

Precellys® 24 Touch



USER MANUAL

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Original instructions

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1 INTRODUCTION

Thank you for purchasing a Precellys® 24 Touch by Bertin Instruments.

Precellys® 24 Touch is a universal tissue homogeniser that is both intuitive to use and effective such that it can be adapted for routine or R&D projects.

The Precellys® 24 Touch can homogenise a large number of different samples in between a few seconds and two minutes.

It has a patented automatic tube locking system that uses a vacuum called "Press and Block" which makes the Precellys® 24 Touch safe and easy to handle. Developed in the field of Life Sciences, the Precellys® 24 Touch is compatible with work environments up to biosafety level 3 (BSL3). The instruments in the Precellys® range are used by thousands of scientists around the world. The instrument's unique 3D motion delivers the same high level of energy and effective homogenisation to each tube. The Precellys® 24 Touch can process up to 24 tubes simultaneously.

This manual presents all the information needed for the unpacking, installation, routine use and maintenance of the Precellys® 24 Touch.

The product's technical specifications and the following information are subject to change without notice.

2 PRECAUTIONS AND RECOMMENDATIONS

This manual must be read carefully by the user before any use of the Precellys® 24 Touch cell lyser/homogeniser.

Handling this device without following the instructions set out in this manual could reduce the level of protection provided by the device.

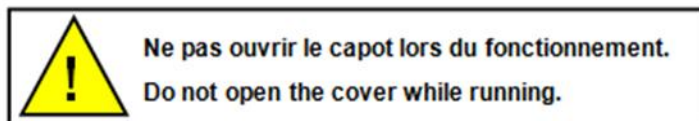
In the event of non-compliance with the safety instructions set out in this document, Bertin Technologies disclaims all liability for any resulting damage to property or physical injury.

Contact the local distributor immediately if there is any doubt as to the safety of the appliance.

2.1 Safety symbols

The following symbols can be found in various places on the device.

Follow the instructions associated with these symbols



The equipment may only be repaired by personnel who have been authorised by the dealer or manufacturer.

The waste resulting from normal analysis operations must be disposed of in biological bins and treated by specialised companies.



The sticker with the "Biohazards" symbol is delivered with the device and must be stuck on the front of the device for use with potentially infectious samples.



Heavy load hazard: there is a heavy load sticker on the packaging of the equipment. The Precellys® 24 Touch should be carried by two operators, preferably. Safety shoes must be worn by the operator during transportation.



High temperature hazard: this sticker warns about a hot surface. The maintenance operator must wait at least 60 minutes after the end of a cycle before carrying out work on the equipment



Electrical hazard: before any maintenance operation, the operator must disconnect the mains supply.

Failure to follow the instructions associated with the symbol may result in physical injury and environmental damage.

2.2 Recap of the directions for use



- Only use the device with the type of electrical power source indicated on the label;
- Do not pull on the cords. Hold the plug and not the cable when plugging in or unplugging the cord;
- Do not expose the device to sudden variations in temperature and humidity, avoid knocks, and only use it indoors;
- Do not immerse the device, do not use the device in explosive atmospheres or in wet environments;
- Do not disassemble or repair this power supply yourself. There is a risk of electrocution;
- Unplug the cord from the wall outlet before cleaning it;

- Disconnecting the power cord from the device cuts off the power supply to the device.
- Do not put the device in a place where it would be difficult to operate the disconnecting procedure.

2.3 Risk of electric shock

Although the device is perfectly insulated and earthed, it is important that all users are made aware of the risks associated with the use of liquids near an electrical power supply. If a liquid is spilled, the device must be immediately disconnected from the power supply by unplugging the mains plug even if the device is in operation. The device should then be dried and any spilled liquid should be wiped up.



- Do not plug the device back in until it has been checked.
- The casing must not be removed by the operator under any circumstances - Risk of electrocution.

To avoid any risk of an electric shock, the device's power supply must be connected to an installation that complies with the standards in force.



If the system does not start, the operator should contact the manufacturer

2.3.1 Fuse

The device contains 2 external fuses located on the rear panel. If they need to be changed, they must be replaced with a fuse reference 5x20 - T 6.3 A - L 250 V. It can be easily replaced by the user, see §4.2 Installation and connection.

2.4 Biological hazards

Wear gloves when handling samples and take all necessary precautions to prevent any risk of contamination. Use the best practices implemented in your laboratory.



Protective glasses



Gloves

2.5 Non-ionising radiation



This device is a Class A device. In a residential environment, this device may cause radio interference. In this case, the user should take appropriate measures.

2.6 Risk of use

2.6.1 Using the grinding kits

Depending on the user settings (speed, number of cycles, duration of a cycle, time delay between two cycles) of the Precellys® 24 Touch, the grinding tubes may get very hot leading to sudden damage.

For the Precellys® 24 Touch to work properly, it is strongly recommended to use the grinding tubes supplied by Bertin Technologies and keep within the operating limits defined for each grinding kit. These operating limits specify the maximum levels of the settings (speed, number of cycles, duration of a cycle, time delay between two cycles, etc.) that should not be exceeded for the biological samples to be prepared correctly.

The operating limits of the lysing kits are available on the www.bertin-instruments.com website

2.6.2 Incorrect operation

Handling this device without following the instructions set out in this manual could reduce the level of protection provided by the device.

- Do not tilt the device: the Precellys® 24 Touch must always be resting on its four feet. If not, the internal components can get damaged or the plastic casing will break.
- Do not handle the instrument if the casing is partially or completely disassembled or if it is damaged; the levels of the voltages in the device are hazardous.
- Do not handle the instrument if the earth connection has been disconnected.
- Do not install any unauthorised boards, components or accessories; this could affect the protection provided by the device and will void the warranty.
- Check that the supply voltage specified on the rear panel of the device matches the voltage of the power supply.
- Do not immerse the device

Bertin Technologies shall be exempt from any claim for compensation for any damage to property or physical injury resulting from a non-compliance with the safety instructions set out in this document.

3 DESCRIPTION OF THE PRECELLYS® 24 TOUCH

3.1 Presentation of the equipment

3.1.1 Instrument

The Precellys® 24 Touch is a device designed to lyse and homogenise biological samples contained in tubes at variable speeds, in order to extract proteins, nucleic acids, drugs, etc. It simultaneously processes tubes at high speed which may contain several millilitres of sample (see the range of tubes offered at www.bertin-instruments.fr).

Main advantages of the Precellys® 24 Touch:

- Easy tube loading: innovative and automated locking system.
- Easy to disinfect: the areas to be cleaned are very easily accessible.
- Flexible and easy programming cycles (cycle time, speed).
- No degradation of the biological material and no cross-contamination.
- Effective and identical grinding in all the tubes

3.1.2 Tube kinetics

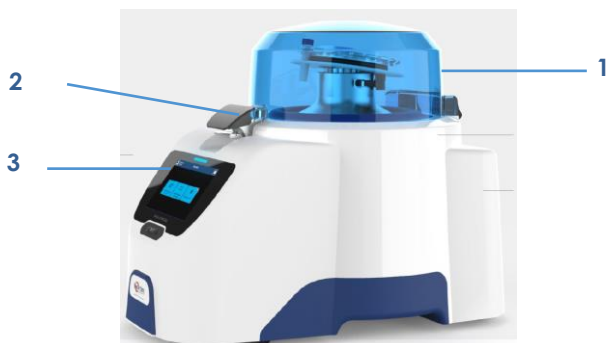
Given the design and symmetry of the machine, each of the tubes of the same type placed in the tube holder has strictly the same kinetics, which guarantees the same quality of lysis and homogenisation in each of the tubes.

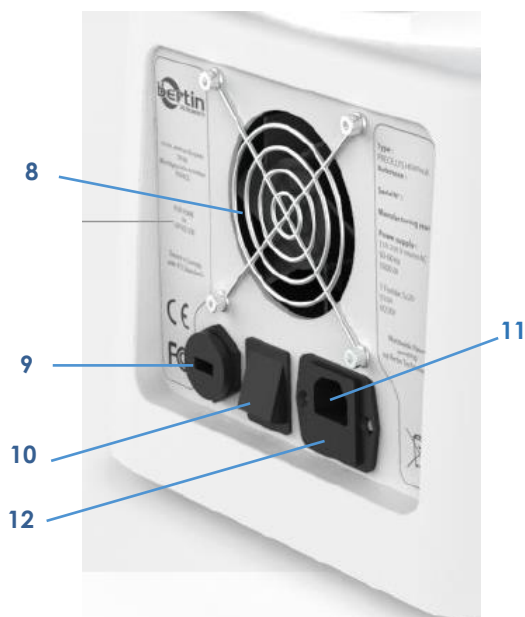
The centre of gravity of the tubes moves through a complex hemispherical-shaped pathway. The mixture contained in the tubes therefore undergoes a three-dimensional motion that prioritises vertical movements, thereby ensuring the efficiency of the lysis. The movement generated by the Precellys® 24 Touch is a precessional motion, which means that the tubes are not rotated.

The geometry of the tubes used must be compatible with the tube holder and be able to withstand accelerations of 600 g for 5 minutes without becoming deformed (see recommendations for use § 1.1.1).

The precessional motion undergone by the biological samples causes the temperature of the sample and apparatus to rise.

3.1.3 Description of the equipment





- 1 **Lid:** closes the equipment.

- 2 **Locking handle:** locks the Precellys® 24 Touch lid and prevents it from opening.

- 3 **Human Machine Interface:** programs and starts the cycles.

- 4 **Blocking plate:** keeps the lysis tubes inserted in the tube holder.

- 5 **Tubes:** tubes containing the samples.

- 6 **Tube holder:** holds the lysis tubes.

- 7 **Containment seal:** seals the Precellys® 24 Touch.

- 8 **Air inlet:** diffuses the air in the Precellys® 24 Touch.

- 9 **USB port:** exports/imports data using a USB stick.

- 10 **On/Off button:** turns the Precellys® 24 Touch on and off.

- 11 **Power plug:** connects the Precellys® 24 Touch to the power supply.

- 12 **Fuse:** protects the Precellys® 24 Touch from power surges.

3.1.4 *Presentation of the command interface*

The touch screen lights up when the Precellys® 24 Touch is powered on and displays the main menu the system has booted (a few seconds).

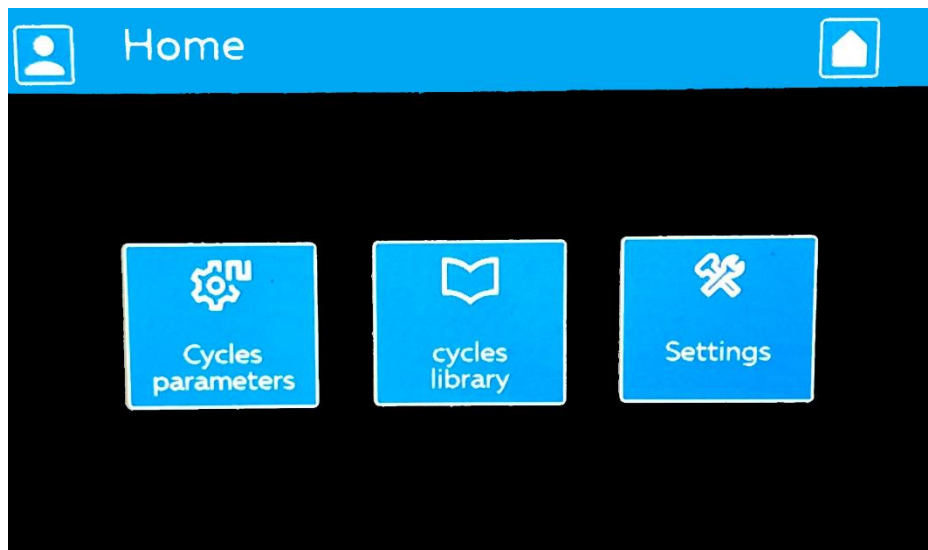


Figure 1: home screen

3.1.4.1 Programming

The Precellys® 24 Touch is designed to operate at a maximum speed of 6800 rpm.

A Precellys® 24 Touch operating cycle is made up of several successive runs between which the lid must not be opened: a stepped cycle that is broken down into a number of runs performed for a certain period.

The speed as well as the other settings which define a stepped cycle can be modified in both programs:

- Settings: Adjustment interval
- Speed: 4500 to 6800 rpm in 100 rpm increments
- Number of periods: 1 to 10
- Duration of the period: 5 to 90 s in increments of 1 second
- Time delay between 2 periods: 5 to 120 s in increments of 1 second

The operating protocol is under the responsibility of the operator. The manufacturer recommends an operating range for each kit that prevents the device from getting too hot.

For high speed use, reduce the times of each period and leave the unit to cool down between two cycles (approximately 2 minutes). A thermal safety device protects the device and prevents its use in the event of overheating.

3.1.4.2 Description of the command interface

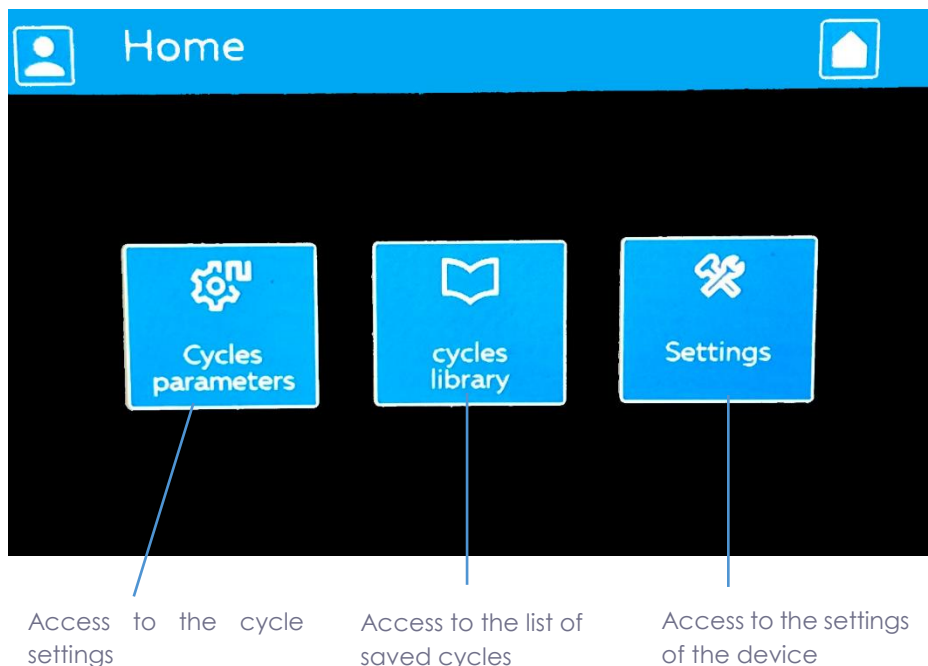


1 Screen: displays all the information relating to the settings and faults of the equipment

2 Start/pause button: starts and stops the cycle.

LED: indicates the status of the equipment

- 3**
- green: equipment operational and ready to start a cycle
 - red: alarms



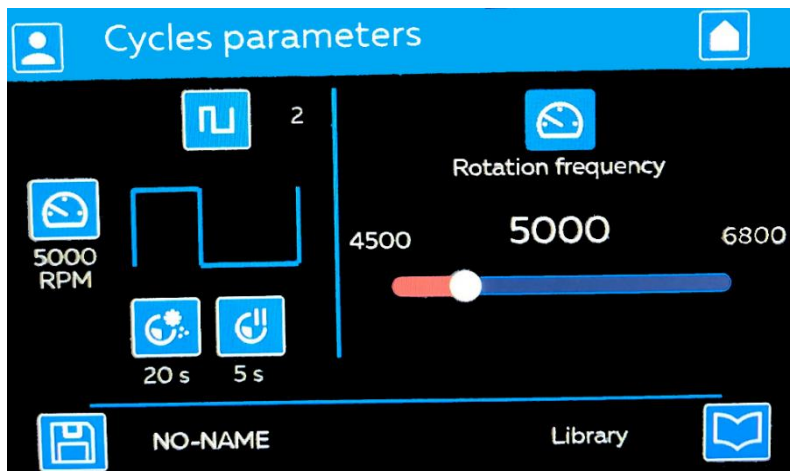
3.1.4.3 *Setting up the cycles of the Precellys® 24 Touch*

The Precellys® 24 Touch operates at a maximum speed of 6800 rpm.





A homogenisation protocol for a Precellys® 24 Touch is made up of one or more steps between which the lid must not be opened.

The Speed and other settings can be set using the touch screen.

In order to program a homogenisation cycle, press the Cycle Setup icon on the home screen. The screen below then appears:

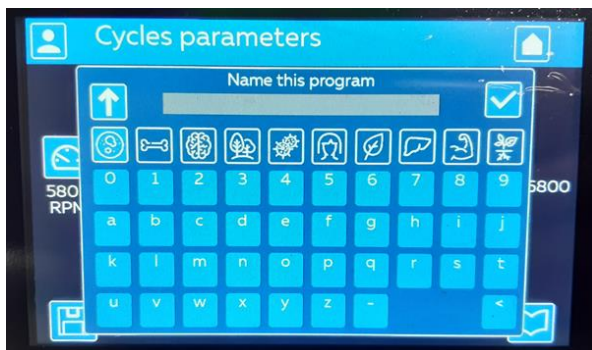



1. Click on the icon to choose the setting that you want to modify
2. An adjustment bar appears on the right of the screen
3. Change the value by dragging the slider from right to left

<i>Protocol settings</i>	<i>Icon</i>	<i>Values</i>
Speed		4500 to 6800 rpm in 100 rpm increments
Grinding time		5 to 90 s
Pause time		5 to 120 s
Number of grinding steps		1 to 10

Once all the parameters are set, it is possible to either run the protocol by pressing the start button on the instrument below the screen, or to save the protocol in the instrument library.

To save a protocol, press on the disc icon on the cycles parameters screen (bottom left of the screen). The screen below then appears:



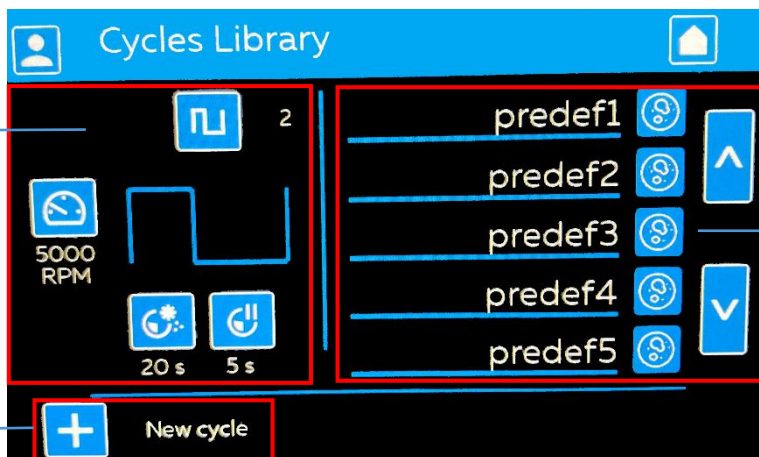
1. Enter a protocol name using the virtual keyboard
2. Select icon to be associated with the protocol
3. Save by using the button,  the protocol is directly added to the list of the protocols available in the Library menu.
4. press the home icon to back to home screen.

The operator is responsible for the settings of the equipment. For each lysing kit, the manufacturer recommends ranges of settings.

Note: To prevent the motor from overheating during a long grinding phase, the Precellys® 24 Touch has a safety system that prevents the device from running when the motor temperatures are too high. Should this occur, let the device cool down before using it.

3.1.4.4 Access to the list of saved cycles of the Precellys® 24 Touch

In order to select an existing protocol, press the Cycles library icon on the home screen. The screen below then appears:



1. Global protocol settings overview
2. Name of the saved protocol
3. Create new cycle

By choosing a protocol in the list, (right side of the screen) the associated parameters are visible (left side of the screen).

Once a protocol selected it is possible to run the protocol by pressing start button on the instrument, the system creates a vacuum below the indented plate. Once the tubes are correctly held in place (i.e. sufficient vacuum), the protocol will begin and the green light will flash.

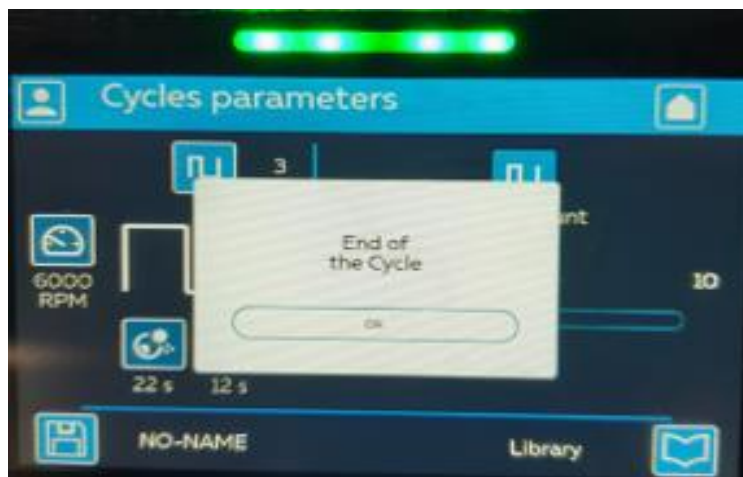
During the run, the screen below then appears:



Light signal:

- Flashing green: lysing cycle in progress
- Flashing red: equipment fault message will appear (**see paragraphs 7 for further details**)

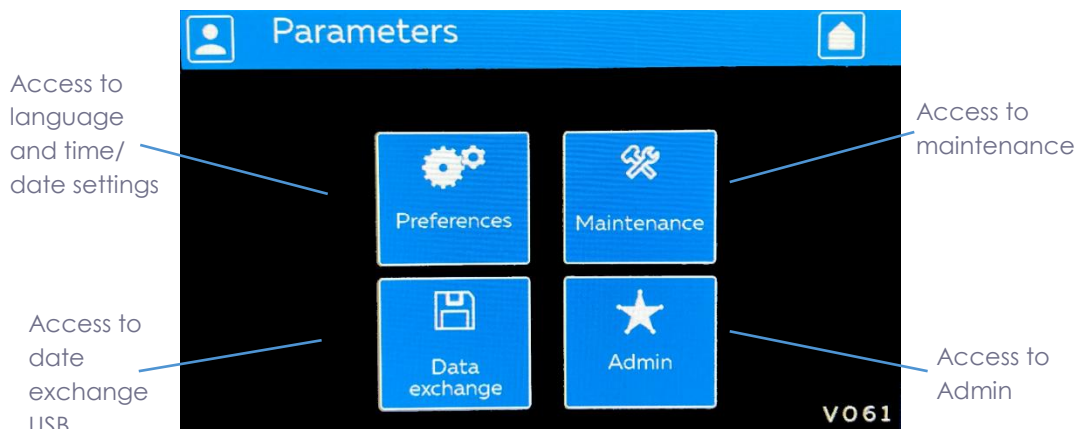
At the end of protocols run, the following screen appears:



Click Ok on the pop-up message, then open the lib by pinching the locker.

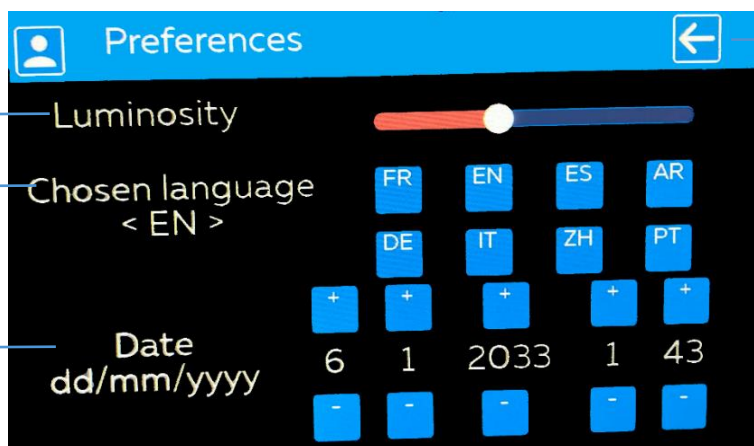
3.1.4.5 Access to the settings of the Precellys® 24 Touch device

In order to modify the setting of the device, press the Setting icon on the home screen. The screen below then appears:



a. Access to language and time/ date setting

In order to Adjust the settings, press the Preferences icon on Parameters screen. The screen below then appears:

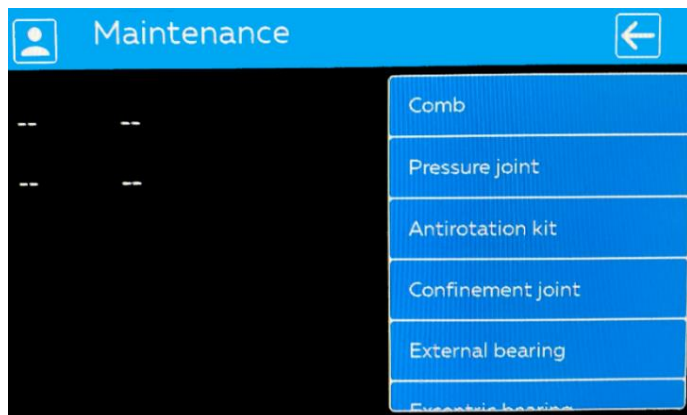


1. An adjustment bar appears on the right of the screen to modify the luminosity according your wishes
2. Click on the icon to change the language of the MMI according your country
3. Click on the icon to adjust the date and time "Only French or English are available"
4. Press the arrow to back to Parameters screen

b. Access to Maintenance

This icon represents a list of spare parts and specifies the maintenance actions that users must perform on a regular basis in order to ensure the continuous good working order of Precellys® 24 Touch,

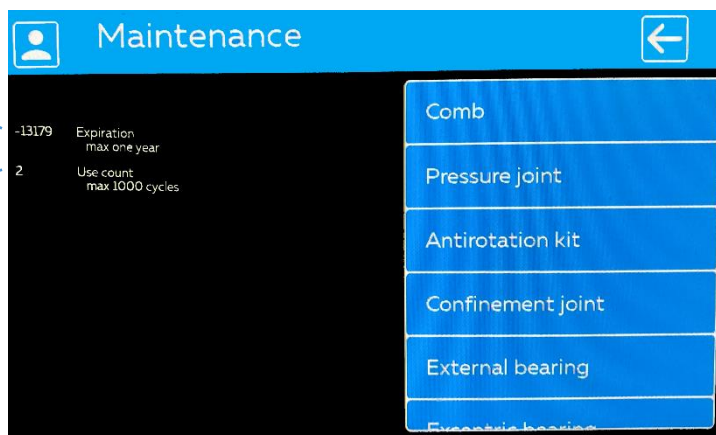
Press the Maintenance icon on Parameters screen. The screen below then appears:



Press on the spart parts list icon you wish, 2 indicator appears as shown on the following screen:

Frequency of
replacement

Number of the
cycles used



Press the arrow to back to Parameters screen.

c. Access exchange USB:

In order to exports/imports data using a USB stick, press the Data exchange icon on Parameters screen. The screen below then appears:



1. Click on Export logs to USB icon to back up the equipment's file history: protocols launched, alerts, date changes...
2. Click on Export library to USB icon to Transfer all protocols recorded in the Precellys® 24 Touch unit to an external data storage source
3. Click on import library from USB icon to Transfer all protocols from an external data storage source to the Precellys® 24 Touch unit.

WARNING: this action will delete all the protocols registered in the unit

4. Press the arrow to go back to the Parameters screen then press the home icon to back to home screen

3.1.4.6 Maintenance

The Precellys® 24 Touch is made up of wear parts that must be replaced at least once a year or before if wear can be observed because of intensive use.

For any other problem, refer to paragraph 9.2 or contact your local dealer.

3.2 Characteristics

Technical characteristics	
Supply voltage and frequency	230 V ~ -240 V ~- 50 Hz (EU standard) 100 V~ - 120 V~ - 60 Hz (US standard)
Consumption	<1 kVA
Fuse	2x - 5x20 - T 6.3A - L 250
Safety	Class I device
Physical characteristics	
Width	287 mm
Depth	408 mm
Height	390 mm (515 mm with the lid open)
Mass	23 kg
Temperature of use and storage	15-30°C
Humidity	50-85% RH
Altitude	< 2,000 m
Noise	< 70 dB
Pollution level	No. 2: standard environment
Operating characteristics	

Speed	4500 – 6800 rpm
Number of periods	1 - 10
Duration of period	10 – 90 seconds
Time delay between two periods	1 – 120 seconds
User interface	
Keyboard	1 push button
Display	1 x 5-inch LCD capacitive touchscreen 1 indicator (green and red)
Capacity	
Number of tubes	24
Total volume of a tube	0.5 mL / 2 mL

3.3 Noise level

In normal operation (rotation at 6800 rpm), the device emits a noise level of less than 70 dB.

3.4 Warranty

Bertin Technologies warrants that the equipment is free of defects when it is shipped.

This warranty is limited to a period of one (1) year and does not include the following parts: fuses, anti-rotation kit, vacuum and containment seals and blocking plate.

This warranty begins when the equipment is installed and registered online on the www.bertin-instruments.com website.

It does not apply in the following cases:

- The equipment has not been installed, operated or maintained in accordance with the instructions described in this manual.
- The equipment has been repaired or altered by unqualified personnel.
- The serial number of the equipment is damaged or removed.

3.5 Manufacturer's Address

Bertin Technologies
Parc d'activité du Pas du Lac
10bis Avenue Ampère
78180 MONTIGNY-LE-BRETONNEUX
France

3.6 Technical assistance

If you cannot resolve a problem after reading this manual, contact the local office of your dealer.

3.7 Standardisation requirements

This equipment complies with CE marking requirements.



3.7.1 Intensive operation

If the device is used intensively (high speed, long cycle times, full tube load, sequenced cycles), the normal rise in the overall temperature of the system may trigger the thermal safety device. In this case, the power supply to the motor is automatically cut off in order to prevent the device from overheating.

3.8 Machine reference

Reference of the Precellys® 24 Touch: P002391-P24T0-A.0.

4 TRANSPORT AND STORAGE

4.1 Transport

Avoid violent shocks which could make the device not work properly.

Do the following each time you transport the device:

- 1- Reposition the tube holder locking foam
- 2- Close the lid
- 3- Use the items from the original packaging.

4.2 Storage

The device must be stored in a dry place and at a temperature between 0°C and 50°C.

5 INSTALLATION



Do not connect the device to the power supply until you have completed the installation.

Do not tilt the device: the Precellys® 24 Touch must always be level and resting on its four feet. If not, the internal components will get damaged or the plastic casing will break.

5.1 Unpacking the device

1. Check the contents of the box using the following list:
 - 1 user manual (French/English)

- 1 Precellys® 24 Touch

- mains cable *
- 1 blocking plate
- 2 vacuum seals (including 1 in place on the machine)
- 2 mains fuses (including 1 in place on the machine)
- 1 individual quality control form
- 1 CE certificate
- 1 manufacturer's inspection certificate

Should the delivery be incomplete, contact your local dealer immediately.

* A suitable adapter or cable (not supplied) is required in countries using power outlets other than: Europe, United Kingdom, United States, Switzerland and Australia.

2. Carefully remove the Precellys® 24 Touch from its box and place it on a clean, horizontal and stable work surface (weight of the device = 23 kg); the height of the 4 feet can be adjusted in order to make the equipment more stable.



Handle



Do not lift the device by holding the lid when removing it from its box. It must be lifted either using the extraction handles provided or by holding the equipment from underneath at the notches provided on the side of the casing (see paragraph 2.2). There are also notches provided in the protective foam.

Given its mass, the device should preferably be handled by two operators.

3. Check its external appearance. Immediately report any defect to the carrier.

4. Keep the original carton, protective foam pads and documentation: these items will be needed in the event of a return.



In the event of a significant temperature difference between the storage area and the laboratory, allow the device to return to room temperature to avoid any condensation.

5.2 Installation and connection

1. Remove the foam padding from the tube holder and replace the containment seal if necessary (see § 8.3.2).



Keep the foam padding, which must be put back in place before transporting the device. If the device is returned to the dealer or manufacturer without this protection, the warranty will not apply.

The containment seal must be fitted in accordance with the instructions in this manual in order to adequately protect the operator. Indeed, the containment seal is an important element of the system used to contain the electrical parts of the device and protect them from getting sprayed by liquids.

2. Fit the vacuum seal (see § 8.3.1).
3. Check that the technical characteristics of the device provided in this manual are consistent with the voltage of your power supply (see § 2.1).



Before connecting the power cord to the device, check the indicated rating on the white window of the fuse holder. Make sure your power supply matches the rating displayed on the window. If not, remove the fuse holder under the power supply, remove the seat of one of the fuses, reverse its position and replace the fuse holder by snapping it into place.



Figure 2 Instructions for adapting the device to the electric current (220V/110V)

If this verification is not done and the rating indicated on the fuse holder is 220V when it is connected to a 110V electric current, the device will not start. Conversely, if the rating indicated on the fuse holder is 110V and it is connected to a 220V electrical current, this could have serious consequences for the user and the device. Check that the fuse fitted in the holder has a rating of 6.3A.

WARNING:

Using an incompatible power supply can irreversibly damage the electronics of the device.

4. Check that the air intake of the fan and the base of the casing are unobstructed: the air outlet is located under the device.



Leave about 10 cm of clearance around the air inlets and outlets.

5. Connect the Precellys® 24 Touch to the mains power using the appropriate mains cable.



This device must be powered by a mains outlet with a protective earth terminal.

6 INSTRUCTIONS



Wearing gloves and taking all necessary precautions according to the risk of infection are recommended when using the device and handling samples.

6.1 Preparing samples

The samples must be prepared in the lysing kits recommended by Bertin Technologies listed on the www.bertin-instruments.com website.

Only the lysing kits recommended by Bertin Technologies should be used. Using any other accessories may reduce the level of protection provided by the device.

6.2 Launching a grinding protocol

6.2.1 *Switching on the equipment*

After connecting the device, the power is turned on using the On/Off switch located on the rear panel, near the power cable terminal.

A few seconds after starting the device, the main menu is displayed. The operator can choose a stored program from the library or program the cycle directly in the cycle setup page.

6.2.2 *Opening the lid*



Never open the lid if the tube holder is in motion.

If the lid is opened during a grinding protocol, the protocol is automatically stopped.

To open the lid: lift the locking handle and tilt the lid as far as the rear limit stop.

6.2.3 Loading the tubes

The tubes containing the samples are held in the tube holder by the collar, and are retained by the blocking plate that must be removed to load or unload the tubes.

A vacuum system keeps the blocking plate pressed down on the tube holder. The branches of the blocking plate hold the tubes in place when this system is activated (at the start of a cycle), and release them when there is no longer any vacuum (a few seconds after stopping a cycle).

6.2.4 Closing the lid

Tilt the lid until the locking handle engages in its clasp.

6.2.5 Running a grinding protocol

After confirming the start of a grinding protocol with the "Start" button, the vacuum system lowers the blocking plate.

When the tubes are correctly locked in place (when the pressure is low enough), the protocol begins and the green light flashes.

The timer (in minutes and seconds) displays the time remaining before the complete end of the programmed protocol.

6.2.6 End of the grinding protocol



Wait for the system to come to a complete stop before opening the lid.

At the end of a grinding protocol, the system returns to the "Use" menu. The vacuum under the blocking plate stops a few seconds after the system stops: the blocking plate cannot be removed from the tube holder during this period.

Note:

The time and speed cannot be changed when it is running.

6.2.7 *Stopping the grinding protocol*



Wait for the system to come to a complete stop before opening the lid.

During the course of the cycle, the user can stop the current cycle at any time by pressing the "Stop" button.

After the user has stopped the cycle, the display shows the remaining time of the grinding protocol. The "STOP" or "START" button can be pressed to return to the "Start" menu. The vacuum under the blocking plate stops a few seconds after the system stops: the blocking plate cannot be removed from the tube holder during this period.

6.2.8 5.3. *Operating limits of the grinding kits*

The lysing kits offered by Bertin Technologies must be used within the operating limits indicated on the www.bertin-instruments.fr website



Using the lysing kits beyond the operating limits can lead to the sudden deterioration of the tubes.

7 ALARMS

The list of the main problems which can occur during operation and the measures to resolve them are set out in the following table:



Before any maintenance and servicing operation, the device must be cleaned and disinfected in accordance with the risk of infection associated with the samples treated and with the protective equipment

required by the rules in force. After any maintenance and servicing operation, check that the device is safe.

Alarm messages	Possible cause(s)	Remedial measures
Pressure error	The tubes recommended by Bertin Technologies are incorrectly positioned on the tube holder	<ol style="list-style-type: none"> 1. Reposition the tubes. 2. Press in the centre of the blocking plate during the vacuum process (lid open).
	The blocking plate or the tube holder is positioned incorrectly.	Put the blocking plate or tube holder back in position on the tube holder, making sure that the blocking plate is correctly guided by the mistake-proofing key.
	The vacuum seal is incorrectly positioned.	Put the vacuum seal back in place on the tube holder making sure the seal is sitting properly inside the groove of the tube holder.
	The blocking plate is damaged.	Replace the blocking plate.
	The vacuum seal is damaged.	Replace the vacuum seal.
	The vacuum circuit is defective.	<ol style="list-style-type: none"> 1. Switch off the device. 2. Contact the technical support.
Lid error	The lid is not properly closed.	<ol style="list-style-type: none"> 1. Check that nothing is preventing the lid from closing. 2. Press the lid down and make sure that the locking handle

		is properly engaged in the clasp of the housing.
	The detection system is defective.	<ol style="list-style-type: none"> 1. Switch off the device. 2. Contact the technical support.
Motor error	The temperature of the motor has reached its safe limit.	<ol style="list-style-type: none"> 1. Leave the device on so that the ventilation system can operate. 2. Make sure that the fan air inlets/outlets are unobstructed. 3. If, after 30 minutes of ventilation, the alarm is still on in the display, contact the technical support.
	The power supply to the system is unsuitable.	Check that the supply voltage specified on the rear panel of the device matches the voltage of the power supply.
	The speed control or the detection system is faulty.	<ol style="list-style-type: none"> 1. Switch off the device. 2. Contact the technical support.

If one of these faults persists, contact the technical team.

8 CLEANING AND DISINFECTION

8.1 Recommendations

For safety reasons, and to avoid damaging the equipment, the following recommendations must be observed:

- Do not spray liquids directly onto the device, especially the electrical connectors and the openings of the casing (vents and air inlet)
- Unplug the equipment before cleaning.
- Do not use a scraper sponge: risk of damage to the device.
- Do not use an aerial disinfection process.
- Do not use caustic soda or acetone: the device will be irreversibly damaged.
- Immediately remove any liquid from the equipment with a dry cloth.

The exterior of the equipment can be cleaned with a sponge or cloth that has been moistened with water, 70% alcohol or a disinfectant, e.g. Anios Surfa'Safe.

8.2 Disinfection protocol

Should a tube burst during operation, for example, the parts likely to be contaminated by infectious agents must be disinfected with a suitable disinfectant.

The user shall assume full responsibility for their choice of disinfection process.

The parts likely to be contaminated can, for example, be cleaned using a paper towel soaked in a 6 °Cl diluted solution of bleach.

If another disinfection process has to be implemented, contact the technical support service beforehand in order to confirm that the procedure is compatible with the equipment.

9 MAINTENANCE AND SERVICING

9.1 Repair

The equipment must undergo a cleaning and disinfection protocol before being shipped for a repair.

The equipment must be shipped with the return slip clearly specifying the procedure used, the people involved as well as the date of the cleaning or disinfection process (see appendix 1).

If there is no duly completed return slip, the equipment cannot be processed by the Bertin Technologies' After-Sales Service.

Replacing the power cord:



Similarly, when replacing the power cord, it is important to use a cord with exactly the same characteristics (... VAC-... A).

The user must be aware of the significant risk in the event of non-compliance with this rule.

9.2 Problems encountered

<i>Encountered problem</i>	<i>Possible cause(s)</i>	<i>Remedial measures</i>
The fan is not turning.	There is no power at the mains socket.	<ol style="list-style-type: none"> 1. Check the mains voltage. 2. Check that the voltage supplied by the mains matches that of the device. 3. Check the connection of the device to the mains.
	The fuse is defective.	Replace the fuse.
	The ventilation system is defective.	<ol style="list-style-type: none"> 1. Switch off the device. 2. Contact the technical support.
The screen does not turn on.	There is no power at the mains socket.	<ol style="list-style-type: none"> 1. Check the mains voltage. 2. Check that the voltage supplied by the mains matches that of the device. 3. Check the connection of the device to the mains.
	The fuse is defective.	Replace the fuse
	The display system is defective.	<ol style="list-style-type: none"> 1. Switch off the device. 2. Contact the technical support.
	The fuse holder displays a rated voltage of 220V while the power supply is 110V	<ol style="list-style-type: none"> 1. Unplug the device from the mains 2. Remove the fuse holder from its compartment

		<p>3. Remove the seat from one of the fuses</p> <p>4. Reverse the position to the 110V side</p> <p>5. Replace the fuse holder by snapping it into its compartment</p>
A tube is no longer sealed.	The top was screwed on incorrectly or the tube is defective.	If the product contained in the tube is hazardous or potentially hazardous, perform the appropriate disinfection procedure.
	The tube used is not a Precellys® tube	
	The operating limits were not respected	
Power cut	-	<p>For safety reasons, the blocking plate stays locked in position by the vacuum system.</p> <p>Switch the device back on in order to remove the blocking plate.</p>

9.3 Replacing wear parts

This paragraph specifies the maintenance that users must perform on a regular basis to ensure that the Precellys® 24 Touch works properly and that the tubes are maintained during the homogenisation phase:

<i>Wear part</i>	<i>Reference</i>	<i>Replacement frequency</i>
- Blocking plate 2 ml		1 year or when damaged

Vacuum seal		6 months or when damaged
Containment seal		1 year or when damaged
Fuse		When it has blown
Off-centre bearing		5 months or when damaged
Anti-rotation kit		1 year or when damaged
Anti-vibration mounts		If the suspended part hits the fixed part repeatedly during the cycles



The levels of the voltages in the device are hazardous. In order to guarantee the safety of the user, including during the cleaning and disinfection phases, the containment seal must not be damaged (puncture, tear, etc.)

DO NOT tilt the device: the Precellys® 24 Touch must always be resting on its four feet. If not, the internal components can get damaged or the plastic casing will break.

9.3.1 Replacing the vacuum seal

The vacuum seal on the tube holder wears out during operation. It is recommended to change it when the "Pressure error" alarm appears permanently or recurrently. As a preventive measure, this seal should be replaced at least once every 6 months.



9.3.2 Replacing the containment seal

The containment seal should be changed at least once a year. The tube holder does not have to be dismantled when replacing it.



Switch off the appliance and unplug the power cord before carrying out this operation.

1. Place the inner groove of the containment seal over the metal flange.
2. Place the outer groove of the containment seal on the housing. The containment seal should be changed at least once a year. The metal tube holder does not have to be removed in order to do this procedure.



9.3.3 Replacing the fuse



Switch off the appliance and unplug the power cord before carrying out this operation.

Remove the fuse holder by pinching the retaining clips.



Fuse

9.3.4 Replacing the anti-rotation tubes

The anti-rotation tubes should be changed at least once a year. The tube holder does not have to be dismantled when replacing them.



Switch off the appliance and unplug the power cord before carrying out this operation.

Rotate the tube holder.

Disconnect the first anti-rotation tube by pulling on the assembly from one side to the other.

Install the new anti-rotation tube by connecting it on one side and then on the other.



Do the same with the other anti-rotation tube.

9.4 Support

If any information is not present in this manual, contact your local distributor.

For the latest information on our services, you can consult the www.bertin-instruments.com page.

You can contact the Bertin Instruments team at the following address:
sample-prep@bertin-instruments.com.

10 ELIMINATION

The cleaning and disinfection procedure is mandatory before disposing of the equipment in order to protect people and the environment.

The equipment, its spare parts and its consumables are to be sorted and recycled in accordance with the directive on waste electrical and electronic equipment (WEEE) 2012/19/EU.

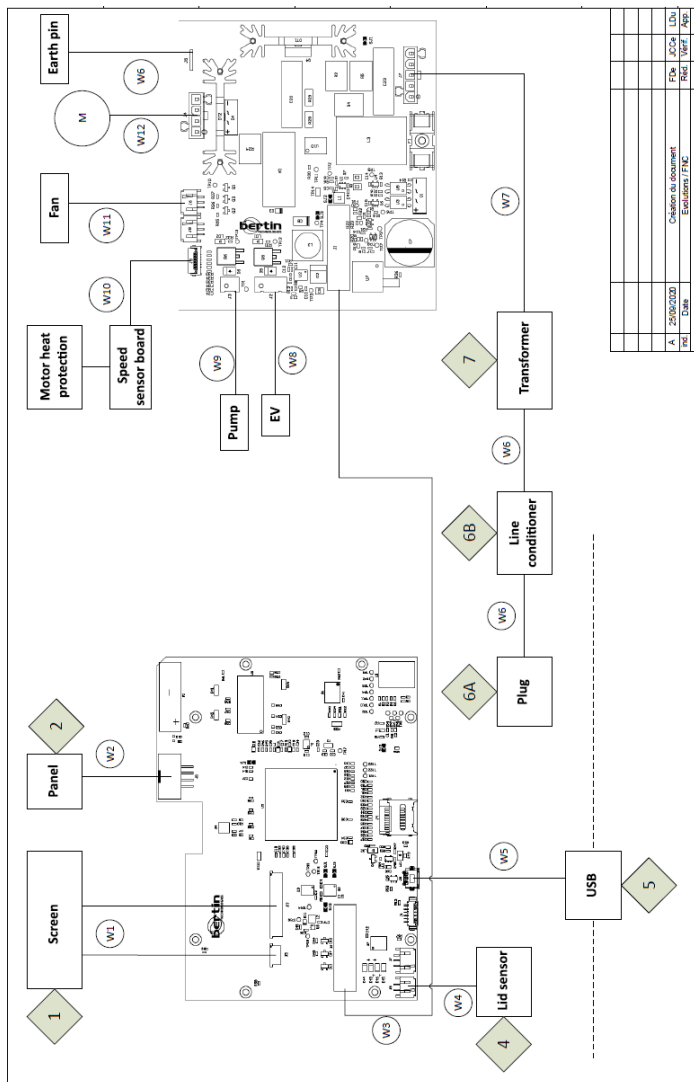


Bertin Technologies is responsible for processing WEEE for its products sold in France (via RECYLUM). For other countries, the importer is responsible for waste processing.



11 APPENDICES:

11.1 Electrical diagram

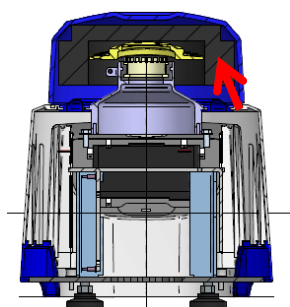


11.2 Precellys® returns

Should you wish to return a Precellys, contact your local distributor.

11.2.1 Preparing the Precellys® 24 Touch

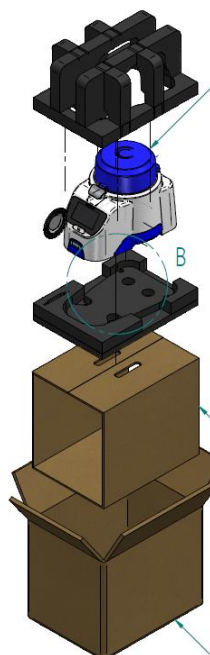
1. Open the lid and place the black foam padding inside.
2. Close the lid.



11.2.2 Positioning the original packaging

1. Place the lower black foam pad on the cardboard drawer.
2. Place the Precellys® 24 Touch in its space, while ensuring that the housing and feet are fully inserted into the foam.
3. Cover the Precellys® 24 Touch with the upper black foam pad.
4. Place the assembly right in the bottom of the cardboard box.

Do not hold the device by the lid when putting it in its box. It must be held using either the extraction handles provided or by holding the equipment from underneath at the notches provided on the side of the casing. There are also notches provided in the lower protective foam pad.





Given its mass, the device should preferably be handled by two operators.

11.2.3 Packing

WARNING: handle the device with care as significant shocks can damage the equipment.

1. Close the box with strong packing tape when ready.
2. Place the box on a pallet and secure it with strapping.





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