be as indicated on the installation plant.
- Avoid drain pipe extension.

	ATTENTION
	Drain must be done following International rules. **The manufacturer cannot be held responsible if an inaccurate use of machine causes pollution.**
	If the discharge pipe is clogged take great care when processing the water and avoid contact with hands, eyes, etc. In the case of contact rinse the parts concerned with plenty of water.
	When the machine is connected to an exhaust ventilation system, the drain pipe should be positioned externally of the building, protected from any animal access, and make sure that it not causes any hazard.



3.8 Water softener built-in (DS 500 CD – DS 500 SCD)

The water softener built-in function is to reduce the anti-limescale quantity contained into the inlet water.
If the machine is connected with hard water, the result is a rapid degeneration with lost in functions and performances.
Regeneration must be done in order to maintain active ionic resins.

For machines equipped with water softener, when installed, water hardness value (French degrees -°F) must be introduced by entering into programmation (PRG switch 5 seconds), at parameter **P76** and introduce one of the following values:

WATER HARDNESS (°f)	SETTING PARAMETER	CYCLES
0-10	Value 10	No regeneration
11-20	Value 20	Regeneration every 25 cycles
21-30	Value 30	Regeneration every 18 cycles
31-40	Value 40	Regeneration every 12 cycles
41-50	Value 50	Regeneration every 6 cycles
51-60	Value 60	Regeneration present at each cycle (it is recommended for authorized people only).

The machine advise that it need a regeneration with a written on display "**sal**".

Actions:

- Open the door.
- Unscrew the plastic cap of salt box.
- Spill 0.5 kg of common salt inside the box by using the appropriate funnel.

WARNING: During this operation, pay attention do not let fall sail outside box.

- Closed the plastic cap.

After having introduce the basket, start with a normal washing cycle.
Machine regenerates automatically.

WARNING:
Washing cycle made after "salt" will be longer and it seems that machine doesn't work.
During this phase, on display will appear "REG".

3.9 Ambient ventilation requirements

During the normal operation, the machine warms up itself dispersing heat and hot air increasing the humidity value. Therefore, in order to guarantee a comfortable environment with good temperature and humidity for the operator, it is necessary to prepare an air conditioning or air circulation system capable to balance the emissions reported in the installation plan.

A detail of the machine connections is shown on the installation plant and electrical wiring.

4. CHECKS PRIOR TO START-UP

4.1 Introduction

The preliminary adjustments and controls are performed by a skilled technician, who has been specifically trained for this purpose.

4.2 Checks of safety systems

Indicative list of adjustments and checks of safety systems and devices to be carried out:

- Check the mains supply voltage;
- Check the efficiency of the emergency and machine shutdown devices (circuit breaker);
- Check the efficiency of the door opening safety micro switch;
- Check the operation of machine controls, especially the **START** and **STOP** commands.

4.3 General controls

Indicative list of general adjustments and checks to be made:

- Check proper execution of general supplies of the machine (electrical and plumbing);
- Ensure that the **MACHINE OPERATOR** is trained for its use;
- Check that the motors installed on the machine rotate in the correct direction (only for machines equipped with tri-phase power supply motors).

5. USING THE MACHINE (FOR THE USER)

5.1 Checks

Check the quantity of chemical additives present and top-up if necessary as described below:

- Obtain appropriate individual protection gear (gloves for protection from chemical substances, breathing protection masks, goggles etc.) and the new detergent container.
- Turn off the machine.
- Follow the instruction on sections 3.6.

ATTENTION:
The chemical product which is used may be hazardous if touched or inhaled.
Prior to use, carefully read the safety information provided by the detergent supplier and the label applied to the package.

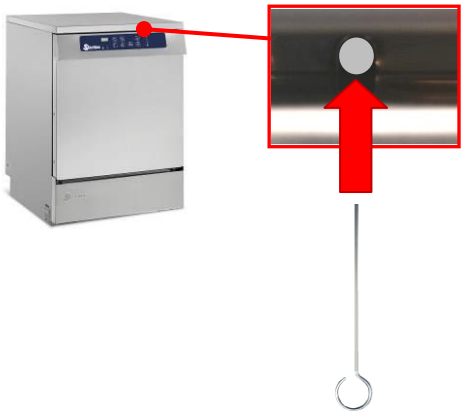
5.2 Opening and closing the door

- The machine is fitted with an electric door lock to prevent it being opened when the machine is running.
- To open the door during a wash cycle, interrupt the cycle and remember that:
  1. The items inside the machine may be very hot.
  2. The entire wash cycle must be repeated.

5.2.1 Door unlocking

In case of power fail or malfunctioning of door lock, it is possible to unlock and open the door by follow the procedure:

1. Identify the hole between the door and the cover panel (see the picture).
2. Insert the dedicated instrument.
3. Keep pushing the dedicated instrument. In this moment the door is unlocked and it is possible to open it.
4. To close the door, keep pushing the dedicate instrument as described on point 3.



	ATTENTION
	After performing the procedure described previously, remember that: • **The items inside the machine could be very hot and contaminated.** • **The entire washing cycle must be repeat.**

5.3 Switching on

Turn on the machine following the procedure:

- Activate the dedicated safety device.
- The control panel starts automatically.
- Check that there are no alarm message. In negative case remove it.

5.4 Preparation

- Place the items to be washed inside the machine and position them carefully on the holder and in the rack.
- Items should not overlap.
- Receptacles should be positioned so that liquids can flow out easily.
- Tall or heavy items should be placed towards the middle of the basket if possible to facilitate washing.
- Make sure that nothing is blocking the arms and that they turn freely.
- Place the load uniformly in the basket.
- Check the patency of hollow instruments prior to their treatment in the machine.

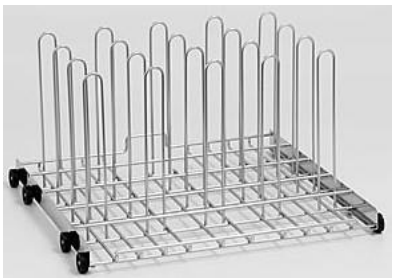
CAUTION

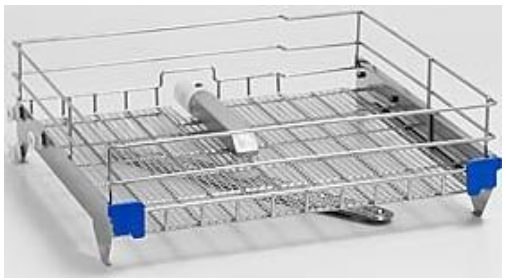
- **The maximum load for each cycle is 20 Kg (basket included).**
- **Never use the machine without basket!!!!**

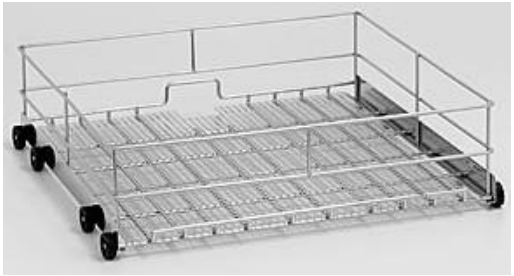
WARNING

Prior to placing instruments in the washer disinfector, remove materials like composite, cement and amalgam following proper protocol an waste management.

Below there are some examples of the basket:







	**WARNING** • **Do never emptying any solid waste into the machine (excrement, toilet paper etc.). This will block the outlet system with pump and destroy the machine.** • **The treatment cycle has to be activated only if the basket is present into the machine or if it is used a basket equipped with an injection system.** • **Non observance, even in part, of the rule here indicated, can cause dangerous leakage of water from the door.**

6. CONTROL PANEL AND SYMBOLS USED

The control panel is illustrated in the diagram. This panel makes the machine easy to use as it indicates the stage of the cycle in progress, the maximum temperature reached during disinfection and fault messages.

6.1 Control panel

Selection of washing cycle and machine start-up are performed by the operator via the machine's control panel.
The control panel includes the following components:

DISPLAY LCD

- Displays the various programmes, stages, temperatures and any machine faults.
- During Wait, the type of programme selected is displayed.
- After pressing Start, the display indicates the temperature of the washing water.
- In the event of a Shutdown, the display indicated the shutdown status and the type of fault.

LED

- There are 11 Led:
- a yellow Start led **(1,** a flashing red led to indicate that disinfection did not take place **(2)**, a green led to indicate a complete cycle **(3)**, three yellow led for indication of the various programme **(4)** and one yellow led for drying switch **(9),** one yellow for the prewashing phase **(5)**, one yellow for the washing phase **(6)**, one yellow for the drying phase **(5)**, and a flashing red led to indicate that there isn't chemical **(8)**.

BUZZER

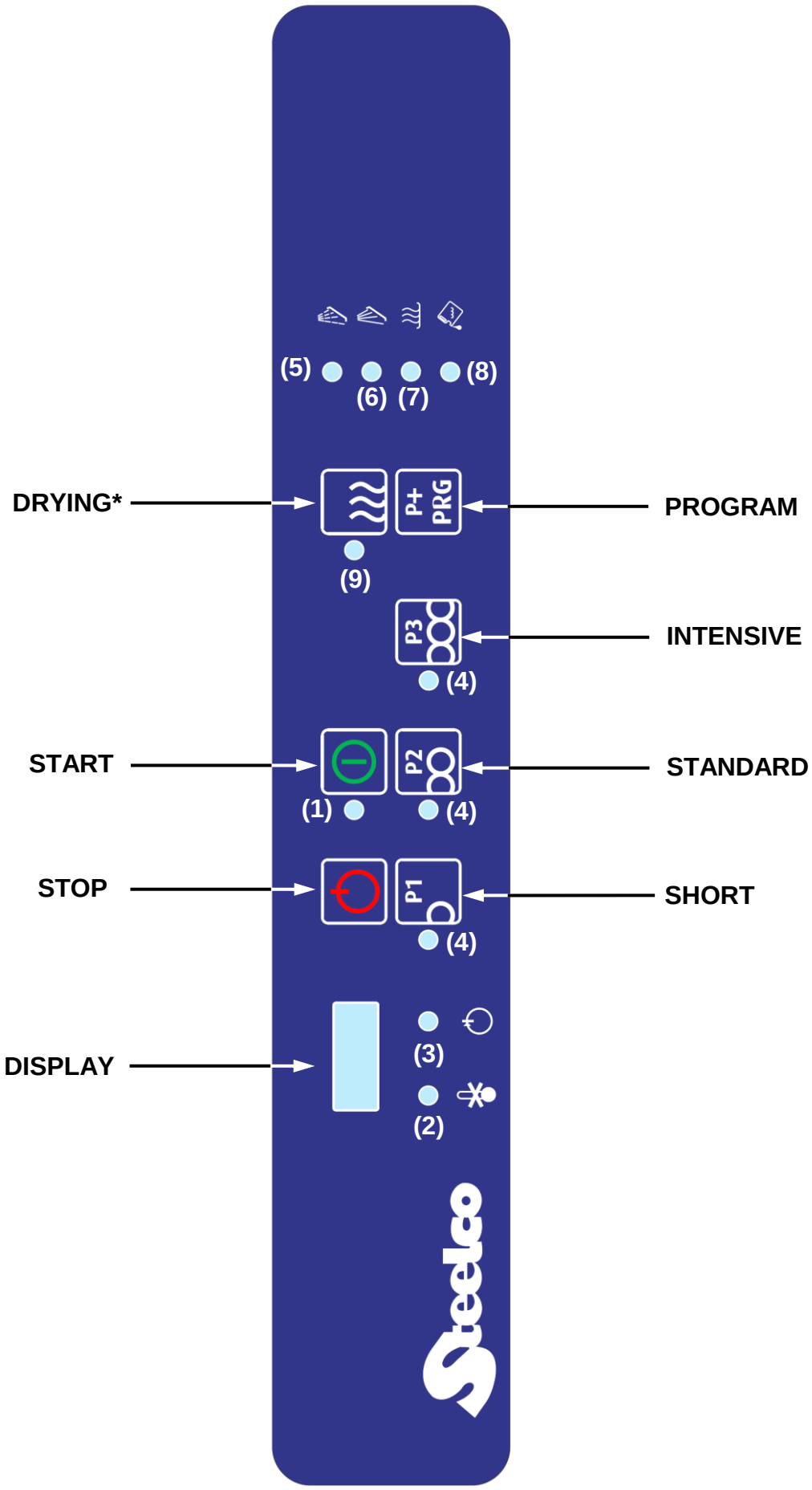
- The buzzer sounds each time a key is pressed and intermittently in the case of a machine Shutdown.

6.2 Switches

Programmes available to the user are the following:

BUTTON		DESCRIPTION
P1		Select **"SHORT"** cycle.
P2		Select **"STANDARD"** cycle.
P3		Select **"INTENSIVE"** cycle.
P+		By pushing button **P+/PRG** you select other programmes; each pressure corresponds to a new programme.
PRG		Keep pressed for five seconds during Wait or Shutdown to display the Menu. The programming menu access is reserved to specialized technician in possession of the password.
START		Select the programme required and press the relative switch to start the cycle.
STOP		This switch interrupts the cycle in progress, the card interrupts the process, displays a message indicating that disinfection did not take place, keeps the door locked and if necessary indicates a high temperature inside the chamber. To return the machine to normal conditions the button must be pressed once more. Press this button to unlock the door at the end of washing cycle.
DRYING*		This switch allows the exclusion of drying phase from selected cycle.
THE ACCESS TO THE PROGRAMMING MODE IS RESTRICTED ONLY TO AUTHORIZED AND SKILLED TECHNICIANS WHICH ARE SUPPLIED WITH THE PASSWORD.		

** As drying it is just intended the machine waits for a set time*


(5)
(6)
(7)
(8)
DRYING*
P+
PRG
PROGRAM
(9)
P3
INTENSIVE
(4)
START
P2
STANDARD
(1)
(4)
STOP
P1
SHORT
(4)
DISPLAY
(3)
(2)

7. WASHING PROGRAMMES

The machine has three main washing programs in according to the necessity:

SHORT PROGRAMME	**P1**	Suitable for lightly soiled items.
STANDARD PROGRAMME	**P2**	Suitable for moderately soiled items.
INTENSIVE PROGRAMME	**P3**	Suitable for heavily soiled items.

The machine has several washing programmes; it is possible to select remaining programmes by pushing **P+/PRG**.

7.1 Pre-programmed cycles

The programs available to the user are as follows:

	PHASE													
PROGRAM	PREWASHING	WASHING									RINSING		THERMODIS.	DRYING
	Water - Tempo	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time Chemical	Water Temp.-Time	Water Temp.-Time	Water Temp.-Time Chemical	Temper. Time
BabyBott.S	COLD - 120 s	WARM 60 °C - 180 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 120 s							DEMI 60 s		DEMI 90 °C - 180 s DOS.3 - 0,5 ‰	120°C 720 s
BabyBott.I	COLD - 120 s	WARM 65 °C - 360 s DOS.1 - 3 ‰	WARM 120 s DOS.2 - 3 ‰	-- 60 °C - 120 s							DEMI 60 s		DEMI 90 °C - 180 s DOS.3 - 0,5 ‰	120°C 1320 s
BGA90x3 St		DEMI 90 °C - 180 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s									DEMI 75 °C - 180 s DOS.3 - 0,5 ‰	120°C 1920 s
BGA90x10 I		DEMI 90 °C - 600 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							DEMI 60 s		DEMI 75 °C - 180 s DOS.3 - 0,5 ‰	120°C 720 s
BLOOD Th.	COLD - 120 s	WARM 60 °C - 180 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							DEMI 60 s		DEMI 90 °C - 180 s DOS.3 - 0,5 ‰	120°C 720 s
BL.Th.Int	COLD - 120 s	WARM 65 °C - 360 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							WARM 60 s	DEMI 60 s	DEMI 90 °C - 600 s DOS.3 - 0,5 ‰	120°C 720 s
SHORT		WARM 50 °C - 180 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s									DEMI 90 °C - 60 s DOS.3 - 0,5 ‰	120°C 720 s
STANDARD	COLD - 120 s	WARM 60 °C - 180 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	WARM 30 s DOS.2 - 3 ‰									DEMI 90 °C - 60 s DOS.3 - 0,5 ‰	120°C 1320 s
INTENSIVE	COLD - 120 s	WARM 65 °C - 360 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							DEMI 60 s		DEMI 90 °C - 60 s DOS.3 - 0,5 ‰	120°C 1320 s
MICROBIOL		DEMI 60 °C - 180 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							DEMI 60 s		DEMI 75 °C - 120 s	120°C 720 s
MICROB.int		DEMI 90 °C - 600 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							WARM 60 s	DEMI 60 s	DEMI 75 °C - 180 s	120°C 720 s
Veget.Oil	COLD - 120 s	DEMI 90 °C - 60 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s							WARM 60 s	DEMI 60 s	DEMI 75 °C - 180 s	120°C 720 s
Miner.Oil		WARM 75 °C - 120 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	DEMI 5 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	-- 90 °C - 600 s DOS.3 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s			WARM 30 s	DEMI 60 s	DEMI 75 °C - 180 s	120°C 720 s
SPECIAL		WARM 80 °C - 120 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	DEMI 90 °C - 180 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s				WARM 60 s	DEMI 60 s	DEMI 75 °C - 30 s	120°C 720 s
PetrolFuel		DEMI 5 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	-- 90 °C - 600 s DOS.3 - 3 ‰	DEMI 5 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	-- 90 °C - 600 s DOS.3 - 3 ‰	DEMI 5 s DOS.1 - 3 ‰ DOS.4 - 3 ‰	-- 90 °C - 600 s DOS.3 - 3 ‰	WARM 60 °C - 90 s DOS.2 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s	WARM 60 s		DEMI 75 °C - 180 s	120°C 720 s
STANDARD75	COLD - 120 s	WARM 75 °C - 120 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s								DEMI 60 s	DEMI 75 °C - 180 s	120°C 720 s
CHEM. DISI		WARM 60 °C - 120 s DOS.1 - 3 ‰	WARM 30 s DOS.2 - 3 ‰	-- 60 °C - 60 s	WARM 30 s	WARM 60°C - 300 s DOS.4 - 3 ‰							DEMI 60 °C - 60 s	120°C 720 s
ENZYMATIC	COLD - 120 s	WARM 35 °C - 180 s	-- 60 °C - 360 s DOS.1 - 3 ‰	DEMI 60 °C - 60 s									DEMI 70 °C - 180 s DOS.4 - 0,5 ‰	120°C 720 s
DRYING														120°C 720 s
PREWASH	COLD - 120 s													

DOSING PUMP	CHEMICAL PRODUCT
DOS. 1	ALKALINE or NEUTRAL DETERGENT
DOS. 2	ACID or NEUTRALIZER
DOS. 3	LUBRICANT or RINSE AID - NO FOAM
DOS. 4	SODA or DISINFECTANT

8. MACHINE STATUS

8.1 Wait

The machine is ready to start a cycle.
The diagnostics are active.
If necessary the display indicates that the door is open or gives warning messages:
no detergent, no lime-scale remover, memory full (historic data) or high temperature inside chamber.

8.2 Cycle

Cycle mode is entered by pressing the **START** key, this command is only accepted if the machine is in wait mode and the door is closed.
The cycle carries out the foreseen stages.
The diagnostics and regulators are active.
The user interface gives information concerning the stage in progress.

8.3 Shutdown

The diagnostics have detected a fault that causes the machine to shutdown, the cycle is suspended and the door remains locked.
The fault is indicated on the display and the user interface is ready for the door release sequence and the Reset procedure to restore the machine to Wait (see reset procedure).

9. SPECIAL FEATURES

9.1 Power failure

When tension is restored after a power failure during Preparing, Wait or Shutdown, the card returns to the previous programme.
When tension is restored following a power failure with a cycle in progress, the card shuts down the machine (power failure), indicates that the cycle has been interrupted and waits for the reset procedure to be carried out.

9.2 Reset procedure

In the event of a Shutdown or when the stop key is pressed with a cycle in progress, the door remains locked.
To open the door the door release sequence must be carried out from the keyboard as follows:

1. Press the **STOP**  and **START**  switch together and keep pressed for 5".
2. Display indicating switch procedure.
3. Press the programme switch **P2**  followed by the program switch **P1**  .
4. The machine is reset and returns to standby.

N.B.:
If the machine shutdown persists due to a fault in one of its components (e.g.: faulty probe, unsuitable levels, etc.), the door is released and the machine remains inactive.
Seek technical assistance.

10. WORK PROCEDURES

10.1 Introduction

The machine was constructed only for washing and thermal disinfection of orthodontic and medical instruments, trays and objects normally used in orthodontic studios, hospital wards, assisted living centres, and so forth.
It is therefore subject to constant contact with aggressive detergents and with contaminated instruments.
For this reason it is necessary to provide some useful instructions for the operators who will be using it.

10.2 Instructions to personnel

The machine operator, in normal operating conditions, is not subject to risks if he works safely using suitable means of protection.
In order to work safely the operator must:

- Carefully comply with the instructions set forth in this manual.
- Use safety devices appropriately and with care, as well as group and individual safety gear provided in the workplace.
- Personally take action, or inform appropriate persons in the event of deficiencies in the aforementioned devices and means, as well as any hazardous conditions which he may become aware of, taking action directly in urgent cases within their scope of responsibilities and abilities to eliminate or reduce the deficiencies or hazards.

The maintenance technicians, in normal operating conditions, are not subject to risks if they work safely using suitable means of protection.
In order to work safely the maintenance technician must:

- Carefully comply with the instructions set forth in this manual.
- Use safety devices appropriately and with care, as well as group and individual safety gear provided in the workplace.
- Use special care in making repairs or replacing mechanical parts (e.g. drain pump, etc.) on malfunctioning machines which have not completed the thermal disinfection cycle.

10.3 Decontamination procedures

When making repairs or replacing mechanical parts (e.g. drain pump, heating element, etc.) on malfunctioning machines that have not completed the thermal disinfection cycle, before undertaking any sort of maintenance on the internal parts of the machine, the disinfection procedure must be carried out in order to eliminate any pathogenic residues and protect operators who come into contact with the machine from the risk of infection.

The decontamination procedure must be performed by the system operator, who must be equipped with all provided individual protection gear.

MACHINE STATUS:
The machine must not be powered electrically and the dedicated disconnected device must be in the OFF position.
The person performing the task must ensure that there is no-one around the machine during this operation.

SAFETY SYSTEMS TO BE ADOPTED:
The operation must be carried out in compliance with standards governing the use of disinfectant substances used (see technical information for the product being used, provided by the manufacturer), in compliance with standards concerning contact with parts of the machine which may be contaminated by pathogenic materials and with use of individual protection gear.

MODE OF INTERVENTION:
If possible, dry run a cycle for thermal disinfection of the wash chamber.
Open the wash chamber door and spray evenly with a suitable disinfectant.
Cover all internal parts as well as any basket and the instruments it may contain.
Wait for the amount of time required for disinfection (see technical information for the disinfectant product).
When performing maintenance on parts of the machine which have not been reached by the disinfectant, take appropriate precautions and use suitable safety gear.

11. MENU

11.1 Accessing the menu

To enter the menu keep the **PRG** key pressed for five seconds .
Press **PRG** programme switch to scroll through the menu:

Par – Clo – Prn – Era – Ser - UrC

Press **START** to confirm selection, press **STOP** to exit the menu and return to Wait or Shutdown mode.

ACTION	PHASE	DISPLAY
KEYS SEQUENCE TO ENTER INTO PARAMETER MENU		
Press **PRG** for 5 seconds		**P a r**
Press **START**	Select **PASSWORD** "**XXX**" using the **P1** and **P2** button	**P A S**
If an incorrect password is entered the menu is closed immediately.		
Press **P1**	Insert the **PASSWORD**	
Press **START**	Modify with **P1** and **P2**	**Value**
KEYS SEQUENCE FOR TIME REGULATION		
Press **PRG** for 5 seconds		**P a r**
Scroll the menù with the **PRG** button until to display the program **CLo**		**C L O**
Press **START**	Modify with **P1** and **P2**	Input day
Press **START**	Modify with **P1** and **P2**	Input month
Press **START**	Modify with **P1** and **P2**	Input year
Press **START**	Modify with **P1** and **P2**	Input hour
Press **START**	Modify with **P1** and **P2**	Input minutes
Push **START** to go out from regulation		
KEYS SEQUENCE FOR PRINTING HISTORICAL DATAS		
Press **PRG** for 5 seconds		**P a r**
Scroll the menù with the **PRG** button until to display the program **Prn**		**P r n**
Press **START**	All memorized cycles are printing	Automatic exit from programming phase
KEYS SEQUENCE TO DELETE ALL HISTORICAL EVENTS		
Press **PRG** for 5 seconds		**P a r**
Scroll the menù with the **PRG** button until to display the program **Era**		**E r a**
Press **START**	Select **PASSWORD** "**XXX**" using the **P1** and **P2** button	**P A S**
If an incorrect password is entered the menu is closed immediately.		
Press **P1**	Insert the **PASSWORD**	
Press **START**	Confirm to delete the historical.	
KEYS SEQUENCE FOR MACHINE WORKING HOURS VISUALIZATION		

Press **PRG** for 5 seconds		**P a r**
Scroll the menù with the **PRG** button until to display the program **SEr**		**S E r**
Press **START**	The machine displays the working hours	**Value**

KEYS SEQUENCE FOR USER CYCLES PROGRAMMATION		
Press **PRG** for 5 seconds		**P a r**
Scroll the menù with the **PRG** button until to display the program **Urc**		**U r C**
Press **START**	With **P1** and **P2** scroll the 5 user's cycles	**U r 1 ÷ U r 5**
Press **START**	With **P1** and **P2** scroll the 7 phases of the selected cycle	**E n, P h 1 ÷ P h 7**

Description of various phases:			
Press **START**	**E n**	Enable the washing cycle	All led of various phases are lit
	P h 1	Enable prewashing phase	Led of prewashing phase is lit
	P h 2 ÷ P h 6	Enable washing phase	Led of washing phase is lit
	P h 7	Enable drying phase	Led of drying phase is lit

Press **START**	Visualization the parameters of phase selected	

PARAMETER LIST OF PREWASHING PHASE:		
Press **P1** and **P2** to modify of parameter and press **START** to confirm the modification.	**En**	Enable of phase
	SEc	Phase duration in seconds (0÷599 sec. After 600 seconds it is possible to set the minutes → 10÷99 min)
	H20	Water type used:
		0 = no water
		1 = cold water
		2 = demi water
	rin	Duration of rinsing phase in seconds (0=not activated)

PARAMETER LIST OF WASHING PHASE:		
Press **P1** and **P2** to modify of parameter and press **START** to confirm the modification.	**En**	Enable of phase
	SEc	Phase duration in seconds (0÷599 sec. After 600 seconds it is possible to set the minutes → 10÷99 min)
	H20	Water type used:
		0 = no water
		1 = cold water+warm water (mixed filling)
		2 = demi water
		3 = warm water+cold water (mixed filling)
	°C	Washing chamber temperature
	Ch1	Amount of chemical 1 (dosing pump 1: seconds or pulses)
	Ch2	Amount of chemical 2 (dosing pump 2: seconds)
	Ch3	Amount of chemical 3 (dosing pump 3: seconds or pulses)
	rin	Duration of rinsing phase in seconds (0=not activated)

PARAMETER LIST OF DRYING PHASE:		
Press **P1** and **P2** to modify of parameter and press **START** to confirm the modification.	**En**	Enable of phase
	Lo '	Duration of low speed phase in minutes
	Hi '	Duration of high speed phase in minutes

**As drying it is just intended the machine waits for a set time*

11.2 Parameters settings

ACTION	PHASE	DISPLAY
KEYS SEQUENCE TO ENTER INTO PARAMETER MENU		
Press **PRG** for 5 seconds		**P a r**
Press **START**	Select **PASSWORD** "**XXX**" using the **P1** and **P2** button	**P A S**
If an incorrect password is entered the menu is closed immediately.		
Press **P1**	Insert the **PASSWORD**	
Press **START**	Modify with **P1** and **P2**	**Value**
Press **STOP** to exit the parameters page		

WARNING:
It is allowed to enter into planning menu to authorised technician, with password only.
The password must be requested from the manufacturer.

PAR. NR.	PARAMETER DESCRIPTION v.6.09	UNIT	NOTE	RANGE
P03	Waiting time after warm water and neutral detergent loading and before pump fractionary	Sec.		0-999
P05	Maximum time of heating elements functioning (Diagnostic)	Min.		0-99
P06	Maximum waiting drain time during water loading (Diagnostic)	Sec.		0-999
P07	Washing time at temperature P59 value for Pr1 (50°C)	Sec.		0-999
P08	Clear water rinsing time (Pr4)	Sec.		0-99
P09	Loading time of alkaline detergent for filling up pipe	Sec.		0-999
P10	Loading time of acid detergent for filling up pipe	Sec.		0-999
P11	Maximum waiting time in lock door (Diagnostic)	Sec.		0-99
P14	Maximum waiting time in warm and cold water loading (Diagnostic)	Sec.		0-999
P15	Maximum waiting time of drain (Diagnostic)	Sec.		0-99
P17	Regeneration time (water softener built-in)	Sec.		0-999
P19	Water loading time during regeneration (water softener built-in)	Sec.		0-999
P20	Cold water loading time during regeneration time	Sec.		0-999
P22	Disinfection temperature (Pr1, Pr2, Pr3, Pr4)	°C		0-93
P23	Wash temperature with acid phase	°C		0-85
P25	Rinse temperature with demineralized water (Pr4, Pr5)	°C		0-85
P26	Washing time at temperature P33 value for Pr2 (60°C)	Sec.		0-999
P29	Draining time	Sec.		0-99
P30	Washing time at temperature P23 value for acid phase (60°C)	Sec		0-999
P31	Demineralized water rinsing time (Pr3, Pr4, Pr5)	Sec.		0-999
P32	Warm water first washing time at temperature P60 value for Pr5 (75°C)	Sec.		0-999
P33	Washing temperature (Pr2)	°C		0-85
P35	Minimum temperature for inlet chemical 1 (dosing enable)	°C		0-85
P36	Minimum temperature for inlet chemical 2 or 3 (dosing enable)	°C		0-85
P37	Drying first speed	Min.		0-99
P38	Drying second speed	Min.		0-99

PAR. NR.	PARAMETER DESCRIPTION v.6.09	UNIT	NOTE	RANGE
P39	Flowmeter 1 impulses number	Num.		0-999
P40	Flowmeter 2 impulses number	Num.		0-999
P41	Flowmeter 1 impulses number on test	Num.		0-999
P42	Flowmeter 2 impulses number on test	Num.		0-999
P46	Washing temperature (Pr3)	°C		0-85
P47	Washing time at temperature P46 value for Pr3 (65°C)	Sec		0-999
P51	Cold washing time, 1° and 2° neutral phase	Sec.		0-999
P54	Disinfection time at temperature P22 value for Pr1, Pr2, Pr3, Pr4 (90°C)	Sec.		0-999
P59	First wash temperature for Pr1 cycle	°C		0-85
P60	First wash temperature for Pr5 cycle	°C		0-85
P63	Loading time of lubricant for filling up pipe	Sec.		0-999
P64	Prewashing time (Pr2, Pr3, Pr4, Pr5)	Sec.		0-999
P66	Neutral acid detergent loading time (Flowmeter)	Sec.		0-999
P67	Alkaline detergent loading time (Flowmeter)	Sec.		0-999
P68	Lubricant loading time	Sec.		0-300
P69	Time on heating element during resistive drying	Sec.		0-5
P70	Time off heating element during resistive drying	Sec.		30-999
P71	Number of impulses for resistive drying	Num.		0-999
P72	Temperature to activate drain cooling	°C		0-99
P73	On/off neutral phase 0= Disable the neutralizing phase 1= Enable the neutralizing phase	Sel.		0-1
P74	Maximum waiting time in demineralize water loading (Diagnostic)	Sec.		0-999
P75	Wash pump waiting time during fractionary (in neutral. phase)	Sec		0-99
P76	Lime-scale value: 10: regeneration every 40 cycles, 20: regeneration every 25 cycles 30: regeneration every 18 cycles 40: regeneration every 12 cycles 50: regeneration every 6 cycles 60: regeneration each cycle	Num.		10-60
P77	Temperature probes configuration: 0= N°1 probe on main board. 1= N°1 probe on main board and N°1 probe on expansion board. 2= N° 2 probes on main board.	Sel.		0-2
P78	Neutral doser selection: 0= no present 1= present	Sel.		0-1
P79	Maximum temperature difference between control and recording probe values (Diagnostic)	°C		0-99
P80	Lubricant or rinse-aid doser selection: 0= no present 1= present	Sel.		0-1
P81	UL visualization.	Sel.		0-1
P88	Chemical block selection: 0=no block in case of chemical lack 1=no possibility to make cycle in case of chemical lack	Sel.		0-1

PAR. NR.	PARAMETER DESCRIPTION v.6.09	UNIT	NOTE	RANGE
P89	Number of regeneration to load salt	Num.		1-18
P90	Demi water connection selection: 0=Present 1=Not present	Sel.		0-1
P91	2nd dosing pump selection: 0=acid chemical 1=rinse-aid/lubricant	Sel.		0-1
P92	Time lag in opening	Sec.		0-100
P93	Time lag in closing	Sec.		0-100
P94	Drain cooling activation	Sel.		0-1
P95	Printer selection: 0= Disable printer 1= Enable printer	Sel.		0-1
P96	Dryer Type: 0= Disable dryer 1= Enable dryer selected for the cycle 2= Enable dryer unselected for the cycle	Sel.		0-2
P97	Temperature limit over which starts the steam condenser cycle during thermodisinfection	°C		0-99
P98	Time ON steam condenser cycle during thermodisinfection (relay 27)	Sec.		0-99
P99	Time OFF steam condenser cycle during thermodisinfection (relay 27)	Sec.		0-99
H00	P1 button program selection : 0=Pr1; 1=Pr2; 2=Pr3; 3=Pr4; 4=Pr5 ; 5=Us1; 6=Us2; 7=Us3; 8=Us4; 9=Us5	Sel.		0-9
H01	P2 button program selection : 0=Pr1; 1=Pr2; 2=Pr3; 3=Pr4; 4=Pr5 ; 5=Us1; 6=Us2; 7=Us3; 8=Us4; 9=Us5	Sel.		0-9
H02	P3 button program selection : 0=Pr1; 1=Pr2; 2=Pr3; 3=Pr4; 4=Pr5 ; 5=Us1; 6=Us2; 7=Us3; 8=Us4; 9=Us5	Sel.		0-9
H05	Pump OFF time during fractionary	Sec.		0-99
H06	Pump ON time during fractionary	Sec.		0-99
H07	Dosing pump 1 control: 0=Pressure switch 1=Flowmeter	Sel.		0-1
H08	Dosing pump 2 control: 0=Pressure switch 1=Flowmeter	Sel.		0-1
H09	Pump pressure switch selection: 0=Pump pressure switch disabled 1=Pump pressure switch enabled (if present)	Sel.		0-1
H10	Third dosing pump presence: 0=Not present 1=Present	Sel.		0-1
H11	Fan alarm diagnostic time during the second drying phase	Sel.		0-99

**As drying it is just intended the machine waits for a set time*

11.3 Details of the electronic card

The electronic card was designed for the control of the type of machine described below.
Any use other than that specified above.
The electronic card was designed following the indications given in the standards below:

EN 60335	Low voltage
EN 61000-6-3	Emissions
EN 61000-6-1	Immunity

11.4 Features of master card

The electronic card installed in your machine is composed, in its basic version, of the following components.

SERIAL INTERFACE

Com1:
Low voltage bus bar for two-way communication with the keyboard card.
Com2:
Asynchronous serial interface type RS 232 foreseen for connection to PC or printer.

11.5 Input and output

WARNING

For input and output's specification see the wiring diagram.

12. CLOCK

- The card has a real-time clock.
- Time readings are also used when recording historical data.

13. PC INTERFACE

The card has a communication channel RS 232 with Modbus protocol.
The channel can be used to access the historical data records file by setting the printer as follows:

- **baud rate: 2400 baud, X ON X OFF**
- **data bits: 8 bits,**
- **parity: none.**

14. HISTORICAL DATA

During the working cycle, the machine memorizes on a card all the working data of the wash cycles that have been performed.

- The card is able to record the fields described below for up to a max. of 400 cycles in the permanent memory. The fields given in the example below are recorded for each cycle:

DATE	START TIME	PROGRAMME	MAX °C	HOLD>85°C	FAULTS
	12.00	Short	93 °C	60 seconds	01
	13.05	Standard	94 °C	180 seconds	01

- When 95% of the memory is full the dump memory message appears on the display.
  To remove the message it is necessary to print the historical.
- The various causes for machine shutdowns are indicated in the **FAULTS** section, the faults are identified by numbers as shown below.

15. ALARMS AND EVENTS LIST

15.1 Logical description of alarm interventions

During machine operation, the operator is aided by **ALARMS** or **ALARM MESSAGES** which make use of visual signals on the operator display panel to advise him of possible anomalies in progress and machine alarms which have intervened.
Intervention of an **ALARM** during operation of the system is signalled to the operator by a message on the operator panel.
The alarm which appears on the panel remains active until the cause of intervention is removed.
The intervention of an alarm stops the wash cycle currently in progress.

15.2 List of alarm messages

Possible alarms which may intervene during a work cycle are shown on the control panel display.
The message includes the number of the alarm that has intervened and its name.
A complete list of possible alarm messages follows.

ALLARM	DESCRIPTION
Er0	Power fail
Er2	No disinfection
Er3	Unblocked door
Er4	Open door
Er5	No water
Er6	Faulty heating element
Er7	Faulty tank probe
Er8	Faulty control tank probe
Er9	Faulty tank probe 2
Er10	Drain pump problem
Er12	No demi water
Er13	Can serial
Er14	Pump pressure switch problem
Er15	Fan lock
Er16	Chemical n°1 lack
Er17	Chemical n°2 lack
Er18	Chemical n°3 lack

ASSISTANCE:
IF A NORMAL FUNCTIONING OF THE MACHINE IS NOT ACHIEVED, EVEN AFTER INTERVENTIONS OF ORDINARY MAINTENANCE, GET IN TOUCH WITH OUR SERVICE ASSISTANCE STATING THAT KIND OF THE DEFECT, THE MODEL AND THE SERIAL NUMBER OF THE MACHINE.

16. MAINTENANCE

16.1 General recommendations on maintenance

The machine was constructed only for washing and thermal disinfection of orthodontic instruments, trays and objects normally used in orthodontic studios, hospital wards, assisted living centres, and so forth.
It is therefore subject to constant contact with aggressive detergents and with contaminated instruments.
For this reason it is necessary to provide some useful instructions for the operators who will be performing maintenance on it.

The maintenance technicians, in normal operating conditions, are not subject to risks if they work safely using suitable means of protection.
In order to work safely the maintenance technician must:

- Carefully comply with the instructions set forth in this manual.
- Use safety devices appropriately and with care, as well as group and individual safety gear provided in the workplace.
- Use special care in making repairs or replacing mechanical parts (e.g. drain pump, etc.) on malfunctioning machines which have not completed the thermal disinfection cycle.

Maintenance operations for the machine described in this manual can be divided into "**Routine Maintenance**" and "**Special Maintenance**".

GENERAL GUIDELINES

MACHINE STATUS:
The machine must not be powered electrically and the dedicated safety device must be in the OFF position.
Person performing the task must ensure that there is no-one around the machine during this operation.

SAFETY SYSTEMS TO BE ADOPTED:
The operation must be carried out in compliance with standards governing the use of disinfectant substances used (see technical information for the product being used), in compliance with standards concerning contact with parts of the machine which may be contaminated by pathogenic materials and with use of individual protection gear.

16.2 Procedure for routine maintenance work

Routine maintenance includes all operations aimed at keeping various parts of the machine clean and functional.
They must be performed on a regular basis (see table in paragraph 16.3) or when considered necessary due to incorrect performance of washing cycle.

Since these are simple cleaning operations, they are normally performed by the machine operator on his own liability.

16.3 Table of routine maintenance tasks

The following table shows the various routine maintenance tasks, their frequency, who is to perform them and the reference to the specific intervention form.
Each single task is more fully explained in the single reference forms.

Even if the water supply is relatively soft, the high temperature can cause the formation of residues which may create problems with the heating element, compromising the correct wash cycle and the reaching of the disinfection temperature.
For these reasons it is advisable to carry out regular cleaning as described below.

TABLE OF ROUTINE MAINTENANCE TASKS

DS 500 C - DS 500 CD - DS 500 SC - DS 500 SCD

Programmed maintenance scheme

Components	Step	months							Activity	WORKER	TIME	REFERENCE
	make every.....	3	6	9	12	15	18	24				
Chamber filters	make every day								Take off filters and cleaning.	Ac	10'	M1
Water solenoid filter	make every.....		x				x		Check, clean and if necessary replace.	Is	10'	M4
Temperature probes	make every.....		x		x			x	During periodic validation, check the sensor status.	Is	60'	M2
Safety thermostat	make every.....		x		x			x	Verify the sensor.	Is	5'	M2
Chemical flowmeters (if present)	make every.....		x		x			x	Open the flowmeter and clean the inner side. If it stays inactive for more that 15 days, make and inner cleaning before using.	Is	10'	
Chemical dosing pump	make every.....	x	x		x		x		Check the membrane pipe and the presence of lack.	Is	5'	M6
Inner pipe and connection pipe of dosing pump	make every.....	x	x		x			x	Replace.	Is	12'	M6
Chemical tank level sensor	make every.....		x		x		x		Check and clean the suction filter.	Is	4'	
Connection pipe of dosing pump	make every.....		x		x		x		Check of crashing, any lacks or hardening.	Is	10'	
Washing arms	every week								Check for free rotation. Open the cleaning caps and wash inside: check and in case cleaning the nozzle.	Ac	30'	M3
Door gasket	make every.....		x		x		x		Verify the gasket .	Ac	5'	
									Replace after 1000 cycles.	Is	20'	
Washing pumps	make every...				x			x	Check for water leacks from the arm seal.	Is	5'	
Water heating element	make every...				x			x	Check for water leacks fro the gasket.	Is	1'	
Water solenoid valves	make every...				x			x	Check for any leaks, if necessary remove and clean the membrane seat.	Is	3'	
Drain pump	make every...				x			x	Check for any leaks, if necessary remove and clean the membrane seat.	Is	3'	
Pressure switches	make every...				x			x	Operation is checked by the control system. In case of defect of control system of water levels, go on by empting the tank, blowing inside the black pipe connected to the pressure switch, in oder to free from obstructions.	Is	10'	
Pipe of unloading water	make every...				x			x	Check the situation of pipe and the seal.	Is	3'	
Pipes of loading water	make every...				x			x	Check the situation of pipe and the seal.	Is	3'	

***Is** = Installation and repair technician - **As** = Responsible authority for the machine in the workplace - **Ac** = Machine operator*

N.B.:

Routine maintenance tasks must be performed at the intervals set forth in the table.
It is however advisable to carry out single cleaning tasks anytime you feel they may be necessary.

In case the machine requires the replacement of one or more components, please refer to the manufacturer's spare part list.	
⇨	**It is advisable to carry out a general check-up and to clean the appliance regularly, particularly if the supply water is very hard.**
⇨	**Particular attention should be paid to heating element and the probe of thermostats.**

WARNING

- Do not clean the machine outside with high pressure water.
- Please contact the retailer that supplies your cleaning products for details of recommended methods and products for sanitizing the machine regularly.
- The machine has a safety thermostat that shuts down the power supply to the heating elements in the event of overheating.
- Before turning the machine back on, you will need to eliminate the problem and wait for the temperature to drop back below operating levels.

To re-start the appliance the fault that caused overheating must be corrected.

Every 12 months

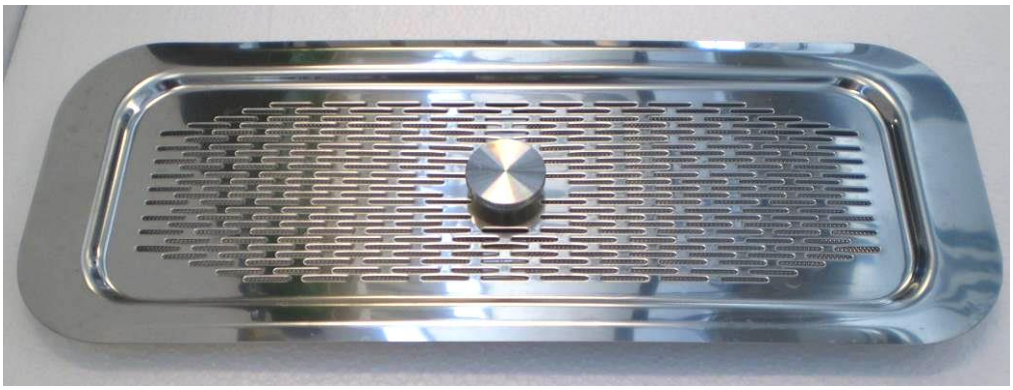
- Clean the diaphragms of solenoid valves and replace if necessary;
- Clean the thermostat probe.
- Change the membrane pipe inside dosing pump

Even if the supply water is soft, the high working temperatures may cause limescale to build-up.
Apart from damaging the resistors, lime-scale can also clog the nozzles in which case the correct tank temperature for thermodisinfection may not be reached.

WARNING

IT IS NECESSARY TO MAKE A MAINTENANCE AT REGULAR INTERVALS, THIS MEANS EVERY 3 MONTHS, IN ORDER TO GUARANTEE THE PERFECT FUNCTIONING OF PUMPS DOSING CHEMICAL PRODUCTS.

CLEANING OF WASHING CHAMBER DRAIN FILTERS		
M1	Worker: **Ac**	Frequency of Intervention: **every day**
METHOD OF INTERVENTION: clean the washing chamber drain filters in the following manner:		
• Open the washing chamber door and extract the basket. • Extract the drain water filtering assembly from the chamber.		
		
• Unscrew the threaded pin and remove the cover of the drain water filter basket.		



- Clean the drain water filter basket. Remove residues deposited during various washing cycles.
- Remove and clean any deposits and incrustations from the washing chamber drain.

- Replace the clean filter on the washing chamber drain.
- Put the cover for the drain water filter back in place. Lock it in position with the threaded pin.
- Put the drain water filter group back in the wash chamber.

CLEANING OF WASH CHAMBER THERMOSTAT PROBE		
M2	Worker: **Is**	Frequency of Intervention: **6 months**

METHOD OF INTERVENTION: clean the wash chamber thermostat probe in the following manner:

- Open the wash chamber door and extract the basket.
- Check the wash chamber thermostat probe and clean it of any deposits or lime incrustations using a damp cloth and an appropriate detergent.

Take care not to damage or move the probe.

CLEANING OF WASHING ROTORS

M3	Worker: **Ac**	Frequency of Intervention: **every week**

METHOD OF INTERVENTION: clean the washing rotors as follows:

- Open the washing chamber door and extract the basket.
- Unscrew the fastening pin of the two rotors and extract them from the chamber.

- Unscrew the closure plug of the rear part of the nozzle and remove it.

- Carefully cleaned and remove any incrustations from the washing rotor nozzles using appropriate detergents.
- Put the plugs back in place at the ends of the washing arms.
  Make sure the gasket is properly positioned and in good condition.
  Replace it if necessary.
- Put the rotors back on the machine.
- Lock them in place with the previously removed fastening pin.

CLEANING AND CHECKING WASH CHAMBER INSTRUMENTATION

	Worker: **Ac**	Frequency of Intervention: **Once a week or when it is necessary**

METHOD OF INTERVENTION:

Carry out an empty washing cycle with a basket present so as to carry out the disinfection process inside the washing chamber. This will guarantee a complete disinfection of the washing chamber, the basket and the hydraulic circuits.

In case it is not possible to carry out an empty washing cycle, it is advisable to proceed with the disinfection of the machine as described below:

- Open the access door to the chamber and check that no equipment, trays, or instruments have been left on the washing basket.
- Inside the washing chamber, evenly spray a disinfectant that is both compatible to be used on stainless steel surfaces and which contains the following active ingredients:
  - quaternary ammonium salts
    or
  - chlorhexidine digluconate – ammonium chloride – isopropyl or ethyl alcohol
- All internal parts must be treated by this operation.

The approved STEELCO product for cleaning and disinfection of the chamber is called "STEELCO Surface Cleaner Disinfectant".

ATTENTION

As regards the contact time and the methods of use of the disinfectant used, please comply with the instructions given on the technical data sheet of the product itself.

Always check the compatibility of the chemical product with the materials it will be used on; this information can be found on the technical data sheet of the chemical product used.

The application of the disinfectant inside the chamber must be carried out when the surfaces are cold in order to avoid harmful fumes coming from the product being inhaled.

It is advisable to contact your cleaning products dealer to obtain detailed instructions relating to the periodic disinfection of the machine.

CLEANING THE EXTERNAL BODY OF THE MACHINE

	Worker: **Ac**	Frequency of Intervention: **every day**

METHOD OF CLEANING OUTER BODY

Use a damp cloth to clean the outer body of the machine.
Use only neutral detergents.
Do not use abrasive detergents or solvents and/or thinners of any kind.

METHOD OF CLEANING MARKING LABEL

Use a damp cloth to clean the marking label surface. Use only water or isopropyl alcohol.
Do not use abrasive detergents or solvents and/or thinners of any kind.

METHOD OF CLEANING CONTROL PANEL

Clean the control panel using only a soft cloth dampened with a product for the cleaning of plastic materials.

LIMESCALE REMOVAL TREATMENT

	Worker: **Ac**	Frequency of Intervention: **whenever necessary**

METHOD OF INTERVENTION:

Use a descaling agent (we recommend vinegar) during an empty washing cycle with cold water (this is usually carried out every week unless the quality of the water requires a daily treatment in order to prevent the build-up of limescale and the blockage of the water jets).
As regards the quantity of the product to use, please comply with the instructions given on the technical data sheet of the product itself. In case vinegar is used, use 0.5 litres.
The descaling product must be poured into a container of the same size, positioned on an empty loading basket.
Use a washing programme with water at room temperature, without activating the drying cycle.

ATTENTION

Even if the feed water only contains a small amount of limescale, high temperatures can generate the formation of limescale residues. This, as well as problems that could be caused to the heating element, may cause the blockage of the nozzles, jeopardising the correct washing process and preventing the ideal disinfection temperature in the tank to be reached.

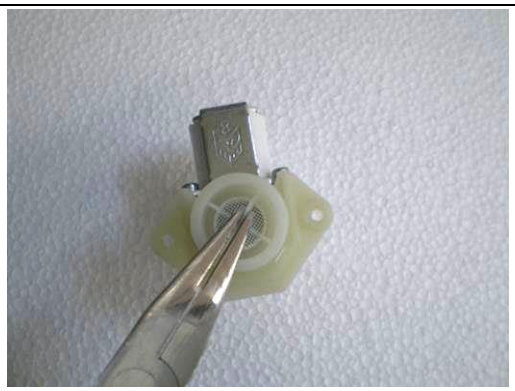
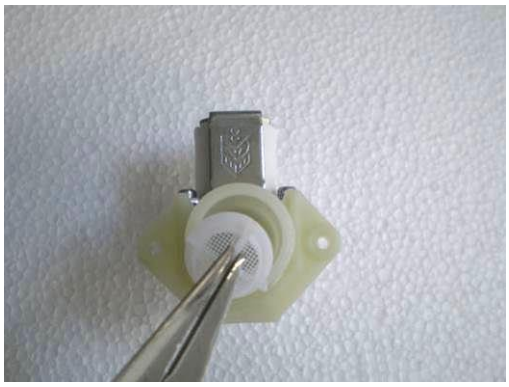
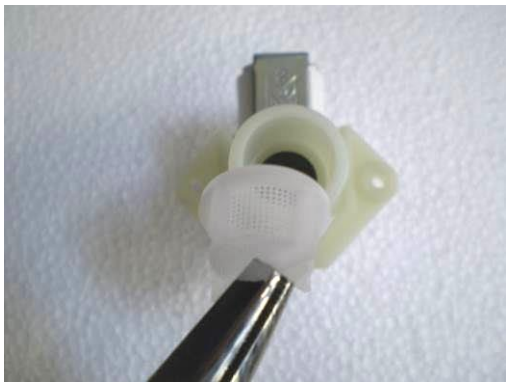
16.4 Procedure for special maintenance work

All special maintenance work is to be performed only by qualified, skilled personnel.

A table is shown below which includes possible special maintenance work that may be required.
If your machine should require special maintenance, please contact your retailer/distributor.

16.5 Table of special maintenance tasks

See scheduled maintenance form table.

<table>
<tr><th colspan="3">CLEANING OF COLD EATER INLET FILTERS</th></tr>
<tr><td>M4</td><td>Worker: Is</td><td>Frequency of Intervention: 6 months or when necessary</td></tr>
<tr><td colspan="3">METHOD OF INTERVENTION: clean (or replace) the filter on the cold water supply tube as described below:</td></tr>
<tr><td colspan="3">• Close the water supply tap.
• Loosen and completely unscrew the water supply pipe.
• Remove the filter located inside the water supply pipe fitting and clean it, removing any incrustation or deposits by immersing it in a container of water, or in appropriate lime removal products if required.</td></tr>
<tr><td colspan="3">  
   </td></tr>
</table>

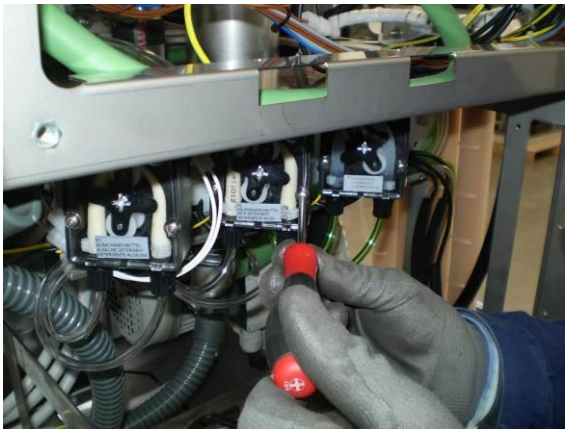
REPLACEMENT THE MEMBRANE PIPE OF DISPENSING PUMP

M6	Worker: **Is**	Frequency of Intervention: **from 3 to 6 months**

METHOD OF INTERVENTION: replace the membrane pipe of dispensing pump for chemical products as described below:

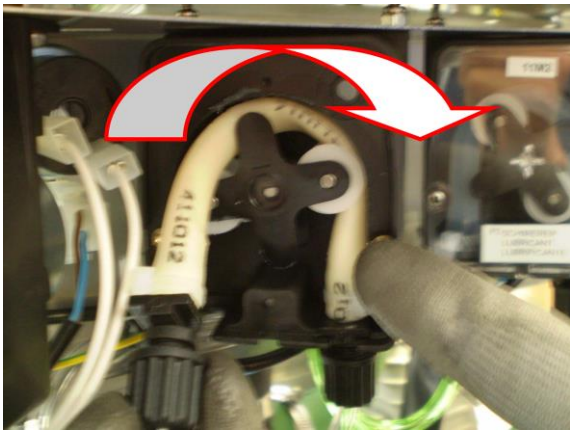
1. Remove the closure panel of the machine by removing the screws.

2. Access the chemical product pump. Use a tool to remove the protective mask of the rotor.



3. Extract the membrane pipe from the dispensing pump.

4. Turn the rotor manually, clockwise, until the membrane pipe is fully extracted from the dispensing pump.



ATTENTION: the rotor of dispensing pump turns ONLY clockwise !!!

5. Place the membrane pipe in vertical position to help the flow of chemical product from membrane tube to chemical circuit. Do this operation to prevent leakage of chemical product during replacement.

6. Loosen the tube clamps and disconnect the product supply tubes from the membrane pipe attachments.

7. Replace the membrane pipe with an other the same type. (see the spare part list).

8. Replace the membrane pipe into dispensing pump, manually operating the rotor.  **ATTENTION: the rotor of dispensing pump turns ONLY clockwise !!!**	**9.** Replace the protective mask of the rotor. 

CLEANING OF DISPENSING PUMP FOR CHEMICAL PRODUCTS		
M6	Worker: **Is**	Frequency of Intervention: **from 3 to 6 months**
METHOD OF INTERVENTION: clean the pump for the dispensing of chemical products as described below:		
• Remove the closure panel of the machine by removing the screws. • Access the chemical product pump. Use a tool to remove the protective mask of the rotor • Loosen the tube clamps and disconnect the product supply tubes from the membrane tube attachments • Turn the rotor manually, clockwise, until the membrane tube is fully extracted from the dispensing pump. • Apply an even layer of silicon grease to the membrane tube you have just removed before re-installing it on the dispensing pump, following the previously described operations in reverse order.		

CLEANING OF SAFETY SIGNALS SURFACES		
	Worker: **Is**	Frequency of Intervention: **1 year**
METHOD OF INTERVENTION:		
Clean the safety signals surfaces with water or isopropyl alcohol, using a cloth.		

⇨	**WARNING**
	In order to remove the scale, suitable products can be used, yet pay attention that they are not highly corrosive.
⇨	**ASSISTANCE**
	Should your machine not work properly even after ordinary maintenance has been carried out, contact the Technical Support Centre of reference, describing the fault and giving the machine model and serial numbers.

17. PROBLEMS - CAUSES – SOLUTIONS

17.1 Introduction

This chapter includes possible problems which may occur during machine operation, along with their cause and solution.
All components, if not identified by specific figures, are referred to by the attached assembly drawings.
Should the inconveniences continue or take place frequently even after having carried out all the instructions stated in this chapter, please contact the Technical Support Centre of reference.

17.2 Problems - Causes - Solutions

I. MACHINE WILL NOT START:

C. Circuit breaker de-activated.

R. Place it in the "ON" working position.

C. Machine start switch de-activated.

R. Press the start button.

I. UPON GIVING START-UP COMMAND, WASHING CYCLE DOES NOT START:

C. The door is not correctly closed or locked.

R. Check door closure. Check that the door micro-switch is properly activated.

C. Micro-switch failure.

R. Check operation and replace as necessary.

C. No detergent in tank.

R. Turn the machine off and fill the tank.

I. MACHINE DOES NOT REACH SET TEMPERATURE FOR THE SELECTED WASHING CYCLE:

C. The thermostat probe of the washing chamber is dirty or covered with lime.

R. Clean the thermostat probe of the washing chamber, performing the routine maintenance described in chapter 16 (Form M2) of this manual.

I. MACHINE DOES NOT PROPERLY RUN WASHING CYCLE:

C. The nozzles of the washing rotors are clogged my deposits or lime.

R. Clean the rotors by carrying out the routine maintenance set forth in chapter 16 (Form M3) of this manual.

C. Water required for proper washing does not arrive.

R. Ensure that the water is supplied at the correct pressure and that there are no obstructions.

C. The correct amount of water required for correct washing cycle does not arrive.

R. Completely close the tap for connection to the plumbing system located upstream from the machine and clean the filter as described in chapter 16 (form M1) of this manual.

I. DETERGENT FILLING PHASE DOES NOT OCCUR CORRECTLY:

C. Chemical dispensing pump not very efficient.

R. Perform the routine maintenance set forth in chapter 16 (Form M6) of this manual.

C. Chemical dispensing pump failed.

R. Contact the Technical Support Centre of reference and ask for the assistance of an **authorized workshop technician** for the repair or replacement of the pump.

18. DECOMMISSIONING

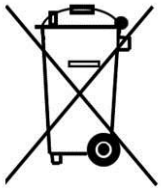
18.1 Instructions for disassembly of the machine

For demolition and subsequent disposal of your machine, proceed as follows:

- Disconnect the machine from the electrical power and water supply, and from the drain. With the machine disconnected, check that the water circuit is not pressurized.
- Contact the organization responsible for reporting and certifying machine demolition, in accordance with the laws in the country where the machine is installed.
- Carry out draining, storage and subsequent disposal of substances such as oils and grease which may be in the lubrication tanks in accordance with the law.
- When disassembling the machine, make sure to divide the materials it is made of according to their chemical makeup (iron, aluminium, bronze, plastic, etc.).
- Ensure that the floor where the machine or any parts of it are placed is made of washable materials, non-absorbent, and provided with adequate drainage to protect against accidental oil leaks or rust.
  These drains must carry any leakage to watertight collection containers.
- Cover the machine or parts of it with insulating covers to prevent rain or humidity from damaging the structure through oxidation or rust.

Following the legal requirements where the machine is installed and used, dispose of all materials and substances resulting from its disassembly.

18.2 Machine disposal



- For the dispose of the equipment get through to the manufacturer or distributor.
- Do not dispose of this equipment as miscellaneous solid municipal waste, but arrange to have it collected separately.
- The re-use or correct recycling of the electronic and electrical equipment (AEE) is important in order to protect the environment and the well-being of humans.
- In accordance with European Directive WEEE 2012/19/EC, special collection points are available to which to deliver waste electrical and electronic equipment and the equipment can also be handed over to a distributor at the moment of purchasing a new equivalent type.
- The public administration and producers of electrical and electronic equipment are involved in facilitating the processes of the re-use and recovery of waste electrical and electronic equipment through the organisation of collection activities and the use of appropriate planning arrangements.
- Unauthorized disposal of waste electrical and electronic equipment is punishable by law with the appropriate penalties.