Steelco

Miele Group Member

Service Manual

PLW 7111

LAB 610 G2

DS 600 G2
DS 610 G2
DS 610 SL G2

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Read the operating instructions carefully before installing and using the machine. This will help protect users from personal injury and help prevent damage to the machine.

en – UK

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1. GENERAL RULES

The washer-disinfector is generally referred to as “the machine” in these operating instructions. Reprocessable laboratory glassware and utensils are referred to as “load items” if they are not more closely defined.

1.1 Limits of 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 service technician must comply with all instructions set forth in the operating instructions, most notably:

- ► Always consider the intended use of the machine
- ► Always carry out the required maintenance work
- ► Use of the machine should be limited to persons who have been properly trained and instructed on the use of the machine
- ► Use only original spare parts

Any modifications, adaptation or other 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 operating instructions on the following pages are designed to guarantee the longevity and functionality of your machine.

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

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

1.2 Validity, contents and storage

It is very 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 owner or user in order for them to become acquainted with its operation and the relative warnings.

Read the instructions carefully before installing and using the machine.

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

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 in case of any doubts or uncertainties about the operation to be performed.
- ► ask Customer Service Department for clarifications on the instruction.

2. PRODUCT INFORMATION

2.1 Appropriate use

Laboratory version
This machine is used to reprocess laboratory glassware and laboratory utensils using water. The process includes cleaning, rinsing and, where required, disinfection and drying.
These machines are designed for use in laboratory as well as laboratory-type application in the industrial sector.
Due to the wide variety of laboratory glassware and laboratory utensils on the market, it may be necessary in some cases to establish whether the item is suitable for reprocessing in a washer-disinfector.
This will depend on its use and the type of soiling present as well as the disinfection parameters. Please refer to the information provided by the manufacturer of the laboratory glassware and laboratory utensils.

Laboratory glassware and laboratory utensils suitable for reprocessing include:

- ► Vessels such as test tubes, beakers, flasks, cylinders, etc.
- ► Measuring vessels such as measuring cylinders, pipettes, volumetric flasks, etc.
- ► Dishes such as Petri dishes, watch glasses, etc.
- ► Plates such as slides, sequencing plates, etc.
- ► Small items such as lids, spatulas, magnetic stirring rods, stoppers, etc.
- ► Other items such as funnels, pipe/hose pieces, etc.

Medical version
These machines can be used to clean, rinse, disinfect (through thermal disinfection), reprocessable medical devices in healthcare facilities such as (dental) practices, hospital CSSDs, and outpatient operating centres. Reprocessable medical devices include invasive and non-invasive medical devices.
For this purpose, the information provided by the manufacturers of the medical devices (EN ISO 17664) and the manufacturers of the process chemicals must also be observed.

Information note: The ISO 17664 standard: 2004 defines the responsibility of the manufacturer of the reusable medical instrument in providing all the instructions for its proper reprocessing and maintenance after outpatient use. This is the information for the correct preparation, cleaning, disinfection, drying, packaging, control, testing, sterilisation, and storage phases. If medical devices have been used and exposed to compromised blood or tissues, before each use/reuse with human patients, these devices must necessarily be reprocessed in accordance with the instrument manufacturer's guidelines, in compliance with international and local standards, and in accordance with good hospital practices. Thermal disinfection washing devices perform a partial function in the overall reprocessing of reusable medical devices.
This washing and disinfection device is therefore not intended to be used for terminal disinfection or sterilisation.

2.1.1. Fields of application

Laboratory version

- ► Laboratories in schools, colleges and universities
- ► Research, quality assurance, development, technology and production
- ► Different areas of inorganic, organic, analytical and physical chemistry
- ► Biology, microbiology and biotechnology
- ► Hospital laboratories
- ► Industries

The machine fulfils the requirements of the EU Machinery Directive 2006/42/EC.

Medical version

- ► Private practice doctors
- ► Hospitals
- ► Dentistry practices
- ► Clinics
- ► Hospital CSSDs
- ► Healthcare facilities

Reprocessing conditions must be suitable for the load and type of soiling. Process chemicals must be suitable for the type of soiling.
The use of a suitable load carrier (basket, module, insert, etc.) is important to ensure adequate reprocessing of the load.
The machine can be qualified for process validation.

The machine fulfils the requirements of the EU Machinery Directive 2006/42/EC.

WARNING

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

Inappropriate use can lead to personal injury and damage to property.

Miele and Steelco cannot be held liable for damage caused by improper or incorrect use or operation of the machine.

2.2 Safety instructions and warnings

This machine complies with all statutory safety requirements. Inappropriate use can lead to personal injury and damage to property.
Read the service instructions carefully before installing this machine. This will prevent both personal injury and damage to the machine.
Keep these instructions in a safe place where they are always accessible to users.

2.2.1. Appropriate use

- ► Use of the machine is only approved for the applications stated in the operating instructions. Alterations or conversion of the machine or using it for purposes other than those for which it was intended, are not permitted and could be dangerous.
- ► The cleaning and disinfection processes are only designed for laboratory glassware and utensils (laboratory version) or for for reprocessing medical devices include invasive and non-invasive medical devices (medical version), which are designated as re-processable by the manufacturer. The information provided by the manufacturer of the load items must be observed.
- ► Miele and Steelco cannot be held liable for damage caused by improper or incorrect use or operation of the machine.
- ► This machine is intended for indoor use only.

2.2.2. Risk of injury

Please pay attention to the following notes to avoid injury

- ► The machine may only be installed, commissioned, repaired and maintained by the Customer Service Department of Miele or Steelco or a suitably qualified service technician. A service contract is recommended to ensure full compliance with GLP guidelines. Incorrect repairs can cause considerable danger to users.
- ► Do not install the machine in an area where there is any risk of explosion or of freezing conditions.
- ► To reduce the risk of water damage, the area around the machine should be limited to furniture and fittings that are designed for use in commercial environments.
- ► With some metal parts, there is a risk that you may be injured or cut. Wear cut-resistant protective gloves when transporting and setting up the machine.
- ► The electrical safety of the machine can only be guaranteed when it is correctly earthed. It is essential that this standard safety requirement is observed and regularly tested. If in any doubt, please have the electrical installation inspected by a qualified electrician. Miele and Steelco cannot be held liable for the consequences of an inadequate earthing system (e.g. electric shock).
- ► A damaged or leaking machine can pose a threat to your safety. Always switch off a damaged or leaking machine immediately and contact the Customer Service Department of Miele or Steelco.
- ► Machine operators must be instructed on the use of the machine and trained regularly. Untrained personnel must not be allowed access to the machine or its controls.
- ► Only use process chemicals which have been approved by their manufacturer for the relevant application. The manufacturer of the process chemicals is liable for any negative influences on the material of the load and the machine.
- ► Take care when using process chemicals. Some chemicals may be caustic, irritating and toxic. The relevant safety regulations and safety data sheets issued by the process chemical manufacturers must be observed. Wear gloves and protective goggles.

  The machine is only designed for use with water and appropriate process chemicals. The use of organic solvents or inflammable liquids is not permitted. This could cause an explosion or damage rubber or plastic components in the machine and cause liquids to leak out.
- ► The water in the wash chamber must not be used as drinking water.
- ► Do not lift the machine by protruding parts such as the door handle or the opened service flap as these could be damaged or torn off.
- ► Do not sit or lean on the opened door. This could cause the machine to topple over and become damaged or cause you an injury.
- ► Be careful when sorting items with sharp, pointed ends. Position them in the machine so that you will not hurt yourself or create a danger for others.
- ► Broken glass can result in serious injury when loading or unloading. Broken glass items must not be processed in the machine.
- ► Please be aware that the machine may be operating at high temperatures. Deactivating the lock to open the door can result in a risk of burning or scalding or contact with corrosive substances. Where disinfectant is in use, there is also a risk of inhaling toxic vapours.
- ► Should personnel accidentally come into contact with toxic vapours or process chemicals, follow the emergency instructions given in the manufacturer's safety data sheets.
- ► Load carriers such as baskets, mobile units and inserts must be allowed to cool down before they are unloaded. Any water remaining in containers could still be very hot. Empty this water into the wash chamber before removing items.
- ► Never clean the machine or near vicinity with a water hose or a pressure washer.
- ► The machine must be disconnected from the power supply before any maintenance or repair work is carried out.

2.2.3. Quality assurance

The following points should be observed to assist in maintaining quality standards when reprocessing laboratory glassware and utensils (laboratory version) or reprocessable medical devices include invasive and non-invasive medical devices (medical version), to avoid damage to the loads being cleaned.

- ► Only authorised personnel may interrupt a programme in exceptional circumstances.
- ► Under certain circumstances, process chemicals may damage the machine. Users are urged to follow the recommendations issued by manufacturers of process chemicals. Contact Customer Service Department of Miele or Steelco in the event of damage and any suspicion of material incompatibility.
- ► Cleaning agents containing chlorine can damage the elastomers of the machine. If cleaning agents containing chlorine must be used, a maximum temperature of 70 °C in the “Main wash” programme blocks is recommended (see programme chart).
- ► Abrasive substances should not be introduced into the machine as these could cause damage to mechanical components in the water circuit. Abrasive residues on the load must be removed completely before reprocessing.
- ► Always follow the relevant manufacturer's instructions on storage and disposal of process chemicals.
- ► In critical applications where very stringent requirements have to be met, it is strongly recommended that all the relevant factors for the process, such as detergents, water quality, etc., are discussed with Miele.
- ► After any plumbing work, the water pipework to the machine will need to be vented. If this is not done, machine components can be damaged.

2.2.4. Using accessories

- ► Only use genuine original spare parts and components suitable for the application they are required for. Model designations are available from Customer service department.
- ► Only use Miele or Steelco load carriers, such as mobile units, baskets, modules and inserts. Using mobile units, baskets and inserts made by other manufacturers or making modifications to the original components can result in an unsatisfactory cleaning and disinfection result. Any resultant damage would not be covered by the warranty.

2.2.5. Disposing of your old appliance

Please note that the machine may contain contamination from blood and other bodily fluids, pathogens, facultative pathogens, genetically modified material, toxic or carcinogenic substances, heavy metals, etc., and must be decontaminated before disposal.

For environmental and safety reasons, dispose of all process chemical residues in accordance with safety regulations. Wear gloves and protective goggles.

Make the door lock inoperable, so that children cannot accidentally shut themselves in. Then make appropriate arrangements for safe disposal of the machine.

Old electrical and electronic appliances often contain valuable materials. However, they also contain harmful substances which were essential for their correct functioning and safety. These could be hazardous to human health and to the environment if disposed of with general waste or if handled incorrectly. Please do not, therefore, dispose of your old appliance with general waste.

Make use of local waste collection/recycling centres for electrical and electronic devices. Consult your dealer if necessary. National legislation may require the deletion of personal data saved on the machine before disposal. Please ensure that your old appliance poses no risk to children while being stored prior to disposal.

2.2.6. Warning signs

To inform service personnel of their obligations and to warn of residual risks, the machine is equipped with safety labels in accordance with the relevant legislation (Directive 92/58 EEC)

General warning signs

Caution!
Danger of electric shock!

Caution!
Observe the operating instructions!

Caution!
Hot surfaces!

The evaluation of risks for the health and safety carried out on-site, as well as the evaluation of residual risks, determine the safety equipment which the supervisor must provide for the user.

Miele and Steelco cannot be held liable for damage or injury caused by non-compliance with the safety instructions and warnings.

2.3 Training

Instructions for installation and service of the machine will be provided by the Customer Service Department or an authorised service technician during machine commissioning.

It is the duty of the supervisor to ensure that users are sufficiently trained and instructed.

2.3.1 User profiles

User profiles are identified as follows:

SUPERVISOR	**Senior service technician** Special settings of the machine can be executed only from Customer Service Department, as the installation of new functions.
MAINTENANCE ENGINEER	**Service technician:** The machine may only be installed, commissioned, repaired and maintained by the Customer Service Department or an authorised service technician.
DEPARTMENT MANAGER	**Responsible for the machine in the workplace:** More advanced tasks, e.g. interrupting or cancelling a programme, require more detailed knowledge of machine reprocessing of laboratory glassware and utensils (laboratory version) or medical devices including invasive and non-invasive medical devices (medical version). Alterations or adaptations of the machine, e.g. to accessories used or on-site conditions, require additional specific knowledge of the machine. Validation processes assume specialist knowledge about machine reprocessing of laboratory glassware and utensils, the processes involved and applicable standards and legislation.
OPERATOR	**User:** Users must be instructed in operating and loading the machine and trained regularly to guarantee safe daily use. They require knowledge of machine reprocessing of laboratory glassware and utensils.

2.4 Residual risks

SERVICE in normal working conditions is not exposed to risks provided they work in safe conditions, using the appropriate means of protection.

In order to work safely the maintenance technician must:

- ► Carefully comply with the instructions set forth in this manual and the service manual.
- ► Use safety devices appropriately and with care and the group and individual safety gear provided in the workplace.
- ► Use particular care and precautions in the case of repairs and replacement of mechanical parts (e.g. drain pump, etc.) on faulty machines that have not completed the thermal disinfection cycle.

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

It is however considered that the **glassware washer** includes some residual risks. Below are set out the appropriate measures to be taken for each phase or significant intervention of work:

PHASE	**BASKET LOADING**
RISK	Bruising and cutting of the upper limbs, caused by accidental contact due to a fall or impact against tools and objects and instruments, mainly during the basket handling operations.
MEASURE	Enable only trained and equipped personnel for this type of operation (e.g. baskets with protections, transport trolleys) and appropriate clothing and PPE (e.g. protective overalls and gloves).
PHASE	**DOSING OF DETERGENTS/CHEMICAL ADDITIVES**
RISK	Contact of parts of the body with washing chemicals.
MEASURE	Assign staff that is trained and equipped with appropriate clothing and PPE. Wear clothing, gloves and goggles and comply with the safety instructions indicated by the manufacturer of the chemical products.
FIRST AID MEASURE	► Remove/immediately remove clothes that have been contaminated or soaked with the product. ► If the substances come into contact to the skin, wash off affected areas immediately and rinse with water.
RISK	Inhaled vapours of washing chemicals.
MEASURE	Assign staff that is trained and equipped with appropriate clothing and PPE. Comply with the safety requirements specified by the manufacturer of chemicals and in case it is foreseen, wear a protective mask suitable for the protection of the respiratory tract.
RISK	Accidental release of washing chemicals.
MEASURE	Not to disperse the concentrated chemical into drains or directly on surfaces. Collect any spilled fluid with absorbent material (e.g., sand, earth, sawdust); Rinse the residue quantity of chemical with plenty of water.
⚠	IN CASE OF CONTACT WITH THE BODY OR RELEASE OF CHEMICAL PRODUCTS, ALWAYS REFER TO THE SAFETY MEASURES INDICATED IN THE PRODUCT DATA SHEET.
PHASE	**MAINTENANCE OF INTERNAL EQUIPMENT**
RISK	Of burns to parts of the body from hot parts of the equipment.
MEASURE	Only allow maintenance operations to be carried out by trained and qualified staff, wearing protective clothes and PPE.
PHASE	**DAMAGE TO THE DEVICE**
RISK	Use of inappropriate components, detergents, washing processes.
MEASURE	Use suitable components that do not damage the surface of the device and check its integrity. Use the chemical product in the quantity and manner prescribed by the manufacturer and follow its instructions regarding the compatibility of the material.
RISK	Microbial growth inside the device.
MEASURE	Use potable and demineralised water according to the prescriptions in the “Water connection” chapter.

	Perform complete drying cycles and make sure that the inside of the machine is completely dry at the end of the washing cycle.
RISK	Ageing.
MEASURE	Respect the instructions provided by the manufacturer for optimal maintenance of the device.
RISK	Insufficient rinsing.
MEASURE	Rinse adequately using demineralised water.
RISK	Insufficient drying.
MEASURE	Dry immediately using suitable tools or repeat a drying phase.
PHASE	**ELECTRIC RISK**
RISK	Contact with electrical energy resources - electric shock.
MEASURE	Installation of panels to protect electrical components.
RISK	Current leakage on the ground.
MEASURE	Machine tested according to EN 61010-1.
RISK	Electrical components/parts activate during fault conditions.
MEASURE	Installation of switches and temperature controls.
PHASE	**DEVICE DIRTY**
RISK	This damage can be caused by inappropriate accessories, cleaning agents, washing process and initial conditions.
MEASURE	Check the integrity, adequacy and hygiene of the accessories used. Strictly follow the manufacturer's instructions regarding disassembly procedures. Pay particular attention to any cavities and threads.
RISK	Caused by insufficient disinfection time.
MEASURE	Check the sensors periodically. Use the validated cycles for each type of washing.
PHASE	**INCORRECT CONNECTION OF CHEMICAL PRODUCTS**
RISK	Use of the incorrect chemical for the process when changing the chemical tank.
MEASURE	Use of a colour code for the chemical caps to help the operator when replacing the chemicals.
PHASE	**INSTALLATION ERROR**
RISK	Incorrect connection of pipes. Inadequate cleaning - Risk of contamination.
MEASURE	The documentation also includes the installation drawing.
RISK	Incorrect connection of chemicals. Inadequate cleaning - Risk of contamination.
MEASURE	The documentation also includes the installation drawing.
RISK	Incorrect electrical connection. Damage to the machine - no risk for the operator.
MEASURE	The documentation also includes the installation drawing.

2.5 Device duration

The device has been designed for a duration of 10 years assuming scheduled maintenance is performed.

2.6 Table of symbols

Symbols applied to the machine

	Electrical shock risk
	Warning: hot surface
	Manufacturer
	Manufacturing date
	Warning! See the accompanying documentation for important cautionary notices, such as warnings and precautions.
	Consult the user instructions
	Earth terminal
CE	CE mark (laboratory version)
CE 0051	CE mark issued by the notified body: 0051 identifies IMQ Indicated on the serial number label (medical version)
	WEEE waste disposal
Only for medial version:	
MD	Medical device indication
COD	It indicates the final product code of the medical device. It is reported in the serial number label. The “COD” corresponds to the article code in the system (AS 400) and in the sales invoice. This code can be variable depending on the configuration/specifications required by the customers. The machine configuration requested by the customer is in line with the configuration reported inside the technical documentation “DT-8051520DSXX2A” and in the DD-8051520DSXX2A medical device description document.
REP	Local authorized representative for Switzerland
CH REP	Local authorized representative
#	Indicate the number of the product model. Indicated on the serial number label
UDI	Indicate the unique number of the device Indicated on the serial number label

3. INSTALLATION

3.1 Activity before installation

3.1.1 Preparation of installation site

Preparation of the connections to the electricity and water supply systems must be carried out by the customer before installing the machine.
The connections must comply with the directives in force in the country of installation and follow with the instructions contained in the documentation (provided on request) prior to machine installation.

For the installation specifications, refer to the installation plan.

3.1.2 Environment conditions

Temperature: +5 ... +35 °C.

- ► Relative humidity: 80% for temperatures up to 31 °C decreasing linearly to 50% RH at 40 °C
- ► Maximum altitude: 2,000 m above s.l. (special settings of the device are available for higher altitudes).
- ► Visibility: 215 lux max 1500 lux.
- ► Indoor use

In case of altitude over 2,000 m above s.l., it is necessary to adjust the setting of the thermal disinfection phase. The temperature have to be decreased and the time have to be extended.

According to the altitude the settings are the following (referred to disinfection phases with A0 value = 3000):

- 2,000 m → T: 88 °C, t: 480”
- 2,500 m → T: 87 °C, t: 600”
- 3,000 m → T: 86 °C, t: 760”

3.2 Positioning

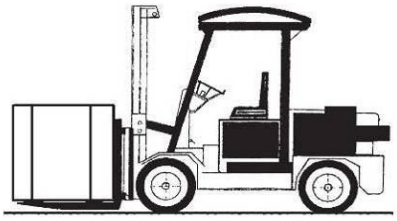
3.2.1 Handling, unpacking, and positioning

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

Lifting and handling
Handling of the machine is envisaged through the use of equipment for lifting and transportation and must comply with the following indications:

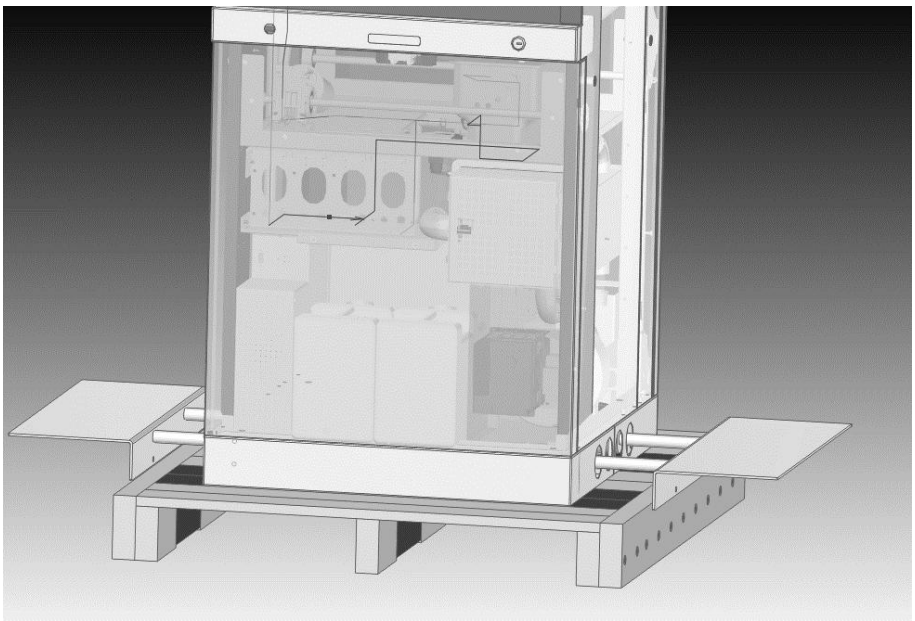
- ► The lifting capacity must be higher than the total weight of the load to be handled.
- ► The machine must be kept as close as possible to the ground during handling.
- ► Stacking: not permitted.
- ► Rotation: do not overturn.

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



Unpacking and positioning
Near the place of installation, unpack the machine carefully, as follow:

- ► Carefully open the packaging.
- ► Do not overturn the machine as this may cause irreparable damage.
- ► Cut the strap, open the packing carton, and remove the corner protections.
- ► Remove the cardboard first and then the nylon film.
- ► Unscrew the sides of the wood pallet: this allows to disassemble it and to easier lift and place the machine.
- ► Use the dedicated tool to move the machine from the pallet to the floor:

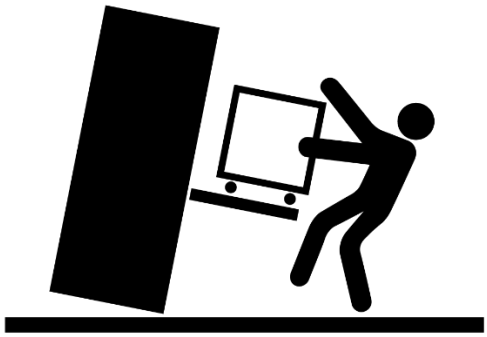


1. Insert the bar through the holes on the basement
2. Screw the bar on the supports
3. Lift the machine through the lateral supports using two trans pallets
4. Remove the wooden pallet
5. Lift the machine at the floor

- ► Place the machine, using the wheels, on the work surface and level it by means of the adjustable feet.
- ► The machine must be positioned horizontally with a maximum inclination of 1 ÷ 2°.
- ► Do not position the machine on a surface which could cause a fire or fume hazard.

ATTENTION

Dispose of the packaging material according to the directives in force in the country of installation.
All the packaging materials can be recycled.



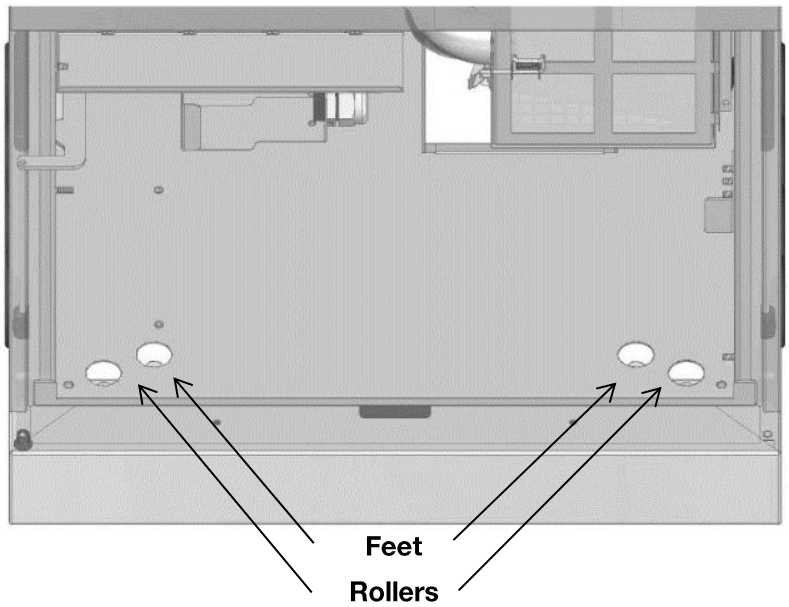
ATTENTION – TIP OVER HAZARD

Warning: The machine may not be fitted with counterweights, which may cause it to overturn during handling.
Do not open the doors and do not load any weight on the door until the machine is anchored to the floor, or until the presence of counterweights has been verified.

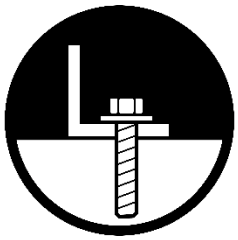
3.3 Feet regulation

The machine is equipped with rollers and feet for its positioning.
It is possible to move the machine using the rollers and to stop the machine in its final position and level it by means of the feet.

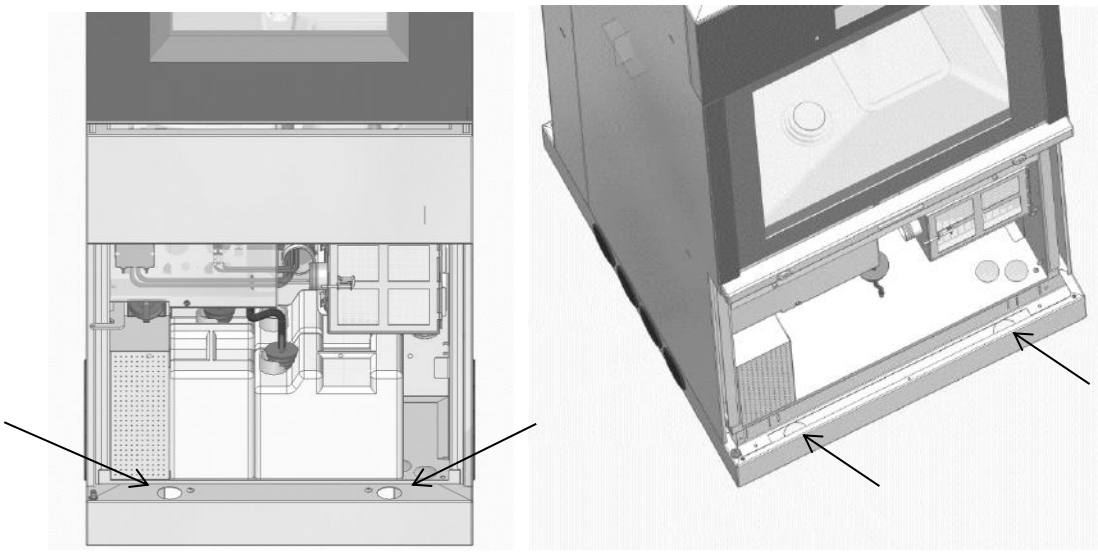
In the base of the machine, behind the technical area panel on the frontal part, there are 4 holes to regulate rollers and feet.
To move the machine, screw the rollers down by using a socket wrench in the respective hole (see drawing). When the machine is placed in its final position, lift-up the rollers by using a socket wrench.
To fix and level the machine screw down the respective feet with a socket wrench (see drawing)



3.4 Floor anchoring



The machine is designed for floor anchoring.
Floor anchoring is necessary for hinged door machines and recommended for sliding door machines.
In the single door version, the optional counterweight can be requested to avoid fixing it to the floor.
In the double door version, floor anchoring is mandatory.
A sticker on the door warns of the danger of overturning.



Hinged door version *Sliding door version*

Tip over hazard:
Before using the machine and placing the basket over the door, it is necessary to perform the floor anchoring.

3.5 Water connection

3.5.1 Water quality

The quality of the water used in all the cleaning stages is essential in achieving good results.

- ► The water must be compatible with the material from which the machine is made.
- ► The water must be compatible with process chemicals.
- ► The water must be compatible with process requirements for the various stages of the process.

In order to achieve good reprocessing results, the machine requires a supply of soft water with a low calcium content. Hard water results in the build-up of calcium deposits on the load and in the machine.

Water with a hardness level higher than 0.7 mmol/l (7 °fH – French scale or 4 °dH – German scale) must be softened. This occurs automatically during a programme sequence on machines with a built-in water softener (option ex works). The water softener must be set to the exact hardness of the water supply.
The water softener must be reactivated at regular intervals. This requires the use of special reactivation salt. Reactivation is carried out automatically after a programme execution.

Softened water must be provided on site for machines without a built-in water softener.

Maximum hardness allowed for the water is 65 °fH or 36 °dH.

Note: The water hardness is controlled by the Service and the parameters are set accordingly.

A good water quality to ensure the effectiveness of the process must take into account the following factors:

HARDNESS	High hardness of the water generates inactivation of the detergent, reducing its effectiveness. It also causes limescale deposits in the machine, compromising cleaning of the tools and some components of the machine, especially on parts subject to heating (for example heating elements).

IONIC CONTAMINANTS	The high concentration of ionic contaminants can cause the corrosion of steel and some tools if they are made from manganese or copper. If the chloride content of the water exceeds 100 mg/l, the risk of corrosion to the load in the machine will be further increased.
MICROBIAL CONTAMINANTS	Microbial contaminants can increase the microbial contamination of instruments after washing, especially in chemical disinfection cycles.

- ► The water used in the pre-washing and washing phases is drinkable and of quality compliant with the "3rd Edition drinking water guideline" published by the World Health Organisation.
- ► In certain regions (e.g. mountainous areas), the water composition may cause precipitates to form, requiring the use of softened water in the steam condenser.
- ► Demineralised water is used for the rinsing phase and can also be used for the washing phases.

The requirements of demineralised water are:

pH	5.5 ÷ 8
Conductivity	< 10 µs/cm
TDS	< 40 mg/L
Maximum hardness ($CaCO_3$)	< 50 mg/L
Chlorine	< 10 mg/L
Heavy metals	< 10 mg/l
Iron	< 2 mg/L
Phosphates	< 0.2 mg/L
Silicates	< 0.2 mg/L
Endotoxins	< 0.25 EU/mL
Colony forming unit	< 100 CFU / 100 mL

Local regulations are stricter than the envisaged recommendations. The regulations of the country of installation must be followed.

3.5.2 Requirements

- ► The machine must be connected to the water supply in strict accordance with local regulations.
- ► Use only the hoses supplied with the machine
- ► Do not shorten the hoses supplied with the machine
- ► The **minimum flow pressure** for cold water, hot water and DI water connections is 40 kPa.
- ► The **recommended flow pressure** is ≥ 200 kPa for the cold and hot water connections and ≥ 200 kPa for the DI water connection in order to avoid excessively long water intake times and to guarantee the best perfomance for the steam condenser (if installed).
- ► The **maximum permissible static water pressure** is 600 kPa.
- ► A booster pump is required for the DI water connection if the flow pressure is below 40 kPa.
- ► If the machine is equipped with a booster pump but the pressure on the demineralised water tap is higher than 40 kPa, disconnect the booster pump, otherwise the component could be seriously damaged.
- ► If the pressure is higher than 600 kPa, a pressure reducer must be installed.
- ► If water pressure is not within the specified range, contact the Service or an authorised service technician for advice.

► A stopcock valve with a ¾” male threaded union must be provided on site. The valve should be easily accessible, since the water supply should be shut off whenever the machine is not in use.

For the water connection specifications, refer to the installation plan.

During installation of the machine, the installer must perform the following procedure:

1. Identify the pipes supplied with the machine and check that they are not damaged
2. Identify the correspondence between the flexible hoses and the general water supply taps set up on site, in accordance with the references in the table below.

CONNECTION	COLOUR
HOT WATER	RED
COLD WATER	BLUE
DEMINERALISED WATER	WHITE

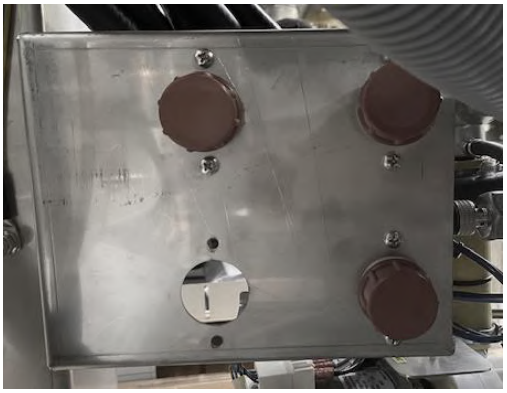
3. Screw and tighten the pipe ring nut to the attachment prepared on site.
4. Remove any debris in the pipes or taps. To do this, open the tap and let the water flow into a bucket.
5. Check the water temperature according to the specifications of the installation plan.
6. Identify the correspondence of connection of the flexible hoses to the water supply solenoid valves of the machine, in accordance with the references in the table above.
7. Screw and tighten the pipe ring nut to the attachment prepared in the machine.
8. Gradually open the water supply taps and check the tightness of the connections.
9. Once the connection is complete, in case of water leaks repeat the procedure again.

Do not overtighten the threaded unions on the hoses.

Information:

► The anti-return water system is already installed inside the appliance in accordance with the IEC 61770 standard.

► If no hot or DI water supply is available, the **red** or **white** coded inlet valves should be closed with a cap supplied with the machine.



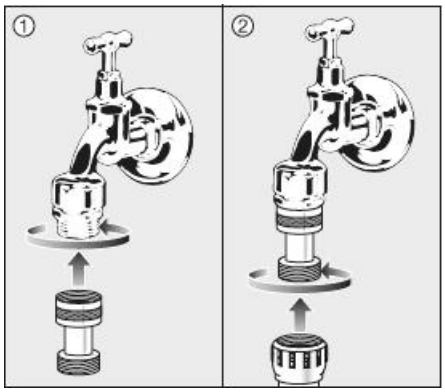
The hot or demi water absence must be set in the machine settings: in this case the machine automatically fills cold water instead of the non-connected water type. In this case, the non used water hoses do not need to be assembled.

If no cold water supply is available, or the hardness of the water is higher than specified in the installation plan, and the machine is not equipped with a water softener, the **blue** coded inlet valve should be closed with a cap supplied with the machine.

The water absence needs to be set in the machine settings, in order to allow the machine to automatically fill the alternative water.

► Non-compliance with the above conditions will render the warranty invalid.

Special requirements:
In some countries as Germany, Switzerland, Netherlands, Australia and New Zealand to protect the drinking water supply network, the enclosed backflow preventer (*to be ordered separately*) must be installed between the tap and the water inlet hose.



► Screw the backflow preventer onto the water tap (1).

► Screw the water supply hose onto the thread of the backflow preventer (2).

This backflow prevention kit need to be inspected on yearly base to check the status of the valve and for cleaning purposes.

The backflow prevention kit is validated according to BRL-K14011.

3.5.3 Built-in softener

The built-in softener has the function of reducing the quantity of limescale contained in the supply water used for washing and thermal disinfection. The instrument washer, if fed with particularly hard water, quickly degenerates, compromising its functioning and its very duration.
To keep the resins that perform the descaling activity active, they must be regenerated as described in the table.

For machines equipped with this device, at the time of installation, the value corresponding to the water hardness must be set, as follow:

WATER HARDNESS (°fH)	WATER HARDNESS (°dH)	PARAMETER SETTING
7 - 15	**4 - 8**	**6**
16 - 30	**9 - 17**	**4**
31 - 50	**18 - 28**	**2**
51 - 65	**29 - 37**	**1**

Whenever the lack of salt alarm appears on the display, perform the following operations:

Use only special, coarse-grained dishwasher salt or other pure evaporated salt for reactivation. Never use any other kind of salt, e.g. table salt, animal feed salt or de-icing salt. Other salts may contain insoluble additives which can impair the functioning of the water softener.

The container for dishwasher salt is located in the base of the wash chamber inside the machine.

1. Open the door.
2. Remove the load carrier.
3. Unscrew the plastic cap on the container.
4. Fill the funnel with salt.
5. Raise the funnel by the handle and place it on the container.
6. Release the handle. The salt then passes from the funnel into the container.
7. Repeat the process until the container is visibly full.

The supply container contains approx. 800 g of salt.

The container must always be completely filled. If filled to less than full, the water softening capacity is reduced and limescale deposits may occur on the load and on wash chamber surfaces.

8. Refit the plastic cap on the salt container and screw tight.
9. Place the load carrier in the machine.
10. Start the “Rinse” programme.

Always run the “Rinse” programme after refilling the salt. This removes and dissolves spillages of salt and brine. Excess salt and brine which has overflowed can cause corrosion damage if they are not rinsed away.

During reactivation, the following simbol appears on the display: • .

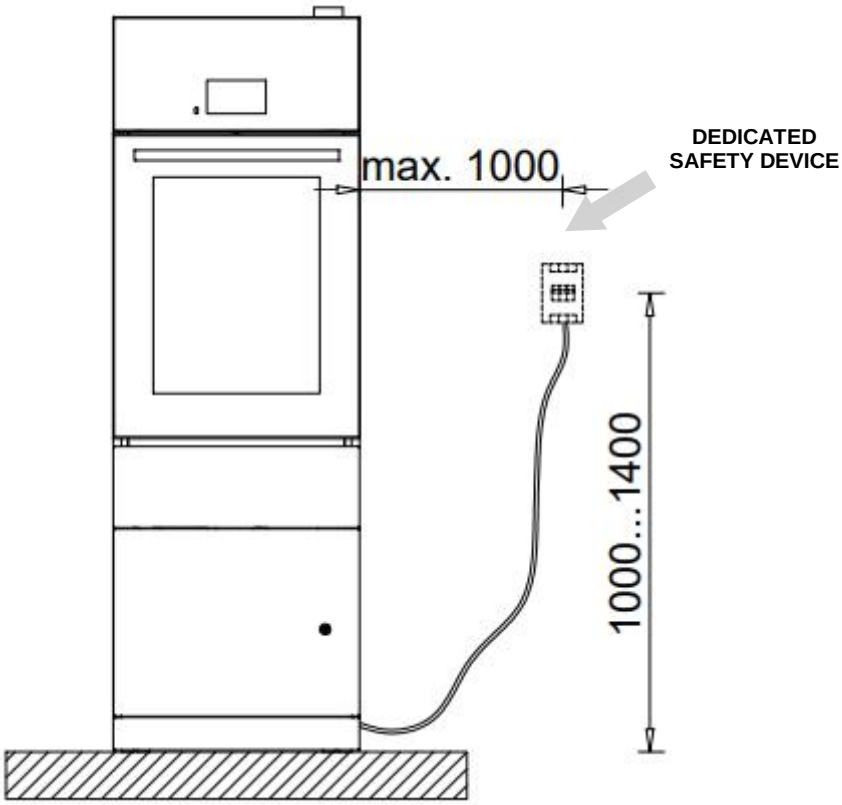
3.6 Electrical connection

Only qualified, skilled personnel may connect the machine to the power supply.

- ► It is recommended that the machine be connected to the mains electrical supply via a suitably rated plug and socket compliant with all local and national standards.
- ► The machine must only be operated with the voltage, frequency and fuse rating shown on the data plate.
- ► The electrical connection must be made according to the technical regulations in force.
- ► The power supply voltage must not differ from its nominal value by more than ±10 %.
- ► The frequency of the power supply must not differ from its nominal value by more than 1 %.
- ► The electrical safety of the machine can only be guaranteed when it is correctly earthed. Equipotential bonding is required.
- ► Make sure that the electrical systems are properly earthed.

- The earth conductor is to be connected to the earth terminal identified by the standard symbol.
- The machine is equipped with a terminal identified by the relative symbol for equipotential connections between appliances (see rules for electrical systems), placed on the lower technical area, on the solenoid valve bracket
- The machine is equipped with a power cable
- Machines that are permanently connected (without a plug) must be connected via a power switch with all-pole isolation. The power switch must be designed to operate at the rated current.
- For increased safety, it is recommended to protect the machine with a suitable residual current device (RCD) with a trip current of 30 mA (DIN VDE 0664)

EXAMPLE OF DEDICATED SAFETY DEVICE POSITIONING



- The installed safety device must be equipped with fuses according to the specification indicated in the Installation plan and Wiring diagram
- The machine should be disconnected from the power supply when not used for a longer period of time.
- The electrical connection and fuse rating must comply with local and national regulations.

For the electrical connection specifications, refer to the installation plan.

3.6.1 Fuses

The fuses are used to protect the electrical circuits of machine from possible failure due to overload or short circuits. If a fuse fails, the components connected downstream, and their functions are no longer available.

The fuses must comply with the characteristics (size, dimensions, and tripping characteristic) indicated in the wiring diagram.

Replacing the fuse

ATTENTION

The replacement of the fuse must be carried out by authorized operators only.
Before fuse replacement procedure, determine and eliminate the cause of the fault.
If necessary, contact the manufacturer's technical assistance service.

Procedure:

1. Disconnect the machine safely using the main switch.
2. Access to the electric switchboard.
3. Based on the electrical diagram, identify fuse to be replaced.
4. Remove the relevant fuse from the fuse-holder.
5. Replace the defective fuse with a new fuse with the same characteristics. The correct values of the fuses are shown in the wiring diagram.

ATTENTION

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

3.7 Drain connection

- ► The connection to the drain must be checked carefully.
- ► The drain must be suitable for biological, chemical and high temperature fluids.
- ► If the drain is not suitable for high temperature fluids, a drain cooling valve need to be installed (optional)

The connection of the drain hose to the sewer system takes place as follows:

- ► Identify the drain pipe and relative connection fitting.
- ► Locate the drain manifold.
- ► Insert the drainage hose and lock it in place with the appropriate clamp.
- ► Insert the other end of the flexible hose to the drain union, connecting it appropriately and locking it in place.

Requirements

- ► The drain pipe must not have abnormal bends or angles in its path.
- ► If the on-site drain connection is above the machine drain valve, a drain pump must be installed.
- ► Maximum drain height from the floor with drain pump installed is 1.5 m.
- ► Avoid extensions of the drain pipes.

Follow these instructions carefully, as an incorrect connection of the drain can cause the machine to block.

ATTENTION

Drainage must be carried out in compliance with the international directives.
We decline all responsibility in case improper use of the machine causes contamination.
In case of obstruction of the drain, be very careful when treating the water, and carefully avoid contact with hands, eyes, etc.
If necessary, wash the parts in contact with plenty of water.

3.8 Compressed air connection (only for medical versions with PPC installed)

In units equipped with the Power Pulse Cleaning (PPC), medical compressed air is required.
Compressed air with the quality of medical compressed air must comply with class II according to ISO 8573-1:2010.
A coupling socket with a nominal width of 10 mm must be provided for the connection.

- ► Connection to the compressed air must be performed in accordance with what is specified in the installation plant and in compliance with the applicable legislation.
- ► Pressure: 550-650 kPa
- ► Flow rate: 10 Nm3/h

ATTENTION

Before performing maintenance, empty the compressed air circuit

3.9 Filtration of the drying air

The machine is equipped as standard with a "class G1" air filter according to the EN 779 standard.
It is recommended to replace the filter every 6 months.

The machine is also equipped with an additional "HEPA H14" filter according to the EN 1822 standard.
It is recommended to replace the filter every 12 months.

For replacement details follow the maintenance instruction on this manual.

3.10 Environment ventilation requirements

During normal operation, the machine heats up, dispersing heat and hot air containing humidity; during the drying phase these values increase. Therefore, in order to ensure a constant temperature and humidity environment that is comfortable for the operator, it is necessary to prepare an air conditioning system or an air change with a capacity that balances the emissions indicated in the installation plant.

3.10.1 Air exhaust (for machines connected to a ventilation system).

- ► When the machine is connected to a ventilation system, the exhaust pipe must be placed outside the building, protected from access by animals and making sure that it cannot cause any danger.
- ► The maximum permissible back pressure in the extraction pipe is indicated in the installation plant.
- ► To connect the device to the ventilation system it is necessary to install an air gap, to guarantee the performance of the machine.

A detail of the data relating to the connections of the machine is shown in the wiring and installation plant.

4. CHEMICAL PRODUCT DISPENSING SYSTEM

The dispensing system for process chemicals comprises:

- ► 1 dispenser pump (DOS1) for cleaning agent
- ► 1 dispenser pump (DOS3) for neutralising agent
- ► Fill level sensor that monitors the fill level in the process chemical canisters. A lack of product is indicated on the display.
- ► The system is equipped with flow meters. This electronic device monitors the volume of product dispensed.

Additional dispenser pumps can be fitted by the Service or an authorised service technician.

Use only chemical products recommended by the manufacturer (indication are present on the table below): in case of chemicals other than those declared by the manufacturer, it is necessary to request authorisation before using the chemical.

Recommendations:

- ► Use only chemical products that are appropriate for the reprocessed load and the machine
- ► Do not use inflammable chemicals
- ► Do not use chemical products with risk of explosion

Each pump is combined with a label that identifies the number of the dispenser. Depending on the type of chemicals used, a coloured tube and its cap are installed.
As the pre-set cycles in the machine refer to a dedicated dosing system (DOS1-4) according to the chemicals recommended by the manufacturer, it is necessary to check the correspondence of the pre-set cycles with chemicals selected by the user.
Make sure that a specific chemical canister matches the correct dosing system (DOS1-4).

ATTENTION

In case of use of chemicals other than those recommended, check the correctness of the dosage set in the cycles in accordance with the technical data sheets of the products used, and if necessary, modify it.

The colours and name used to identify the chemicals are as follows:

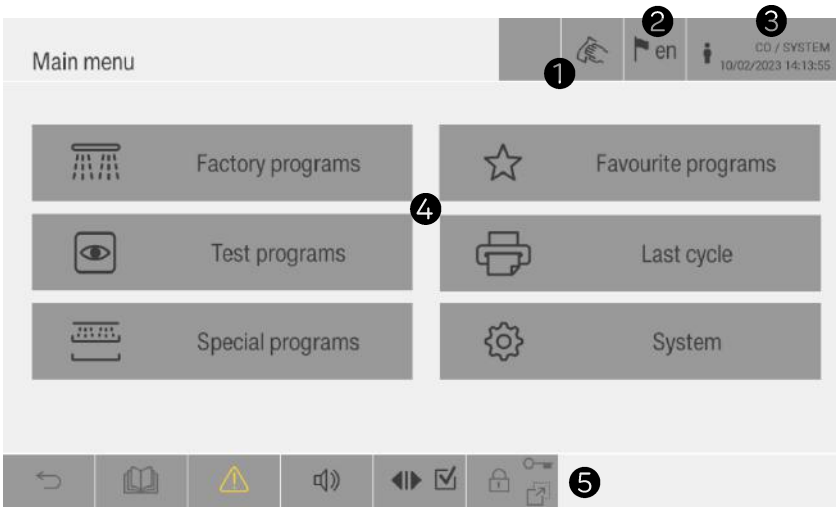
DOS 1	**BLUE**	Installed ex-factory Alkaline, enzymatic, or neutral detergent	e.g. ProCare Med 10 A ProCare Med 10 MA ProCare Med 10 EN Miele ProCare Lab 10 AP Miele ProCare Lab 10 AT Miele ProCare Lab 10 MA
DOS 2	**GREEN**	Optional pump (Retrofit kit) Lubricant or rinse aid	e.g. ProCare Med 60 LUB ProCare Med 40
DOS 3	**RED**	Installed ex-factory Neutralising agent or acid detergent	e.g. ProCare Med 30 C ProCare Med 30 P Miele ProCare Lab 30 C **Miele ProCare Lab 30 P**
DOS 4	**BLACK**	Optional pump (Retrofit kit)	e.g. ProCare Med 20 CT

Recommendations:

- ► Consult the relevant manufacturer's instructions for the maximum amount of process chemical permitted for each programme.

5. CONTROL PANEL & MENU

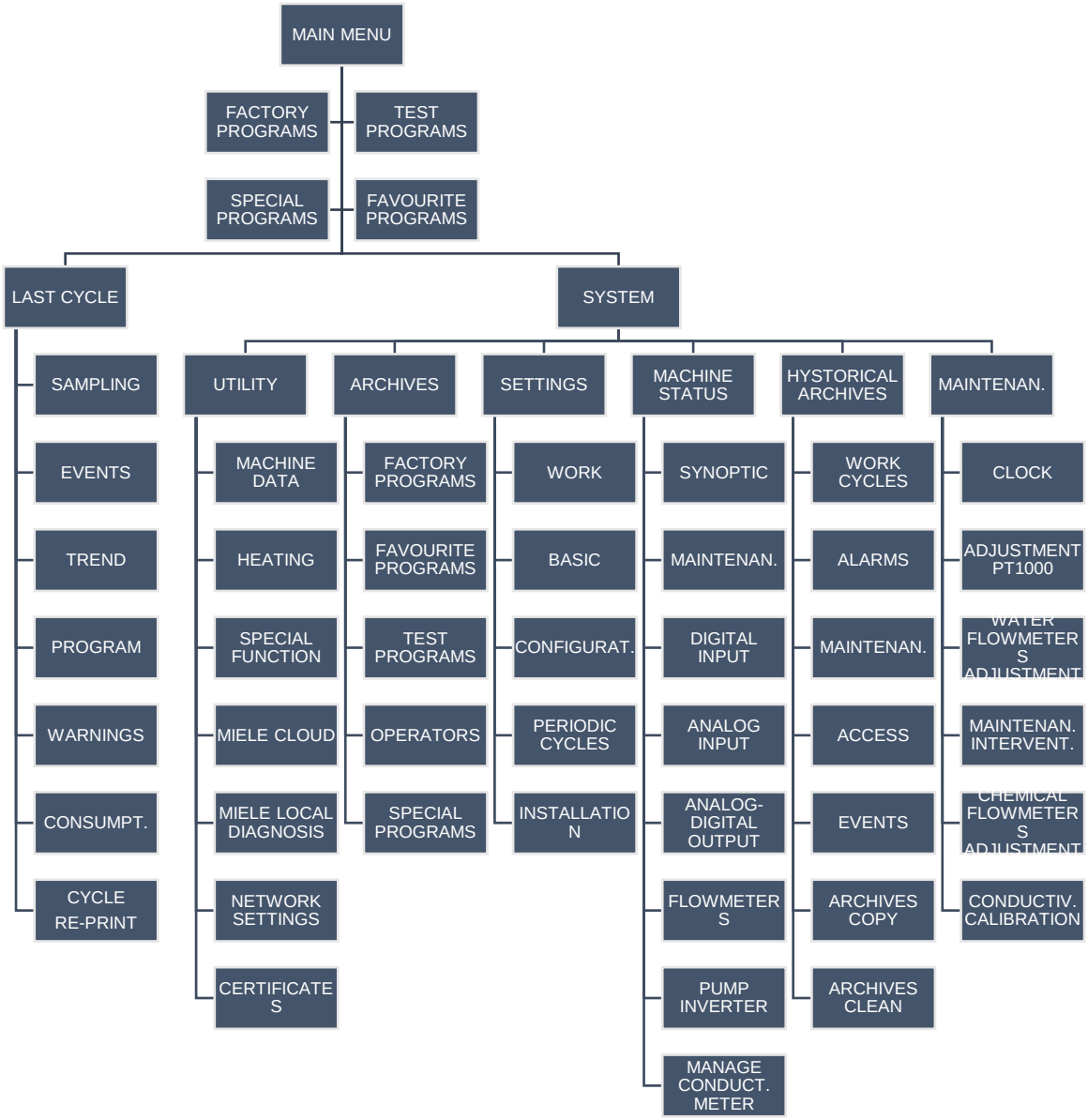
5.1 Control panel - loading side



❶ Header
❷ Display language selection
Current user
❹ Buttons to call up sub-menu
Cycles selection
Last cycle information menu
Settings menu
❺ Footer

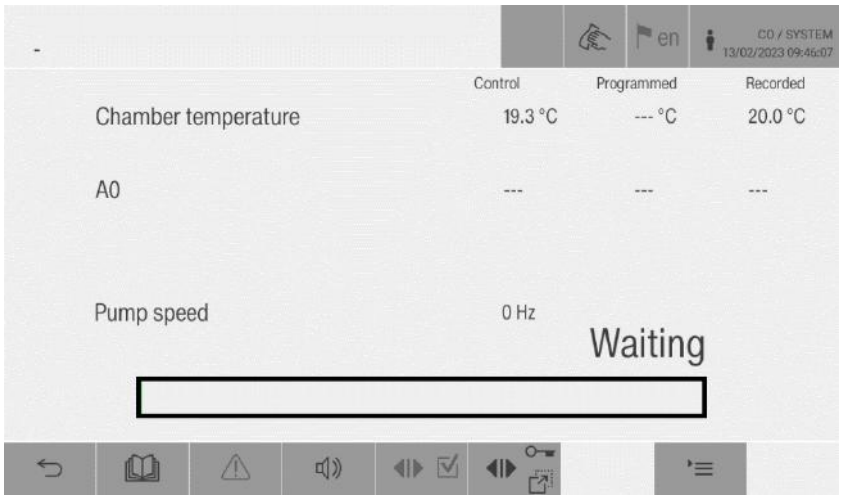
Symbols	Description / Function of the button
Factory programs	List of ex-factory programs
Test programs	List of test programs
Special programs	List of special or customised programs
Favourite programs	List of programs saved as favourite choose between Factory and Special programs
Last cycle	Sub menu with all the information about the last cycle executed
System	Sub menu with the settings, adjustment and utility functions

5.1.1 Menu tree

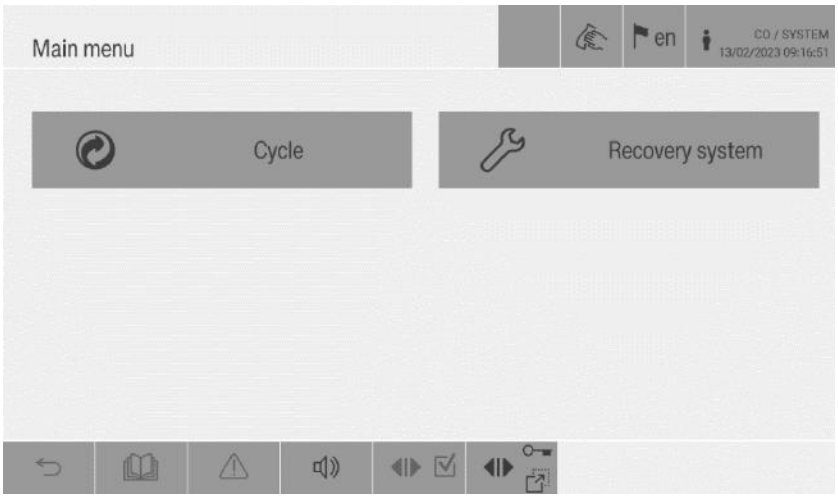


5.2 Control panel - unloading side (Medical versions only)

When the machine is waiting for a cycle start, the following screen appears.

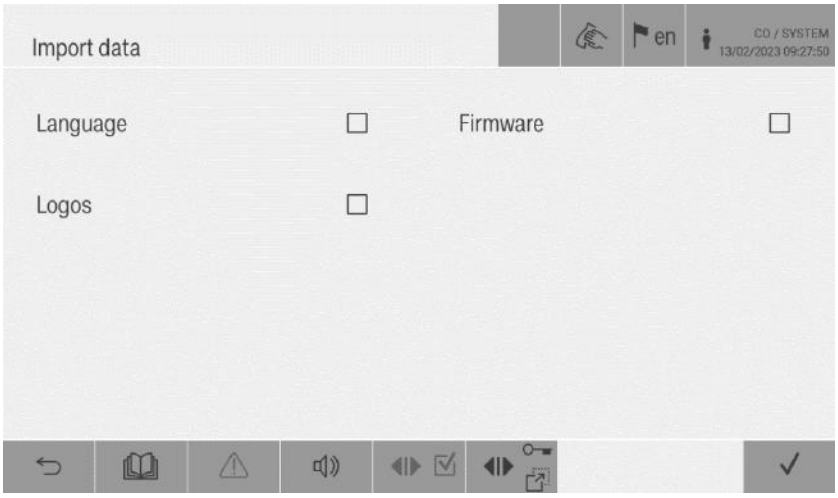


If the menu icon is pressed the following page will appear:



Selecting the CYCLE button it is possible to come back to the cycle page as shown previously.

Pressing the RECOVERY SYSTEM menu, it is possible to update the unloading side panel. For this operation, follow the instruction on section 7.

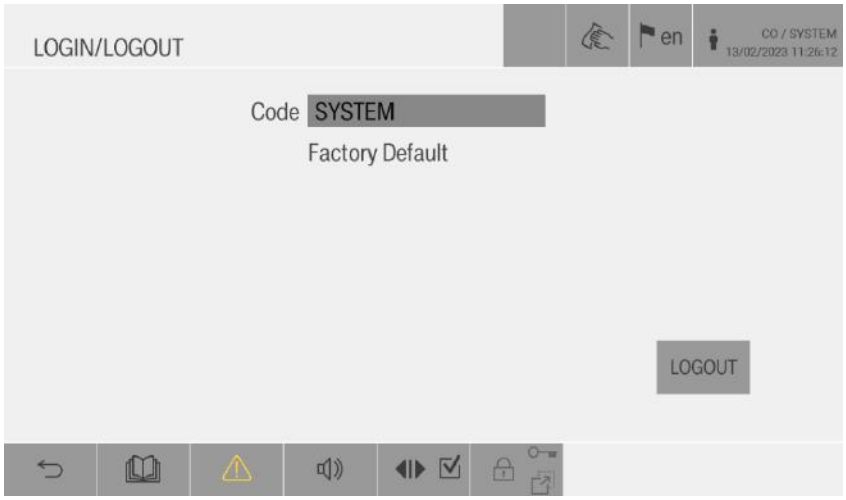


5.3 User login

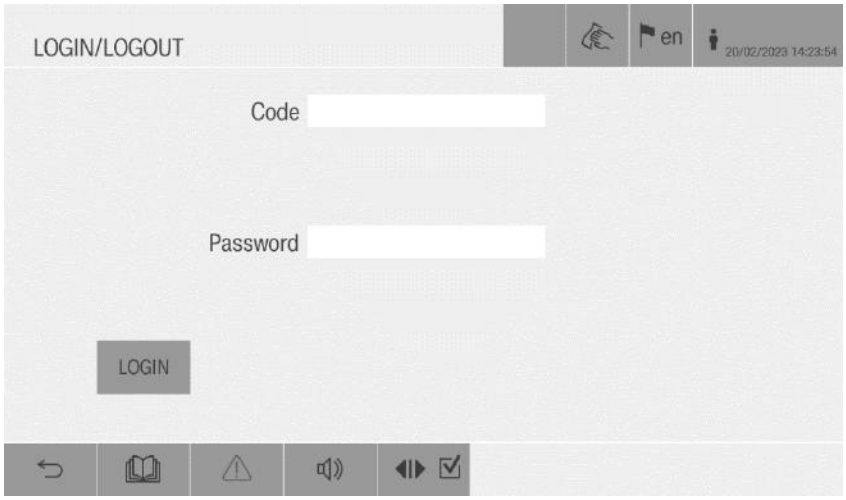
The user must log in to be able to execute every operation on the display. Depending on the operator's level of authorisation, elements of the menu may be hidden.

To log in, press the icon in the header.

If another user is already logged in, the LOGOUT button must be pressed.



When the icon is pressed again, the following page will appear:



Insert the code and the password, then press LOGIN.
The user code will appear on the right top of the display over date and time.

ATTENTION

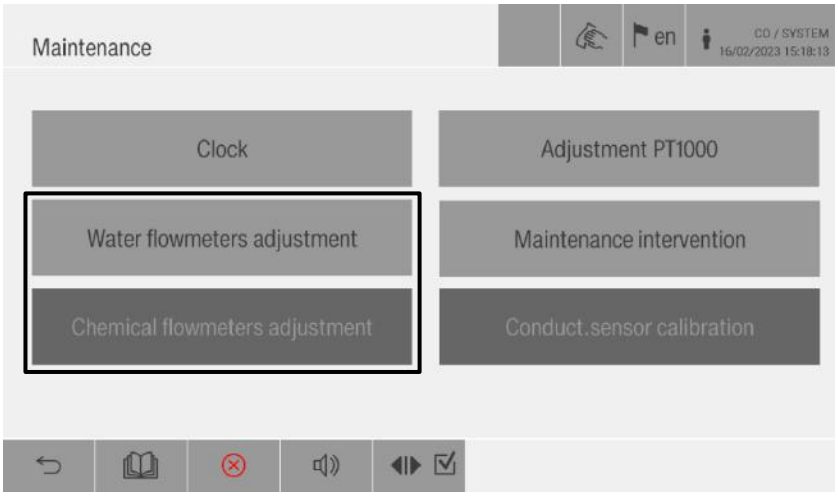
For a user that execute for the first time the access, a password change is requested.
After the password change it will be necessary to LOGIN again.

5.3.1 Access levels

Level	Code / Description	Function
1	OP / Operator	Start of programmes Machine status visualisation
2	CR / Department manager	Basic settings of machine Maintenance intervention for BIANNUAL intervention
3	MN / Maintenance technician	Manual controls activation Sensors adjustment
4	SV / Supervisor – Service	Programmes creation
5	CO / Manufacturer	Complete access to all the menu of the machine

6. FLOWMETERS ADJUSTMENT

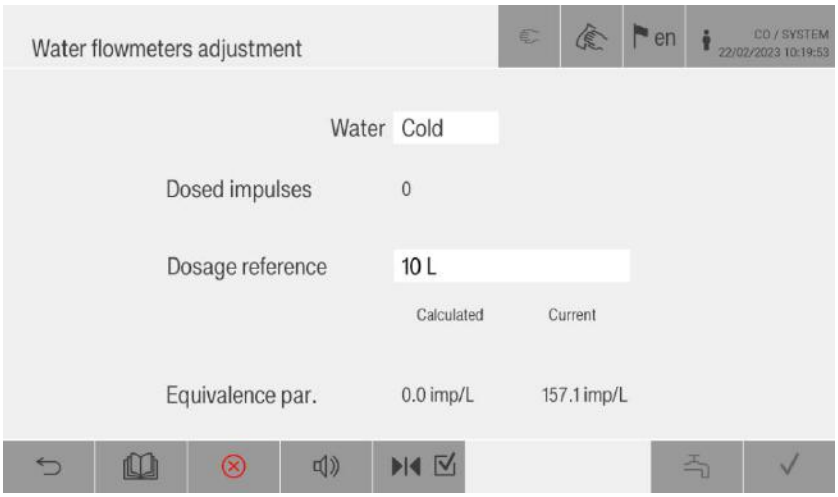
On the MAINTENANCE menu (accessible from the SYSTEM menu) it is possible to execute the flowmeters adjustment.
To execute the flowmeters adjustment, it is necessary to access with access level 3 or higher.



6.1 Water flowmeters adjustment

This page allows to adjust the equivalence in impulses/litre of the water flowmeters.
The flowmeters adjustment needs to be executed at the machine start up and in the event of a flowmeter replacement.

Two methods can be used to adjust the water flow meter:
a) By measuring the water volume/level in the chamber sump with a measuring tape
b) By using an external water flow meter in the water intake line



1. Access the WATER FLOWMETERS ADJUSTMENT menu
2. Activate the manual control using the hand icon on the display header
3. Select the water to be adjusted
4. Activate the tap icon to dose the water (it is possible to start the water filling also with door open – be careful that water does not come out from the chamber)
5. Stop the water dosing when the reference instrument or the measuring tape shows the reference value (e.g. 10 L) by pressing the tap icon again

Procedure using the measuring tape:

1. Remove the filter and place the measuring tape on the sump
2. Here below some reference point and measurement at different filling levels:

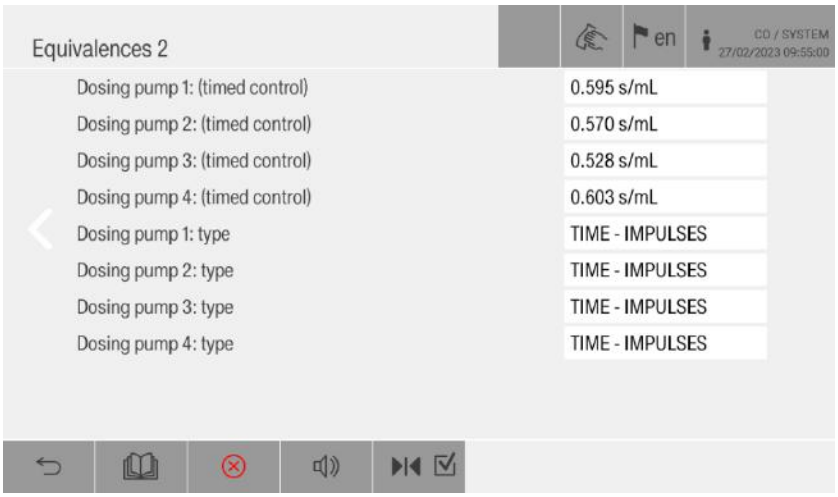
   166 mm ± 1 mm → 7 L → in line with the sump frame (picture above)
   179 mm ± 1 mm → 8 L
   191 mm ± 1 mm → 9 L
   199 mm ± 1 mm → 10 L

6. If the value measured from the reference instrument or the measuring tape is different from what is shown on the display, change the reference quantity according to the correct value
7. Press the confirmation button ✓ to save the new adjustment value into the reference menu

6.2 Chemical flow meter adjustment

The flowmeters adjustment needs to be executed at the machine start up, in the event of a flowmeter replacement or a chemical replacement (the viscosity of the chemical product influences the flowmeters adjustment, so the chemical product replacement with another type or brand, require a new adjustment procedure).

On the settings menu, on the EQUIVALENCE page, it is possible to select the type of control for the chemical dosing.
The menu can be reached from MAIN MENU – SYSTEM – SETTINGS – BASIC – EQUIVALENCE – PAGE 2

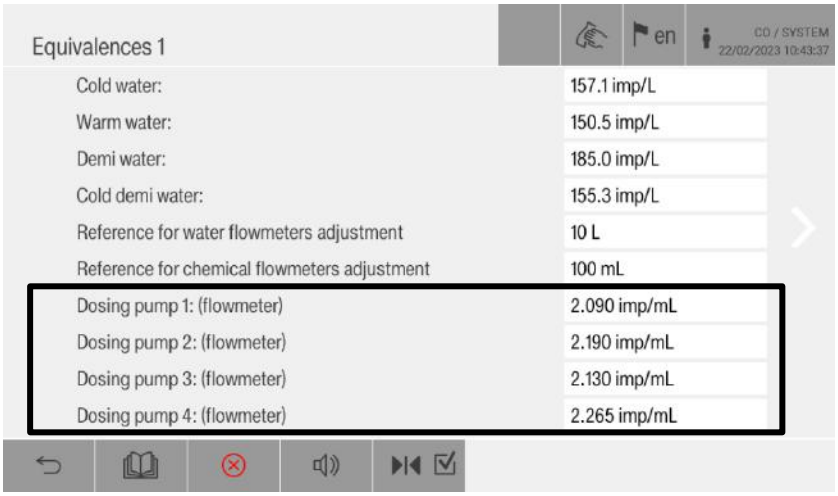


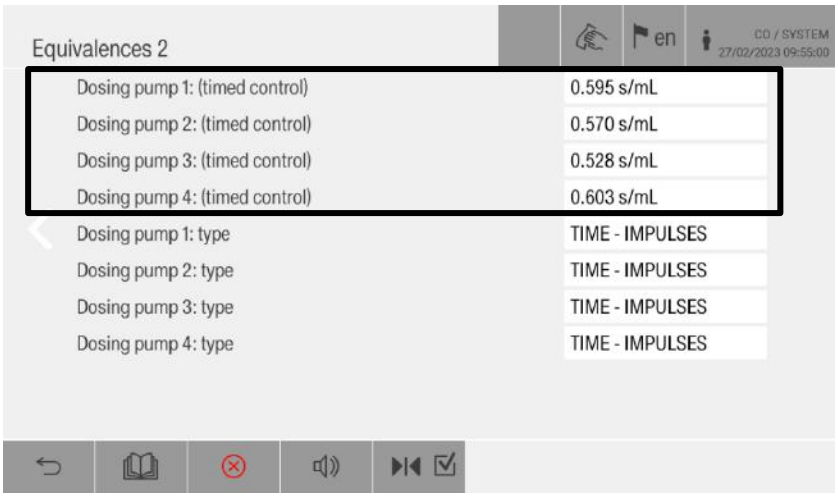
There are 3 possibilities, described below:

Setting	Description
TIME	The dosing pump is controlled only by time. According to the adjustment value ("/mL), the control calculates the dosing time and stop the pump when the value is reached.
IMPULSES	The dosing pump is controlled only by impulses. According to the adjustment value (imp/mL), the control calculates the dosing impulses and stop the pump when the value is reached.
TIME – IMPULSES	The dosing pump is controlled by time, so according to the adjustment value ("/mL), the control calculates the dosing time and stop the pump when the value is reached. At the end of the dosing time, the control verifies the number of impulses and calculate the chemical amount, comparing it with the amount calculated with the time dosing. If the compared values are within the 5%, the dosing is considered valid, otherwise the machine will give a discrepancy alarm. ***In this case a new adjustment procedure is suggested.***

Independently from the control selection, the procedure allows to adjust both time ("/mL) and impulses (imp/mL) at the same time.

According to the type of chemical product installed, it is possible to set the equivalence value on the parameters. The menu EQUIVALENCE is included into MAIN MENU – SETTINGS – BASIC





Below a table with the equivalence values for the suggested chemical products:

	impl/mL	“/mL
ProCare Med 10 A	1.902	0.651
ProCare Med 10 MA	2.100	0.609
ProCare Med 30 C	1.832	0.634
ProCare Med 30 P	2.052	0.574
ProCare Lab 10 AP	1.640	0.699
ProCare Lab 10 AT	1.125	0.714
ProCare Lab 10 MA	1.323	0.796
ProCare Lab 30 C	1.857	0.615
ProCare Lab 30 P	0.950	0.815

If the chemical products used are not included on this table, it is possible to run the adjustment procedure below.

6.2.1 Adjustment procedure

Circuit venting

To adjust the dispenser system, it must be vented.
To vent the dispensing circuit, follow this instruction:

- Insert the suction lance into the chemical product canister
- Enter the SYSTEM menu, then MACHINE STATUS section and finally the DIGITAL OUTPUT menu
- Activate manual controls pressing the hand icon on the header •
- Operate the dosing pump pressing the red square on the right side of the description
- Stop the pump as soon as you see chemical product that flow into the chamber from the injector

Repeat the procedure for all the dosing pumps, executing the rinse program after each procedure to rinse off the chemical product from the chamber.

Adjustment

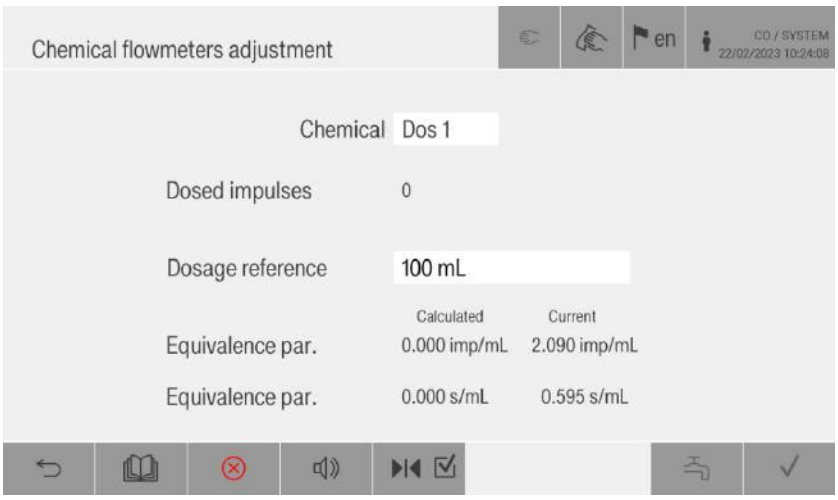
The following items are required for adjusting the dispensing system:

- Big capacity measuring cylinder (at least 250 ml)
- Small capacity measuring cylinder (100÷200 ml)

Follow this procedure:

1. Insert the suction lance into the large measuring cylinder
2. Fill the large measuring cylinder with process chemicals up to a defined mark (e.g. 150 mL).

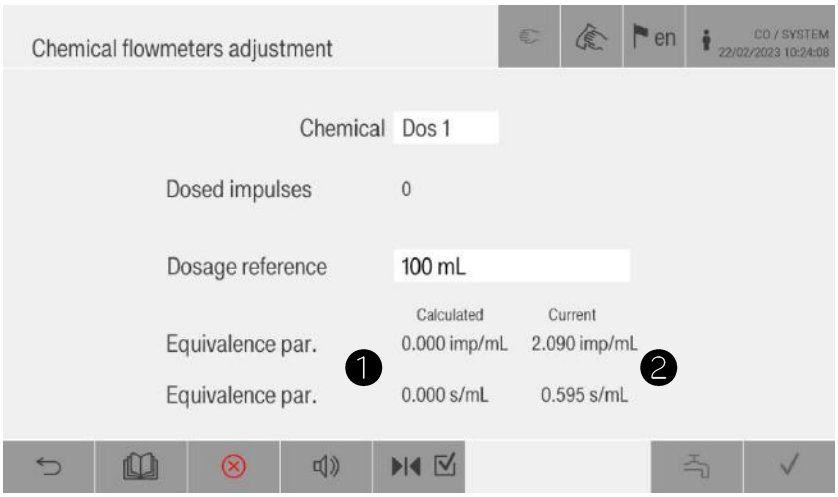
3. Fill the small measuring cylinder with 100 mL of process chemicals.
4. Also pour the 100 mL of process chemicals into the large measuring cylinder.
   There will now be 250 mL of process chemicals in the large measuring cylinder.



5. Enter the CHEMICAL FLOWMETERS ADJUSTMENT menu
6. Activate the manual control using the hand icon on the display header
7. Select the dosing system to be adjusted
8. Activate the tap icon to start the dosing pump.
9. Stop the chemical dosing when the mark on the cylinder has been reached
10. If the value on the white box with the chemical quantity reference is not correct, press the box and enter the correct reference value. Press the confirmation button to automatically save the new adjustment value into the reference menu.

Once you have completed the adjustment procedure, you must carry out the process again to check the result.

Repeat the procedure from step 1 to 4, then compare the new calculated value ❶ with the saved value ❷.



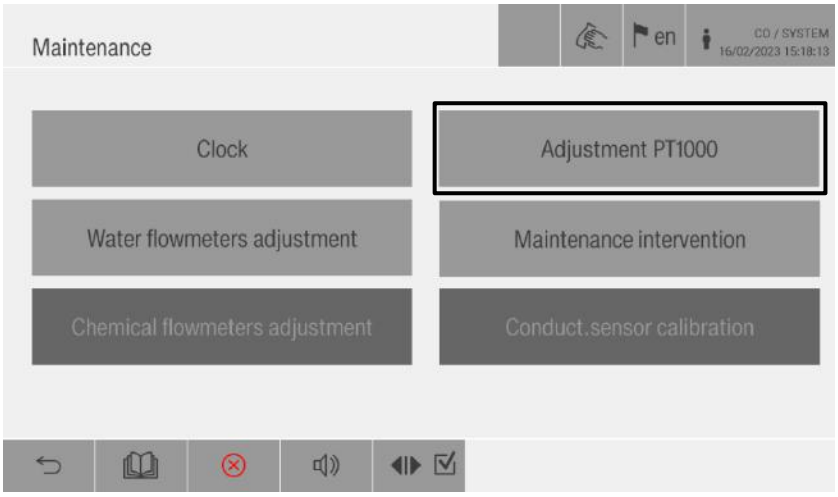
If the values are within the 5% from the expected value, the procedure is completed.

ATTENTION

To clean the process chemicals from the wash cabinet, after each adjustment procedure, start a rinse programme and let it run.

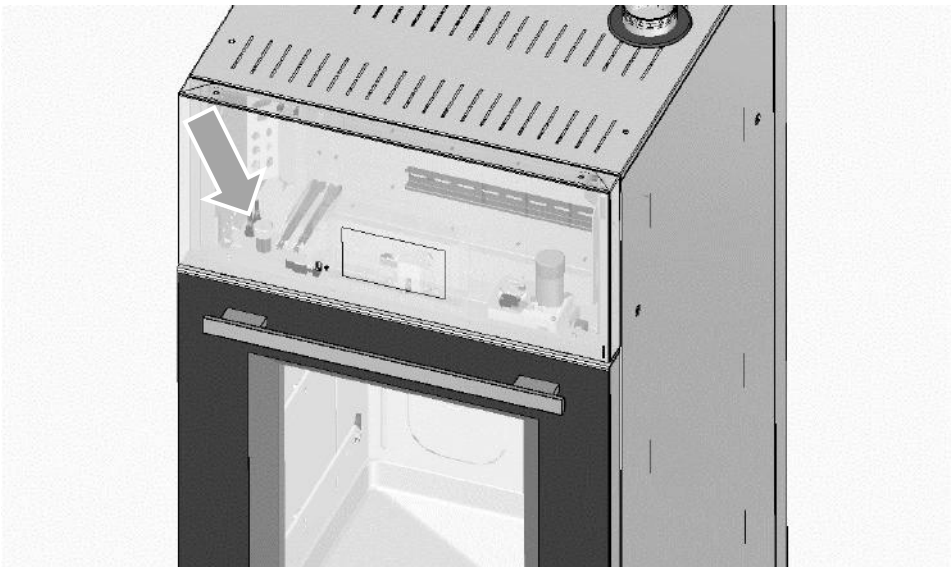
7. PT 1000 ADJUSTMENT

On the MAINTENANCE menu (accessible from the SYSTEM menu) it is possible to execute the PT 1000 probes adjustment.
To execute the adjustment, it is necessary to access with access level 3or higher.

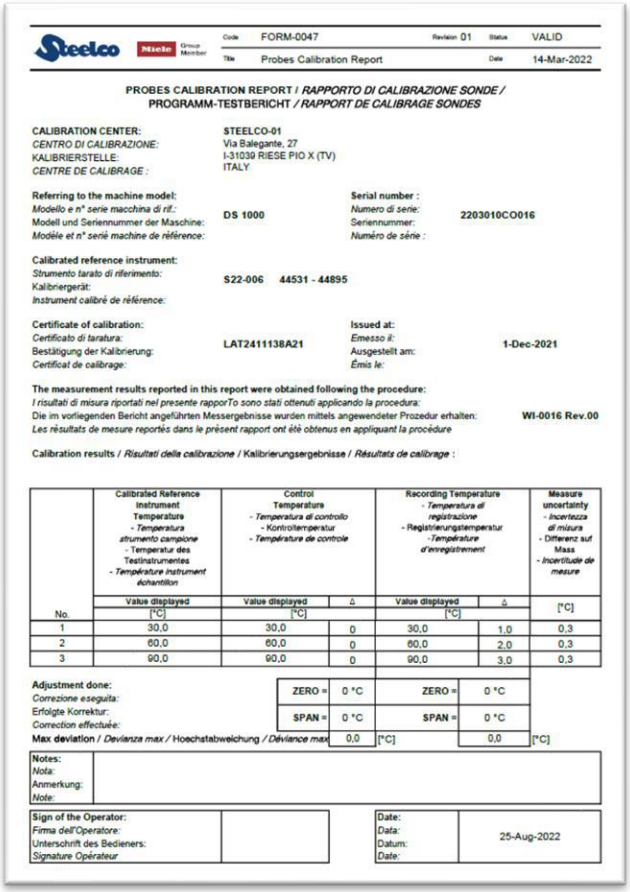


Procedure:

1. Unscrew the probe inspection cap



2. Insert a calibrated probe and fix it close to the chamber probes
3. Run the Probe Test cycle saved into the TEST PROGRAM menu. It will execute 3 phases with the heating set at three temperature stages: 30°C, 60°C and 90°C
4. At each temperature stage, fill the Probe Calibration Sheet with the temperature measured from the calibrated instrument, chamber probe 1 and chamber probe 2



Steelco Miele Group Member

Code	FORM-0047	Revision 01	Status	VALID
Title	Probes Calibration Report		Date	14-Mar-2022

PROBES CALIBRATION REPORT / *RAPPORTO DI CALIBRAZIONE SONDE /*
PROGRAMM-TESTBERICHT / *RAPPORT DE CALIBRAGE SONDES*

CALIBRATION CENTER:
CENTRO DI CALIBRAZIONE:
KALIBRIERSTELLE:
CENTRE DE CALIBRAGE :

STEELCO-01
Via Balegante, 27
I-31039 RIESE PIO X (TV)
ITALY

Referring to the machine model:
Modello e n° serie macchina di rif.:
Modell und Seriennummer der Maschine:
Modèle et n° serié machine de référence:
DS 1000

Serial number :
Numero di serie:
Seriennummer:
Numéro de série :
2203010CO016

Calibrated reference instrument:
Strumento tarato di riferimento:
Kalibriergerät:
Instrument calibré de référence:
S22-006 44531 - 44895

Certificate of calibration:
Certificato di taratura:
Bestätigung der Kalibrierung:
Certifical de calibrage:
LAT2411138A21

Issued at:
Emesso il:
Ausgestellt am:
Émis le:
1-Dec-2021

The measurement results reported in this report were obtained following the procedure:
I risultati di misura riportati nel presente rapporTo sono stati ottenuti applicando la procedura:
Die im vorliegenden Bericht angeführten Messergebnisse wurden mittels angewendeter Prozedur erhalten:
Les résultats de mesure reportés dans le présent rapport ont été obtenus en appliquant la procédure
WI-0016 Rev.00

Calibration results / *Risultati della calibrazione* / Kalibrierungsergebnisse / *Résultats de calibrage* :

No.	Calibrated Reference Instrument Temperature - *Temperatura strumento campione* - Temperatur des Testinstrumentes - *Température instrument échantillon*	Control Temperature - *Temperatura di controllo* - Kontroltemperatur - *Température de controle*		Recording Temperature - *Temperatura di registrazione* - Registrierungstemperatur -*Température d'enregistrement*		Measure uncertainty - *Incertezza di misura* - Differenz auf Mass - *Incertitude de mesure*
	Value displayed [°C]	Value displayed [°C]	Δ	Value displayed [°C]	Δ	[°C]
1	30,0	30,0	0	30,0	1,0	0,3
2	60,0	60,0	0	60,0	2,0	0,3
3	90,0	90,0	0	90,0	3,0	0,3

Adjustment done:
Correzione eseguita:
Erfolgte Korrektur:
Correction effectuée:

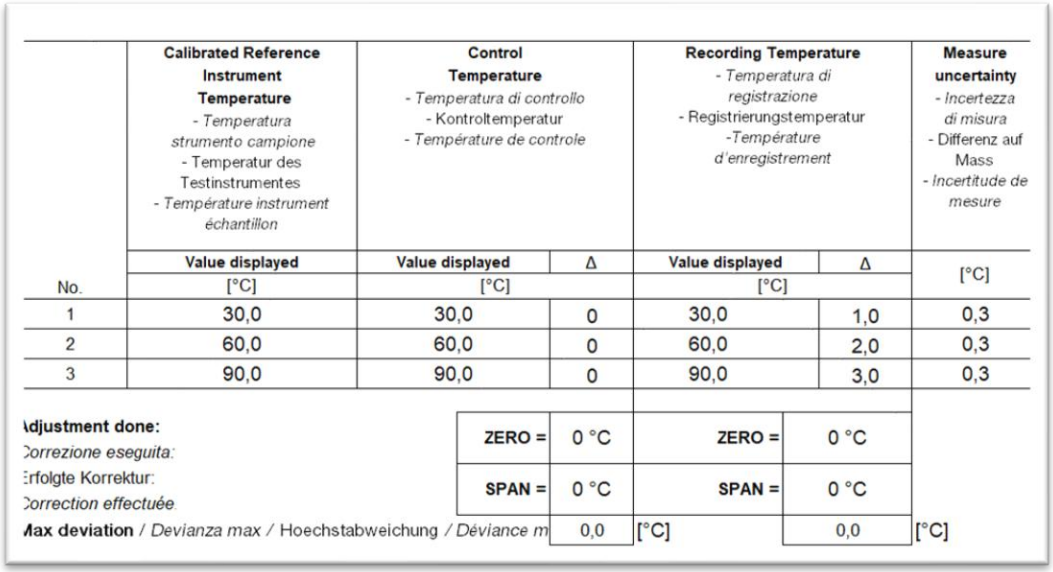
ZERO =	0 °C	ZERO =	0 °C
SPAN =	0 °C	SPAN =	0 °C

Max deviation / *Devianza max* / Hoechstabweichung / *Déviance max* 0,0 [°C] 0,0 [°C]

Notes:
Nota:
Anmerkung:
Note:

Sign of the Operator:
Firma dell'Operatore:
Unterschrift des Bedieners:
Signature Opérateur

Date:
Data:
Datum:
Date:
25-Aug-2022



No.	Calibrated Reference Instrument Temperature - *Temperatura strumento campione* - Temperatur des Testinstrumentes - *Température instrument échantillon*	Control Temperature - *Temperatura di controllo* - Kontroltemperatur - *Température de controle*		Recording Temperature - *Temperatura di registrazione* - Registrierungstemperatur -*Température d'enregistrement*		Measure uncertainty - *Incertezza di misura* - Differenz auf Mass - *Incertitude de mesure*
	Value displayed [°C]	Value displayed [°C]	Δ	Value displayed [°C]	Δ	[°C]
1	30,0	30,0	0	30,0	1,0	0,3
2	60,0	60,0	0	60,0	2,0	0,3
3	90,0	90,0	0	90,0	3,0	0,3

djustment done:
Correzione eseguita:
Erfolgte Korrektur:
Correction effectuée

ZERO =	0 °C	ZERO =	0 °C
SPAN =	0 °C	SPAN =	0 °C

Max deviation / *Devianza max* / Hoechstabweichung / *Déviance m* 0,0 [°C] 0,0 [°C]

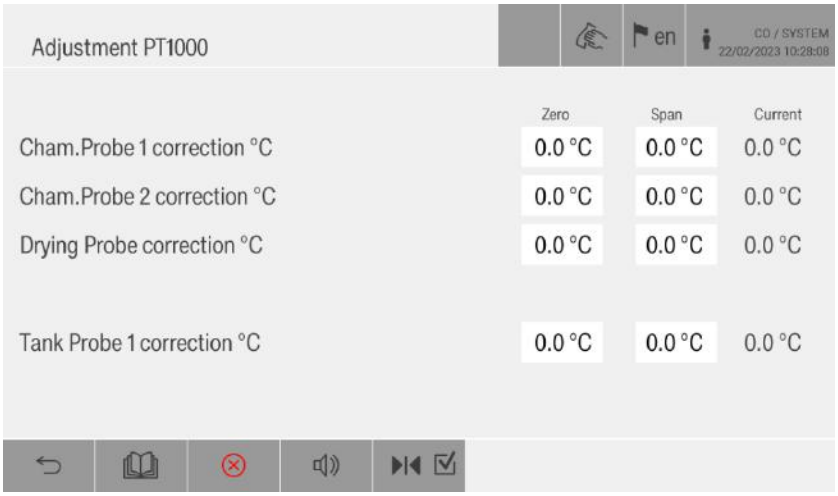
5. At the end of the cycle, read the calculation on the form, and fill the results on the ADJUSTMENT PT1000 page:

No.	Calibrated Reference Instrument Temperature - *Temperatura strumento campione* - Temperatur des Testinstrumentes - *Température instrument échantillon*	Control Temperature - *Temperatura di controllo* - Kontroltemperatur - *Température de controle*		Recording Temperature - *Temperatura di registrazione* - Registrierungstemperatur -*Température d'enregistrement*		Measure uncertainty - *Incertezza di misura* - Differenz auf Mass - *Incertitude de mesure*
	Value displayed [°C]	Value displayed [°C]	Δ	Value displayed [°C]	Δ	[°C]
1	30,0	30,0	0	30,0	1,0	0,3
2	60,0	60,0	0	60,0	2,0	0,3
3	90,0	90,0	0	90,0	3,0	0,3

djustment done:
orrezione eseguita:
rfolgte Korrektur:
orrection effectuée

ZERO =	0 °C	**ZERO =**	0 °C
SPAN =	0 °C	**SPAN =**	0 °C

ax deviation / *Devianza max* / Hoechstabweichung / *Déviance m* 0,0 [°C] 0,0 [°C]

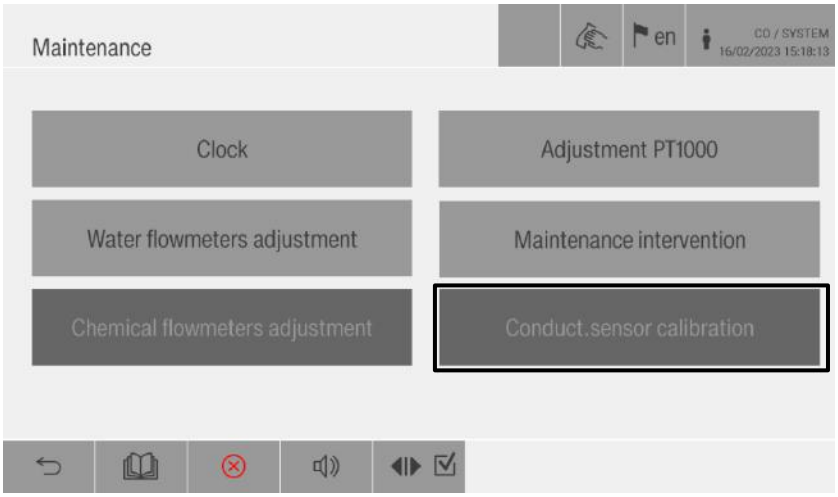


6. The values of the temperatures will be automatically adjusted

8. CONDUCTIVITY SENSOR CALIBRATION

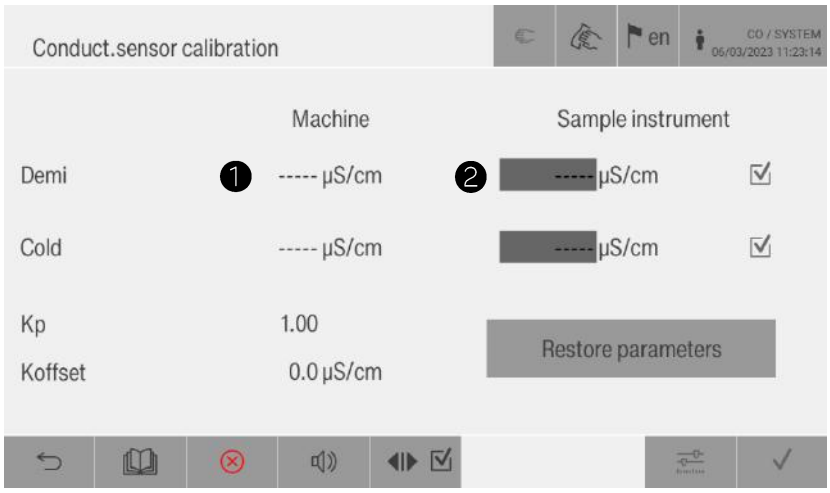
On the MAINTENANCE menu (accessible from the SYSTEM menu) it is possible to execute the conductivity sensor calibration.
To execute the calibration, it is necessary to access with access level 3or higher.

To execute this procedure, the machine needs to be connected to both cold and demineralised water.



The conductivity sensor calibration needs to be executed at the machine start up and in the event of a sensor replacement.

The calibration page allows to run a cycle to compare the value measured from the integrated conductivity sensor with a calibrated sample instrument.



To start the calibration cycle, it is necessary to activate the procedure pressing the on the header of the screen.
It is then necessary to press the starting button placed on the footer of the screen.

After the first step with demi water is completed, the machine will stop and will unlock the door. The screen will show the measured value on position ❶ and will ask for the sample instrument value on field ❷. When the data are inserted, it is possible to close the door and confirm with the button ☑. In this moment the cycle will proceed with the second step.

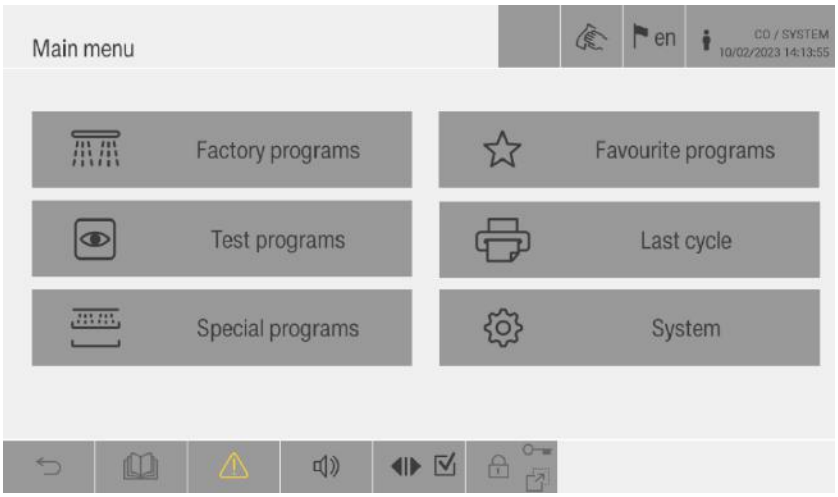
On the second step the same procedure will be executed, and the machine will stop again after the cold water step, asking for the sample instrument value. Insert the value red on the instrument, then confirm with the ☑ button. The values for constants “Kp” and “Koffset” will be automatically calculated.

To complete the procedure and save the calculated values, it is sufficient to confirm the whole procedure with the ✓ button as soon as the button become active after the competition of the calibration cycle.

9. MENU

9.1 Main Menu

The main menu allows the access to all the settings menu, archives, machine status and cycle selection menu.
According to the access level of the operator logged in it is possible to access completely or partially the following menu.

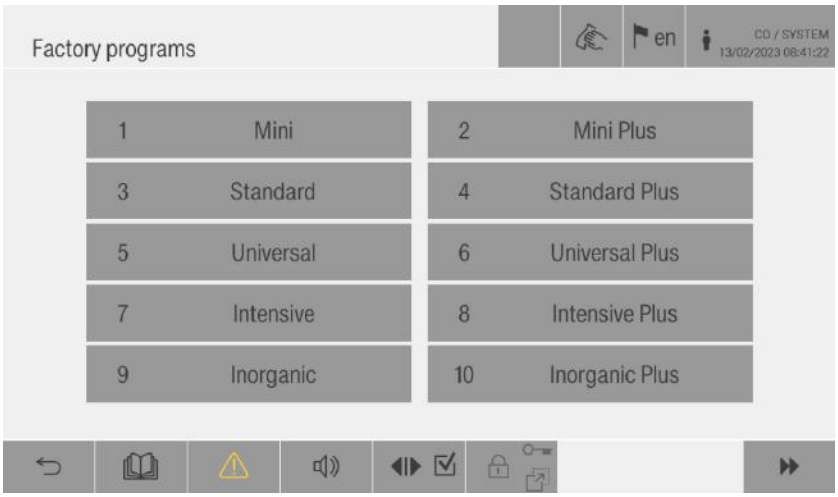


9.2 Factory programs

This menu is dedicated to the selection of the manufacturer programs, to start a washing cycle.

This menu is accessible with access level 1 or higher.

To set a factory program it is necessary to access with access level 4 or higher.



9.3 Test programs

This menu is dedicated to the selection of the special test programs, defined from the manufacturer for validation purposes:

ATTENTION

The TEST PROGRAMS are enabled only for access level 4. They need to be used only for start-up and validation purposes. They cannot be used as reprocessing cycles.

9.4 Special programs

This menu is dedicated to the selection of the special programs settable after a request from the customer, to start a washing cycle.
This menu is accessible with access level 1 or higher.

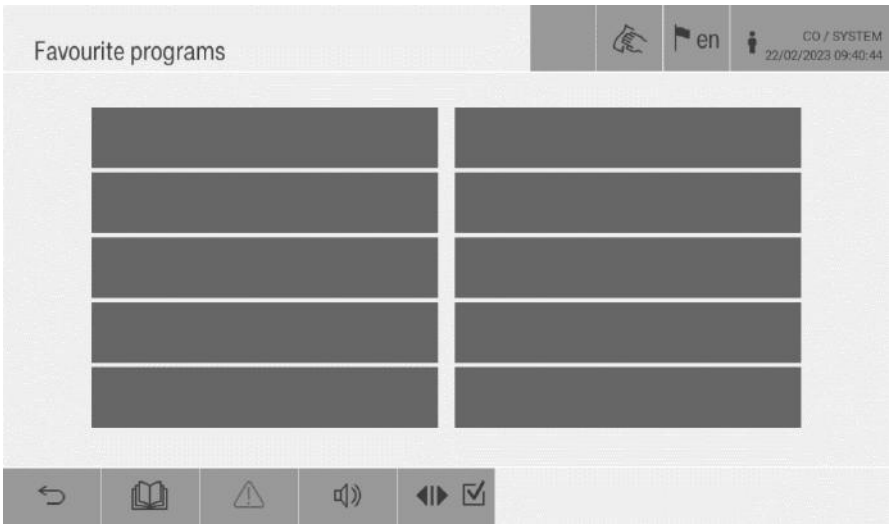
To set a special program it is necessary to access with access level 4 or higher.

ATTENTION

These programs are not validated at the factory, so it is necessary to run a validation at the installation site to allow the operator to use them.

9.5 Favourite programs

On this menu it is possible to save favourite programs.
To set a favourite program it is necessary to access with access level 2 or higher.

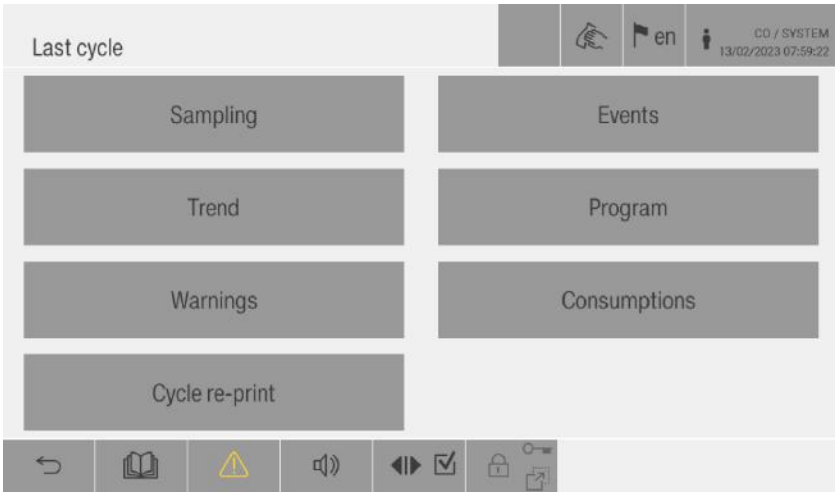


To save a program as favourite it is sufficient to enter this menu, then select the position on which saving the program. A new screen with the program list including FACTORY and SPECIAL programs will appear.
Select the desired program and it will be automatically saved on the selected position into the FAVOURITE PROGRAMS menu.

9.6 Last cycle

This page allows you to view the process data of previous cycle.

This menu is accessible with access level 1 or higher.

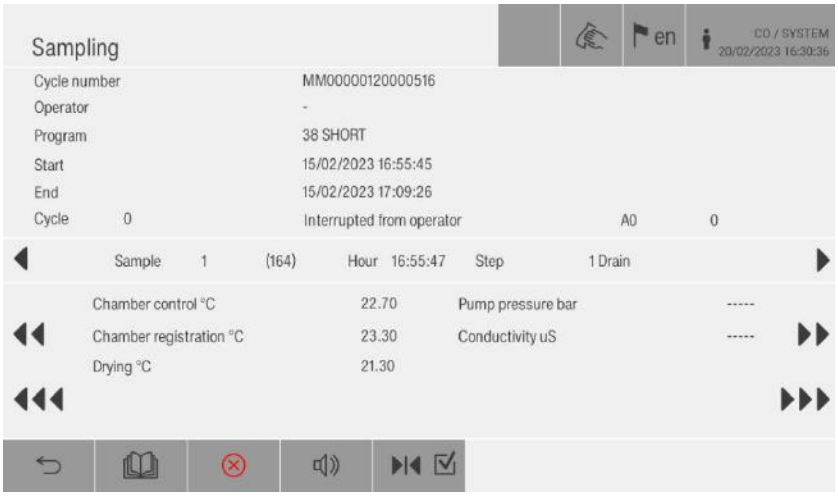


From this page you can access the various dedicated pages to view the samples, events, graphs, program specifications, warnings, and consumption data that occurred during the most previous program run.

It is also possible to reprint the entire report, if there is a printer installed or a USB key present, or to print the selected data sets.

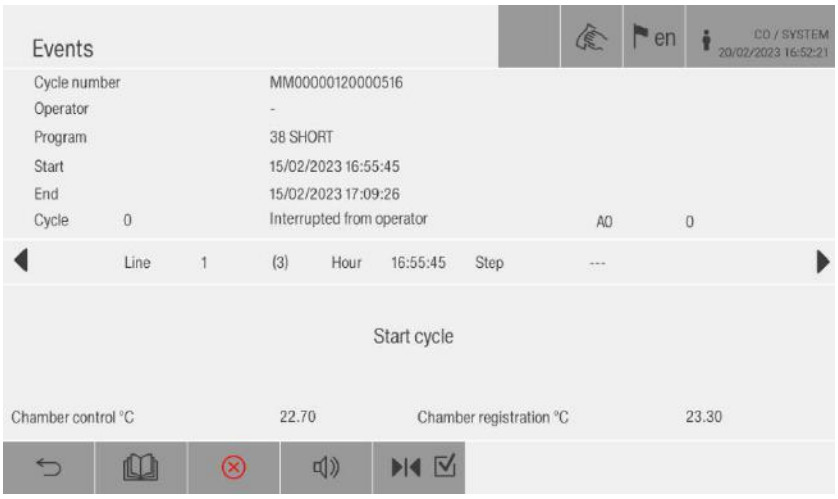
9.6.1 Sampling

It is possible to scroll the different pages to see all sensor recordings:



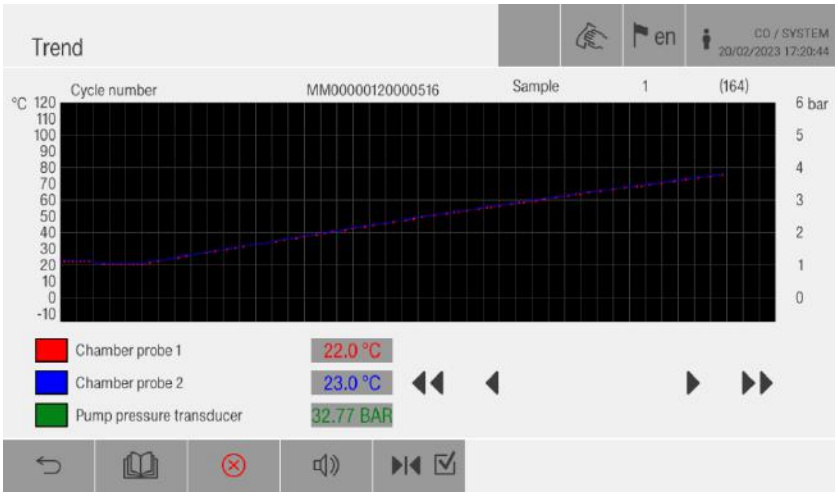
9.6.2 Events

Documentation of executed steps during a cycle.



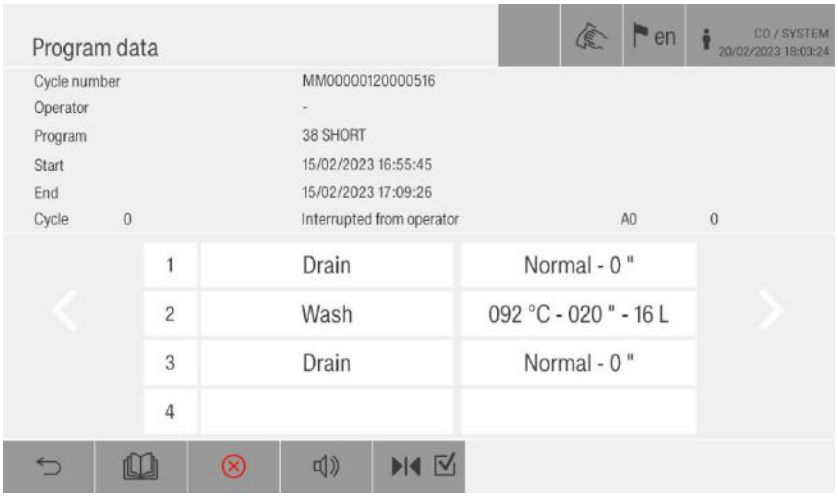
9.6.3 Trend

Allows to show the probes trend:



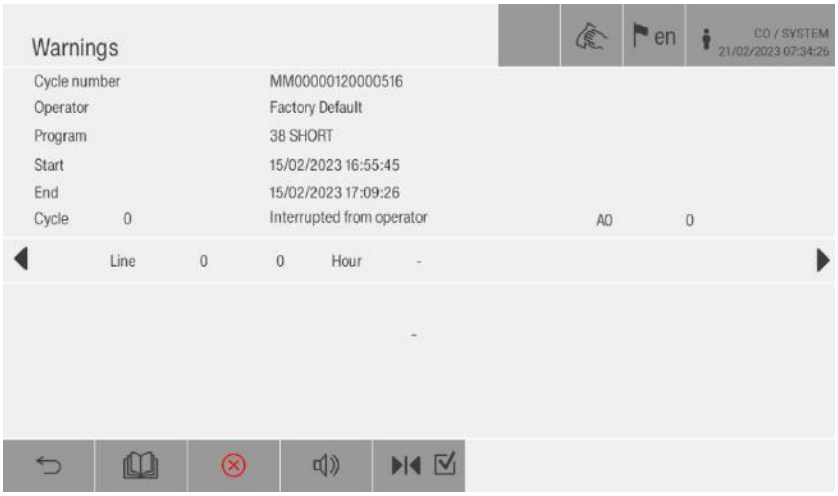
9.6.4 Program data

Allows to see the cycle parameters.



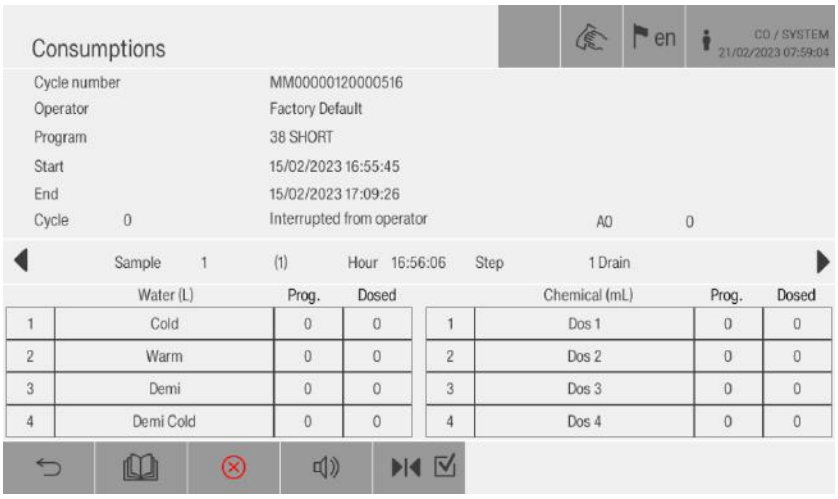
9.6.5 Warnings

It is possible to view the warnings and alarms that occurred during previous cycle execution:



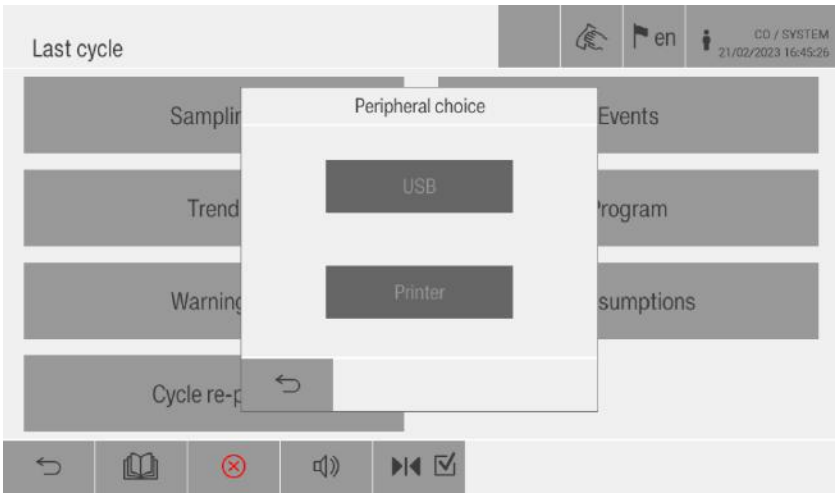
9.6.6 Consumptions

Allows to see all the consumption data of water and chemical products for each stage of a previous cycle:



9.6.7 Cycle re-print

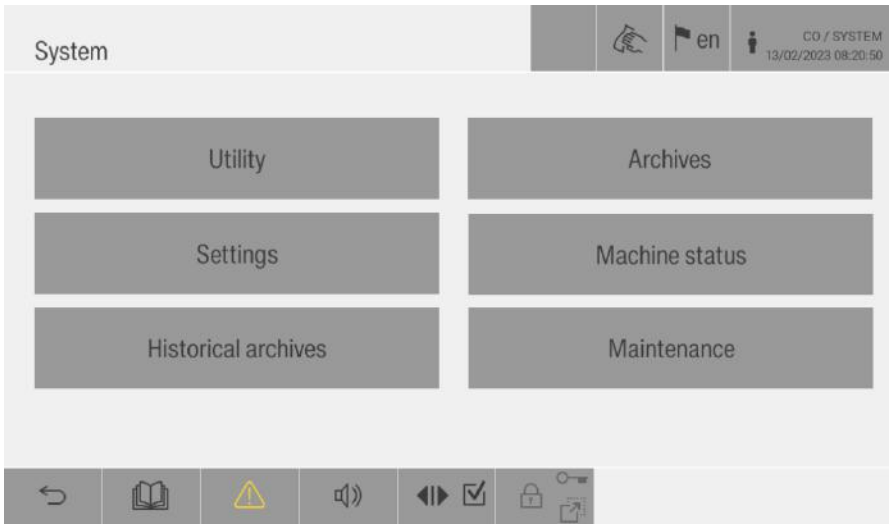
Allows to save the cycle record on a USB key or print on a printer, the cycle data, according to the features installed on the machine.



9.7 System

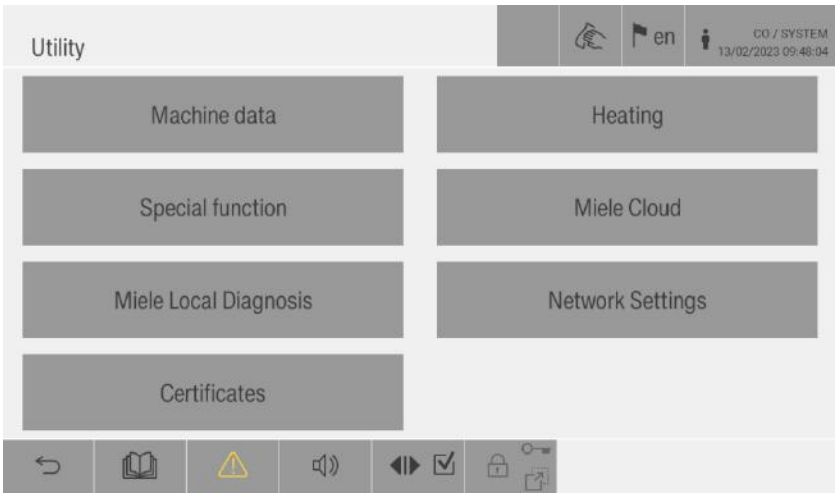
This menu allows the access to several menu:

- ► Utility: backup and restore of the machine
- ► Archives: cycle settings
- ► Settings: machine set up
- ► Machine status: check and activation of input/output
- ► Historical archives: to consult maintenance interventions, events, cycles, etc..
- ► Maintenance: execution of maintenance intervention and adjustment operations

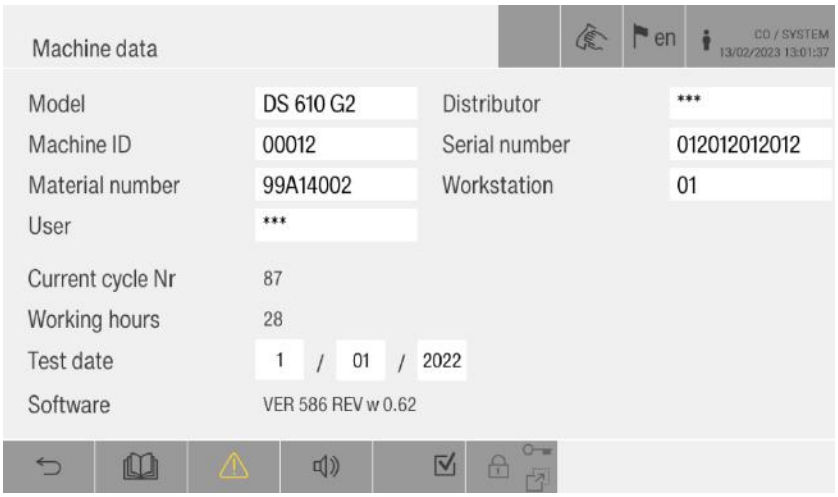


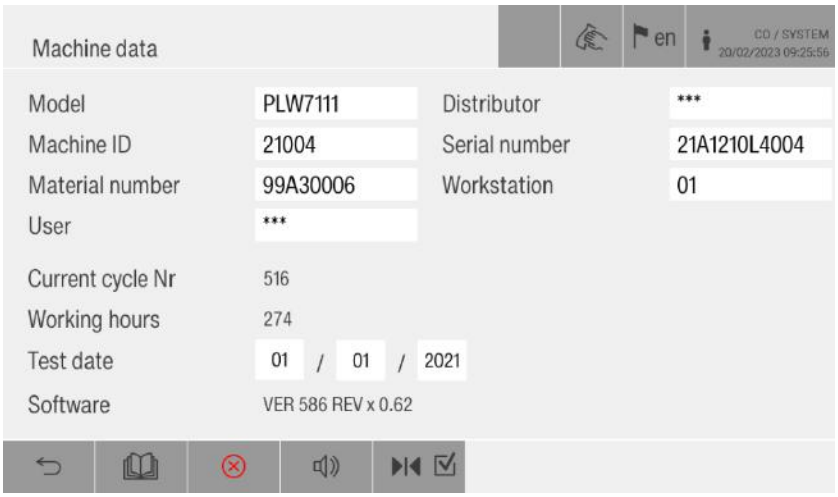
This menu is accessible with access level 1 or higher, but its sub-menu could be accessible with higher user's level. A detail is explained on the pages below.

9.7.1 Utility



Machine data: to set the main data of the machine as name, serial number, test date and user. This menu is accessible with access level 1 or higher with reading right only. The modification of this page is allowed only for the manufacturer.





Heating: Allows selecting the heating mode. This menu is active only if the setting of the machine, as chamber and tank heating, is set to MIXED. With MIXED selection it is meant that the machine is equipped with both heating circuits but only one can be used at the same time. For this reason, in this menu, it is possible to switch between steam and electrical heating pressing the heating icon.

This menu is accessible with access level 2 or higher.

Steam heating

Electrical heating

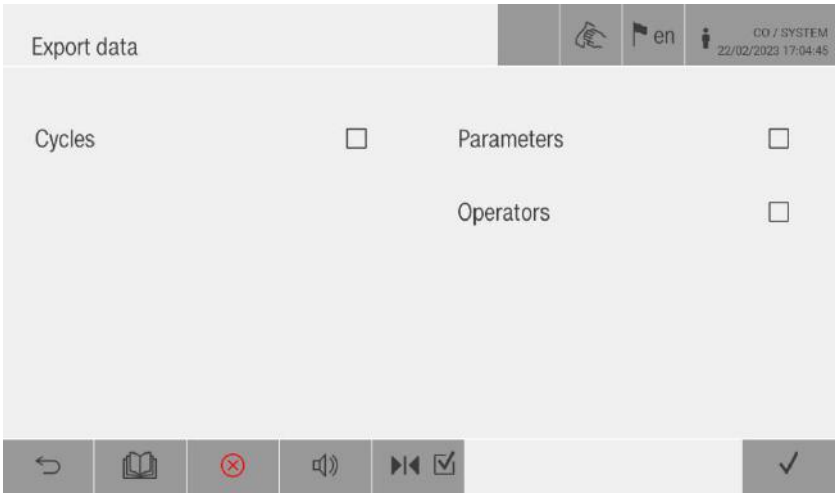
Special function: Allows the backup and recovery of the machine.
Moreover, it allows to activate the automatic cycle repetition function.

This menu is accessible with access level 3 or higher.

Save system: To execute the backup of the machine, enter the SAVE SYSTEM menu: insert a USB key, select the file to be saved and confirm.

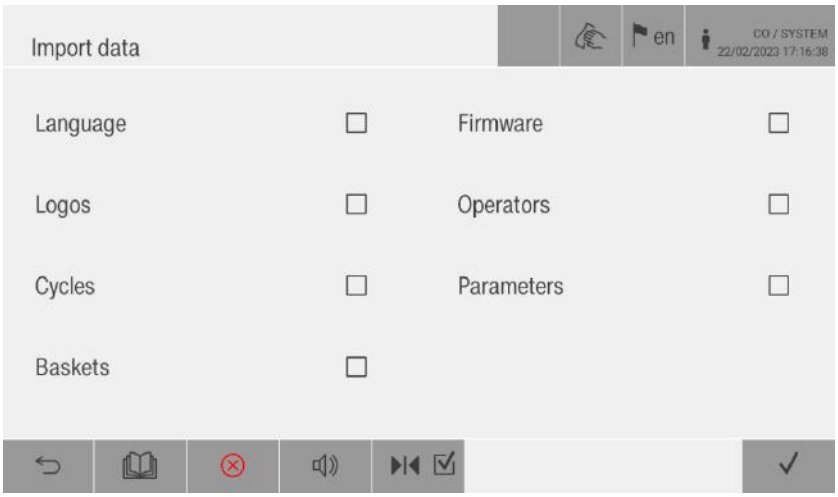
The operation can only be executed for one check box per time. No multiple check boxes can be selected.

This menu is accessible with access level 4 or higher.



Recovery system: To update the machine, enter the RECOVERY SYSTEM menu: insert a USB key, select the file to be updated and confirm.
The operation can be executed for each single file. No multiple files can be selected.

This menu is accessible with access level 4 or higher.

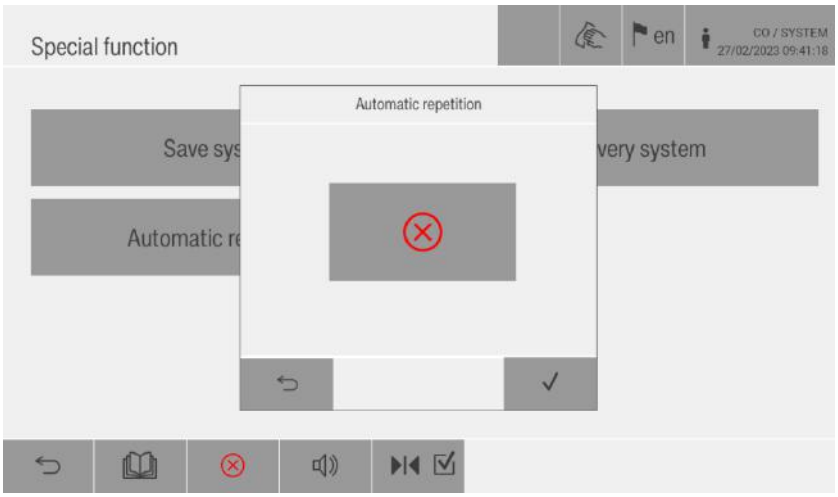


ATTENTION

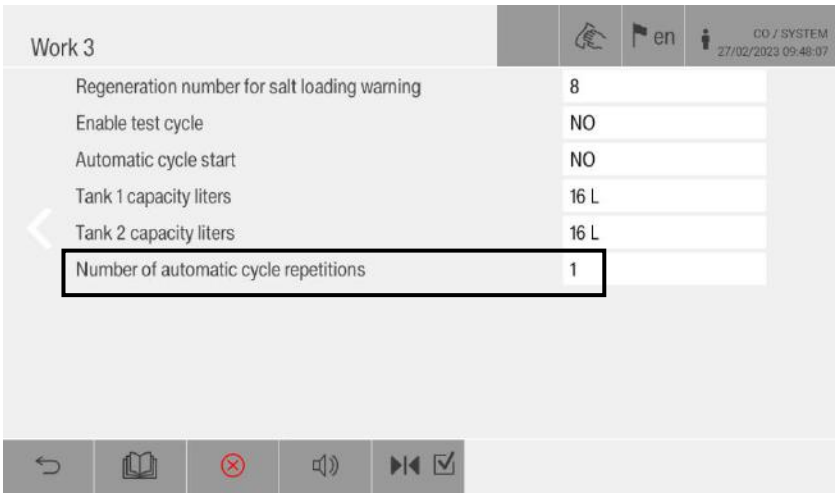
Making the update of each file, all the others will be not involved, compromised, or damaged. So, in case of an update of a single file of the list, all the other will be maintained as after the last upgrade.

Automatic repetition: To activate the automatic repetition of the cycles, enter the AUTOMATIC REPETITION menu and select the red cross, then confirm. When the red cross ⊗ gets bold ✓ the automatic repetition is active.

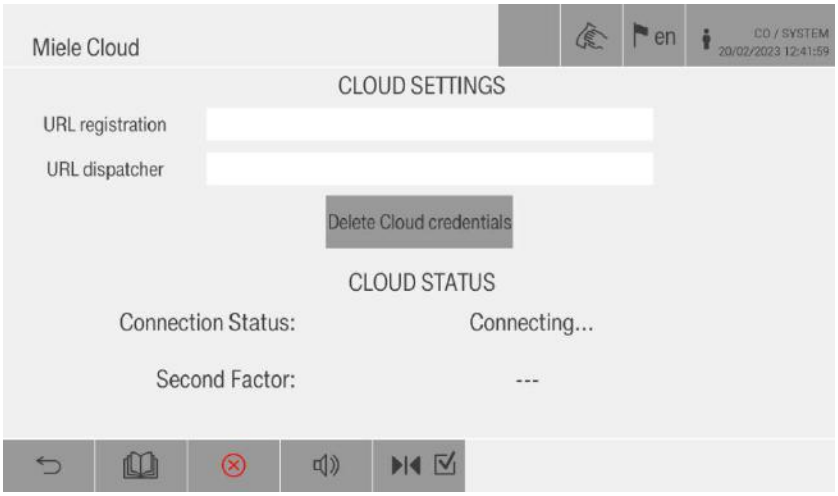
This menu is accessible with access level 3 or higher.



On the WORK settings into the SYSTEM – SETTINGS menu, it is possible to set the number of repeated cycles.



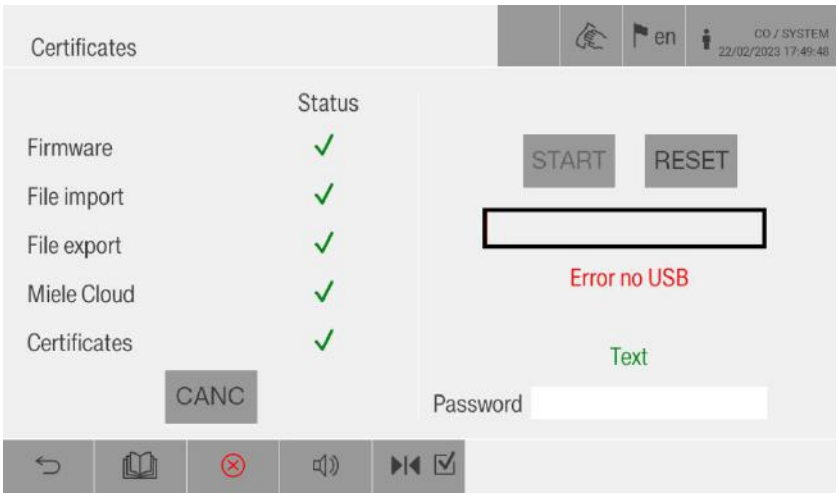
Miele Cloud: To set and check the status of the connection with Cloud.
This menu is accessible with access level 3 or higher.



Miele Local Diagnosis: To set the parameters for the local connection to a device.
This menu is accessible with access level 3 or higher.

Network settings: To set the parameters for the ethernet and Wi-Fi connection.
This menu is accessible with access level 3 or higher.

File certificates: This menu is accessible with access level 4.
On this page it is possible to check the status of certificates of the machine.

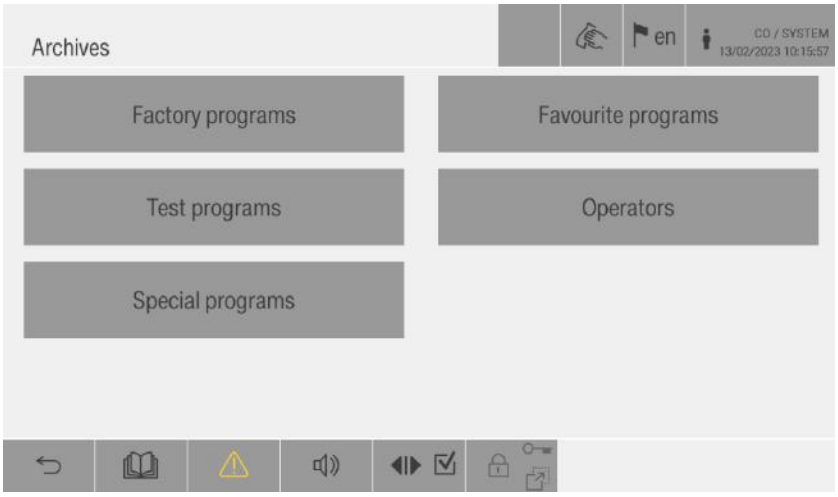


In case some of the lines show a red cross ⊗, it means that the certificates need to be updated.
To update the certificates, it is necessary to enter the password, insert a USB key with valid certificated inside, and then press the START button.
At the end of the procedure the machine needs to be switched OFF and ON again.

9.7.2 Archives

This menu contains the archives with all the program's settings, and the menu to create new washing programs. The details for the program's settings are described in chapter 10.

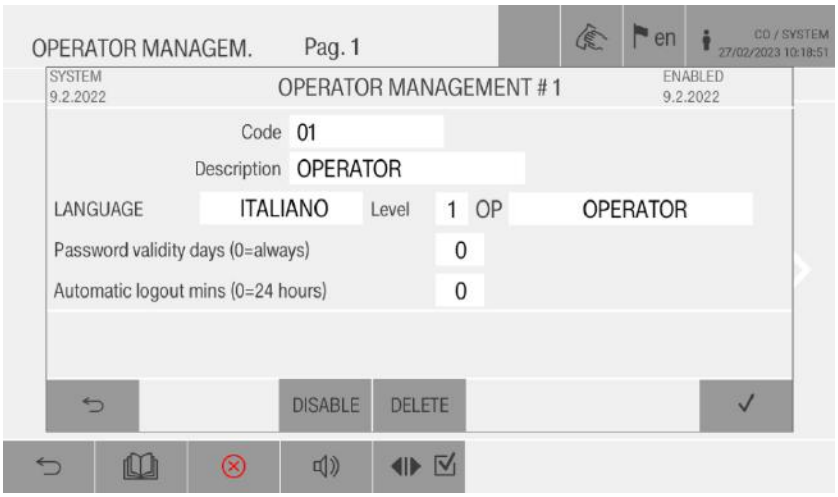
This menu is accessible with access level 2 or higher.



Operators: On the OPERATOR MANAGEMENT menu it is possible to set all the user's data.
This menu is accessible with access level 2 or higher.

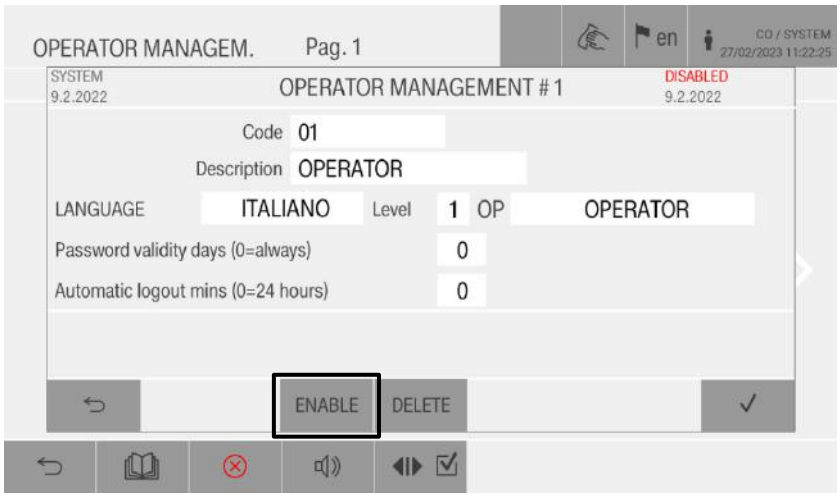
- **Operator code prefix**: prefix used only with barcode reader installed, to distinguish a user code from a basket code. This prefix will be then linked with the *Code* to define the final user code.
- **Variable code length**: identify the length of the user code

New user: on the main page, pressing at the right side of the operator code, appears this screen:



- **Code**: alphanumeric value that identify the user. In case the barcode reader is installed, it is linked with the *Operator code prefix* to identify the final recognition code
- **Description**: brief description of the user: i.e., could be a role, the name, or anything else that could help to identify a specific user.
- **Language**: it is possible to select the language of the user. In case of login the language automatically switches to the selected one.
- **Level**: user access level (ref. to the access level descripted on paragraph 5.3.1) – the description will be automatically filled according to the level number.
- **Password validity days**: number of days for the password validity. Setting 0 the password has no expiry date.
  In case of password expiration, the password change request will be automatically displayed during the login operation.
- **Automatic logout mins**: minutes for the automatic user logout. Setting 0 the operator will be dislodged automatically after 24 hours
- **Disable**: temporarily suspend the user from the login. If this user tries to login the machine will not recognize the code.

To enable again the user, it is sufficient that an upper-level operator enters the Operators page and enable it again, pressing the ENABLE button



► **Delete**: to definitively remove a user from the list

ATTENTION

New users can be added only by an upper-level user.

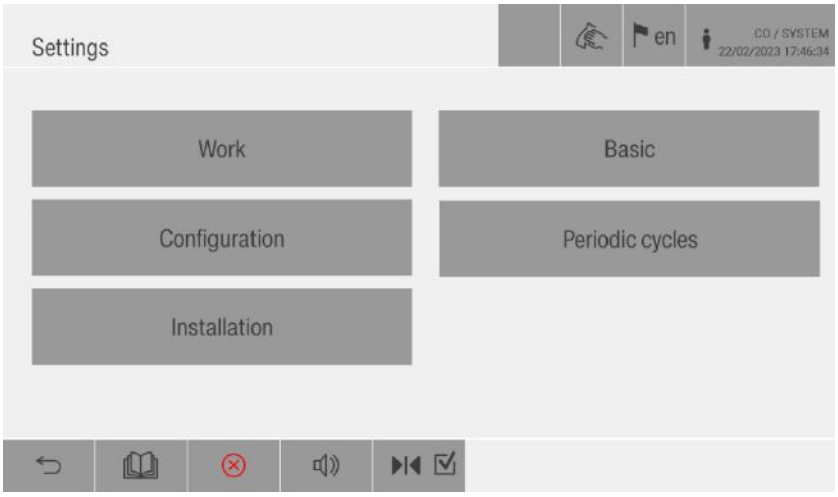
The users that execute for the first time the access, must use as password the code assigned, then the system will automatically request the password change.
After the password change it will be necessary to LOGIN again.

9.7.3 Settings

On the SETTINGS menu it is possible to set-up the machine configuration and manage parameters dedicated to diagnostic and working mode.
This menu is accessible with access level 2 or higher.

The access to this menu is allowed only to trained technicians with an access level:

- **2**: for access to WORK and PERIODIC CYCLES
- **4**: for access to INSTALLATION and BASIC
- **5**: for access to CONFIGURATION



WORK: in this section all the parameters related to operational procedures are listed (e.g., buzzer, chamber light etc.)
BASIC: in this section all the parameters related to basic settings. are listed (e.g., alarm delay, flowmeters, sensors settings etc.)
CONFIGURATION: in this section all the configuration parameters related to activate or deactivate machine features installed on the machine are listed (e.g., number of doors, tank, heating type etc.)
INSTALLATION: resume page where the main settings that should be done from the technician during the start-up are listed. The same parameters are also present on the other menu, according to the right section.

Parameter list:

WORK MENU

Work – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Basket code *Type of basket identification*	DIGITAL INPUT	DIGITAL INPUT - BASKET RECOGNITION	2
Working cycle *Cycle selection*	CHOICE	CHOOSE - BASKET - BOTH	2
Automatic print of consumption on USB *Settings for printing on USB*	YES	YES – NO	2
Automatic print of probe trend on USB *Settings for printing on USB*	YES	YES – NO	2
Automatic print of cycle setting on USB *Settings for printing on USB*	YES	YES – NO	2
Automatic print of consumption on printer *Settings for printing on printer*	NO	YES – NO	2
Automatic print of probe trend on printer *Settings for printing on printer*	NO	YES – NO	2
Automatic print of cycle setting on printer *Settings for printing on printer*	NO	YES – NO	2
Buzzer loading side – end cycle *Enabling of the acoustic signal*	YES	YES – NO	2
Buzzer loading side – alarm *Enabling of the acoustic signal*	YES	YES – NO	2

Work – Page 2

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Buzzer loading side – end cycle *Enabling of the acoustic signal*	YES	YES – NO	2
Buzzer loading side – alarm *Enabling of the acoustic signal*	YES	YES – NO	2
Chamber light *Chamber light functional settings*	ON CYCLE	ON CYCLE – ON STAND-BY – BOTH - OFF	2
Door opening at end cycle *Enabling of the door opening at the end of the cycle on the automatic version*	YES	YES – NO	2
Drain phase number *Number of pulsed drain executed when the minimum level is reached into the chamber*	2	1 - 99	2
Stand-by temperature on tank 1 *Temperature settings of pre-heated tanks*	75 °C 167 °F	0 – 85 32 – 185	2
On-cycle temperature on tank 1 *Temperature settings of pre-heated tanks*	80 °C 176 °F	0 – 85 32 – 185	2
Stand-by temperature on tank 2	55 °C 131 °F	0 – 85 32 – 185	2

Temperature settings of pre-heated tanks			
On-cycle temperature on tank 2 *Temperature settings of pre-heated tanks*	60 °C 140 °F	0 – 85 32 – 185	2
Regeneration (cycles number) *Number of cycles run before the execution of the regeneration phase*	0	0 – 99	2

Work – Page 3

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Regeneration number for salt loading warning *Number of regeneration cycles to warn about the salt filling*	7	0 – 18	2
Enable test cycle *Enable the function for test purposes to unlock/enable the door after each phase for water sampling*	NO	YES – NO	2
Automatic cycle start *Possibility to start a cycle immediately after the cycle selection*	YES	YES – NO	2
Tank 1 capacity *Water quantity into the tank*	16 L 4.23 gal	1 – 99 1.00 – 99.99	2
Tank 2 capacity *Water quantity into the tank*	16 L 4.23 gal	1 – 99 1.00 – 99.99	2
Number of automatic cycle repetition *When the automatic cycle repetition is active, this parameter set the number of repetitions*	30	1 - 99	2

CONFIGURATION MENU

Configuration – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Double door machine *Type of machine, door configuration*	NO	YES - NO	5
Tank 1 *Presence of the tank*	NO	YES - NO	5
Tank 2 *Presence of the tank*	NO	YES - NO	5
Pump pressure switch *Presence of the pump pressure switch*	YES	YES - NO	5
Chamber heating *Type of heating on chamber*	ELECTR.HEATING	ELECTRICAL HEATING – STEAM HEATING – MIXED HEATING	5
Drying enabled *Possibility to enable/disable the drying function and to set the machine without the drying circuit*	YES	YES - NO	5
Extractor fan presence *Presence of the extractor fan*	NO	YES - NO	5
Door type	MANUAL	MANUAL - AUTOMATIC	5

Type of doors: automatic or manual			
Enable power pulse *Presence of the power pulse*	NO	YES - NO	5
Tank 1 heating *Type of heating for tanks*	ELECTR.HEATING	ELECTRICAL HEATING – STEAM HEATING –	5

Configuration – Page 2

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Tank 2 heating *Type of heating for tanks*	ELECTR.HEATING	ELECTRICAL HEATING – STEAM HEATING –	5
Cold demi water presence *Presence of the cold demi water – this additional water is present if one of the pre-heating tank is present*	NO	YES – NO	5
Steam condenser presence *Presence of the steam condenser*	NO	YES – NO	5
Pump control type *The pump is controlled from an inverter as standard. It can be equipped with a different inverter on UL version or can be controlled as ON-OFF on special cases*	INVERTER	ON-OFF – INVERTER – ALTIVAR (for UL version)	5
Interface color *Type of color on the interface: Miele and Steelco version*	0	0 = LIGHT GREY 1 = BLACK	5
Start-up logo *Initial logo that identifies the type of machine: DS 610 G2 Steelco version, LAB 610 G2 Steelco version, PLW 7111 Miele version*	1	1 = DS 610 2 = LAB 610 3 = MIELE	5
Enable heat recovery on steam condenser *Presence of the special steam condenser for heat recovery for demi water – this steam condenser can be used only if tank 1 is present*	NO	YES – NO	5
Total power available *Total power for the machine for the power manager function*	10 kW	5 – 17	5
Chamber power (heating element + pump) *Power of heating elements and pump into the chamber*	10 kW	1 - 10	5
Drying total power *Power of the drying unit considering heating elements and fan*	5.0 kW	0.0 – 5.5	5

Configuration – Page 3

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Tank 1 heating power *Power of tanks (only heating elements)*	6.0 kW	0.0 – 6.0	5

Tank 2 heating power *Power of tanks (only heating elements)*	6.0 kW	0.0 – 6.0	5
Critical temperature for maximum pump speed *Temperature limit where the pump speed is decreased to avoid cavitation*	90 °C 194 °F	0 – 99 32 – 210	5
Maximum pump speed over the critical temperature *Pump speed setting over the critical temperature*	40 Hz	0 – 60	5
Minimum speed washing pump *Minimum speed settable into the washing phases.* *Max pump speed automatically set at 60 Hz from the system*	35 Hz	1 – 60	5
Enable recording probe *Enable the presence, reading and control of the second probe for redundancy check*	YES	YES – NO	5
Chamber temperature threshold for cooling *Temperature limit to activate the cooling function*	80 °C 176 °F	0 – 99 32 – 210	5
Fan speed for cooling on chamber temperature *Setting of the fan speed during cooling*	50%	0 - 100	5
Cold water lack *In case of lack of cold water (or cold water with excessive hardness) it is possible to use cold demi water in its place. The water filling is automatically controlled from the system, it is not necessary to change physically any connection.*	NO	YES – NO	5

Configuration – Page 4 - MAINTENANCE

TYPE	DESCRIPTION	DAYS	HOURS	LEV.
1	BIANNUAL *Ordinary maintenance for pre-filter change*	190	500	5
2	ANNUAL *Annual ordinary maintenance for Hepa filter and pre-filter change and general check of the machine*	365	1000	5
3	EXTRAORDINARY *Special maintenance intervention as components changes*	0	0	5

INSTALLATION MENU

Installation – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Cold demi water presence	NO	YES - NO	**2**

Cold water lack	NO	YES - NO	**2**
Regeneration (cycles number)	0	0 – 99	2
Regeneration number for salt loading warning *Number of regeneration cycles to warn about the salt filling*	7	0 – 18	2
Demi water absence *Alternative cold water filling*	NO	YES - NO	2
Warm water absence *Alternative cold water filling*	NO	YES - NO	2
Dosing pump 1: type	TIME-IMPULSES	TIME – IMPULSES – TIME-IMPULSES – NO	2
Dosing pump 2: type	NO	TIME – IMPULSES – TIME-IMPULSES – NO	2
Dosing pump 3: type	TIME-IMPULSES	TIME – IMPULSES – TIME-IMPULSES – NO	2
Dosing pump 4: type	NO	TIME – IMPULSES – TIME-IMPULSES – NO	2

BASIC SETTINGS MENU

Personal data – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Imperial unit of measurement *Use of Fahrenheit degree instead of Celsius degree*	NO	YES – NO	4
Chemical dosing % *Alternative calculation for chemical dosage. Standard is set as ‰, but it is possible to set it also in %. Conversion automatically done from the system in case of change*	NO	YES – NO	4

Personal data – Page 2 to 5

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Printout language *Selection of the language to be used for the printout*	ENGLISH	-language selection-	4

Technical data – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Printer on board *Presence of the printer*	NO	YES - NO	5
Action after a power failure *Automatic action that the system run after a power failure*	START STEP	START STEP – START CYCLE – END CYCLE	4
Action after an alarm *Automatic action that the system run after an alarm*	START STEP	START STEP – START CYCLE – END CYCLE	4
Action in case of chemical lack	ALARM	ALARM – WARNING	4

Automatic action that the system run after a chemical lack alarm			
Pass through function *Possibility to activate the function to simply move a basket from one to the other side*	NO	YES - NO	4
Enable pump during water filling from tank *Activation of the pump during the water filling from tank*	NO	YES - NO	4
Drain cooling solenoid valve *Presence of the drain cooling solenoid valve*	NO	YES - NO	4
Special drain valve *Presence of the special drain valve for water recycling or recovery – industrial application or special laboratory application*	NO	YES - NO	4
Pressure transducer *Presence of the pump pressure transducer*	NO	YES - NO	4
Conductivity sensor *Presence of the conductivity sensor for water quality check*	NO	YES - NO	4

Technical data – Page 2

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Demi water absence *Absence of the demi water. In alternative cold water is filled. Automatic filling is controlled by the system. It is not necessary to execute any physical change*	NO	YES - NO	4
Warm water absence *Absence of the warm water. In alternative cold water is filled. Automatic filling is controlled by the system. It is not necessary to execute any physical change*	NO	YES - NO	4
Humidity sensor *Presence of the humidity sensor for drying control*	NO	YES - NO	4
Connection type *Type of network connection*	WIFI	WIFI – ETHERNET	4

Analog sensors – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Lower limit pressure *Limit settings for the pressure transducer*	0.00 bar 0.0 psi	-1.00 – 6.00 bar -14.5 – 87.0 psi	4
Upper limit pressure *Limit settings for the pressure transducer*	6.00 bar 87.0 psi	-1.00 – 6.00 bar -14.5 – 87.0 psi	4

Time data – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Maximum time to heat 1°C on chamber *Waiting time to see 1°C increase on chamber before showing an alarm*	300”	0 – 999	4
Maximum time to heat 1°C on tank *Waiting time to see 1°C increase on tank before showing an alarm*	300”	0 – 999	4
Max drain time *Waiting time to reach minimum chamber level before showing an alarm*	80”	0 – 999	4
Max drain time with rinsing *Waiting time to reach minimum chamber level before showing an alarm in case of drain with rinsing activated*	90”	0 – 999	4
Max time water filling on tank 2 *Waiting time for tank filling before showing the alarm*	400”	0 – 999	4
Max time water filling on tank 1 *Waiting time for tank filling before showing the alarm*	400”	0 – 999	4
Maximum waiting time between levels on tank *Waiting time from the activation of the first level switch until the activation of the second ones into the tank during filling*	20”	1 – 99	4
Max tank emptying time *Waiting time for tank drain to see the inactivation of the level switches before showing the alarm*	40”	0 – 999	4
Maximum time for water flowmeter impulses *Waiting time to see 1 impulse from water flowmeter*	5.0”	0.0 – 99.9	4
Maximum time for chemical flowmeters impulses *Waiting time to see 1 impulse from chemical flowmeter*	20.0”	0.0 – 9.9	4

Time data – Page 2

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Maximum time unlocking door opening *Waiting time to see the door unlocked before showing the alarm*	8.0”	0.0 – 99.9	4
Maximum time unlocking door closing *Waiting time to see the door locked before showing the alarm*	8.0”	0.0 – 99.9	4
Max time open/close door (automatic) *Waiting time to reach the open/close status of the automatic door before showing the alarm*	15.0”	0.0 – 99.9	4
Delay on pressure switch reading	15.0”	0.0 – 99.9	4

Delay time after the change of status of the pressure switch to show the alarm			
Delay on drying pressure switch (0 = disabled) *Delay time after the drying pressure switch status change to show the alarm*	15.0”	0.0 – 99.9	4
Chemical 1 filling time *Filling time of the circuit after an alarm for chemical lack*	0.0”	0.0 – 99.9	4
Chemical 2 filling time *Filling time of the circuit after an alarm for chemical lack*	0.0”	0.0 – 99.9	4
Chemical 3 filling time *Filling time of the circuit after an alarm for chemical lack*	0.0”	0.0 – 99.9	4
Chemical 4 filling time *Filling time of the circuit after an alarm for chemical lack*	0.0”	0.0 – 99.9	4
Tank heating stand-by (after inactivity) *Filling time of the circuit after an alarm for chemical lack*	3 h	0 – 24	4

Time data – Page 3

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Steam condenser time ON *Activation time of steam condenser during thermal disinfection*	10.0”	0.0 – 99.9	4
Steam condenser time OFF *Deactivation time of steam condenser during thermal disinfection*	2.0”	0.0 – 99.9	4
Fractionated pump time ON *Activation time of the pump during the pulsed pump phase (in case of cooling function of the chamber or during filling)*	0.0”	0.0 – 99.9	4
Fractionated pump time OFF *Deactivation time of the pump during the pulsed pump phase (in case of cooling function of the chamber or during filling)*	0.0”	0.0 – 99.9	4
Drain time ON *Activation of the drain valve and pump during the pulses phase (after the minimum level is deactivated)*	10.0”	0.0 – 99.9	4
Drain time OFF *Deactivation of the drain valve and pump during the pulses phase (after the minimum level is deactivated)*	2.0”	0.0 – 99.9	4
Chamber steam heating time ON *Activation time of the steam heating during the inertia phase*	2.0”	0.0 – 99.9	4
Chamber steam heating time OFF *Deactivation time of the steam heating during the inertia phase*	4.0”	0.0 – 99.9	4
Tank steam heating time ON	2.0”	0.0 – 99.9	4

Activation time of the steam heating during the inertia phase			
Tank steam heating time OFF *Deactivation time of the steam heating during the inertia phase*	4.0”	0.0 – 99.9	4

Time data – Page 4

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Drying cooling time *Cooling time of the drying (fan activated with heating elements deactivated) at the end of the drying phase*	30”	0 – 999	4
Delay on loading door lock opening *Waiting time for opening of the door lock*	0.0”	0.0 – 9.9	4
Delay on loading door lock closing *Waiting time for closing of the door lock*	0.0”	0.0 – 9.9	4
Delay on unloading door lock opening *Waiting time for opening of the door lock*	0.0”	0.0 – 9.9	4
Delay on unloading door lock closing *Waiting time for closing of the door lock*	0.0”	0.0 – 9.9	4
Pause time during regeneration *Pause time for salt solution reaction with resins during regeneration*	600”	0 – 9999	4
Water filling time for regeneration *Water filling time during regeneration to fill of salt solution the resins*	120”	0 - 999	4
Rinsing time for regeneration *Water filling time at the end of the regeneration to rinse all the remaining salt from the resins*	60”	0 - 999	4
Sampling time for trend (temperature and pressure) *Time interval for data sampling*	5”	5 – 99	4
Delay on pump activation after tank drain (rinse function) *Delay time for activation of the pump during the water filling from the tank. This function allows to start the rinsing phase during water filling from tank*	10”	1 – 60	4

Time data – Page 5

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Delay on drain activation after pump start (rinse unction) *Delay time for activation of the drain from the activation of the pump. This function allows to recirculate as less as possible the water for a fast rinsing of the load*	10”	1 – 60	4
Delay on leakage sensor reading (0 = disabled)	4”	0.0 – 99.9	4

Waiting time after status change of the sensor to show the alarm			
Timeout PP piston (Medical) *Waiting time for status change of the piston (from FW to BW and vice versa)*	2.0”	1 – 99	4
PP pressure switch delay (Medical) *Waiting time for a signal from the pressure transducer*	5.0”	0.0 – 9.9	4
Time PP air OFF (Medical) *Pulsed time OFF for air pulses on the circuit*	1.0”	0.0 – 9.9	4
Time PP air ON (Medical) *Pulsed time ON for air pulses on the circuit*	0.2”	0.0 – 9.9	4
Minimum time for pump functioning *Safety time for pump functioning for mixing and stabilisation purposes*	30”	0 – 99	4
Minimum time for tank 1 refilling *Time between 2 refilling of the water. In case the time is lower than this parameter there is a leakage on the tank and an alarm is shown*	20”	0 – 999	4
Minimum time for tank 2 refilling *Time between 2 refilling of the water. In case the time is lower than this parameter there is a leakage on the tank and an alarm is shown*	20”	0 – 999	4
Fan stop waiting time *Delay on door opening to wait the stop of the fan*	5”	0 - 60	4

Time data – Page 6

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Wait for wash pump stop *Delay on door opening to wait the stop of the pump*	4”	0 – 60	4

Various data – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Min water quantity *Minimum water quantity that can be set into the washing phase setting*	16 L 4.23 gal	7 – MAX 1.85 – MAX	4
Max water quantity *Maximum water quantity that can be set into the washing phase setting*	29 L 7.66 gal	10 – 99 2.64 – 26.15	4
Temperature for probe discrepancy check *Minimum temperature to start the probe discrepancy check. This check is executed only on washing stages*	80 °C 176 °F	0 – 95 32 - 203	4
Max probe discrepancy *Maximum probe difference to show the discrepancy alarm*	2 °C 4 °F	0 – 99 0 - 210	4
Max chemical dosage discrepancy	5 %	1 – 50	4

Maximum dosage discrepancy between time and flowmeter. This check is active only if the dosing pumps control are set to TIME-IMPULSES			
Minimum drying temperature *Minimum drying temperature set is 0°C, but it is possible to set a minimum temperature value to be reached during the drying stage to check the functionality of the heating elements*	50 °C 122 °F	0 – 100 32 - 212	4
Low speed fan *Speed set for the fan during low speed phase*	20 %	0 – 100	4
High speed fan *Speed set for the fan during high speed phase*	80 %	0 – 100	4
Max temperature prewash *Maximum temperature measured into the chamber allowed for the prewashing phase*	40 °C 104 °F	0 – 95 32 – 203	4
Drain cooling temperature activation *Temperature measured into the chamber to activate the drain cooling solenoid valve during the next drain step*	60 °C 140 °F	0 – 100 32 - 212	4

Various data – Page 2

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Steam condenser activation temperature *Temperature for steam condenser activation with ON-OFF steps during thermal disinfection*	80 °C 176 °F	0 – 95 32 – 203	4
Exceeding impulses for water flowmeter if valve is off *Control of the water solenoid valve: if the impulses, when the valve is OFF, exceed the set value, an alarm is shown*	100	0 – 99	4
Exceeding impulses for chemical flowmeter if valve is off *Control of the dosing pump: if the impulses, when the pump is OFF, exceed the set value, an alarm is shown*	10	0 – 99	4
Temperature interval A0 *Values for the A0 calculation*	10 °C	0 – 99	4
A0 reference temperature *Values for the A0 calculation*	80 °C	0 – 99	4
Lower temperature limit A0 *Values for the A0 calculation*	80 °C	0 – 99	4
Upper hysteresis T<90 °C *Temperature over the set point to deactivate the heating elements*	0.5 °C 1 °F	0.1 – 3.0 0.1 – 9.9	4
Lower hysteresis T<90 °C *Temperature below the set point to re-activate the heating elements*	0.3 °C 0.6 °F	0.1 – 3.0 0.1 – 9.9	4
Upper hysteresis T>90 °C	0.5 °C	0.1 – 3.0	4

Temperature over the set point to deactivate the heating elements	1 °F	0.1 – 9.9	
Lower hysteresis T>90 °C *Temperature below the set point to re-activate the heating elements*	0.3 °C 0.6 °F	0.1 – 3.0 0.1 – 9.9	4

Various data – Page 3

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Chamber steam heating inertia *Temperature before the set point is reached where the ON-OFF of the steam heating start, to avoid an overheating of the water*	5 °C 10 °F	0 – 99 0 – 99	4
Tank steam heating inertia *Temperature before the set point is reached where the ON-OFF of the steam heating start, to avoid an overheating of the water*	5 °C 10 °F	0 – 99 0 – 99	4

Equivalences – Page 1

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Cold water *Equivalence for water impulses* *Set automatically from the adjustment procedure*	150.0 imp/L 577.0 imp/gal	0.1 – 999.9 0.1 – 999.9	4
Warm water *Equivalence for water impulses* *Set automatically from the adjustment procedure*	150.0 imp/L 577.0 imp/gal	0.1 – 999.9 0.1 – 999.9	4
Demi water *Equivalence for water impulses* *Set automatically from the adjustment procedure*	150.0 imp/L 577.0 imp/gal	0.1 – 999.9 0.1 – 999.9	4
Cold demi water *Equivalence for water impulses* *Set automatically from the adjustment procedure*	150.0 imp/L 577.0 imp/gal	0.1 – 999.9 0.1 – 999.9	4
Reference for water flowmeters adjustment *Reference water quantity for the adjustment procedure*	10 L 2.64 gal	1 – 99 1.00 – 9.99	4
Reference for chemical flowmeters adjustment *Reference chemical quantity for the adjustment procedure*	100 mL 3.38 fl.oz	1 – 999 0.00 – 99.99	4
Dosing pump 1: (flowmeter) *Equivalence for chemical impulses* *Set automatically from the adjustment procedure*	-- imp/mL -- imp/fl.oz	0.001 – 9.999 0.001 – 99.999	4
Dosing pump 2: (flowmeter) *Equivalence for chemical impulses* *Set automatically from the adjustment procedure*	-- imp/mL -- imp/fl.oz	0.001 – 9.999 0.001 – 99.999	4
Dosing pump 3: (flowmeter)	-- imp/mL	0.001 – 9.999	4

Equivalence for chemical impulses *Set automatically from the adjustment procedure*	-- imp/fl.oz	0.001 – 99.999	
Dosing pump 4: (flowmeter) *S Equivalence for chemical impulses* *et automatically from the adjustment procedure*	-- imp/mL -- imp/fl.oz	0.001 – 9.999 0.001 – 99.999	4

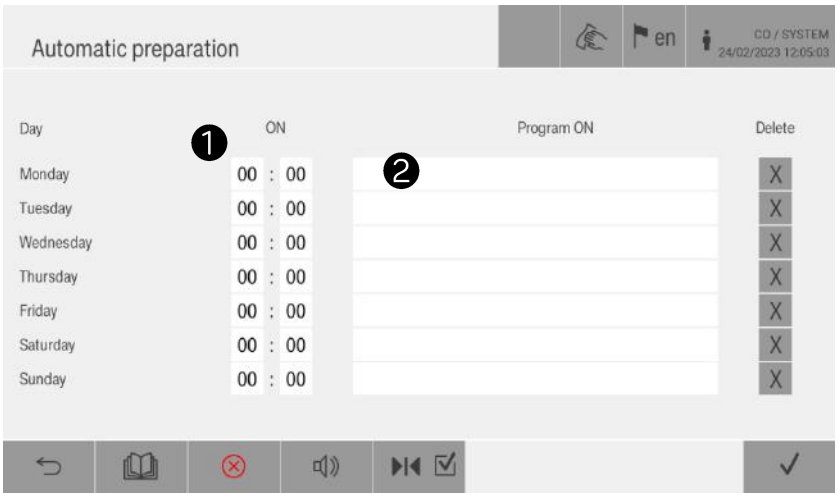
Equivalences – Page 2

DESCRIPTION	DEFAULT	SELECTIONS	LEV.
Dosing pump 1: (timed control) *Equivalence for chemical dosage by time* *Set automatically from the adjustment procedure*	-- sec/mL	0.001 – 9.999 0.01 – 99.99	4
Dosing pump 2: (timed control) *Equivalence for chemical dosage by time* *Set automatically from the adjustment procedure*	-- sec/mL	0.001 – 9.999 0.01 – 99.99	4
Dosing pump 3: (timed control) *Equivalence for chemical dosage by time* *Set automatically from the adjustment procedure*	-- sec/mL	0.001 – 9.999 0.01 – 99.99	4
Dosing pump 4: (timed control) *Equivalence for chemical dosage by time* *Set automatically from the adjustment procedure*	-- sec/mL	0.001 – 9.999 0.01 – 99.99	4
Dosing pump 1: type *Type of control for chemical dosage*	TIME-IMPULSES	TIME – IMPULSES – TIME-IMPULSES - NO	4
Dosing pump 2: type *Type of control for chemical dosage*	NO	TIME – IMPULSES – TIME-IMPULSES - NO	4
Dosing pump 3: type *Type of control for chemical dosage*	TIME-IMPULSES	TIME – IMPULSES – TIME-IMPULSES - NO	4
Dosing pump 4: type *Type of control for chemical dosage*	NO	TIME – IMPULSES – TIME-IMPULSES - NO	4

Periodic cycles:

In this menu it is possible to select a program and time to automatically execute a program, e.g., self-disinfection.

To allow the automatic start of the programmed cycle it is necessary to leave the machine with the door closed and powered on.



To activate a periodic cycle, it is necessary to enter the time ❶ to start the program and then selecting the program pressing the white section ❷. Then the list of programs will be shown, and it is so possible to select the program.

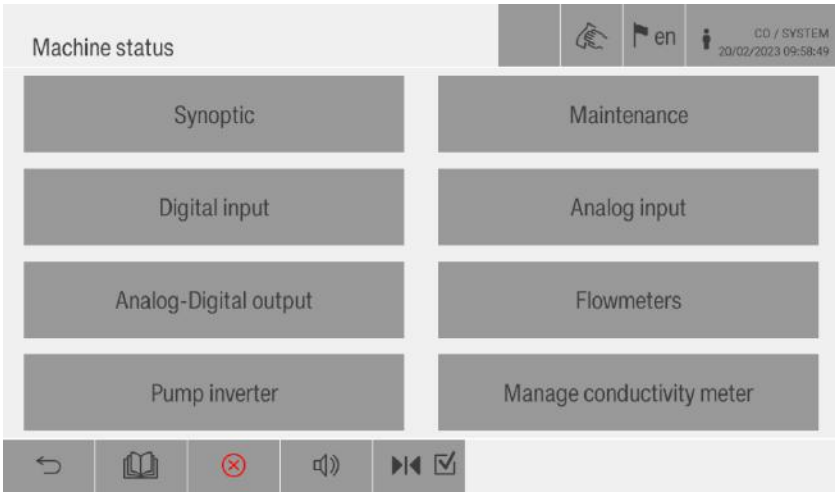
9.7.4 Machine status

In this menu it is possible to check and activate digital input and output of the machine.
This menu is accessible with access level 2 or higher.

The activation of the digital and analogue output is possible only by activating the manual control on the display while the machine is in stand-by i.e., no program running.

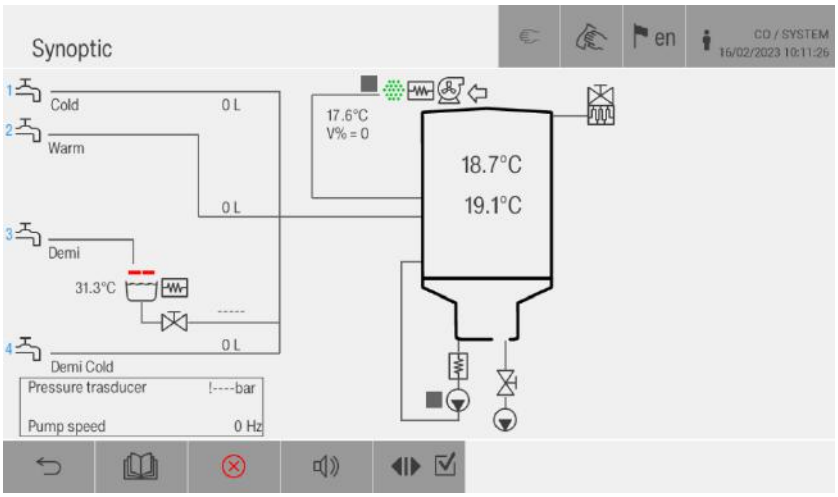
To activate the manual control, press the hand icon on the header in the display. When the hand icon is yellow, the manual control is active.

If a cycle is running, this menu is hidden.



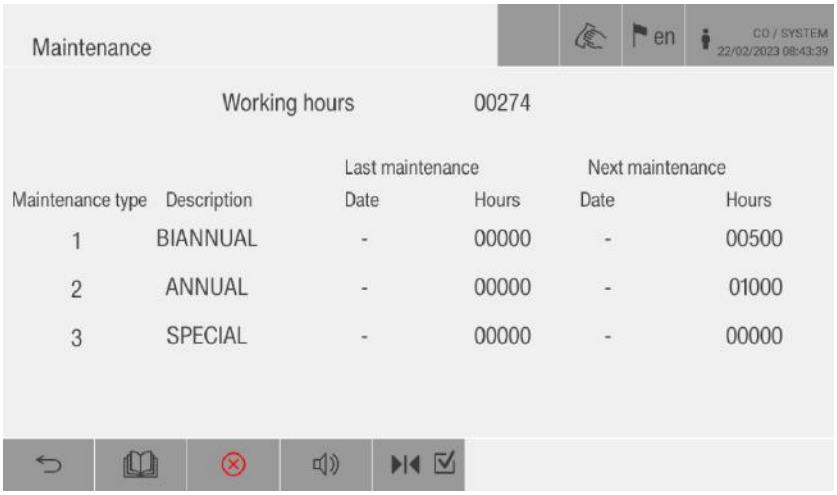
Synoptic:

Allows to check and activate the components directly from the functional scheme.
The component will become green when active, grey when disabled and red if in alarm.
This menu is accessible with access level 2 to check, and with level 3 or higher to control manually the input / output.



Maintenance:

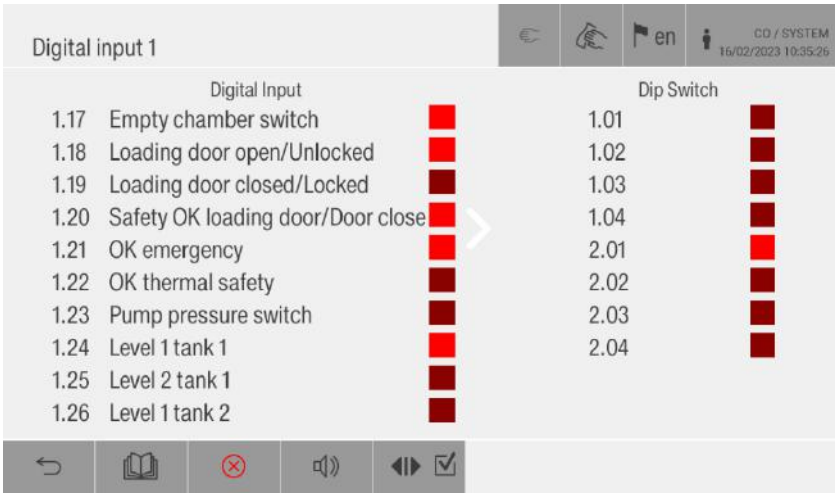
Allows to see the status of the maintenance interventions
This menu is accessible with access level 2 or higher.



Maintenance type	Description	Last maintenance Date	Last maintenance Hours	Next maintenance Date	Next maintenance Hours
1	BIANNUAL	-	00000	-	00500
2	ANNUAL	-	00000	-	01000
3	SPECIAL	-	00000	-	00000

Digital input:

Allows to see the status of the digital input.
This menu is accessible with access level 2 to check, and with level 3 or higher to control manually the input / output.



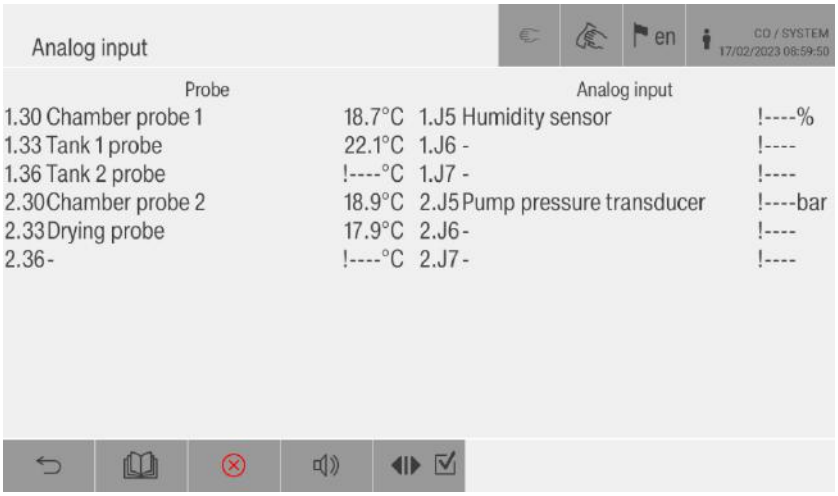
Input ON

Input OFF

With the arrows it is possible to move to the other pages.

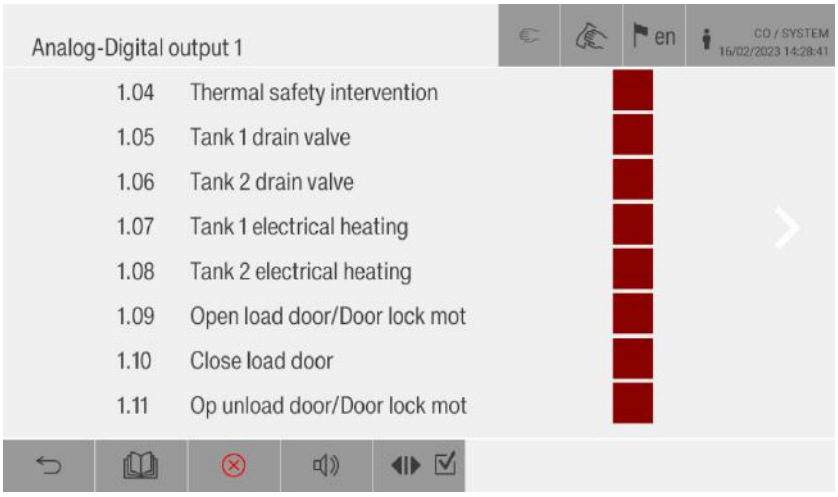
Analogic input:

Allows to see the status and values measured from the analogic input such as probes and pressure transducers.
This menu is accessible with access level 2 or higher.



Analogue-Digital output:

Allows to see and change the status of the analogue and digital outputs.
To activate the digital output, it is sufficient to press on the red square on the right side of the output description.
To deactivate it press again on the red square.
This menu is accessible with access level 2 to check, and with level 3 or higher to control manually the input / output.



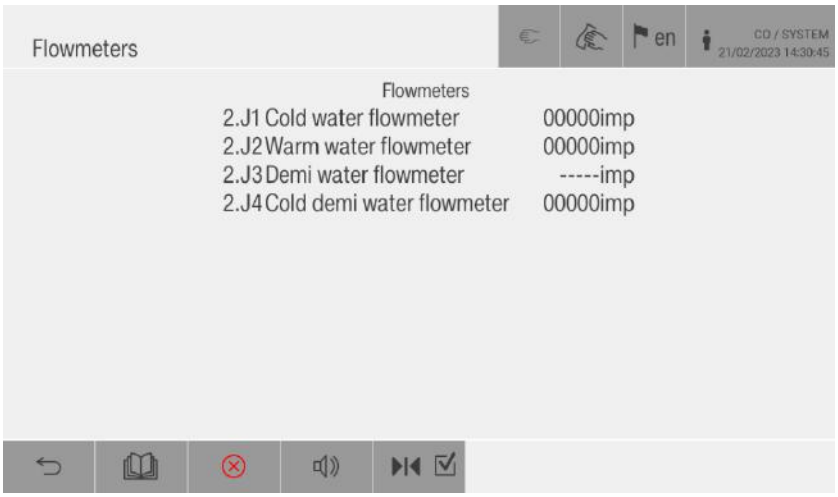
Output active

Output not active

With the arrows it is possible to move to the other pages.

Flowmeters:

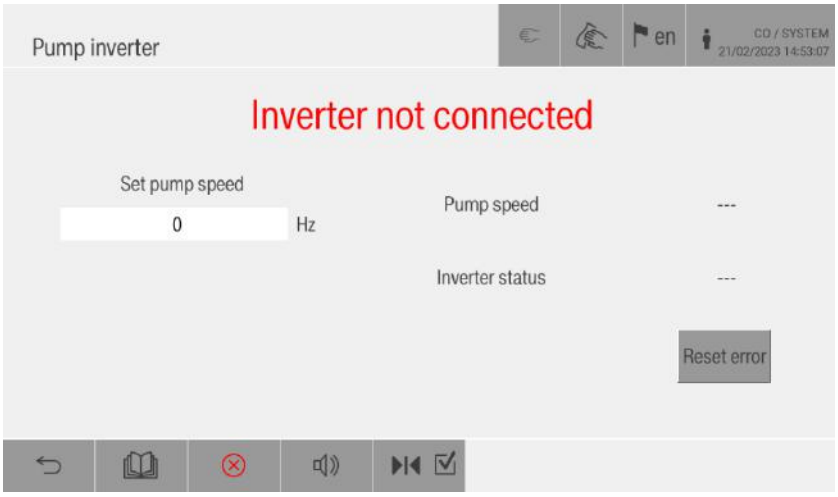
Allows to see the status and value measured from the water and chemical flowmeters.
This menu is accessible with access level 2 or higher.



Pump inverter:

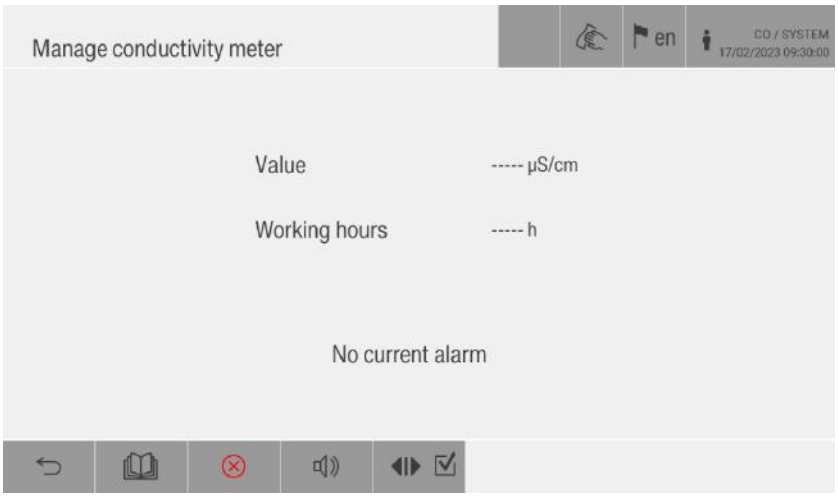
Allows to activate manually the pump when the inverter is installed.
To activate the pump inverter, it is necessary that the manual control is activated. For test purposes the pump speed is adjustable.
This menu is accessible with access level 2 to check, and with level 3 or higher to control manually the input / output.

⚠	To activate manually the pump inverter, it is necessary that the door is closed, the chamber is filled with water and that no alarms are shown on the screen below



Manage conductivity meter:

Allows to see the status of the conductivity meter, presence of alarms, and see the value measured from the probe.
This menu is accessible with access level 2 or higher.

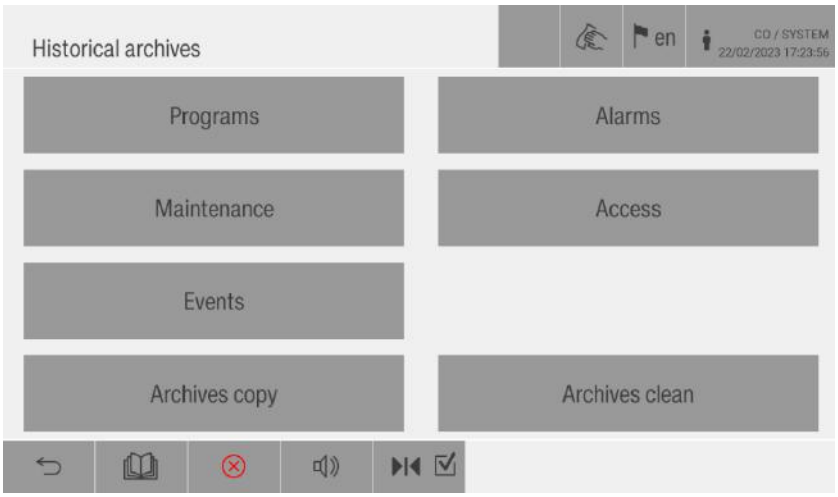


Value: measured value from the conductivity meter
Working hours: working hours of the conductivity meter

9.7.5 Historical archives

In this menu it is possible to see all the data related to the programs that has been already executed:

- **Programs**: visualize all the data of the executed programs
- **Alarms**: list all the faults occurred
- **Maintenance**: show the maintenance intervention executed
- **Access**: record all the user accesses
- **Events**: list all the events occurred, as programs start and stop or interruptions
- **Archives copy**: allow the copy of the whole archive
- **Archives clean**: allow to delete the archives



Programs:

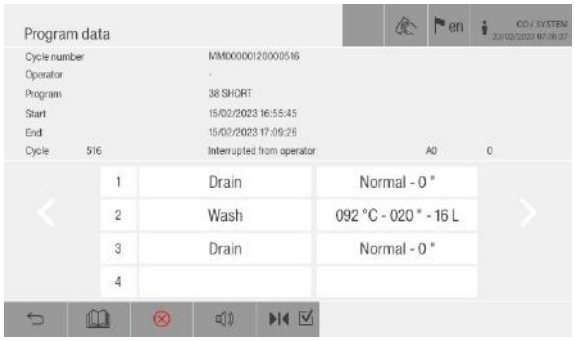
In this menu it is possible to read all the data of a program executed.
This menu is accessible with access level 2 or higher.

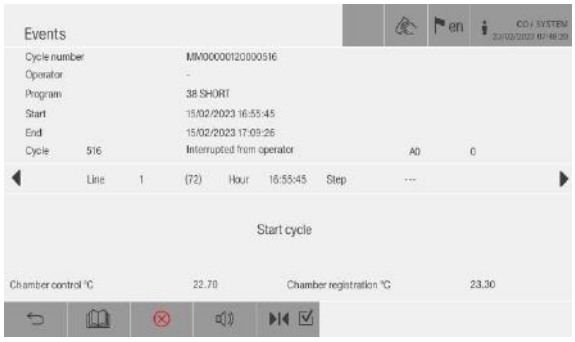
With the arrows it is possible to scroll and select the program.
Pressing each button on the lower part of the screen, it is possible to access the program data, as:

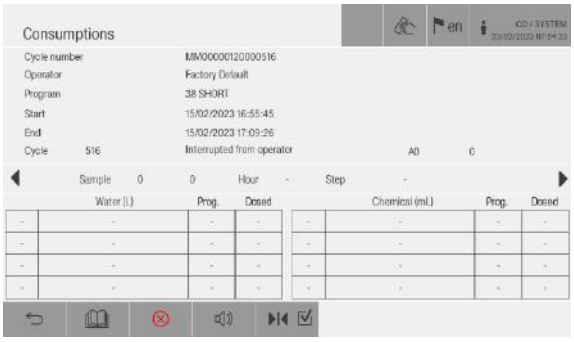
- Program settings
- Sampling
- Events
- Consumption
- Trend
- Warning

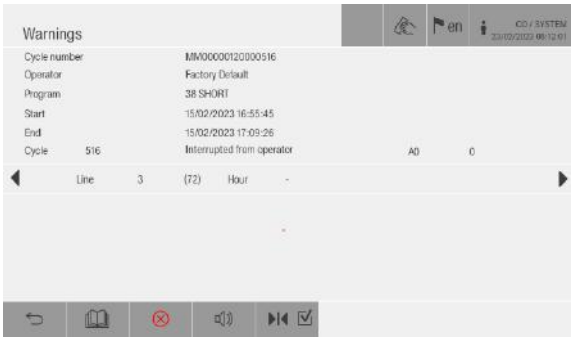
It is also possible to print the program data using the button “Printout”

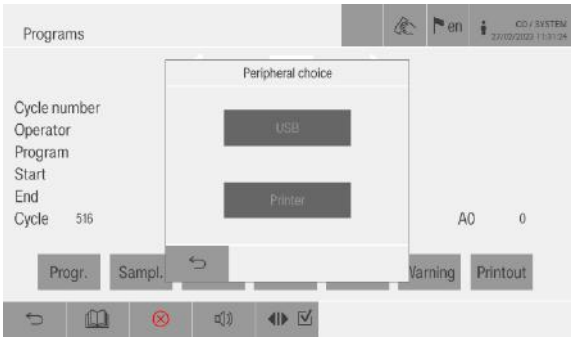
Below all the single pages that can be open pressing one of the buttons on the footer of the screen.







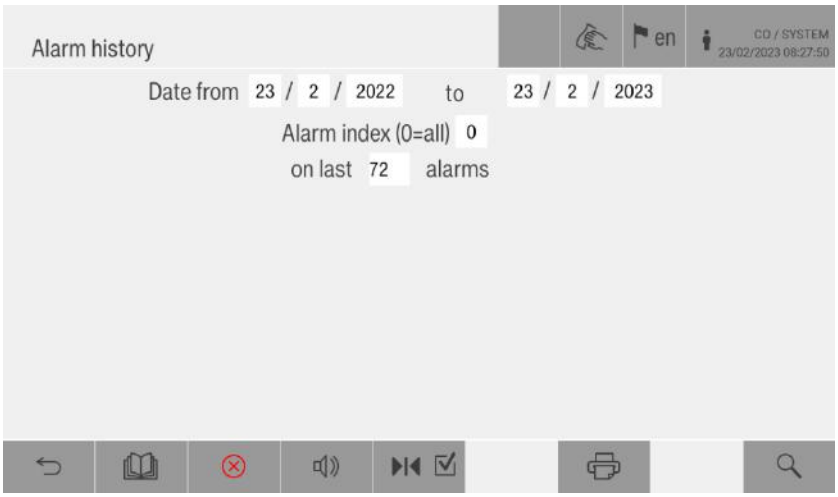


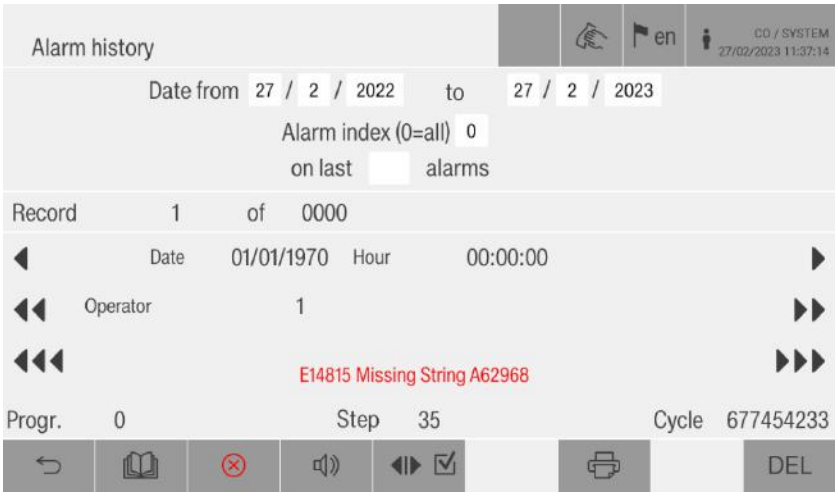


Alarm history:

In this menu it is possible to see all the alarms occurred on the machine.
This menu is accessible with access level 2 or higher.

After selecting a date and pressing the magnifying glass the list of alarms will be shown.

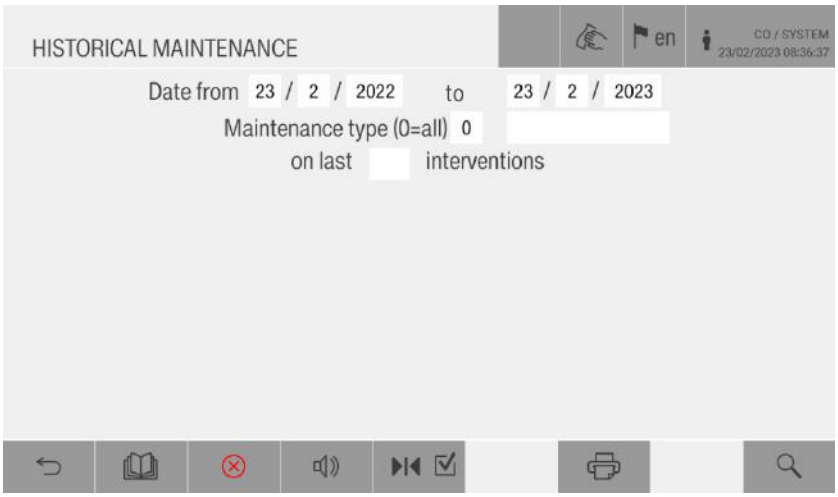


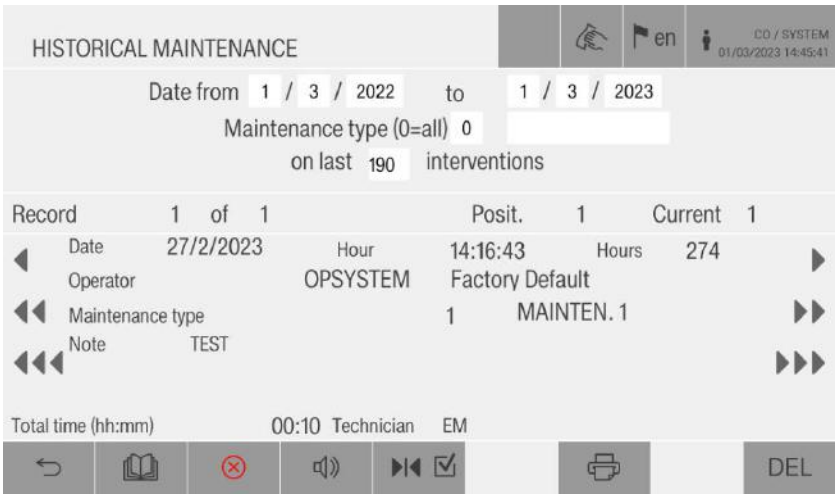


Historical maintenance:

In this menu it is possible to see all the maintenance intervention executed on the machine. This menu is accessible with access level 2 or higher.

After selecting a date and pressing the magnifying glass the list of the maintenance intervention will be shown.





Historical access:

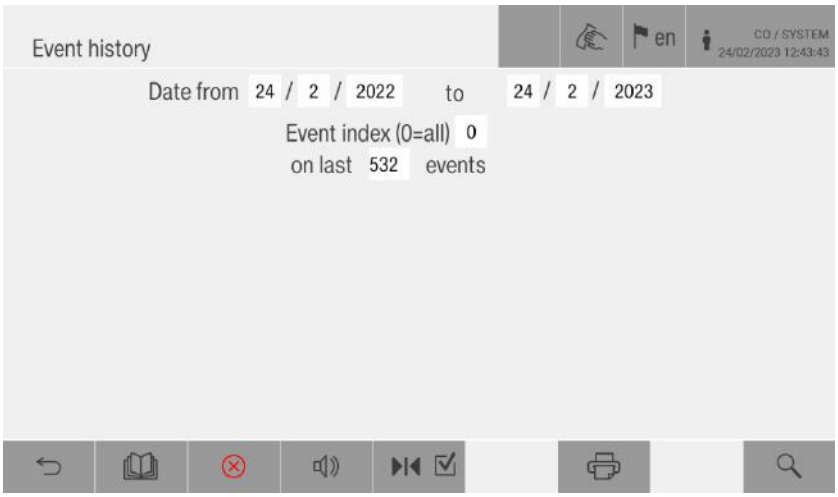
On this menu it is possible to see all the operator logins.
This menu is accessible with access level 2 or higher.

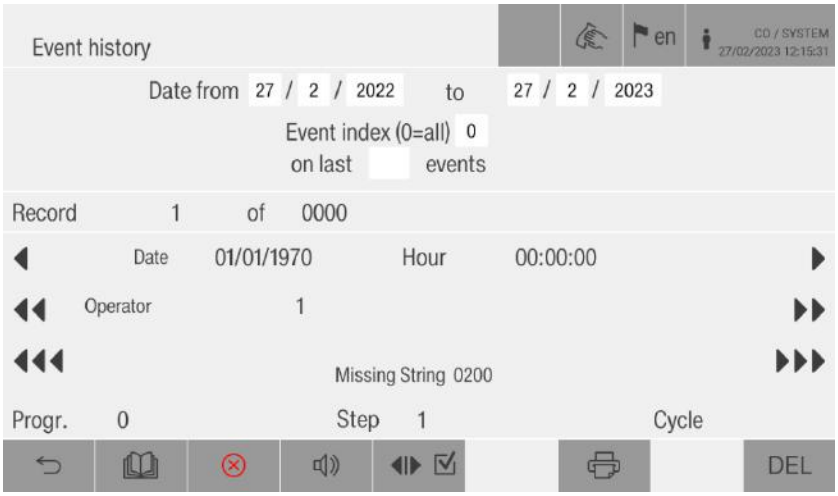
After selecting the date and pressing the magnifying glass the list of operator logins will be shown.

Event history:

In this menu it is possible to see all the events occurred on the machine.
This menu is accessible with access level 2 or higher.

After selecting the date and pressing the magnifying glass the list of events will be shown.

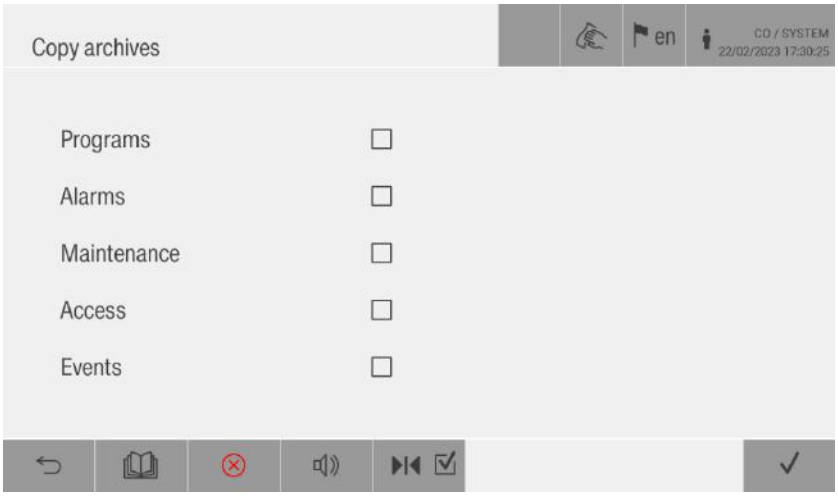




Copy archives:

In this menu it is possible to save the historical files on a USB key.
This menu is accessible with access level 4 or higher.

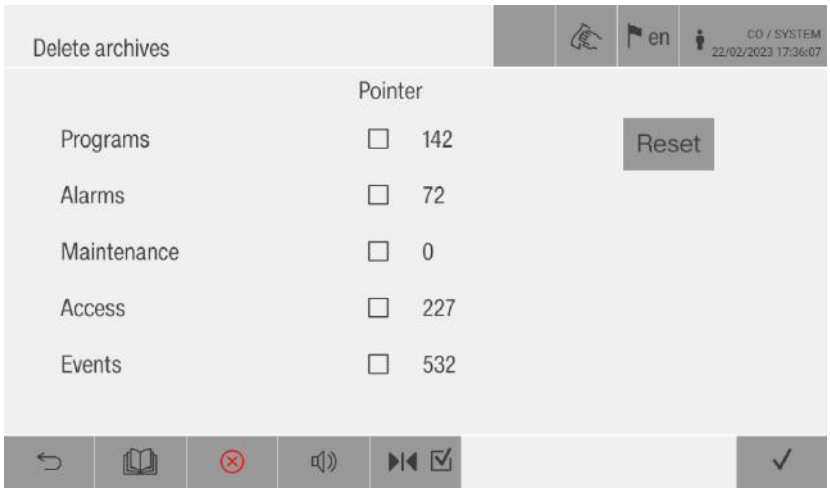
Insert a USB key and check one of the historical files to save, then confirm.



Delete archives:

In this menu it is possible to delete the historical files.
This menu is accessible with access level 4 or higher.

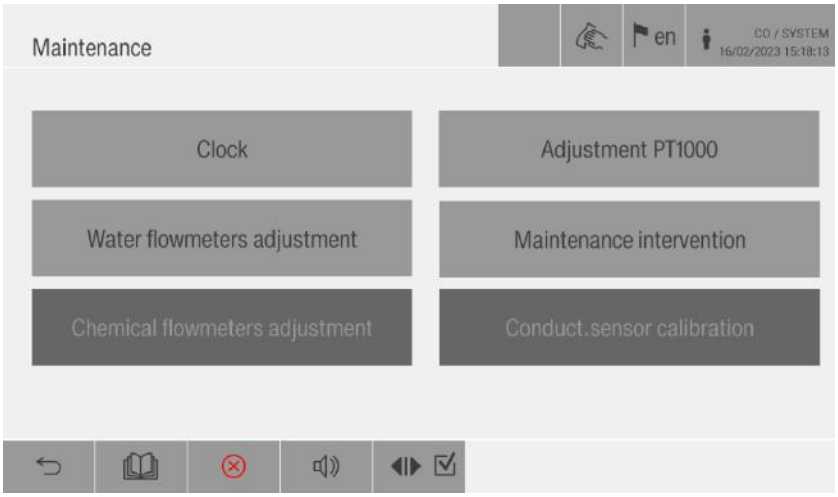
Check the historical file to delete, then confirm.



The RESET button allows to delete all the archives on the SD card.

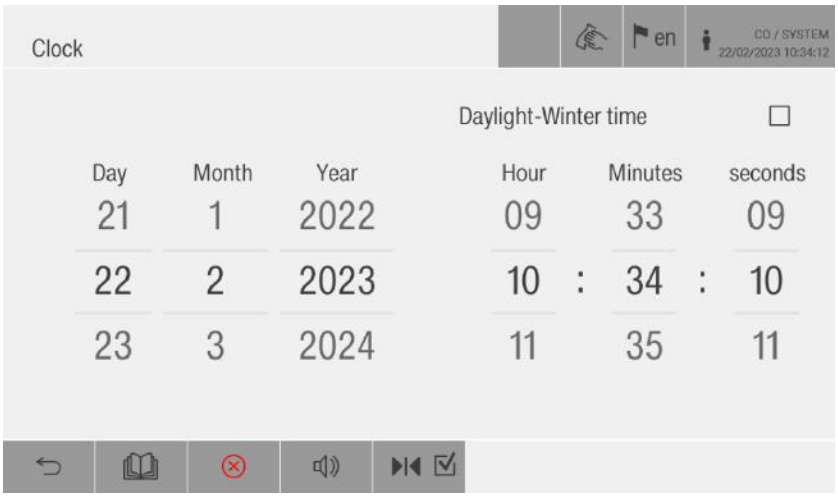
9.7.6 Maintenance

This menu allows the execution and registration of all the maintenance and adjustment interventions such as flowmeters and temperature probes adjustment.
This menu is accessible with access level 1 or higher.



Clock - Date / time setting:

Allows the setting of the clock and the daylight / legal time.
This menu is accessible with access level 2 or higher.

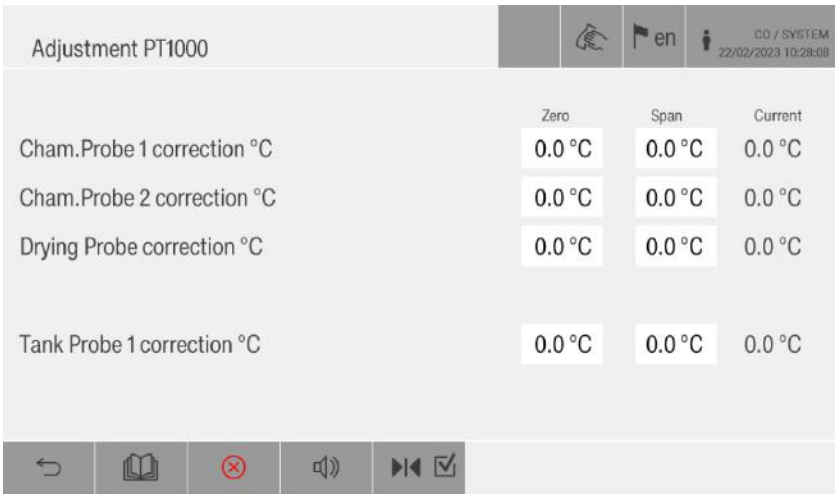


Daylight – Saving time: this selection allows the automatic setting of the time on countries where it is active the daylight – saving time.

Adjustment PT 1000:

Allows to adjust the reading of the temperature probes. After the execution of the calibration procedure, it is possible to insert the “zero” and “span” values for each one of the temperature probes.
This menu is accessible with access level 3 or higher.

The probes adjustment is done during the factory test and is not needed as an ordinary maintenance intervention.

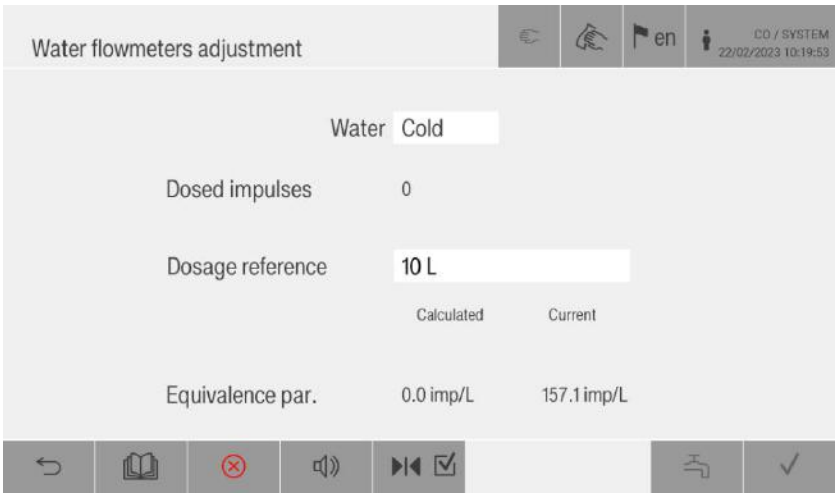


In case of replacement of a probe, the adjustment procedure execution is suggested.

The procedure is explained on section 7.

Water flowmeters adjustment:

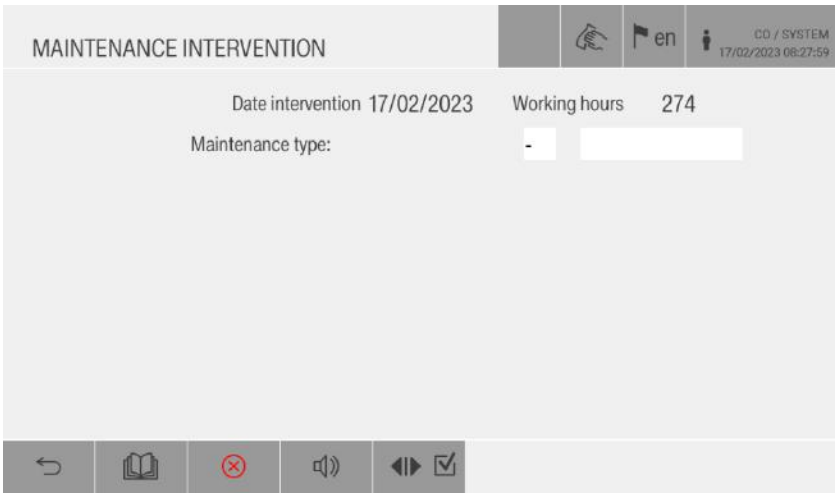
Allows to adjust the equivalence in impulses/litre of the water flowmeters.
This menu is accessible with access level 3 or higher.



The procedure is explained on section 6.

Maintenance intervention:

In this menu it is possible to register a maintenance intervention.
This menu is accessible with access level 1 for BIANNUAL intervention registration, and 3 or higher for the other maintenance interventions.

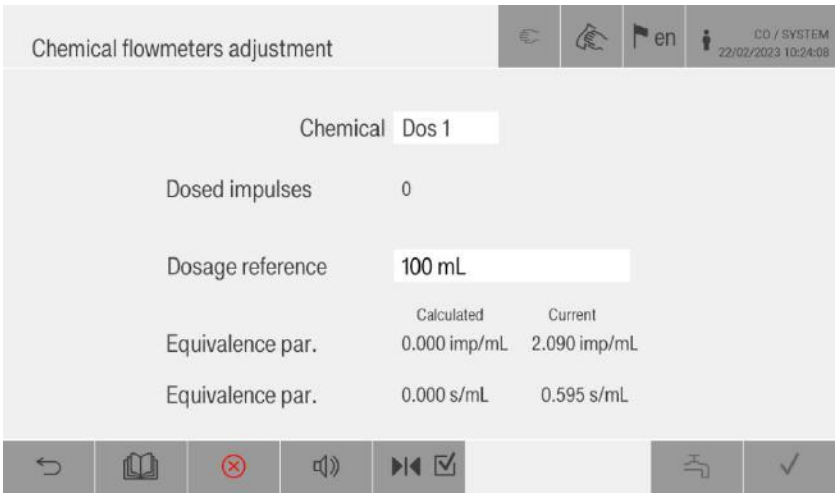


- ► The date is automatically filled according to the clock
- ► Select the type of maintenance (ANNUAL, BIANNUAL or EXTRAORDINARY maintenance)
- ► Enter the description of the maintenance intervention executed
- ► Enter the intervention duration
- ► Enter the name of the technician or operator that executed the maintenance
- ► Confirm and save using the ✓ button

The next maintenance interval will be automatically set according to the configuration settings of the machine.

Chemical flowmeters adjustment:

Allows to adjust the equivalence in impulses/ml or seconds/ml of the chemical flowmeters.
This menu is accessible with access level 3 or higher.



The procedure is explained on section 6.

10. CYCLE MANAGEMENT

This chapter describes functions related to cycles management, such as the start of a cycle, the modification of an existing cycle and the creation of a new cycle.

10.1 Start of a cycle

It is possible to set the start of the cycle in two ways:

- ► Selecting manually the cycle
- ► Using the basket recognition

This setting can be done as follow:

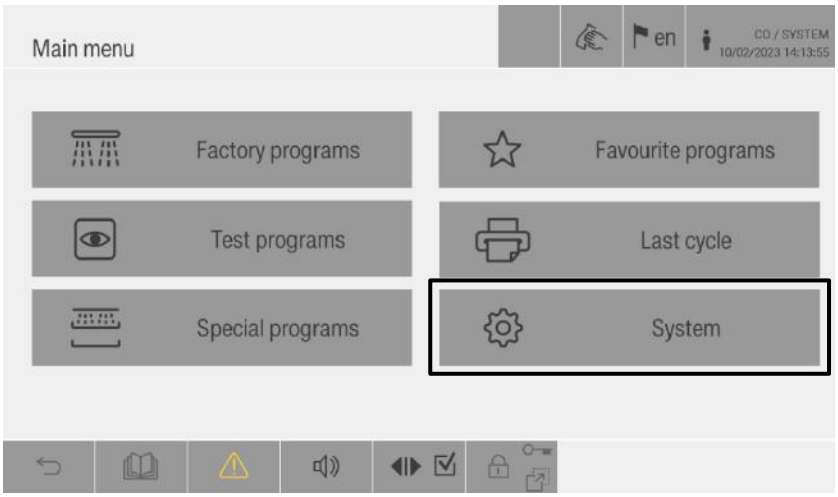
- ► Enter the SYSTEM menu, then SETTINGS, WORK
- ► On page 1 it is possible to set the type of start of the cycle choosing between the following:
  - ▷ MANUAL: the user needs to select manually the cycle to be executed
  - ▷ BASKET RECOGNITION: when the basket is insert into the chamber, the enabled programs for the specific code read from the magnets, are shown on the display
  - ▷ MIXED: both the previous selections are activated. The user can either select the program manually or using the magnet code of the basket

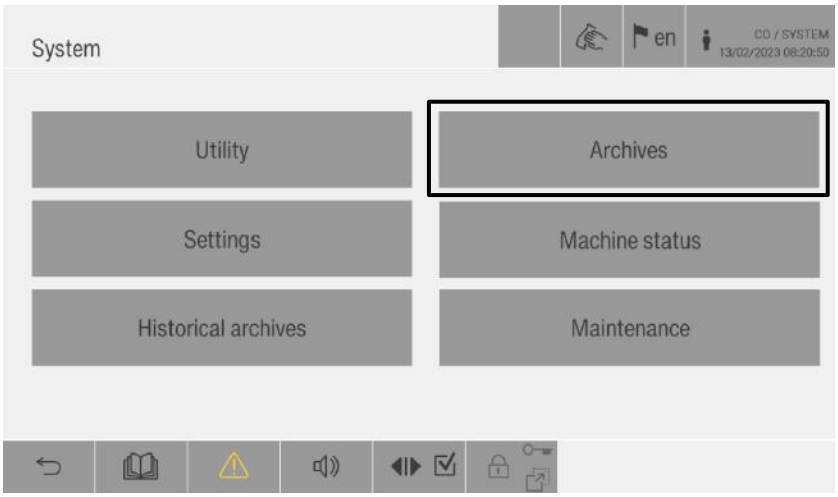
10.2 Washing program management

On the SETTINGS menu it is possible to modify or set new cycles.

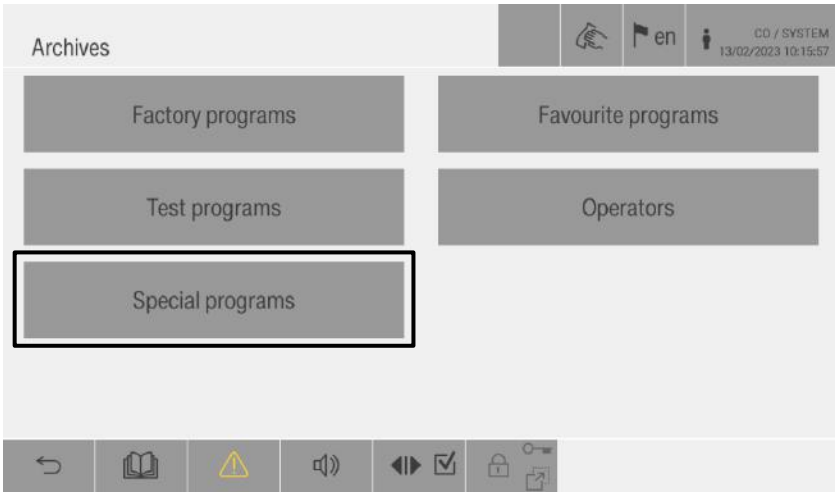
10.2.1 Creating washing programs

To create a washing program, it is necessary to access the programs page from MAIN MENU – SYSTEM – ARCHIVES.





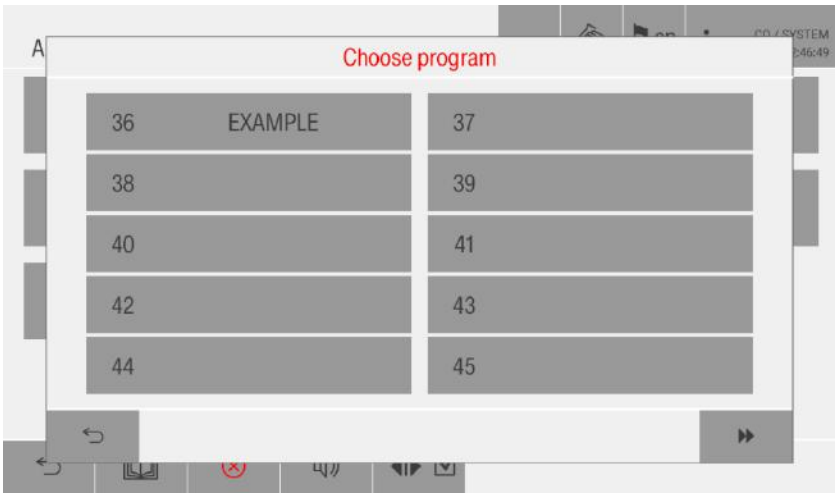
This menu is accessible with access level 2 or higher.



Here below a detail of the different program's menu:

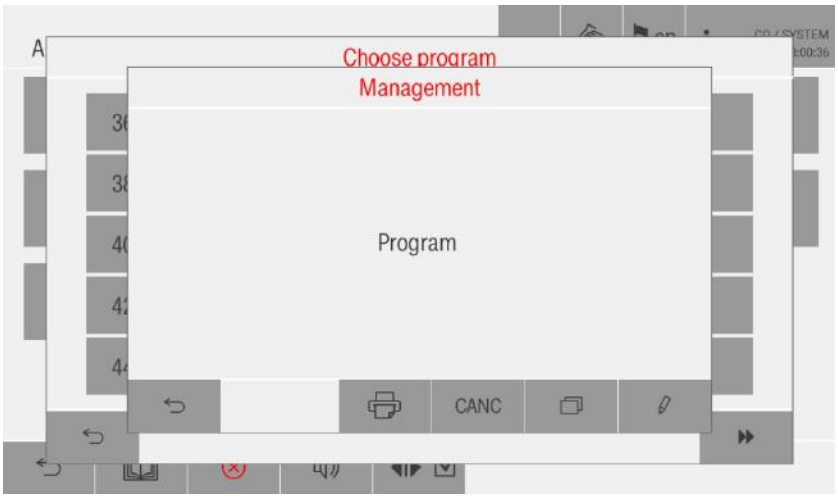
FACTORY PROGRAM	It allows you to modify manufacturer programs: unsuggested procedure. This menu is accessible from access level 3 or higher. **Factory programs should not be changed except on dosing values according to the chemical products used from the customer**
TEST PROGRAM	It allows you to create validation programs: unsuggested procedure. This menu is accessible from access level 3 or higher.
SPECIAL PROGRAM	It allows you to create customer programs.
FAVOURITE PROGRAMS	It allows you to group a series of the most used programs.

Enter the desired menu and select the position on which creating or modifying a program:



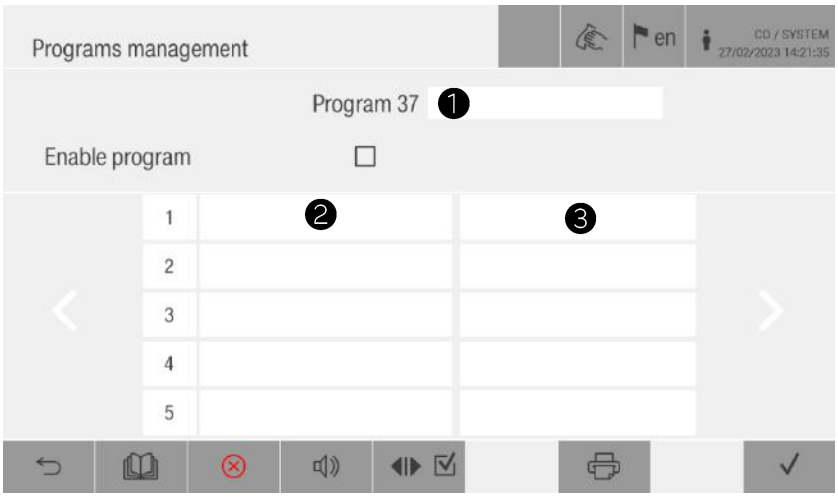
▶▶	Allow to scroll the pages where the cycles are saved

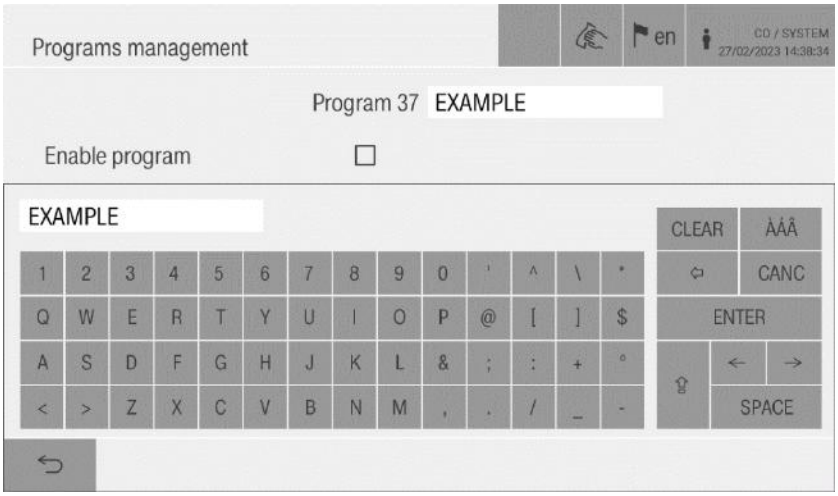
After the selection of the program or program position, press on the modification key :



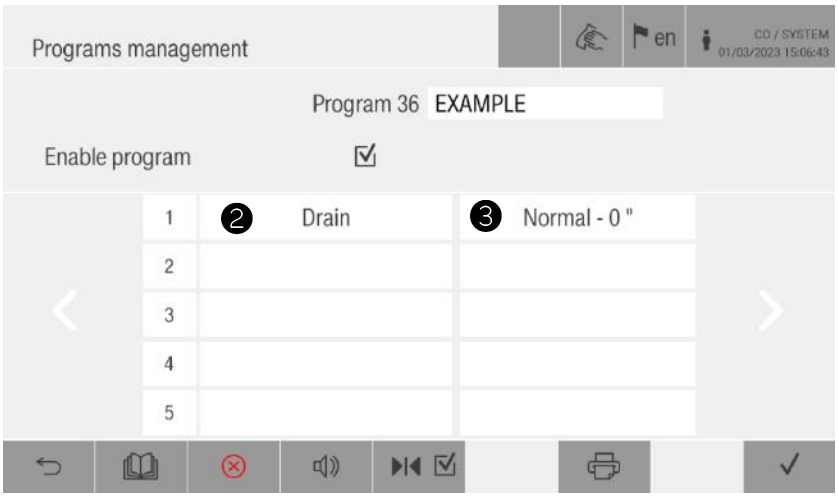
	Programs management - allow to modify/create the selected program
	Allow to copy the selected cycle on another position
CANC	Allow to delete the selected program
	Allow to print the cycle settings (on a printer or USB)

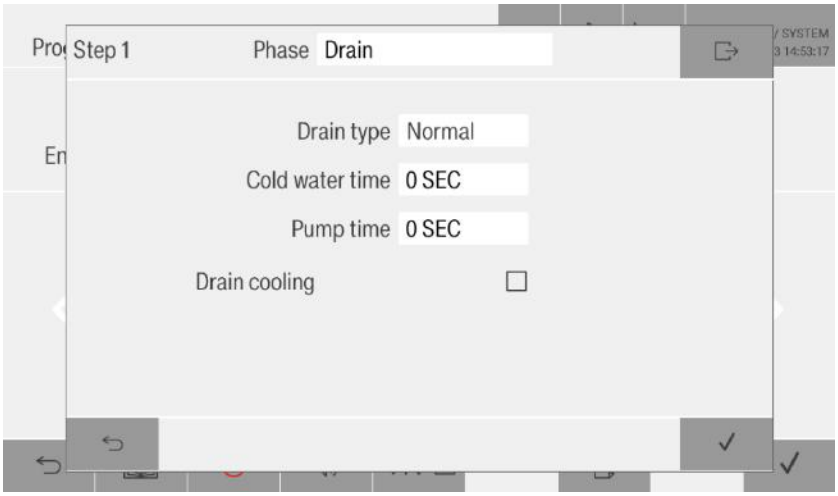
1. Insert the name of the cycle, pressing the white area next to the writing “Program” ❶. A keyboard will appear to insert the cycle name. Confirm with ENTER button:



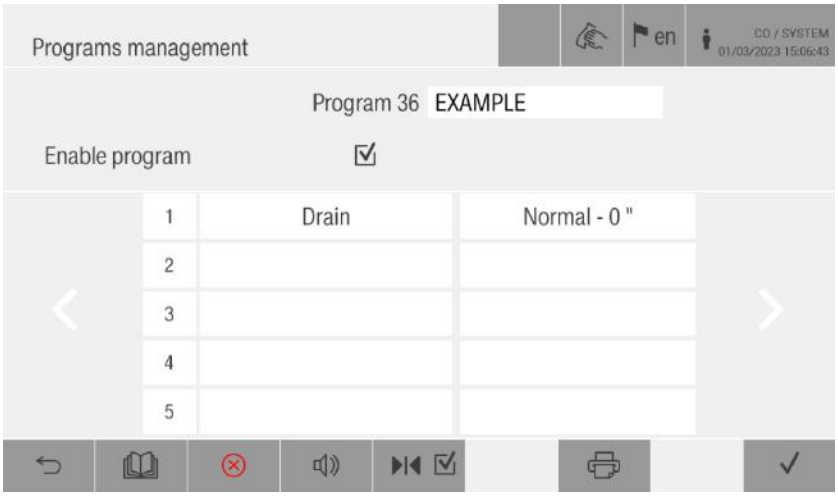


2. Select the phases to create the program ❷, choosing between:
   - ► Drain
   - ► Prewash
   - ► Wash
   - ► Rinse
   - ► Drying
   - ► Tank disinfection
3. Once the desired phase has been selected at section ❷, press on the section ❸ to set the parameters of the phase:

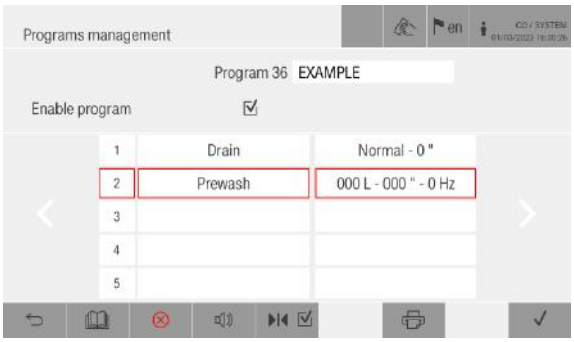


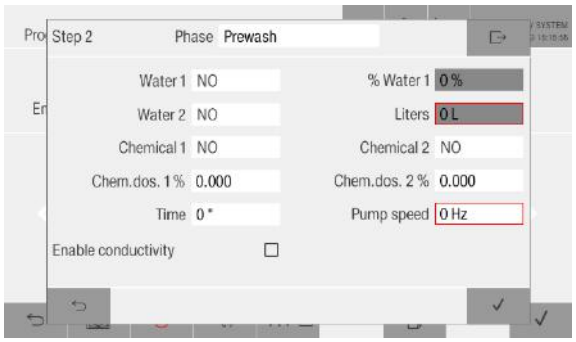


4. At the end of the setting, confirm using the ✓ button on the phase pop-up and on the main page of the cycle too.



During the program setting if a red square is shown, the parameters of the selected phase are not correct or complete. It is necessary to solve the anomaly before saving the program, otherwise the program will not be saved.



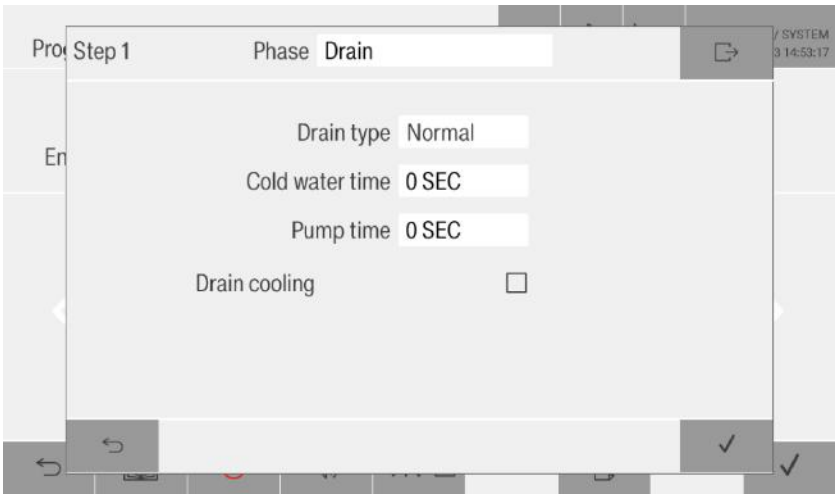


When the program is completed, during the program saving, the system executes a check on the entered parameters, and in the event of errors (e. g. wrong parameter settings), it is not possible to save the cycle (button disabled).

During a program start, the system executes a check on the entered parameters, and in the event of errors (e. g. wrong parameter settings), a message will appear at the start of a cycle “INVALID CYCLE”.

Below the detail of the pop-ups for the different phases:

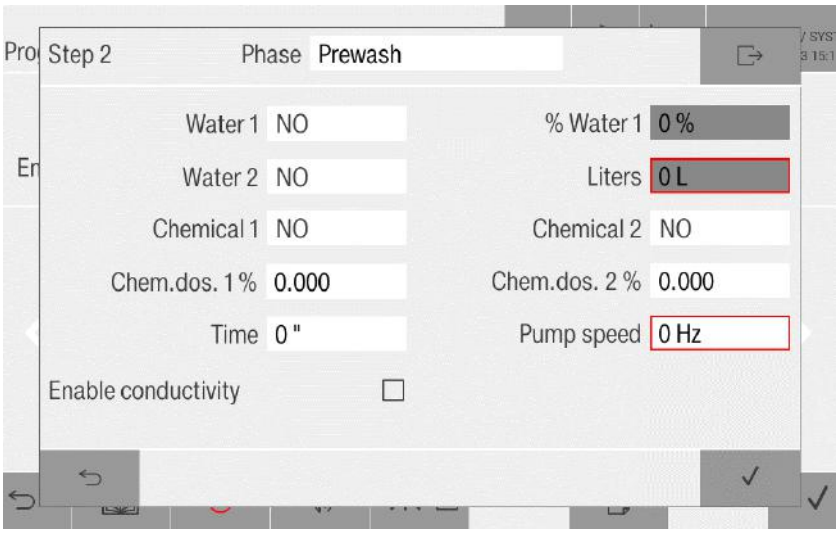
Drain



- *Drain type:*
  Normal: standard drain to the sewer
  Special: secondary drain circuit for recycling water on a separate drain or tank
- *Cold water time:*
  Activation of the cold water filling during drain in order to remove foam from the sump
- *Pump time:*
  Additional activation time for the washing pump to help flowing out the water from the circuits
- *Drain cooling:*
- Enable the cold water filling directly to the drain, when the temperature exceed the activation temperature set as global parameter

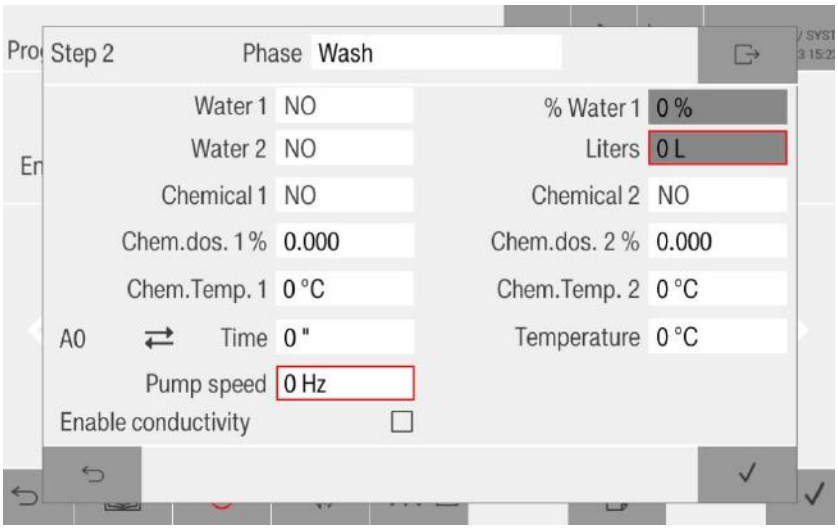
↩	Returns to the previous page
✓	Saves the entered values

Prewash



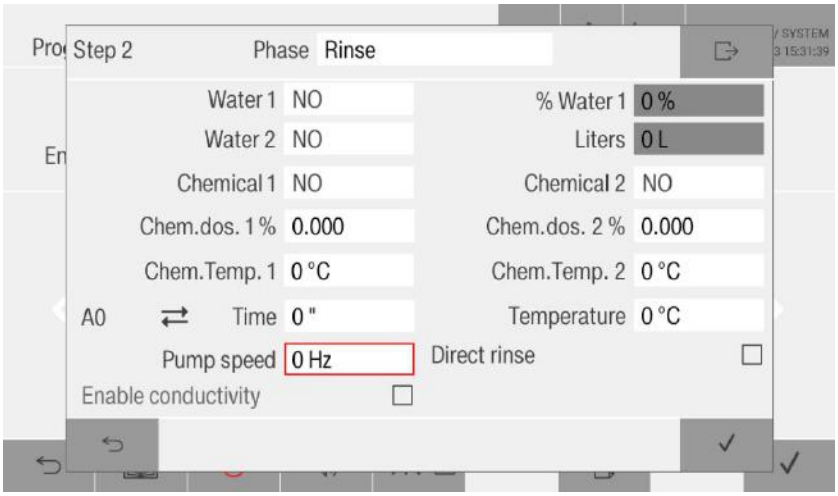
- *Water 1 – Water 2:*
  Type of water to be filled. It is possible to fill up two 2 different types of water mixing the water according to parameters set on *% Water 1* and *Liters*
- *Chemical 1:*
  Type of chemical, or dosing pump number
- *Chem.dos. 1 ‰:*
  Quantity of chemical to be dosed
- *Time:*
  Circulation pump time, counted after the water and the chemical is filled
- *Enable conductivity:*
  Enable the conductivity check at the beginning of the phase
- *% Water 1:*
  In case of mixed water, the quantity of Water 1 needs to be set. According to the selection, the second water is automatically calculated
- *Liters:*
  Total amount of water to be filled
- *Chemical 2:*
  Type of chemical, or dosing pump number
- *Chem.dos. 2 ‰:*
  Quantity of chemical to be dosed
- *Pump speed:*
  Allow the choice of the speed (Hz) for the pump functioning

Wash



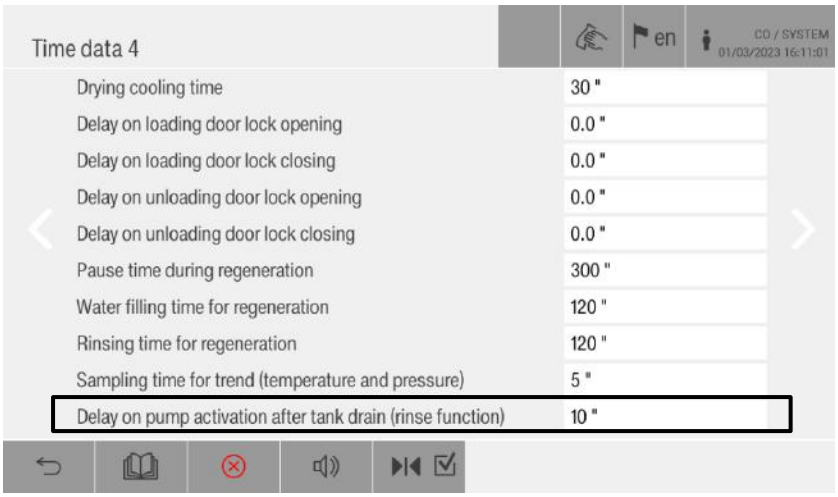
- *Water 1 – Water 2:*
  Type of water to be filled. It is possible to fill up two 2 different types of water mixing the water according to parameters set on *% Water 1* and *Liters*
- *Chemical 1:*
  Type of chemical, or dosing pump number
- *Chem.dos. 1 ‰:*
  Quantity of chemical to be dosed
- *Chem.Temp. 1:*
  Setting of the dosing temperature
- *Time:*
  Circulation pump time, counted after the water, the chemical is filled and the temperature is reached
- *Enable conductivity:*
  Enable the conductivity check at the beginning of the phase
- *Pump speed:*
  Allow the choice of the speed (Hz) for the pump functioning
- *% Water 1:*
  In case of mixed water, the quantity of Water 1 needs to be set. According to the selection, the second water is automatically calculated
- *Liters:*
  Total amount of water to be filled
- *Chemical 2:*
  Type of chemical, or dosing pump number
- *Chem.dos. 2 ‰:*
  Quantity of chemical to be dosed
- *Chem.Temp. 2:*
  Setting of the dosing temperature
- *Temperature:*
  Setting of the temperature to be reached during the wash

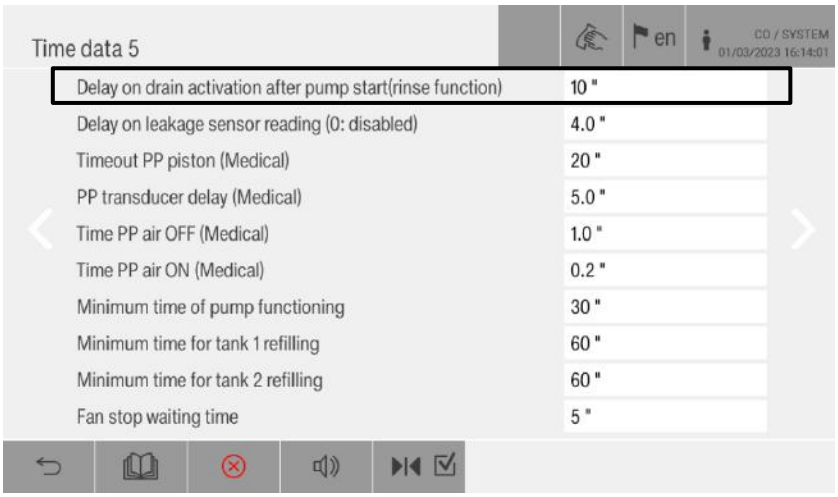
Rinse



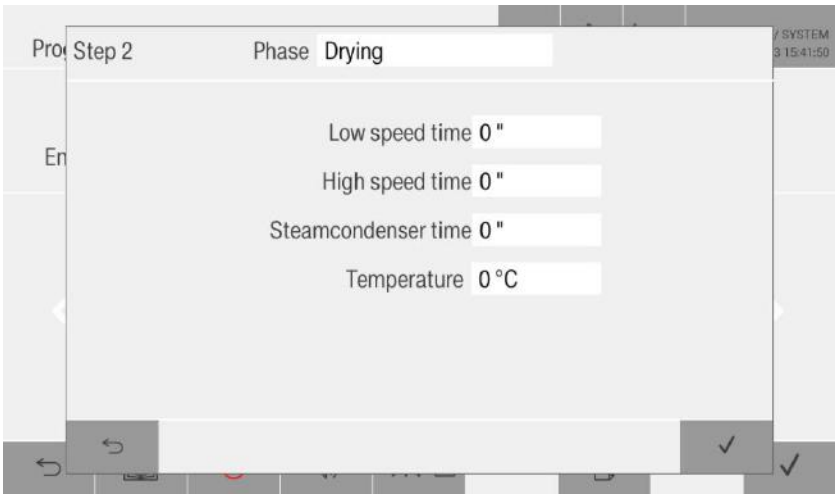
The Rinse phase contains the same settings than the Wash phase with an additional check box for rinse settings.

Checking the Rinse function box ☑, the pump is activated during the water filling from the tank and the drain is also activated with a delay defined by a parameter, to allow a fast rinse of the object without a recirculation of the dirty water.
This function available only on machines provided with the at least 1 pre-heating tank.
The delay for the activation of the pump and the drain valve are set on the SETTINGS – BASIC – TIME DATA menu:



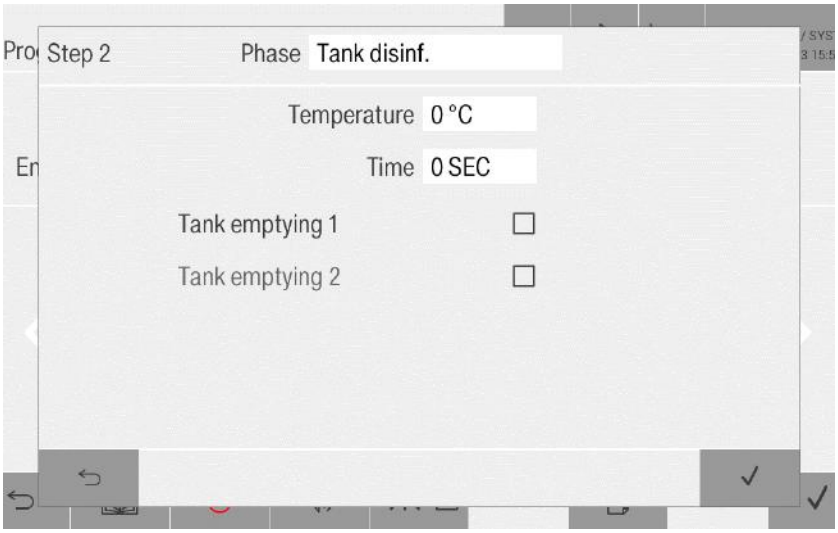


Drying



- *Low speed time:*
  First drying step with fan controlled at low speed to remove the steam from the chamber
- *High speed time:*
  Second drying step with fan controlled at maximum speed where the air is also heated up to the temperature set at Temperature section
- *Steam condenser time (optional function):*
  Time for steam condenser activation at the beginning of the drying phase during the low speed time. The steam condenser time need to be lower than the low speed time in order to avoid water dropping out of the vent stack
- *Temperature:*
  Temperature to be reached from the drying circuit – reference is the drying probe
- *Humidity (optional function):*
  The drying phase can also be controlled by the humidity sensor. As soon as the humidity reach the setting value, the drying phase is stopped, even if the time is not expired – function to speed up the drying phase

Tank disinfection



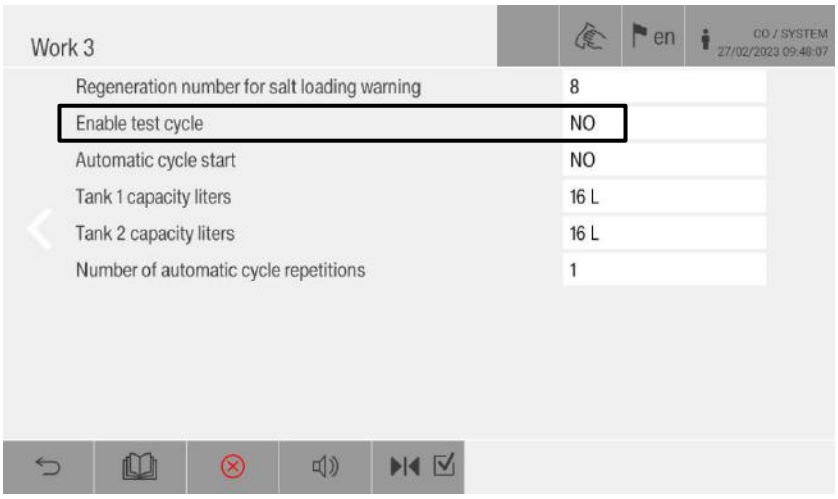
- *Temperature:*
  Disinfection temperature for the tanks
- *Time:*
  Time kept at that temperature
- *Tank emptying 1:*
  Selection of the tank to be emptied at the end of the disinfection process
- *Tank emptying 2:*
  Selection of the tank to be emptied at the end of the disinfection process

10.3 Test cycle mode

On this machine it is possible to activate a special function that allows, on validation conditions, to open the door for water sampling at the end of each washing phase.

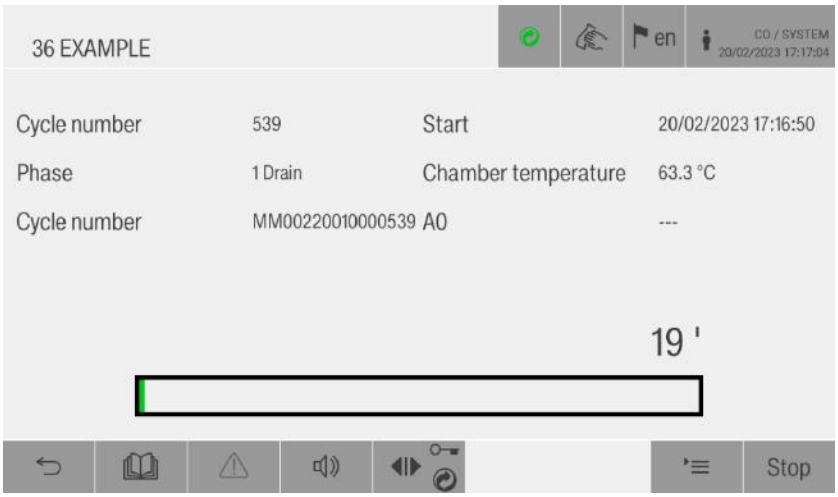
To access this function, it is necessary to login with user level 2.

To activate the TEST MODE function, enter SYSTEM – SETTINGS – WORK – PAGE 3



When the function is enabled, after starting a cycle, each phase will stop immediately before the drain and the door will be unlocked automatically.

It is possible to open the door, to take a sample, close the door and start again the cycle pressing START.



To come back to the standard execution of the cycles it is necessary to disable the function.

⚠	This function can be used only and exclusively for testing purposes, during the machine validation, and cannot be used during the standard working cycles. **Be careful: water can be very hot and chemical products could also be present. Use the appropriate PPE.**

11. ALARM AND WARNING MESSAGES

11.1 Alarm intervention description

An alarm that occurs during the machine operation is indicated by a red cross on the display ⊗ and a message and acoustic signal.
The alarm remains active until the problem is solved and the message is reset, as explained in the related section.

11.2 Alarms list

Some alarms are specifically related to the manual or automatic door version.

M: manual door
A: automatic door

For some of the alarms that could occur the operator can solve the problem and restore the alarm.
For other alarms messages, the intervention of the service technician is necessary.
To safely access the chamber and the technical area, please refer to the “Maintenance” section.

On the Cloud platform, alarms are identified by the same code in the list below, preceded by the prefix 9 (for example: the A37 alarm will be identified in the Cloud by the code A9037)

The person in charge of the alarm resolution is indicated on the following table according to the legend below.

OP: operator
S: service technician

Nr.	Message displayed	Door version	Description	Responsible for the alarm solution
1	**Power failure**		It signals the interruption of the electric power supply when it is restored, which occurred with the cycle in progress	OP
2	**Loading door open during cycle**	**M**	Loading side door has opened or/and was unlocked during the cycle in progress	S
3	**Unloading door open during cycle**	**M**	Unloading side door has opened or/and was unlocked during the cycle in progress	S
4	**Loading door open & locked**	**M**	Loading side door is open and locked (inconsistency)	S
5	**Unloading door open & locked**	**M**	Unloading side door is open and locked (inconsistency)	S
6	**Door status discrepancy**	**M**	The 2 doors are in an inadmissible configuration (they may both be open, because both unlocked or/and open). Or because one of the doors with door lock motorisation off, the status of the 2 locking and unlocking limit switches is incompatible.	OP

7	**Loading door locking failure**	**M**	Triggered in the following possible situations (loading side door): **a)** the door was not locked within the time defined from the parameter **b)** the door was opened when the door had started locking	S
8	**Unloading door locking failure**	**M**	Triggered in the following possible situations (sterile side door): **a)** the door was not locked within the time defined from the parameter **b)** the door was opened when the door had started locking	S
9	**Loading door unlocking failure**	**M**	The opening of the loading door lock did not finish within the time defined from the parameter	S
10	**Unloading door unlocking failure**	**M**	The opening of the sterile door lock did not finish within the time defined from the parameter	S
2	**Loading door opening failure**	**A**	Loading side door opening time exceed the maximum time set on the parameter	S
3	**Unloading door opening failure**	**A**	Unloading side door opening time exceed the maximum time set on the parameter	S
4	**Loading door closing failure**	**A**	Loading side door closing time exceed the maximum time set on the parameter	S
5	**Unloading door closing failure**	**A**	Unloading side door closing time exceed the maximum time set on the parameter	S
6	**Door status discrepancy**	**A**	The 2 doors are in an inadmissible configuration (they may both be open)	OP
7	**Loading door open during cycle**	**A**	Loading door open during cycle	S
8	**Unloading door open during cycle**	**A**	Unloading door open during cycle	S
9	**Loading door limit switch discrepancy**	**A**	On loading side door, both door open and closed signal are active	S
10	**Unloading door limit switch discrepancy**	**A**	On unloading side door, both door open and closed signal are active	S
11	**No cold water**		The cold water wash tank supply has not been completed (lack of new water flowmeter pulse for more than the time defined from the parameter).	S
12	**No warm water**		The hot water wash tank supply has not been completed (lack of new water flowmeter pulse for more than the time defined from the parameter). In the configuration with tank 2 present, it	S

			indicates that the water 2 supply in the tank or the water 2 discharge from the tank to the wash tank has not been completed within the maximum time defined from the parameter (level control).	
13	**No demi water**		The demineralized water wash tank supply has not been completed (lack of new water flowmeter pulse for more than the time defined from the parameter). In the configuration with tank 1 present, it indicates that the water 1 supply in the tank or the water 1 discharge from the tank to the wash tank has not been completed within the maximum time defined from the parameter (level control).	S
17	**Chemical DOS 1 lack**		The product associated with the dosage unit 1 (detergent) is finished (if enabled as an alarm by the parameter). Diagnostics based on (with activated dosing pump): - pressure switch disabled if time-based dosage (1.5 s reading delay); - no new pulse for more than the time defined from the parameter if dosage by flowmeter.	OP
18	**Chemical DOS 2 lack**		The product associated with the dosage unit 2 (neutralising agent) is finished (if enabled as an alarm by the parameter). Diagnostics based on (with activated dosing pump): - pressure switch disabled if time-based dosage (1.5 s reading delay); - no new pulse for more than the time defined from the parameter if dosage by flowmeter.	OP
19	**Chemical DOS 3 lack**		The product associated with the dosage unit 3 (lubricant) is finished (ifenabled as an alarm by the parameter). Diagnostics based on (with activated dosing pump): - pressure switch disabled if time-based dosage (1.5 s reading delay); - no new pulse for more than the time defined from the parameter if dosage by flowmeter.	OP
20	**Chemical DOS 4 lack**		The product associated with the dosage unit 4 (soda ash) is finished (ifenabled as an alarm by the parameter). Diagnostics based on (with activated dosing pump): - pressure switch disabled if time-based dosage (1.5 s reading delay); - no new pulse for more than the time defined from the parameter if dosage by flowmeter.	OP

23	**Drain failure**		It triggers after a time limit that the drain solenoid valve is open if the wash tank level is still active (wash tank not emptied);	S
24	**Fan failure**		Diagnostics active the delay parameter is not zero, for the following situations: - the fan pressure switch is inactive, having sent a command to turnthe fan on at maximum speed; - the fan pressure switch is active, having sent a command to turnthe fan off. The pressure switch reading is subject to the delay defined from the parameter	S
25	**Minimum drying temperature not reached**		The air temperature has never reached the minimum threshold defined in the parameter during drying with electric heating (or it has not reached the drying set point when the latter has a value lower than the ones defined from the parameter).	S
26	**Prewash temperature too high**		The wash tank temperature has risen above the maximum limit defined from the parameter during the prewash phase.	OP
27	**Chamber temperature too high**		The temperature in the wash tank exceeds the limit 102°C (operatinglimit to protect against overheating).	S
28	**Drying temperature too high**		The air temperature exceeds the limit 162°C (operating limit to protect against overheating).	S
29	**Tank 1 temperature too high**		In the configuration with tank 1 present, the air temperature in tank 1 exceeds the limit 100°C (operating limit to protect againstoverheating).	S
30	**Chamber probe 1 failure**		Fault in wash tank temperature probe 1 (regulation probe)	S
31	**Chamber probe 2 failure**		Fault in wash tank temperature probe 2 (redundancy probe).	S
32	**Drying probe failure**		Fault in air temperature probe (drying probe).	S
33	**Tank 1 probe failure**		In the configuration with tank 1 present, temperature probe fault intank 1.	S
34	**Chamb. probes temperature discrepancy**		Triggered when the parameter about the control is set to YES, only during the treatment phase and if all the following conditions are satisfied: a) the wash tank temperature is greater than the limit set by the parameter b) the wash tank probe 2 differs from probe 1 by an absolute value greater than the maximum limit set by the parameter;	S

			c) the heating element in the wash tank is inactive (the heating elements in the wash tank are off or the steam heating is inactive);	
36	**Unloading side panel not connected**		Lack of communication with the keyboard on the unloading door side(on Can Bus serial)	S
37	**CAN serial connection failure**		Lack of communication on the serial (Can Bus) that connects the master keyboard with the slave base boards.	S
39	**No chamber heating**		During the electrical heating of the wash tank (wash tank resistance on) the temperature increased by less than 1°C during the time set in the parameter.	S
41	**No tank 1 heating**		In the configuration with tank 1 present, during the electrical heatingof tank 1, the temperature of tank 1 increased by less than 1°C during the time set in the parameter.	S
42	**Thermal protection intervention**		The thermal safety input is disabled with the safety contactor command on or is active when the safety contactor command is off(1.5 s reading delay).	S
46	**Washing pump pressure switch failure**		Diagnostics active if parameter = YES. The pressure switch of the wash impeller pump is disabled with the pump command on or is active with the pump command off (the diagnostics with the pump command on is bypassed during the water supply and during active draining). It intervenes with a reading delay as defined in the parameter.	S
47	**Chemical flowmeter 1 failure**		The flowmeter for the chemical additive 1 (detergent) signals surplus pulses above the limit defined by the parameter, with the dosing pump command off.	S
48	**Chemical flowmeter 2 failure**		The flowmeter for the chemical additive 2 (neutralising agent) signalssurplus pulses above the limit defined by the parameter, with the dosing pump command off.	S
49	**Chemical flowmeter 3 failure**		The flowmeter for the chemical additive 3 (lubricant) signals surplus pulses above the limit defined by the parameter, with the dosing pump command off.	S
50	**Chemical flowmeter 4 failure**		The flowmeter for the chemical additive 4 (soda ash) signals surpluspulses above the limit defined by the parameter, with the dosing pump command off.	S

51	**Cold water flowmeter failure**		The flowmeter for the cold water signals surplus pulses above the limit defined by the parameter, with the water solenoid valve command closed.	S
52	**Warm water flowmeter failure**		The flowmeter for the hot water signals surplus pulses above the limit defined by the parameter, with the water solenoid valve command closed.	S
53	**Demi water flowmeter failure**		The flowmeter for the demineralised water signals surplus pulses above the limit defined by the parameter, with the water solenoid valve command closed.	S
54	**Hepa filter obstructed**		The air filter of the drying fan is clogged (5.0 s reading delay).	S
55	**Conductimeter failure**		Electrical conductivity sensor error (Ex, with x = 1,..., 6) - E1: generic error - E2: measurement above the maximum limit - E3: measurement below the minimum limit - E4: sensor in short circuit - E5: calibration error - E6: communication error (on the MieleBus serial)	S
56	**Conductivity too high**		The conductivity value exceeds the maximum threshold set as phase parameter. (The conductivity monitoring is carried out in the pre-wash/treatment phase which has the "conductivity" phase parameter enabled, in a time interval of 15 s which runs, with the water supply into the wash tank completed, after 15 s from the continuous activation of the wash pump and after the possible sensor initialisation time from the start-up of the power supply is ended (30 s). When the conductivity check fails, the step is repeated, draining the water first. The alarm is triggered after three consecutive failures of the conductivity check.).	S
57	**Washing arm speed too low**		Ex, where x means the number associated to the washing arm not detected. The alarm occurs when the speed of the washing arm x is lower than the parameter. Moreover the following conditions need to be satisfied: a) Parameter “Working cycle” set to BASKET or BOTH b) The washing arm x is present on the selected configuration c) The pump is active from more than 20”	**S**

58	**No chamber heating**		During the steam heating, the temperature is not increased of 1°C within the time defined form the parameter	**S**
59	**No tank 1 heating**		With tank 1 present, with steam heating activated, the temperature into the tank is not increased of 1°C within the time defined from the parameter	**S**
60	**Failure on thermo-regulation**		In the treatment phase, the thermoregulation timeout (equal to 30 min) which began to count the first time the temperature in the washtank reaches the set point + 0.5°C (with the water supply completed and any gradual chamber cooling concluded) has expired. Notifies an undefined situation of permanence in the phase for the following possible reasons: a) temperature fluctuations above/below the set point due to a structural defect in the flue. b) incorrect chemical input temperature setting (>than thermoregulation set point)	S
61	**Washing arm speed too high**		Ex, where x means the number associated to the washing arm not detected. The alarm occurs when the speed of the washing arm x is higher than the parameter. Moreover the following conditions need to be satisfied: d) Parameter “Working cycle” set to BASKET or BOTH e) The washing arm x is present on the selected configuration f) The pump is active from more than 20”	**S**
67	**Door manually unlocked**	**M**	During an energy lack, the door has been manually unlocked. The operator needs to rest the alarm and to fix the door motor again	**OP**
68	**Emergency intervention**		Emergency button activation (the digital input to which it is connectedis open).	S
69	**Humidity sensor failure**		The humidity sensor is broken or not connected	**S**
70	**Water below drain level**		On prewash, wash and rinse phase after the water filling time, the minimum level sensor must detect the water presence on the chamber.	**S**
74	**Tank 2 temperature too high**		In the configuration with tank 2 present, the air temperature in tank2 exceeds the limit 100°C (operating limit to protect against overheating).	S

75	**Tank 2 probe failure**		In the configuration with tank 2 present, fault of the temperatureprobe in tank 2.	S
77	**Tank 2 limit switch failure**		In the configuration with tank 2 present, it intervenes in one of the following conditions. a) Inconsistency of level switches: in tank 2 the lower max level (N.A.) is open and the upper maximum level (N.C.) is open (Diagnostics generated without any delay). b) Waiting timeout for switching a level switch: in tank 2, the maximum transition time between the lower and upper filling levels (and vice versa) during the supply/drainage of the tank water has elapsed.	S
78	**Tank 1 limit switch failure**		In the configuration with tank 1 present, it intervenes in one of the following conditions. a) Inconsistency of level switches: in tank 1 the lower max level (N.A.) is open and the upper maximum level (N.C.) is open (Diagnostics generated without any delay). b) Waiting timeout for switching a level switch: in tank 1, the maximum transition time between the lower and upper filling levels (and vice versa) during the supply/drainage of the tank water has elapsed.	S
83	**No tank 2 heating**		In the configuration with tank 2 present, during the electrical heatingof tank 2, the temperature of tank 2 increased by less than 1°C during the time set in the parameter.	S
85	**No cold demi water**		The type 4 water wash tank supply has not been completed (lack ofnew water flowmeter pulse for more than the time set in the parameter).	S
86	**Cold demi water flowmeter failure**		The flowmeter for the type 4 water signals surplus pulses above the limit set in the parameter, with the water solenoid valve command closed.	S
91	**DOS 1 dosing failure**		In the chemical dosage configuration with time control and flowmeter redundancy, in the dosage into the wash tank of the chemical product from dosage unit 1 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in the specific configuration parameter	S

92	**DOS 2 dosing failure**		In the chemical dosage configuration with time control and flowmeterredundancy, in the dosage into the wash tank of the chemical product from dosage unit 2 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in the specific configuration parameter	S
93	**DOS 3 dosing failure**		In the chemical dosage configuration with time control and flowmeterredundancy, in the dosage into the wash tank of the chemical product from dosage unit 3 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in the specific configuration parameter	S
94	**DOS 4 dosing failure**		In the chemical dosage configuration with time control and flowmeterredundancy, in the dosage into the wash tank of the chemical product from dosage unit 4 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in the specific configuration parameter	S
98	**Pump inverter communicatio n failure**		Diagnostics active if the wash pump with ECS inverter Timeout on the RS485 communication serial between the keyboard and the wash pump inverter	S
99	**Pump inverter alarm**		Diagnostics active if wash pump with ECS inverter The wash pump inverter is in an alarm state. The sub-code "Ex" or "Ax" is displayed: "Ex" indicates the active error code, "Ax" the specific activealarm code for the inverter (see inverter specification), with x number> 0	S
101	**Timeout PP valve ON (Medical)**		Diagnostics active if Power Pulse configured (P58> 0) The piston forward valve has been active for longer than the maximum allowed time defined by the parameter	S

102	**Timeout PP valve OFF (Medical)**		Diagnostics active if Power Pulse configured The piston reverse valve has been active for longer than the maximum allowed time defined by the parameter	S
103	**Piston failure during cycle PP (Medical)**		Diagnostics active if Power Pulse configured During the cycle enabled with the Power Pulse the forward limit switch of the piston has become disabled (piston displaced or limit switch faulty)	S
104	**Limit switch discrepancy PP (Medical)**		Diagnostics active if Power Pulse configured The piston forward and reverse limit switches are both active.	S
105	**Compressed air lack PP (Medical)**		Diagnostics active if Power Pulse configured with the compressed air valve command open, the air pressure switchis disabled (0 = diagnostic disabled)	S
106	**Compressed air too high PP (Medical)**		Diagnostics active if Power Pulse configured with the compressed air valve command open, the air pressure switch is disabled (0 = diagnostic disabled)	S
107	**Water leak in tank 1**		With drain valve from tank 1 off, the water re-filling has been executed before the time defined from the parameter. With 0, the diagnostic is disabled	**S**
108	**Water leak in tank 2**		With drain valve from tank 2 off, the water re-filling has been executed before the time defined from the parameter. With 0, the diagnostic is disabled	**S**
110	**Power pulse transducer failure**		Active only with optional power pulse cleaning (PP) active) The pressure transducer is broken or not connected	**S**
111	**Washing arm sensors – communicatio n problems**		**Active only if Cycle selection is set to BASKET or BOTH.** The serial connection is on failure: E1: failure on RS485 line E2: communication error between CAN and main board (display)	**S**

11.3 Warning intervention description

A warning that occurs during the machine operation is signalised from a yellow triangle on the display ⚠.

The warning remains active until the problem is solved and the message is reset, as explained in the related section.

11.4 Warning list

Message displayed	Description	Responsible for the warning solution
Pump pressure transducer failure	The pressure transducer is disconnected or damaged	S
Drain in progress	If the cycle is interrupted from an operator and the chamber is full, the machine automatically drains the water. The program is not completed until the drain is not completed.	OP
Certificates not valid	The certificates of the machine are expired or not valid	S
Empty program	If an empty program is selected, this warning appears during the start	S
Warning – warm material !!	If the temperature into the chamber is higher than 65°C the message is displayed at the end of the cycle	OP
A door is open	Signal that the door is open. In this situation a new program cannot be started	OP
Wait	The machine is checking or executing an operation and a program cannot be started or completed	OP
Close door	Warns that the door need to be closed to allow the execution of the operation	OP
Salt loading needed	Active if the regeneration has been activated. The salt box is provided with a sensor that warn about the salt lack. With this message it is necessary to refill the salt box	OP
Print in progress	The printing is in progress. In this situation it is not possible to start another program until the printing of the last program is completed	OP
Cooling in progress	Chamber cooling in progress: this event occurs if the program has been interrupted or end after a phase with temperature higher than 60 °C	OP
Lack of chemical DOS1	Chemical 1 level switch is ON, detecting a lack of the product. Active only if type of dosing is set to IMPULSES or TIME - IMPULSES	OP

Lack of chemical DOS2	Chemical 2 level switch is ON, detecting a lack of the product. Active only if type of dosing is set to IMPULSES or TIME - IMPULSES	OP
Lack of chemical DOS3	Chemical 3 level switch is ON, detecting a lack of the product. Active only if type of dosing is set to IMPULSES or TIME - IMPULSES	OP
Lack of chemical DOS4	Chemical 4 level switch is ON, detecting a lack of the product. Active only if type of dosing is set to IMPULSES or TIME - IMPULSES	OP
Main board communication error	Unloading side display is not able to communicate with the main display on loading side	S
No basket	The basket has a code not identified from the machine	OP / S
Maintenance expired	The maintenance period is expired, and a new maintenance intervention is required. The description after the warning indicates the name of the maintenance expired between the 3 available: NNUAL, BIANNUAL and EXTRAORDINARY	S

11.5 Troubleshooting

	Alarm 02 – Loading door open during cycle – manual door	
	During the cycle the door load side results in status OPEN or UNLOCKED	
	Involved parts:	
	15SQ18 15SQ19 15SQ20	
	Causes	*Solutions*
1.	Defective door unlocked micro switch 15SQ18	1. Replace the micro switch
2.	Defective door locked micro switch 15SQ19	2. Replace the micro switch
3.	Defective door closed sensor 15SQ20	3. Replace the magnetic sensor
4.	Defective input 1.18	4. Replace the main board 7VI1
5.	Defective input 1.19	5. Replace the main board 7VI1
6.	Defective input 1.20	6. Replace the main board 7VI1
7.	Door not correctly locked during the cycle	7. Check the door lock and in case adjust it

	Alarm 02 – Loading door opening failure – automatic door	
	After the command to open the door, the door is not open within the time set by the parameter	
	Involved parts:	
	2M1 12SQ1 12SQ2 12KM9 15SQ18	
	Causes	*Solutions*
1.	Defective micro switch door open	1. Replace the micro switch
2.	Defective door motor 2M1	2. Replace the door motor
3.	Technical area door open	3. Close the technical area door
4.	Defective input 1.18	4. Replace the main board 7VI1
5.	Defective output 1.09	5. Replace the main board 7VI1
6.	Defective relay for door opening	6. Replace the relay

	Alarm 03 – Unloading door open during cycle	
	During the cycle the door unload side results in status OPEN or UNLOCKED	
	Involved parts:	
	18SSQ40 18SQ41 18SQ42	
	Causes	*Solutions*
1.	Defective door unlocked micro switch 18SSQ40	1. Replace the micro switch
2.	Defective door locked micro switch 18SSQ41	2. Replace the micro switch
3.	Defective door closed sensor 18SQ42	3. Replace the magnetic sensor
4.	Defective input 1.40	4. Replace the main board 7VI1
5.	Defective input 1.41	5. Replace the main board 7VI1
6.	Defective input 1.42	6. Replace the main board 7VI1
7.	Door not correctly locked during the cycle	7. Check the door lock and in case adjust it

	Alarm 03 – Unloading door opening failure – automatic door	
	After the command to open the door, the door is not open within the time set by the parameter	
	Involved parts:	
	2M2 12SQ5 12KM11 18SQ40	
	Causes	*Solutions*
7.	Defective micro switch door open	7. Replace the micro switch
8.	Defective door motor 2M2	8. Replace the door motor
9.	Technical area door open	9. Close the technical area door
10.	Defective input 1.40	10. Replace the main board 7VI1
11.	Defective output 1.11	11. Replace the main board 7VI1
12.	Defective relay for door opening	12. Replace the relay

	Alarm 04 – Loading door open & locked – manual door		
	Loading side door is open and locked (incongruence)		
	Involved parts:		
	15SQ18 15SQ19 15SQ20		
	Causes		*Solutions*
1.	Defective door unlocked micro switch 15SQ18	1.	Replace the micro switch
2.	Defective door locked micro switch 15SQ19	2.	Replace the micro switch
3.	Defective door closed sensor 15SQ20	3.	Replace the magnetic sensor
4.	Defective input 1.18	4.	Replace the main board 7VI1
5.	Defective input 1.19	5.	Replace the main board 7VI1
6.	Defective input 1.20	6.	Replace the main board 7VI1
7.	Door not correctly locked during the cycle	7.	Check the door lock and in case adjust it

	Alarm 04 – Loading door closing failure – automatic door		
	After the command to close the door, the door is not open within the time set by the parameter		
	Involved parts:		
	2M1 12SQ3 12SQ4 12KM10 15SQ19		
	Causes		*Solutions*
1.	Defective micro switch door closed	1.	Replace the micro switch
2.	Defective door motor 2M1	2.	Replace the door motor
3.	Defective input 1.19	3.	Replace the main board 7VI1
4.	Defective output 1.10	4.	Replace the main board 7VI1
5.	Defective relay for door opening	5.	Replace the relay

	Alarm 05 – Unloading door open & locked		
	Unloading side door is open and locked (incongruence)		
	Involved parts:		
	18SSQ40 18SQ41 18SQ42		
	Causes		*Solutions*
1.	Defective door unlocked micro switch 18SSQ40	1.	Replace the micro switch
2.	Defective door locked micro switch 18SSQ41	2.	Replace the micro switch
3.	Defective door closed sensor 18SQ42	3.	Replace the micro switch
4.	Defective input 1.40	4.	Replace the main board 7VI1
5.	Defective input 1.41	5.	Replace the main board 7VI1
6.	Defective input 1.42	6.	Replace the main board 7VI1
7.	Door not correctly locked during the cycle	7.	Check the door lock and in case adjust it

	Alarm 05 – Unloading door closing failure – automatic door		
	After the command to close the door, the door is not open within the time set by the parameter		
	Involved parts:		
	2M2 13SQ1 13SQ2 13KM12 18SQ41		
	Causes		*Solutions*
1.	Defective micro switch door closed	1.	Replace the micro switch
2.	Defective door motor 2M2	2.	Replace the door motor
3.	Defective input 1.41	3.	Replace the main board 7VI1
4.	Defective output 1.12	4.	Replace the main board 7VI1
5.	Defective relay for door opening	5.	Replace the relay

Alarm 06 – Door status discrepancy – manual door

The 2 doors are in an inadmissible configuration (they may both be open, because both unlocked or/and open). Or because one of the doors with door lock motorization off, the status of the 2 locking and unlocking limit switches is incompatible.

Involved parts:

15SQ18 15SQ19 15SQ20 18SSQ40 18SQ41 18SQ42

Causes	*Solutions*
1. Check all the micro switches and the sensors of the doors indicated to see if one is defective or needs to be adjusted	1. Check which sensor is not working correctly and in case replace it
2. One of the inputs of the above parts is defective	2. Replace the pcb 7VI1

Alarm 06 – Door status discrepancy – automatic door

The 2 doors are in an inadmissible configuration, as for example both doors open.

Involved parts:

12SQ1 12SQ5 15SQ18 18SQ40

Causes	*Solutions*
1. Check all the micro switches and the sensors of the doors indicated to see if one is defective or needs to be adjusted	1. Check which sensor is not working correctly and in case replace it
2. One of the inputs of the above parts is defective	2. Replace the pcb 7VI1

Alarm 07 – Loading door locking failure – manual door

Triggered in the following possible situations (loading side door):
a) the door was not locked within the time set in *Time Data – Page 2 – Max time unlocking door closing*
b) the door was opened when the door had started locking

Involved parts:

15SQ19 15SQ20

Causes	*Solutions*
1. Door locked micro switch defective	1. Check and in case replace the micro switch
2. Defective input 1.19	2. Replace the pcb 7VI1
3. Door closed sensor defective	3. Check and in case replace the sensor or the magnet in the door
4. Defective input 1.20	4. Replace the pcb 7VI1

Alarm 07 – Loading door open during cycle – automatic door

The door result open during the cycle

Involved parts:

12SQ1 15SQ18

Causes	*Solutions*
1. Micro switch defective	1. Check and in case replace the micro switch
2. Defective input 1.18	2. Replace the pcb 7VI1

Alarm 08 – Unloading door locking failure – manual door

Triggered in the following possible situations (unloading side door):
a) the door was not locked within the time set in *Time Data – Page 2 – Maximum time unlocking door closing*
b) the door was opened when the door had started locking

Involved parts:

18SQ40 18SQ41

Causes	*Solutions*
1. Door locked micro switch defective	1. Check and in case replace the micro switch
2. Defective input 1.40	2. Replace the pcb 7VI1
3. Door closed sensor defective	3. Check and in case replace the sensor or the magnet in the door
4. Defective input 1.41	4. Replace the pcb 7VI1

Alarm 08 – Unloading door open during cycle – automatic door

The door result open during the cycle

Involved parts:

12SQ5 18SQ40

Causes	*Solutions*
3. Micro switch defective	3. Check and in case replace the micro switch
4. Defective input 1.40	4. Replace the pcb 7VI1

Alarm 09 – Loading door unlocking failure – manual door

The opening of the loading door lock did not finish within the time set in *Time Data – Page 2 – Maximum time unlocking door opening*

Involved parts:

15SQ18 15SQ20

Causes	*Solutions*
1. Door unlocked micro switch defective	1. Check and in case replace the micro switch
2. Defective input 1.18	2. Replace the pcb 7VI1
3. Door closed sensor defective	3. Check and in case replace the sensor or the magnet in the door
4. Defective input 1.20	4. Replace the pcb 7VI1

Alarm 09 – Loading door microswitch discrepancy – automatic door

The door is in an inadmissible configuration: both microswitch for door open and closed are active

Involved parts:

15SQ18 15SQ19

Causes	*Solutions*
1. Check all the micro switches and the sensors of the doors indicated to see if one is defective or needs to be adjusted	1. Check which sensor is not working correctly and in case replace it
2. Defective input 1.18 and 1.19	2. Replace the pcb 7VI1

Alarm 10 – Unloading door unlocking failure – manual door

The door unload side didn't unlock in the time defined by the parameter set in *Time Data – Page 2 – Maximum time unlocking door opening*

Involved parts:

15SQ40 15SQ42

Causes	*Solutions*
1. Door unlocked micro switch defective	1. Check and in case replace the micro switch
2. Defective input 1.40	2. Replace the pcb 7VI1
3. Door closed sensor defective	3. Check and in case replace the sensor or the magnet in the door
4. Defective input 1.42	4. Replace the pcb 7VI1

Alarm 10 – Unloading door limit switch discrepancy – automatic door

The door is in an inadmissible configuration: both microswitch for door open and closed are active

Involved parts:

18SQ40 18SQ41

Causes	*Solutions*
1. Check all the micro switches and the sensors of the doors indicated to see if one is defective or needs to be adjusted	1. Check which sensor is not working correctly and in case replace it
2. Defective input 1.40 and 1.41	2. Replace the pcb 7VI1

Alarm 11 – No cold water

The cold water filling has not been completed (lack of new water flowmeter pulse for more than the time set in *Time Data – Page 1 – Maximum time for water flowmeter impulses*).

Involved parts:

23YV8 34PC1 28SL23

Causes	*Solutions*
1. Lack of cold water or pressure too low	1. Check the water supply
2. Parameter time too low	2. Increase the time of the parameter
3. Defective cold water solenoid valve	3. Check and in case replace the valve
4. Defective output 2.04	4. Replace the pcb 8VI1
5. Defective cold water flowmeter	5. Replace the flowmeter
6. Defective cold water flowmeter cable	6. Check and in case replace the cable
7. Defective input 2.J1	7. Replace the pcb 8VI1
8. Intervention of the leakage sensor 28SL23	8. Check the leakage and solve the failure

Alarm 12 – No warm water (standard version or with pre-heating tank)

The hot water filling has not been completed (lack of new water flowmeter pulse for more than the time set in *Time Data – Page 1 – Maximum time for water flowmeter impulses*).

Involved parts:

23YV5 34PC2 28SL23

Causes	*Solutions*
1. Lack of hot water or pressure too low	1. Check the water supply
2. Parameter time too low	2. Increase the time of the parameter
3. Defective hot water solenoid valve	3. Check and in case replace the valve
4. Defective output 2.05	4. Replace the pcb 8VI1
5. Defective hot water flowmeter	5. Replace the flowmeter
6. Defective hot water flowmeter cable	6. Check and in case replace the cable
7. Defective input 2.J2	7. Replace the pcb 8VI1
8. Intervention of the leakage sensor 28SL23	8. Check the leakage and solve the failure

Alarm 13 – No demi water (standard version or with pre-heating tank)

The demi water filling has not been completed (lack of new water flowmeter pulse for more than the time set in *Time Data – Page 1 – Maximum time for water flowmeter impulses*).

Involved parts:

23YV6 26YV1 34PC3 28SL23

Causes	*Solutions*
1. Lack of hot water or pressure too low	1. Check the water supply
2. Parameter time too low	2. Increase the time of the parameter
3. Defective hot water solenoid valve	3. Check and in case replace the valve
4. Defective output 2.06	4. Replace the pcb 8VI1
5. Defective hot water flowmeter	5. Replace the flowmeter
6. Defective hot water flowmeter cable	6. Check and in case replace the cable
7. Defective input 2.J3	7. Replace the pcb 8VI1
8. Intervention of the leakage sensor 28SL23	8. Check the leakage and solve the failure

Alarm 17 – Chemical DOS1 lack

The product associated with the dosage unit 1 is finished.
Diagnostics based on (with activated dosing pump):
- level switch closed if time-based dosage;
- no new pulse for more than the time set in *Time Data 1 -> Max time for chemical flowmeters impulses* if dosage by flowmeter.

Involved parts:

27SL18 22PC1 25M12

Causes	*Solutions*
1. Lack of chemical in the tank	1. Replace the chemical tank
2. Defective chemical probe level switch (only if time dosage)	2. Check and in case replace the probe
3. Defective input 2.18 (only if time dosage)	3. Replace the pcb 8VI1
4. Defective chemical flowmeter (only if pulse dosage)	4. Check and in case replace the flowmeter
5. Defective chemical flowmeter cable (only if pulse dosage)	5. Check and in case replace the cable
6. Defective input 1.J1 (only if pulse dosage)	6. Replace the pcb 7VI1
7. Defective dosing pump (only if pulse dosage)	7. Check and in case replace the dosing pump
8. Defective output 2.12 (only if pulse dosage)	8. Replace the pcb 8VI1

Alarm 18 – Chemical DOS2 lack

The product associated with the dosage unit 2 is finished.
Diagnostics based on (with activated dosing pump):
- level switch closed if time-based dosage;
- no new pulse for more than the time set in *Time Data 1 -> Max time for chemical flowmeters impulses* if dosage by flowmeter.

Involved parts:

22PC2 25M13 27SL19

Causes	*Solutions*
1. Lack of chemical in the tank	1. Replace the chemical tank
2. Defective chemical probe level switch (only if time dosage)	2. Check and in case replace the probe
3. Defective input 2.19 (only if time dosage)	3. Replace the pcb 8VI1
4. Defective chemical flowmeter (only if pulse dosage)	4. Check and in case replace the flowmeter
5. Defective chemical flowmeter cable (only if pulse dosage)	5. Check and in case replace the cable
6. Defective input 1.J2 (only if pulse dosage)	6. Replace the pcb 7VI1

7.	Defective dosing pump (only if pulse dosage)	7.	Check and in case replace the dosing pump
8.	Defective output 2.13 (only if pulse dosage)	8.	Replace the pcb 8VI1

Alarm 19 – Chemical DOS3 lack

The product associated with the dosage unit 3 is finished.
Diagnostics based on (with activated dosing pump):
- level switch closed if time-based dosage;
- no new pulse for more than the time set in *Time Data 1 -> Max time for chemical flowmeters impulses* if dosage by flowmeter.

Involved parts:

22PC3 25M14 27SL20

	Causes		*Solutions*
1.	Lack of chemical in the tank	1.	Replace the chemical tank
2.	Defective chemical probe level switch (only if time dosage)	2.	Check and in case replace the probe
3.	Defective input 2.20 (only if time dosage)	3.	Replace the pcb 8VI1
4.	Defective chemical flowmeter (only if pulse dosage)	4.	Check and in case replace the flowmeter
5.	Defective chemical flowmeter cable (only if pulse dosage)	5.	Check and in case replace the cable
6.	Defective input 1.J3 (only if pulse dosage)	6.	Replace the pcb 7VI1
7.	Defective dosing pump (only if pulse dosage)	7.	Check and in case replace the dosing pump
8.	Defective output 2.14 (only if pulse dosage)	8.	Replace the pcb 8VI1

Alarm 20 – Chemical DOS4 lack

The product associated with the dosage unit 3 is finished.
Diagnostics based on (with activated dosing pump):
- level switch closed if time-based dosage;
- no new pulse for more than the time set in *Time Data 1 -> Max time for chemical flowmeters impulses* if dosage by flowmeter.

Involved parts:

22PC4 25M15 28SL21

	Causes		*Solutions*
1.	Lack of chemical in the tank	1.	Replace the chemical tank
2.	Defective chemical probe level switch (only if time dosage)	2.	Check and in case replace the probe
3.	Defective input 2.21 (only if time dosage)	3.	Replace the pcb 8VI1
4.	Defective chemical flowmeter (only if pulse dosage)	4.	Check and in case replace the flowmeter
5.	Defective chemical flowmeter cable (only if pulse dosage)	5.	Check and in case replace the cable
6.	Defective input 1.J4 (only if pulse dosage)	6.	Replace the pcb 7VI1
7.	Defective dosing pump (only if pulse dosage)	7.	Check and in case replace the dosing pump
8.	Defective output 2.15 (only if pulse dosage)	8.	Replace the pcb 8VI1

Alarm 23 – Drain failure

It triggers after a time limit that the drain solenoid valve is open if the chamber level is still active (wash tank not emptied); the timeout refers to:
a) parameter *Time data 1 -> Max drain time* for drainage without water input (rinsing);
b) parameter *Time data 1 -> Max drain time with rinsing* for drainage accompanied by water input (rinsing).

Involved parts:

15SL17 24YV11 28KA1 3M4 3FU3 26KA1

	Causes		*Solutions*
1.	Drain pipe clogged or bent	1.	Check the drain pipe
2.	Defective drain valve	2.	Replace the drain valve
3.	Defective output 2.10	3.	Replace the pcb 8VI1
4.	Defective chamber level switch	4.	Replace the level switch
5.	Defective input 1.17	5.	Replace the pcb 7VI1
	Only if the drain pump is present:		Only if the drain pump is present:
6.	Defective drain pump	6.	Check and in case replace the drain pump
7.	Drain pump fuse blown	7.	Replace the fuse
8.	Drain pump relay defective	8.	Replace the relay
9.	Defective output 2.OC1	9.	Replace the pcb 8VI1

Alarm 24 – Fan failure

The status of the pressure switch of the blower is contradictory to the status of the blower (closed with blower OFF and vice versa)
The air filter is obstructed

Involved parts:

27SP17 3M2 3FU2

	Causes		*Solutions*
1.	Defective pressure switch	1.	Replace the pressure switch
2.	Defective input 2.17	2.	Replace the pcb 8VI1
3.	Defective blower	3.	Replace the blower
4.	Blower fuse blown	4.	Replace the fuse
5.	Defective output 2.AN0	5.	Replace the pcb 8VI1
6.	Speed blower parameter not set correctly	6.	Check and set the parameter correctly
7.	Air filter clogged	7.	Check and in case replace the air filter

Alarm 25 – Minimum drying temperature not reached

The air temperature in the chamber during drying with electric heating has never reached the minimum threshold defined in parameter *Various Data 1 – Min Drying temperature*

Involved parts:

13KM14 4EH4-6

	Causes		*Solutions*
1.	Drying temperature set in the cycle is below the minimum temperature set by the parameter	1.	Check the temperature set in the cycle and the value of the parameter, and correct the wrong one
2.	Defective dryer heating element	2.	Check and in case replace the heating element
3.	Defective dryer heating element contactor	3.	Replace the defective contactor
4.	Defective output 1.14	4.	Replace the pcb 7VI1

Alarm 26 – Prewash temperature too high

The chamber temperature is above the maximum limit *Various Data 1 – Max temperature prewash* during the prewash phase.

Involved parts:

19BT1

Causes	*Solutions*
1. The minimum prewash temperature parameter is set too low	1. Check and correct the parameter
2. Filling water temperature is too high	2. Check the temperature of the water
3. Defective chamber control temperature probe	3. Replace the temperature probe
4. Defective analog input on the pcb 7VI1	4. Replace the pcb 7VI1

Alarm 27 – Chamber temperature too high

The temperature in the chamber exceeds the limit 102°C (operating limit to protect against overheating).

Involved parts:

13KM15 19BT1

Causes	*Solutions*
1. Chamber heating elements contactor jammed	1. Replace the contactor
2. Defective output 1.15	2. Replace the pcb 7VI1
3. Defective chamber control temperature probe	3. Replace the temperature probe
4. Defective analog input on the pcb 7VI1	4. Replace the pcb 7VI1

Alarm 28 – Drying temperature too high

The drying temperature exceeds the limit 162°C (operating limit to protect against overheating).

Involved parts:

13KM14 32BT1

Causes	*Solutions*
1. Dryer heating elements contactor jammed	1. Replace the contactor
2. Defective output 1.14	2. Replace the pcb 7VI1
3. Defective dryer temperature probe	3. Replace the temperature probe
4. Defective analog input on the pcb 8VI1	4. Replace the pcb 8VI1

Alarm 29 – Tank 1 temperature too high

In the configuration with tank 1 present, the temperature in tank 1 exceeds the limit 100°C (operating limit to protect against overheating).

Involved parts:

12KM7 20BT1

Causes	*Solutions*
1. Tank heating elements contactor jammed	1. Replace the contactor
2. Defective output 1.07	2. Replace the pcb 7VI1
3. Defective tank temperature probe	3. Replace the temperature probe
4. Defective analog input on the pcb 7VI1	4. Replace the pcb 7VI1

Alarm 30 – Chamber probe 1 failure

Fault in chamber temperature probe 1 (control probe)

Involved parts:

19BT1

Causes	*Solutions*
1. Defective chamber control temperature probe	1. Replace the temperature probe
2. Defective analog input on the pcb 7VI1	2. Replace the pcb 7VI1

Alarm 31 – Chamber probe 2 failure

Fault in chamber temperature probe 2 (record probe)

Involved parts:

31BT1

	Causes		*Solutions*
1.	Defective chamber record temperature probe	1.	Replace the temperature probe
2.	Defective analog input on the pcb 8VI1	2.	Replace the pcb 8VI1

Alarm 32 – Drying probe failure

Fault in air temperature probe (drying probe).

Involved parts:

32BT1

	Causes		*Solutions*
1.	Defective dryer temperature probe	1.	Replace the temperature probe
2.	Defective analog input on the pcb 8VI1	2.	Replace the pcb 8VI1

Alarm 33 – Tank 1 probe failure

Temperature probe fault in tank 1.

Involved parts:

20BT1

	Causes		*Solutions*
1.	Defective tank temperature probe	1.	Replace the temperature probe
2.	Defective analog input on the pcb 7VI1	2.	Replace the pcb 7VI1

Alarm 34 – Chamb. Probes temperature discrepancy

There is an excessive difference between the control and record probes of the chamber.
Only during the treatment phase and if all the following conditions are satisfied:
a) the chamber temperature is greater than the limit set by the parameter in *Various Data 1 -> Temperature for probe discrepancy check*
b) the chamber probe 2 differs from probe 1 by an absolute value greater than the maximum limit set by the parameter in *Various Data 1 -> Max probe discrepancy*

Involved parts:

19BT1 31BT1

	Causes		*Solutions*
1.	Parameters not set correctly	1.	Check and correct the parameters
2.	Control or record probe defective	2.	Check which probe is defective and replace it
3.	Control or record probe not calibrated correctly	3.	Do a calibration of the chamber probes
4.	Analog input on pcb 7VI1 or 8VI1 defective	4.	Replace the defective pcb

Alarm 36 – Unloading side panel not connected

Lack of communication with the keyboard on the unloading door side (on Can Bus serial)

Involved parts:

8VI1 8VI7

	Causes		*Solutions*
1.	Communication cable disconnected or defective	1.	Check and in case replace the cable
2.	Defective pcb 8VI1	2.	Replace the pcb 8VI1
3.	Defectibe display board 8VI7	3.	Replace the display board 8VI7

Alarm 37 – CAN Serial connection failure

Lack of communication on the serial (Can Bus) that connects the master keyboard with the slave base boards.

Involved parts:

7VI1 8VI1 9VI1 7A1 8VI7

Causes	*Solutions*
1. Disconnected, wrongly connected or defective CAN BUS cable	1. Check the cable and in case replace it
2. One of the pc boards connected through the CAB BUS cable is defective	2. Check which pc board is defective and replace it
3. Wrong parameters setting. One of the parameters that enable a device connected to a pc board not present is enabled.	3. Check the parameters and set the correctly

Alarm 39 – No Chamber heating

During the electrical heating of the chamber the temperature increased by less than 1°C during the time set in *Time Data 1 -> Maximum time to heat 1°C on chamber*

Involved parts:

4EH1-3 13KM15 19BT1 4QF1 11KM4

Causes	*Solutions*
1. Defective heating elements	1. Replace the heating elements
2. Defective heating elements contactor	2. Replace the contactor
3. Defective output 1.15	3. Replace the pcb 7VI1
4. Defective magneto thermic switch 4QF1	4. Replace the magneto thermic switch
5. Defective contactor 11KM4	5. Replace the contactor
6. Defective chamber control temperature probe	6. Replace the temperature probe
7. Defective analog input on 7VI1 for the temperature probe	7. Replace the pcb 7VI1

Alarm 40 – No tank 2 heating

During the electrical heating of tank 2, the temperature of tank 2 increased by less than 1°C during the time set in *Time Data 1 -> Maximum time to heat 1°C on tank*

Involved parts:

4EH10-12 12KM8 21BT1 4QF1 11KM4

Causes	*Solutions*
1. Defective heating elements	1. Replace the heating elements
2. Defective heating elements contactor	2. Replace the contactor
3. Defective output 1.08	3. Replace the pcb 7VI1
4. Defective magneto thermic switch 4QF1	4. Replace the magneto thermic switch
5. Defective contactor 11KM4	5. Replace the contactor
6. Defective tank 2 control temperature probe	6. Replace the temperature probe
7. Defective analog input on 7VI1 for the temperature probe	7. Replace the pcb 7VI1

Alarm 41 – No tank 1 heating

During the electrical heating of tank 1, the temperature of tank 1 increased by less than 1°C during the time set in *Time Data 1 -> Maximum time to heat 1°C on tank*

Involved parts:

4EH7-9 12KM7 20BT1 4QF1 11KM4

Causes	*Solutions*
8. Defective heating elements	8. Replace the heating elements
9. Defective heating elements contactor	9. Replace the contactor
10. Defective output 1.07	10. Replace the pcb 7VI1
11. Defective magneto thermic switch 4QF1	11. Replace the magneto thermic switch
12. Defective contactor 11KM4	12. Replace the contactor
13. Defective tank 1 control temperature probe	13. Replace the temperature probe

14. Defective analog input on 7VI1 for the temperature probe	14. Replace the pcb 7VI1

Alarm 42 – Thermal protection intervention

The thermal safety input is disabled with the safety contactor command on, or is active when the safety contactor command is off

Involved parts:

11KM4 11ST2 11ST3 11ST3A 11ST4 11ST5

Causes	*Solutions*
1. Defective safety contactor 11KM4	1. Replace the contactor
2. One of the thermal safeties is open	2. Check and in case replace the thermal safety
3. Defective output 1.04	3. Replace the pcb 7VI1
4. Defective input 1.22	4. Replace the pcb 7VI1

Alarm 46 – Washing pump pressure switch failure

The pressure switch of the washing pump is disabled with the pump command on, or is active with the pump command off

Involved parts:

16SP23 3M3 3AV1 24YV11

Causes	*Solutions*
1. Water quantity in the chamber not sufficient	1. Check the water quantity in the chamber, in case do a calibration of the water flowmeter
2. Drain valve leaking	2. Check and in case replace the drain valve
3. Defective pump pressure switch	3. Replace the pressure switch
4. Washing pump wrongly connected or defective	4. Check the connection of the washing pump (phase sequence) and in case replace the pump
5. Defective inverter pc board 3AV1	5. Replace the invert pcb
6. Speed parameters for the inverter board not correct	6. Check and correct the parameters into the cycle recipe
7. Defective main board 7VI1 (no output for the speed reference of the inverter)	7. Replace the main board 7VI1

Alarm 47 – Chemical flowmeter 1 failure

The flowmeter for the chemical 1 counts a number of impulses over the limit set in *Various Data 2 -> Exceeding impulses for chemical flowmeter if pump off*, with the dosing pump command off.

Involved parts:

7VI1 8VI1

Causes	*Solutions*
1. Defective dosing pump output 2.12	1. Replace the pcb 8VI1
2. Defective input 1.J1	2. Defective pcb 7V1

Alarm 48 – Chemical flowmeter 2 failure

The flowmeter for the chemical 2 counts a number of impulses over the limit set in *Various Data 2 -> Exceeding impulses for chemical flowmeter if pump off*, with the dosing pump command off.

Involved parts:

7VI1 8VI1

Causes	*Solutions*
1. Defective dosing pump output 2.13	1. Replace the pcb 8VI1
2. Defective input 1.J2	2. Defective pcb 7V1

Alarm 49 – Chemical flowmeter 3 failure

The flowmeter for the chemical 3 counts a number of impulses over the limit set in *Various Data 2 -> Exceeding impulses for chemical flowmeter if pump off*, with the dosing pump command off.

Involved parts:

7VI1 8VI1

Causes	*Solutions*
1. Defective dosing pump output 2.14	1. Replace the pcb 8VI1
2. Defective input 1.J3	2. Defective pcb 7V1

Alarm 50 – Chemical flowmeter 4 failure

The flowmeter for the chemical 4 counts a number of impulses over the limit set in *Various Data 2 -> Exceeding impulses for chemical flowmeter if pump off*, with the dosing pump command off.

Involved parts:

7VI1 8VI1

Causes	*Solutions*
1. Defective dosing pump output 2.15	1. Replace the pcb 8VI1
2. Defective input 1.J4	2. Defective pcb 7V1

Alarm 51 – Cold water flowmeter failure

The flowmeter for the cold water counts a number of impulses above the limit set in *Various Data 2 -> Exceeding impulses for water flowmeter if valve off*, with the water solenoid valve command closed.

Involved parts:

8VI1 34PC1

Causes	*Solutions*
1. Defective water valve output 2.04	1. Replace the pcb 8VI1
2. Defective water flowmeter input 2.J1	2. Replace the pcb 8VI1
3. Defective flowmeter	3. Replace the flowmeter

Alarm 52 – Warm water flowmeter failure

The flowmeter for the hot water counts a number of impulses above the limit set in *Various Data 2 -> Exceeding impulses for water flowmeter if valve off*, with the water solenoid valve command closed.

Involved parts:

8VI1 34PC2

Causes	*Solutions*
1. Defective water valve output 2.05	1. Replace the pcb 8VI1
2. Defective water flowmeter input 2.J2	2. Replace the pcb 8VI1
3. Defective flowmeter	3. Replace the flowmeter

Alarm 53 – Demi water flowmeter failure

The flowmeter for the demi water counts a number of impulses above the limit set in *Various Data 2 -> Exceeding impulses for water flowmeter if valve off*, with the water solenoid valve command closed.

Involved parts:

8VI1 34PC3

Causes	*Solutions*
1. Defective water valve output 2.06	1. Replace the pcb 8VI1
2. Defective water flowmeter input 2.J3	2. Replace the pcb 8VI1
3. Defective flowmeter	3. Replace the flowmeter

Alarm 54 – Hepa filter obstructed

The alarm is bypassed by default setting high the input 2.22

Involved parts:

8VI2 27SL17

Causes	*Solutions*
1. Filter obstructed – need to be replaced	1. Replace Heap filter
2. Input 2.17 disconnected or defective	2. Check the input and in case replace the pcb 8VI1
3. Drying pressure switch defective	3. Replace drying pressure switch

Alarm 55 – Conductimeter failure

Electrical conductivity sensor error (Ex, with x = 1,..., 6)
- E1: generic error
- E2: measurement above the maximum limit
- E3: measurement below the minimum limit
- E4: sensor in short circuit
- E5: calibration error
- E6: communication error (on the MieleBus serial)
- E7: maximum reset time
- E8: conductimeter status discrepancy
- E9: Miele bus plug-in not present

Involved parts:

8VI4 8AP18VI3

Causes	*Solutions*
1. Conductivity sensor defective or disconnected	1. Check and in case replace the sensor
2. Defective board 8VI4	2. Replace the pcb 8VI4
3. Defective board 8VI3	3. Replace the pcb 8VI3
4. Wrong wiring or defective wiring	4. Check wires and connectors

Alarm 56 – Conductivity too high

The conductivity value exceeds maximum threshold set as phase parameter

Involved parts:

8AP1

Causes	*Solutions*
1. Conductivity of the water over the set limit	1. Check the water quality and in case adjust the parameter
2. Conductivity sensor defective	2. Check and in case replace the sensor
3. Calibration to be updated	3. Execute the calibration

Alarm 57 – Washing arm speed too low

The speed of the washing arm x is lower than the limit of the parameter. Ex identify the number of the washing arm that is in failure

Involved parts:

10B1÷10B8

Causes	*Solutions*
1. Water pressure too low	1. Check the load and the cycle settings
2. Foam into the sump	2. Check the quality of the chemical and the application temperature
3. Defective sensor	3. Replace the sensor 10Bx
4. Defective input	4. Replace board 10VI1

Alarm 58 – No chamber heating

During the steam heating of the wash tank (continuous or intermittent steam delivery) the temperature increased by less than 1°C during the time set in Time Data 1 -> Maximum time to heat 1°C on chamber.

Involved parts:

37YV2

Causes	*Solutions*
1. Time parameter not set correctly	1. Check and in case correct the parameter
2. Steam supply not good	2. Check the steam supply line
3. Steam trap blocked	3. Check the steam line drain, in case replace the steam trap
4. Steam valve defective	4. Check and in case replace the valve
5. Steam valve relay defective	5. Check and in case replace the relay
6. Output 3.08	6. Replace the pcb 9VI1
7. Chamber temperature probe 1 defective	7. Replace the probe
8. Analog input where the temperature probe is connected defective	8. Replace the pcb 7VI1

Alarm 59 – No tank 1 heating

During the steam heating of tank 1, the temperature of tank 1 increased by less than 1°C during the time set in Time Data 1 -> Maximum time to heat 1°C on tank

Involved parts:

37YV1

Causes	*Solutions*
1. Lack of steam supply	1. Check the steam line supply
2. Defective steam valve relay	2. Check and in case replace the relay
3. Defective steam valve	3. Check and in case replace the valve
4. Defective output 3.07	4. Replace the pcb 9VI1
5. Defective tank temperature probe	5. Replace the temperature probe
6. Defective analog input where the temperature probe is connected	6. Replace the pcb 7VI1
7. Defective steam trap	7. Check and in case replace the steam trap

Alarm 60 – Failure on thermos-regulation

In the treatment phase, the thermoregulation timeout (equal to 30 min) which began to count the first time the temperature in the wash tank reaches the set point + 0.5°C (with the water supply completed and any gradual chamber cooling concluded) has expired. Notifies an undefined situation of permanence in the phase for the following possible reasons:
- temperature fluctuations above/below the set point due to a structural defect in the flue;
- incorrect chemical input temperature setting (>than thermoregulation set point)

Involved parts:

19BT1

Causes	*Solutions*
1. Wrong parameters in the cycle phase (the dosing temperature of the chemical is above the set point of the phase)	1. Check and correctly set the parameters of the phase
2. Excessive aspiration from the chimney	2. Check the aspiration connected to the chimney if it has been installed as indicated in the installation drawing
3. Defective temperature probe	3. Replace the temperature probe
4. Defective analog input where the temperature probe is connected	4. Replace the pcb 7VI1

Alarm 61 – Washing arm speed too high

The speed of the washing arm x is higher than the limit of the parameter. Ex identify the number of the washing arm that is in failure

Involved parts:

10B1÷10B8

Causes	*Solutions*
1. Water pressure too high	1. Check the cycle settings
2. Defective sensor	2. Replace the sensor 10Bx
3. Defective input	3. Replace board 10VI1

Alarm 67 – Door manually unlocked

The door has been open with the manual procedure when the machine was off

Involved parts:

Causes	*Solutions*
1. Door open during machine was off with manual procedure	1. Follow the procedure to reset the door lock explained on the user manual

Alarm 68 – Emergency intervention

Emergency button activation (the digital input to which it is connected is open).

Involved parts:

16SB1 16SB2 16KA1

Causes	*Solutions*
1. Emergency button engaged	1. Release the emergency button
2. Defective emergency button	2. Replace the emergency button
3. Defective input 1.21	3. Replace the pcb 7VI1

Alarm 69 – Humidity sensor failure

Value measured from the humidity sensor out of range

Involved parts:

22BP5

Causes	*Solutions*
1. Sensor damaged	1. Replace the sensor
2. Defective input 1.J5	2. Replace the board 7VI1

Alarm 70 – Water below tank drain level

After the water filling, the pump cannot be activated because there is no water on the sump cause of the signal coming from the minimum level sensor

Involved parts:

15SL17

Causes	*Solutions*
1. Minimum level switch defective	1. Release the level switch
2. Defective input 1.17	2. Replace the pcb 7VI1

Alarm 74 – Tank 2 temperature too high

In the configuration with tank 2 present, the temperature in tank 2 exceeds the limit 100°C (operating limit to protect against overheating).

Involved parts:

12KM8 21BT1

Causes	*Solutions*
1. Tank heating elements contactor jammed	1. Replace the contactor
2. Defective output 1.08	2. Replace the pcb 7VI1
3. Defective tank temperature probe	3. Replace the temperature probe
4. Defective analog input on the pcb 7VI1	4. Replace the pcb 7VI1

Alarm 75 – Tank 2 probe failure

Temperature probe fault in tank 2.

Involved parts:

21BT1

Causes	*Solutions*
1. Defective tank temperature probe	1. Replace the temperature probe
2. Defective analog input on the pcb 7VI1	2. Replace the pcb 7VI1

Alarm 77 – Tank 2 limit switch failure

It intervenes in one of the following conditions.
- Inconsistency of level switches: in tank 2 the lower max level (N.O.) is open and the upper maximum level (N.C.) is open (Diagnostics generated without any delay).
- Waiting timeout for switching a level switch: in tank 2, the maximum transition time between the lower and upper filling levels (and vice versa) during the supply/drainage of the tank water has elapsed.

Involved parts:

17SL26 17SL27 23YV5 17KA27

Causes	*Solutions*
1. Defective min or max level switch of the tank	1. Check and replace the defective level switch
2. Defective input 1.26 or 1.27	2. Replace the pcb 7VI1
3. Water pressure supply too low, it takes too much time to fill the tank	3. Check the water supply line
4. Defective tank drain valve	4. Check and in case replace the drain valve
	5. Replace the pcb 7VI1
5. Defective output 1.05	6. Replace the relay
6. Defective relay 17KA27	

Alarm 78 – Tank 1 limit switch failure

It intervenes in one of the following conditions.
- Inconsistency of level switches: in tank 1 the lower max level (N.O.) is open and the upper maximum level (N.C.) is open (Diagnostics generated without any delay).
- Waiting timeout for switching a level switch: in tank 1, the maximum transition time between the lower and upper filling levels (and vice versa) during the supply/drainage of the tank water has elapsed.

Involved parts:

16SL24 17SL25 11YV5 17KA25

Causes	*Solutions*
7. Defective min or max level switch of the tank	7. Check and replace the defective level switch
8. Defective input 1.24 or 1.25	8. Replace the pcb 7VI1
9. Water pressure supply too low, it takes too much time to fill the tank	9. Check the water supply line
10. Defective tank drain valve	10. Check and in case replace the drain valve
11. Defective output 1.05	11. Replace the pcb 7VI1
12. Defective relay 17KA25	12. Replace the relay

Alarm 83 – No tank 2 heating

During the steam heating of tank 2, the temperature of tank 2 increased by less than 1°C during the time set in Time Data 1 -> Maximum time to heat 1°C on tank

Involved parts:

37YV3

Causes	*Solutions*
1. Lack of steam supply	1. Check the steam line supply
2. Defective steam valve relay	2. Check and in case replace the relay
3. Defective steam valve	3. Check and in case replace the valve
4. Defective output 3.09	4. Replace the pcb 9VI1
5. Defective tank temperature probe	5. Replace the temperature probe
6. Defective analog input where the temperature probe is connected	6. Replace the pcb 7VI1
7. Defective steam trap	7. Check and in case replace the steam trap

Alarm 85 – No cold demi water

The type 4 water chamber supply has not been completed (lack of new water flowmeter pulse for more than the time set in *Time Data 1 -> Max time for water flowmeters impulses*).

Involved parts:

26YV1 26KA2 34PC4 28SL23

Causes	*Solutions*
1. Lack of water or pressure too low	1. Check the water supply
2. Parameter time too low	2. Increase the time of the parameter
3. Defective water 4 solenoid valve	3. Check and in case replace the valve
4. Defective valve relay 26KA2	4. Check and in case replace the relay
5. Defective output 2.OC2	5. Replace the pcb 8VI1
6. Defective water 4 flowmeter	6. Replace the flowmeter
7. Defective cold water flowmeter cable	7. Check and in case replace the cable
8. Defective input 2.J4	8. Replace the pcb 8VI1
9. Intervention of the leakage sensor 28SL23	9. Solve the leakage

Alarm 86 – Cold demi water flowmeter failure

The flowmeter for the type 4 water signals surplus pulses above the limit *Various Data 2 -> Exceeding impulses for water flowmeter if valve off*, with the water solenoid valve command closed.

Involved parts:

26KA1 34PC4

Causes	*Solutions*
1. Defective valve relay 26KA1	1. Check and in case replace the relay
2. Defective output 2.OC2	2. Replace the pcb 8VI1
3. Defective input 2.J4	3. Replace the pcb 8VI1
4. Defective flowmeter	4. Replace flowmeter

Alarm 91 – DOS1 dosing failure

In the chemical dosage configuration with time control and flowmeter redundancy, in the dosage of the chemical product from dosage unit 1 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in Various data 1 -> Max chemical dosage discrepancy

Involved parts:

22PC1 25M12

Causes	*Solutions*
1. Chemical flowmeter defective	1. Replace the defective flowmeter
2. Defective input 1.J1	2. Replace the pcb 7VI1

3. Time dosing not calibrated correctly	3. Check and calibration and carry it out again if needed
4. Defective dosing pump	4. Check and in case replace the dosing pump
5. Defective output 2.12	5. Replace the pcb 8VI1

Alarm 92 – DOS2 dosing failure

In the chemical dosage configuration with time control and flowmeter redundancy, in the dosage of the chemical product from dosage unit 2 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in Various data 1 -> Max chemical dosage discrepancy

Involved parts:

22PC2 25M13

Causes	*Solutions*
1. Chemical flowmeter defective	1. Replace the defective flowmeter
2. Defective input 1.J2	2. Replace the pcb 7VI1
3. Time dosing not calibrated correctly	3. Check and calibration and carry it out again if needed
4. Defective dosing pump	4. Check and in case replace the dosing pump
5. Defective output 2.13	5. Replace the pcb 8VI1

Alarm 93 – DOS3 dosing failure

In the chemical dosage configuration with time control and flowmeter redundancy, in the dosage of the chemical product from dosage unit 3 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in Various data 1 -> Max chemical dosage discrepancy

Involved parts:

22PC3 25M14

Causes	*Solutions*
1. Chemical flowmeter defective	1. Replace the defective flowmeter
2. Defective input 1.J3	2. Replace the pcb 7VI1
3. Time dosing not calibrated correctly	3. Check and calibration and carry it out again if needed
4. Defective dosing pump	4. Check and in case replace the dosing pump
5. Defective output 2.14	5. Replace the pcb 8VI1

Alarm 94 – DOS4 dosing failure

In the chemical dosage configuration with time control and flowmeter redundancy, in the dosage of the chemical product from dosage unit 4 there was a difference in absolute value between the value measured by time and the value measured by the flowmeter greater than the maximum percentage error (with respect to the quantity of chemical programmed) set in Various data 1 -> Max chemical dosage discrepancy

Involved parts:

22PC4 25M15

Causes	*Solutions*
1. Chemical flowmeter defective	1. Replace the defective flowmeter
2. Defective input 1.J4	2. Replace the pcb 7VI1
3. Time dosing not calibrated correctly	3. Check and calibration and carry it out again if needed
4. Defective dosing pump	4. Check and in case replace the dosing pump
5. Defective output 2.15	5. Replace the pcb 8VI1

Alarm 97 – Water leakage

The input of the leakage sensor is still open over the time set from the parameter

Involved parts:

15SL17

Causes	*Solutions*
1. Leakage/presence of water on the basement of the machine	1. Check the reason of the leakage
2. Sensor defective	2. Replace the sensor
3. Defective input 1.17	3. Replace the pcb 7VI1

Alarm 98 – Pump inverter communication failure

The wash pump ECS inverter communication timeout on the RS485 communication serial between the keyboard and the wash pump inverter

Involved parts:

3AV1 3FU1 3KM1 7A1 15KA19

Causes	*Solutions*
1. Defective inverter board	1. Check and in case replace the inverter board
2. Defective keyboard	2. Check and in case replace the keyboard
3. Defective cable between the inverter board and the keyboard	3. Check and in case replace the cable
4. Defective inverter fuse 3FU1	4. Check and replace the fuse
5. Defective inverter contactor 3KM1	5. Check and in case replace the contactor
6. Defective relay 15KA19	6. Replace the relay

Alarm 99 – Pump inverter alarm

The wash pump inverter is in an alarm state. The sub-code "Ex" or "Ax" is displayed: "Ex" indicates the active error code, "Ax" the specific active alarm code for the inverter (see inverter specification), with x number> 0

Involved parts:

3AV1

Causes	*Solutions*
1. Defective inverter board	1. Check and in case replace the inverter board

Alarm 100 – Inverter operation anomaly

Diagnostics active if machine equipped with pump inverter
Detected an anomaly on the status of the inverter

Involved parts:

3AV1 7A1

Causes	*Solutions*
1. Defective inverter board	1. Check the inverter 3AV1
2. Defective output from the display	2. Replace the pcb 7A1
3. Defective wiring	3. Check the correct wiring of the inverter

Alarm 101 – Timeout PP valve ON (Medical)

Diagnostics active if Power Pulse configured (Time Data 5 -> Timeout PP piston)
The piston forward valve has been active for longer than the maximum allowed time

Involved parts:

35YV5 38SQ18

Causes	*Solutions*
4. Defective piston forward valve	4. Check and in case replace the valve

5.	Defective output 3.05	5.	Replace the pcb 9VI1
6.	Defective piston forward sensor	6.	Check and in case replace the sensor
7.	Defective input 3.17	7.	Replace the pcb 9VI1

Alarm 102 – Timeout PP valve ON (Medical)

Diagnostics active if Power Pulse configured (Time Data 5 -> Timeout PP piston)
The piston reverse valve has been active for longer than the maximum allowed time

Involved parts:

35YV6 38SQ17

	Causes		*Solutions*
1.	Defective piston backward valve	1.	Check and in case replace the valve
2.	Defective output 3.06	2.	Replace the pcb 9VI1
3.	Defective piston forward sensor	3.	Check and in case replace the sensor
4.	Defective input 3.17	4.	Replace the pcb 9VI1

Alarm 103 – Piston failure during cycle PP (Medical)

Diagnostics active if Power Pulse configured (Time Data 5 -> Timeout PP piston) During the cycle enabled with the Power Pulse the forward limit switch of the piston has become disabled (piston displaced or limit switch faulty)

Involved parts:

35YV5 38SQ18

	Causes		*Solutions*
1.	Defective piston forward valve	1.	Check and in case replace the valve
2.	Defective output 3.05	2.	Replace the pcb 9VI1
3.	Defective piston forward sensor	3.	Check and in case replace the sensor
		4.	Replace the pcb 9VI1
4.	Defective input 3.18		

Alarm 104 – Limit switch discrepancy PP (Medical)

Diagnostics active if Power Pulse configured (Time Data 5 -> Timeout PP piston)
The piston forward and reverse limit switches are both active.

Involved parts:

38SQ17 38SQ18

	Causes		*Solutions*
1.	Defective piston forward or backward sensor	1.	Check which one is defective and replace it
2.	Defective input 3.17	2.	Replace the pcb 9VI1
3.	Defective input 3.18	3.	Replace the pcb 9VI1

Alarm 105 – Compressed air lack PP (Medical)

Diagnostics active if Power Pulse configured (Time Data 5 -> Timeout PP piston)
With the compressed air valve command open, the air pressure switch is disabled

Involved parts:

38BP19 35YV4

	Causes		*Solutions*
1.	Defective pressure switch	1.	Check and in case replace the pressure switch
2.	Defective input 3.19	2.	Replace the pcb 9VI1
3.	Defective compressed air valve	3.	Check and in case replace the valve
4.	Defective output 3.04	4.	Replace the pcb 9VI1

Alarm 106 – Compressed air too high PP (Medical)

Diagnostics active if Power Pulse configured (Time Data 5 -> Timeout PP piston) With the compressed air valve command open, the air pressure switch is disabled

Involved parts:

38BP19 35YV4

Causes	*Solutions*
1. Defective pressure switch	1. Check and in case replace the pressure switch
2. Defective input 3.19	2. Replace the pcb 9VI1
3. Defective compressed air valve	3. Check and in case replace the valve
4. Defective output 3.04	4. Replace the pcb 9VI1

Alarm 107 – Water leak in tank 1

With tank 1 drain valve closed a refill for the tank is necessary. This refill time exceed the maximum refill time set by parameter.

Involved parts:

11YV5

Causes	*Solutions*
1. Defective drain valve	1. Check and in case replace the valve
2. Defective output 1.05	2. Replace the pcb 7VI1
3. Defective input 1.24 or 1.25	3. Replace the pcb 7VI1

Alarm 108 – Water leak in tank 2

With tank 2 drain valve closed a refill for the tank is necessary. This refill time exceed the maximum refill time set by parameter.

Involved parts:

11YV6

Causes	*Solutions*
4. Defective drain valve	4. Check and in case replace the valve
5. Defective output 1.06	5. Replace the pcb 7VI1
6. Defective input 1.26 or 1.27	6. Replace the pcb 7VI1

Alarm 110 – Power pulse transducer failure

Failure on the reading of the transducer. Value over the limits

Involved parts:

40BP5

Causes	*Solutions*
1. Defective pressure transducer	1. Check and in case replace the pressure transducer
2. Defective input 3.J5	2. Replace the pcb 9VI1

Alarm 111 – Washing arms sensor – communication problems

The serial communication of the washing arms data is on failure:

- E1: failure on RS485 with the washing arms board
- E2: CAN connection failure with main board

Involved parts:

Causes	*Solutions*
1. Defective board 10VI1	1. Replace the pcb
2. Defective wiring	2. Check the connections between the boards

12. CONNECTIVITY

12.1 USB

On the loading and unloading (2 door machine version) side, next to the control panel, a USB port is present that allows to:

- program the machine
- backup the machine data
- save historical data
- save cycles data during execution instead of a printer

12.1.1 USB key requirements

The USB key needs to be formatted in FAT format.
The capacity of the USB key must be at maximum 32 GB.

Only for SELV connections to external devices compliant with IEC 60950-1 or IEC 62368

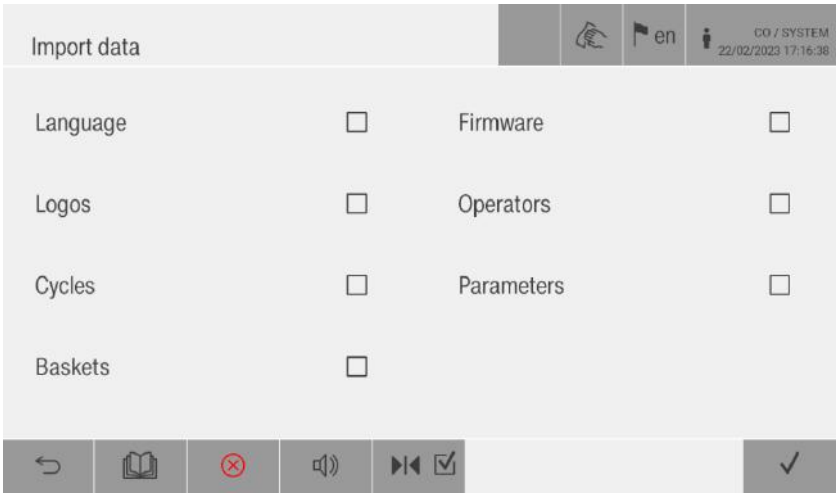
12.1.2 Update of the firmware

Using the USB key it is possible to update the firmware of the display and the following parts:

- Language
- Start-up logo
- Operator list
- Cycles
- Parameters
- Baskets archives

To program the machine, it is sufficient to switch ON the machine, log in, insert the USB key and follow this procedure:

1. Enter SYSTEM menu
2. Enter UTILITY menu
3. Enter SPECIAL FUNCTION menu
4. Enter RECOVERY SYSTEM menu to import data according to the selection

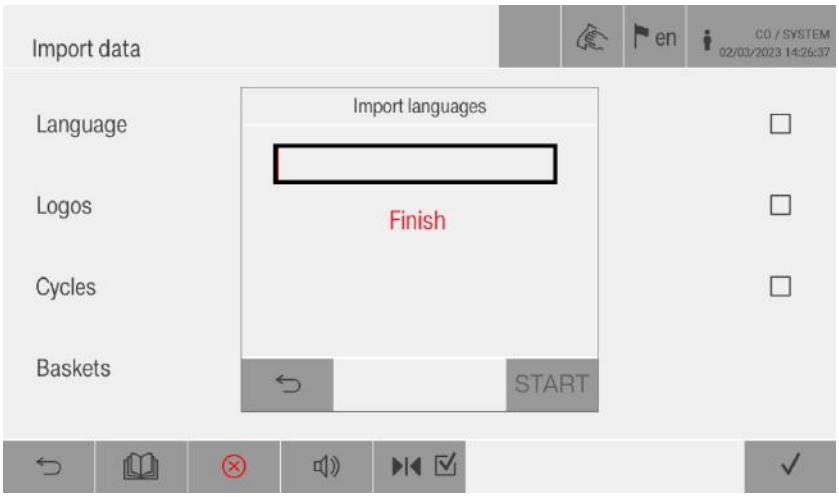


5. Check on the file you want to upload and confirm it with ✓. A “Ready” message will be shown if no problems on USB key are found, and the file is present and correct.

Messages and meanings:

- ***File not found:*** the USB key do not contain the right file for the update
- ***Error no USB:*** the USB key has not been connected or is damaged
- ***Ready:*** Procedure ready to be started
- ***Finish:*** Procedure completed

6. Press START and wait until the procedure is completed and “Finish” appears.



7. Now it is possible to come back to the previous screen pressing the back arrow ⮌

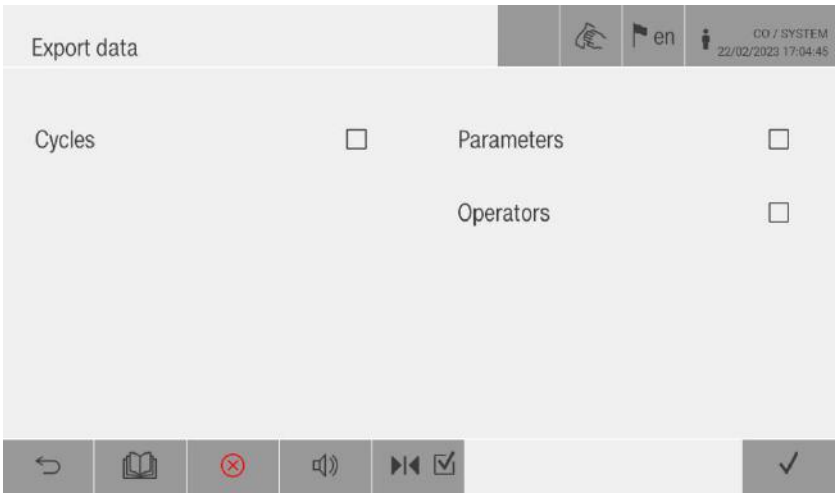
12.1.3 Backup and download of settings

Using the USB key, it is possible to make a backup of the machine, for:

- ► Operator list
- ► Cycles
- ► Parameters

To create a backup of the machine, it is sufficient to switch ON the machine, log in, insert the USB key and follow this procedure:

1. Enter SYSTEM menu
2. Enter UTILITY menu
3. Enter SPECIAL FUNCTION menu
4. Enter SAVE SYSTEM menu to backup data according to the selection



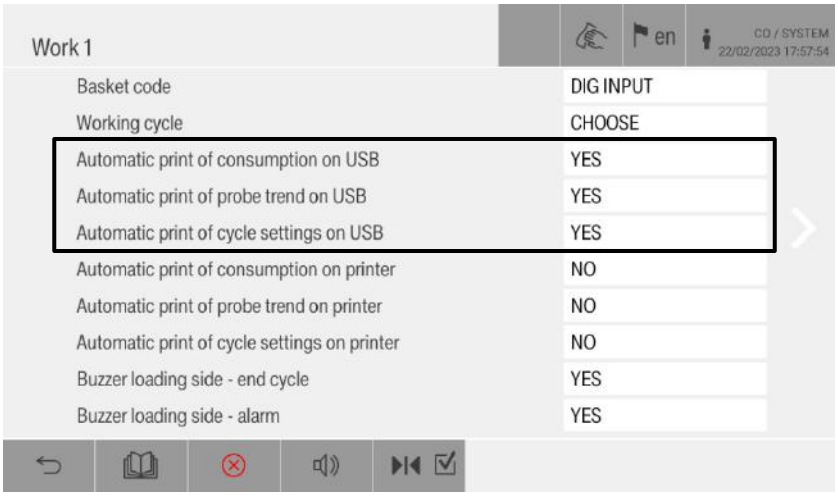
5. Check on the file you want to download and confirm it with ✓. A “Ready” message will be shown if the download can start.

   Messages and meanings:
   - ***Error no USB**:* the USB key has not been connected or is damaged
   - ***Ready**:* Procedure ready to be started
   - ***Finish**:* Procedure completed

6. Press START and wait until the procedure is complete and “Finish” appears.
7. Now it is possible to come back to the previous screen pressing the back arrow ⮌.

12.1.4 Washing cycle print on USB

During a cycle execution it is possible to save the cycle settings, the consumption data, and the probe values, using the USB key.
If the USB key is inserted the following parameters on WORK data (page 1) must be set to YES.



At each program execution, 3 files will be saved:

PRT00157
SET00157
TMP00157

Each of them is saved as a TXT file.

The USB-printout will be executed according to the language selection for the printout.
To select the printout language set the printing language on the SYSTEM – BASIC – PERSONAL DATA menu – Page 2.

PRT00XXX This file includes the data of the cycle execution

```
****************************************
User              :  ST
Model             :  DS 610 G2
Machine           :  21004
Station           :  01
Software          :  VER 586 REV e 0.62
Operator#       0 :  Factory Default
----------------------------------------
 38 EXAMPLE                     # 00279
.......................................
START:            04/08/22     h: 10:43

-> 01: Drain                    h: 10:43
    T1=   29.5 °C  T2= 29.8  °C

-> 02: Prewash                  h: 10:46
    T1=   28.1 °C  T2= 28.4  °C
                   program.   executed
Water1:              18  l     18    l
Conduct.           000.0 <=    0  uS/cm


-> 03: Drain                    h: 10:47
    T1=   28.1 °C  T2= 28.5  °C

-> 04: Wash                     h: 11:02
    T1=   55.2 °C  T2= 55.7  °C
                   program.   executed
Water2:              18  l     18    l
     T>= 55  °C   t=  300 s  t=  300 s
     (T1=  55.5°C) (T2=  56.0 °C)
     A0(1)=     0  A0(2)=     0
Conduct.             0.0 <=     0 uS/cm


-> 05: Drain                    h: 11:03
    T1=   55.0 °C  T2= 55.4  °C

-> 06: Rinse                    h: 11:07
```

Head of the printout contains general data of the machine from the “Machine Data” menu

Name of the program and cycle number

Start time and date

Phase name – End time

Temperature measured in the chamber

Time and temperature set and executed values
A0 value
Conductivity value

```
    T1=   34.2 °C  T2= 34.5  °C
                   program.   executed
Water3               18  l      18    l
     T>=  0  °C   t=  120 s  t=  120 s
     (T1=  37.7°C) (T2=  36.8 °C)
     A0(1)=     0  A0(2)=     0
Conduct.             0.0 <=     0 uS/cm


-> 07: Drain                     h: 11:08
    T1=   34.4 °C  T2= 34.6  °C

-> 08: Wash                      h: 11:25
    T1=   90.8 °C  T2= 91.4  °C
                   program.   executed
Water3                2  l       2    l
Water3               16  l       8    l
     T>= 90  °C   t=  300 s  t=  300 s
     (T1=  90.5°C) (T2=  91.1 °C)
     A0(1)=  4201  A0(2)=  4816
Conduct.             0.0 <=     0 uS/cm


-> 09: Drain                     h: 11:26
    T1=   90.1 °C  T2= 90.8  °C

-> 10: Drying                    h: 11:44
    T1=   41.5 °C  T2= 41.8  °C
    Tmax= 36.3 °C
```

Water and chemical programmed and dosed

```
END CYC.        : OK
```

Cycle result

TMP00XXX This file includes the probe values

```
****************************************
User             :  ST
Model            :  DS 610 G2
Machine          :  21004
Station          :  01
Software         :  VER 586 REV e 0.62
Operator#      0 :  Factory Default
----------------------------------------
 38 EXAMPLE                     # 00279
.......................................
 °C(1):                          Chamber
 °C(2):                    Chamb.control
 °C(3):                           Tank 1
 °C(4):                           Tank 2
 °C(5):                           Drying
Bar  :                          Pressure
uS/cm:                       Conductivity
.......................................
n °  0001    mm:ss 00:00
  °C(1):  29.5     °C(2):  29.8
  °C(3):  31.6     °C(4): ---.-
  °C(5):  29.3    Bar: --.--
  uS/cm: -----.-
```

Head of the printout contains general data of the machine from the “Machine Data” menu

Name of the program and cycle number

Legend of the probe values

Sampling details
Values of all the probes and detail of the sampling time

```
n ° 0002    mm:ss 00:05
  °C(1):  29.5     °C(2):  29.8
  °C(3):  31.6     °C(4): ---.-
  °C(5):  29.3    Bar: --.--
  uS/cm: -----.-
n ° 0003    mm:ss 00:10
  °C(1):  29.5     °C(2):  29.8
  °C(3):  31.6     °C(4): ---.-
  °C(5):  29.3    Bar: --.--
  uS/cm: -----.-

…

n ° 0738    mm:ss 61:24
  °C(1):  41.6     °C(2):  41.9
  °C(3):  86.2     °C(4): ---.-
  °C(5):  36.2    Bar: --.--
  uS/cm: -----.-
n ° 0739    mm:ss 61:29
  °C(1):  41.6     °C(2):  41.9
  °C(3):  86.2     °C(4): ---.-
  °C(5):  36.2    Bar: --.--
  uS/cm: -----.-
n ° 0740    mm:ss 61:34
  °C(1):  41.5     °C(2):  41.9
  °C(3):  86.2     °C(4): ---.-
  °C(5):  36.2    Bar: --.--
  uS/cm: -----.-
```

SET00XXX This file includes the data of the cycle settings

```
****************************************
User              :  ST
Model             :  DS 610 G2
Machine           :  21004
Station           :  01
Software          :  VER 586 REV e 0.62
Operator#       0 :  Factory Default
----------------------------------------
-> 01: Drain                T:    Drain
  Drain type:....................Normal
  Water time:.......................0 s
  Pump time:........................0 s
  Drain cooling:.....................No
```

Head of the printout contains general data of the machine from the “Machine Data” menu

Phase number, name and type

Details of the parameters set for each phase

```
-> 02: Prewash              T:  Prewash
  Water1:..........................Cold
  Water2:............................-
  Chem.1:............................0
```

```
  Chem.2:............................0
  Time:...........................120 s
  % Water 1:........................0 %
  Liters:...........................18 L
  Chem.1:......................0.0 x1000
  Chem.2:......................0.0 x1000
  Conductivity:......................No


-> 03: Drain                T:    Drain
  Drain type:....................Normal
  Water time:.......................0 s
  Pump time:........................0 s
  Drain cooling:.....................No



-> 04: Wash                 T:  Treatm.
  Water1:..........................Warm
  Water2:............................-
  Chem.1:............................0
  Chem.2:............................0
  Chem.1:..........................0 °C
  Chem.2:..........................0 °C
  Temperature:....................55 °C
  Time:...........................300 s
  % Water 1:........................0 %
  Liters:...........................18 L
  Chem.1:....................0.0. x1000
  Chem.2:....................0.0. x1000
  Conductivity:......................No
  A0:...............................   0
  One Shot Rinsing:..................No


-> 05: Drain                T:    Drain
  Drain type:....................Normal
  Water time:.......................0 s
  Pump time:........................0 s
  Drain cooling:.....................No


-> 06: Rinse                T:    Rinse
  Water1:............................4
  Water2:............................-
  Chem.1:............................0
  Chem.2:............................0
  Chem.1:..........................0 °C
  Chem.2:..........................0 °C
  Temperature:....................0 °C
```

```
  Time:.........................120 s
  % Water 1:.......................0 %
  Liters:..........................18 L
  Chem.1:.....................0.0 x1000
  Chem.2:.....................0.0 x1000
  Conductivity:......................No
  A0:.............................   0
  One Shot Rinsing:..................No


-> 07: Drain                T:    Drain
  Drain type:....................Normal
  Water time:......................0 s
  Pump time:.......................0 s
  Drain cooling:....................No


-> 08: Wash                 T:  Treatm.
  Water1:............................4
  Water2:.........................Demi
  Chem.1:............................0
  Chem.2:............................0
  Chem.1:.........................0 °C
  Chem.2:.........................0 °C
  Temperature:....................90 °C
  Time:.........................300 s
  % Water 1:.......................0 %
  Liters:..........................18 L
  Chem.1:....................0.0. x1000
  Chem.2:....................0.0. x1000
  Conductivity:......................No
  A0:.............................   0
  One Shot Rinsing:..................No


-> 09: Drain                T:    Drain
  Drain type:....................Normal
  Water time:......................0 s
  Pump time:.......................0 s
  Drain cooling:....................No


-> 10: Drying               T:   Drying
  High speed time:................900 s
  Low speed time:................180 s
  Steam condenser time:.............0 s
  Temperature:....................0 °C
  Humidity........................0 %
```

12.1.5 Historical data saving on USB

With an USB key it is also possible to save all the historical data for:

- Accesses
- Alarms
- Events
- Maintenance interventions

Considering the memory of the SD card installed, it is possible to store the historical programs for more than 10 years. When the maximum storage capacity is reached the oldest cycle will be deleted and the most recent cycle is saved. (First-in-first-out)

An example is shown below:

Accesses Saved as .csv file

	A	B	C	D	E	F	G
1	Date	Hour	OperatorCode	OperatorName	Operation	Mode	Column1
2	1	1	12	15	TT		
3	06/09/22	14:37	SYSTEM	Factory Default	0	0	
4	06/09/22	09:43	SYSTEM	Factory Default	1	0	
5	06/09/22	09:24	SYSTEM	Factory Default	0	0	
6	05/09/22	17:13	SYSTEM	Factory Default	1	0	
7	05/09/22	14:46	SYSTEM	Factory Default	0	0	
8	05/09/22	12:46	SERVICE	Service Default	1	0	
9	05/09/22	12:43	SERVICE	Service Default	0	0	
10	05/09/22	12:25	OPERATOR	OPERATOR	1	0	
11	05/09/22	09:12	OPERATOR	OPERATOR	0	0	

The file contains all accesses executed. With data and time of access, are saved the following information: operator code, name, type of operation (login = 0 or logout = 1) and mode (keyboard = 0 or barcode reader = 1).

Alarms Saved as .csv file

	A	B	C	D	E	F	G	H	I	J	K
1	Date	Hour	OperatorIndex	Operator	NumberCycle	ProgramName	CycleIndex	PhaseName	PhaseType	IndexAlarm	Alarm
2	07/09/2022	13:33:00	0	Factory Default	289	EXAMPLE	36	Wash	3	17	Chemical DOS1 lack
3	07/09/2022	13:34:00	0	Factory Default	289	EXAMPLE	36		0	17	Chemical DOS1 lack
4	07/09/2022	13:35:00	0	Factory Default	289	EXAMPLE	36	Wash	3	55	Conductivity sensor failure
5	07/09/2022	14:09:00	0	Factory Default	289	EXAMPLE	36	Wash	3	39	No chamber heating

All alarms occurred during a cycle execution can be downloaded. According to data and time, the information saved are the following:

- Operator code (Operator index)
- Operator name
- Progressive number of cycle
- Name and index of the cycle
- Phase number and type
- Alarm code and description

Events Saved as .txt file

```
36 EXAMPLE                          # 00031
.......................................
Operator#    000    Factory Default
-> 253                        T:
START:             20/01/22     h: 16:41

 36 EXAMPLE                          # 00032
```

Number and name of the cycle, and execution date

Operator code and name

```
.....................................
Operator#    000    Factory Default
-> 04: Wash                 T:  Treatm.
  --------- Pow.fail         ---------

 36 EXAMPLE                     # 00032
.....................................
Operator#    000    Factory Default
-> 253                      T:
RESTART:          20/01/22     h: 16:44
```

Event name

Event code

Maintenance intervention Saved as .csv file

OperatorCode	OperatorName	TechName	HoursMan	HoursNextMaint	MaintenanceType	HoursDuration	MinutesDuration	Note
SYSTEM	Factory Default	TECH	103	1103	2	0	20	HEPA FILTER CHANGE
SYSTEM	Factory Default	SA	75	575	1	1	0	PREFILTER CHANGE
SYSTEM	Factory Default	EM	21	1021	2	0	1	HEPA FILTER CHANGE
SYSTEM	Factory Default	TECH	21	521	1	12	15	PREFILTER CHANGE

On the historical file the maintenance intervention executed during the lifetime of the machine are saved. According to data and time, the information saved are the following:

- Operator name logged
- Technician name that executed the maintenance intervention
- Working hour of the machine at the maintenance time
- Next maintenance calculation in hours
- Duration of the intervention

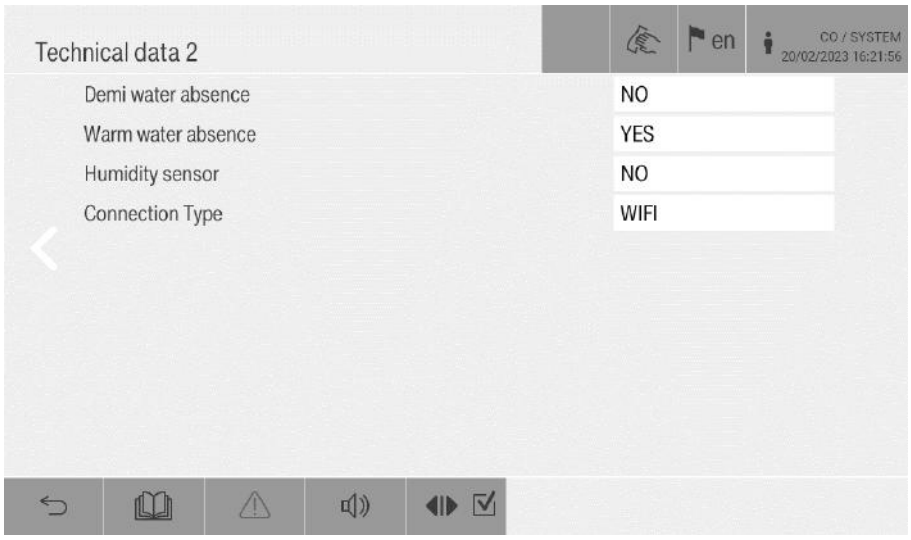
12.2 Network connection

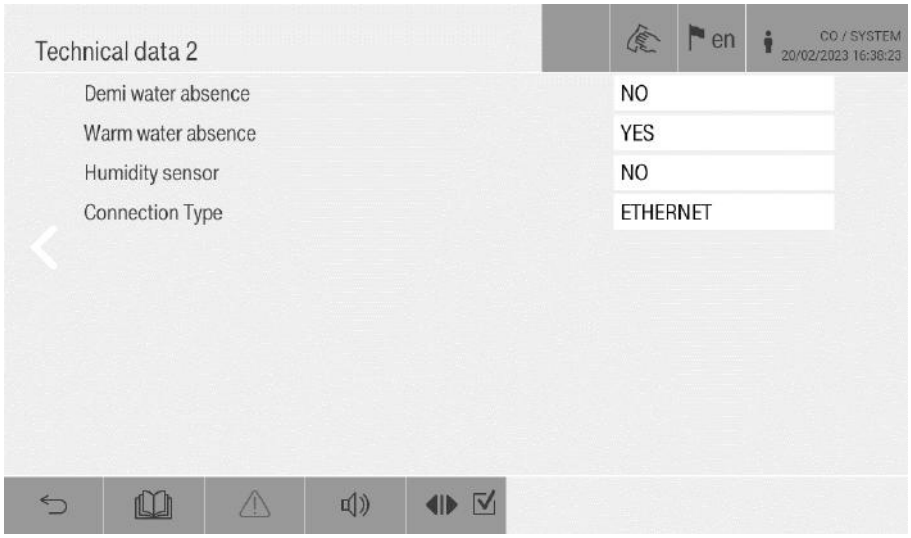
The washer disinfector can be integrated into an internal network via an Ethernet or Wi-Fi interface.

Only the systems required for machine access via a web interface and for the documentation of reprocessing results (e.g., a PC on which the documentation software is installed) may be operated on this network.

1. The machine should be operated only in a separate network segment which meets one of the following requirements:
   – it is physically separated from other network segments
   – access to the segment is restricted by a firewall or a router which has been configured accordingly
2. Limit access to this separate network segment to persons requiring access in the course of their work.
3. Use strong passwords to protect access to systems that are connected to the machine.
4. Configure the Ethernet interface.

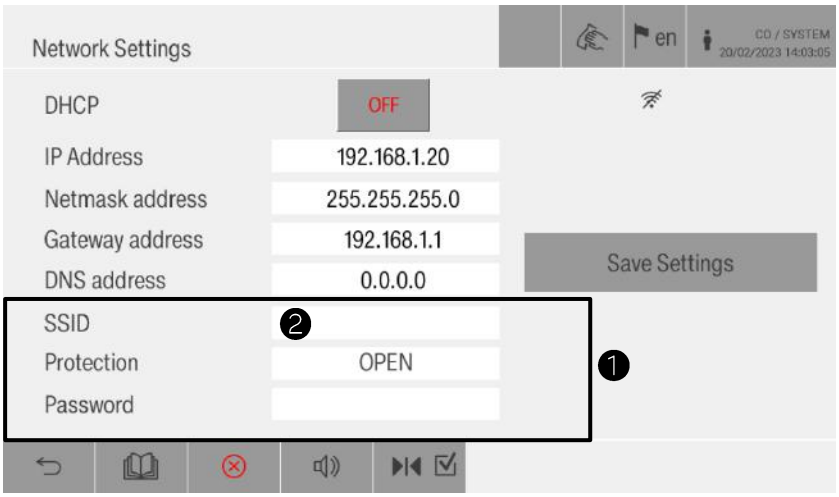
The type of connection can be defined in the SETTINGS menu, under TECHNICAL DATA 2, choosing between Wi-Fi and Ethernet.





The UTILITY menu contains the NETWORK SETTING menu where the IP address or the DHCP function can be set according to the type of connection enabled.
This menu can be accessed with access level 3 or higher.

If the machine is connected using Wi-Fi, the SSID section is also active to connect the machine to an existing network.



- DHCP: setting the DHCP to ON, the address for the internet connection will be set automatically. If set to OFF, it is necessary to manually set all the other parameters below
- IP address – Netmask address – Gateway address – DNS address

After each setting, the SAVE SETTINGS button must be pressed.

If the communication is selected as Wi-Fi connection, the second part of the menu is also visible ·.

To see the Wi-Fi networks available, it is necessary to press the field on the right side of SSID ·. Select the network and insert the related password.
A protection on the network connection can be applied, setting WPA PSK2 instead of OPEN: this setting allows to encrypt the data during the transmission.

Saving all the parameters using the button SAVE SETTINGS, the network will be saved for the next accesses.

When the networking function are activated and the device is connected to the Internet, the device sends the following data to the Cloud
- Device serial number
- Device model and technical features
- Device status
- Information about the software status of the device

Initially, this data cannot be assigned to a specific user and is not saved permanently. Data cannot be saved permanently or assigned to a specific user until the device is linked to a user.
Data transmission and processing are governed by strict security standards.

⚠	**Settings in the machine, e.g., parameters for disinfection or dispensing process chemicals, may be changed as a result of unauthorized access via the network.** **Under no circumstances should it be possible to access the machine via the Internet or other public or unsecured networks, either directly or indirectly (e.g., using port forwarding)!**

12.2.1 Ethernet connection

On the rear part of the control panel, an Ethernet connection port is present. This port allows the connection to the traceability system or to the Cloud.

The connection to these systems using the Ethernet port can be executed only from trained technicians.
The external devices connected need to be compliant with IEC 60950-1 or IEC 62368-1.
The cable used needs to be CAT5 or higher.

This page is accessible from SYSTEM → UTILITY → NETWORK SETTING menu.
On this page it is possible to set the IP address or to set the DHCP setting for the automatic IP address setting.

12.2.2 Wi-Fi connection

The machine is also equipped with a Wi-Fi connection that allows to connect the device to the traceability system or to the Cloud.

The connection to these systems using the Wi-Fi can be executed only from trained technicians.

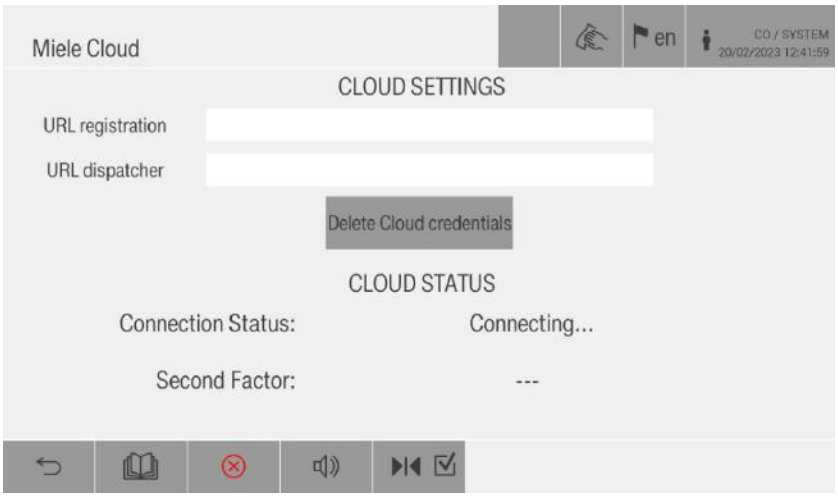
The Wi-Fi connection need to be executed according to 802.11b/g/n.

This page is accessible from SYSTEM → UTILITY → NETWORK SETTING menu.
On this page it is possible to set the IP address or to set the DHCP setting for the automatic IP address setting.

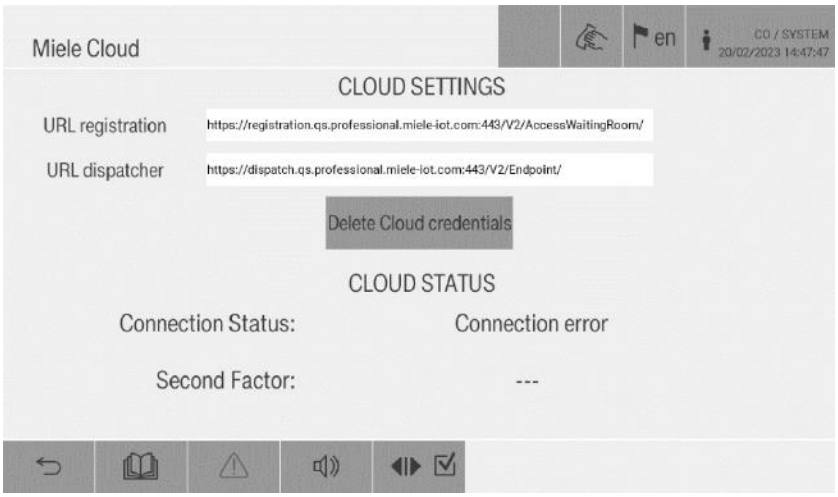
12.3 Miele Cloud

The washer disinfector can be connected to the Cloud.
The settings needed for access are present in the following page in the UTILITY menu.

The connection to the Cloud page is possible with both Wi-Fi and Ethernet connection enabled.



The machine automatically connects to the Cloud when switched on if the machine is connected to a network. The URL registration and URL dispatcher fields are automatically filled.
The technician must run the start-up procedure on the Cloud page to record and identify the machine.



Connection Status:
When the machine tries to access the Cloud, on the Connection State field “Connected to WaitingRoom” is displayed.
As soon as the technician gains access, the machine status will automatically change to “Connecting…” and then “Connected to Miele Prof Cloud”.

The “Second Factor” field will then be filled automatically by the system.

In case of an error, “Connection error” will be displayed.

When the machine is connected to the WiFi network and the connection is lost, the machine is able to reconnect automatically as soon as the connection is restored

12.4 Miele Local Diagnosis

If the machine needs to be connected directly to the diagnostic tool, the technician needs to log in via this page with the Username and Password defined by the manufacturer.

When the data has been entered, the machine connects automatically to the tool.
After the connection has been established, the machine is able to exchange the data and status of the machine, to help the technician during the diagnostic operations.

It is not necessary to set an IP address, because the machine has a unique address dedicated to this specific tool.

13. MAINTENANCE

13.1 General recommendations on maintenance

Maintenance can be divided into routine maintenance and special maintenance.

The operators and 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 operator and 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.

13.1.1 Machine status

The machine must be completely switched off. The person performing the task must ensure that the safety of others in the vicinity is not compromised. The main switch must be in the OFF position.

13.1.2 Safety systems

The machine should only be operated in compliance with valid standards and regulations relating to the use of disinfectants (cf. data sheets for individual products). Rules relating to contact with machine parts potentially contaminated with pathogens also apply. Personal protective gear must be worn.

13.1.3 Procedure

Before making repairs or replacing mechanical parts (e. g. drain pump, heating elements, etc.) in cases where disinfection has not been completed, the disinfection procedure must first be carried out to eliminate any pathogenic residues.

If possible, run a disinfection programme for the wash chamber.
If this is not possible, proceed with the manual disinfection: open the wash chamber door and wipe with a suitable disinfectant. Wipe all internal parts as well as any baskets and their contents.
Leave the disinfectant to act for the required amount of time (see the product data sheet or safety data sheet for the disinfectant in question).

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

13.2 Maintenance reminder

The machine displays the maintenance reminder, with the description of the expired ones, after a specified time or after a specified number of operating hours. This warning does not affect the normal use of the machine. The warning remain active until the maintenance intervention is executed.

Needed maintenance must be provided in the shortest time possible.

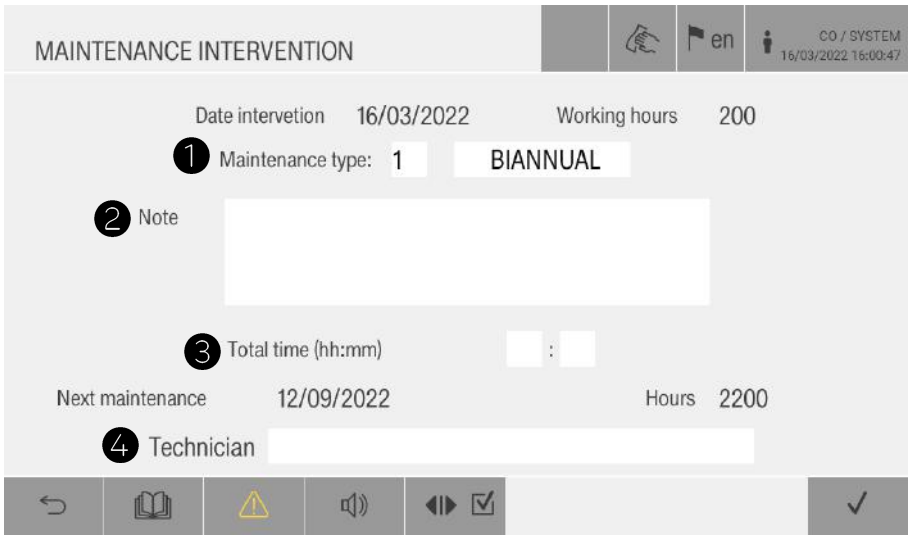
To clear the maintenance warning, proceed as follows:

1. Carry out the maintenance intervention on the machine as described in the procedures below and according to the table.
2. From the MAIN MENU, open the SYSTEM menu:

   SYSTEM → MAINTENANCE → MAINTENANCE INTERVENTION

3. Select the type of maintenance at point ❶, provide a description of the intervention at point ❷, insert the time needed at point ❸ and the name of the operator at point ❹.

   Once filled in, confirm, and save the intervention with the button ✓.



13.3 Procedure for annual maintenance

The annual maintenance is to be performed only by qualified, skilled personnel.
The table below includes all the annual maintenance work required for this machine. **These maintenance tasks must be performed in addition to the maintenance activities described in the user manual.**
To execute the annual maintenance activities a preventitive **maintenance kit** is available.

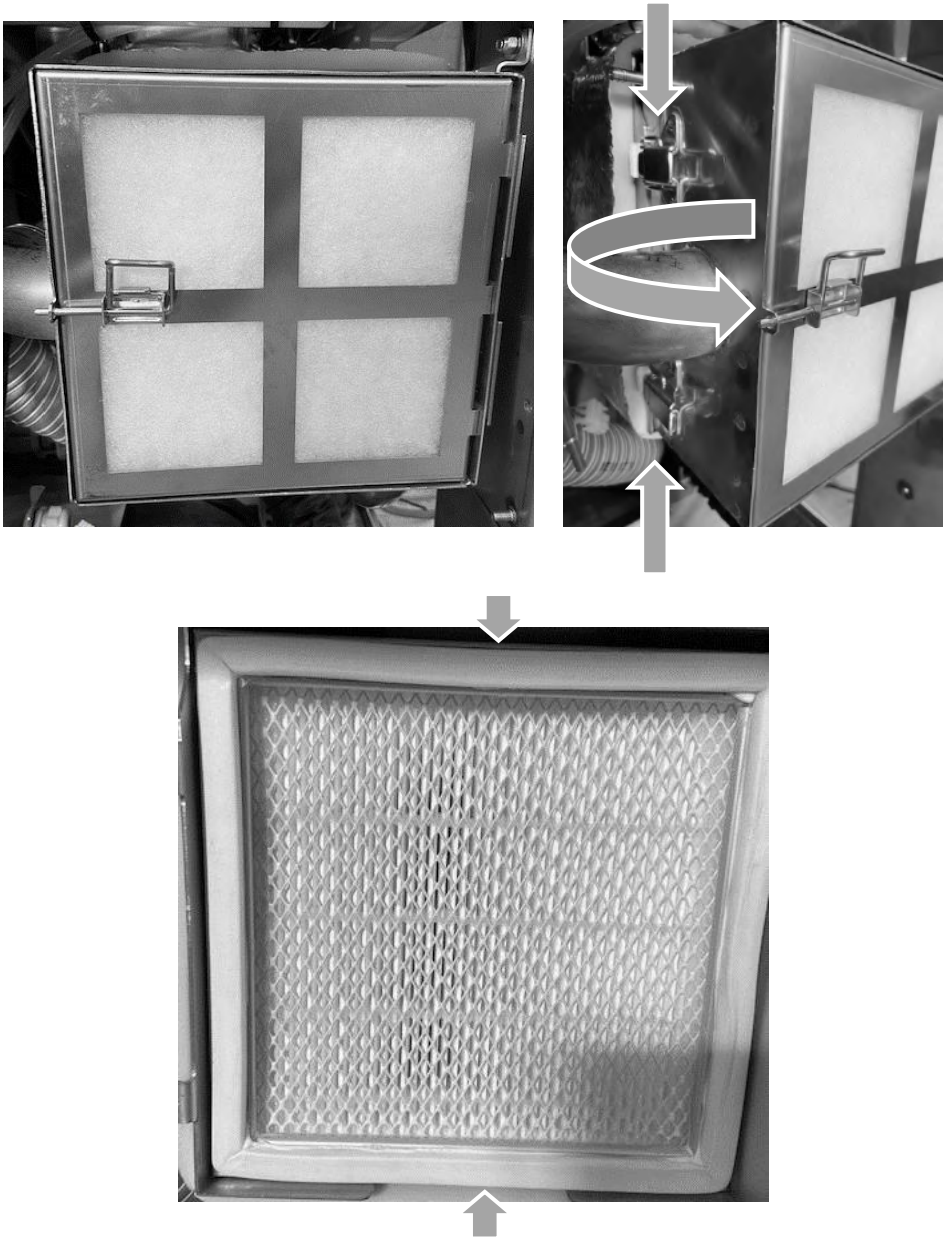
TABLE OF SPECIAL MAINTENANCE TASKS

Component	Responsible	Maintenance interval	Activity	Ref
HEPA filter	S	EVERY YEAR 1000 working hours	Replace	M1
Door gasket	S	EVERY YEAR 1000 working hours	Check the gasket and replace if damaged	M2
Washing / circulation pump	S	EVERY YEAR 1000 working hours	Check for leakages	-
Basket coupling	S	EVERY YEAR 1000 working hours	Check for functionality	-
Heating elements	S	EVERY YEAR 1000 working hours	Check for leakages	-
Water solenoid valves	S	EVERY YEAR 1000 working hours	Check for leakages and flow rate. In case of leakages or low flow rate, check the filter status and clean them under running water	M3
Drain valve	S	EVERY YEAR 1000 working hours	Check for leakages In case of leakages open the valve and clean the membrane	M4
Drain pump	S	EVERY YEAR 1000 working hours	Check for leakages	-
Water intake / Drain pipe	S	EVERY YEAR 1000 working hours	Check for leakages	-
Peristaltic squeeze tubes of chemical dosing pumps ONLY FOR DS 600 G2 EZ (peristaltic pumps only)	S	EVERY YEAR 1000 working hours	Replace the inner pipe of the dosing pump	M5

HEPA FILTER REPLACEMENT		
Reference: M1	Responsible: **S**	**Frequency: EVERY YEAR**

Follow the instruction below:

1. Open the technical area panel
2. Execute the maintenance to the pre-filter as explained in the user manual
3. Open the clamp closure on the side of the filter box and remove the frontal part of the filter
4. Extract the HEPA filter



5. Replace it with another filter of the same type
6. **Put the frontal part back in place and fix the clamps**
7. **Install the pre-filter as described in the user manual**

GASKET CHECK / REPLACEMENT

Reference: **M2**	Responsible: **S**	Frequency**: EVERY YEAR**

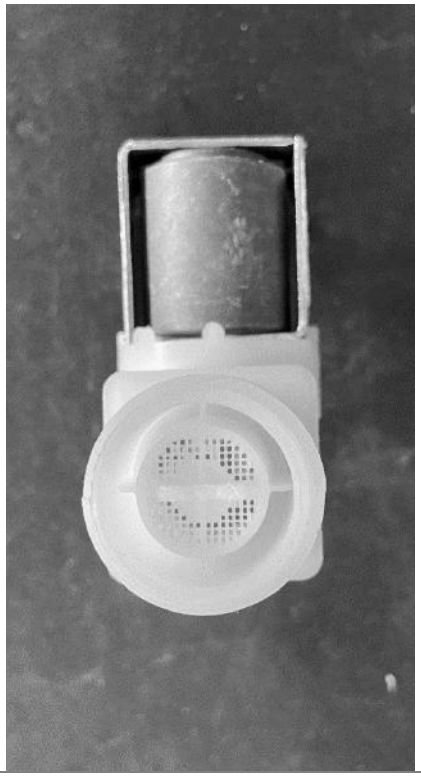
Follow the instruction below:

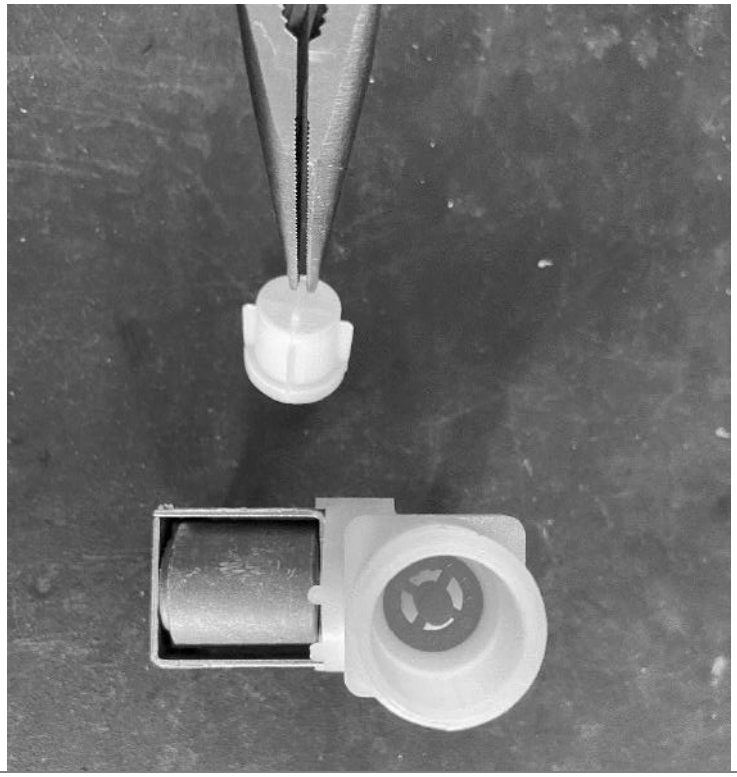
1. Open the door
2. Check door gasket for damages
3. If needed:
4. Remove the old gasket extracting it from the seat
5. Replace the gasket starting from the top center by placing it into the gasket seat. Then proceed by pressing it into the seat on the full frame
6. Pay attention to the corners: do not stretch the gasket

SOLENOID VALVES FILTER CLEANING		
Reference: **M3**	Responsible: **S**	Frequency**: EVERY YEAR**

Follow the instruction below:

1. Close the main water taps
2. Open the technical area panel
3. Remove the protective panels: the solenoid valves are on the left
4. Remove the feeding hoses from the water filling solenoid valves
5. Remove the filter using pliers





6. Clean the filter with running water
7. Place the filter on its original position
8. Connect again the feeding hoses
9. Open the main water taps, checking the absence of leakages from the connection

DRAIN VALVE MEMBRANE CLEANING		
Reference: **M4**	Responsible: **S**	Frequency**: EVERY YEAR**

In case of leakages , clean the membrane, following the instruction below:

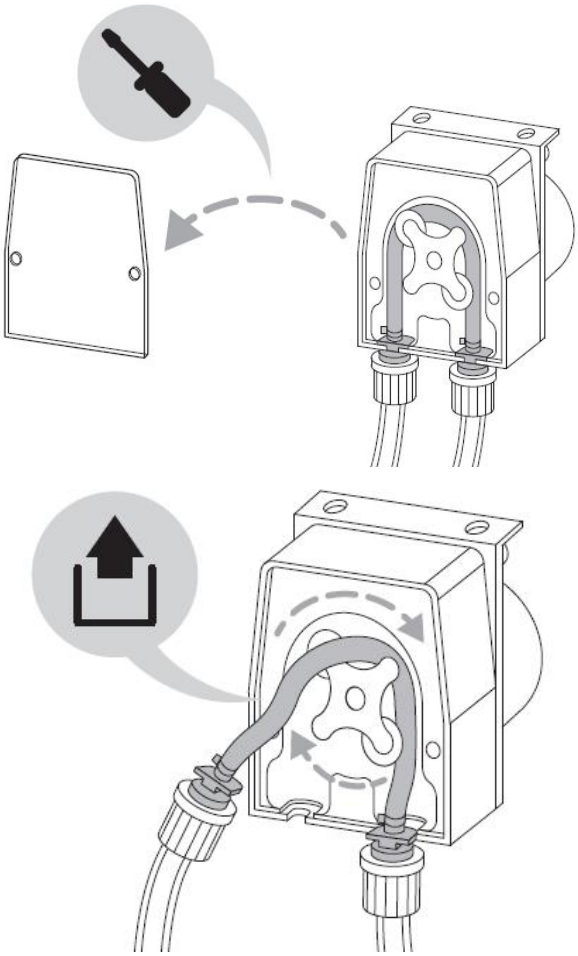
1. Check that the chamber is empty, otherwise drain the chamber completely
2. Open the technical area panel
3. Remove the protective panels: the drain valve is placed on the center
4. Unscrew the valve bracket as shown below

5. Open the valve and remove the membrane
6. Clean the membrane
7. Place it on the original position and then fix again the bracket with the screw
8. Run a cycle and check the absence of leakages from the valve

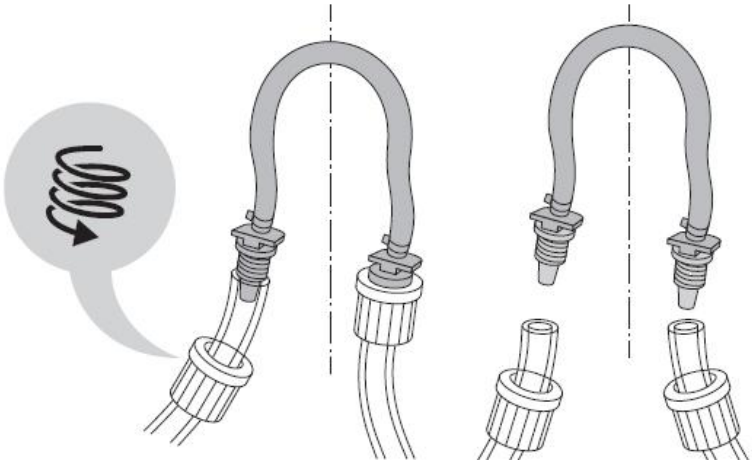
DOSING PUMP: SQUEEZE TUBE REPLACEMENT (EZ VERSION)		
Reference: **M5**	Responsible: **S**	Frequency**: EVERY YEAR**

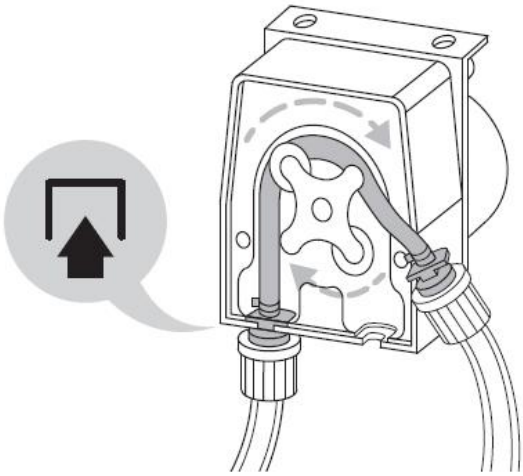
Follow the instruction below:

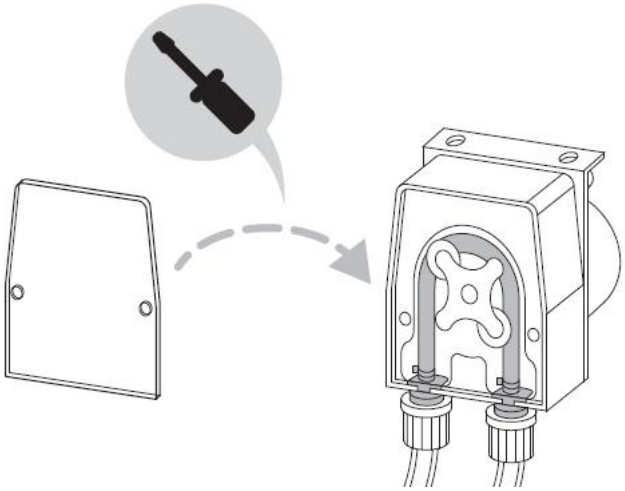
1. Open the technical area panel
2. On the left side, on the top of the technical area, unscrew the protective panel
3. Unscrew the cover of the dosing pump
4. Extract the squeeze tube starting from the connection and then rotating the central rotor



5. Disconnect the squeeze tube from the dosing hose and connect the new squeeze tube
6. Replace the squeeze tube starting from the left connection and then rotating the rotor





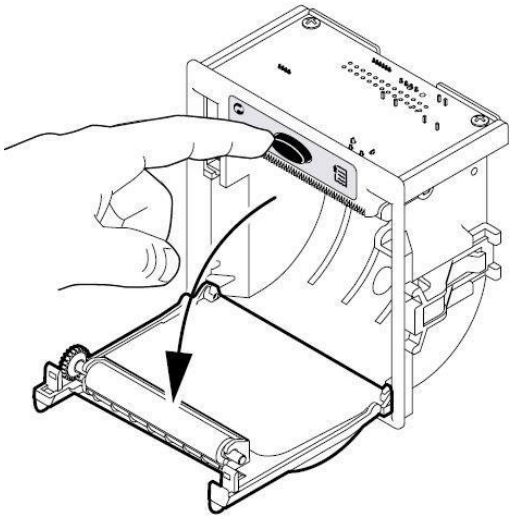


7. Assemble the frontal protection
8. Assemble the protective panels
9. Calibrate the dosing system if necessary for the application

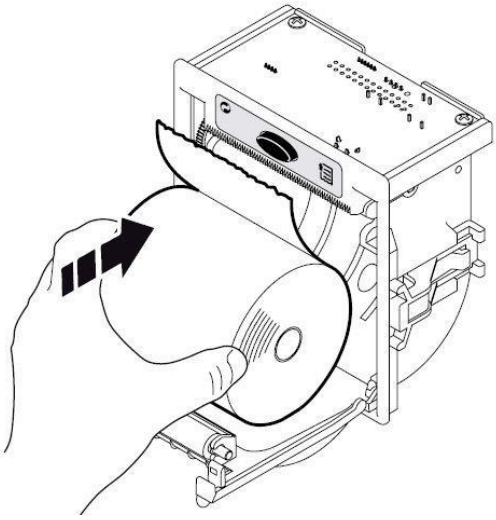
13.4 Changing the printer paper roll

To change the paper roll, proceed as follow:

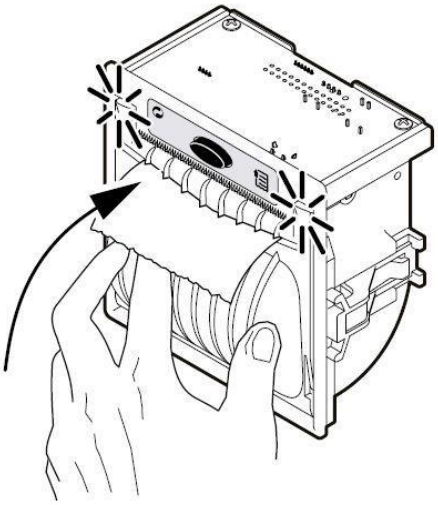
1. Press the OPEN buttony to open the printer cover



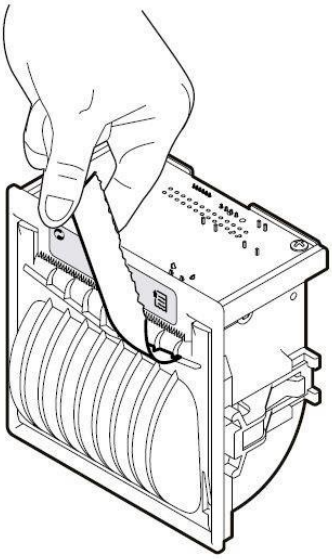
2. Remove the empty plastic roll
3. Place the paper roll making sure it unrolls in the proper direction



4. Take out the paper and close the cover



5. Tear off the exceeding paper using the jagged edge



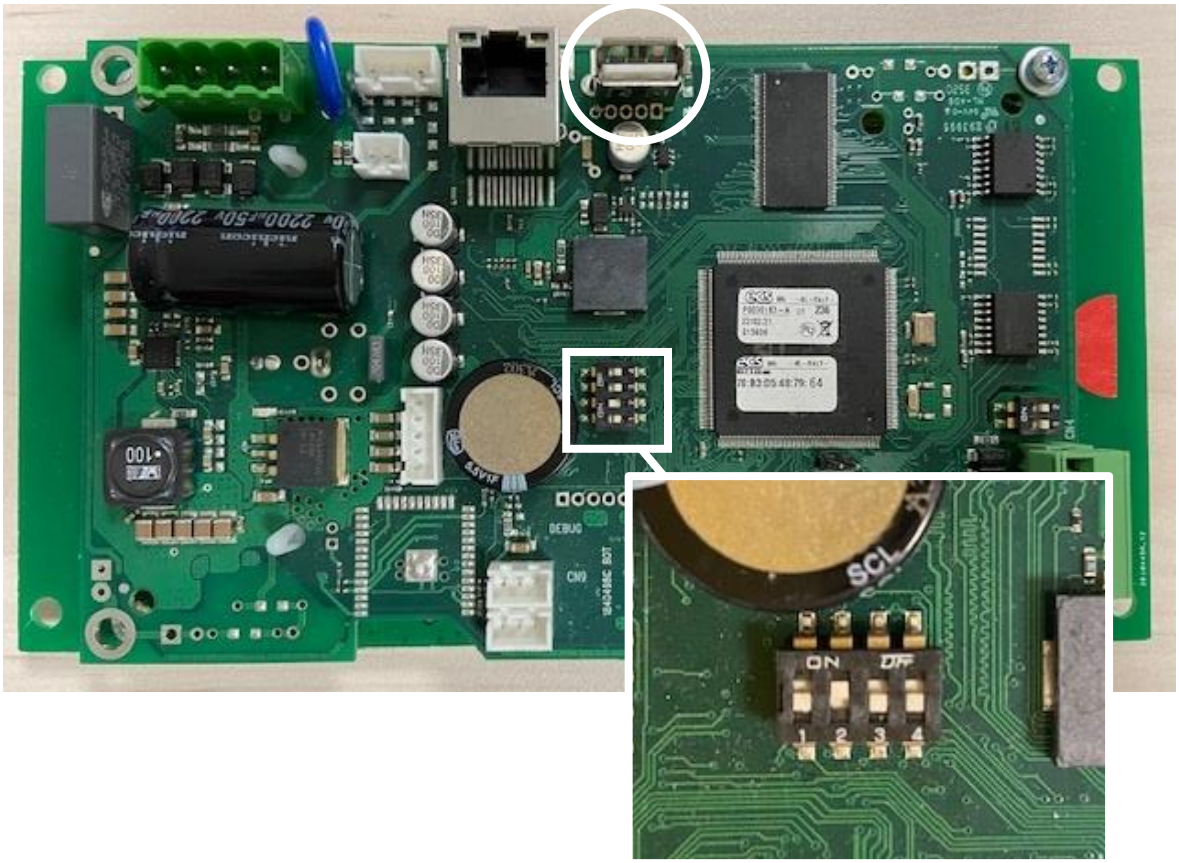
14. FLASHING OF ELECTRONIC BOARDS

14.1 Flashing of display / firmware update

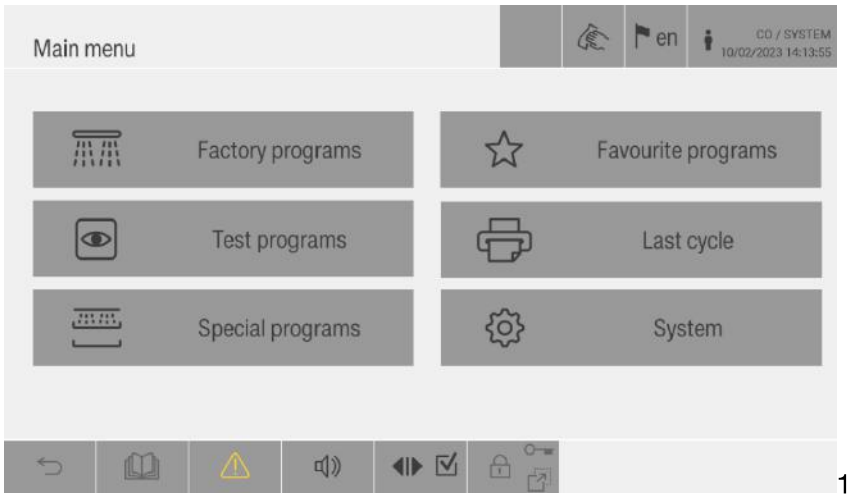
The display, in case of a software update, can be programmed in two different ways.
An upgrade can be programmed via USB as explanined on the CONNECTIVITY section.
The display board is located behind the display panel.

In case of a new or replaced display, an alternative programming procedure can be executed as follow:

1. Set dip-switch 1 to ON position
2. Insert the USB key with the firmware saved inside



3. Turn on the machine and a progression bar will appear on the display. The update runs automatically.
4. After the programming, the display will require to set dip-switch 1 to OFF position.
   Move it without turning off the machine
5. On the display another progression bar will be shown. When the programming is completed, the main menu screen will appear.



1

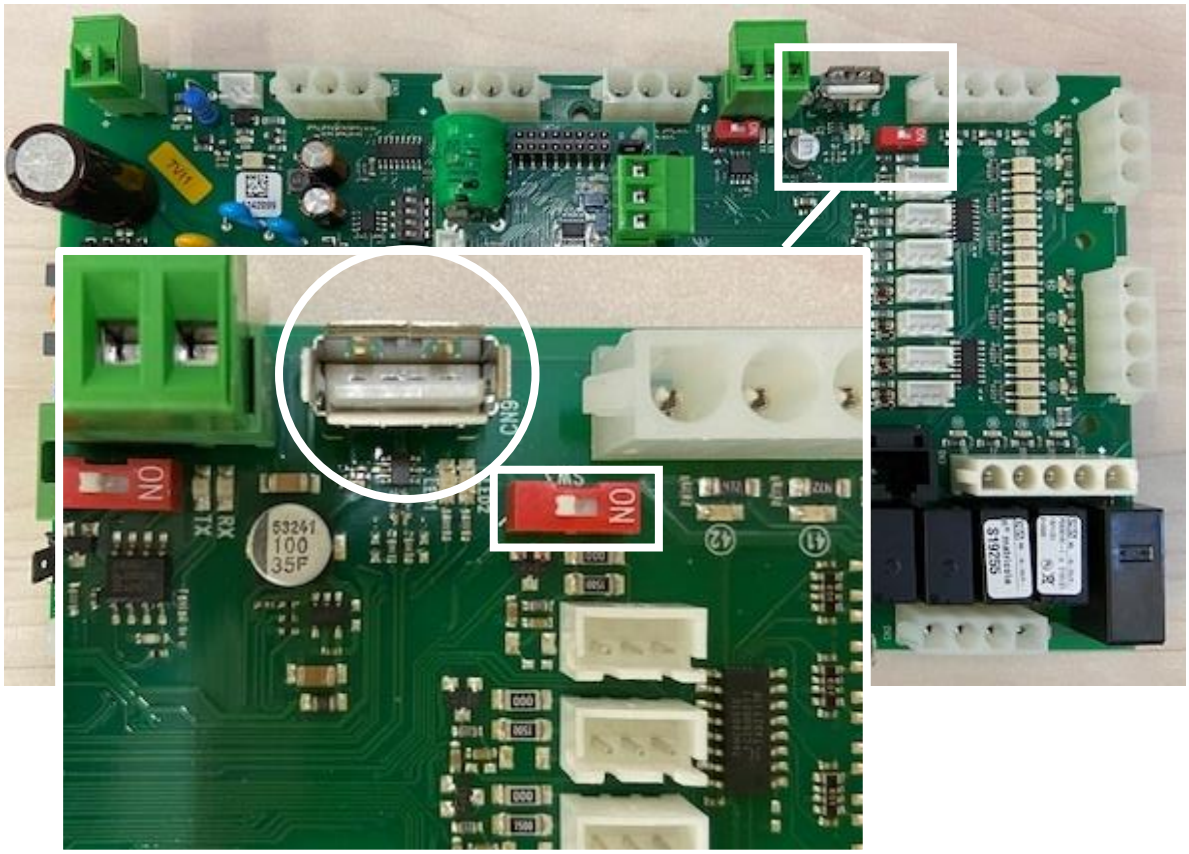
Procedure completed.

⚠	**If the display is used on the loading side, all the dip-switches need to be set to 0.** **If the display is used on the unloading side, the dis-switch 2 need to be set to ON.**

14.2 Flashing of electronic boards / firmware updates

The main board is located behind the display panel.
The electronic board on the electrical box can also be programmed or updated, as follow:

1. Set dip-switch to ON position
2. Insert the USB key with the firmware



3. Turn on the machine: the LED will start flashing
4. When the LED close to the USB ports stops flashing, after about 10 seconds, remove the USB key and set the dip-switch to OFF.
   Execute these actions without switching OFF the machine.
5. The red LED will start flashing. When the red LED stops the board is programmed.

Procedure completed.

If the board is used as first slave board (on top electrical box – right side), all the dip-switches need to be set to 0.

If the board is used as first slave board (on lower electrical box), the dis-switch 1 need to be set to ON.

If the board is used as first slave board (on top electrical box – left side), the dis-switch 2 need to be set to ON.

15. SPARE PARTS LIST

Please refer to the separate document called “Spare parts catalogue”.