

PRECELLYS[®] Evolution Touch



USER MANUAL
PRECELLYS[®] Evolution Touch

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BERTIN TECHNOLOGIES
Parc d'activités du Pas du Lac
10 bis, avenue Ampère
78180 Montigny le Bretonneux
France
Tél : + 33 (0)1 39 30 61 60

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1. Introduction

Thank you for purchasing a Precellys® Evolution Touch by Bertin Technologies.

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

The Precellys® Evolution Touch can homogenize 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® Evolution Touch safe and easy to handle. Evolving in the field of Life Sciences, the Precellys® Evolution 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 homogenization to each tube.

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

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



Read carefully user manual before operating.

2 PRECAUTIONS AND RECOMMENDATIONS

This manual must be read carefully by the user before any use of the PRECELLYS® Evolution Touch homogenizer.

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.




 Ne pas ouvrir le capot lors du fonctionnement.
Do not open the cover while running.


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

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

 Lire attentivement la notice avant utilisation.
Read carefully user manual before operating. 

This manual must be read carefully by the user before using the PRECELLYS® Evolution Touch homogenizer.

 Earth connection: safety of the electrical installation. By allowing to reduce the risks of electrocution and electrification.

 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 Evolution 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 injuries and environmental damages.

2.2. Recap of the advice for using the power supply

- ▶ 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 shocks, intended for indoor use only.
- ▶ Do not disassemble or repair the power supply by yourself. There is a risk of electrocution.
- ▶ Do not immerse the device, do not use the device in explosive atmospheres or in wet environments.
- ▶ Unplug the cord from the wall outlet before cleaning the unit. The power supply may become hot during use. Before transporting it, disconnect it and let it cool down.

- ▶ The means of disconnection of the equipment is the mains connector.
- ▶ 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 mechanism.
- ▶ The power cord must not be replaced with a part number other than the one supplied with the product.

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 any 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 applicable standards.



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

2.3.1 Fuse

The device contains an external fuse located on the rear panel. If they need to be changed, they must be replaced with a fuse 5x20 - T 10 A - H 250 V. It can be easily replaced by the user using a screwdriver (see § 9.3.3).



2.4. Biological risks

Always wear gloves and protective glasses when handling bio-hazardous 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

WARNING:

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

2.6 Risk of use

2.6.1 Use of lysing kits

Depending on the user settings of the PRECELLYS® Evolution Touch (speed, number of cycles, duration of a cycle, time delay between two cycles), excessive heat of the lysing tube may lead to their sudden degradation.

In order to ensure the good working order of the Precellys® Evolution Touch, it is strongly recommended to use the Lysing Kits produced by Bertin Technologies and to comply with the operating limits defined for each Lysing 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 website www.bertin-technologies.com.

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® Evolution Touch must always be resting on its four feet. If not, the internal components can get damaged or the plastic casing break.
- ▶ Do not handle the instrument if the casing is partially or completely disassembled or if it is damaged: high voltage levels in the device are hazardous.
- ▶ Do not handle the instrument if the earth connection is disconnected.
- ▶ Do not install any unauthorised electronic board, component or accessories as this may 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 PRECELLYS® EVOLUTION TOUCH

3.1 Presentation of the equipment

3.1.1 Instrument

The PRECELLYS® Evolution Touch is a device designed to lyse and homogenize 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).

The PRECELLYS® Evolution Touch offers the following key advantages:

- ▶ Easy tube loading: innovative and automated locking system.
- ▶ Easy decontamination: 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 between samples.
- ▶ Effective and identical grinding in all the tubes and whatever their volume.





3.1.2 Tube kinetics

Given the design and symmetry of the machine, each of the tubes of the same type placed in the rack has strictly the same kinetics, which guarantees the same quality of lysis and homogenization 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 prioritizes vertical movements, thereby ensuring the efficiency of the lysis. The movement generated by the PRECELLYS® Evolution Touch is a precessional motion, which means that the tubes are not rotated.

The geometry of the tubes used must be compatible with the rack and be able to withstand accelerations of 600 g for 5 minutes without becoming deformed (see recommendations for use § 2.6.1).

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® Evolution Touch lid and prevents it from opening.
- ③ **Human Machine Interface:** allows the user to program and start the protocols.
- ④ **Tube blocking plate:** blocks the lysing tubes inserted in the tube holder.
- ⑤ **Tube holder:** supports the lysing tubes.
- ⑥ **Metal support:** supports the tube holder.
- ⑦ **Containment seal:** allows the sealing of the Precellys® Evolution Touch.
- ⑧ **Air inlet:** diffuses the air in the Precellys® Evolution Touch.
- ⑨ **USB port:** exports/imports data using a USB stick.
- ⑩ **Additional 24V DC connection:** allows the connection of a Cryolys Evolution unit.
- ⑪ **On/Off button:** turns the Precellys® Evolution Touch on and off
- ⑫ **Power plug:** connects the Precellys® Evolution Touch to the power supply.
- ⑬ **Fuse:** protects the Precellys® Evolution Touch from power surges.
- ⑭ **Additional 3V - 5V DC connection:** allows the connection of a Cryolys Evolution unit.

3.1.4 Présentation de l'interface de commande

The touch screen lights up when the PRECELLYS® Evolution Touch is powered on and displays the main menu after a few seconds of system boot up.



Figure 1 : Home screen



3.1.4.1 Programming

The PRECELLYS® Evolution Touch is designed to operate at a maximum speed of 10 000 rpm.

A PRECELLYS® Evolution Touch operating protocol is made up of several successive cycles. Each protocol is composed of different parameters listed in the table here-after and their setting can be made in the "Protocol settings" or "Protocol library" menus.

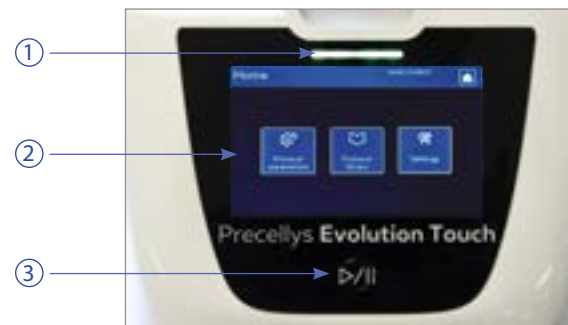
Protocol parameters	Values
Speed*	From 4500 to 6800 rpm and from 7200 rpm to 10 000 rpm increments of 100 rpm
Number of cycles	From 1 to 10
Grinding time	5 to 120 s by increment of 1 second
Time delay between 2 periods	5 to 120 s by increment of 1 second
Tube size	From 0.3 mL to 50 mL
** Cooling module	ON or OFF
** Setpoint temperature	From 0 to 10°C by increment of 1°C
** Cooling control mode	Manual or automatic

* Programming speed between 6900 rpm and 7100 rpm is not permitted, in order to ensure good functioning and a maximum product life.

** The cooling module is an option.

The operating protocol is under the responsibility of the operator. The manufacturer recommends for each speed an operating range that prevents a strong rise in the temperature of the device, the following paragraph gives the limits of the adjustment parameters accessible to the operator.

3.1.4.2 Description of the command interface



- ① **LED:** indicates the status of the equipment:
 - green: equipment operational and ready to start a cycle
 - red: alarms
- ② **Screen:** displays all the information related to the settings and faults of the equipment
- ③ **Start/Stop Button:** starts and stops the cycle



- Access to the protocol settings.
- Access to the list of saved protocols
- Access to the settings of the device.

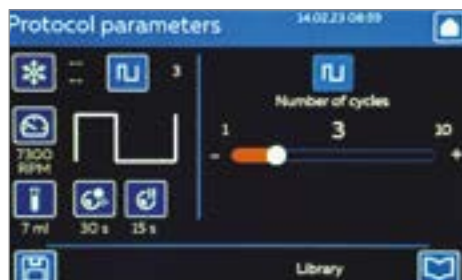
3.1.4.3 *Setting up protocols on the Precellys® Evolution Touch*

The Precellys® Evolution Touch operates at a maximum speed of 10000 rpm.

A homogenization protocol for a Precellys® Evolution 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 an homogenization protocol, press the "Protocol Setup" icon on the home screen. The screen below then appears:



1. Click on an icon on the left side 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 or by using the +/- symbols.

Protocol settings	Icon	Values
Grinding time		5 to 120 s
Speed		4500 to 6800 rpm and 7200 to 10 000 rpm, 100 rpm increments
Number of grinding cycles		1 to 10
Pause time between cycles		5 to 120 s
Tube size		0.3 mL to 50 mL
Cooling module		ON or OFF
Setpoint temperature		From 0 to 10°C in increments of 1°C
Cooling control mode		Manual or Automatic



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.

3.1.4.4 *Saving the protocol*

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. However, it is possible to cancel the saving operation and return to the setting part if necessary by clicking on the bouton .

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

Note: to prevent the motor from overheating during a long grinding phase, the Precellys® Evolution 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.

3.1.4.5 Access to the protocol list

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



1. Global protocol settings overview.
2. Name of the saved protocol.
3. Create a new protocol based on the selected protocol.

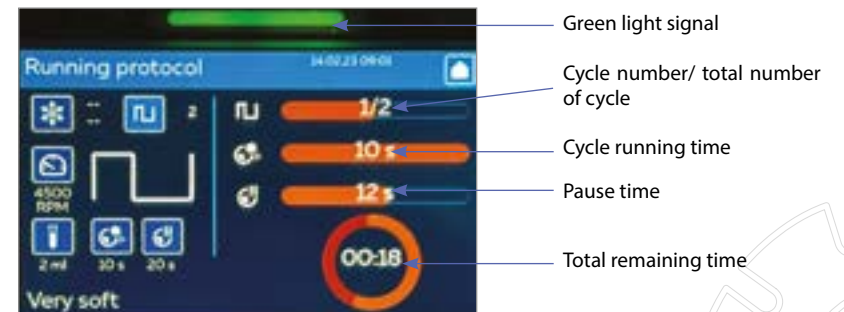
By choosing a protocol in the list, (right side of the screen) the associated parameters are visible (left side of the screen).

- Once a protocol selected it is possible:
- To run the protocol by pressing the start button on the instrument (below the screen). The system creates a vacuum underneath the indented plate. Once the tubes are correctly held in place (i.e. sufficient vacuum), the protocol begins.
 - Edit a protocol by pressing the Edit icon. When the required parameters

of the protocol are set, launch the protocol by pressing the start button of the instrument (below the screen) or save the modified protocol under another name.

3.1.4.6 Running protocol

While a protocol is running on the instrument, the following screen is displayed:



Light signal:

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

3.1.4.7 Protocol end

At the end of a protocol, the following screen appears:



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



3.1.4.8 Access to the settings of the Precellys Evolution Touch device

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



3.1.4.8.1 Preference

3.1.4.8.1.1 General

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



1. Adjust the luminosity of the screen by moving the adjustment bar.
2. Click on the icon of the appropriate language. The choice of language is effective the next time the equipment is switched on (French, English and Spanish languages are available).
3. Set the time and date.
4. Press the top right arrow to back to the settings screen.


3.1.4.9 Access to maintenance

The Precellys® Evolution Touch is composed of wearing parts that must be replaced regularly at least according the defined intervals (see § 9.3) or before if the intensive use of the device leads to a visible wear of parts.

This menu is composed of 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® Evolution Touch:



The first indicator shows the number of days since the part was replaced. The second indicator shows the number of cycles performed with the part.

When any of the indicators exceed the recommended maximum, The tool icon  in the top bar panel. The operator must then proceed to replace the part (§9.3) or contact the local distributor. Press the top right arrow to return to the Settings menu.

For any other issues, refer to paragraph 9 or contact your local distributor.

3.1.4.10 Data exchange :

In order to exports/imports data using the USB port (located on the rear panel of the equipment), 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 the «Export library to USB» icon to save the list of protocols of the equipment.
3. Click on the «import library from USB» icon to replace the library of the equipment with the one saved on the USB stick.

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

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

3.2 Characteristics

Technical characteristics	
Supply voltage and frequency	110 V~ / 230 V~ (+/- 10%) - 50 Hz / 60 Hz
Consumption	<1 kVA
Fuse	5x20 – T 10A – H 250
Button battery	Panasonic CR-2032/BN : 3Vdc – 225 mAh
Safety	Class I device
Physical characteristics	
Width	380 mm
Depth	520 mm
Height	400 mm (635 mm with the lid open)
Mass	27.2 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 – 10000 tr/min
Number of periods	1 - 10
Duration of period	10 – 90 secondes
Time delay between two periods	1 – 120 secondes

User interface	
Keyboard	1 push Button
Display	1 x 5-inch LCD capacitive touchscreen 1 indicator (green and red)
Capacity	
Number of tubes	96 24 12 6 3
Total volume of a tube	0.3ml 0.5 ml/2 ml 7 ml 15 ml 50 ml

3.3 Noise level

In normal operation (rotation at 10 000 rpm), the device emits a noise level lower 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, blocking plate and tube holder. This warranty begins when the equipment is installed and registered online on the www.bertin-technologies.com.

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
 10 bis, 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 the requirements of the CE marking except for requirement 6.3.2 b) of IEC 61010-1. However, with respect to this requirement, the equipment complies with the Low Voltage Directive and the standard governing IT equipment EN 62368-1.



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 Device reference

Reference of Precellys® Evolution Touch: 23405-300-RD001.

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 +10°C and +40°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® Evolution Touch must always be resting on its four feet to avoid damaging internal components or breaking the plastic casing.

5.1 Unpacking the device

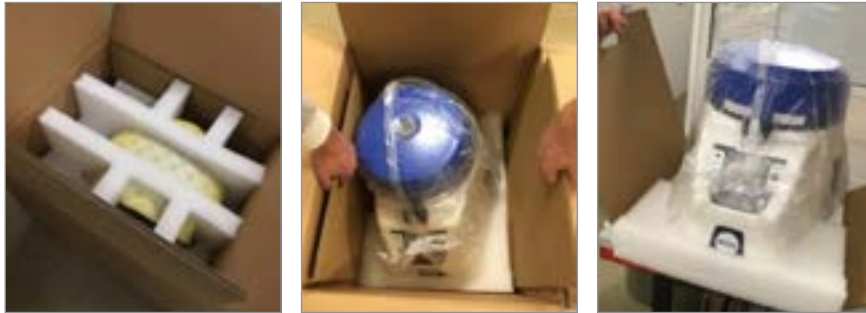
1. Check the contents of the box using the following list:

- ▶ 1 user manual (French OR English)
- ▶ 1 PRECELLYS® Evolution Touch (including 1 blocking plate, 1 vacuum joint and 1 containment seal)
- ▶ 1 mains cable*
- ▶ 1 replacement vacuum joint
- ▶ 1 replacement mains fuse
- ▶ 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® Evolution Touch from its box and place it on a clean, horizontal and stable work surface (weight of the device = 27 kg): the height of the 4 feet can be adjusted in order to make the equipment more stable.



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 2.1). 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 box, the protective foam pads and the original 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 pad from the tube holder and replace the containment seal if necessary (voir § 9.3.2).



Keep the foam pad, 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 joint (voir §9.3.1).



3. Check that the technical characteristics of the device provided in this manual are consistent with the voltage of your power supply (voir §3.2).



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® Evolution 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 OPERATING 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 Samples preparation

The samples must be prepared in the lysing kits recommended by Bertin Technologies listed on www.bertin-technologies.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. (voir paragraphe 3.1.4.3).

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.

The holder is removable and designed in such a way to allow it to stand on its feet even when fully loaded with tubes. It is also possible to operate the equipment without fully loading the holder.

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).



Figure 2 : 2mL holder and associated blocking plate example



1. Removing the blocking plate



2. Place the holder on the instrument and place tubes on the holder.



3. Replace the blocking plate



Note: When loading tubes, ensure that:

- ▶ The vacuum joint is correctly positioned in its slot on the holder.
- ▶ The blocking plate is centered on the holder and rests on the vacuum joint. A coding device helps to put it in place.

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 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 «Protocol settings» 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 as long as the vacuum is not fully released.

Note :

The time and speed cannot be changed when the instrument is running.



In order to avoid overheating of the device, the Precellys® Evolution Touch is equipped with a safety system that prevents the device from operating at high motor temperatures. If this happens, let the device cool down before using it.

6.2.7 Stopping the grinding protocol



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

During 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. Pressing the «Start» button allows the cycle to continue. Pressing the OK button on the screen cancels the cycle and the screen returns to the «Settings Protocol» or «Library» 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 Operating limits of the grinding kits

The lysing kits produced by Bertin Technologies have different usage limitations and must be used within these limits. The limits are 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



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.

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

Alarm messages	Possible cause(s)	Remedial measures
Pressure error	The tubes recommended by Bertin Technologies are incorrectly positioned on the tube holder	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 are not positioned correctly.	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 joint is incorrectly positioned.	Put the vacuum joint back in place on the metal holder making sure the joint is sitting properly inside its groove.

Alarm messages	Possible cause(s)	Remedial measures
Pressure error	The blocking plate is damaged.	Replace the blocking plate.
Pressure error	The vacuum joint is damaged.	Replace the vacuum joint.
	The vacuum circuit is defective.	1.Switch off the device. 2.Contact the technical support.
Lid error	The lid is not properly closed.	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..	1.Switch off the device. 2.Contact the technical support..
Motor error	The temperature of the motor has reached its safe limit	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..	1.Switch off the device. 2.Contact the technical support.

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



8 CLEANING AND DESINFECTATION

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 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 or 70% alcohol.

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.

In case of possible contamination of the instrument, the external parts of the instrument (shell, cover, screen, grinding housing) can be cleaned with a cloth moistened with water and then decontaminated with a cloth moistened with a bleach solution (1000ppm/6°C1), or an anionic disinfectant. The use of ethanol can be considered but should be avoided on rubber seals.

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

If another disinfection process must 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 be cleaned and decontaminated in accordance with the procedure described in § 8.2 before shipment for repair.

The equipment must be sent with a return form indicating clearly, at the very least, the procedure used, the persons involved and the date on which cleaning and/or decontamination was performed. (see appendix 1).

If the return form is missing from the consignment, Bertin Technologies after-sales team reserves the right to refuse to perform repairs.

9.2 Problems encountered

Encountered issues	Possible cause(s)	Remedial measures
The fan is not turning.	There is no power at the mains socket.	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.	1.Switch off the device . 2.Contact the technical support..
The screen does not turn on.	There is no power at the mains socket.	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.	1.Switch off the device. 2.Contact the technical support.
A tube is no longer sealed.	The cap 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		For safety reasons, the blocking plate stays locked in position by the vacuum system. Switch the device back on in order to remove the blocking plate.



9.3 Wear parts replacement

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

Wearing part	Reference	Frequency of replacement	Why ?
2 mL blocking plate + tube holder	P002274-PEVT0-A.0	when damaged	Necessary for maintaining tubes in place during homogenization.
7 mL blocking plate + tube holder	P000911-PEVT0-A.0	when damaged	Necessary for maintaining tubes in place during homogenization.
15 mL blocking plate + tube holder	P000810-PEVT0-A.0	when damaged	Necessary for maintaining tubes in place during homogenization.
Vacuum joint	P000806-PEVT0-A.0	6 months or when damaged	Necessary for maintaining tubes in place during homogenization.
Containment seal	P000805-PEVT0-A.0	1 year or when damaged	Necessary to guarantee the tightness of the device.
Mains fuse	P002574-PEVT0-A.0	when damaged	
Anti-rotation kit	P002378-PEVT0-A.0	1 year or when damaged	Necessary for maintaining tubes in place during homogenization.



The voltage levels 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® Evolution 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 vacuum joint replacement

The vacuum joint located on the metal 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 Containment seal replacement

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. This procedure does not require the dismantling of the metallic support ring.



9.3.3 Fuse replacement

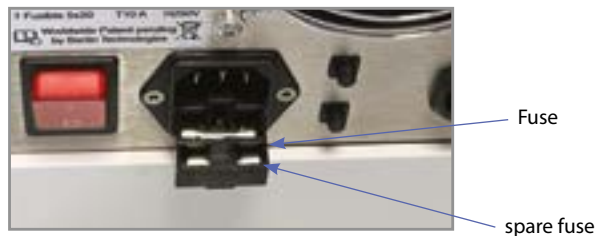


Switch off the appliance and unplug the power cord before carrying out this operation.

Remove the fuse holder by pinching the retaining clips .



flat screwdriver



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

10 ELIMINATION

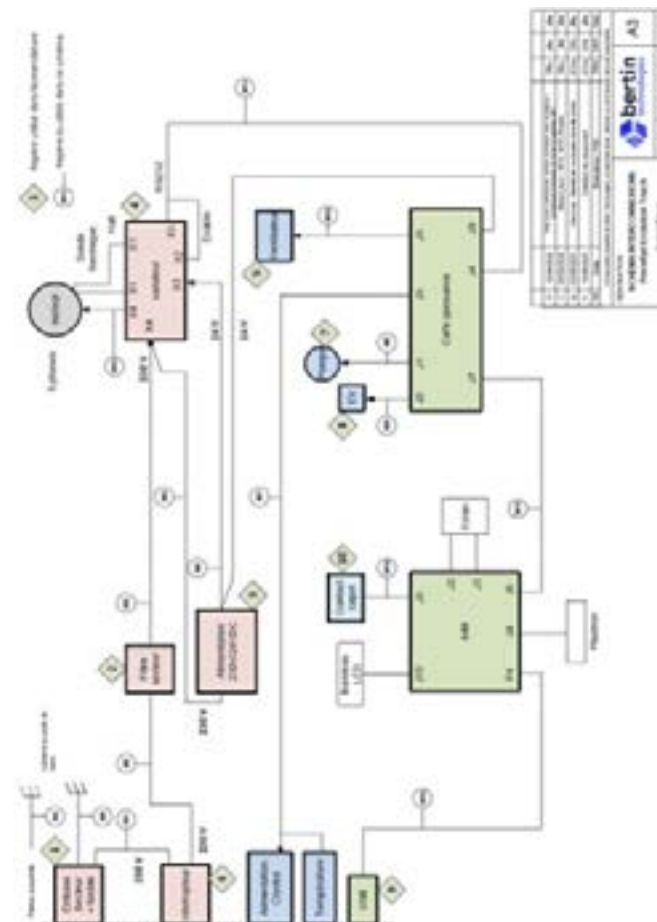
The cleaning and disinfection procedure is mandatory before disposing of the equipment in order to protect people and the environment.
 The equipment, its spare parts and its consumables are to be sorted and recycled in accordance with the directive on waste electrical and electronic equipment (WEEE) 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

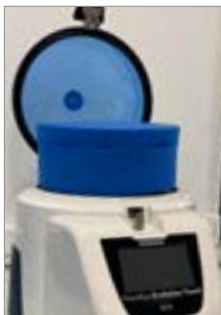
11.2.1 Precellys® Evolution Touch decontamination

Before any return, decontaminate the device (see §8.2) and attach the decontamination certificate.



11.2.2 Preparing Precellys® Evolution Touch

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



Close the lid



5. Place the blocking plate and tubes together as in the figure and place them into the special cutout of the top foam.



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 Positioning the original packaging

1. Place the cardboard inserts on a flat surface and position the bottom foam at its center.



2. Place the Precellys® Evolution Touch in its space, while ensuring that the housing and feet are fully inserted into the foam.



3. Place the Precellys® Evolution Touch in the box using the handles.



4. Place the upper foam.



11.2.4 Packing



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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Precellys 24
The Original



Minily
The Individual

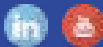


Cryolys
The Cooling Unit



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10 bis, avenue Ampère, 78180 Montigny-le-Bretonneux, France

www.bertin-technologies.com