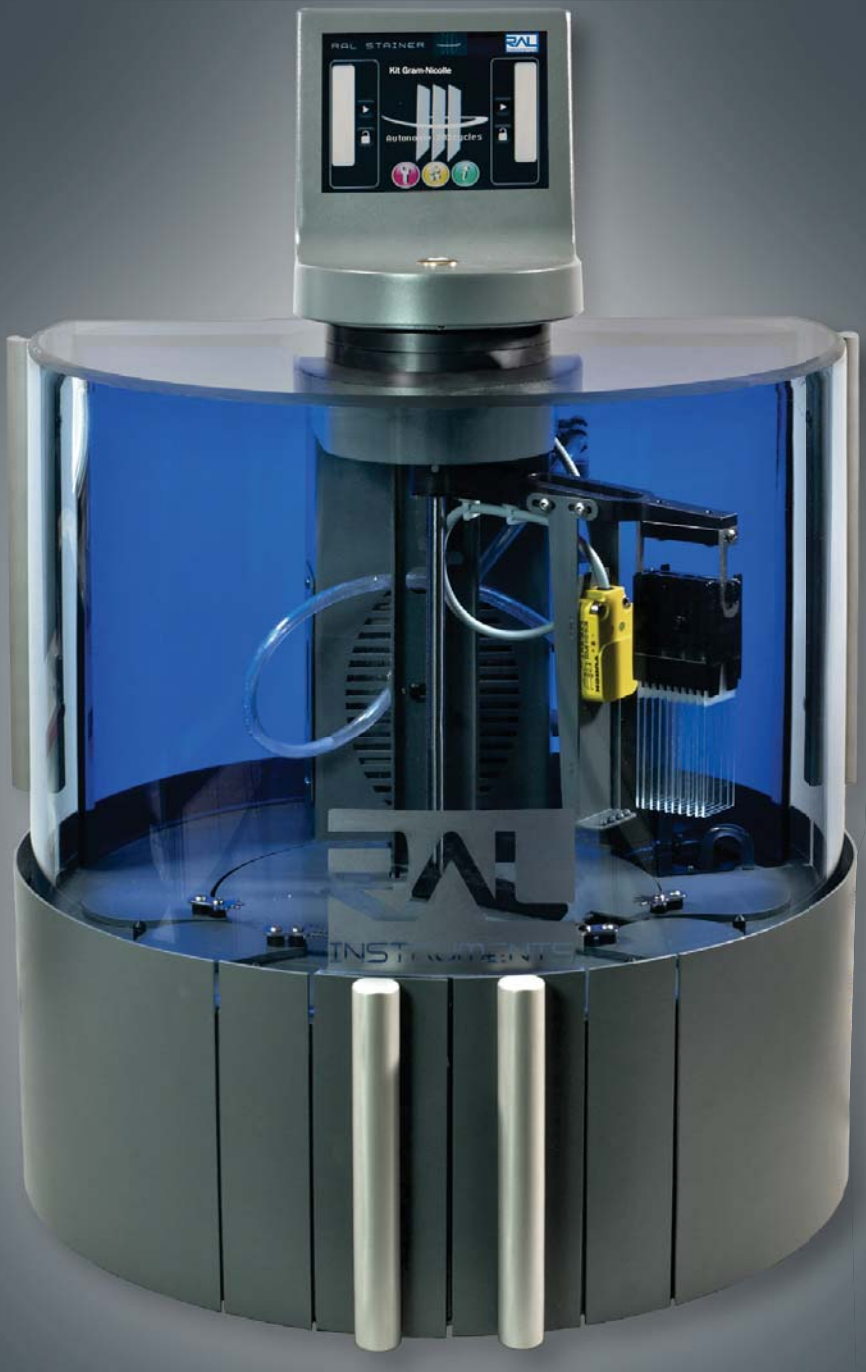
RAL STAINER

The RAL Automated staining system



User Guide

Ref:12060-V05 / EN

Before use, please read the user guide carefully in order to be able to use the equipment correctly.

The user guide must be kept in the immediate vicinity in order to be available for reference at all times.

History of changes to the user guide

Revision	Date	Section	Software Version
1	03/2012		2.43
2	07/2012	6	2.55
3	08/2012	12	2.55
4	02/2013	-	2.60
5	07/2013	-	2.63

Updates available on **www.ral-instruments.com**.

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RAL INSTRUMENTS

RAL STAINER

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1 INTRODUCTION

Thank you for having chosen RAL Stainer.
RAL Stainer is intended for the staining of haematological or bacteriological smears.
It can be used to autonomously stain 20 slides and returns the slides ready for observation.
It recognises the staining kits installed and recommends the protocol to use as well as the renewal of the reagents.
It can trace staining carried out using an RFID system.
It ensures the complete safety of the user: the user loads and unloads the biological samples without opening the appliance, the residual stain emanations are retained by an activated carbon filter.

1.1 RESPONSIBILITY

Even if the greatest care has been given to the drafting of this guide, RAL Instruments cannot be held liable by any party in the event of damages caused, or supposed to have been caused, either directly or indirectly, by the failure to carry out the instructions contained in this guide or by the non compliant use of the equipment described below.

2 SYMBOLS

2.1 SYMBOLS USED IN THIS GUIDE

RAL Stainer is designed in order to ensure the maximum safety of the user. However, it is necessary to follow the instructions described in this guide and indicated by the following symbols:

Attention : Failure to respect the information preceded by this symbol can be dangerous for the user or for the environment ; or cause major damage to the appliance.

Warning: This symbol precedes all information covering the correct use of the appliance and a quality diagnosis.

Biological risks

Information: This symbol precedes information that may be useful to a user operating the appliance.

Tips: This symbol precedes useful advice.

2.2 DESCRIPTION OF THE SYMBOLS ON THE APPLIANCE

Front side

Back side

Biological Risks

REF Appliance Reference

SN Appliance Serial Number

Manufacturer's Address

Fabrication Date

Operating relative humidity limits

Operating temperature limits

Recycling of the instrument or return to the distributor

Pollution Control

Attention, see User Guide

Consult the User Guide

IVD Medical In Vitro Diagnosis System

Security Certification

CE European Compliance

3 WARRANTY AND WARRANTY LIMITS

The duration of the warranty for equipment and manufacturing faults is indicated on your warranty contract.
The warranty period starts on the day your RAL Instruments representative commissions the equipment.
Failure to respect the safety instructions below or a use which is not compliant with this user guide may use cause the cancelling of the warranty.
The warranty does not cover wear parts.

4 SAFETY INSTRUCTIONS

4.1 COMPLIANT USE

- RAL Stainer is intended for the staining of haematological or bacteriological smears. It operates using RAL Stainer kits from RAL Diagnostics. It is not designed for any other use and cannot be operated using other reagents than those from RAL Diagnostics.
- The smears will be made on standard slides.
- RAL Stainer is strictly reserved for interior use.
- The use of the appliance must comply with the instructions given in this guide.
- The conditions of compliant use also include the regular cleaning of the appliance and the carrying out of maintenance operations.
- The unpacking, installation and repair operations must be carried out by an authorised technician.
- The reservoir tank must be always in place. See section 7.3.
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions : (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

4.2 WARNINGS

- Failure to respect the safety instructions and the use instructions may compromise the user safety.
- Never connect the appliance to a mains power outlet supplying a voltage different than that indicated on the rear of the appliance. The main supply must not exceed ± 10% of the specified voltage (100-240V). Failure to follow this instruction can cause a fire or an electric shock.
- Avoid causing damage to the power supply cable. Do not place any appliances on it. Do not tug on the cable (to disconnect the appliance for example). Failure to follow these instructions can cause a short circuit or a disconnection that could, in turn, cause a fire or an electric shock.
- Before connecting the product to the mains, check that the electrical installation of the building complies with national installation regulations.
- Do not use a power cable of a length greater than 3m.
- Never touch the electric circuits or other parts located inside the appliance. There is a risk of electric shock, especially with damp hands.
- The lithium battery contained in the electronic card located in the left reagent drawer of the device can be replaced by a battery with the same characteristics (CR1220 3v). If not, it may cause an explosion. Throwing away used batteries according to your laboratory practises.
- In the event of unusual smoke being emitted by the appliance, immediately switch it off using the main switch and unplug the mains power supply cable. Contact the RAL Instruments post-sales service.
- It is prohibited to force the cover openings, the slide drawers or the reagent drawers both when operating and when not operational.
- It is prohibited to force the rotating arm both when operating and when not operational.
- Wear laboratory gloves and a laboratory coat when using the appliance and its reagents. The dangers relative to each reagent are indicated on their respective packaging or see section 6. In the event of an accident, refer to the relevant safety data sheets.

- **All biological samples, all effluents and all used consumables should be considered to be potentially dangerous. Once the appliance is no longer used, the user should disinfect and wash his/her hands.**
- **The contact between contaminated hands and the appliance can cause the contamination of the appliance. In this case, decontaminate the appliance according to current laboratory best practises. See also section 12.2.**
- Generally, make sure that current laboratory best practises are used.

The guarantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could avoid the user's authority to operate the equipment.

4.3 WASTE

4.3.1 ELECTRONIC WASTE

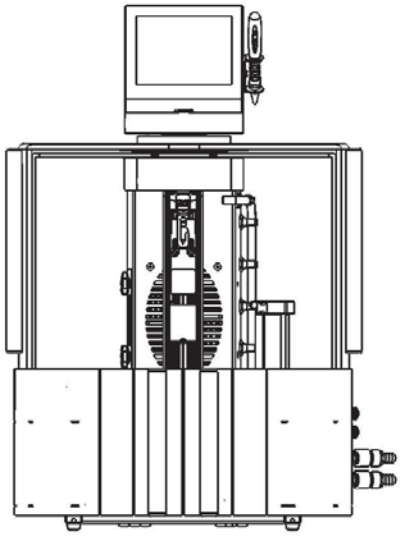
This symbol is applicable in European countries.
It indicates, in compliance with the 2003/108/EC directive relating to electric and electronic waste, that electric and electronic objects are subject to selective waste collection by the company that brought them onto the territory. Contact your RAL Instruments representative.
Outside the European Union, refer to current local or national regulations.

4.3.2 BACTERIOLOGICAL AND CHEMICAL WASTE

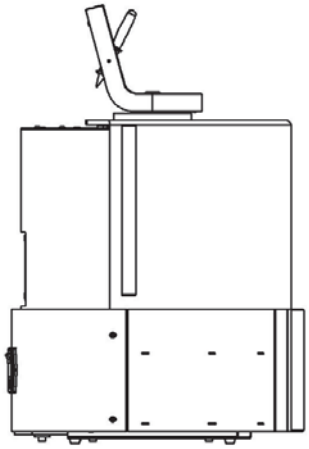
Before disposing of biological samples and/or chemical reagents, consult the reagent safety instructions.

Generally, make sure that current laboratory best practises are used.

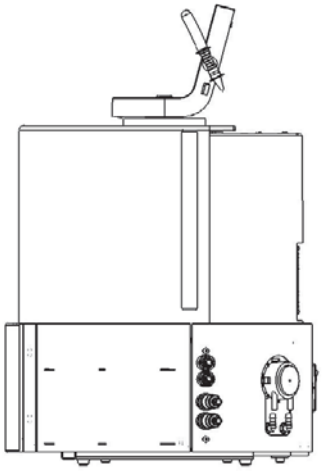
5 DESCRIPTION OF THE APPLIANCE



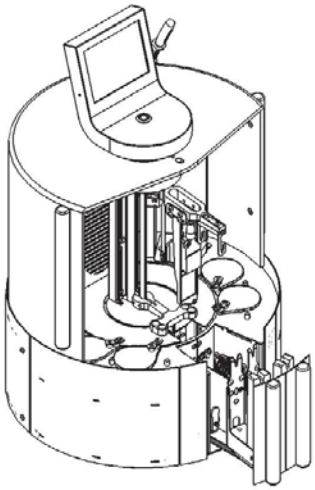
Open front face view



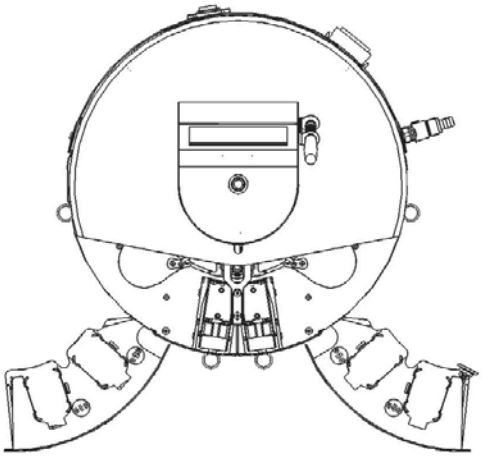
Left view



Right view

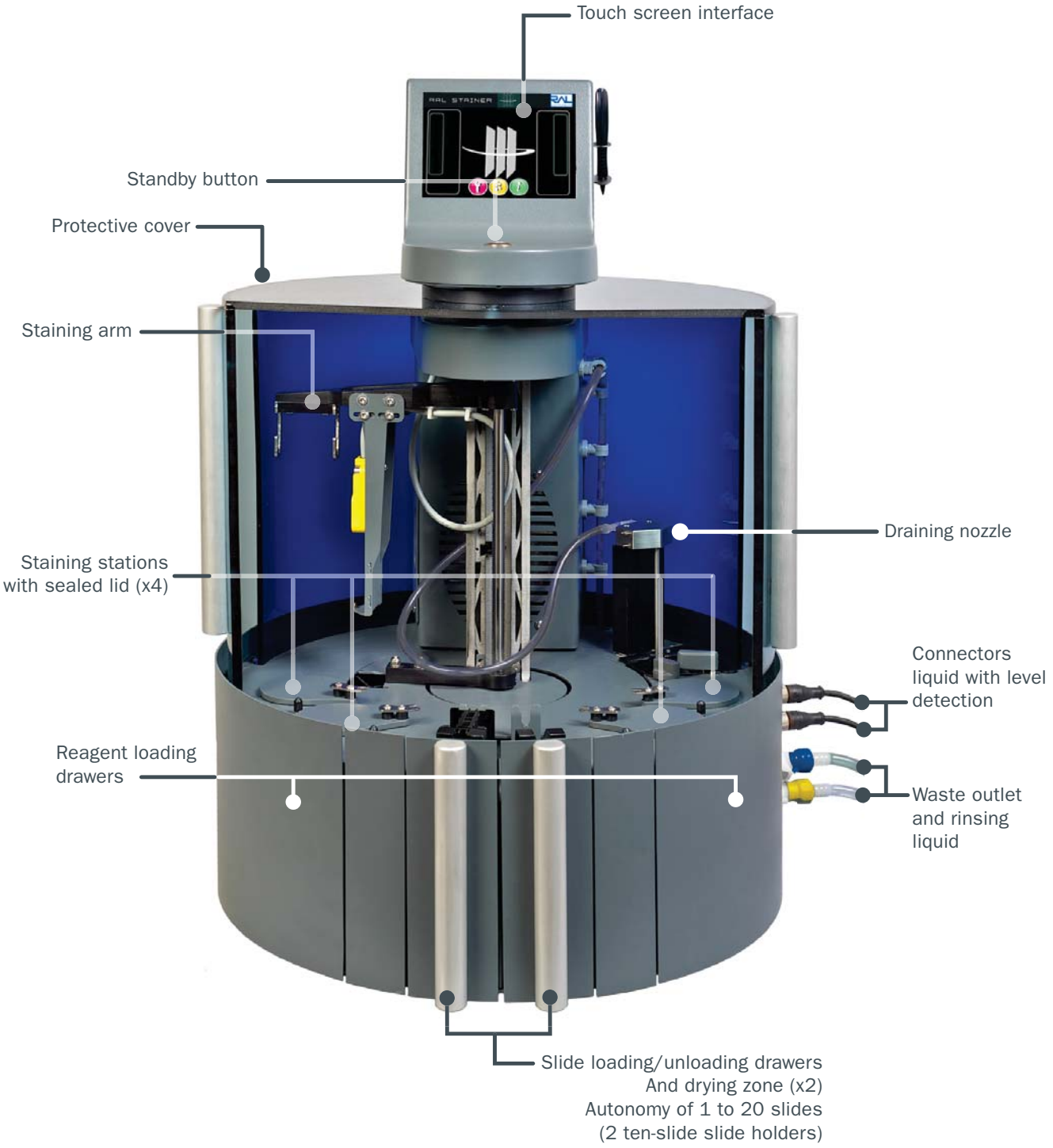


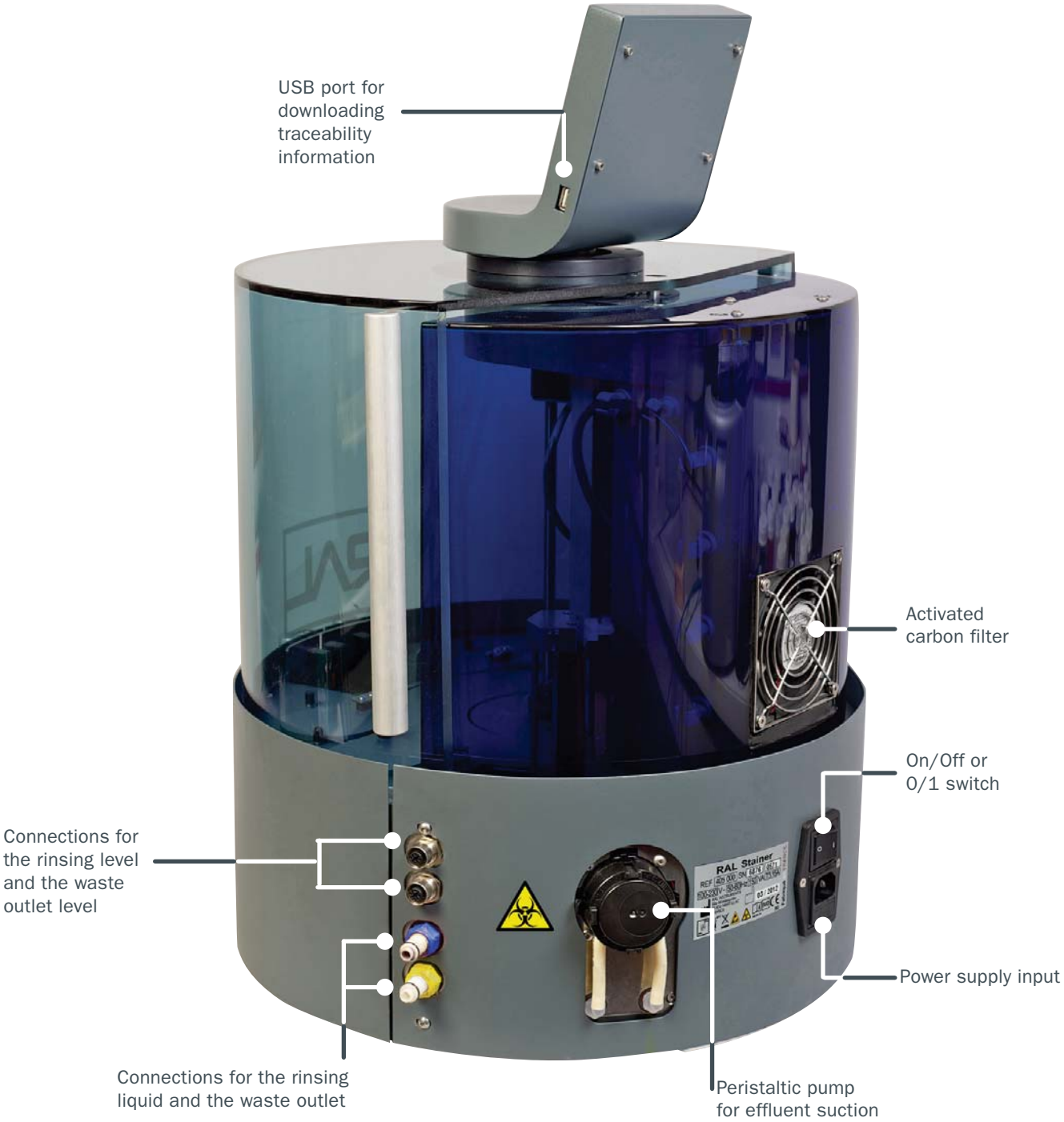
Side view with
drawers open



Top view with
drawers open

RAL STAINER


Touch screen interface
Standby button
Protective cover
Staining arm
Draining nozzle
Staining stations
with sealed lid (x4)
Connectors
liquid with level
detection
Reagent loading
drawers
Waste outlet
and rinsing
liquid
Slide loading/unloading drawers
And drying zone (x2)
Autonomy of 1 to 20 slides
(2 ten-slide slide holders)


USB port for downloading traceability information
Activated carbon filter
On/Off or 0/1 switch
Connections for the rinsing level and the waste outlet level
Power supply input
Connections for the rinsing liquid and the waste outlet
Peristaltic pump for effluent suction

5.1 OPERATING PRINCIPLES

RAL Stainer is an automatic bath staining appliance.
A arm which follows a circular and vertical path successively:
- Hooks the slide holder installed by the user;
- Brings the slide holder into each staining tank and then into the rinsing tank depending on the recorded protocol;
- Returns the slide holder to its initial position.
- The slides are then dried.

Staining is complete.

5.2 PERFORMANCE

· LCD touch screen

· Capacity 2x10 slides

· 4 staining stations

· 1 rinsing station

· 2 loading/unloading drawers for 1 to 10 slides each with a ventilator to dry the slides at the end of the cycle

· Up to 10 staining programmes in memory

· 10 users that can be parametered, four levels of authorisation: Administrator, Expert, User and Maintenance.

· RFID System
Automatic recognition of kits and corresponding staining protocol optimised by RAL Diagnostics.
Control of the batch, the expiry date, the staining kit autonomy and the activated carbon filter replacement.

· Polyvalent use
It is possible to switch from one kit to the other, from one application to another: RAL Stainer keeps the data about all the kits being used in memory.

· Staining traceability
It is possible to print a report giving the correlation of work dates, users, staining and the product batch used.

5.3 SAFETY

Vapour emanation is limited because the loading/unloading of the reagents and slides is carried out using drawers.
Each tank is closed using a sealed lid inside the appliance.
The cover need not be opened other than for cleaning operations.
RAL Stainer has a ventilation system which uses an activated carbon filter to evacuate all possible residual vapour (Warning when the filter needs to be changed).
The arm is fitted with a level sensor which adjusts the slide immersion height depending on the liquid remaining in the containers.
The draining of the solutions is carried out by the appliance itself thanks to a peristaltic pump which directs towards the waste bin (10 L), thus avoiding dangerous handling.
The waste bin level will be automatically detected in order to avoid any overflow.
The level of rinsing liquid will be automatically detected to avoid launching staining without rinsing liquid.
Drainage holes and a reservoir tank can collect liquids in case of leak.

5.4 SIZE

Weight: 28 kg
Diameter: 42.5 cm
Height: 62.4 cm

5.5 ELECTRIC SPECIFICATIONS

Voltage: 100-240V/ ~ 50-60Hz. Overvoltage category 2
Operating power: 150 VA

5.6 ENVIRONMENTAL LIMITS FOR USE

Temperature: from 18 to 30°C
Humidity: from 20 to 85%

RAL Stainer is strictly reserved for interior use. It is not recommended to use this device in a location with an altitude more than 3 000 meters and in an environment having a pollution degree superior than 2.

5.7 ENVIRONMENTAL LIMITS FOR TRANSPORTATION AND STORAGE

Temperature: from -10 to 55°C
Humidity: from 5 to 85%

6 STAINING REAGENTS

Only RAL Diagnostics staining reagents can be used in the RAL Stainer.

Staining kits available:

Field of activity	Kit description	Use	Reference	Number of reusable slides	Number of days after opening = BBD	Expiry	Danger
Haematology	Kit RAL Stainer MCDh	Staining kit for blood and bone marrow smears	360200-0000	500 slides	21 days	18 months	**Xi** Ethylic Alcohol, Isopropanol
Bacteriology	Kit RAL Stainer Gram-Hucker	Staining kit for Gram + and Gram - bacteria	360210-0000	500 slides	14 days	24 months	**F, Xn** Ethylic Alcohol, Crystal Violet
Bacteriology	Kit RAL Stainer Gram-Nicolle	Staining kit for Gram + and Gram - bacteria	360220-0000	500 slides	14 days	24 months	**F** Ethylic Alcohol
Bacteriology	Kit RAL Stainer 555	Fast staining kit for cytobacteriology	360250-0000	300 slides	14 days	24 months	**F, T** Methanol
Bacteriology	Kit RAL Stainer Fluo-RAL	Auramine staining kit for mycobacterium tests	360230-0000	300 slides	7 days	12 months	**F, C** Ethanol, Phénol
Bacteriology	Kit RAL Stainer Cold ZN	Cold fuchsine staining kit for mycobacterium tests	360240-0000	500 slides	14 days	12 months	**F, C** Ethanol, Phénol

Some reagents may occur a danger. Refer to the staining kit packaging and reagents MSDS.

Refer to the staining protocol for the use of each staining kit, for the attempt performances, for the quality control and the standard staining protocol.

7 INSTALLATION

The RAL Stainer must be installed by a technician approved by RAL Instruments.

7.1 PACKAGING LIST

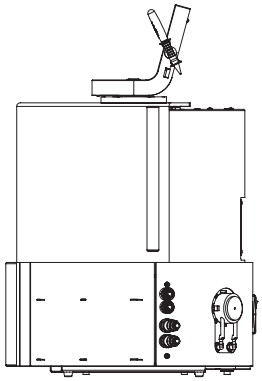
Check that all the items below are contained in the RAL Stainer package:

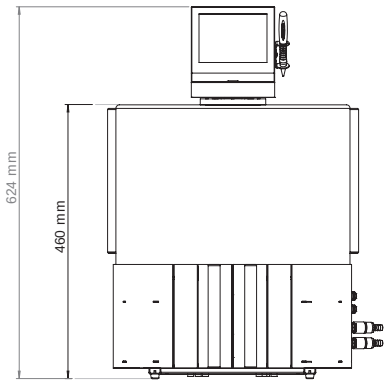
Description	Quantity	
RAL Stainer	1	
Power supply (L=2m)	1	
RAL Stainer 10 L Jerrycan	2	
Hydraulic cane for effluents	1	
Hydraulic cane for rinsing liquid	1	
Reservoir tank	1	
Pack of Slide-holder RAL Stainer (x3)	1	
Rinsing Station RAL Stainer	1	
Filter Cartridge RAL Stainer	2	
Stylus	1	
RAL Stainer CD	1	
RAL Stainer Quick Start	1	
Label sheets	20	
RAL Stainer USB Stick	1	

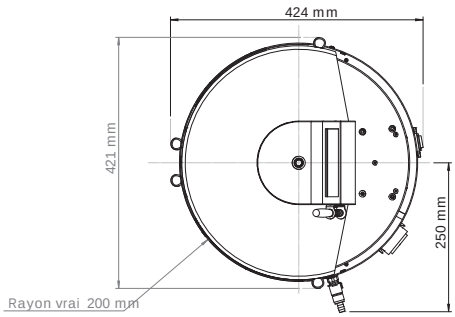
If one of the items is damaged or missing, contact your RAL Instruments representative.

7.2 INSTALLATION ENVIRONMENT

- Store the instrument in a location within the environmental operating limits.
- The appliance must be placed on a stable, flat and clean table. Avoid shocks and vibrations.
- Considering the weight of the RAL Stainer: 28 kg, use a sufficiently solid table.
- Place the appliance close to a mains power outlet and a running water tap if you have selected the running water connection option.
- Considering the size of the RAL Stainer - ø 42.5 cm / H 62.4 cm - plan to use a space of 70 x 70 cm for the appliance installation, use and maintenance.



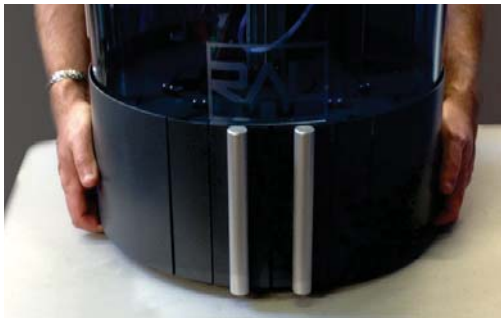




Avoid placing the appliance behind a window in order to limit the heating of the reagents under the sun's rays.
If the appliance has been stored at temperatures outside the environmental usage limits, it must remain at room temperature for 1 hour before powering up.
Avoid using the appliance in close proximity to a chemical reagent storage area or in an atmosphere containing emanations of dangerous gases.

Make sure the on/off switch and the mains power outlet remain accessible.

If you have to move the instrument, handle it carefully by lifting it up by the bottom, like showing the opposite picture



7.3 SETTING UP

Place the RAL Stainer on a flat and stable surface, in a sufficiently v
section 7.2.
Place the two supplied containers beneath the table.
To eliminate any risk of error in the use of the appliance, mark each
supplied labels in order to assign a function to each one: Effluent C
container.

Rinse label

The standard containers supplied with the RAL Stainer can be replaced by autoclave compatible containers. Contact your RAL Instruments representative.
The supplied containers can also be replaced using your usual containers. However the container as it is not certain that the supplied cover fits your container.

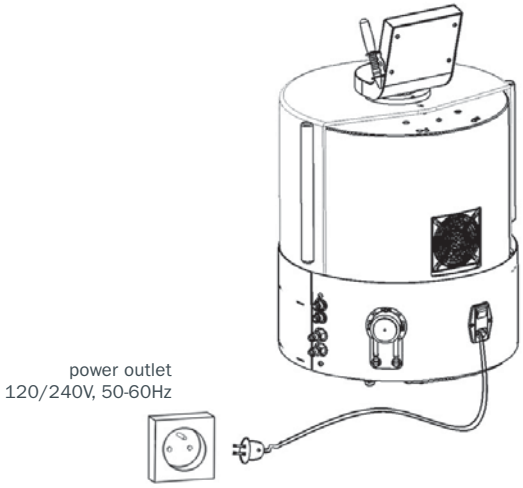
Waste label

Slide the reservoir tank below the machine on the back until it is blocked.

The reservoir tank must always be empty. If it is full, because of the flammability hazard of some products, remove it by sliding it gently, then empty it and call your service engineer.

7.4 CONNECTION OF THE INSTRUMENT TO THE MAINS POWER SUPPLY

Only use the power supply supplied with the appliance.



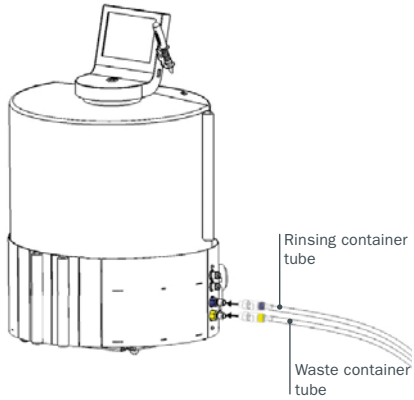
Using the supplied power cable, connect the RAL Stainer to an alternating current power outlet nearby.
The appliance operates in the voltage range 100V to 240V, 50-60Hz

7.5 HYDRAULIC CONNECTIONS

Connect the Effluent container and the rinsing liquid container to the right hand part of the appliance.

1. Introduce the tube and the level sensor connected to the red cover into the waste container and screw the cover to hermetically seal the container.

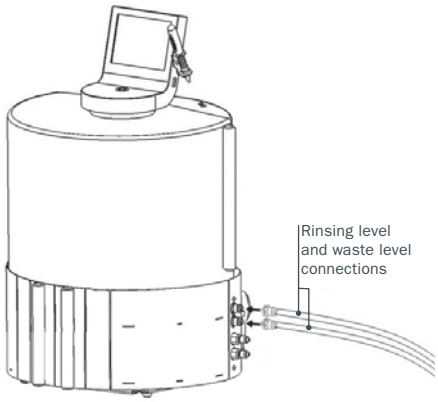
2. Introduce the tube and the level sensor connected to the blue cover into the rinsing container and screw the cover to hermetically seal the container.



3. Connect the tubes to the corresponding couplers on the appliance taking care to respect the colour codes:

Blue: Connection of the rinsing liquid container
Yellow: Connection of the effluent container

4. Connect the electric cables using the male jack connectors to the appliance's female male connectors in any order. The level sensors do not have any specific connectors.



8 SCREEN DESCRIPTIONS

RAL Stainer has a simple and user friendly interface, and a touch screen.

8.1 MEANINGS OF THE SYMBOLS

Validate

Cancel

Go to page

Staining

Settings

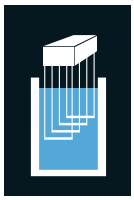
Change session

Information

Unlock the slide drawer

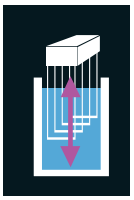
Launch staining

Halt staining



Soak

Rinse



Mix

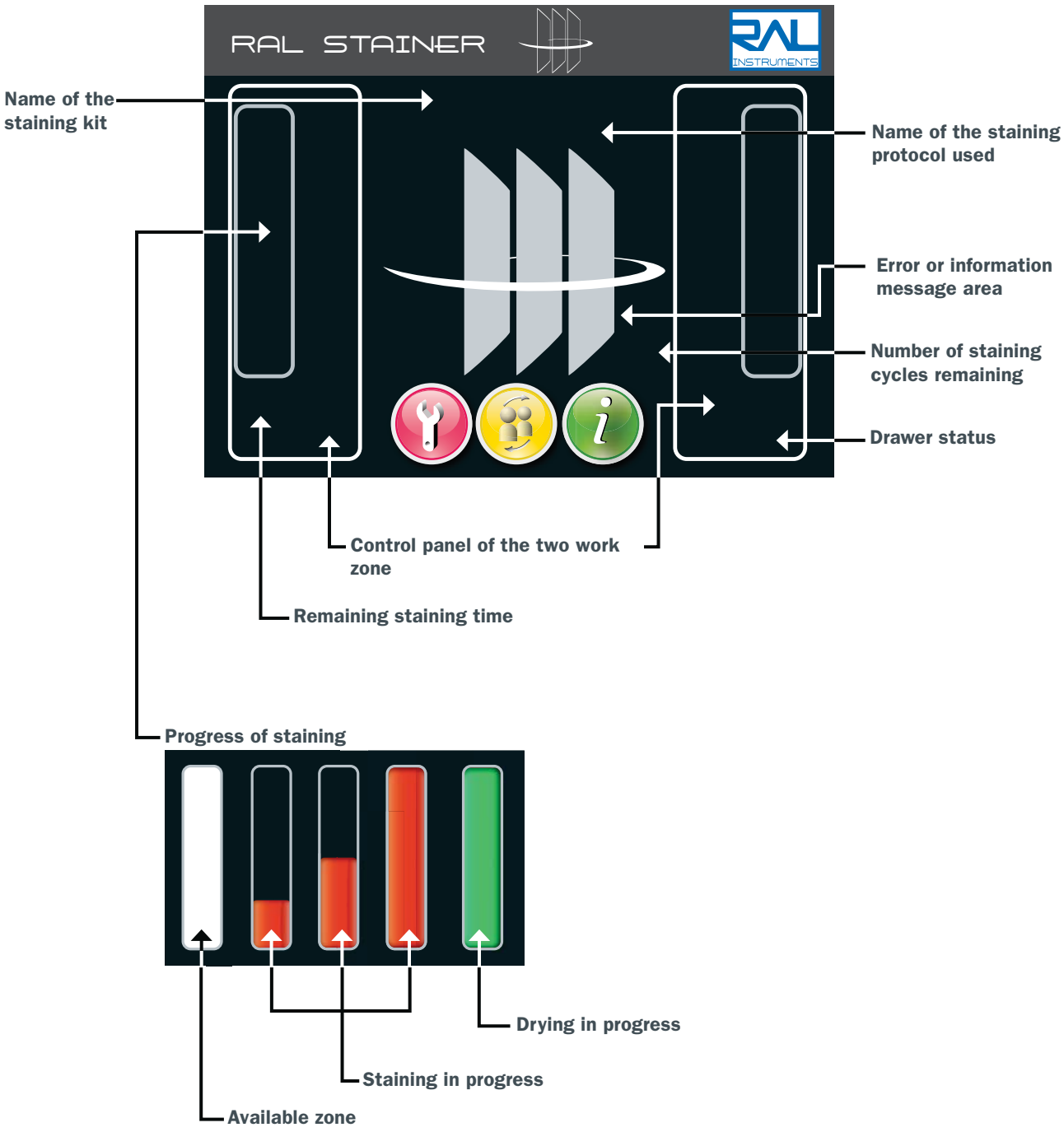
Dry

Drain

8.2 PAGE DESCRIPTIONS

8.2.1 STAINING PAGE

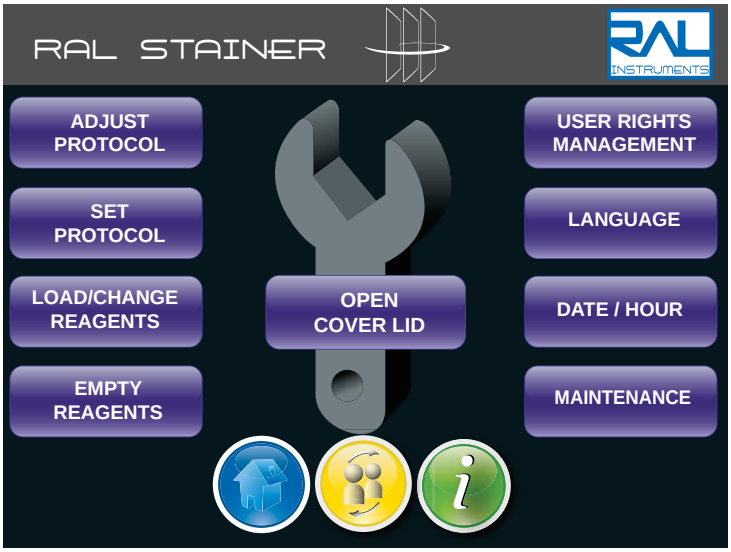
The Staining page is the page that is always displayed by default. Staining is launched from this page.



To return to this page, press the button

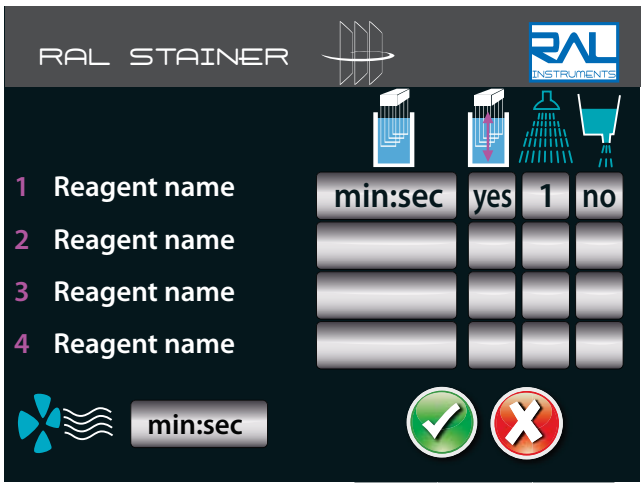
8.2.2 SETTINGS PAGE

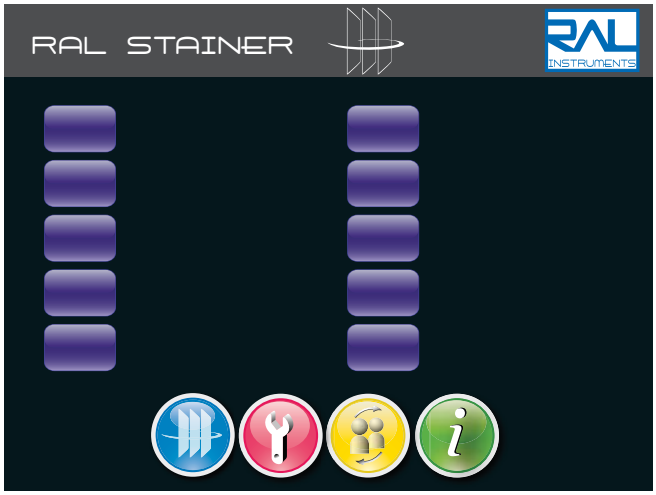
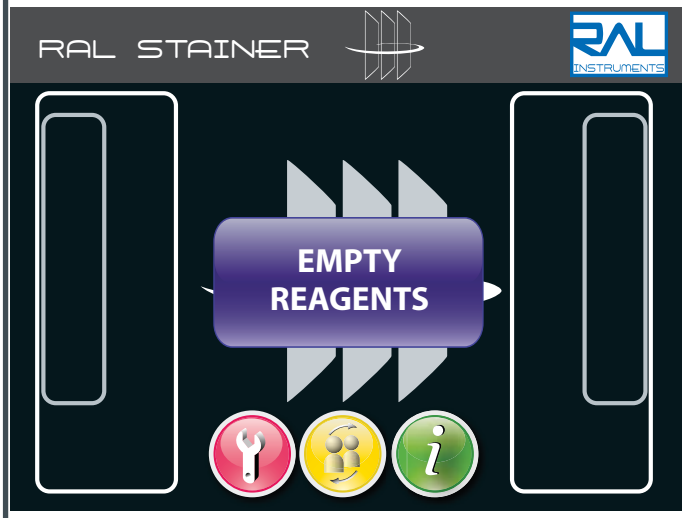
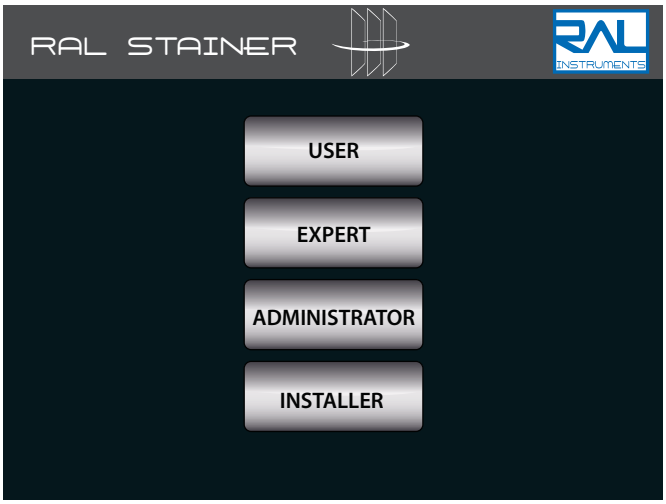
9 functions

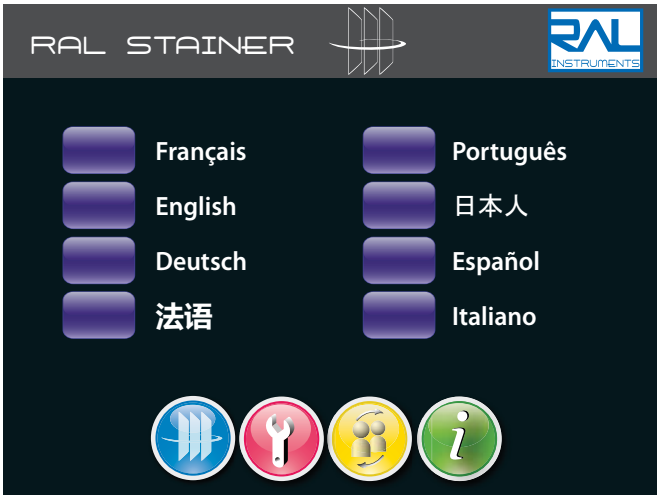
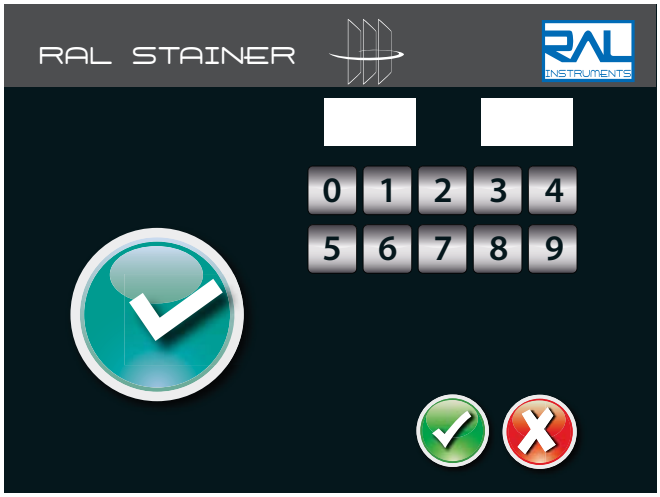
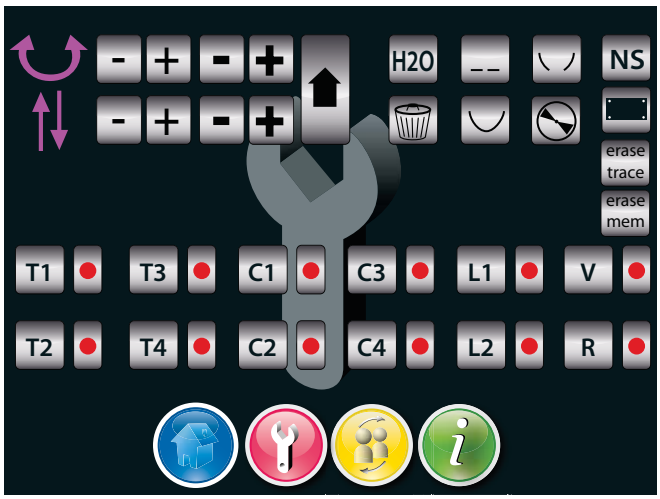


To access this page,

Presentation of the functions:

Name	Screen	Function
ADJUST PROTOCOL		Used to access the protocol modification page and record up to 9 modified protocols modified from standard protocols

Name	Screen	Function
SET PROTOCOL		Used to access the list of recorded protocols and switch from one to the next.
LOAD/CHANGE REAGENTS	No specific screen, PLC action	Used to open the sealed lids of the staining stations and the reagent loading side doors in order to load a new staining kit or replace a staining kit.
EMPTY REAGENTS		Used to drain the reagents in order to remove the containers in complete safety when the staining kit has expired or is out of service, or when the user requires.
OPEN COVER LID	No specific screen, PLC action	Used to open the cover for a weekly interior clean.
USER RIGHTS MANAGEMENT		Used to record the users with a level of rights to be selected.

Name	Screen	Function
LANGUAGE		Used to select the operating language; French, English or German.
DATE / TIME		Used to update the date and time on the machine for use with the traceability monitoring.
MAINTENANCE		Only accessible to authorised persons. Used to check the appliance's operating steps and to operate the hydraulic system.

8.2.3 CHANGE SESSION PAGE

The Change session page is used to change users while operating.

Fill in the code

and press on or .

Four authorisation levels are defined: Installer, Administrator, Expert and User.

To access this page, press

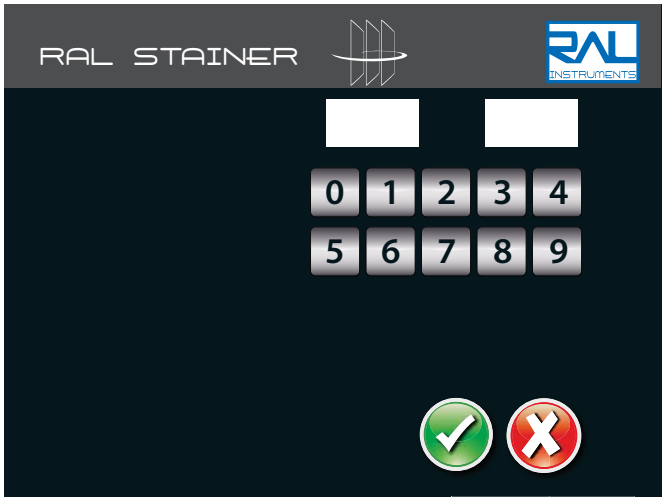
8.2.4 INFORMATION PAGE

The information page gives access to:
- The information on the staining kit being used: Kit batch number and remaining number of cycles;
- The information about your staining appliance: serial number and software version (GUI software version/ Motor software version/ RFID software version)
- Access to information on the activated carbon filter: the remaining time of use
- Information on the user currently working and the list of all users.

To access this page, press

This information can be useful when you contact your RAL Instruments representative for questions about the use of your RAL Stainer appliance or your RAL Stainer staining kit.

8.2.5 ALPHANUMERIC AND NUMBER KEYBOARD



These dialogue pages are used in several parts of the interface.
They are used to enter numbers from 1 to 9, letters, add a space [Space] or a hyphen [-].

The key is used to cancel entered characters.

On the number page, the cursor passes automatically from minutes to seconds.

Then press : or .

9 INITIALISATION

9.1 USER CREATION AND RIGHTS MANAGEMENT

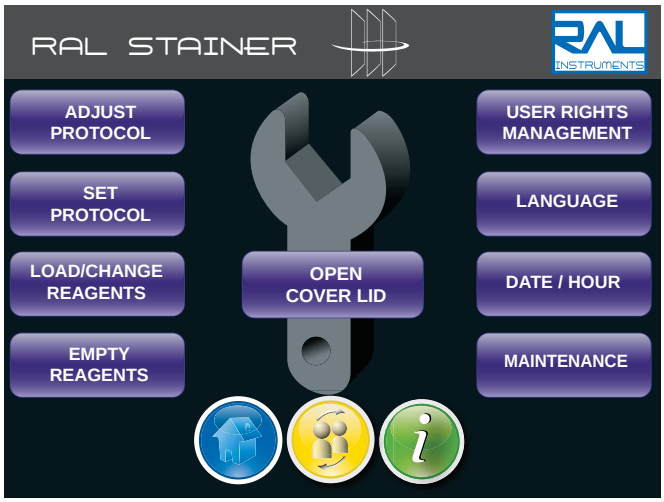
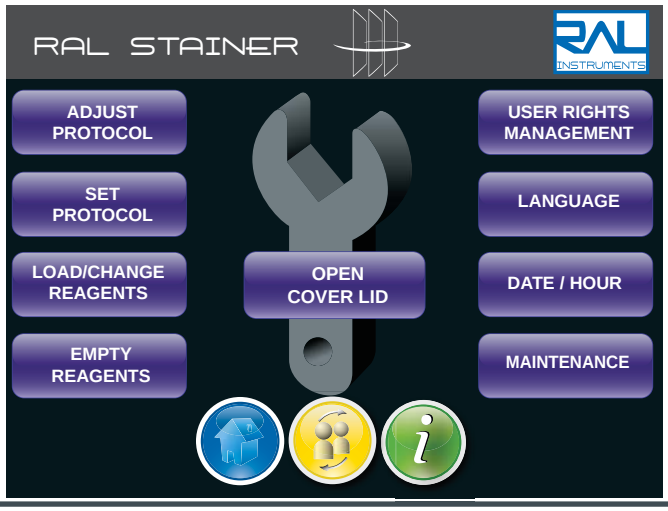
Turn on the appliance using the 0/1 switch located behind the instrument.

Enter the user code created with your RAL Instruments representative during the installation,

On first use, you must record the users and assign them access rights. The user code will then suffice to start up the machine.

Four authorisation levels can be used:

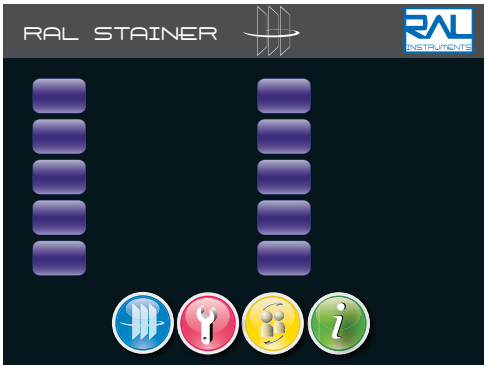
Type	Screen	Rights
USER		**User level** This level makes it possible to use the machine and to load protocols that have been defined by an Expert or Administrator user.
EXPERT		**User level + creation and modification of staining protocols.** This level makes it possible to use the machine and to modify the settings for a protocol or to create a new protocol.

Type	Screen	Rights
ADMINISTRATOR		**Expert level + Rights management + some functions of maintenance screen** This level gives access to all settings except for the Maintenance page. Only an Administrator can create a new user and define his/her rights. Authorized functions on the maintenance screen: operating arm movements, activation of water pump and peristaltic pump for effluents, trace file erasing.
INSTALLER		**Administrator level + access to the maintenance page** This level gives access to all the functions of the machine. It is reserved for persons authorised by RAL Instruments.

a. On the settings menu , press

The user list page appears.

b. Select a location. 10 users can be defined.



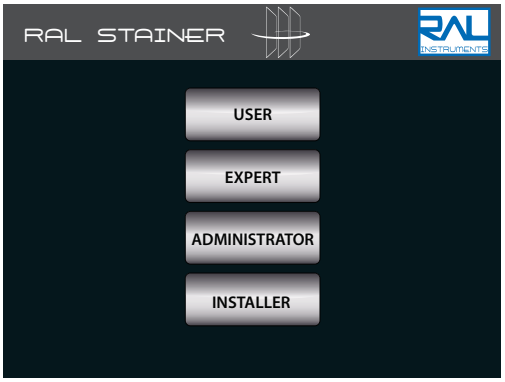
If you use a location that is already in use, the new record will overwrite the previous record.

c. Enter the user name and validate

d. Enter the user identification code and validate

It is recommended to choose a mnemonic type code, the appliance cannot remind the user of the code.

e. Choose the level of rights to associate to the user



At all times it is possible to change users by clicking on the icon
See section 8.2.3.
A strict use of this tool makes it possible to enrich traceability related to the use of the machine.

10.1 STARTING UP

Turn on the appliance using the 0/1 switch located behind the instrument.
The following page is displayed:

Enter the user code. Validate

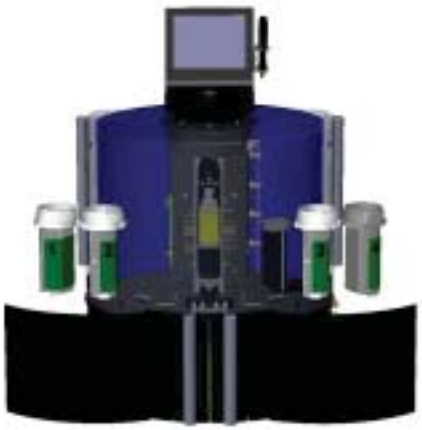
10.2 INSTALLING REAGENTS

10.2.1 STAINING KIT

If, on start-up, the appliance does not detect a staining kit, it will request one to be inserted.

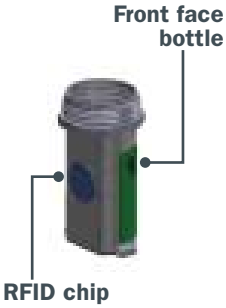
1. Press LOAD/CHANGE REAGENTS on page

2. The appliance opens the lids on the reagent housings and the reagent loading doors.



3. Break the protection seal and place the closed containers from your staining kit using the numbers on the labels to place them at the corresponding location within the instrument. Carefully remove the container caps and keep them. Take off the tamper-proof seal.

Special precautions for bottle 1:
Bottle 1 contains the RFID chip. This chip must be opposite the RFID reader (located to the left of the left reagent drawer) in order to be read. If we consider that the front face of the bottle is the labelled, curved face, this face must be placed opposite you, thus the chip will be correctly read by the appliance. In the event of an error, the "Tag error" message will be displayed. This can be corrected by turning bottle 1.

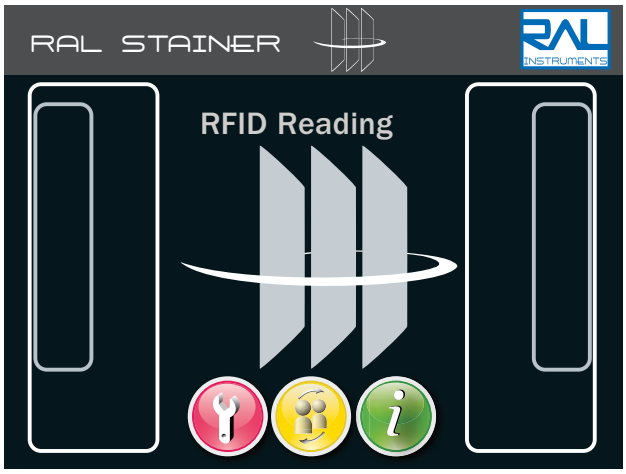


Removing the caps from the bottles once they have been placed in the appliance avoids any dangerous handling such as the spilling of the reagent.
If the kit is new, turn the caps a quarter turn to break the seals.

4. Then gently close the reagent loading drawers until you hear a "click"as they lock.

It is important that the necks of the bottles be free from reagent so that the level sensor can adjust the soaking height of the slides in the reagents.
Remove the tamper-proof seal, the can disturb the arm movement.

5. The appliance closes the covers of the reagent housings.



RAL Stainer identifies the staining kit that was placed in the appliance and proposes a "Standard" protocol.

It is possible to vary the protocol settings (time, mixing, rinsing). See section 10.3.

This function LOAD/CHANGE REAGENTS can also be used to change staining kits during their use.

10.2.2 RINSING SOLUTION

Fill the container reserved for this use with the adequate rinsing liquid for the stain being used. Refer to the staining kit instructions.
Adapt the cap with the suction cane to the rinsing container.

In the case of a low consumption of rinsing water, RAL Instruments recommends the regular replacement of rinsing water in order to prevent the proliferation of bacteria and to clean the rinsing liquid container weekly. See section 12.

RAL Stainer permanently checks the level of the rinsing liquid and notifies you when the level becomes critical.

10.3 STAINING PROTOCOL

10 protocols can be memorised by the appliance.

The protocols proposed by default are protocols optimised by RAL Diagnostic in collaboration with expert laboratories.
Due to the complex actions of the stainers, it is necessary to establish standard staining conditions to ensure good staining quality and reproduction.

We therefore advise to test and assess the protocols tested by RAL Diagnostics before making any changes to the protocol settings.

10.3.1 PROTOCOL MODIFICATION

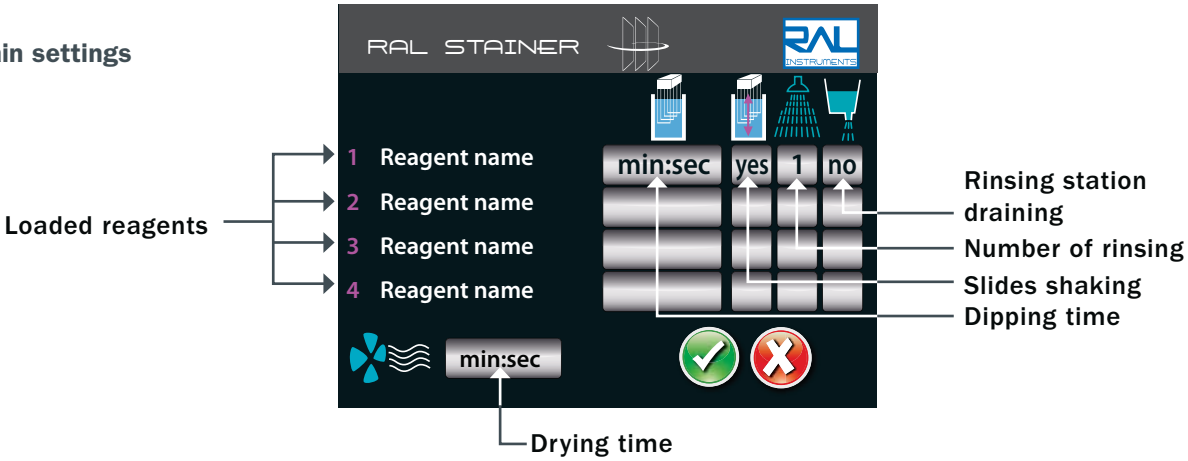
RAL Stainer identifies the staining kit that was placed in the appliance and proposes a “Standard” protocol.

It is, however, possible to vary the protocol settings (time, mixing, rinsing).

On page ,

This function is only accessible to Administrator and Expert users.
See section 9.1.

Main settings



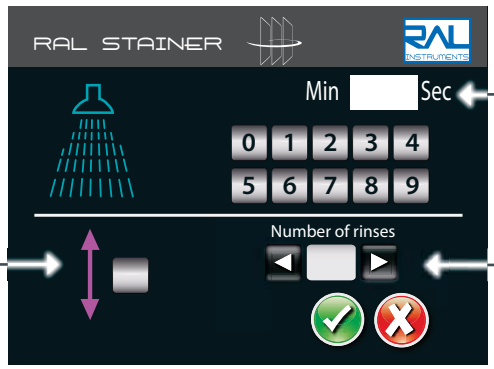
To modify a setting, .

Press the time bar to change the soaking time in tank.	A single push on the key is used to switch from yes to no. Select "Yes" if you wish to agitate the slides in reagent. If you select "No" the slide holder will not move during soaking.	Indicate the number of rinses after each tank. Pressing this key displays another screen used to define the rinsing parameters. See next section.	Indicate whether you wish to drain the rinsing liquid after each rinse. A single push on the key is used to switch from yes to no.

In the event of an error, returns to the previous screen.

Rinsing

3 parameters :



Define rinsing time with the numeric keypad.

Define whether you require movement during rinsing.

Define the number of rinses by pressing on the left and right arrows.

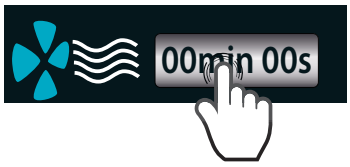
Draining

RAL Stainer makes it possible to limit the volume of your effluents. You choose whether to drain the rinsing liquid after each dip. If you choose never to drain the rinsing liquid during a cycle, RAL Stainer will request the draining frequency by the question :

"**How many cycles before draining rising water?**" Enter the value.

RAL Instruments recommends draining the rinsing tank after each soaking in order to optimise the quality of the staining.

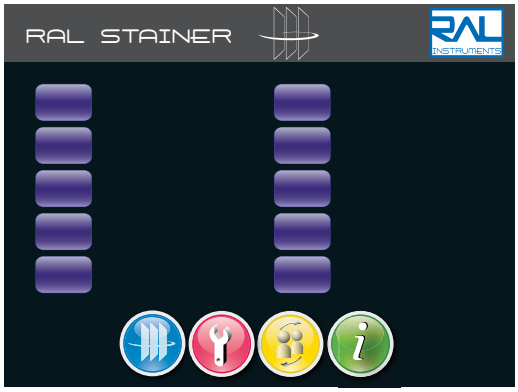
Drying



Select the drying time with the numeric keypad.

When all the settings are correct, .

Give a name to the defined protocol, .



Select a location to which to save your new protocol on the protocol list page.

The selection of a location that has already been used will overwrite the protocol that was previously at this location.
It is impossible to record a new protocol in location 1 which is reserved for the protocol proposed by RAL Diagnostics. It is possible to return to this protocol at any time.

10.3.2 CHANGING THE PROTOCOL

On page ,

This function is available to all users. See section 9.1.

The parametered protocol list is displayed, press on the protocol to be changed to load it.

The last used protocol remains the active protocol after all appliance off/on operations.

10.4 INSTALLING THE SLIDES

10.4.1 LOADING THE SLIDE HOLDER

Place from 1 to 10 slides in the slide holder.

1. Turn the slide holder and free the jaw by placing the knob on the O "Open" position.

2. Place up to ten slides (identification maintained).

3. Block the jaw by moving the knob to the C "Close" position.

Always make sure that the slides are correctly placed and aligned.

10.4.2 PLACE THE SLIDE HOLDER IN THE APPLIANCE

On page , for unlocking the slide loading drawer.

Place the slide holder correctly on its support in the drawer(s).

Close the drawer(s) until the "click" indicates they are locked.

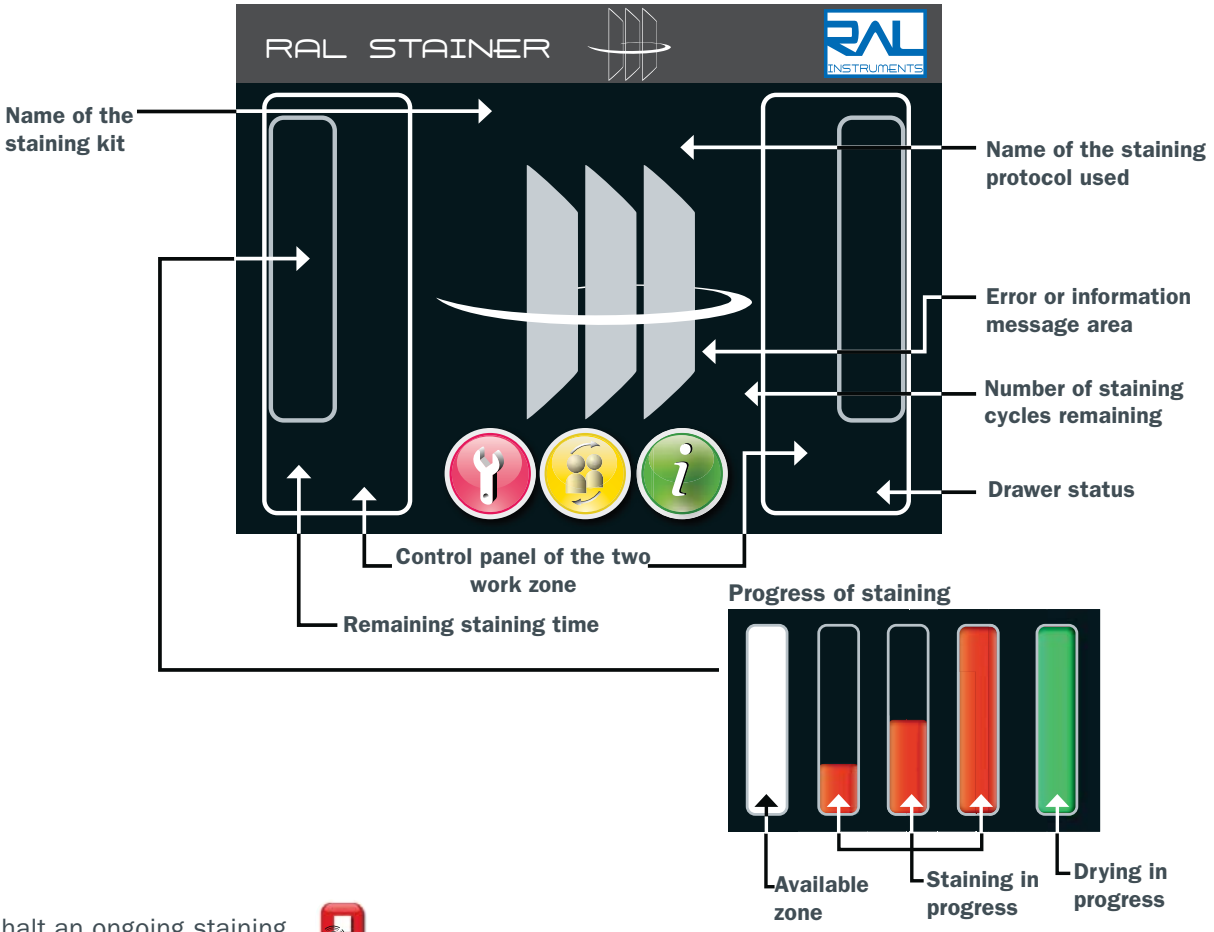
During staining, it is possible to load a second slide holder or to remove an awaiting slide holder to add or change a slide.

10.5 STAINING

Staining is launched from the staining page, gives access to this page from any other page.

Once the protocol has been selected and the slides placed, to launch the staining.

The appliance moves into action, the arm picks up the slide holder. Staining begins.



To halt an ongoing staining, .

At the end of a cycle, unlock the drawer. Your slides are ready to be examined.

If two stainings are launched, the arm will begin the second staining after having dropped the first slide holder back to its initial position. Before the second cycle begins, you can retrieve an awaiting slide holder to add or change a slide by pressing on the lock button.
You can retrieve the first batch of slides after drying while the second batch is being stained.
The slide holder can be retrieved while drying is in progress.

10.6 CHANGING THE STAINING KIT OR DRAINING

10.6.1 CHANGING THE STAINING KIT

This is a useful function if you wish to use the appliance for several staining operations.

Press LOAD/CHANGE REAGENTS on page .

The arm opens the lids, the reagent drawers open.

Put the caps back onto the bottles before removing them.
Remember to store the bottles away from light.

Then insert the bottles for the new staining kit and close the reagent drawers.
The appliance is ready to operate using the new staining kit, no cleaning cycle is required.

The appliance can manage several staining kits in parallel, it keeps the data for each kit in memory: the autonomy and the customised protocols for this kit reference.

10.6.2 DRAINING

The RAL Stainer will systematically drain the reagents being used if:
- the kit has expired,
- the autonomy (cycles or slides) has been exceeded,
- the level of one reagent is lower.

The effluents are rejected into the appliance's waste container, the reagent drawers are opened to allow to remove the empty bottles.

The bottles must be disposed of using the decontaminated waste channel.

If the expiry date after opening is passed, the RAL Stainer will advise you to drain the staining kit with the message: "**Warning BBD expired**".

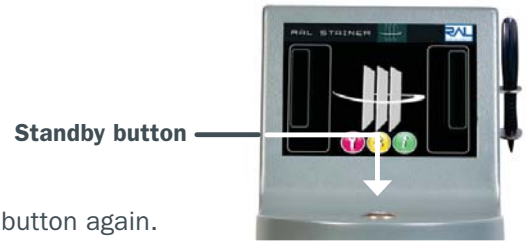
On page ,

.

These safety mechanisms have been included for quality assurance reasons. We advise you to follow the RAL Stainer recommendations.

10.7 STAND-BY

At the end of your working session, simply place the appliance on standby by using the standby button on the top of the machine.



The RAL Stainer can be restarted by simply pressing the same button again.

10.8 POWERING OFF

When a long period of inactivity is foreseen, prefer powering off the machine to placing it on standby.

In this case press the O/1 switch at the back of the appliance.

11 TRACEABILITY

The traceability file will indicate:

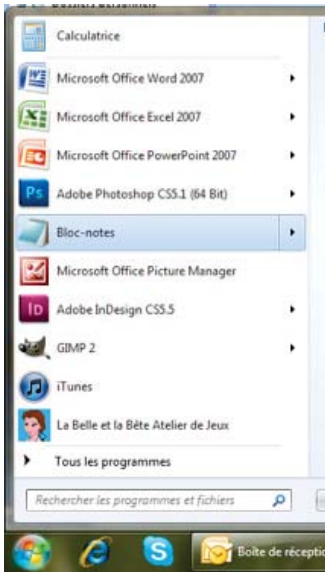
- Dates of each cycle
- User
- Staining kit name and batch
- Dyeing compliant Yes/No with error message. See section 16.1.
- Staining protocol

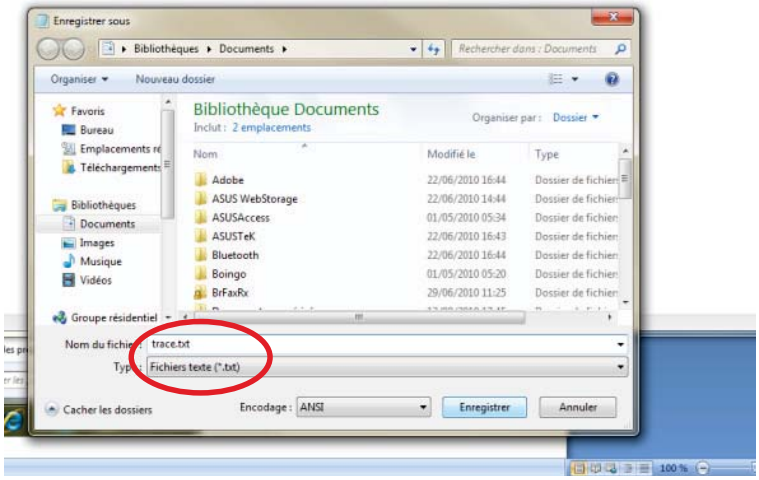
11.1 USING THE TRACEABILITY SOFTWARE

Insert the supplied CD into your computer.
Execute the file "**Trace.exe**" Follow the instructions.
The CD will install software which will enable you to decrypt the traceability file that can be retrieved from the RAL Stainer.

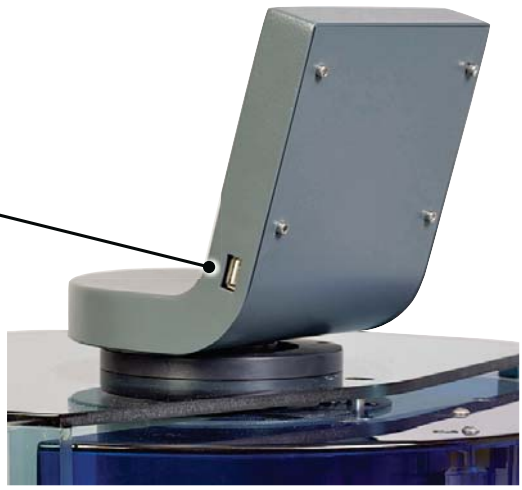
11.2 LOADING THE TRACEABILITY FILE

1. Create a new file on the supplied USB stick called "**TRACE.txt**" (capital letters) using the windows Notepad.





2. Turn off the appliance and insert the USB stick supplied with the appliance in its location.



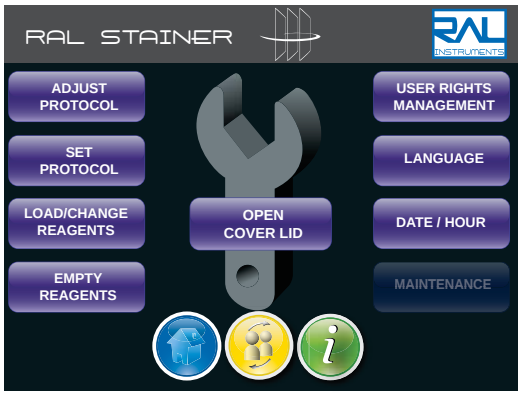
3. Turn the machine back on:
- the diode flashes.
- 3 Beeps indicate the end of the download.

4. Open the file on the USB stick named "**TRACE.txt**" using your traceability software "**Trace.exe**" on your computer.

12.1 CLEANING

On page ,

gives access to the inside of the machine.



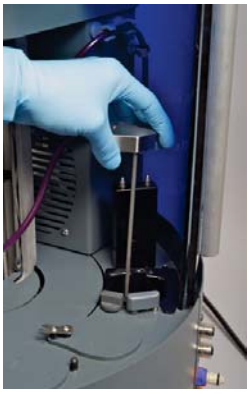
Basic weekly surface cleaning is sufficient with a wet cloth.
You can use for exemple Ethanol 70°.

Clean:
- The slide drawers
- The slide holders
- The inside and outside surfaces
- The rinsing tank

Procedure of rinsing station release

1. Free the rinsing tray by giving a quarter turn to the screw

2. Lift the rinsing nozzle and pivot it lightly



3. Remove the rinsing nozzle

4. Remove the rinsing tank

Never pour liquid onto the appliance, it could damage the electronic components.
Do not use solvents on the screen and the cover lid.

In the event of accidental spillage of reagents, turn off the appliance as quickly as possible and clean using a cloth and the appropriate solvent.
In all cases limit the dose of solvent.

12.2 HYDRAULIC SYSTEM CLEANING

This procedure should be done weekly in order to prevent the bacteria proliferation.

Equipment must be switched on.
Rinsing and draining circuits must be connected to the equipment.

Decontamination solution advised :
- Bleaching water with 2,6 % of active chlorine (available in commerce)
- Solutions like Stereanios of the Laboratoires Anios or Elusept of Pierre Fabre Santé

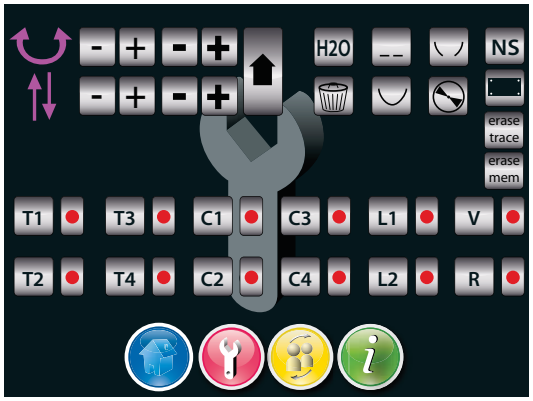
a. Clean the rinsing liquid container with a decontamination solution in order to prevent the proliferation of bacteria on the container bottom.

b. Fill the rinsing liquid container with approximatively 500 ml of decontamination solution.

c. Deep the rinsing cane in the container filled with the disinfectant solution.

d. On page ,

.



e. Switch on the rinsing pump in order to decontaminate the rinsing circuit :

.

Switch off the rinsing pump by pressing

again.
Be careful, pump doesn't stop automatically.

Fill the rinsing tank until to have the level at 1 cm from the rim.

f. Clean the waste circuit by switching on the draining pump, , and press again this touch when the tank is empty in order to switch off the pump.

Repeat at least 3 times steps "**e**" and "**f**" in order to decontaminate perfectly the waste circuit.

g. Rinse the rinsing liquid container with your rinsing solution.

h. Deep now the rinsing cane in **the rinsing solution**.

Repeat again by 3 times (at least) steps "**e**" and "**f**" with the rinsing solution of staining in order to eliminate the disinfectant solution previously used.

12.3 ACTIVATED CARBON FILTER

The RAL Stainer recommends the changes of the activated carbon filter cartridges.
The life span is calculated using the RAL Stainer operating times.

RAL Stainer will give you an advertising message before the necessity of the filter-cartridge change: "**The activated carbon filter has expired: have you replaced it?**"

The filter-cartridges are housed on the left of the machine.

1. Open the cover lid

2. Unscrew the two screws by a quarter turn

3. Remove the used filter cartridge

4. Fit a new filter-cartridge

5. Re-screw the two screws by a quarter turn

6. On page , set the cartridge life span counter to zero by pressing RAZ

RAL Stainer filter cartridges are available from your RAL Diagnostics reseller.

12.4 DECONTAMINATION

All biological samples should be considered to be potentially dangerous. The contact between contaminated hands and the appliance can cause the contamination of the appliance.

Before operation of decontamination, unplug the mains power supply cable.
Use the adapted personal protective equipment : laboratory gloves, laboratory glasses and a laboratory coat.

Decontamination solution advised:
- Bleaching water with 2,6% of active Chlorine (available in the commerce)
- Solutions like Stereanios of the *Laboratoires Anios* or Elusept of *Pierre Fabre Santé*

If your laboratory procedures require it:
- the reagent bottles can be decontaminated before being disposed of;
- the appliance itself and its accessories (slide-holder, rinsing station) can be decontaminated using air or manual cleaning. Use a decontamination solution and scrub using a clean cloth soaked in the disinfecting agent all the apparatus parts : surfaces, draining nozzle, hydraulic system. Please see section 12.1 and 12.2.

- The effluents and their containers are to be eliminated and/or decontaminated in compliance with current laboratory best practises. The procedure will depend on the type of effluent container you are using.

RAL Stainer 10L jerrycan: decontamination using air or manual cleaning
Autoclave compatible container: resists up to 135°C

In all cases respect the laboratory best practises applied by your laboratory.
The use of organic solvents is under the responsibility of the user and may cause the discolouring of certain parts of the appliance as well as the alteration of some plastic parts.

13.1 CONSUMABLES

Consumable name	
Pack of slide-holder RAL Stainer (x3	
Filter cartridge RAL Stainer	
Rinse station RAL Stainer	
RAL Stainer 10L jerrycan	

13.2 OPTIONAL EQUIPMENT

Consumable name	
Autoclavable 10L jerrycan	
Connection system to the mains water networ	

14 MAINTENANCE

Maintenance must be carried out by a technician approved by RAL Instruments.

For the first year following the purchase of your appliance, the maintenance is ensured by your RAL Instruments representative.

Beyond this period you can subscribe to a maintenance contract. Contact your RAL Instruments representative.

15 AFTER-SALES SERVICES

If your RAL Stainer should be return to your RAL Instrument representative workshop, it must be decontaminated.

The decontamination declaration joined with your apparatus should be well filled in and added to the equipment for the acceptation in the workshop.

16.1 ERROR MESSAGES

Message	Diagnosis	Solution
Warning BBD expired	**B**est **B**efore **D**ate expired	Change the Staining Kit
The activated carbon filter has expired	Carbon filter expired	Change the activated carbon filter
Tag error	Bad tag position	Check that bottle 1 is correctly placed as per the operating instructions in section 10.2.1
SID tag incorrect	The tag on your Staining Kit is defective.	Change the staining kit or Contact your RAL Diagnostics representative.
Motor unit card error		Contact your RAL Instruments representative.
Rinsing Station filling fault		Check that the hydraulic circuit is not disconnected at some point. Turn off the appliance and then turn it back on. If the system is not restored, contact your RAL Instruments representative.
Step loss on Theta **Code 200**	Turn off the appliance and then turn it back on Slide-holder incorrectly placed in the drawer Slide incorrectly placed on its support Drainage nozzle incorrectly placed on its support	Check that the arm is operating correctly by simulating a staining kit change. If the system is not restored, contact your RAL Instruments representative.
Step loss on Z **Code 1+tank number+1**= Loss of Z step when lowering to tank X Examples : **Code 131**: Loss of Z step when lowering to tank 3 **Code 1A1**: Loss of Z step when lowering to rinsing tank **Code 1B1**: Loss of Z step when picking up or dropping off basket **Code 1+tank number+2**= Liquid missing in tank X Example : **Code 142**: Liquid missing in tank 4	This can occur when the level detection could not be carried out.	Check that the necks of the bottles are not dirtied. If so, clean them. Turn off the appliance and then turn it back on. Check that the arm is operating correctly by simulating a staining kit change. If the system is not restored, contact your RAL Instruments representative.
Call a maintenance technician		Contact your RAL Instruments representative.

16.2 WHAT TO DO WHEN ...?

Problem encountered	Diagnosis	Solution
Screen off when powering on	The green and blue diodes visible on the USB be port are on?	
If yes	Is the machine on standby?	Press the standby button.
	ON/OFF too fast?	Turn off the appliance and then turn it back on. If the system is not restored, contact your RAL Instruments representative.
If not		Contact your RAL Instruments representative.
The machine does not turn on?	Is the green diode that is visible inside the machine when the arm is in the soaking position in tank 3 on?	
If yes		Contact your RAL Instruments representative.
If not	You must changed the power supply or the fuse.	Contact your RAL Instruments representative.
No reaction of the touch screen	No beep when pressing impossible to enter the code.	Turn off the appliance and turn it back on. If the system is not restored, contact your RAL Instruments representative.
Incorrect reaction on the touch screen		Contact your RAL Instruments representative
The codes do not allow to go to the codes page	Data loss	Fill in the code to initialise the machine. If the system is not restored, contact your RAL Instruments representative.
The machine does not keep the codes in memory	Memory problem	There is an SD card in the RFID card located in the left reagent loading door. Check that the SD card is in the machine. If necessary, remove it and replace it after having cleaned the connections.
Tag reading impossible "Tag reading" very long (greater than 10 seconds)	Check whether the blue diode is on the RFID card and check on the info page whether the RFID software is present.	If the diode is on, try another tag. If it persists impossible, contact your RAL Instruments representative. If the diode is off, contact your RAL Instruments representative.

Problem encountered	Diagnosis	Solution
Staining begins, but slides are found on the machine plate.	one of the positioning settings is to be adjusted.	Contact your RAL Instruments representative.
The slides are incorrectly rinsed	Rinsing is carried out using soiled water.	Drain the rinsing container more often or change the rinsing water in your container. If the fault persists there may be a fault on the draining pump. Contact your RAL Instruments representative.
The rinsing tray overflows		Contact your RAL Instruments representative.
Variation of the soaking of the slides	Check that there is no liquid on the neck thread.	Wipe the bottle necks. If the fault persists, Contact your RAL Instruments representative to adjust the settings on the level sensor.
The arm opens the lids either too far or too little.	The arm positions have become offset.	Contact your RAL Instruments representative.
Major oscillation of the slide holders during Z movements	Too much space between the hooks and the slide holders	Slightly tighten the hooks
Systematic message "Z step loss"	Reagent levels low?	Check the level of the liquid in the containers. If necessary, if the arm is more than one year old, re-grease the Z axis. If the problem persists, contact your RAL Instruments representative.
On installation the arm moves a few mm, groans and stops moving	The machine has been taken out of its packing. The cold tightens the the gaps and fixes the grease on the Z axis.	Wait 1 Hour i.e. at room temperature Use the "Load/Change the staining kit" function several times to make the arm operate.
The loading drawer refuses to shut	Bad adjustment of the switch or electro-magnetic bearing.	Contact your RAL Instruments representative.
Impossible to load the traceability programme	Wrong USB stick	Use the USB stick supplied with your instrument or try to format your USB stick for FAT16. Other USB sticks are available on demand.

17 SUMMARY OF TIPS

At all times it is possible to change users by clicking on the icon
See section 8.2.3.
A strict use of this tool makes it possible to enrich traceability related to the use of the machine.

RAL Stainer permanently checks the level of the rinsing liquid and notifies you when the level becomes critical.

RAL Stainer makes it possible to limit the volume of your effluents. You choose whether to drain the rinsing liquid after each dip. If you choose never to drain the rinsing liquid during a cycle, RAL Stainer will request the draining frequency by the question :
"**How many cycles before draining rising water?**" Enter the value.

If two stainings are launched, the arm will begin the second staining after having dropped the first slide holder back to its initial position. Before the second cycle begins, you can retrieve an awaiting slide holder to add or change a slide by pressing on the lock button.
You can retrieve the first batch of slides after drying while the second batch is being stained.
The slide holder can be retrieved while drying is in progress.

18 INDUSTRIAL PROPERTY

The RAL Stainer model is a community model registered under the n° 001733361-001.

It is prohibited, unless explicitly authorised by RAL Instruments in writing, to manufacture, propose, put on the market, import, export, use or possess a product including the model for the same purposes.

19 EC DECLARATION

DIAGNOSTICS

Déclaration CE de conformité
EC Declaration of conformity

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Dispositif / *Device* :	**RAL STAINER** **REF** 405 000 / 414 195 **Marque / Brand RAL INSTRUMENTS**
Accessoires du dispositif / *Device's accessories* :	**Pinces-lames RAL Stainer/ RAL Stainer Slide-Holder** **REF** 405 105 / 414 192 **Bac de rinçage RAL Stainer / RAL Stainer Rinse Station** **REF** 405 120 / 414 191 **Marque / Brand RAL INSTRUMENTS**

Les dispositifs listés ci-dessus sont conformes aux exigences essentielles de /
The devices listed hereafter meet with the essential requirements of :

	Normes / Standards	Agence certificatrice/ Testing Agency
Directive 98/79/CE IVD FCC Part 15 : 2011 ICES-003/NMB-003 ed4:2004	Règles de sécurité/Safety Standards EN/IEC/UL/CSA 61010-1 // 61010-2-101 //61010-2-081 Exigences CEM/EMC Standards EN 61326-1/ 61326-2-6 // EN 301489-01 / 301489-03 / EN 50364 FCC 47 CFR Part 15 Subclass B CAN/CSA-CEI/IEC CISPR 22.02	TÜVRheinland EMITECH
Directive 1999/5/EEC R&TTE FCC Part 15 : 2011 RSS	EN 300330-1 / 300330-2 EN 301 489-3:2002 FCC Part 15.225 RSS-Gen / RSS 210 Annex 2	EMITECH
Directive 2002/96/CE DEEE		

Informations supplémentaires / *Other information* :
Ce dispositif et ses accessoires ne rentrent pas dans la liste A et B de l'annexe II, ni dans les dispositifs destinés à des autodiagnostics, ni dans les dispositifs destinés à l'évaluation des performances. Par conséquent ils répondent aux exigences de l'annexe I, III et X de la Directive 98/79/CE.
This device and its accessories complies with requirements of annexes I, III and X of Directive 98/79/CE. Therefore, It is not classified as self diagnosis , or performance evaluation devices. Thus, It is not classified into lists A & B of annex II.

Fait à / Edit in MARTILLAC le / the **27/02/2013**

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RAL INSTRUMENTS

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