HOROTEC SA
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HOROTEC VIBRATO

MSA19.705-V5

Technical documentation and instructions

42021/xxx

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1 Copyright

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The illustrations in this guide may slightly differ from the model you actually own.

This instruction manual is drawn in two bilingual copies, French and English. In the event of any discrepancy between the French and English versions or any difficulty of interpretation, the French version shall be applicable.

Document version records			
Version	**Date**	**Visa**	**Comment**
.01	2019/10/09	JB	Original document
.02	2019/10/09	JC	Customer documents
.03	2022/10/27	JC	Customer documents

2 Safety instructions

The user must observe the following safety instructions for the Horotec Vibrato washing machine.

These safety instructions were drawn up in accordance with the report 726401296 by TÜV SÜD Schweiz AG Process Safety - Mattenstrasse 24, 4002 Basel, Switzerland, drawn up on 06/04/2018.

This machine and its operation have been developed and configured to ensure compliance with European Directives 2006/42 EC (relating to machinery) and 2014/34 EU (relating to equipment and protective systems intended for use in potentially explosive atmospheres):
Any use that does not comply with the safety instructions will invalidate compliance with European Directives 2006/42 EC and 2014/34 EU and the machine warranty.
Any modification of the equipment will invalidate compliance with European Directives 2006/42 CE and 2014/34 EU and the machine warranty.
Any use that does not comply with the safety instructions will invalidate compliance with European Directives 2006/42 EC and 2014/34 EU and the machine warranty. It is strictly forbidden to use accessories other than those listed in Section 3.2 "Accessories".

2.1 Instructions and contraindications

2.1.1 Instructions for machine use

The Vibrato MSA19.705-V4 washing machine is intended for washing micromechanical components. Any other use is prohibited.
Before using the machine for the first time, please read these instructions carefully and follow the operating instructions.

The Vibrato MSA19.705-V4 washing machine is designed exclusively for cleaning micro-mechanical components using class T4 solvents. It may only be used by persons who have received prior instruction and have read the instructions for use. We accept no liability for damage resulting from improper use or incorrect handling.

Any repairs, modifications or maintenance to be carried out on or in the machine and in particular on electrically conductive partś must only be carried out by the manufacturer or its authorised after-sales service. Any improper repair may lead to serious accidents as well as malfunctions and may damage the machine. If the machine malfunctions or needś repair, please contact the manufacturer or its authorised local representative.

Only original spare parts may be used.

2.1.2 Machine use contraindications

Do not install the machine in an explosive atmosphere.
Keep away from heat, hot surfaces, sparks, naked flames, and any other source of ignition. Do not smoke or expose to temperatures above 50°C.
Do not place any objects on the machine.
Do not obstruct the fan inlets on the top and rear of the machine.
Do not store flammable products near the machine.
Do not start the machine unless it is connected to a solvent vapour extraction system.
Do not use the machine for purposes other than those for which it was designed.

Do not use products other than those recommended in this document.
Do not use accessories other than those recommended in this document.
Do not deviate from the safety rules set out in this document.
Never disable or bypass safety interlocks.

2.2 Installing/moving the machine

The machine must be installed on a flat, level surface. The machine must never be subjected to external vibrations. It must only be used once it has been correctly installed, in accordance with the instructions given in Section 3.3 "Unpacking and installation".

The machine must never be used without the retaining beaker at the rear, see Chapter 3.3 "Unpacking and installation".

The machine should be placed in an adequately ventilated room at between 18°C and 25°C.

To prevent solvent vapours from escaping from the machine into the room, it must be connected to an extraction device which complies with the machine and environmental standards in force in the country where the machine is used.

In all cases, the concentration of fumes around the machine must comply with the SUVA exposure limit values (in Switzerland). For other countries, please refer to the legislation in force.

Under no circumstances may the machine be used in an ATEX environment.

If the machine is used on a trolley, it must not be moved without being physically disconnected from the mains. Solvents must be removed from the machine before it is moved (see section 2.3.1).

The retaining beaker must be installed at a lower level than the machine's retaining tank. The beaker and the retaining tank must be emptied and cleaned in the event of accidental liquid spillage (see chapters 3.3 and 6.3).

If there is a risk of solvents overflowing, they must be removed in accordance with procedure 2.3.1 "Installation/removal of solvents".

2.3 Machine use

This machine may not be used as it stands. Its installation, environment and use must therefore comply scrupulously with this document.
This machine is designed exclusively for cleaning micromechanical components using class T4 solvents.
It may only be used by people who have received prior instruction and have read the instructions for use.
We accept no liability for damage resulting from improper use or handling errors.

2.3.1 Installation / removal of solvents

Solvents are installed and removed in accordance with procedure 3.11 "Bath installation". Throughout this phase, the handling of flammable liquids must comply with good practice. In particular, all sources of ignition must be kept away from the machine.

The maximum filling level for solvents must be respected as described in section 3.9 "Preparation of containers".

The machine has been developed and configured for use with class T4 products with a minimum auto-ignition temperature of 135°C.
The user must not operate the machine with other products.

The machine must be emptied of its solvents if it is stopped for more than 8 hours.

If solvents accidentally spill into the machine, disconnect the appliance from the mains and follow the cleaning procedure in section 6.3 "Cleaning in the event of an accidental spillage".

The ultrasonic tank must always remain in place.

2.3.2 Static electricity

The machine must be used in an EPA zone (electrostatic discharge protected zone) to protect the user and the machine from any electrostatic discharge (ESD) during use.

2.4 Maintenance

Any modification to the operation of the machine by the user or any change of parts other than those specified in Section 6.1 "Machine maintenance" will invalidate compliance with European Directives 2006/42 EC and 2014/34 EU and the machine warranty.

Empty and clean the beakers before carrying out any maintenance on the machine.

2.5 Solvent vapour extraction

The machine is equipped with a solvent vapour extraction system.
This system must be connected to an external solvent vapour extraction system which complies with European Directives 2006/42/EC and 2014/34 EU.

The external solvent vapour extraction device must be switched on before the machine is switched on and switched off after the machine is switched off
In the event of failure of the external solvent vapour extraction system, the machine must be automatically switched off immediately.

Do not obstruct the fan inlets (**A**) and leave 200 mm of free space at the rear of the machine. Do not store anything on the machine.

The machine's solvent vapour extraction system has been designed according to the volume of the machine and the evaporation rate of the solvent vapours used.

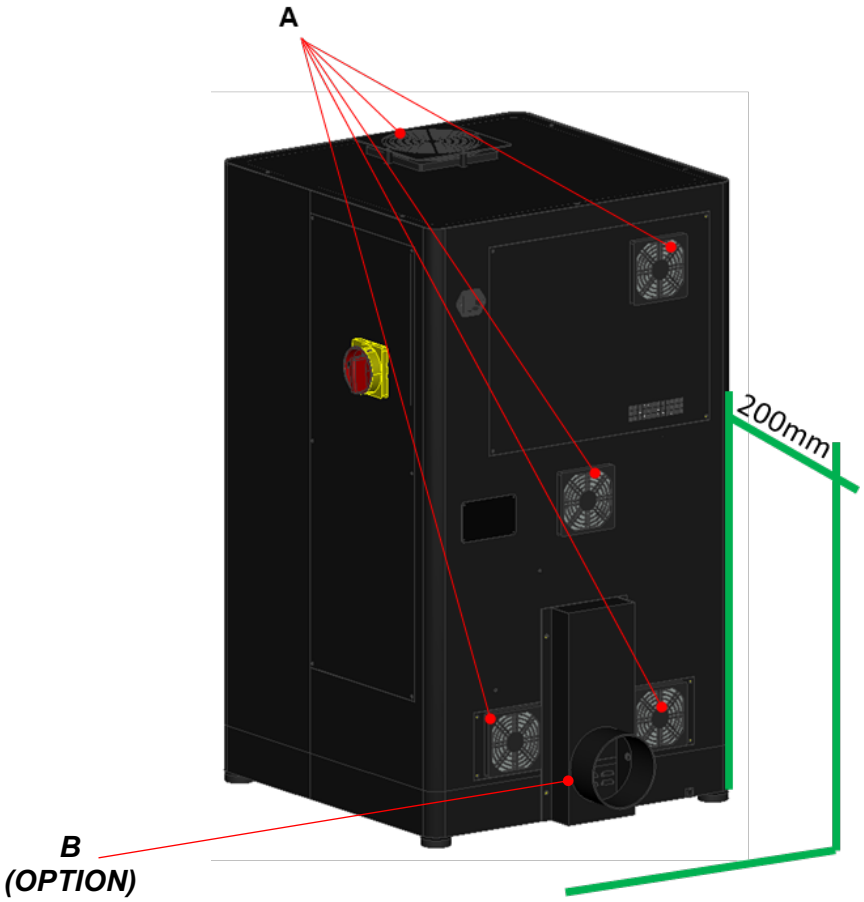
The external solvent vapour extraction system must be connected to the machine.

*Option 1: HOROTEC collector reference MSA19.705-A for external extraction device (**B**).*

Option 2: HOROTEC active carbon filter MSA19.708 (see section 2.5.1).

The external solvent vapour extraction device must be adapted to the machine air flow rate of 176 m^3/h.

Under no circumstances must the external solvent vapour extraction system create an ATEX zone inside or around the machine.



2.5.1 Active carbon filter

The module is fixed to the rear of the machine It is equipped with a fan which must remain permanently connected as long as the solvents are present in the machine, even if the retention tank is not empty. This is to recover the vapours present in the machine.

The area must be regularly ventilated. In all cases, we recommend that you have the direct environment analysed by an HSE specialist.

The HOROTEC activated carbon cartridge, reference MSA19.715, is easy to replace (bayonet fixing system). Its service life depends on the nature of the solvents and the intensity of use of the machine. Used cartridges must be disposed of in accordance with good practice.

2.5.2 Measuring vapours in the air

In order to comply with local air emission values, it is recommended that air concentration measurements be taken (or commissioned) (PID sensor ref. MSA 19.706 for example).

2.6 Troubleshooting

2.6.1 Accidental machine shutdown

In the event of the machine stopping accidentally, if the beakers are not covered, the beakers must be emptied and cleaned according to procedure 2.6.3 "Manual removal of solvents". However, if the beakers are covered, the situation is safe.

If the machine is accidentally stopped for more than 8 hours, remove the solvents manually as per procedure 2.6.3 "Manual removal of solvents", even if the beakers are covered.

2.6.2 Machine breakdown

In the event of a machine breakdown, physically disconnect the appliance from the mains. Open the access door and allow the air to circulate for at least 2 minutes.

Remove the solvents manually as described in section 2.6.3 "Manual removal of solvents".

If any solvents accidentally spills into the machine, disconnect the appliance from the mains and follow the cleaning procedure in Chapter 6.3 "Cleaning in the event of an accidental spillage".

Once the solvents have been removed, contact the machine supplier, who is authorised to carry out repairs.

After repair, check that the external solvent vapour extraction device is working, then restart the machine normally.

2.6.3 Manual removal of solvents

To remove solvents manually, physically disconnect the appliance from the mains. Open the access door and allow the air to circulate for at least 2 minutes.

Manually refit the basket spindle.

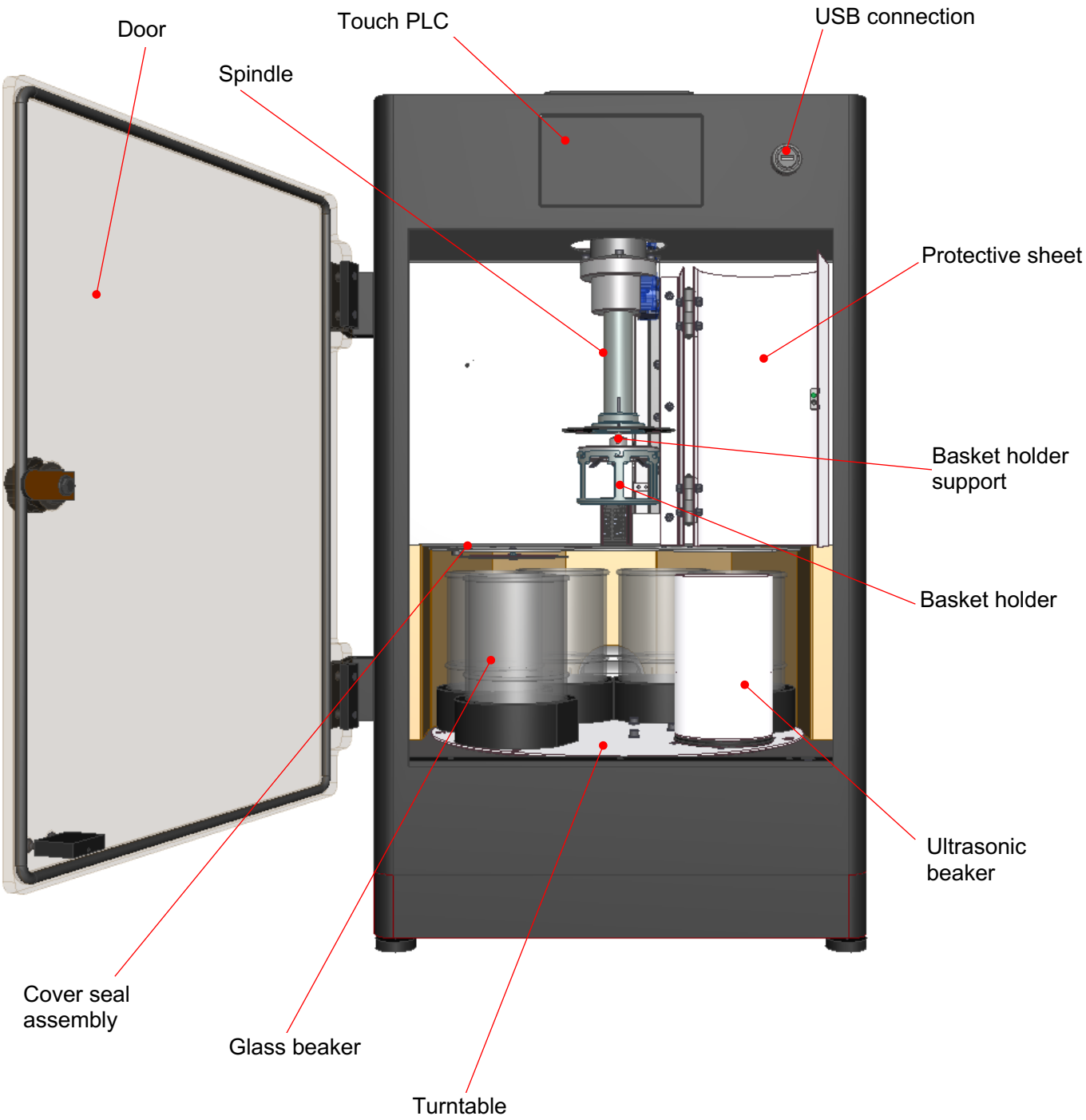
Hold the metal container cover in the raised position with one hand. Turn the lower tray until the container to be removed is in the free position and remove it. Continue until all the containers have been removed from the machine.

If solvents accidentally spill into the machine, refer to the cleaning procedure in section 6.3 "Cleaning in the event of an accidental spillage".

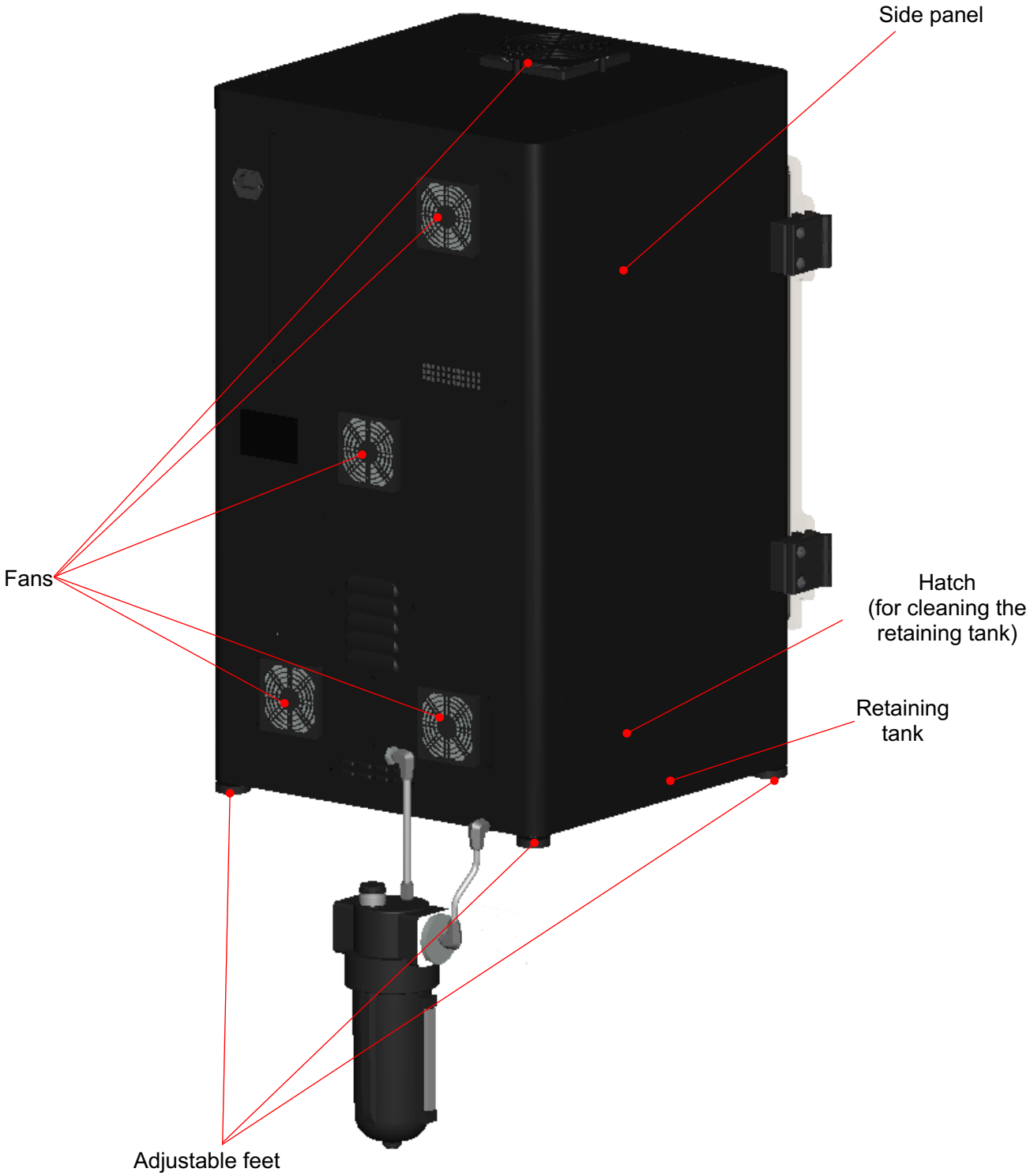
3 Start-up

3.1 Description

Front view:



Rear view:

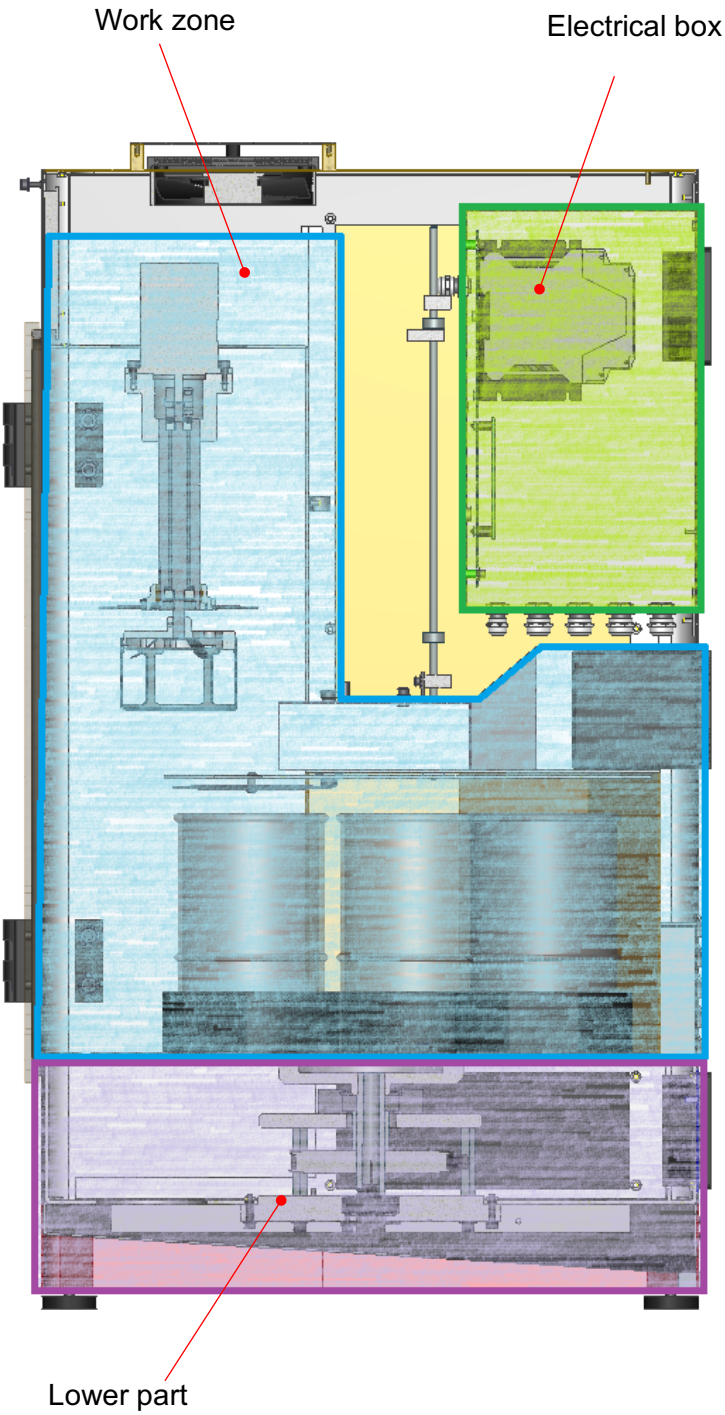

Side panel
Fans
Hatch
(for cleaning the
retaining tank)
Retaining
tank
Adjustable feet

3.1.1 *Machine zoning*

The machine includes three distinct parts.

- The work area: includes the control panel, the drying unit and the motors.
- The lower section: includes the tray drive and the retaining tank.
- The electrical panel: includes the power supply unit.

The first two parts are likely to be in contact with solvent vapours, whereas the electrical box is not supposed to be, as it is pressurised.



3.2 Accessories

The Horotec Vibrato MSA19.705-V4 only accepts glass beakers, wave breakers, basket cages, baskets and basket covers from the machine supplier.

List of accessories recommended by the supplier:

Qty / machine	Description	Reference	Photo
5	Glass beaker with cover	MSA19.711	
5	Wave breaker for beakers	MSA19.563-V2	
1	Basket holder Ø 80 mm Height 74 mm	MSA19.544	
1	Basket holder Ø 80 mm Height 53 mm	MSA19.572	

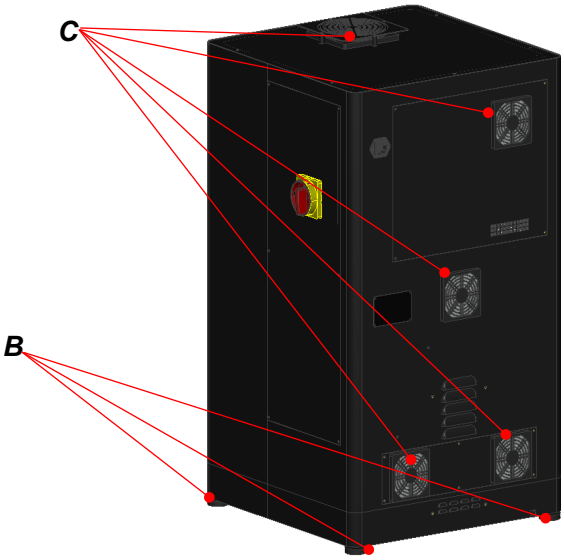
1	Cleaning basket without division. Ø 80 mm Height 30.5 mm	MSA19.794	
1	Cleaning basket without division. Ø 80 mm Height 14 mm	MSA19.790	
1	Cleaning basket with 4 divisions. Ø 80 mm Height 14 mm	MSA19.791	
1	Cleaning basket with 8 divisions. Ø 80 mm Height 14 mm	MSA19.792	
1	Cleaning basket with 12 divisions. + centre Ø 40 mm Ø 80 mm Height 14 mm	MSA19.793	
1	Basket cover Ø 80 mm Height 3.2 mm	MSA19.795	

3.3 Unpacking and installation

The machine must be installed in a well-ventilated room with external ventilation and at a temperature of between 18° C and 25° C. Keep away from heat, hot surfaces, sparks, naked flames, and any other source of ignition. Do not smoke or expose to temperatures above 50°C.

Carefully remove the transport packaging, which includes the machine and its accessories located in a box next to the machine (keep the packaging for possible repair by the manufacturer).

Place the machine on a solid, flat surface at user height and level it by adjusting the feet (**B**).



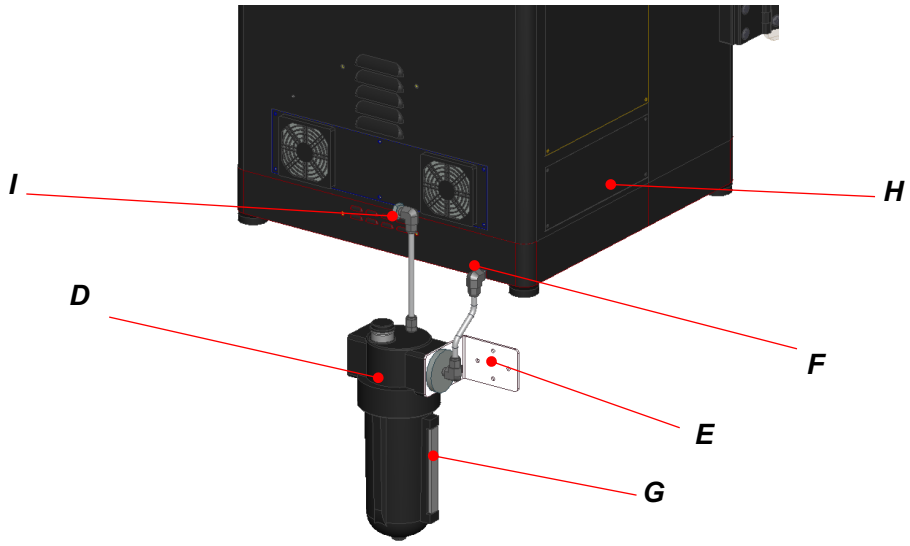
The machine cannot be placed in an ATEX zone and must under no circumstances be subjected to external vibrations. The machine does not create an explosive atmosphere on the outside.

Connect the machine to the solvent vapour extraction system (see Chapter 2.5 "Solvent vapour extraction").

Check that the fan inlets (**C**) are not obstructed (leave 200 mm of free space at the rear of the machine).

Do not place any objects on the machine.

Install the retention beaker (**D**) as shown in the diagram below and secure it with the fixing bracket (**E**):



The retention kit assembly must be installed at a lower level than the machine's retaining tank (**H**).

On the side of the beaker, you will find a level (**G**) to check the degree of filling.

Make sure that the drainpipe (**F**) is pointing downwards, to avoid liquids being trapped inside the machine or in the drainpipe.

Connect the retention kit assembly to the external solvent vapour extraction device via the connector (**I**).

Any use that does not comply with the safety instructions will invalidate compliance with European Directives 2006/42 EC and 2014/34 EU and the machine warranty.

Once you have checked that the external solvent vapour extraction system is operational, connect the machine to the mains using the connection cable (see Chapter 8 "Technical data" for the machine voltage).

3.4 Internal solvent vapour extraction system

The solvent vapour extraction system consists of 4 inlet fans and two air outlets at the rear of the machine.

The machine cannot be started unless the ventilation system has been running for 40 seconds to ensure sufficient air renewal, thus avoiding any risk of explosion. This ventilation stops at the same time as the machine.

The four fans are monitored by a device. In the event of a fault during normal operation, the machine will be shut down immediately. If a fault is detected when the machine is started, it will also be stopped immediately.

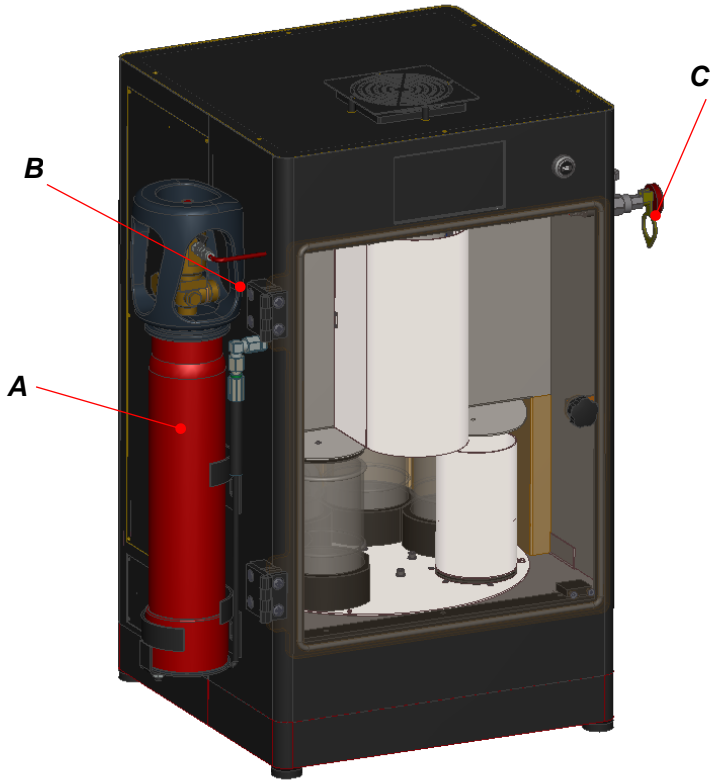
For safety reasons, a protective grille has been placed above the upper mouth to prevent total obstruction. This screen must not be obstructed under any circumstances. Doing so would invalidate compliance with European Directives 2006/42 EC and 2014/34 EU and the machine warranty. We recommend using the accessories listed in Section 3.2 "Accessories".

Machine operating flow rate: 176 m^3/h

3.5 Fire protection (optional)

A fire protection system is available as an option.

The extension system comprises an extinguishing agent cylinder (**A**) and a pneumatic thermal detector in the form of a plastic hose (**B**). This detection hose is pressurised and fixed into the object to be protected. In the event of a fire, it bursts under the influence of flames or as soon as the temperature on the body of the hose exceeds 120°C. It can also be triggered manually via the valve (**C**).

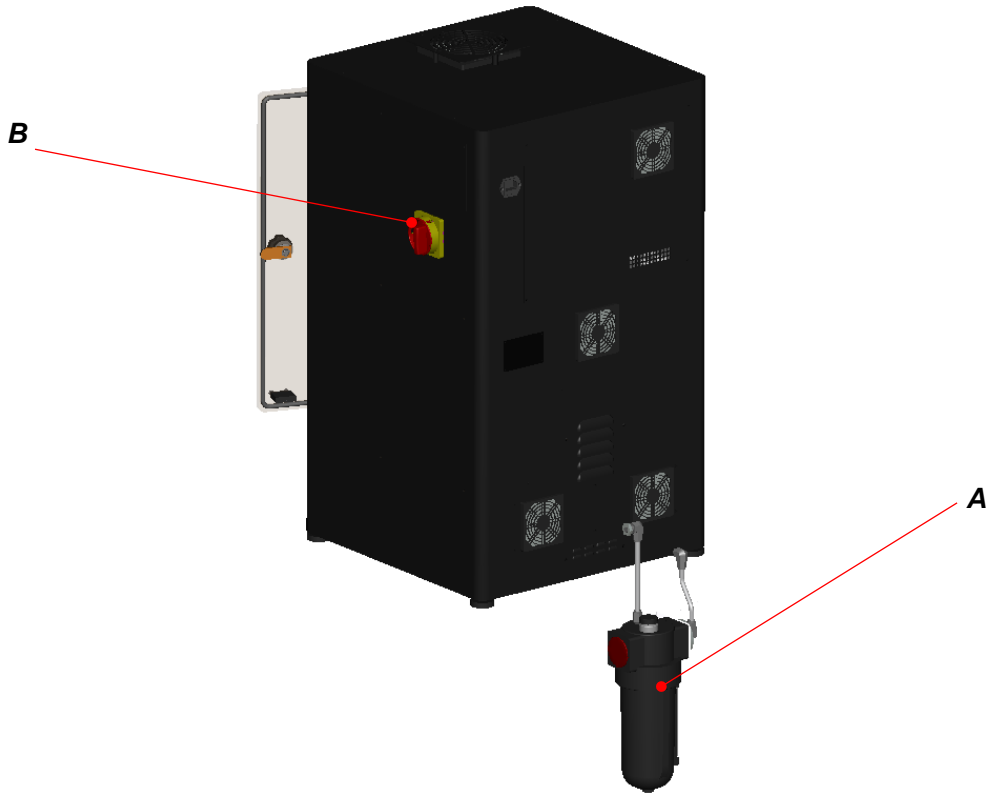


Refer to the device supplier's instructions and recommendations for care and maintenance.

3.6 Starting the machine

Before starting the machine, make sure that the retention beaker (A) is empty.
(See section 6.3 *"Cleaning in the event of an accidental spillage"*).

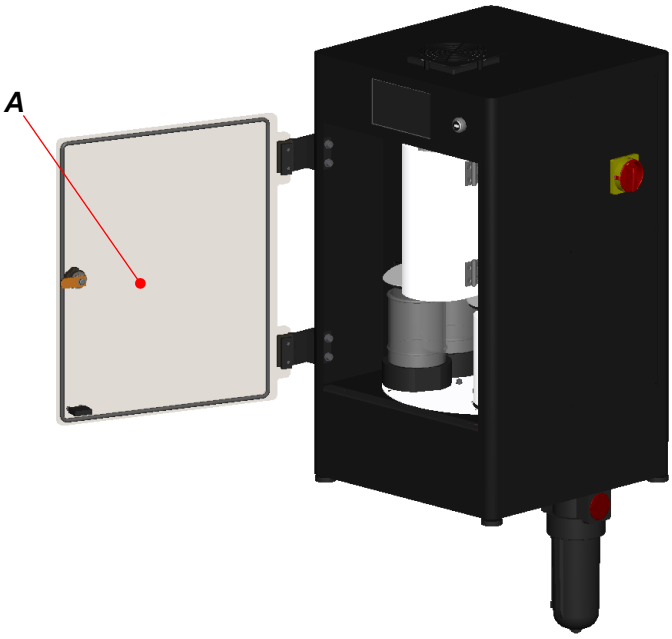
Switch on the machine by turning the *ON/OFF* switch (**B**) on the right of the machine to *ON*.



The fans will run for 40 seconds, and the machine will initialise when it is switched on. The following screen appears:

This initialisation process is repeated after each start-up and must be carried out with the door closed. The machine is now ready for service, and you can start preparing the cleaning baths.

3.7 Door safety



When the door (**A**) is opened, the appliance pauses, and the following screen appears:

It is managed like an emergency stop. Every movement of the appliance is stopped immediately, and the motors are switched off.

Once the door is closed, the cycle starts again.

Never disable or bypass the safety interlocks.

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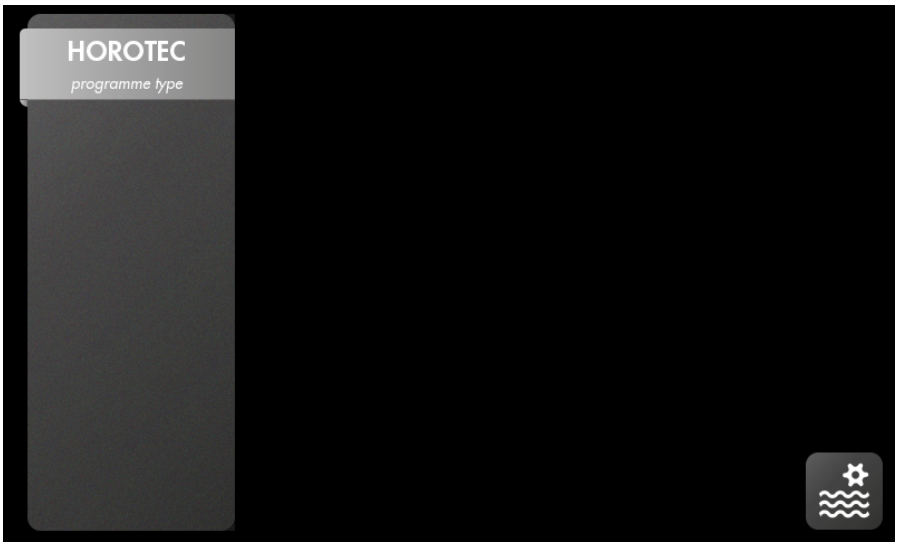
3.8 Starting up the user interface

The following menu is displayed after initialisation, indicating that the user can start using the machine.



By default, a "HOROTEC" type program is already saved. It can be deleted but will be automatically recreated if all the other programs are deleted. The other programmes will be created by the user.

3.9 Preparation of containers

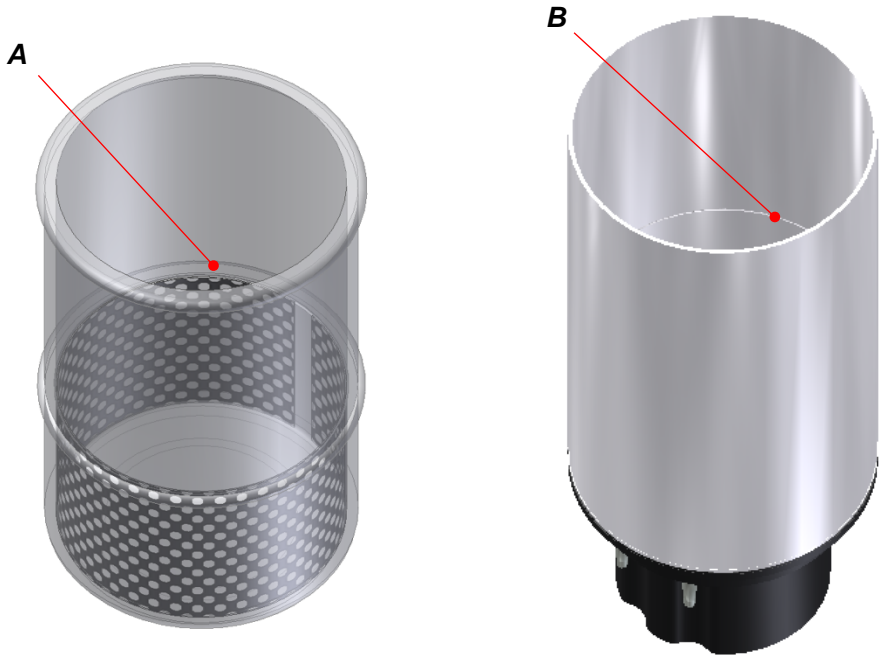
The cleaning and rinsing products used in the appliance are class T4 products with a minimum auto-ignition temperature of 135°C.

Fill the glass beaker up to the mark (**A**) with the cleaning liquid or rinsing solution (max. 0.55l).

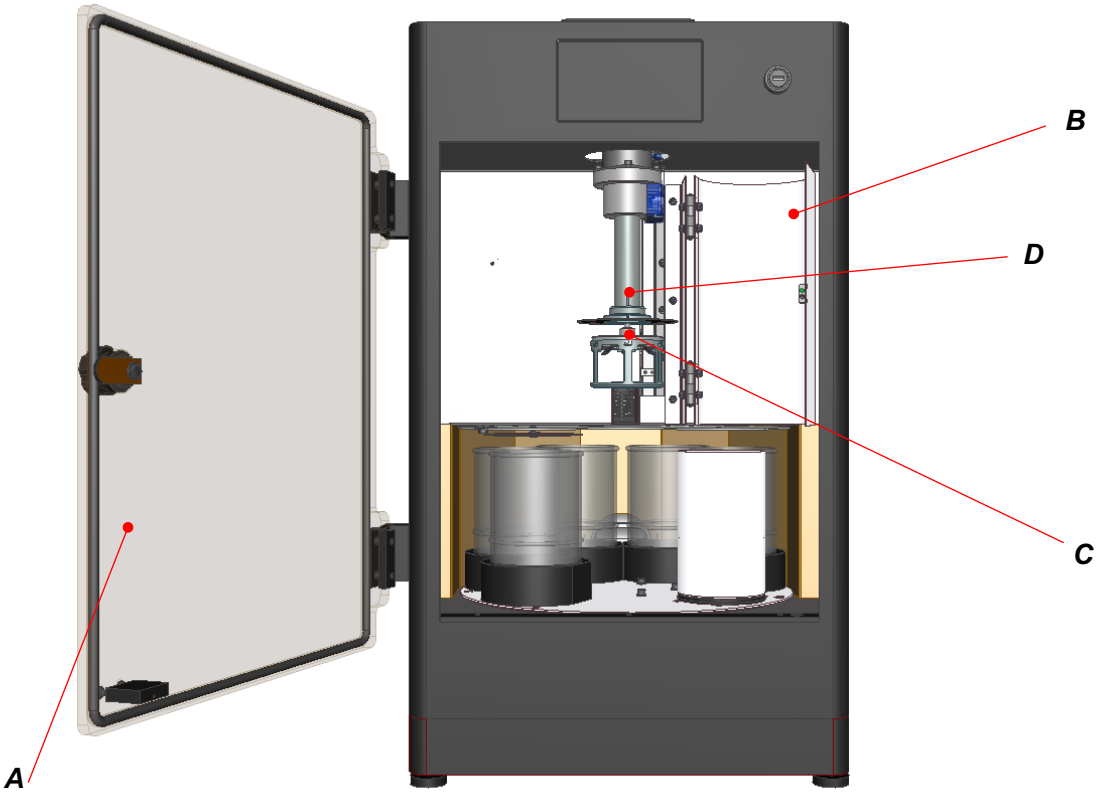
Fill the ultrasonic beaker to the mark (**B**) (max. 0.55l).

Adjust the liquid level according to the basket load.

Always fill the containers in a ventilated area.



3.10 Installing the basket holder

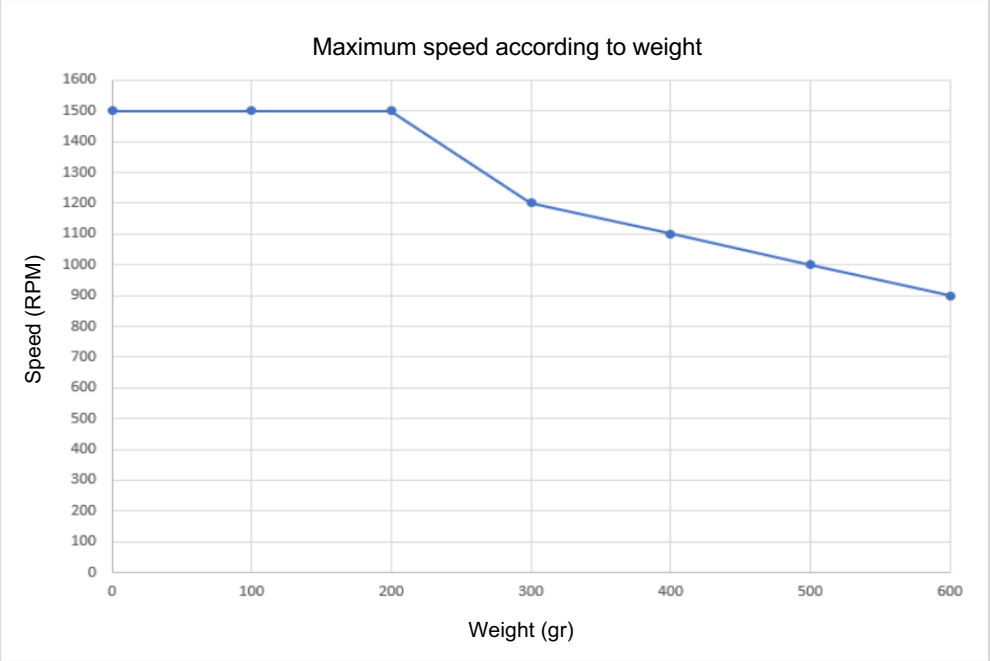


Open the door (**A**), then open the spindle protection plate (**B**).

Place the parts in the perforated baskets and insert them in the basket holder (**C**). Mount the basket holder (**C**) on the basket support (**D**).

The total weight of the baskets, basket holder and parts must not exceed 600 grams. The parts must be evenly distributed over the entire surface of the baskets.

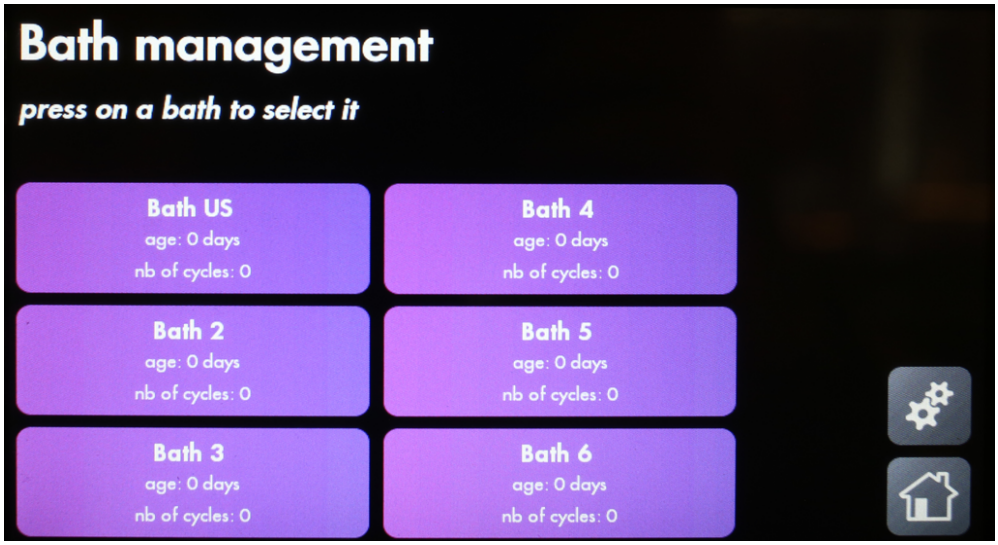
Caution: adapt the speed of rotation according to the load of the basket as follows:



3.11 Bath installation

Go to the bath management menu, accessible via the main menu

The bath management menu appears:



Select the bath number you wish to install on the touch screen. The selected bath then moves to the working position.

Open the door and the spindle protection plate and install the container. Then close the spindle protection plate and close the door.

Repeat the operation for all the baths you wish to install.

Follow the same procedure to remove the containers from the appliance.

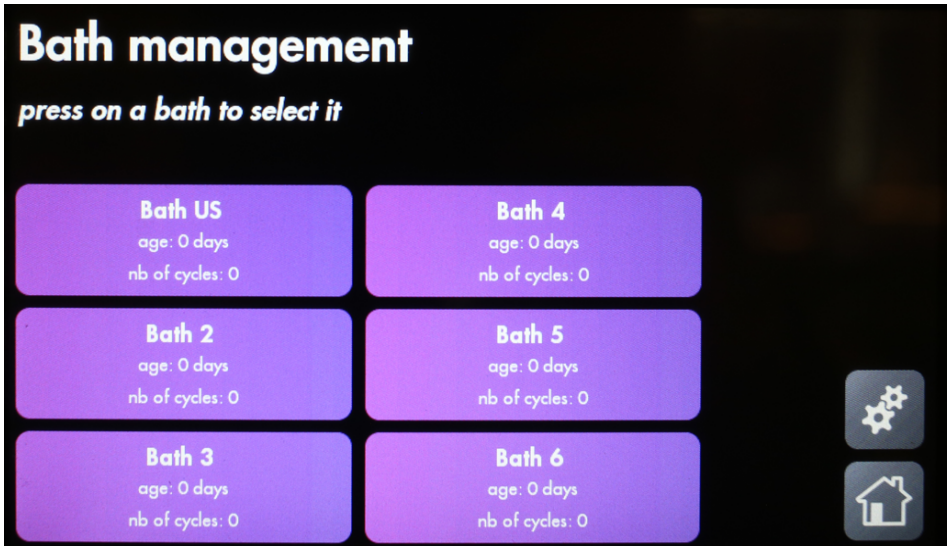
Return to the main menu

3.12 Bath management

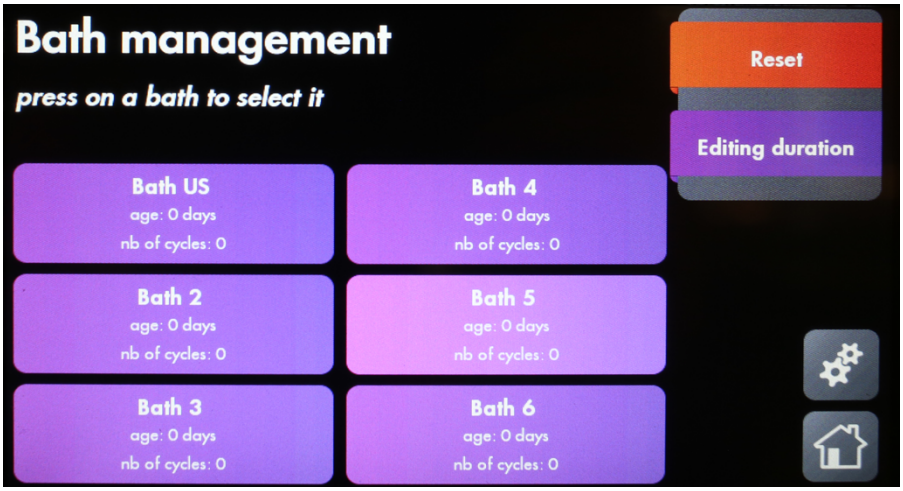
This menu provides information on the position and ageing of each bath. It can also be used to insert and remove individual beakers.

Go to the bath management menu, accessible via the main menu

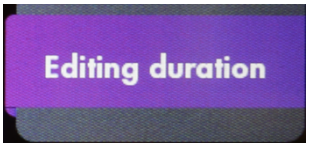
The bath management menu is displayed:



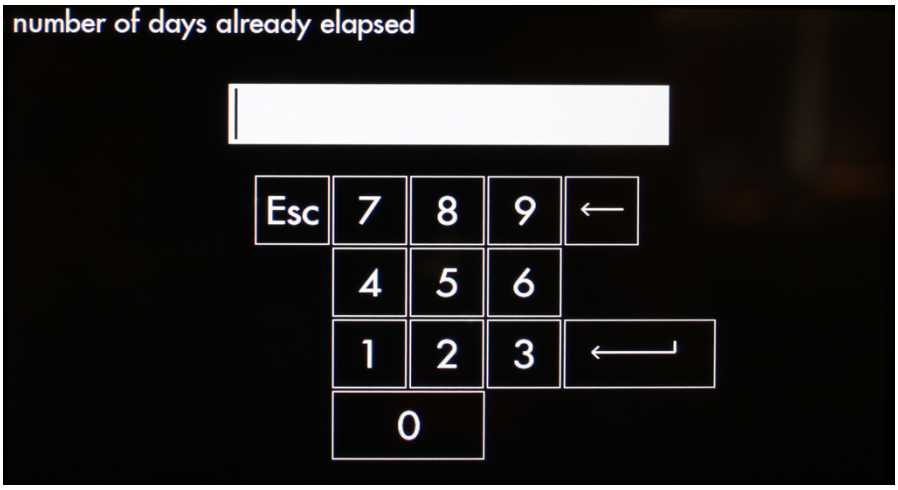
Select a bath according to its position: the bath then moves to face the user so that it is accessible. The following screen appears:

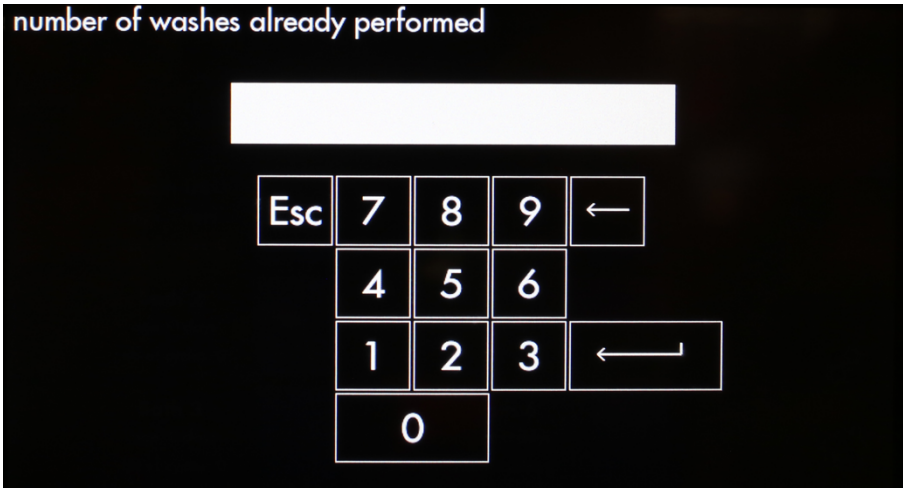


To set all bath values to zero



To enter the number of days already elapsed and the number of washes already performed





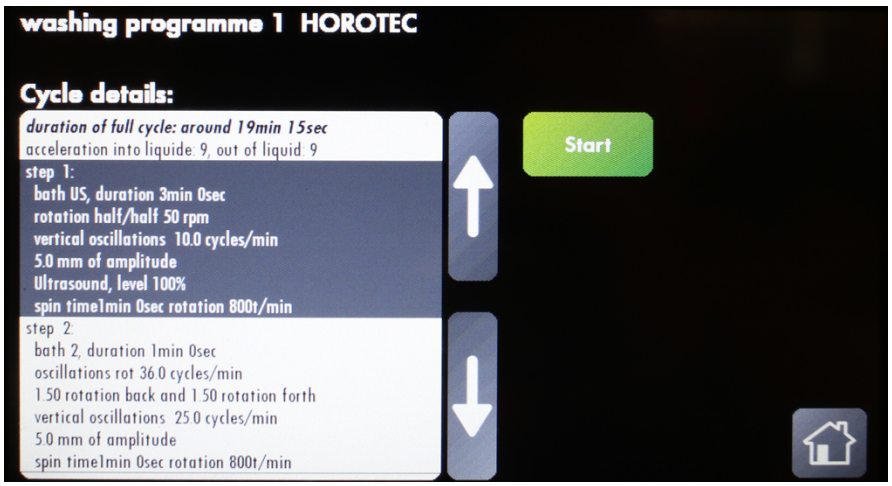
Return to the main menu

4 User interface

4.1 Daily start-up and basic operation

This menu is displayed after the machine has been initialised and indicates to the user that they can start using the machine. It displays the different washing programmes that have been saved.

To view the contents of a programme, click on it and then navigate through it using the up/down arrows:



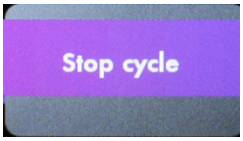
To start the washing programme

You can also pause the cycle.

The following menu will appear:

You can also:

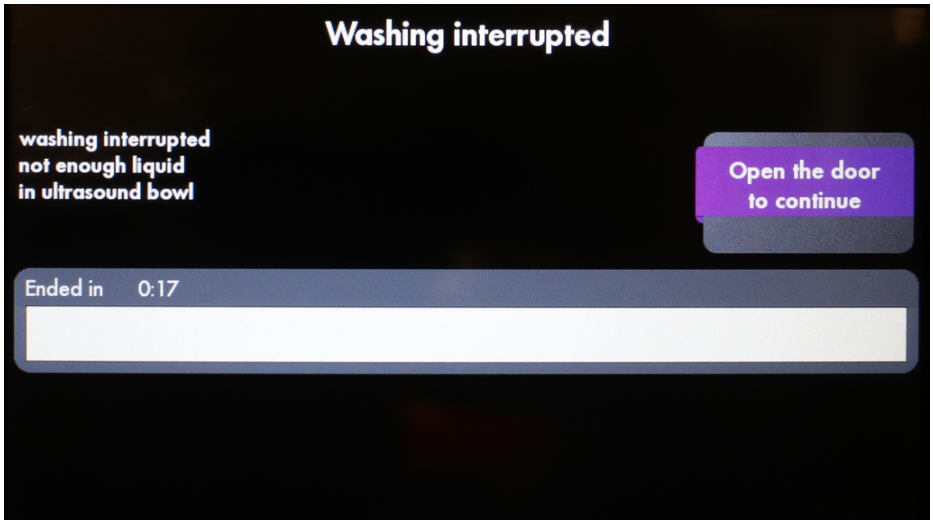
Skip a step
A spin cycle is automatically launched after this action.



Stop cycle
A spin cycle is automatically launched after this action.

Resume cycle

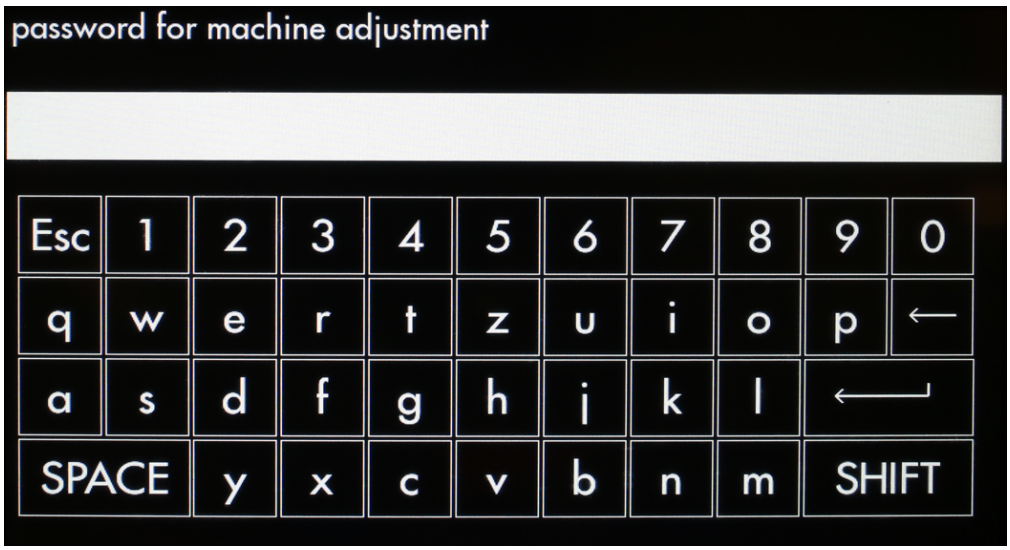
At the end of the washing cycle, the following screen appears. Open the door to remove the washed items and access the main menu.



4.2 Configuring the machine and washing programmes

Machine configuration, accessible via the bath management menu

A password is required to access this menu (default password: **pass**):



Four submenus make up this configuration menu:

Wash programme editing menu

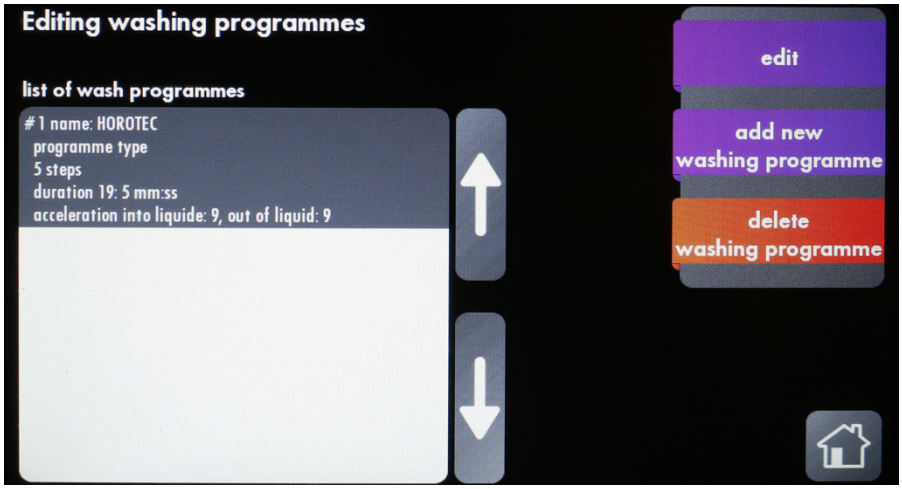
USB memory management menu

Options editing menu

Setting menu
This menu can only be accessed by the supplier using a password.

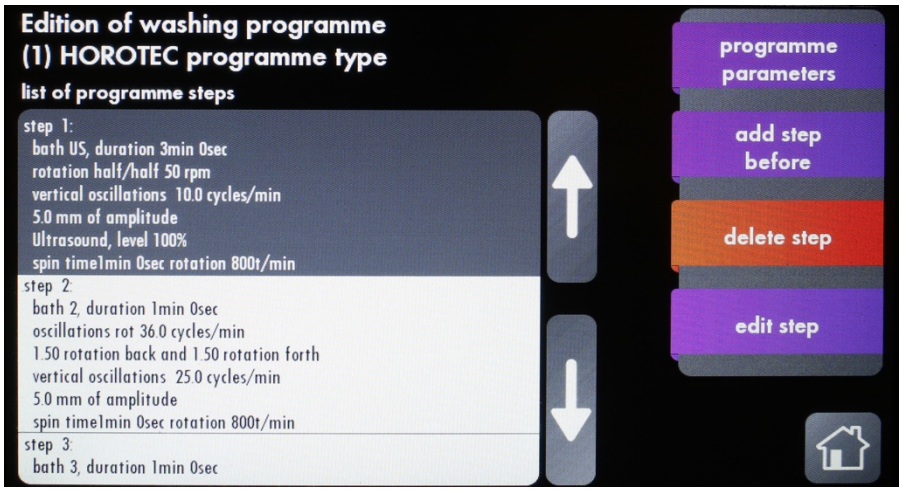
4.2.1 Washing programme edit menu

To access the washing programme edit menu

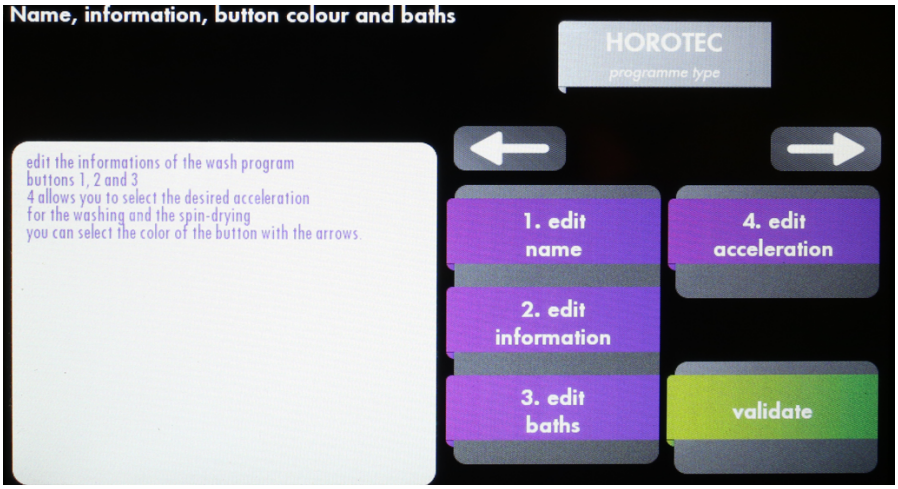


This menu is used to edit, add, or delete washing programmes.

By pressing "edit", you can edit a washing programme in its entirety, i.e., the name of the programme, the products used and the various stages making up the programme. The following screen appears:



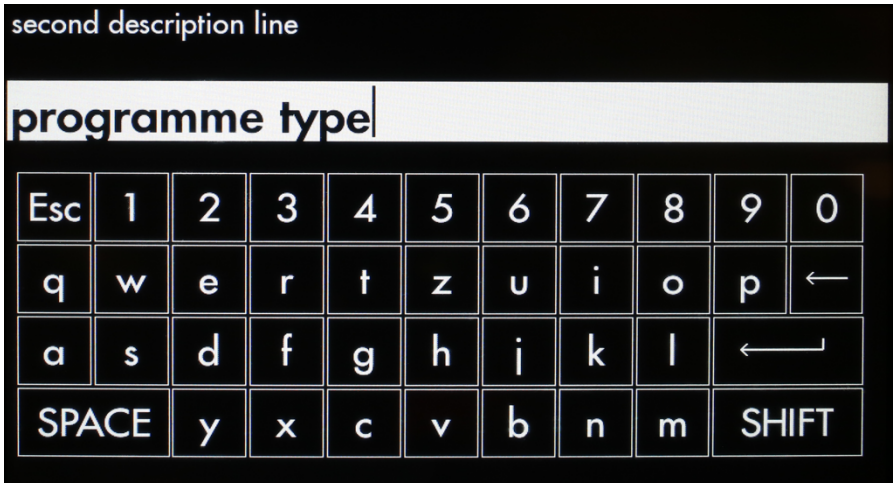
First, enter the "programme parameters" menu:



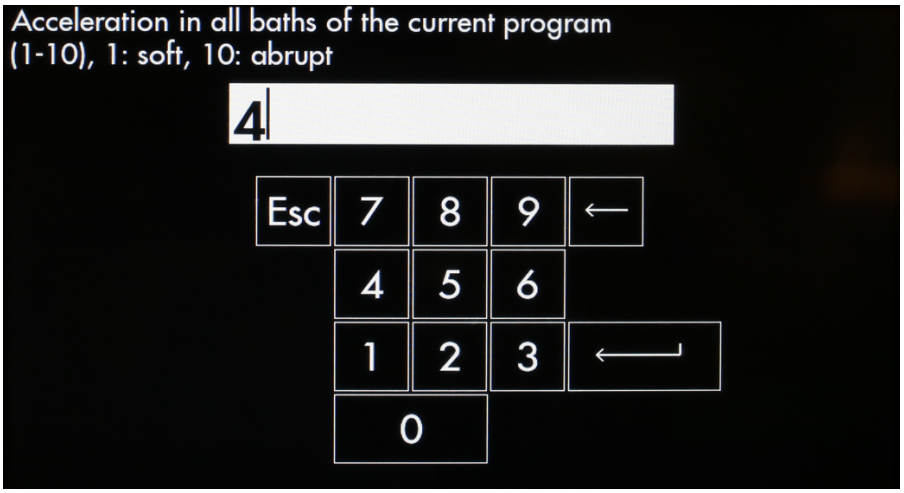
This menu allows to:

- Edit the name of the washing programme. The name has a maximum of 14 characters (including spaces). Only the following characters are permitted:
a-z A-Z 0-9 + * / ( ) = - . : !

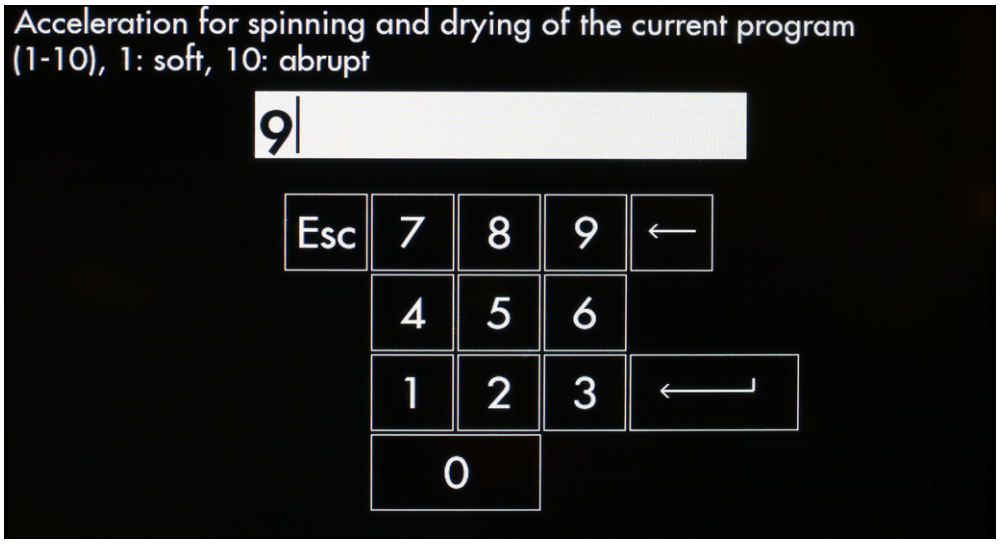
- Edit information for the washing programme. The information has a maximum length of 30 characters (including spaces). Only the following characters are permitted:
a-z A-Z 0-9 + * / ( ) = - . : !



- Edit the speed of rotation in all baths for the washing programme being edited.



- Edit the rotation acceleration for drying and spinning for the washing programme being edited.



- Set the button colour (using the arrows).

- Edit the baths (as described below in chapter 4.2.2.)

4.2.2 Bath edit menu

This menu is used to name the products used at the various stages of a washing cycle.

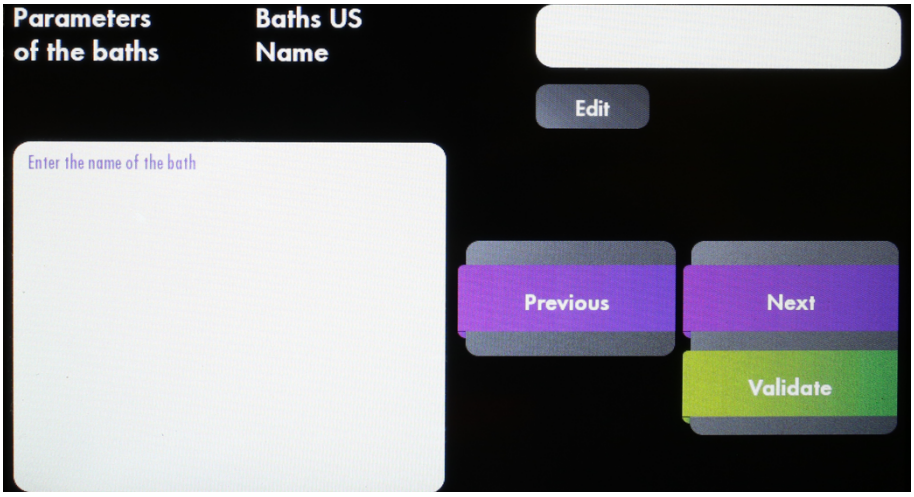
It is also possible, in this menu, to specify a product's lifespan in terms of the number of days and/or number of cycles it has been used. This option ensures optimum washing results at all times and makes it easier to manage bath changes. The machine alerts the user to the need to change a bath within a pre-set limit. This avoids launching a washing cycle with 'dirty' products.

Bath editing is not essential. In this case, no information about product names or shelf life will be displayed.

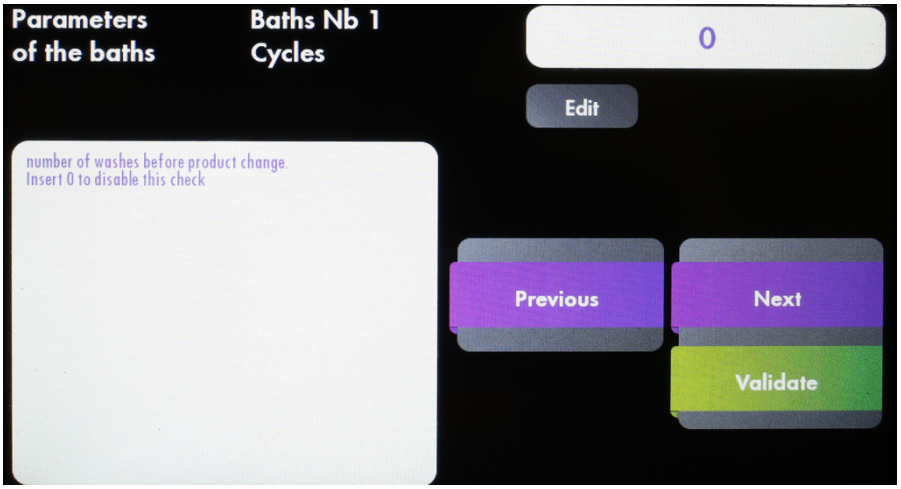
The different stages in editing baths:

Bath name (product used) The name has a maximum of 12 characters (including spaces). Only the following characters are permitted:

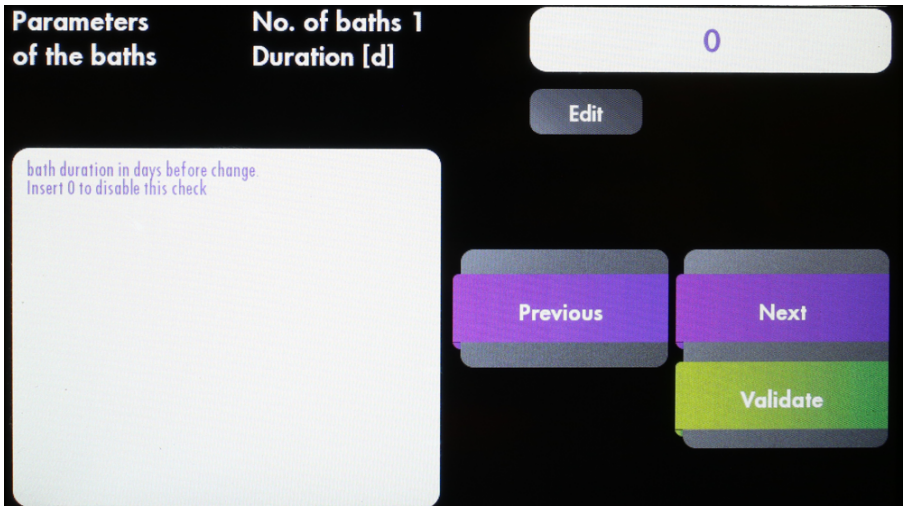
a-z A-Z 0-9 + * / ( ) = - . : !



Bath life in cycles



3) Bath life in days



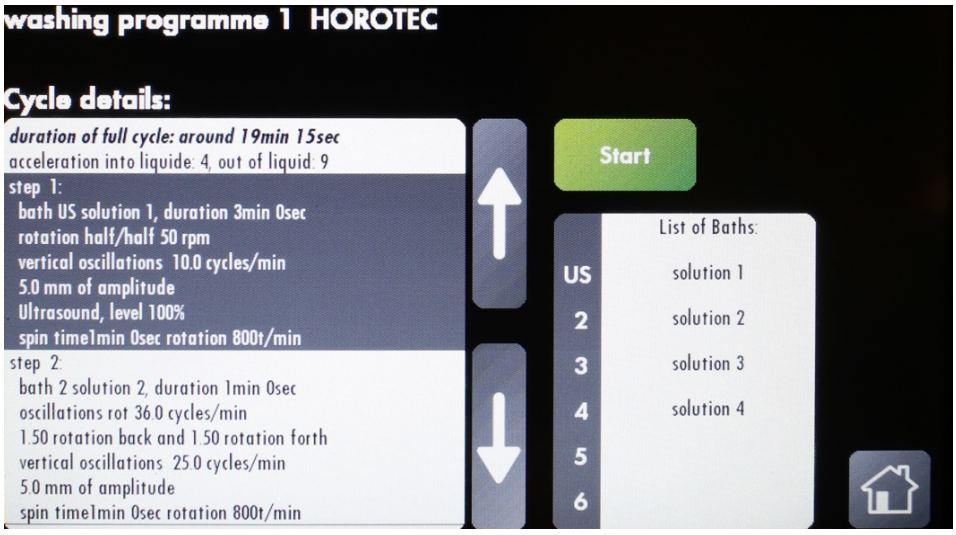
Repeat the operation for all the baths used in the washing programme.

Once all the necessary information has been entered, click on "confirm" to return to the washing programme edit menu.

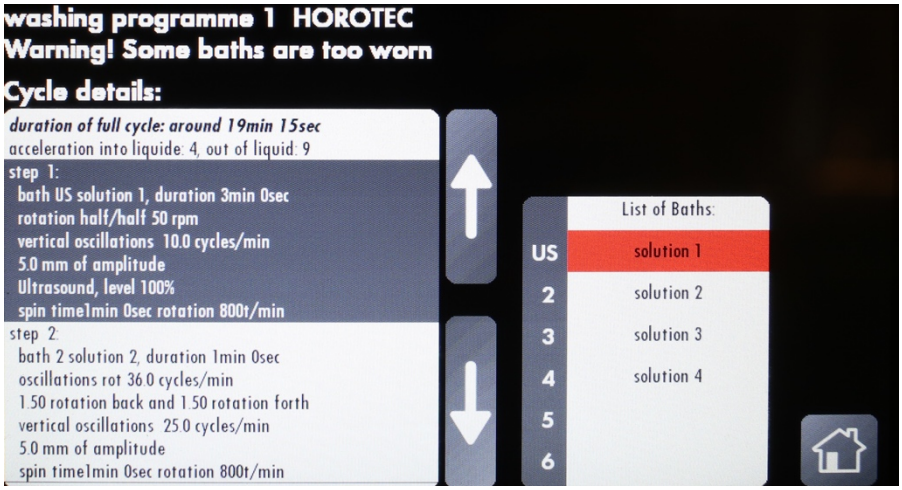
Once this information has been entered, the user is informed whether or not the various baths are in good condition when a washing cycle is started. If the bath life data is not entered, the user will not be informed of the state of the baths.

Cases where the user has named the baths:

If the baths are in good condition:

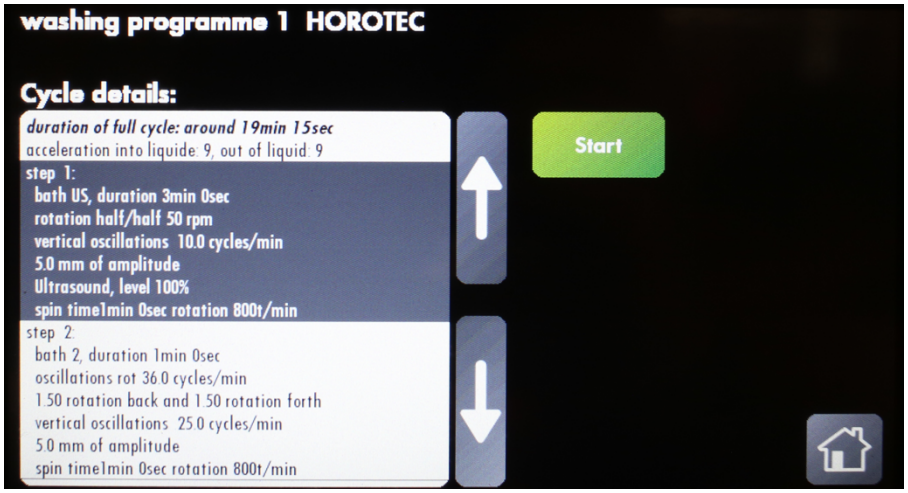


If one or more baths need to be changed (in red) :

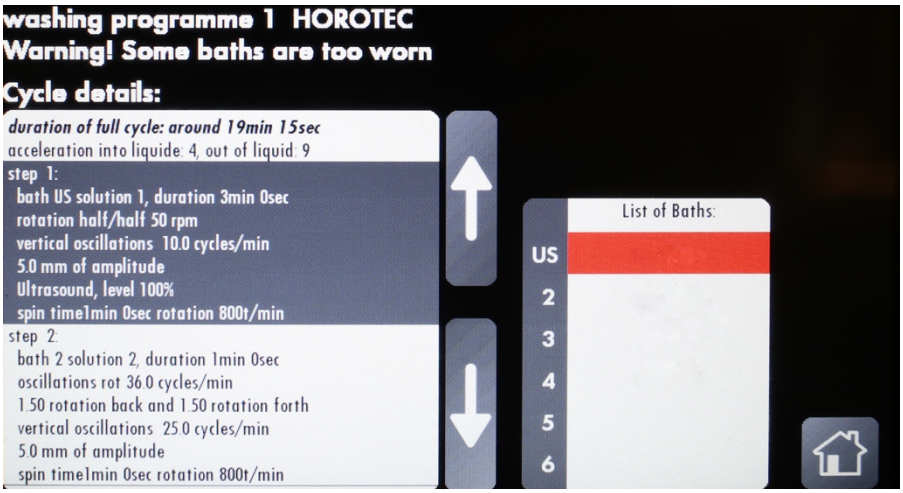


Cases where the user has not named the baths:

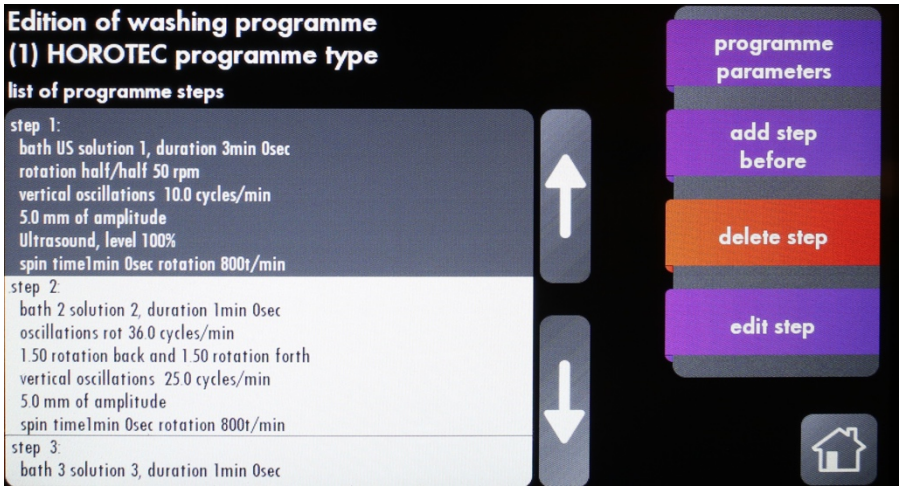
If the baths are in good condition:



If one or more baths need to be changed (in red):



4.2.3 *Editing the washing programme*



A washing programme is made up of several stages that the user can add or delete at will.

A step is made up of several machine functions that the user can programme, activate, or deactivate.

Once the data relating to the washing programme has been entered in the "programme parameters" menu (see chapter 5.3.1, "programme parameters" section), the user can add/delete washing steps using the corresponding buttons.

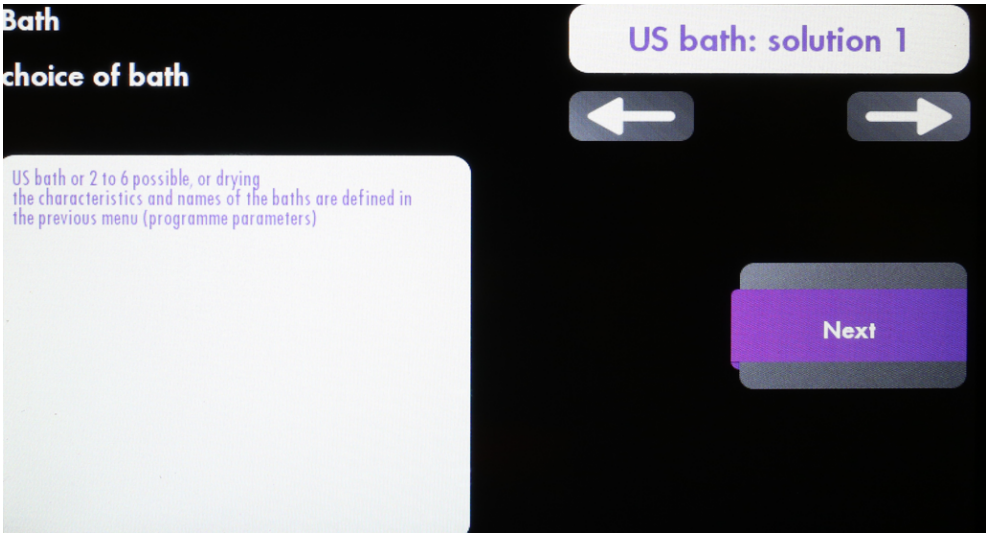
When a step is added, a standard step appears, which can then be edited.

To edit a step

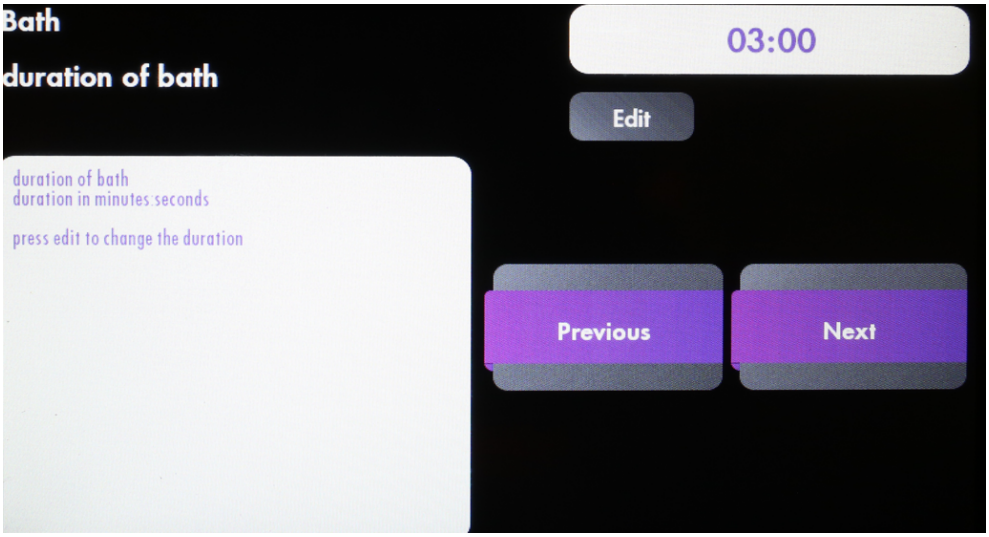
Editing is as follows:

- Select the bath in which the washing will be performed:

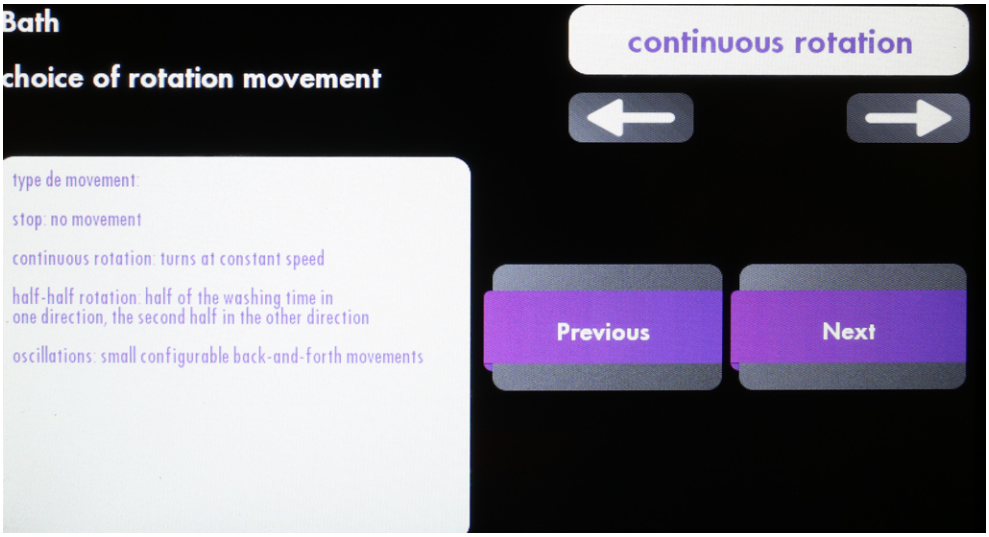
Bath US stainless steel beaker with ultrasonic function (see later in this chapter)
Bath 2 glass beaker
Bath 3 glass beaker
Bath 4 glass beaker
Bath 5 glass beaker
Bath 6 glass beaker
Drying (see later in this chapter)



- Edit bath duration in minutes / seconds:



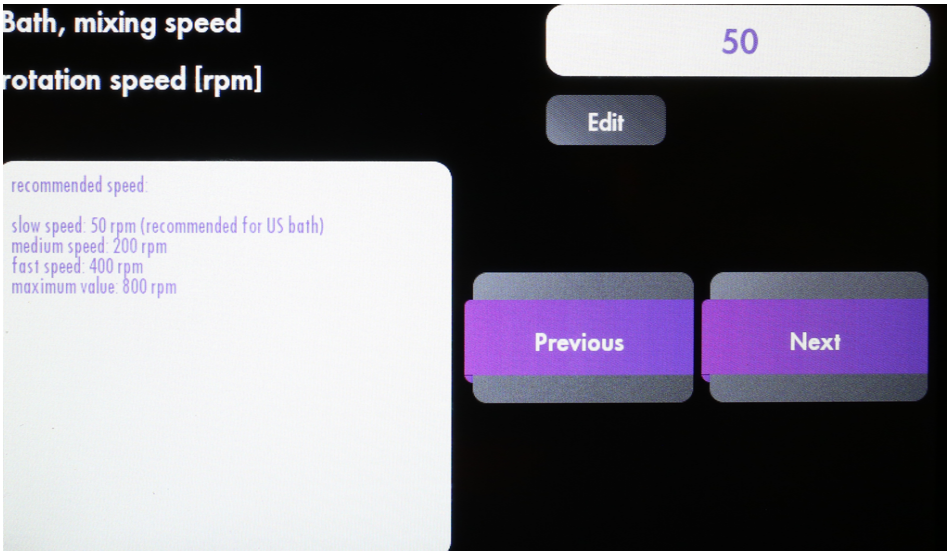
- Choice of basket rotation movement



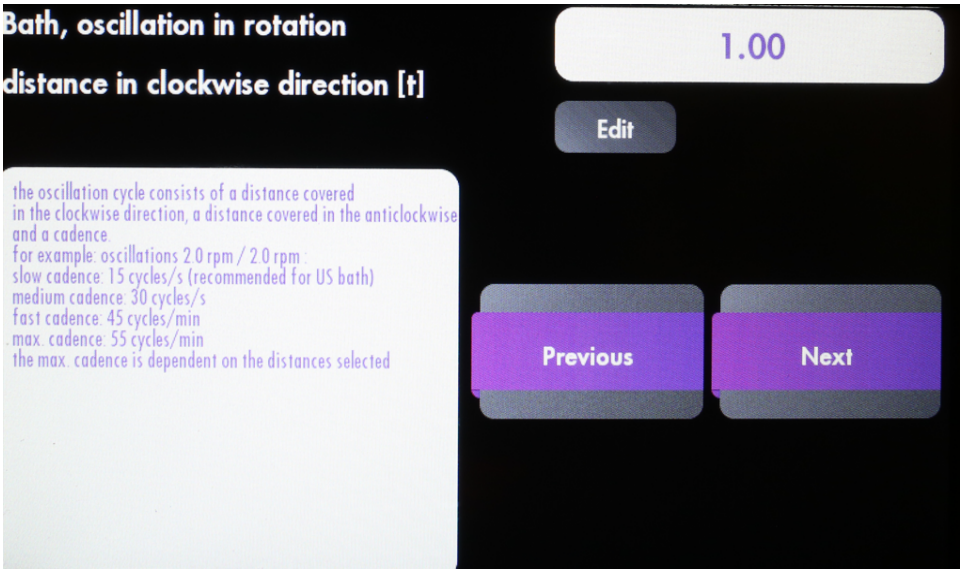
4 possible movements:

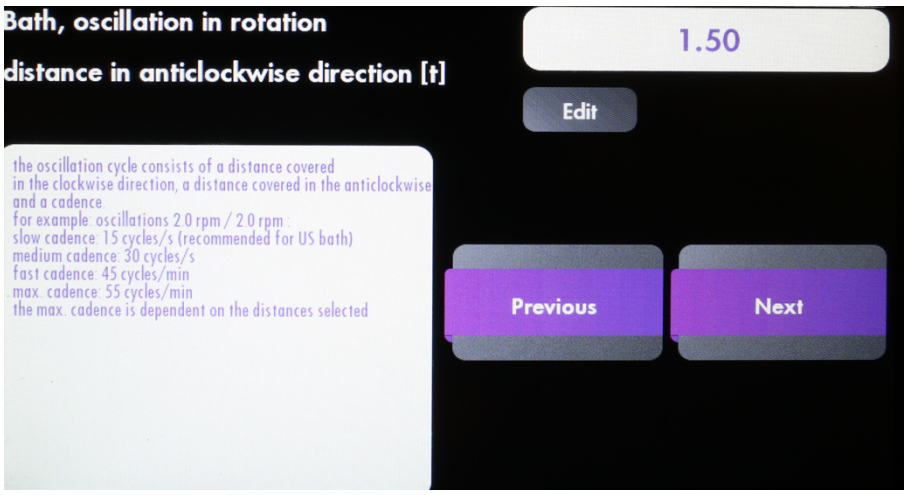
- **Stop**: no rotational movement in the bath.
- **Continuous rotation:** the basket rotates continuously clockwise for the duration of the bath.
- **Half-half rotation**: the basket rotates continuously clockwise for half the duration of the bath, then counter-clockwise for the remaining half.
- **Oscillations**: the basket performs small alternating rotational movements in defined steps.

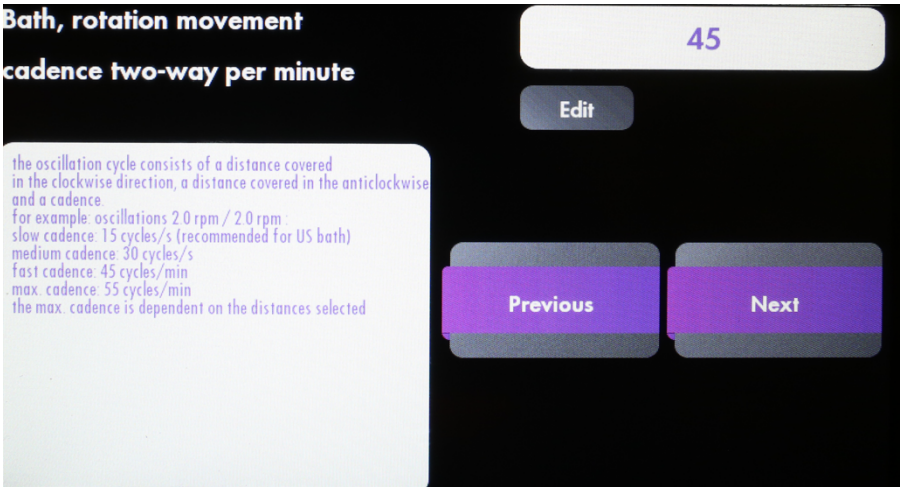
The "continuous rotation" and "half-half rotation" movements can be set from 1 to 800 rpm.



The "oscillation" movement is made up of a clockwise movement, a counter-clockwise movement, and a cadence (number of times the movement is repeated in 1 minute):







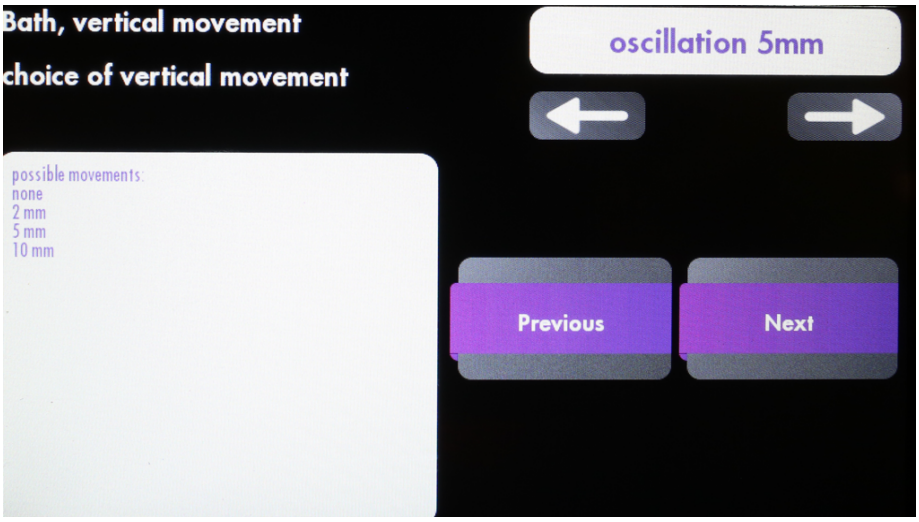
Some examples of oscillation movements:

<u>Very short, sharp movement:</u>
Clockwise distance: 0.25 turns
Counter-clockwise distance: 0.25 turns
Rate: 100 cycles/minute

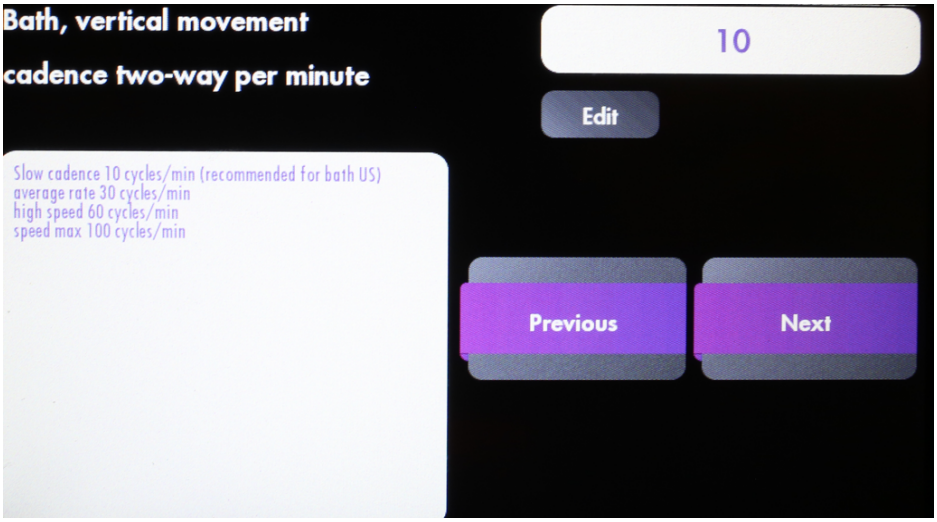
<u>Powerful movement:</u>
Clockwise distance: 2.0 turns
Counter-clockwise distance: 2.0 turns
Rate: 55 cycles/minute

<u>Wide movement:</u>
Clockwise distance: 2.5 turns
Counter-clockwise distance: 2.5 turns
Rate: 36 cycles/minute

For each of these movements, it is then possible to add a vertical movement.

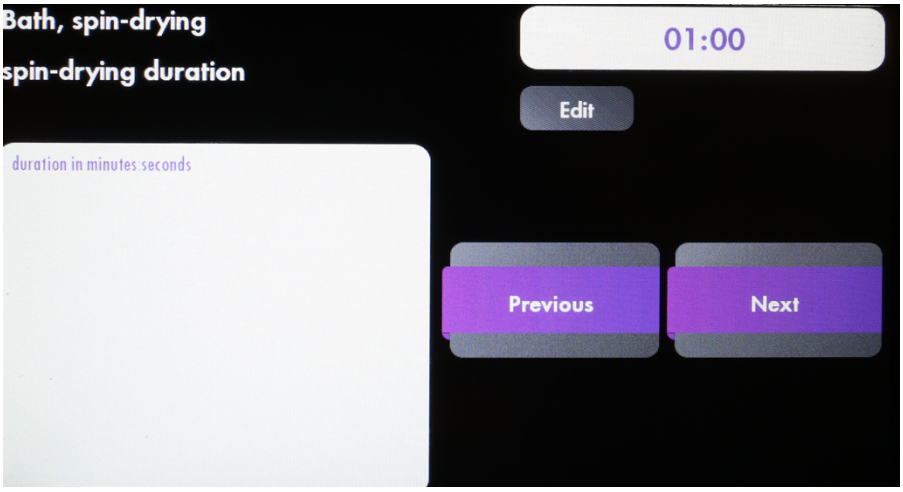


The vertical movement can be set to zero (stop) or to an amplitude of 2, 5 or 10 mm. The rate of this movement can also be set from 1 to 100 cycles/min. This vertical movement ensures that the parts are thoroughly mixed in the cleaning fluid.



After each washing, it is advisable to spin. This is essential to avoid soiling the different baths and dripping during transfers between baths.

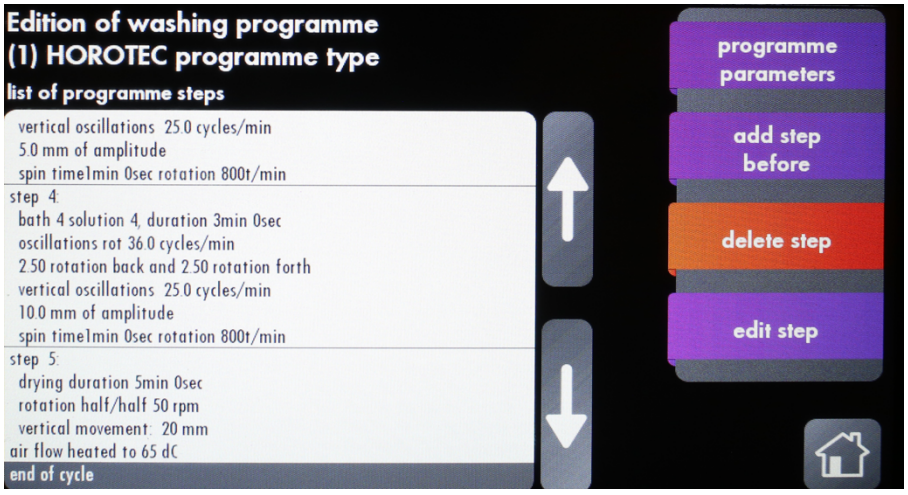
Edit spin duration in minutes / seconds:



Edit spin speed:

The spin movement is a half-half rotation (half the time in one direction, half the time in the other) and can be configured from 1 to 1500 rpm.

Once all these parameters have been edited, click on "confirm". The washing step is then saved in the wash programme. Return to the list of washing programme steps. The "end of cycle" step is selected:

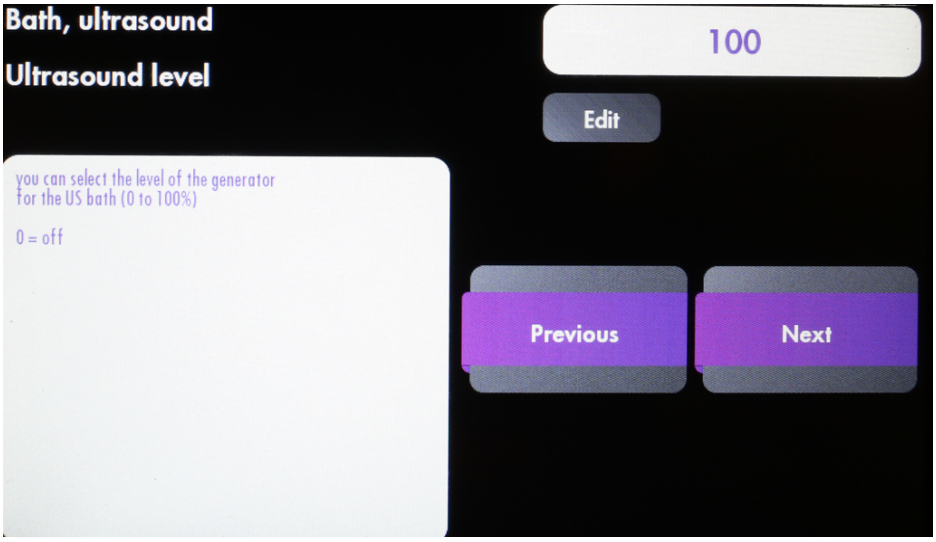


Add a new step to the washing programme

or return to the main menu if you have finished editing the washing programme

Ultrasonic bath

If the ultrasonic bath has been selected, an additional step appears:



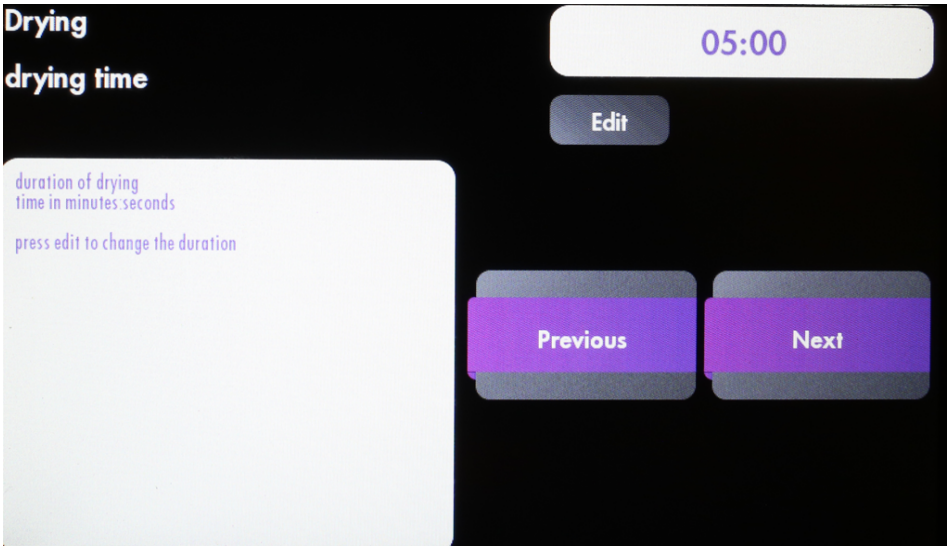
The frequency is 40 KHz with a "sweep" function. This "sweep" function, known as "frequency variation", allows waves to be propagated to any point in the tank for optimum cleaning. The power of the ultrasound generator can be set from 1 to 100% (50 Watt at 100%).

Then continue programming as described above.

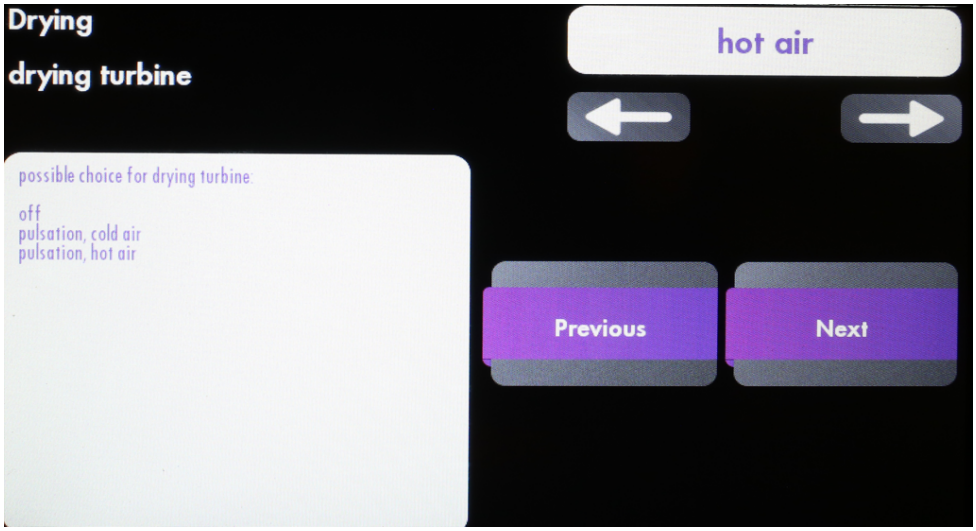
Drying

If you have selected the drying position, programming is as follows:

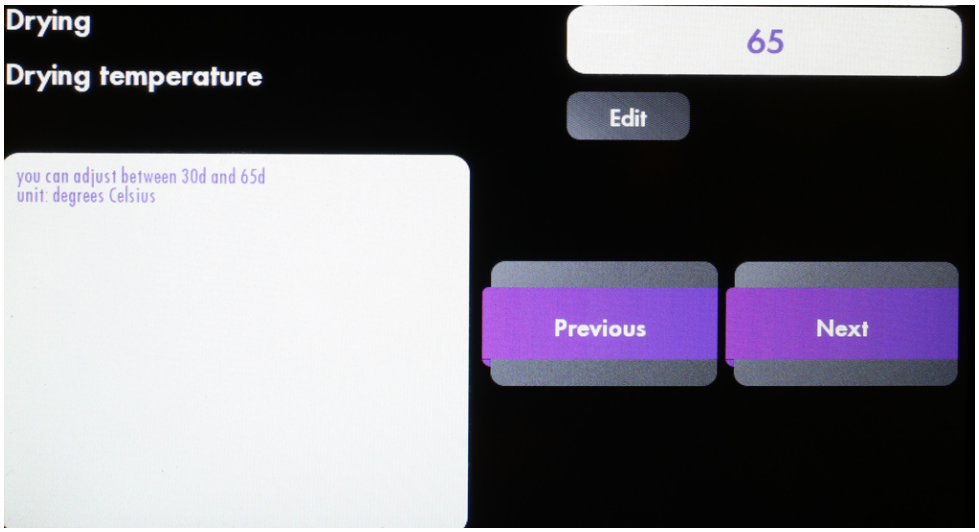
- Edit drying time in minutes / seconds:



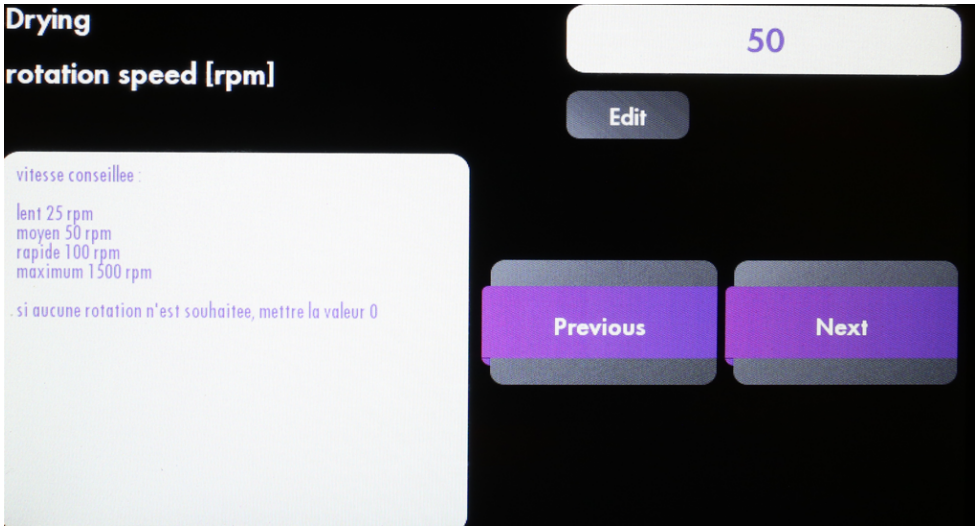
- Select the type of drying: turbine off, cold forced air or hot forced air:



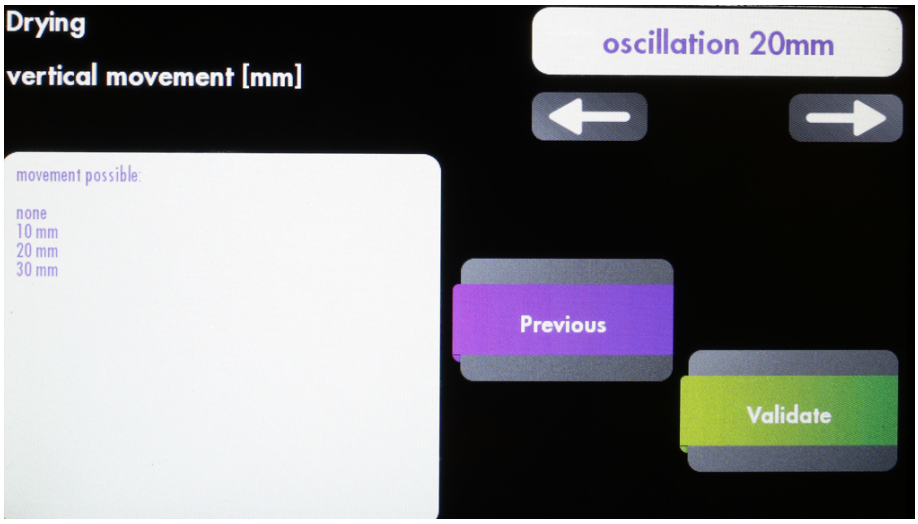
If the hot air turbine option has been selected, edit the forced air temperature (programmable from 30 to 65°C):



It is also possible to set a rotation during drying. The default rotation is half-half (half the time in one direction, half the time in the other). It can be set from 1 to 1200 rpm (a slow rotation speed is recommended at this stage).



It is also possible to add vertical movement during drying:



The vertical movement can be zero (stop) or set to a 10, 20 or 30 mm amplitude. This movement ensures even drying over the entire height of the basket holder.

Once all these parameters have been edited, click on "confirm". The wash step is saved in the washing programme. Return to the list of washing programme steps. The "end of cycle" step is selected:

Add a new step to the washing programme

or return to the main menu if you have finished editing the washing programme.

A few recommendations:

The maximum permissible weight of the basket holder, baskets and parts is 600 grams. The parts must be distributed evenly over the entire surface of the baskets.

Caution: adapt the rotation speeds according to the basket load as described in Chapter 3.10 "Installing the basket holder".

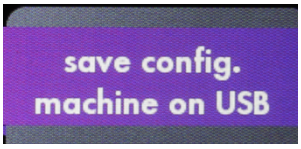
It is not necessary to switch from one bath to another in chronological order; it is possible to switch to the same bath several times during a washing programme. The same applies to drying.

The drying operation is generally located at the end of the washing cycle, but you can place it anywhere in the programme, or even several times.

The VIBRATO machine allows an infinite combination of washing cycles and rotation types, which can be explored to optimise cleaning processes.

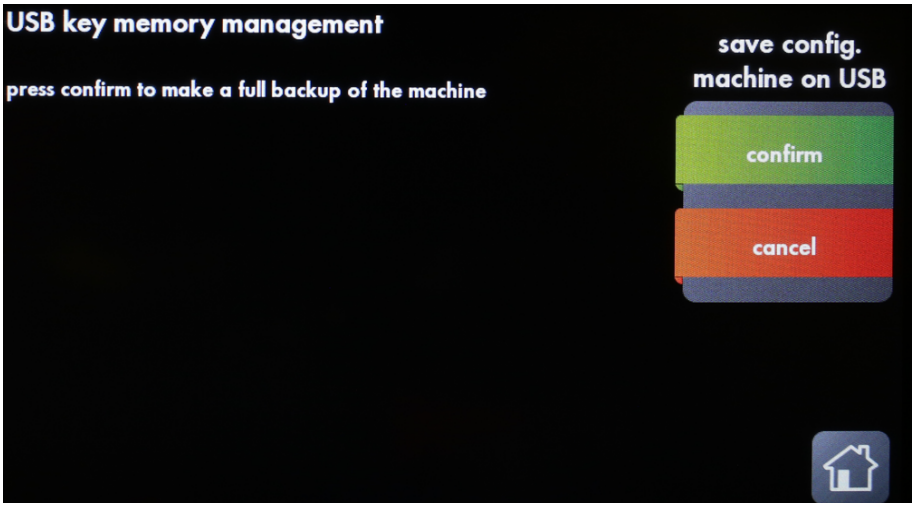
4.3 USB flash drive memory management menu

To access the USB flash drive memory management menu



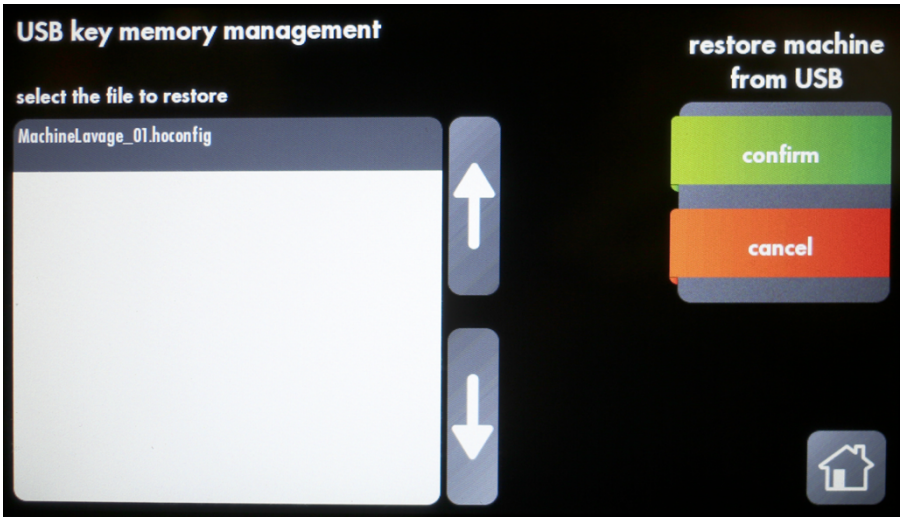
To save the machine configuration on a USB key

Confirm to make the backup



To restore the machine from USB

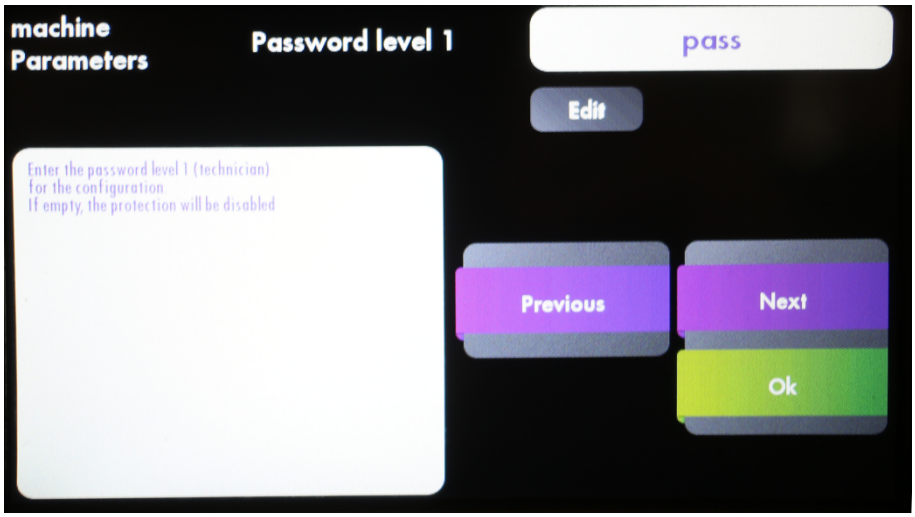
Select the file to restore using the arrows:



To confirm
(**Warning!** This action will delete the file currently on the Horotec "Vibrato" machine).

4.4 Editing options

To access the options editing menu



From this menu, the user can change various machine configuration parameters and options:
- user password
- time before the screen goes to sleep
- language
- buzzer at the end of the washing cycle
- key sound

5 Remote software

This extension allows the user to archive data from one or more Horotec 'Vibrato' machines on their computer/network. The software can also be used to create, modify, or delete washing programmes. The files created can then be loaded onto a USB stick to be imported into a machine (see chapter 4.3 "USB flash dive memory management menu") or sent by email to configure a machine remotely.

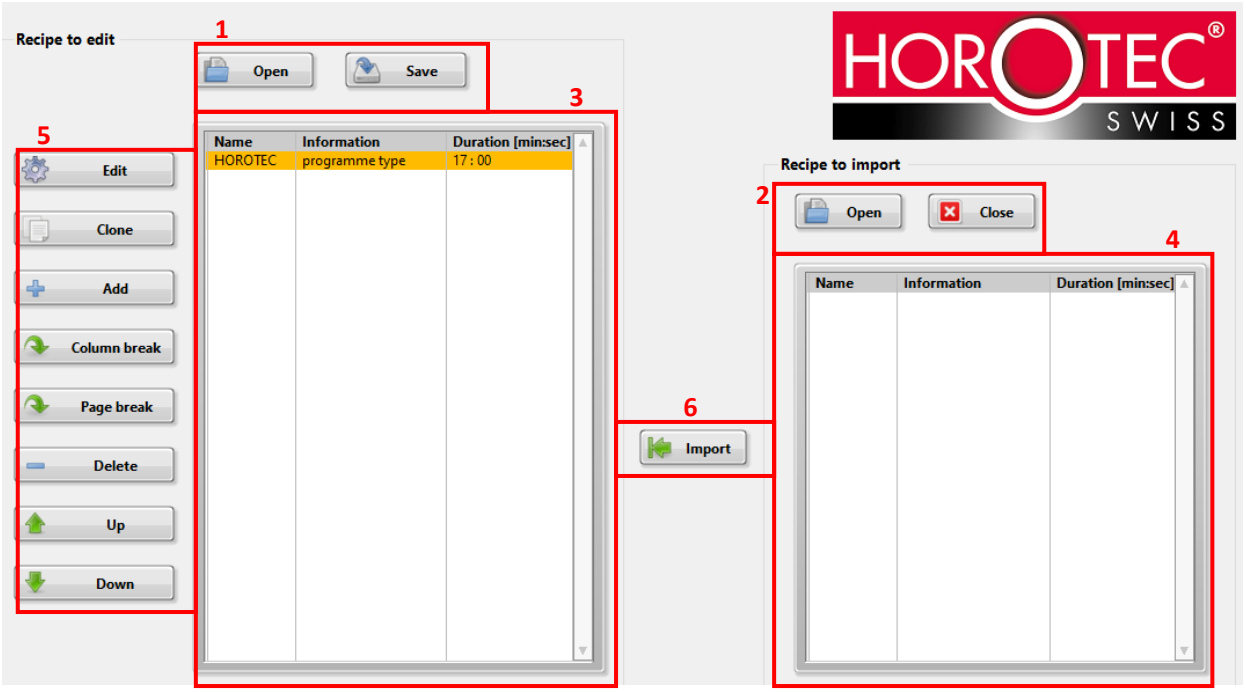
5.1 Installation

The remote software is installed using the USB drive supplied with the Horotec "Vibrato" machine. The software only works on a Windows environment.

5.2 Editing washing programmes

Main interface

The main interface is used to create, open and save a washing programme file (*.hoconfig*). It is also possible to import programmes from another washing programme file.



1.

Open: Use a file selection window to open a washing programme file with the remote software. The list of washing programmes will be displayed in zone **3**. This is where the main file is processed.

Save: Create a file with a file selection window that allows you to determine its name. All washing programmes opened with the remote software will be saved in this file. It is possible to save several files on one computer or on a network.

2.

Open: Use a file selection window to open a washing programme file with the remote software. The list of washing programmes will be displayed in zone **4**. This is where the secondary file is opened in order to extract washing programmes from it and integrate them into the main file.

Close: Clears the list of open washing programmes in zone **4**.

3.

Displays the list of washing programmes.

4.

Displays the list of washing programmes opened with the "Open" button in zone **2**.

5.

This set of buttons is used to manage the list of washing programmes displayed in zone 3.

Edit: Opens the wash programme editing window, which allows you to modify the wash programme selected by the list in zone **3** (see Chapter 5.2 "Editing washing programmes"). If no washing programme is selected in the list, the edit window will modify the first washing programme in the list. If the list is empty, the button performs no action.

Clone: Adds a copy of the wash programme selected by the list in zone **3**. The copy is added at the end of the list. If no washing programme is selected by the list, the copy will be that of the first washing programme in the list. If the list is empty, the button performs no action.

Add: Adds a wash programme to the end of the list (sample programme).

Goto column / Goto page: Adds a "Column break" / "Page break" function at the end of the list. This function is used by the first interface of the washing machine. When displayed, the washing programmes are shown in pages of 3 columns, each consisting of 5 washing programmes. This function can be used to move a washing programme to the next column/page in the interface (see Chapter 4.1 "Daily start-up and basic operation").

Delete: Deletes the selection from the list. If the list is empty, the button performs no action.

Up: Moves the selection in the list upwards. If the list is empty, the button performs no action.

Down: Moves the selection in the list downwards. If nothing is selected in the list, the first selection will be moved down. If the list is empty, the button performs no action.

6.

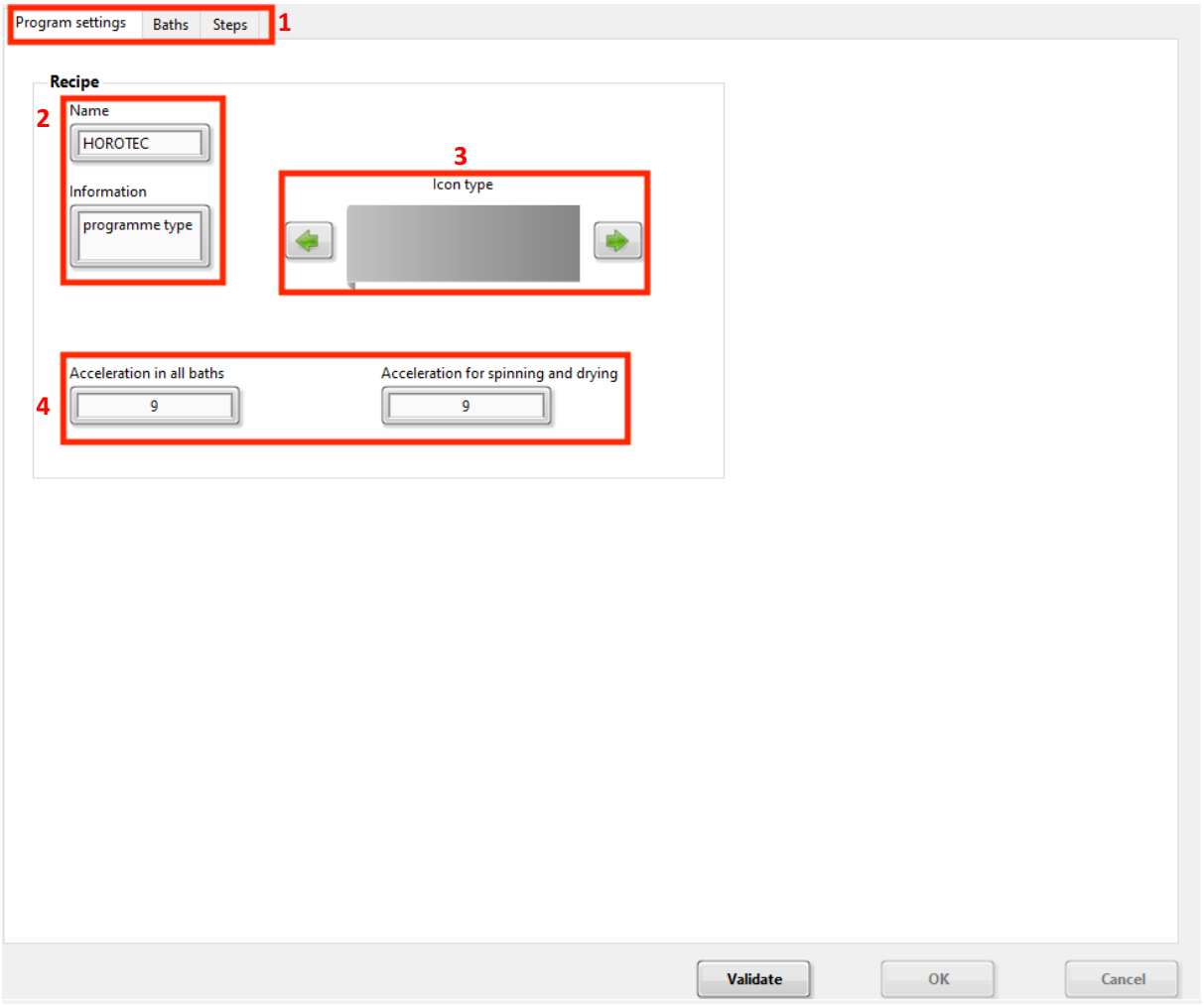
Import: Used to add a copy of a program selected in zone **4** from another file to the file in zone **3**. If the list in zone **4** is empty, the button performs no action.

5.3 Editing the washing programme

1.

The three thumbnails are used to navigate between the pages for editing the parameters of the opened wash programme.

5.3.1 Washing programme settings



2.

Name: Determines the name of the washing programme. The name has a maximum of 14 characters (including spaces). Only the following characters are permitted:
a-z A-Z 0-9 + * / ( ) = - . : !

Information: Determines the washing programme information. The information has a maximum of 30 characters (including spaces). Only the following characters are permitted:
a-z A-Z 0-9 + * / ( ) = - . : !

3.

Determines the colour of the button used by the washing machine interface for the corresponding washing programme. The 2 left and right arrow buttons are used to change between colours.

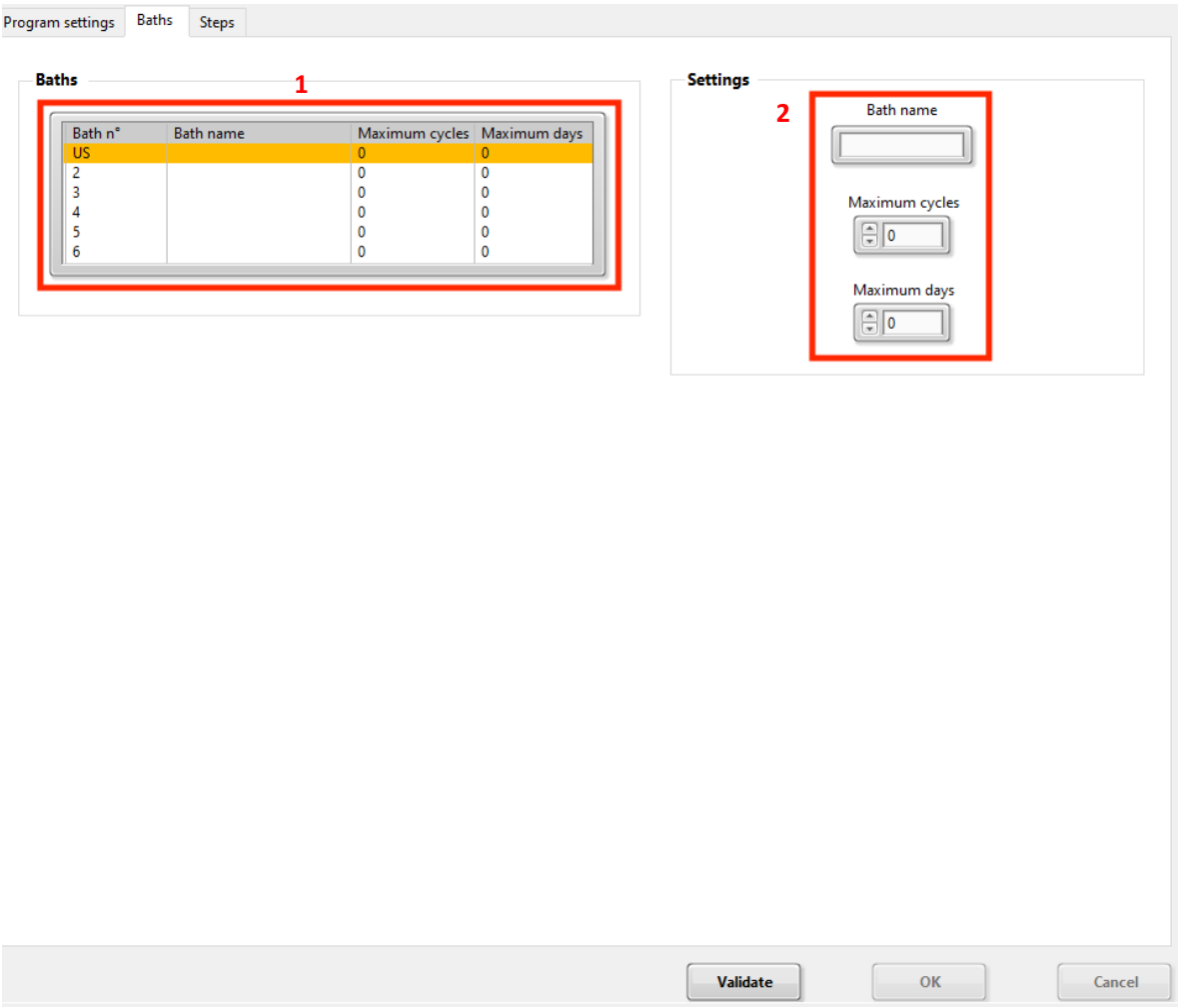
4.

Edit information for the wash programme. The information has a maximum of 30 characters (including spaces).
Only the following characters are permitted:
a-z A-Z 0-9 + * / ( ) = - . : !

Edit the rotation acceleration in all baths for the washing programme being edited.

Edit the rotation acceleration for drying and spinning for the wash programme being edited.

5.3.2 Bath settings



1.

Displays a list of the baths corresponding to the washing programme and their current settings. The selected bath can be changed using the up and down arrow keys.

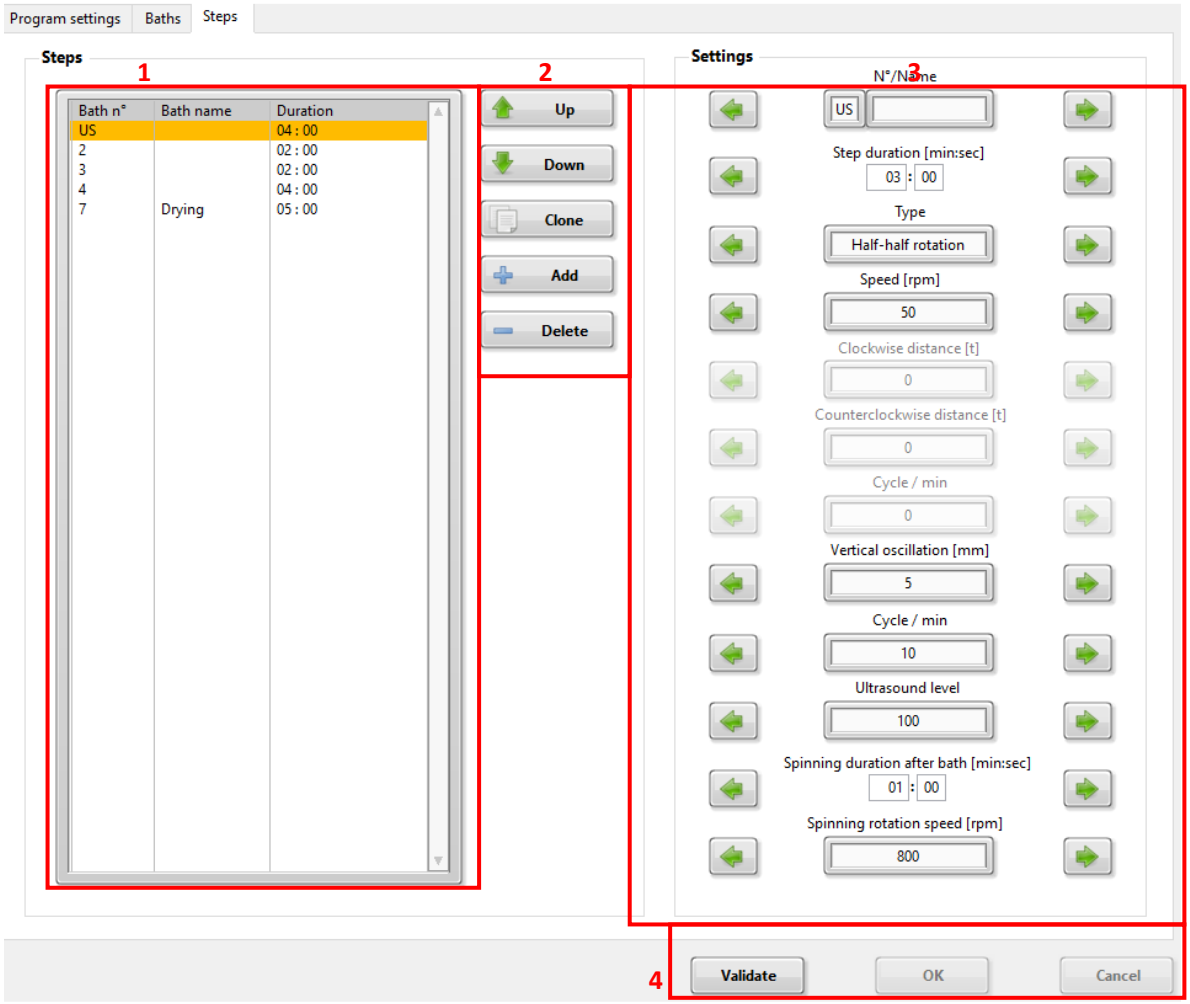
2.

Bath name (optional field): Determines the name of the bath selected in the list in zone **1**. The name has a maximum of 12 characters (including spaces). Only the following characters are permitted:
a-z A-Z 0-9 + * / ( ) = - . : !

Maximum cycles (optional field): Determines the maximum number of cycles for the bath selected in the list in zone **1**.

Maximum days (optional field): Determines the maximum number of days for the bath selected in the zone **1** list.

5.3.3 Step settings



1.

Displays a list of the stages corresponding to the washing programme, together with the number, name of the bath and duration of the stage. The selected step can be changed using the up and down arrow keys.

2.

Set of buttons used to manage the list of steps.

Up: Moves the step selected in the list upwards. If the list is empty, the button performs no action.

Down: Moves the selected stage down the list. If no step is selected in the list, the first step will be moved down. If the list is empty, the button performs no action.

Clone: Adds a copy of the step selected by the list in zone **1**. The copy is added at the end of the list. If no step is selected by the list, the copy will be that of the first step in the list. If the list is empty, the button performs no action.

Add: Adds a step at the end of the list.

Delete: Deletes the step selected in the list. If no step is selected in the list, the first step is deleted. If the list is empty, the button performs no action.

3.

Set of all the parameters corresponding to the step selected in the list in zone **1**. The items correspond to what is requested by the machine when a step is created/modified.

Values can be entered directly in the text fields or using the left and right arrow buttons. See Chapter 4.2.3 "Editing the washing programme" for more details.

4.

Validate: This button is used to validate before closing the window. Once validated, the OK and Cancel buttons are activated. If the user returns to the parameter text zones, validation is cancelled.

OK: Closes the window and validates all changes made in the wash programme editing window.

Cancel: Closes the window and cancels all changes made in the wash programme edit window.

6 Preventive maintenance by user

This preventive maintenance must only be carried out by qualified personnel. Only original parts may be used.

6.1 Machine maintenance

Make sure that the equipment is disconnected from the power supply before any maintenance or cleaning operation.

Before any maintenance operation, open the machine door and leave to air for at least 2 minutes. Be sure to empty and clean the beakers before carrying out any maintenance on the machine.

No parts may be replaced by the user without the manufacturer's agreement, with the exception of the following parts:

Qty	Description	Reference
1	Ultrasonic beaker set	MSA19.705-O
1	Retention kit	MSA19.705-V
6	Cover gasket assembly (see below)	MSA19.705-H
1	Spindle cover gasket assembly (see below)	MSA19.705-J
1	Basket holder support	MSA19.705-P1
3	Delayed fuse 6.3A (see below)	MSA19.708-B
3	Fast fuse 3.15A	MSA19.708-B1
1	Delayed fuse 1.5A	MSA19.708-B2
4	Fan screen 80x80 + foam	MSA19.708-A
4	Fan screen 120x120 + foam	MSA19.708-A
1	Ball screw grease	MSA28.UT18-100

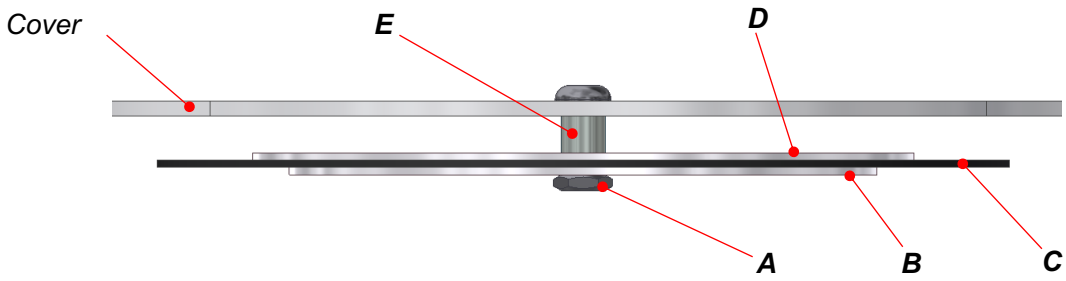
A list of accessories available for this machine is also available in Section 3.2 "Accessories".

Cover seal assembly MSA19.705-H

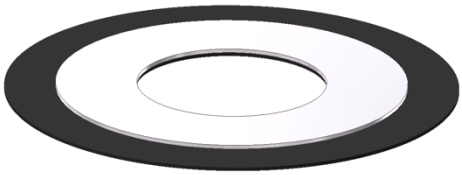
To change the MSA19.705-H cover seal assembly, proceed as follows (*sketch on next page*):

- Unscrew nut (**A**), holding the parts to prevent them from falling into the machine.
- Parts (**B**), (**C**), (**D**) and (**E**) can be removed from the bottom.
- To fit a new MSA19.705-H cover seal assembly (**B, C, D**), reassemble the parts in the following order: (**E**), (**D**), (**C**) and (**B**).

- Fasten with nut (**A**).
Proceed in the same way for the other cover seals.

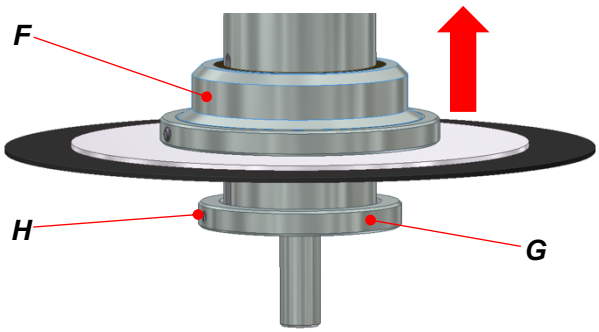


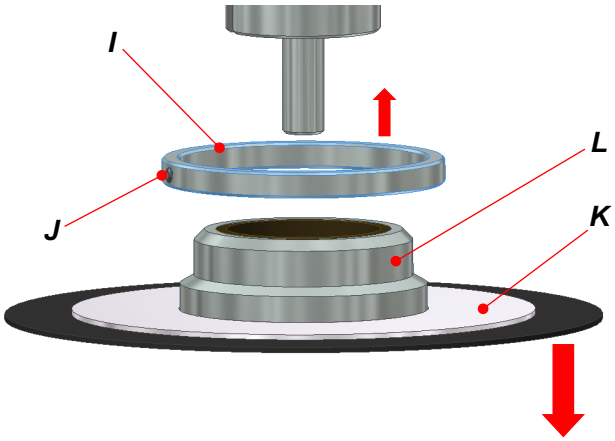
Spindle cover seal assembly MSA19.705-J



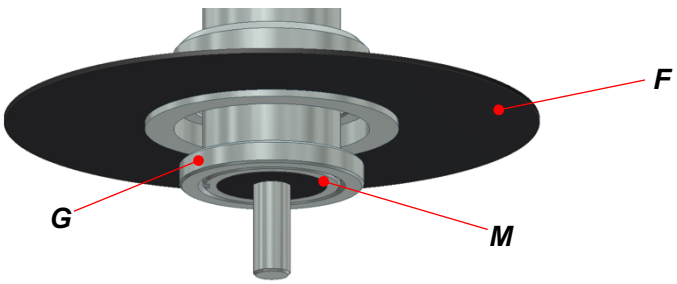
To change the MSA19.705-J spindle cover seal assembly, proceed as follows:

- Slide the entire assembly (**F**) upwards.
- Remove the ring (**G**) by loosening the screw (**H**).
- Remove assembly (**F**) by sliding it downwards.
- Remove the ring (**I**) by loosening the screw (**J**).
- A new seal assembly (**K**) can be placed on the ring (**L**) and reassembled using the reverse procedure.

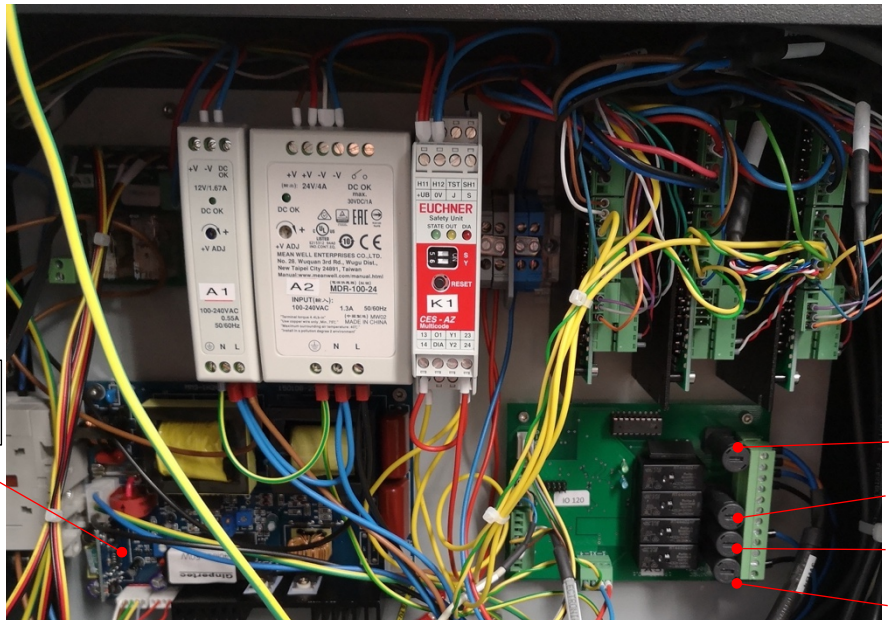




<u>Caution!</u> When reassembling the new seal assembly (**F**), ensure that the ring (**G**) is aligned (flush) with the shaft (**M**) before retightening.



Fuses:

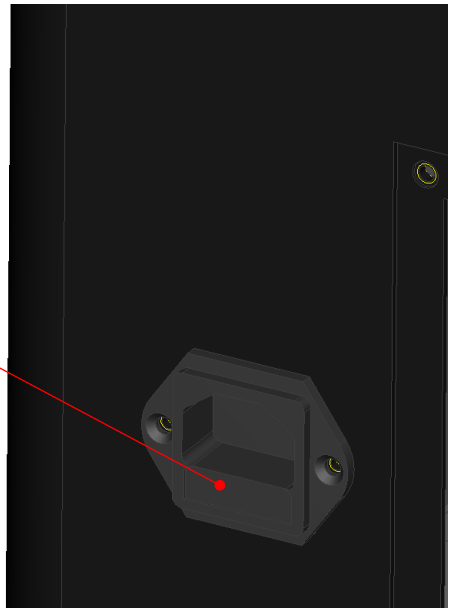


To change the power supply fuse(s), proceed as follows:

Using a tool (screwdriver or similar), remove the fuse-holder tray (**A**).

Replace the fuse(s) according to the references given previously (chapter 6.1 "Machine maintenance").

Replace the fuse-holder tray (**A**)



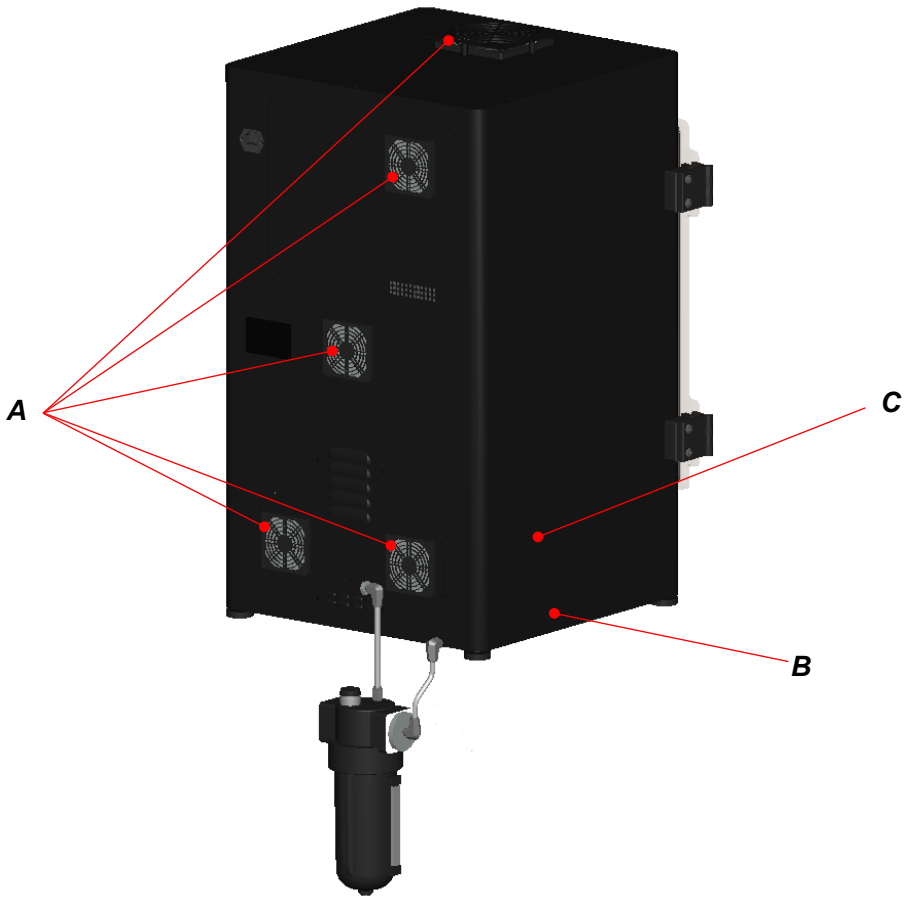
The following maintenance operations are recommended in the user manual. They can be carried out by the user himself.

Weekly:
- Check the fouling level on the fan foams (**A**)
- Check the general cleanliness of the machine.

Monthly:
- Dismantle and thoroughly clean the fan foams (**A**).
- Clean the outside of the appliance only with a soft cloth and a solvent-free product. The interior can be cleaned with all common cleaning products.

Every 6 months:
- Check the condition of the beaker seals: depending on the nature of the solvents, the seals may be damaged prematurely (hardening, cracks).
- Clean the inside of the retaining tank (**B**): open the hatch (**C**) on the left-hand side, clean the retaining tank and make sure it is clean and dry. Leave the machine to dry for 2 hours before closing the hatch (**C**).

Every year:
- Change all fan screens and foam (**A**): see spare parts list above.
- Check that the machine is operating correctly and notify the supplier of any fault found (alignment problems, unusual noises, alterations to the machine's mechanical and electronic functions).
- Grease the ball screw (see section 6.2 "Greasing the ball screw").

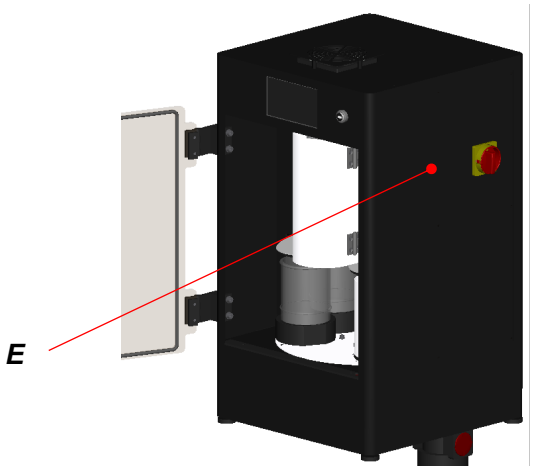


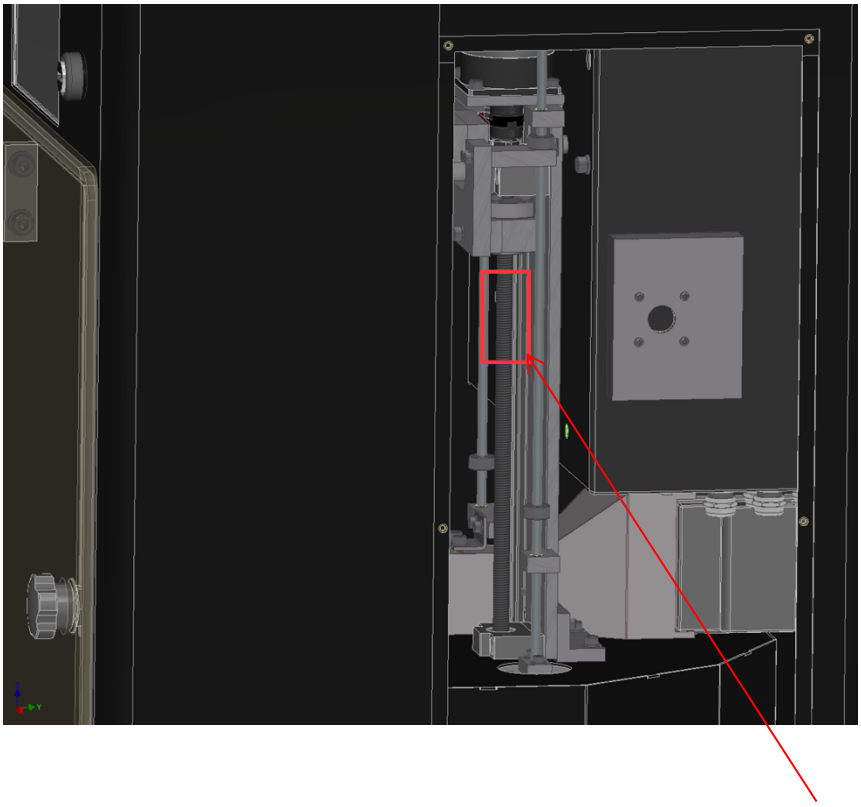
6.2 Greasing the ball screw

To grease the ball screw, proceed as follows:

Disconnect the machine from the power supply

Open the right-hand side panel (**E**)





Apply a small amount of grease (HOROTEC - MSA28.UT18-100) to the top of the ball screw. It is not necessary to grease the entire screw, as the grease will be distributed over the screw as it moves.

6.3 Cleaning in the event of an accidental spillage

In the event of accidental liquid spillage into the machine, there is a drain in the lower part of the machine. The liquid then drains into a retention beaker.

Clean the machine as follows:

Do not work on the interface and disconnect the machine from the power supply.

Open the door (**A**) and the spindle protection plate (**B**).

Remove manually the beakers (**C**), following the procedure described in section 2.6.3 "Manual removal of solvents".

Open the hatch (**D**) on the left-hand side of the machine.

Open the left and right-side closing panels (**E**)

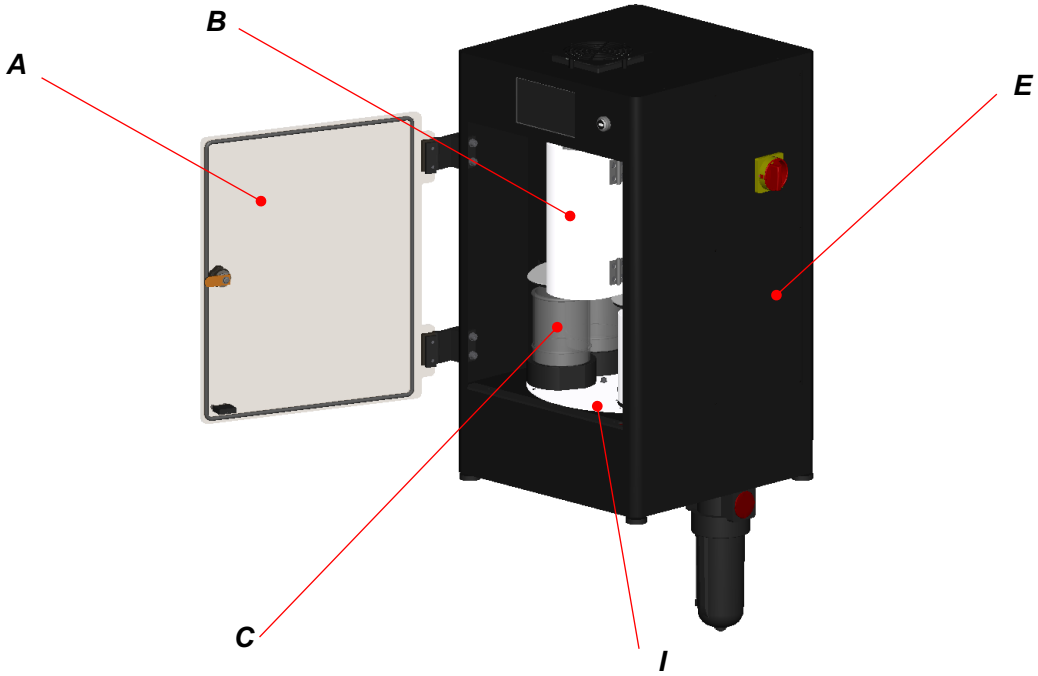
Remove the foam from the fans (**G**) and discard it

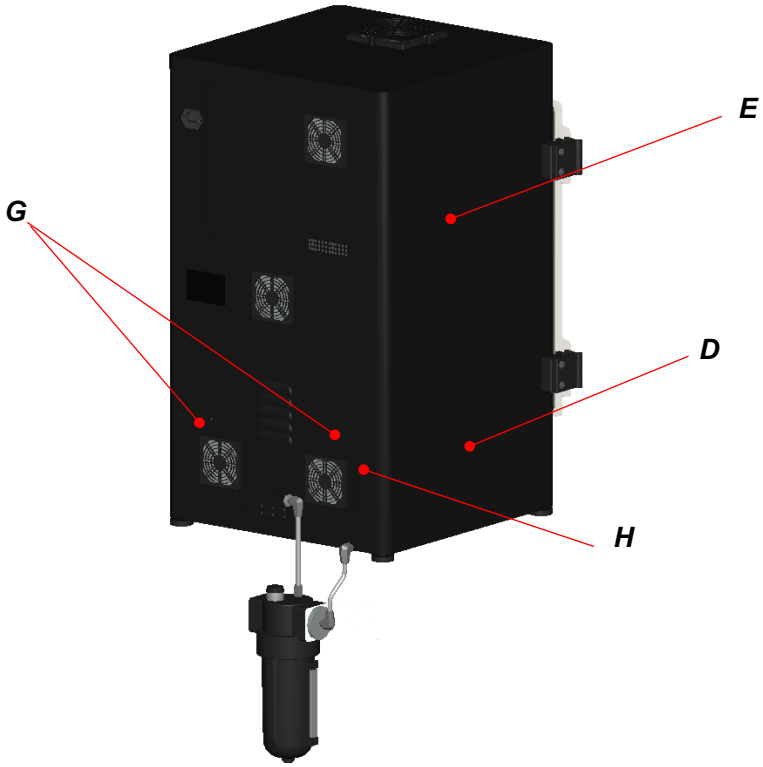
Remove the fan cover (**H**)

Clean the inside of the machine (**I**) with an absorbent cloth.

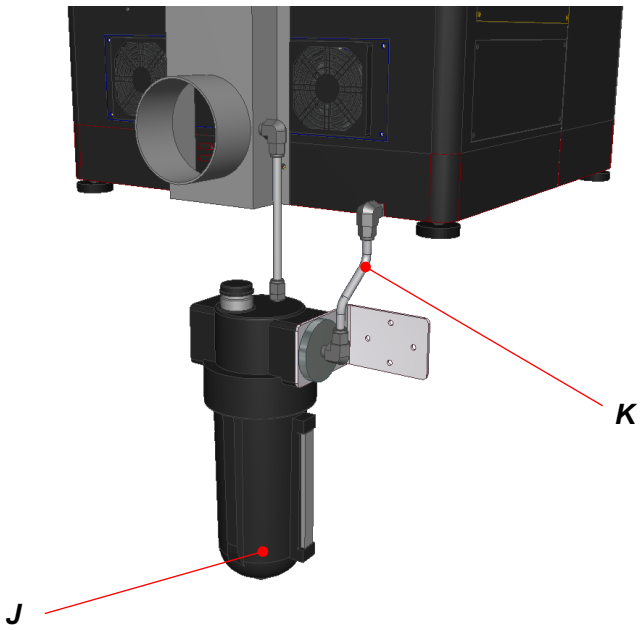
Make sure there is no liquid behind the panels (**E**), clean and wipe if necessary.

Clean the inside of the retaining tank with an absorbent cloth through the hatch (**D**).





Empty the retaining beaker by unscrewing the lower tank (**J**) and allow to dry. Check that the connection pipe (**K**) to the retaining beaker is empty.



Make sure the entire machine is clean and dry.

Let the machine dry for 24 hours.

Replace the retaining beaker (**J**) and the fan cover (**H**).

Change the fan screens and foams (**G**): refer to the list of spare parts in Chapter 6.1 "Machine maintenance".

Refit the side panels (**E**) and then the hatch (**D**).

Make sure that the external air extraction system is switched on.
Connect the machine to the power supply using the connection cable.

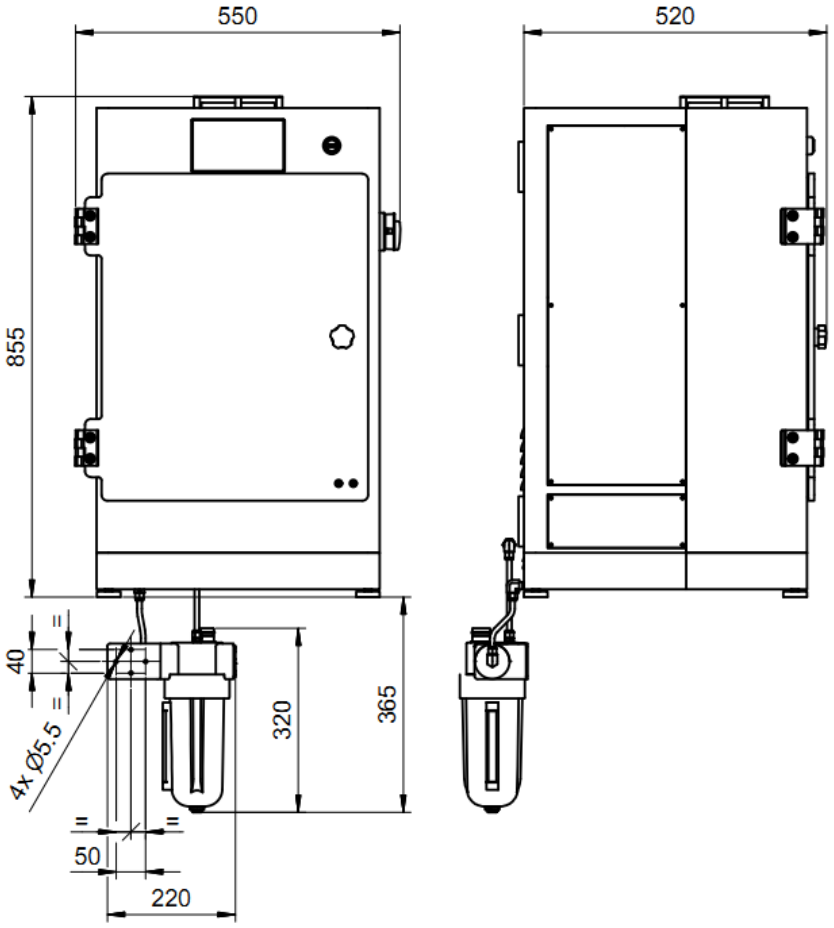
Start the machine normally.

6.4 Changing the spindle bearings

The spindle bearings must be changed:
- Every 4000 hours of spindle operation or 4 years
- Following a crash or a spindle malfunction.

The spindle bearings must be replaced by a Horotec SA service engineer.

7 Technical data



Power:	1000 W
Nominal current:	6 A
Nominal voltage:	Nominal voltage: 230 V (115 V on request, see nameplate on rear of machine)
Ultrasonic:	40 kHz/50 W
Equipment noise level:	< 70dB
Heating temperature:	65° C
Weight:	67.5 kg (148,8 Lbs)
Max. load capacity (including baskets and basket holder):	600 g (1,32 Lbs)

8 TÜV SUD certificate

Process Safety

Appendix A: Certificate

The company TÜV SÜD Schweiz AG
Mattenstrasse 24
CH 4,058 Basel

Hereby certifies that the Vibrato Machine

Supplied by
UNIMEC SA
Jura Industriel 34
CH-2300 La Chaux-de-Fonds

complies with the explosion protection requirements of EU Directive 2014/34 (ATEX 2014} and can be used safely for cleaning timepieces. The machine version is 6435000 and the control software version is V3.00.

Equipment category: 3G. ATEX marking will be : II 3/- G. II 3/- G.

The equipment is designed so that no flammable atmosphere develops outside it, if it is assembled in accordance with the operating instructions and can therefore be installed outside an ATEX zone.

The absence of effective ignition sources for the non-electrical part corresponds to the requirements of the following standards and guides:

- **IEC 60079-0: 2,017**
- **IEC 60079-32-1: 2,013**
- **IEC 80079-36: 2,016**
- **IEC 80079-37: 2,016**
- **EN 1,127: 2,011**

In this regard, the IEC marking can be Ex h b IIB 74 Gc.
The equipment documentation was reviewed by TÜV SÜD Schweiz AG and a systematic analysis of ignition sources was carried out. This certificate is also based on a risk assessment (FMEA), which has enabled the various risks to be exhaustively assessed and corrected.

Unimec – Analyse de risques
Version 1

Process Safety

Serge Forestier
TÜV SÜD Schweiz AG

9 EC Declaration of Conformity

We, the undersigned:

HOROTEC SA, Avenue Léopold-Robert 105b, CH - 2300 La Chaux-de-Fonds

Declare, according to the documentation MSA19.705-V4, under our sole responsibility that the machine described below:

Description: ultrasonic cleaning machine

Description: HOROTEC VIBRATO

Machine reference: MSA19.705-V4 / Série 42021/xxx

- Complies with the provisions of European directives and in particular:

The essential health and safety requirements relating to the design and construction of machinery (Directive 2006/42/EC).

Electromagnetic compatibility of communication disturbances (Directive 2014/30/EU).

Use of low-voltage electrical equipment in compliance with Directive 2014/35/EU. Wiring category 3.

- Complies with the provisions of the following harmonised European standards:

EN ISO 12,100 : 2,010 EN-60204.1.

Person authorised to

compile the file: HOROTEC SA, Avenue
Léopold-Robert 105b CH - 2300
La Chaux-de-Fonds

Date: 27th October 2022

Venue: La Chaux de Fonds - Suisse.

HOROTEC SA

Avenue Léopold-Robert 105b
CH - 2300 La Chaux-de-Fonds

10 ATEX Declaration of Conformity

We, the undersigned:

HOROTEC SA, Avenue Léopold-Robert 105b, CH - 2300 La Chaux-de-Fonds

Declare, according to the documentation MSA19.705-V4, under our sole responsibility that the machine described below:

Description: ultrasonic cleaning machine

Description: HOROTEC VIBRATO

Machine reference: MSA19.705-V4 / Série 42021/xxx

To which this declaration refers complies with the following standards or normative documents:

Directive 2014/34/EU (ATEX 2014)

Title or number of standards and documents:

- EN 13463-1
- IEC 60079-0
- IEC 60079-32-1
- IEC 80079-36
- IEC 80079-37
- EN1127

Equipment category: - ATEX marking: II 3/- G

Product category: - Ex h b 11B T4 Gc

Person authorised to **to compile the file:** -

HOROTEC SA, Avenue Léopold-Robert 105b CH – 2300 La Chaux-de-Fonds

Date : 27th October 2022

Venue: La Chaux de Fonds - Suisse.

HOROTEC SA

Avenue Léopold-Robert 105b
CH - 2300 La Chaux-de-Fonds

11 Disposal

Your appliance may contain solvent residues. Please purge the machine before disposal. The machine contains many recoverable, recyclable, or hazardous materials. Please do not dispose of it in a rubbish bin but take it to an approved service centre for treatment.

You can obtain more information about legal requirements from your local authorities.