



**Instruction manual
User Manual**

WASHER DISINFECTOR

**LAVA 50 DRS - LAVA 50/2 DRS
LAVA 50 DRSD - LAVA 50/2 DRSD**

Serial N°: _____

CE 0051

tuttनावर

**Paardeveide 36 P.O.B. 7191
4800 GD Breda
NETHERLAND**

**APPLY
HERE
LABEL
WITH
SERIAL NUMBER**

Manufacturer:

STEELCO S.p.A.
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ITALIA

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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.

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 incorrect 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.

The purpose of the warnings is to safeguard the user in compliance with directive 2007/47/CE and incorporated in the "Harmonised Technical Product Standards " EN 61010-1 and EN61010-2-45 and directives 2002/95/EC, 2002/96/EC and 2003/108/EC concerning the reduction of the use of hazardous substances in electrical and electronic equipment as well as the disposal of waste which is mentioned in the CE declaration of conformity included below.

Read the warnings carefully before installing and using the machine.

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

The intended use of the machine is the washing and thermal disinfection of instruments, equipment and objects. Therefore:

INTENDED USE:

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

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

Improper use of this unit may be hazardous to the operator and may seriously damage the machine itself.

WARNING:

If the appliance is used in a manner not specified by the manufacturer, protection of the appliance may be compromised.

As an example, hereunder is a list of some of the most common items and components which must not be washed using this appliance:

IMPROPER USE:

Any use other than that for which the machine was intended is forbidden.

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 orthodontic and 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 disinfectant 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 disinfectant 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).



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 DPI to prevent contact with infected material and the risk of contamination.
- Recommending chemical additives does not make the manufacturer responsible for any damage to the materials and objects treated.
- 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.
- 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.
- 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.

2.5 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	TROLLEY 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. trolley 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	<ul style="list-style-type: none"> 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 on section 4.7.

2.6 Safety signal 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
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 TUTTNAUER 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 1.6 m at a distance of 1 m from the machine.

AVERAGE SOUND PRESSURE LEVEL: < 70 dB (A)

3. INSTALLATION INSTRUCTIONS

General information for the user



- 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 2002/96/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 equipments is punishable by law with the appropriate penalties.

4. INSTALLATION (FOR THE INSTALLER ONLY)

4.1 Activity warnings and suggestion

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.

4.2 Positioning

4.2.1 Movement, unpacking and placing

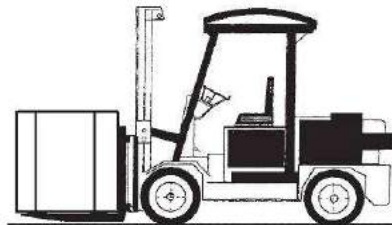
The machine is delivered to the client fully packed, resting on a wood base and completely protected by cardboard covering.

LIFTING AND MOVEMENT:

Movement of the machine to the work site is carried out by means of a pallet truck or forklift, with special attention given to the following:

- 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.
- Straps, ropes or chains and relative hooks for lifting must be suitable to the total weight of the machine to be lifted.

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.

4.2.2 Maximum floor load

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

- LAVA 50 DRS - LAVA 50/2 DRS → 175 kg/m²
- LAVA 50 DRSD - LAVA 50/2 DRSD → 210 kg/m²

4.2.3 Positioning of the machine

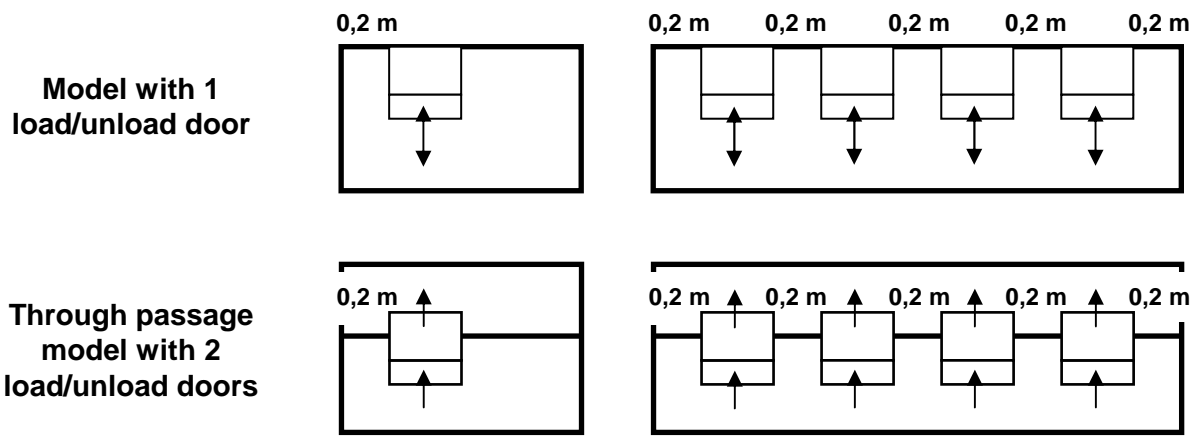
In normal conditions, the minimum dimensions are suggested for the use of the machine in a single installation or with the coil nearby.

For different installation ask for the distributors.

Minimum room ceiling height:

LAVA 50 DRS - LAVA 50/2 DRS → 1 m

LAVA 50 DRSD - LAVA 50/2 DRSD → 1,2 m



4.3 Water connection (for the installer only)

- This machine should be connected to the water network in compliance with current legislation
- For connection use cocks with an attachment of $\frac{3}{4}$ ", located in an easily accessible location as near as possible to the machine.
- The machine is equipped with connecting hoses 1.5 metres long, female threaded $\frac{3}{4}$ ".
- Make sure that the general supply pipe is sufficient for the flow rate required by the machine and that it is equipped with a general cut-off cock.
- Make sure that the mains water pressure falls within 100 and 800 kPa.
- If it is below 100 kPa (1 Bar) dynamic pressure, you will need to install a pressure increase pump.
- If the pressure is higher than 800 kPa (8 Bar) a pressure reducer must be installed.
- Maximum hardness of supplied water $7^{\circ}\text{Fr} = 4^{\circ}\text{D} = 70 \text{ ppm of CaCO}_3 = 7 \text{ mg/l of CaCO}_3$
- If the water is harder than this you will need to use a water softener.
- If the average hardness of the water is higher than 7°Fr , decalcified water must be used.
- Each machine is supplied with rubber water supply hoses with $\frac{3}{4}$ " threaded fittings plus a discharge hose.
- The pipe should be connected to cold water supply.
- Your machine can be equipped with a water connection to demineralized water, in this case you should connect the pipe marked white to demineralize water supply.
- If your demineralized water connection comes from a tank or can without pressure, machine can be equipped with a booster pump.
- Do not shorten or damage the rubber pipes supplied with the machine.
- Use the pipes supplied with the machine only.
- On the back of the machine, identify the water supply pipe and connect it via the pipe union.

Feed pipes must be connected together if your machine is equipped with a demineralized water supply but there isn't on installation.

If there is no double water feed cold/warm water, you have to connect the two pipes together.

TUTTNAUER SHALL NOT BE HELD LIABLE FOR DAMAGE OR ACCIDENTS CAUSED BY FAILURE TO COMPLY WITH STANDARDS FOR SUPPLY SYSTEMS.

IF YOU FAIL TO COMPLY WITH THE ABOVE CONDITIONS, THE DAMAGE INCURRED WILL NOT BE COVERED BY THE GUARANTEE.

4.4 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 machine is provided with one of the following electrical connection, as indicated on the rating label.

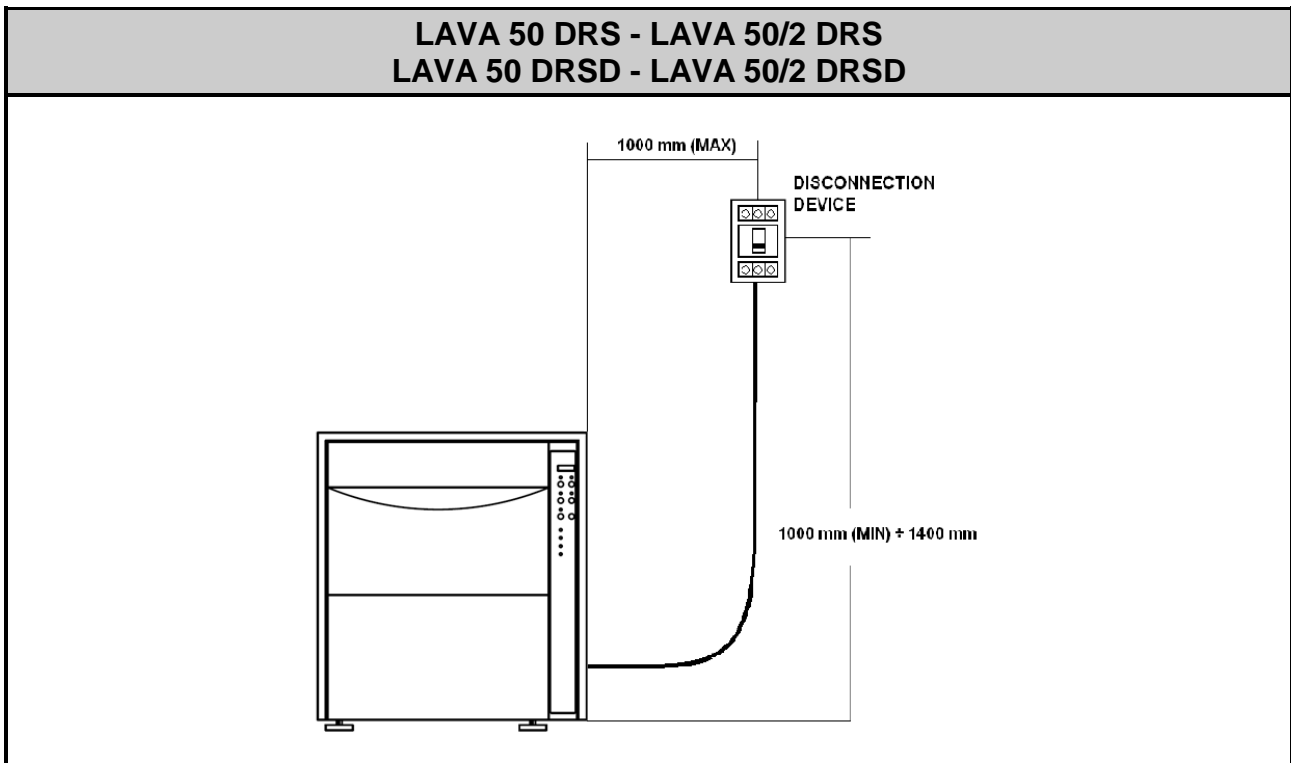
LAVA 50 DRS - LAVA 50 DRSD - LAVA 50/2 DRS - LAVA 50/2 DRSD							
Voltage	208 V 2~+PE 50Hz	220 V 1+PE 50Hz	230 V 1~+PE 50Hz	230 V 1~+PE 50Hz	240 V 1~+PE 50Hz	400 V 2~+N+PE 50Hz	Other voltage only on request
Power Max	2750 W	2750 W	2750 W	2750 W	2750 W	2950 W	/
Current Max	13,5 A	12,5 A	12 A	12,5 A	12 A	8 A	/
MODEL	LAVA 50 DRS LAVA 50 DRSD	LAVA 50 DRS LAVA 50 DRSD	LAVA 50 DRS LAVA 50 DRSD	LAVA 50 DRS - LAVA50 DRSD - LAVA 50/2 DRS - LAVA 50/2 DRSD	LAVA 50 DRS - LAVA 50 DRSD - LAVA 50/2 DRS LAVA 50/2 DRSD	LAVA 50 DRS LAVA 50 DRSD	

- 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 performed properly.
It must be provided with an earth connection and an equipotential circuit as set forth by current standards.
- An omnipolar magnetothermal switch sized to suit the absorption and with a contact opening of at least 3mm must be installed.

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

- 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 terminal on the rear of the machine and identified by the relative symbol is for equipotential connections between appliances (see rules for electrical plants).
- The electrical connection from the mains to the machine is to be made on the terminals of the magneto-thermal switch, which is to be located very near the machine and easily accessible by the operator.
- Connect the machine using a power cord with 5 wires and a disconnection system (not provided).
- The magneto-thermal switch must be provided with quality markings and must be indicated as an electrical shut-off device for the machine.
- Near the magneto-thermal switch, a sign must be placed which reads:

DEDICATED DISCONNECTION DEVICE FOR MACHINE



4.5 Fuses

The fuses for protection against overload included in the dedicated disconnection magneto-thermal switch must be of the same size indicated in the fuse holder.

SIZE OF FUSE:

NUMBER	SIZE	DIMENSION	FUNCTION CONTROLLED
N°1	5 A	5x20	Board protection

4.6 Detergent dispenser

To ensure proper treatment of the objects, it is advisable to use specific products.

The retailer can inform you of the most suitable, manufacturer-tested products.

It is advisable to use detergent with which the machine has been tested concerning the specific working needs as set forth by the client.

- The liquid detergent dispenser is a standard fitting on the machine.
The quantity of detergent supplied can be adjusted by following the directions given in paragraph 11.4.
- The default values correspond to the percentage recommended by the detergent manufacturer for an average consumption of 10 c.c. per cycle.

ATTENTION:

THE MACHINE IS FITTED WITH A GAUGE THAT SENDS A WARNING SIGNAL WHEN THE DETERGENT RUNS OUT.

FILLING OF THE DETERGENT CANISTER:

1. Turn the machine **OFF** by pressing the on/off button.
2. Open the tank compartment.
3. Insert the provided funnel in the detergent tank.
4. Fill the tank by pouring in detergent. Do not pour detergent outside the tank.
5. Close the tank compartment, close the detergent container cap and put it in an area used for the storage of chemical substances.
6. Turn the machine **ON** by pressing the on button.

For the maximum amount of product which can be used per wash cycle, follow the instructions for the product you are using.

The machine has been validated in accordance with the provisions of Standard UN 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 .

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.

4.7 Chemical Acid detergent dispenser (Optional)

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.

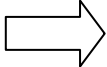
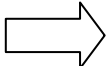
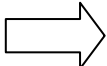
- The machine must could possess the chemical acid detergent dispenser.
- The quantity of detergent supplied can be adjusted by following the directions given in paragraph 11.4.
- The default values correspond to the percentage recommended by manufacturer of products for an average consumption of 45 cc.

ATTENTION:

THE MACHINE IS FITTED WITH A GAUGE THAT SENDS A WARNING SIGNAL WHEN THE DETERGENT RUNS OUT.

FILLING OF THE DETERGENT CANISTER:

1. Turn the machine **OFF** by pressing the on/off button.
2. Open the tank compartment.
3. Insert the provided funnel in the detergent tank.
4. Fill the tank by pouring in detergent. Do not pour detergent outside the tank.
5. Close the tank compartment, close the detergent container cap and put it in an area used for the storage of chemical substances.
6. Turn the machine **ON** by pressing the on button.

	<p>WARNING</p>
	<p>To ensure the efficiency of the dispenser pumps for chemical products it is important to service them regularly as described in paragraph 16.</p>
	<p>OPTIONAL PUMPS</p>
	<p>Other dosing pumps for chemical products can be furnished on request. LAVA 50 DRS - LAVA 50/2 DRS - LAVA 50 DSRD – LAVA 50/2 DRSD are equipped with one dosing pump.</p>
	<p>WARNING</p>
	<p>Use liquid chemical products only machine cannot function with powder detergent.</p>

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.

4.8 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.
- **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.**
- These models are equipped with a drain pipe of 22 mm diameter connected to bottom of the chamber.

CONNECTING DRAIN PIPE:

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.
- On the back of the machine, 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.

- Diameter of drain main must be of at least 25 mm.
- Avoid drain pipe extension.

**DRAIN MUST BE DONE FOLLOWING INTERNATIONAL RULES.
THE MANUFACTURER CANNOT BE HELD RESPONSIBLE IF AN INACCURATE USE OF MACHINE
CAUSES POLLUTION.**

**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.**

4.9 Water softener built-in (LAVA 50 DRSD - LAVA 50/2 DRSD)

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 must be introduced by entering into programming (PRG switch 5 seconds), at parameter P7.26 and introduce one of the following values:

VALUE 10	NO REGENERATION
VALUE 15	REG. every 30 cycles
VALUE 20	REG. every 25 cycles
VALUE 25	REG. every 21 cycles
VALUE 30	REG. every 18 cycles
VALUE 35	REG. every 15 cycles
VALUE 40	REG. every 12 cycles
VALUE 45	REG. every 9 cycles
VALUE 50	REG. every 6 cycles
VALUE 55	REG. every 3 cycles
VALUE 60	REG. present at each cycle (it is recommended for authorized people only).

The machine advise that it needs a regeneration with a written on display "salt load".

ACTIONS:

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

WARNING: during this operation, pay attention do not let fall salt 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 inlet" will be longer and it seems that machine doesn't work. During this phase, on display will appear "REGENERATION".

4.10 Drying air filtration

The machines are standard equipped with an air filter of class 5 following rules EN 779.
The filter's replacement is suggested after 100 working hours equal to 200 working cycles.

The machines can be equipped also with a further absolute filter "HEPA H14" following rules EN1822.
The filter's replacement is suggested after 500 working hours equal to 1000 working cycles.



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

5. CHECKS PRIOR TO START-UP

5.1 Introduction

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

5.2 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.

5.3 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).

6. USING THE MACHINE (FOR THE USER)

6.1 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 etc.) and the container of detergent to be poured into the tank of the machine.
- Turn the machine off by pressing the **OFF** button.
- Follow the instruction on sections 4.6.

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.

6.2 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.

6.3 Preparation

WARNING:

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

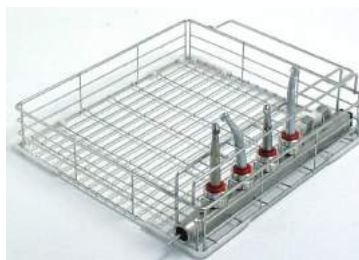
- Place the items to be washed inside the machine and position them carefully on the holder and in the rack.
- Items should not overlap.
- Receptacles should be positioned so that liquids can flow out easily.
- Tall or heavy items should be placed towards the middle of the basket if possible to facilitate washing.
- Make sure that nothing is blocking the arms and that they turn freely.
- **Attention the maximum load for each cycle is 8.0 kg. (Basket included)**

WARNING: NEVER USE THE MACHINE WITHOUT BASKET

Below are shown some example of basket's type available for the machine:



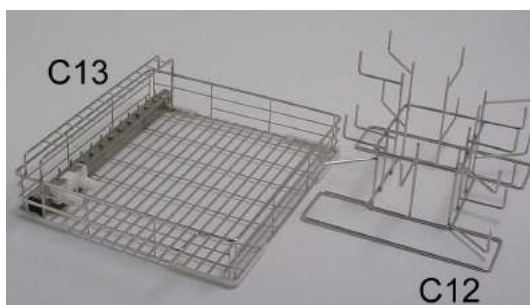
C06



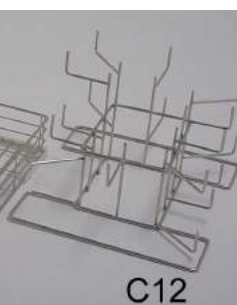
C80



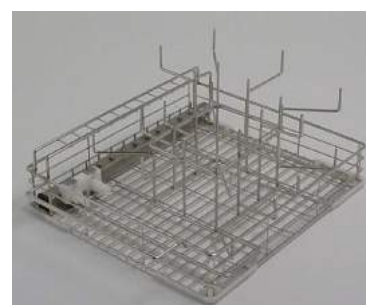
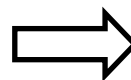
C83



C13



C12



C12 + C13

6.4 Functioning

Place the items to be washed in the relative tray positioning them carefully and follow the instruction that follows. The control panel with display 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.

WARNING	Do never emptying any solid waste into the machine. This will block the outlet system with pump and destroy the machine.
WARNING	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.

6.5 Treatment of turbines and straight and angular hand pieces (opposed-angles)

Your machine can be equipped with a special basket studied specifically for washing hollow instruments, that need to be washed and for thermosinfection both inside and outside the cavity.

CODE: C84

The above-mentioned basket is equipped with special accessories suitable for inserting the hand pieces.

These supports are made in two parts, screwed together, between which there is a special filter.

There is a rubber adaptor in the top part, available in two different diameters for the hand pieces.

We recommend washing the filters in the fitting for supporting the turbines and the hand pieces on a weekly basis, or replacing them with new filters.

The following operations should be performed for the correct treatment of the turbines and straight and angular hand pieces:

- Prewash with cold water, to eliminate residues of blood and saliva.
- Wash at 45°C, adding mineral-free, neutral-PH, liquid detergent.
- Thermosinfection at a temperature of 90°C for 1 minute, adding the additive for eliminating the residual water.

PRECAUTIONS

Micromotors can't be subjected to thermosinfection treatment.

The thermosinfection treatment can't be done with the 90°C program for 3 or 10 minutes.

Never use powder detergents.

7. CONTROL PANEL AND SYMBOLS USED

7.1 Washing programmes

Your machine can be used with three different wash programmes based on your needs. These include:

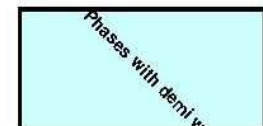
RAPID PROGRAMME	P1	Suitable for lightly soiled items.
STANDARD PROGRAMME	P2	Suitable for moderately soiled items.
INTENSIVE PROGRAMME	P3	Suitable for heavily soiled items.

The machine has several washing programs;

SWITCH	N° PROG	PROGRAM PHASES							
		1	P7	SHORT PROGRAM	WASH AT 50°X3' WITH ALCALIN DET.	NEUTRAL PHASE 1' WITH ACID DET.	THERMODISINF. 90° x 1' WITH RINSE-AID		
	DOS.		A	N	B oppure L				
2	P8	STANDARD PROG. 90°	COLD PREWASH CLEAR WATER	WASH AT 60°X3' WITH ALCALIN DET.	NEUTRAL PHASE 1' WITH ACID DET.	THERMODISINF. 90° x 1' WITH RINSE-AID			
	DOS.			A	N	B oppure L			
3	P9	INTENSIVE	COLD PREWASH CLEAR WATER	WASH AT 65°X6' WITH ALCALIN DET.	NEUTRAL PHASE 1' WITH ACID DET.	RINSE WITH DEMINERAL	THERMODISINF. 90° x 1' WITH RINSE-AID		
	DOS.			A	N		B oppure L		

Dosing pump list

A	ALCALIN DETERGENT OR ENZYMATIC DET.
N	ACID DETERGENT OR NEUTRALISED
L/B	LUBRIFICANT OR RINSE AID



7.2 Details of the electronic card

The electronic card was design 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 50081-1 EN 50082-1	general
EN 55014	emissions
EN 55104	immunity

7.3 Features of master card

Serial interface

Com1:

Low voltage bus bar for two-way communication with the keyboard card.

Com2:

Asynchronous serial interface type RS232C foreseen for connection to PC or printer.

7.4 Control panel

DISPLAY

- 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.

LEDS

There are 8 Leds:

- A yellow Start led (1), a red Stop led (2), a flashing red led to indicate that disinfection did not take place (3), a green led to indicate a complete cycle (4) and three yellow leds for indication of the various programme (5) and one yellow led for drying switch (6).

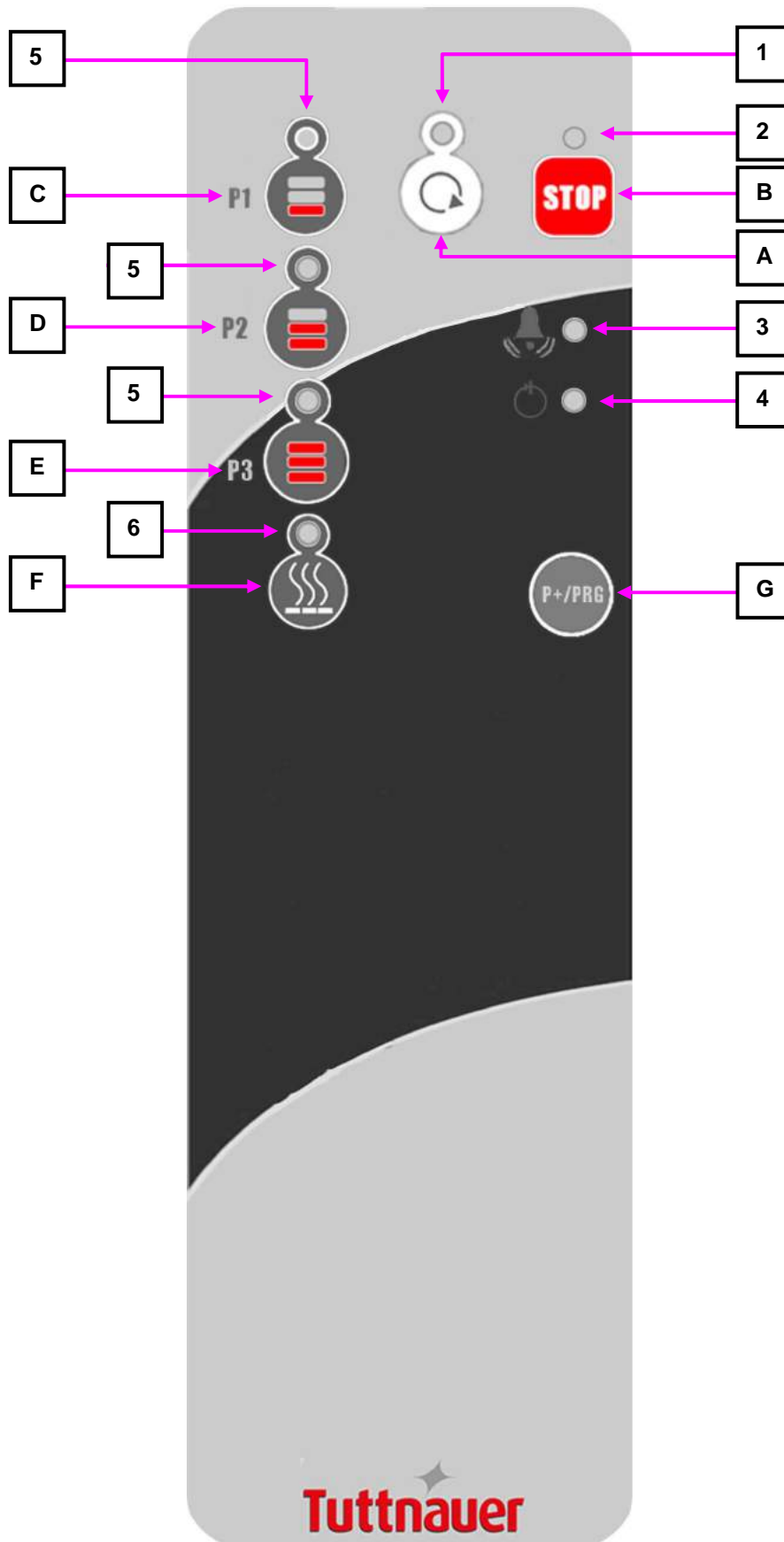
BUZZER

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

7.5 Switches

There are 7 switches available with the following functions:

BUTTON	REFERENCE	DESCRIPTION
P1	C	Select “ short+detergent ” cycle.
P2	D	Select “ standard+detergent ” cycle.
P3	E	Select “ intensive+detergent ” cycle.
P+/PRG	G	By pushing button P+ you select other programmes; Each pressure corresponds to a new programme. Keep pressed for five seconds during Wait or Shutdown to display the Menu.
START	A	Select the programme required and press the relative switch to start the cycle.
STOP	B	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 reset procedure must be carried out.
DRYING	F	It functions in machine equipped with drying. This switch allows the exclusion of drying forced phase from selected cycle.



7.6 Control panel unload side (only for 2 doors version)

DISPLAY LCD

- Displays the various programmes, stages, temperatures and any machine faults.
- During Wait, the type of programme selected is displayed.
- When push the button unlocks the door unload side in unlocked, while the door load side is locked.
If when push the button lock the door load side in unlocked, while the door unload side is locked.
This function is enabled only after a complete cycle.

LEDS

- There are 4 Leds:
- Two yellow for lock and unlock, a flashing red led to indicate that disinfection did not take place, a green led to indicate a complete cycle.

7.7 Buttons

Programmes available to the user are the following:

BUTTON	DESCRIPTION
LOCK	After a complete cycle when push the button lock the door load side in unlocked, while the door unload side is locked.
UNLOCK	After a complete cycle when push the button unlock the door unload side in unlocked, while the door load side is locked.

8. MACHINE STATUS

When there is a voltage drop in the line and the tension is restored, the machine memorises the status that was present at the time of the voltage drop.

When the tension is restored the machine normally returns to "WAIT" mode.

8.1 Wait

The machine is ready to start a cycle.

The diagnostics are active.

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 machines automatically repeats from the beginning of the phase, it was before failure.

The door remains blocked during all the power failure time.

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. Press the programme switch **P2** followed by the program switch **P1**.
3. 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 construct 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 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 magneto-thermal switch must be in the OFF position (see figure on section 4.4).

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).

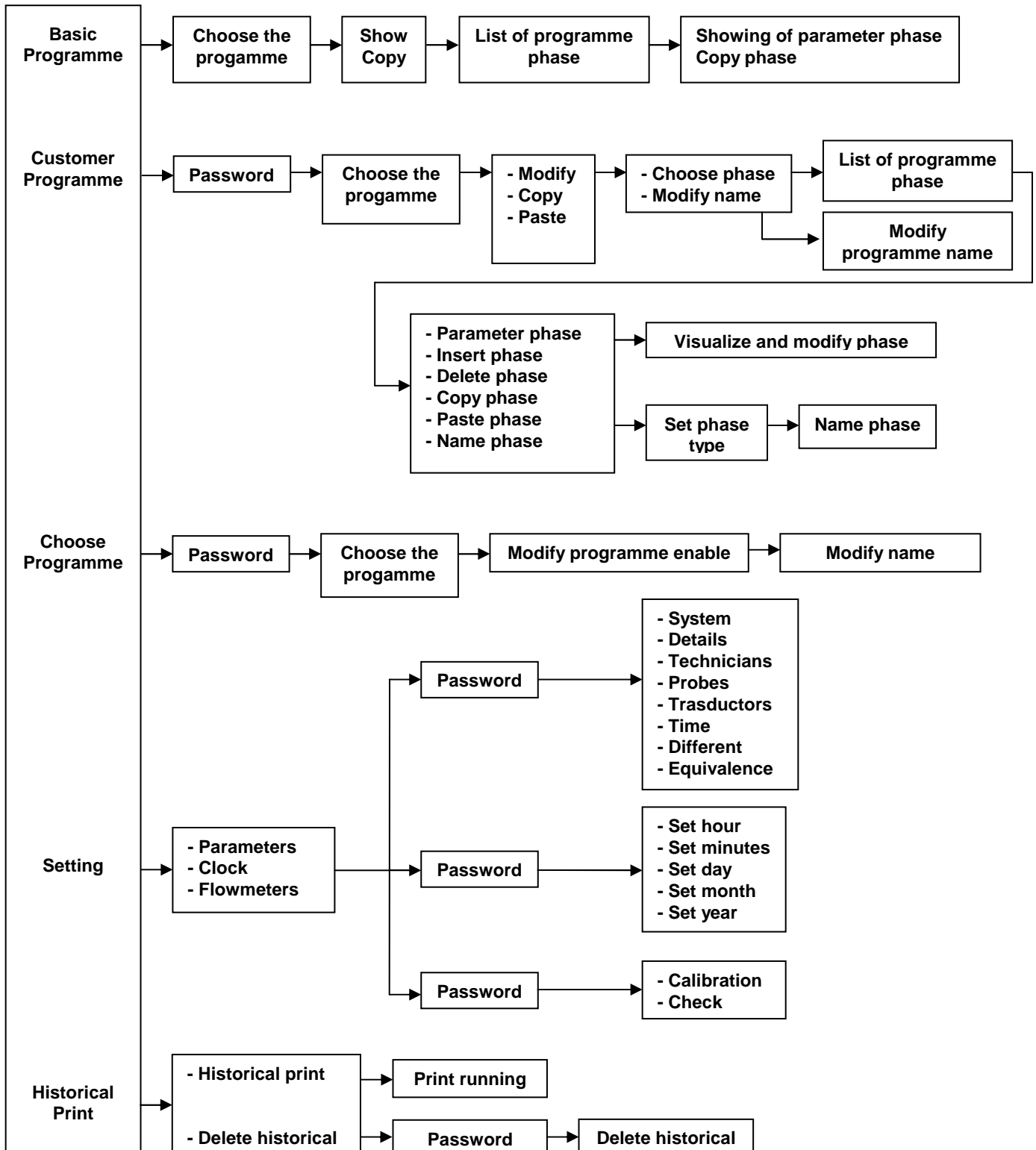
When performing maintenance on parts of the machine which have not been reached by the disinfectant, take appropriate precautions and use suitable safety gear.

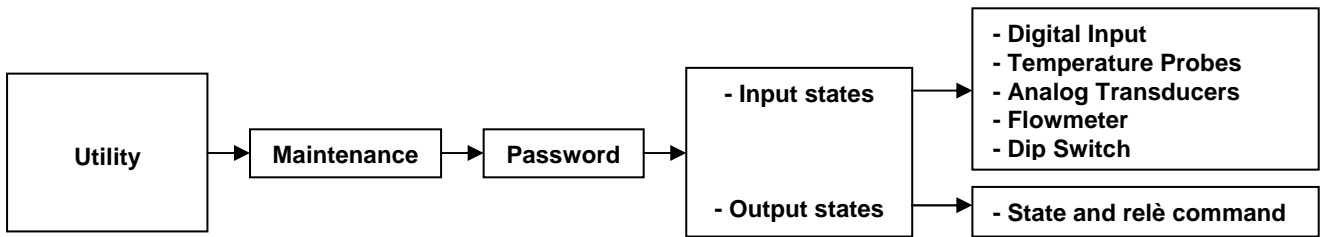
11. MENU

11.1 Menu plan

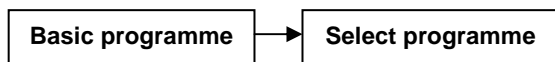
To enter the menu keep the **PRG** key pressed for five seconds.

- Press **P1** programme switch to scroll through the menu:
print historical data, - delete historical data, - set date, - set parameters – select language.
- Press Start to confirm selection, press Stop to exit the menu and return to Wait or Shutdown mode.



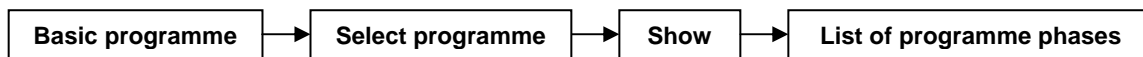


SHOWING OF A PROGRAMME FORM THE BASIC PROGRAMMES LIST



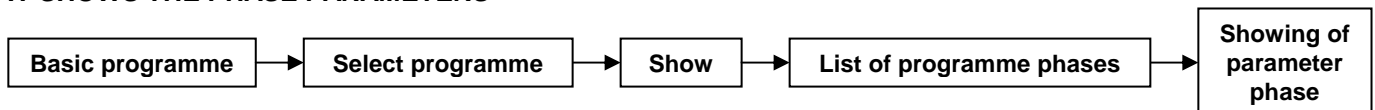
It is selected the wished programme from the present basic programme list.

IT SHOWS THE PHASES LIST OF BASIC PROGRAMMES



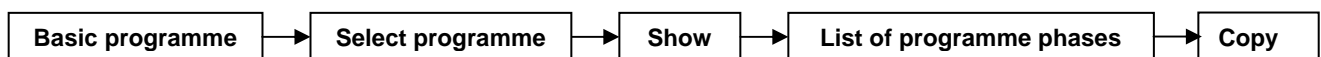
The wished phase is shown.

IT SHOWS THE PHASE PARAMETERS



After having chosen the phase, the relative parameters are shown. Pay attention: each phase type (drain, prewashing, washing and drying) has its own set of parameters.

COPY OF A BASIC PROGRAMME



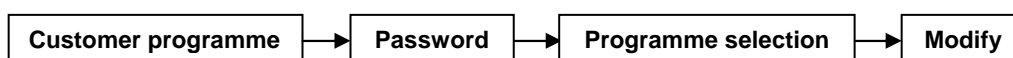
A basic programme is copied for being posted into an user programme.

IT SHOWS A PROGRAMME FORM THE LIST OF CUSTOMER PROGRAMMES



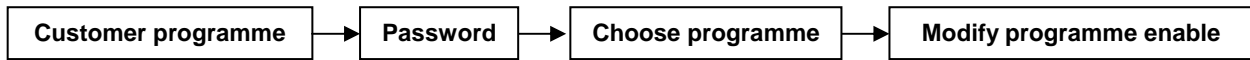
After insert the passwrod, it is shown the wished programme from the present customer programme list.

NAME CHANGE OF A CUSTOMER PROGRAMME



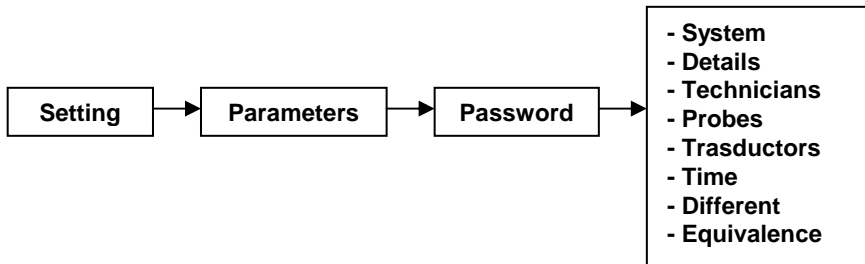
Here is possible modify the customer programme.

ENABLE PROGRAMME



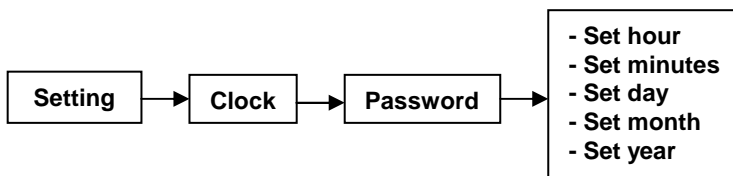
It is possible to change the enable selection for programme

PARAMETERS



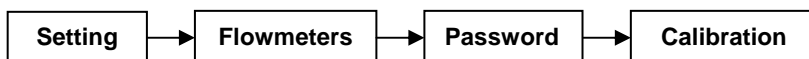
The parameters of the machine determines the different set up and configuration of the machine. Diveded into range and it is necessary to go to the chapter dedicated for an exhaustive explanation of each parameter.

CLOCK



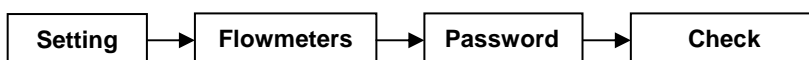
It allows to give the exact dates of the clock.

CALIBRATION



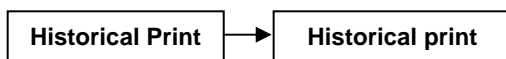
It allows to calibrate the flowmwter.

CALIBRATION CHECK



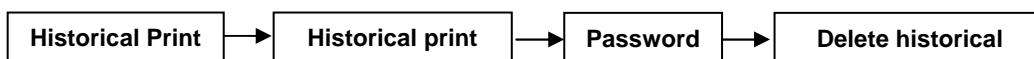
It allows to check the calibration of the flowmwter.

HISTORICAL PRINT



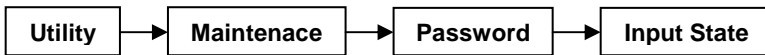
It is possible to print the historical cycle.

DELETE PRINT



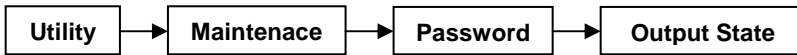
It is possible to delete the historical data.

INPUT STATE



It allows to check input state.

OUTPUT STATE



It allows to check output state.

11.2 Phase parameters

11.2.1 Drain phase

- Cold water time for rinsing (sec)
- Functioning time of tank pump (sec.)
- Drain cooling choice (yes/no)

11.2.2 Prewashing phase

- Water type 1
- Water type 2
- Water total litres
- Chemical type 1
- Dosing quantity of product 1
- Chemical type 2
- Dosing quantity of product 2
- Phase time (sec.)

11.2.3 Treatment phase

- Water type 1
- Water type 2
- Water total litres
- Chemical type 1
- Dosing quantity of product 1
- Min. temperature for filling up of 1st chemical
- Chemical type 2
- Dosing quantity of product 2
- Min. temperature for filling up of 2nd chemical
- Phase time (sec)
- Phase temperature set point

11.2.4 Drying phase

- Fan starting type at low speed (sec)
- Fan starting time at high speed (sec.)
- Phase temperature set point

11.3 Parameter settings

To set the parameters will be requested a password, that will be entered using **P1** and **P2** keys.

If the password entered is wrong, you will quit the menu immediately.

Pressing **P1** and **P2** keys it is possible to increase or decrease the value of the various parameters once selected them.

Pressing instead **P1** it will be possible to scroll through the various parameters.

If the parameters are not modified, it is possible to quit the parameters menu keeping pressed the **STOP** key for 5 seconds. To select parameters please follows this special procedure.

It is allowed to enter into planning menu to authorised technician, with password only.

Parameters list

N° PAR.	DESCRIPTION CONFIGURATION SETTING Rev. 6.12	UNIT	DEFAULT	PERS. PLANNING	RANGE
SYSTEM					
1. SYSTEM DETAILS					
P 1.01	OPERATOR	Characters	*****		20 car. (A ÷ Z; 0 ÷ 9)
P 1.03	OPERATOR IDENTIFICATION	selection	NO		YES- NO
P 1.06	PRINT GRAPHIC ON LINE 0 = no 1 = print grafic 2 = print table	Selection	1		0 - 2
P 1.08	PRINT PROGRAMME BODY	Selection	YES		YES - NO
P 1.09	PRINT USES AT END CYCLE	Selection	NO		YES - NO
P 1.10	COLLECTINC DETAILS END CYCLE	Selection	NO		YES - NO
P 1.12	ACOUSTIC ALARMS	Selection	1		0= NO 1= Only alarm 2= acoustic signal advising end cycle 3= acoustic signal for both
P 1.13	ENABLE A0	Selection	YES		YES - NO
MANUFACTURER DETAILS					
2. REGISTRY					
P 2.01	MACHINE MODEL	Characters	Model		8 car. (A ÷ Z; 0 ÷ 9)
P 2.02	SERIAL NUMBER	Number	0001		4 car. (0 ÷ 9)
P 2.03	TESTING DATE	Date	01/01/05		(01-31)/(01÷12)/(01÷99)
P 2.04	LANGUAGE	selection	ENGLISH		ITALIAN - ENGLISH - FRENCH - DEUTSCH
P 2.07	STATION NUMBER	Number	00		0 ÷ 99
P 2.08	CUSTOMER/ DISTRIBUTOR	characters	Xxxxxx		16 car. (A÷Z; 0÷9)
3. TECHNICAL					
P 3.01	PASS THROUGH MACHINE	Selection	YES		YES - NO
P 3.02	2 nd PROBE ON TANK 0=absent 1=connected to expansion board 2=connected to main board	Selection	1		0÷2
P 3.05	LACK ENERGY ON CYCLE	selection	AUTOMATIC INIT. STEP		NORMAL – INIT. STEP – START. PROG. – END CYCLE
P 3.06	CYCLE ALLARMS MANAGEMENT	Selection	AUTOMATIC INIT. STEP		NORMAL – INIT. STEP - START. PROG. – END CYCLE

N° PAR.	DESCRIPTION CONFIGURATION SETTING Rev. 6.12	UNIT	DEFAULT	PERS. PLANNING	RANGE
P 3.09	PRINTING ON BOARD	Selection	NO		YES - NO
P 3.16	ROTATING ARM SENSORS	Selection	NO		YES - NO
P 3.17	CONDUCTIBILITY DIG. SENS.	Selection	NO		YES - NO
P 3.20	RINSING SOLENOID VALVE	selection	NO		YES - NO
P 3.25	PUMP PRESSURE SENSOR	selection	YES		YES- NO
P 3.26	PUMP PRESSURE ANALOGIC SENSOR	selection	NO		YES- NO
P 3.27	IF LACK OF PRODUCTS	selection	WARNING		WARNING – ALARM
P 3.30	CONDUCTIVITY PROBE	selection	NO		YES- NO
P 3.31	DRYER SELECTION 0 = never 1 = normal enabled 2 = normal disabled	selection	1		0 - 2
P 3.32	LACK DEMINERALIZE WATER	selection	NO		YES- NO
P 3.33	LACK WARM WATER	selection	YES		YES- NO
P 3.35	DOOR SAFETY MICROSWITCH PRESENCE FOR UL COMPLYING	Selection	NO		YES-NO
P 3.38	DRYING PROBE PRESENCE	Selection	YES		YES-NO
4. PT1000 PROBE					
P 4.19	CHECK PROBE SENS °C TANK (-)	°C	00		-99 ÷ 99
P 4.21	CHECK PROBE SENS°C DRYING (-)	°C	00		-99 ÷ 99
P 4.23	CHECK PROBE SENS °C BOILER (-)	°C	00		-99 ÷ 99
P 4.25	CHECK ADJUST. °C TANK (Z)	°C	00		00 ÷ 99
5. ANALOGUE TRANSDUCER					
P 5.01	PUMP TRANS.FUNCT.LIMIT(-)	bar	-0.25		-1.00 ÷ (P 5.02)
P 5.02	PUMP TRANS. FUNCT.LIMIT(+)	bar	1.00		(P 5.01) ÷ 3.00
P 5.03	CONDUCT. TRANS.FUNCT.LIMIT(-)	µS/cm	0.0		0.0 ÷ (P 5.04)
P 5.04	CONDUCT. TRANS. FUNCT.LIMIT(+)	µS/cm	500		(P 5.03) ÷ 20000
6. TIME DETAILS					
P 6.01	MAX TEMP. 1°C TANK (")	Seconds	300.0		000.0 ÷ 999.9
P 6.03	MAX TEMP.1°C BOILER (")	Seconds	300.0		000.0 ÷ 999.9
P 6.04	DRAIN MAX TIME (")	Seconds	60.0		000.0 ÷ 999.9
P 6.05	TIME OUT BLOCK DOORS (")	Seconds	03.0		00.0 ÷ 99.9
P 6.06	WATER CHECK TIME (")	Seconds	05.0		00.0 ÷ 99.9
P 6.07	PROD. CHECK TIME (")	Seconds	20.0		00.0 ÷ 99.9
P 6.09	FRACT. PUMP TIME (")OFF	Seconds	0.0		00.0 ÷ 99.9
P 6.10	FRACT. PUMP TIME (") ON	Seconds	0.0		00.0 ÷ 99.9
P 6.11	DRAIN CYCLE TIME (") OFF	Seconds	05.0		00.0 ÷ 99.9
P 6.12	DRAIN CYCLE TIME (") ON	Seconds	20.0		00.0 ÷ 99.9
P 6.13	PUMP SENSOR CHECK TIME (")	Seconds	10.0		00.0 ÷ 99.9
P 6.14	DOOR OPENING SAFETY TIME (")	Seconds	02.0		00.0 ÷ 99.9
P 6.15	DRAIN COOLING TIME (")	Seconds	30.0		00.0 ÷ 99.9
P 6.16	STEAM CONDENSER TIME (") OFF	Seconds	0.0		00.0 ÷ 99.9

N° PAR.	DESCRIPTION CONFIGURATION SETTING Rev. 6.12	UNIT	DEFAULT	PERS. PLANNING	RANGE
P 6.17	STEAM CONDENSER TIME (") ON	Seconds	10.0		00.0 ÷ 99.9
P 6.18	STOP BOILER TIME	Hours	3		00 ÷ 24
P 6.20	ARCH. SAMPLE TIME (")	Seconds	10		02 ÷ 99
P 6.21	STEAM TANK TIME ON	Seconds	4		00 ÷ 99
P 6.22	STEAM TANK TIME OFF	Seconds	6		00 ÷ 99
P 6.23	STEAM BOILER TIME ON	Seconds	02		00 ÷ 99
P 6.24	STEAM BOILER TIME OFF	Seconds	15		00 ÷ 99
P 6.25	Fan drying time after thermoregulation	Seconds	60		0÷999
P 6.27	Delay time after boiler level switch ON	Seconds	30		0÷99
P 6.28	Maximum waiting time in warm + demi water loading	Seconds	350		0÷999
P 6.29	Maximum waiting time demi water loading.	Seconds	350		0÷999
P 6.30	Maximum time heating elements functioning.	MIN.	30		0÷99
P 6.31	Maximum waiting drain time during water loading	Seconds	50		0÷999
P 6.32	Maximum waiting time in cold water loading	Seconds	350		0÷999
P 6.33	Maximum waiting time warm water loading.	Seconds	350		0÷999
P 6.34	Maximum waiting in warm and cold water loading.	Seconds	350		0÷999
P 6.35	Maximum waiting time in cold+demi water loading.	Seconds	350		0÷999
P 6.36	Loading time of chemical 1 for filling up pipe	Seconds	60		0÷999
P 6.37	Loading time of chemical 2 for filling up pipe	Seconds	60		0÷999
P 6.38	Loading time of chemical 3 for filling up pipe	Seconds	60		0÷999
P 6.39	Loading time of chemical 4 for filling up pipe	Seconds	60		0÷999
P 6.40	Regeneration time	Seconds	600		0÷999
P 6.41	Water loading regeneration time	Seconds	120		0÷999
P 6.42	Cold water loading on regeneration time	Seconds	60		0÷999
P 6.49	Signal delay after load side door opening	Seconds	0.5		0.0-10.0
P 6.50	Signal delay after unload side door opening	Seconds	0.5		0.0-10.0
P 6.51	Signal delay after load side door closing	Seconds	0.5		0.0-10.0
P 6.52	Signal delay after unload side door closing	Seconds	0.5		0.0-10.0
P 6.56	Delay on fan pressure switch reading(0=diagnostic disabled)	Seconds	0.0		0.0-25.0
7. DIFFERENT DETAILS					
P 7.01	NR. FRACT. PUMP CYCLES	Number	06		00 ÷ 99
P 7.02	NR. FRACT. PUMP CYCLES	Number	01		01 ÷ 99
P 7.03	END CYCLE BOILER TIME °C	°C	60		00 ÷ 99
P 7.04	TANK PROBE MAX DIFF. °C	°C	02		00 ÷ 99

N° PAR.	DESCRIPTION CONFIGURATION SETTING Rev. 6.12	UNIT	DEFAULT	PERS. PLANNING	RANGE
P 7.05	MIN. WATER QUANTITY IN LT.	Liters	4		00 ÷ 99
P 7.06	MAX WATER QUANTITY IN LT.	Litres	8		(P 7.05) ÷ 99
P 7.07	CYCLE BOILER TEMPERAUTRE °C	°C	70		00 ÷ 80
P 7.08	TEMP. GAP 'A0' °C	°C	10		00 ÷ 99
P 7.09	REFER. TEMP. 'A0' °C	°C	80		00 ÷ 99
P 7.10	LOWER LIM. TEMP. 'A0' °C	°C	85		00 ÷ 99
P 7.11	CONTRAD. LIMIT. TEMP. °C	°C	80		00 ÷ 95
P 7.12	TEMP. ACTIVATION DRAIN COOLING	°C	70		00 ÷ 100
P 7.13	DRYING LIMIT TEMP. °C	°C	70		00 ÷ 100
P 7.14	HORIZONTAL GRAPHIC RESOLUTION	pixel/h	300		240÷1000
P 7.15	RECORD PRINT LIMIT °C	°C	80		000 ÷ 95
P 7.21	DRAIN WATER	Impulse	30		00 ÷ 99
P 7.23	LIMIT CONDUCTIVITY PROBE	µS/cm	80		00 ÷ 20000
P 7.24	PREWASH MAX TEMP.	°C	80		00 ÷ 95
P 7.25	STEAM INERTIA TANK HEATING	°C	10		00 ÷ 99
P 7.26	STEAM INERTIA BOILER HEATING	°C	20		00 ÷ 99
P 7.27	Regeneration value 10: NO REGENERATION 15: EVERY 30 CYCLE 20: EVERY 25 CYCLE 25: EVERY 21 CYCLE 30: EVERY 18 CYCLE 35: EVERY 15 CYCLE 40: EVERY 12 CYCLE 45: EVERY 9 CYCLE 50: EVERY 6 CYCLE 55: EVERY 3 CYCLE 60: EVERY CYCLE	num	40		10÷60
P 7.28	Number of regeneration to load salt		8		1÷18
P 7.29	Selection programme for switch 1		7		1÷40
P 7.30	Selection programme for switch 2		8		1÷40
P 7.31	Selection programme for switch 3		9		1÷40
8. EQUIVALENCE					
P 8.05	Impulse number / ml Product 1	Impulse	1.200		0,000 ÷ 9.999
P 8.06	Impulse number / ml Product 2	Impulse	1.200		0,000 ÷ 9.999
P 8.07	Impulse number / ml Product 4	Impulse	1.200		0,000 ÷ 9.999
P 8.08	Impulse number / ml Product 3	Impulse	1.200		0,000 ÷ 9.999
P 8.09	Second / ml Product 1	Seconds	2.400		0,000 ÷ 9.999
P 8.10	Second / ml Product 2	Seconds	2.400		0,000 ÷ 9.999
P 8.11	Second / ml Product 4	Seconds	2.400		0,000 ÷ 9.999
P 8.12	Second / ml Product 3	Seconds	2.400		0,000 ÷ 9.999
P 8.13	Selection control Product 1	Selection	TIME		IMP. - TIME
P 8.14	Selection control Product 2	Selection	TIME		IMP. - TIME
P 8.15	Selection control Product 4	Selection	TIME		IMP. - TIME
P 8.16	Selection control Product 3	Selection	TIME		IMP. - TIME
P 8.17	Autocalibration Quantity	ml	100		0 - 300

The parameters in the list are referred:

Water 1: → Solenoid valve cold water

Water 2: → Solenoid valve warm water

Water 3: → Solenoid valve demineralized water

Product 1: → Acid detergent dosing pump

Product 2: → Neutral detergent dosing pump

Product 3: → Lubrificant dosing pump

Product 4: → Caustic soda dosing pump

11.4 Flowmeter setting

In order to set the flowmeter it is necessary to fill completely the product dosing system.

The product coming out during the setting must be gathered in a ml-graduated measure.

Enter the setting menu of the flowmeter where you can choose which dosing pump to set.

After selecting the dosing pump, push **START** to start the procedure or **STOP** to cancel it.

Check the level in the graduated measure, when you reach the predefined level (that is shown nearby the display) push **START** again.

The message "**CALIBRATION -END-**" will advise you that the setting has been executed.

It is also possible to verify the setting of the product.

Enter the check menu of flowmeter.

Select the dosing pump that must be verified and push **START** to begin.

Once finished the dosing, the level of product in the dosing pump should be the same of that one shown in the display.

Whether the levels do not correspond, a new setting must be executed.

The quantity of product to execute the setting can be changed using a parameter.

11.5 Starting up and display of devices

It is possible to display the state of the devices.

Enter the maintenance menu "**Input State**" once insert the password.

Push **START** to select the input that you want visualize.

Push **P1** to display the state of every entry.

Nearby the display appears the entry state.

Whether the entry is not active, the writing **OFF** appears, otherwise when active appears **ON**.

It is also possible to activate every device but the electrical resistance manually.

Enter the maintenance menu "**Output State**" once insert the password.

Push **START** and select the contactor you want to activate.

Then push **P1** to activate it or **P2** to cancel.

Nearby the display appears the contactor state.

Whether the contactor is not active, the writing **OFF** appears, otherwise when active appears **ON**.

If a contractor is not possible to activate you will see in the display "**FORBIDDEN**".

11.6 Input/Output

NUMBER	INPUT	DEVICE	TERMINAL
1	base	Neutral detergent pressure switch N.C.	17
2	base	Pressure switch water level N.O.	18
3	base	Pump pressure switch N.C.	19
4	base	FREE	20
5	base	Alcaline detergent pressure switch N.C.	21
6	base	Lock door N.O.	22
7	base	Door closed N.O.	23
8	base	FREE	24
9	base	FREE	25
10	base	FREE	26
11	base	FREE	27
12	base	FREE	40
13	base	FREE	41
14	base	FREE	42

NUMBER	OUTPUT	DEVICE	TERMINAL
1	base	Demi water solenoid valve	4
2	base	Alcaline doser	5
3	base	Cold water solenoid valve	6
4	base	Dryer heating element	7
5	base	Dryer	8
6	base	Drain pump	9
7	base	Heating element contactor	10
8	base	Alcaline doser	11
9	base	Motor lock door	12
10	base	FREE	13
11	base	Regeneration water solenoid valve	14
12	base	Washing pump	15

NUMBER	DIP SWITCH	DIP/JUMPER
1	base	dip1
2	base	dip2
3	base	dip3
4	base	dip4

NUMBER	PROBE	DEVICE	TERMINAL
1	base	Chamber probe 1	29-30
2	base	Chamber probe 2	32-33
3	base	FREE	35-36

12. CLOCK

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

13. 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 around 200 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°F	FAULTS
	12.00	Short	93°C	60 secondes	00
	13.05	Standard	94°C	180 secondes	00

- When 95% of the memory is full, a signalling pop-up with the message "5% FREE MEMORY" appears on the display.
[Printing out the whole historical data will clear the message.](#)
- The various causes for machine shutdowns are indicated in the **FAULTS** section, the faults are identified by numbers.

14. ALARMS AND EVENTS LIST

14.1 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.

14.2 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.

LAVA 50 – LAVA 50/2 ALARMS LIST

ALARMS	DISPLAY MESSAGE	DESCRIPTION
1	Power failure	It shows power failure during cycle
2	Load door open	Loading door open during cycle
3	Unload door open	Unloading door open during cycle
4	Block load door	Loading door blocked
5	Block unload door	Unloading door blocked
6	Doors problem	Uncorrect door position (both open or unblocked)
7	Unblock load door	Loading door problems: a) Overtime lock door ref. P6.05 b) During block door, the door has been opened
8	Unblock unload door	Unloading door problems: c) Overtime lock door ref. P6.05 d) During block door, the door has been opened
9	Load door timeout	Overtime unlock loading door ref. P6.14
10	Unload door timeout	Overtime unlock unloading door ref. P6.14
11	Cold water lack	Overtime cold water loading level ref. P6.32
13	Demi water lack	Overtime demi water loading level ref.P6.29
15	Mixed C+D lack	Overtime cold+demi water loading level ref. P6.35
17	No chemical 1	Lack of chemical 1
18	No chemical 2	Lack of chemical 2
19	No chemical 4	Lack of chemical 4
20	No chemical 3	Lack of chemical 3
23	Drain timeout	Overtime minimum tank level during the drain: Ref . P6.04 and P6.31
24	Blower	Blower switch on with pressure switch open
26	max°C prewash.	Tank temperature over maximum setup during prewashing
27	lim°C tank probe	Tank temperature over maximum value 102°C
30	Tank probe	Tank temperature 1 st probe failure
31	2 tanl probe	Tank temperature 2 nd probe failure

34	Temp. Check	It appears when: a) Tank temperature over value ref. P7.11 b) The temperature between the two probes has a difference higher than
35	Load.panel	No connection from main board to loading switch board
36	Unload. Panel	No connection from second board to unloading switch board.
37	CAN serial	No connection from main to second electronic board (can bus)
39	No tank heat.	During tank electrical heating phase, the temperature does not increase of 1°C into the prefixed time given by parameter P6.01
46	Pressure switch pump	The washing pressure is under the lower limit
47	Impulse error product 1	The flowmeter product 1 had count a impulse number different from set point + P7.21
48	Impulse error product 2	The flowmeter product 2 had count a impulse number different from set point + P7.21
49	Impulse error product 4	The flowmeter product 4 had count a impulse number different from set point + P7.21
50	Impulse error product 3	The flowmeter product 3 had count a impulse number different from set point + P7.21
55	Conductivity probe	Conductivity 1 st probe failure
56	High conductivity	For 3 times high conductivity
58	No tank heat.	During tank steam heating phase, the temperature does not increase of 1°C into the prefixed time given by parameter P6.01
60	Time	Phase time to much long
61	Steam Heating	The machine is set to steam heating and one of the input (19 or 27) is opened

LAVA 50 - 50/2 WARNINGS LIST

	DISPLAY MESSAGE	DESCRIPTION
	Lack chemical 1	Lack of chemical 1 (acid detergent)
	Lack chemical 2	Lack of chemical 2 (neutral detergent)
	Lack chemical 4	Lack of chemical 3 (caustic soda)
	Lack chemical 3	Lack of chemical 4 (lubrificant)
	Salt loading	It warns to load salt after a number of regeneration cycles given by parameter P7.28
	Open door	It points out that the/a door is open
	Wait	Generic warning that signals to the operator that he has to wait before starting with any new action
	Close the door!	It warns to close the door/doors opened during the doors initialisation procedure in order to allow the correct procedure
These warnings function if the parameter P3.27 is set.		

LAVA 50 - 50/2 HISTORICAL EVENTS

EVENT	DISPLAY MESSAGE	DESCRIPTION
From 1 to 61	Same list of alarms	(see alarms list)
90	OK	Cycle ends with success
91	NO DISINFECTION	Cycle has been interrupted.

15. PC INTERFACE

The card has a communication channel RS232 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: 8bits,**
- **parity: none.**

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 magneto-thermal switch 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), 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

		LAVA 50 DRS - LAVA 50/2 DRS - LAVA 50 DRSD - LAVA 50/2 DRSD - LAVA 50/2 DRSD													TIME	RIFERENCE	
		Programmed maintenance scheme															
		Step	months														Activity
3	6		9	12	15	18	24										
Components	make every.....																
Tank filters	make every day														Take off filters and cleaning.	10'	M1
Water solenoid filter	make every.....	X										X			Check, clean and if necessary replace.	10'	M4
Pre filter dryer F5	make every 100 hours														Replace.	2'	M5
Dryer HEPA filter	make every 300 hours														Replace.	2'	M5
Temperature probes	make every.....				X								X		During periodic validation, check the sensor status.	60'	M2
Safety thermostat	make every.....				X								X		Verify the sensor.	5'	M2
Chemical dosing pump	make every.....	X										X			Check the membrane pipe and the presence of lack.	5'	M6
Inner pipe and connection pipe of dosing pump	make every.....												X		Replace.	12'	M6
Chemical tank level sensor	make every.....	X													Check and clean the suction filter.	4'	
Connection pipe of dosing pump	make every.....	X											X		Check of crashing, any lacks or hardening.	10'	
Washing arms	every week														Check for free rotation. Open the cleaning caps and wash inside: check and in case cleaning the nozzle.	30'	M3
Door gasket	make every...	X										X			Verify the gasket and replace after 1000 cycles.	20'	
Washing pumps	make every...				X										Check for water leaks from the arm seal.	5'	
Water heating element	make every...											X			Check for water leaks fro the gasket.	1'	
Dryer heating elements	none														Operation is checked by the control system.		
Water solenoid valves	make every...								X						Check for any leaks, if necessary remove and clean the membrane seat.	3'	
Drain pump	make every...								X						Check for any leaks, if necessary remove and clean the membrane seat.	3'	
Pressure switches	make every...								X						Operation is checked by the control system. In case of defect of control system of water levels, go on by emptying the tank, blowing inside the black pipe connected to the pressure switch, in order to free from obstructions.	10'	
Pipe of unloading water	make every...												X		Check the situation of pipe and the seal.	3'	
Pipes of loading water	make every...												X		Check the situation of pipe and the seal.	3'	

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.

	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, limescale can also clog the nozzles in which case the correct tank temperature for thermosinfection 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 WASH CHAMBER DRAIN FILTERS		
M1	Worker: Ac	Frequency of Intervention: 3 months
METHOD OF INTERVENTION: clean the wash chamber drain filters in the following manner:		
<ul style="list-style-type: none"> • Open the wash 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 wash cycles. • Remove and clean any deposits and incrustations from the wash chamber drain. • Replace the clean filter on the wash 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: Ac	Frequency of Intervention: 3 months
METHOD OF INTERVENTION: clean the wash chamber thermostat probe in the following manner:		
<ul style="list-style-type: none"> • 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 WASH ROTORS

M3 Worker: **Ac** Frequency of Intervention: **3 months**

METHOD OF INTERVENTION: clean the wash rotors as follows:

- Open the wash 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 wash rotor nozzles using appropriate detergents.
- Put the plugs back in place at the ends of the wash 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: **8 h**

METHOD OF INTERVENTION:

Open the access door to the wash chamber and check that no equipment, trays or instruments have been left in the wash basket.
Spray the inside of the wash chamber evenly with a disinfectant.
Cover all internal parts.
Wait for the amount of time required for disinfection (see technical information for the disinfectant product).

CLEANING THE EXTERNAL BODY OF THE MACHINE

Worker: **Ac** Frequency of Intervention: **8 h**

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.

ANTI-LIME TREATMENT

Worker: **Ac** Frequency of Intervention: **1 week**

METHOD OF INTERVENTION:

Use an incrustation removal product when necessary during a dry run (usually once a week unless the amount of water requires daily use to prevent lime build-up and clogging of the water jets).
This product should be applied using 100 ml of incrustation remover poured into a container of the same size located on an empty basket.
Run this programme without the drying cycle active.
De-activate drying by pressing the drying On/Off button.

DISINFECTION TREATMENT

Worker: **Ac** Frequency of Intervention: **1 week**

METHOD OF INTERVENTION:

Start a washing cycle (recommended short cycle) with empty machine and with basket present.
This will guarantee the complete disinfection of the washing chamber, of the basket and of the hydraulic circuits.

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


See scheduled maintenance form table.

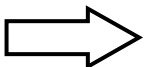
CLEANING OF COLD WATER INLET FILTERS		
M4	Worker: Is	Frequency of Intervention: 3 months
METHOD OF INTERVENTION: clean (or replace) the filter on the cold water supply tube as described below:		
<ul style="list-style-type: none"> • Close the water supply tap. • Loosen and completely unscrew the water 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. 		

CLEANING OF DRYING SYSTEM FILTER		
M5	Worker: Is	Frequency of Intervention: 3 months
METHOD OF INTERVENTION: clean (or replace) the drying system filter as described below:		
<ul style="list-style-type: none"> • Remove the two screws from the drying system filter protective front panel and remove it from the machine. • Extract the filter and clean it of any dust. If the filter is no longer usable, replace it with another filter of the same type. • Carefully put the clean (or new) filter back in place. Use the screws to fasten the previously removed protective front panel. 		

CLEANING OF DISPENSING PUMP FOR CHEMICAL PRODUCTS		
M6	Worker: Is	Frequency of Intervention: 3 months
METHOD OF INTERVENTION: clean the pump for the dispensing of chemical products as described below:		
<ul style="list-style-type: none"> • Remove the closure panel of the rear part 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. 		
N.B.: Every 12 months, it is advisable to replace the membrane tube of the dispensing pump.		

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.		

	<p>WARNING</p> <p>It is advisable to carry out a general check-up and to clean the appliance regularly, particularly if the supply water is very hard.</p>
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	<p>ASSISTANCE</p> <p>If your machine is not working properly even after routine maintenance, contact our service assistance centre, describe the fault and give the model and serial number of the machine.</p>
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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.

If after following all instructions in this chapter the problems persist or re-occur frequently, please contact our technical service.

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, WASH 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 wash chamber is dirty or covered with lime.
- R. Clean the thermostat probe of the wash chamber, performing the routine maintenance described in chapter 16 (Form M2) of this manual.

I. MACHINE DOES NOT PROPERLY RUN WASH CYCLE:

- C. The nozzles of the wash rotors are clogged by 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 our technical service and ask for the assistance of an **authorized workshop technician** for the repair or replacement of the pump.

I. MACHINE DOES NOT PERFORM DRYING PHASE:

- C.** Air filter of drying system is dirty or clogged.
- R.** Clean the filter by carrying out the routine maintenance set forth in chapter 16 (Form M5) of this manual.
- C.** The fan of the drying system does not work.
- R.** Check the electrical connections of the drying system.
- R.** Contact our technical service and ask for the assistance of an **authorized workshop technician** for the repair or replacement of the motor.

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.