

NEW GENERATION Minilys Personal Homogenizer

SAMPLE PREPARATION & CELL LYSIS



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# 1. Introduction

This user manual includes the required information regarding unpacking, installation, operation and maintenance of the **MINILYS**.

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

## 1.1. Safety Information

**This user manual must be read carefully before operating the Minilys.**

If there is any doubt or concern about the safety of the equipment, please contact your local distributor.

### 1.1.1. Use of the lysing kits

Depending on the parameters of the MINILYS (speed, cycle duration, waiting time between two cycles), an important overheating of the lysing tubes may lead to their sudden degradation.

To prevent any risk to the user when running the MINILYS it is scrupulously recommended to use the lysing kits produced by Bertin Technologies and respect the use limits defined for each lysing kit. Those limits specify maximum level for parameters (speed, number of cycles, cycle duration, waiting time between two cycles, etc). It will ensure good biological samples preparation.

The use limits of every Lysing kits are available on the website [www.precellys.com](http://www.precellys.com) or in each Bertin Technologies Kit.

### 1.1.2. Risk of Electric Shock

Although this equipment is fully insulated and grounded, it is important for all users to be aware of the potential hazard of using liquids close to a power supply. If any liquids are spilled, disconnect immediately the instrument from the main power supply (remove the power cord from the AC power input on the rear panel) and clean the equipment and the surrounding area.

**Do not** reconnect the equipment until it has been fully inspected.

### 1.1.3. Incorrect Operation

Operating this equipment in other ways than those detailed in this user manual may impair the protection of the unit.

- ▶ **Do not** turn the unit upside down during working: the Minilys must always rest on its 4 feet for fear of damaging internal components or breaking plastic casing
- ▶ **Do not** operate the unit when the casing is removed; potentially lethal voltage exists within the instrument.
- ▶ **Do not** operate the unit with the safety ground disconnected.
- ▶ **Do not** install unauthorised cards, spare components or accessories as this may impair the safety of the unit and the warranty will be void.
- ▶ **Do not** overfill the tubes as this may lead to liquid contamination and impair the safety of the unit.
- ▶ **Check** that the voltage indicated on the rear panel of the unit matches to the local power supply.
- ▶ **Check** that the power cord is properly plugged-in. Colour codes are as follows:

	International Code	USA Code
Phase Live	Brown	Black
Neutral	Blue	White
Earth / Ground	Yellow & Green	Green

#### 1.1.4. Fuses

The equipment contains two replaceable external fuses located on the rear panel. If one of the fuses is to be replaced, please use the following fuse 5x20 – F 2 A – H 250 V. It can easily be replaced by the user with a screwdriver (see §7.2).

#### 1.1.5. Biological Risks

Wear gloves when handling samples and follow strictly all of the safety instructions related to bio-hazardous agents to prevent any risk of contamination.

The waste produced by the normal operation of the instrument must be disposed of in biological waste containers and handled by specialized companies.

#### 1.1.6. Maintenance

The equipment can only be repaired by either the authorised distributor or the manufacturer.

#### 1.1.7. Noise Level

The equipment's noise level is below 75 dBa when in operating mode at the maximum speed.

#### 1.1.8. Electromagnetic Interference

##### **WARNING:**

**This is a Class A apparatus. The equipment may cause radio-electric interference in a residential environment. In this case, it is recommended that the user takes appropriate measures.**

#### 1.1.9. Intensive Use

If this device is used in an intensive manner (high speed and long cycle duration), the temperature of the system will increase. A high temperature level may cause the thermal security protection to function. In this case, the electrical power input of the motor will be cut automatically to avoid overheating of the device.

## 1.2. Warranty

Bertin Technologies certifies that this product is free of defects at the time of shipment.

This warranty is limited to a period of one (1) year and it does not apply to the following parts: fuses, tube adapter.

This warranty is not applicable in the following circumstances:

- ▶ The equipment has not been installed, operated, maintained or shipped according to the instructions described in this user manual.
- ▶ The equipment has been repaired or modified by unauthorised personnel.
- ▶ The equipment serial number has been damaged or removed.

### **1.3. Minilys' Reference**

Code: MINILYS 06404.200.RD000

### **1.4. Manufacturer Information**

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### **1.5. Technical Support**

First, read this user manual very carefully. If you cannot solve the problem after having used this manual, please contact the nearest distributor's office or Bertin Technologies' Customer Support Department located in France (see the address above).

## 2. Description of the MINILYS

### 2.1. Product Overview

The MINILYS lyser / homogeniser has been designed to lyse and to homogenise biological samples contained in grinding tubes, at variable speeds. It can simultaneously agitate tubes with biological sample volumes up to 7 mL at very high speed.

Minilys' main advantages include:

- ▶ Easy tube loading : removal holder
- ▶ Easy decontamination: zones which have to be decontaminated are easily accessible.
- ▶ Flexible and easy cycle programming (time, speed...).
- ▶ No alteration of the biological samples and no cross-contamination.
- ▶ Efficient and homogeneous lysis in all the tubes.

The Minilys' lyser / homogeniser is shown hereafter:



### 2.2. Tube Motion

Thanks to the equipment's design, every tube of the same size follows the same motion to ensure the same level of lysis and homogenization for each sample.

The centre of gravity of the tubes follows a tri-dimensional path on a sphere's surface. While the mixture contained in grinding tubes moves in all directions, it moves primarily in the vertical axis to allow for efficient homogenization.

The movement generated by the MINILYS equipment is called a "precession" movement (i.e. grinding tubes are not rotated).

Each 2mL tube has a stroke of 16mm projected on the main vertical axis.

Each 7mL tube has a stroke of 17mm projected on the main vertical axis.

The tubes must be compatible with the holder and must withstand 600 G of linear acceleration during 3 minutes without suffering any deformation (see use instruction § 1.1.1 and recommended references § 2.3).

Precession movement doing biological sample homogenization also causes an increase of temperature of the samples and the equipment.

### 2.3. Lysing kits MINILYS

The Minilys lysing kits range is strictly the same than the Precellys lysing kits range. This range includes tubes ready-to-use containing beads adapted to every sample type. References of the lysing kits are available on the website [www.precellys.com](http://www.precellys.com).

### 2.4. Programming

The MINILYS has been designed to operate at a maximum speed of 5,000 rpm.

A run consists of one cycle, within which the cover must not be opened.

Speed as well as cycle duration can be adjusted by the keypad.

Parameters	Operating range
Speed	3,000, 4,000 or 5,000 rpm
Cycle duration	From 5 to 240s in increments of 1 second

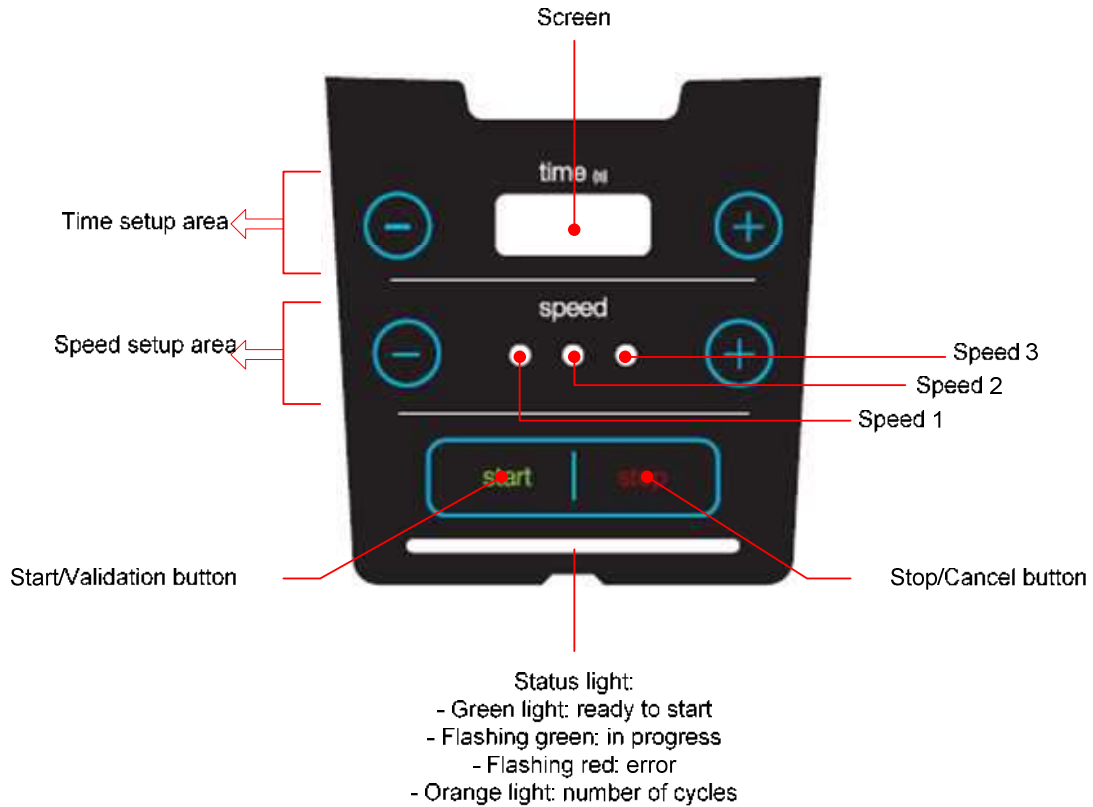
The operator is responsible for programming the unit.

For high speed operation, it is recommended to reduce each cycle duration and let the unit cool down between 2 cycles (at least 2 minutes). A security device disables the unit to prevent overheating.

### 2.5. Presentation of the Keypad

The LCD screen lights up when the MINILYS is switched on. The keypad (see diagram below) consists of a 3 digits LCD screen, 6 buttons and 4 lights (3 lights for the speed, 1 light green or red for the status of the equipment). The LCD screen and the speed light indicate the parameters of the last cycle operated.





The user can adjust the different homogenization settings (see § 5) with this interface. Buttons called “+” and “-” of the “Time” area are used to adjust the cycle duration. Buttons called “+” and “-” of the “Speed” area are used to choice the speed of the cycle.

## 2.6. Technical Features

Technical characteristics		
Power requirements	110V - 230 V 50 Hz – 60 Hz	
Power consumption	< 250 VA	
Fuse specifications	5x20 – F 2 A – H 250 V	2 fuses
Safety	Class A apparatus	
Physical / Environmental conditions		
Length	180 mm	
Width	380 mm	
Height	290 mm	397 mm cover open
Weight	7.8 kg	
Operating temperature	15-40°C	
Humidity	15-85 % HR	
Altitude	< 2000 m	
Operating characteristics		
Speed	3,000 – 4,000 – 5,000 rpm	

Cycle duration	5 – 240 s	
Acceleration time	< 2 s	
Deceleration time	< 4 s	
<b>User interface</b>		
Keypad	6 buttons	
Display	A 3 digit LCD, back-light 1 lights 3 colors (green, red and orange)	
<b>Capacity</b>		
Number of tubes	3 x 2ml or 1 x 7ml	

## 4. Installation

### **WARNING:**

**Do not connect the unit to the main supply before the installation is over.**

**Do not turn the unit upside down expect for unscrewing the shipment screw: the Minilys must always stand on its 4 feet in order to avoid damaging internal components or breaking plastic casing.**

### 4.1. Unpacking

1. Check the content of the box. The box must contain the following items:

- ▷ 1 Minilys
- ▷ 2 holders for 2mL tubes
- ▷ 2 holders for 7mL tubes
- ▷ 1 user manual
- ▷ 1 CE Declaration of Conformity
- ▷ 1 QC report
- ▷ 1 AC power cord\*
- ▷ 2 extra fuses
- ▷ 1 10mm allen key for shipment screw

\* A plug adapter or a compatible power cord (not included) is required for the UK and other countries such as the USA, Canada, Japan, etc.

2. Remove the MINILYS from the box and place it on a clean, horizontal and stable surface (weight of the Minilys = 8 kg).

### **WARNING:**

**Do not operate the equipment if the shipment screw is not totally removed from the equipment (see §4.2).**

3. Unpack the MINILYS with care and inspect it carefully. Report any damage to the carrier immediately.

4. Save the packaging material especially the shipment screw, in case a return is necessary.

### 4.2. Installation and Connecting the Power Supply

1. Remove the shipment screw located under the equipment

## 5. Instructions for Use

### 5.1. Preparing Samples

The samples have to be prepared in the tubes recommended by Bertin Technologies (see § 2.3).

**WARNING:**

Each tube has to be filled with 1.4 ml of the sample.

### 5.2. Starting a Run

#### 5.2.1. Turning the equipment ON

Turn ON the MINILYS by pressing the ON/OFF button located on the rear panel near the AC power input.

#### 5.2.2. Starting Information

When the unit is turned on, the LCD screen and the speed light indicate the parameters of the last cycle operated.

**WARNING:**

Do not start the equipment without at least one tube and his appropriate holder.



#### 5.2.3. Opening the Cover

**WARNING:**

Never open the cover while the unit is running.

To open the cover, use the hole under the sticker “Minilys” and raise the cover until you reach the top of the body.

#### 5.2.4. Tubes holder to be used

Each tubes holder is specific to a grinding tubes size which can be used with the Minilys.

Use the appropriate holder with the tubes of the lysing kits range defined by Bertin Technologies on the website [www.precellys.com](http://www.precellys.com).



*Holder for 3 x 2mL tubes*



*Holder for 1 x 7mL tubes*

#### 5.2.5. Loading Grinding Tubes

Lysing tubes (filled with samples) are placed on the holder and are held down by the tubes blocking rod.

The Minilys has a capacity for 3x2 mL tubes or 1x7 mL tubes. During a run, only same type of tubes can be located on the tubes holder.

##### **WARNING:**

**When loading tubes, make sure that:**

- ▶ The holder is properly positioned in his housing.
- ▶ The tubes are properly positioned in the holder: in case of using only one 2 mL tube, put the tube at the central position on the 2ml holder (see photo hereafter).



*Correct and only position for 1 tube*



*Correct and only position for 2 tubes*

- ▶ **The tube blocking rod is properly pushed: this part must be positioned on the cap of each tube and under the metallic finger on the right side.**



*Tube blocking rod locked position*

### 5.2.6. Closing the Cover

Close the cover just by putting it in low position.

### 5.2.7. Adjusting the Duration of the cycle

The user can change the cycle's duration using the "+" and "-" buttons of the "Time" area. The cycle's duration ranges from 5 seconds to 240 seconds in increments of 1 second. If the user holds the button "+" or "-", the increment speed rises.

### 5.2.8. Adjusting the Speed

The user can change the speed value using the "+" and "-" buttons of the "Speed" area. There are 3 speeds pre-programmed in the display:

- ▶ Speed 1 (left light): corresponding to 3,000 rpm;
- ▶ Speed 2 (central light): corresponding to 4,000 rpm;
- ▶ Speed 3 (right light): corresponding to 5,000 rpm.

### 5.2.9. Running a Program

When the parameters of the run have been set, the lysing starts by pressing the "Start" button. During the cycle, a timer (in seconds) counts down the remaining time before the end of the cycle.

The status light is flashing green.



**WARNING:**

**Never open the cover while the unit is running.**

### 5.2.10. Ending a Run

At the end of a run, the holder is stopped and the unit displays the duration and the speed of the ended run. The status light is green.

**WARNING:**

**Wait until the complete stop of the unit before opening the cover.**

### 5.2.11. Interrupting a Run

The user can stop a run by pressing the “Stop” button. The holder is stopped and the unit displays “Stp”. By pressing “Start” or “Stop” button, the LCD screen and the speed light indicate the parameters of the last cycle operated. The unit is ready to a new run.



**WARNING:**

Wait until the complete stop of the unit before opening the cover.

## 6. Alarms

### 6.1. Alarm Messages before Starting a Run

When the user presses the “Start” button to start, a run the system checks information from the cover sensor before allowing a run to start. If the cover is not properly closed, the unit displays “toP” and the status light is flashing red.





By pressing “Start” or “Stop” button, the unit returns into the main status (ready to start).

## 6.2. Run Interruption by Alarm Messages

A run in progress can be stopped by alarm messages.

### 6.2.1. Cover Alarm

If the cover is opened while a run is in progress, the cover alarm sets off and the run stops immediately. The message “toP” is displayed on the screen and the light is flashing red.

To return into the main status, the user must press “Start” or “Stop” button.

Actions to be done in case of alarm are described in § 6.3.

### 6.2.2. Err Alarm

The message “Err” is displayed on the screen and the light is flashing red to indicate several dysfunctions:

- ▶ The engine can't start (electric or mechanical issue).
- ▶ The speed of the engine is too high (electrical or sensor issue).
- ▶ The temperature is too high (intensive use)

## 6.3. What to Do When an Alarm Message Occurs

Alarm message	Possible cause	Action(s)
toP	The cover is not locked properly.	<ol style="list-style-type: none"> <li>1. Check that nothing prevents the cover from closing.</li> <li>2. Press cover and ensure the handle is locked properly.</li> </ol>
	Detection system is faulty.	<ol style="list-style-type: none"> <li>1. Turn off the unit.</li> <li>2. Contact technical assistance.</li> </ol>
Err	Power supply is not suitable	Check that the voltage on the back of the unit matches that delivered by the main power supply cord.
	Engine temperature has reached the safety limit.	<ol style="list-style-type: none"> <li>1. Leave the unit off.</li> <li>2. Ensure air openings are clear.</li> <li>3. After 30 minutes of cooling, if the alarm is still on, contact technical assistance.</li> </ol>
	Speed regulation or detection system is faulty.	<ol style="list-style-type: none"> <li>1. Turn off the unit.</li> <li>2. Contact technical assistance.</li> </ol>

## 7. Maintenance

### **WARNING:**

Potentially dangerous voltage exists inside the instrument, to ensure the user's safety only the technical assistance (authorized persons by Bertin Technologies) can remove the shell to repair the unit.

Do not turn the unit upside down: the MINILYS must always rest on its 4 feet for fear of damaging internal components or breaking plastic casing.

### 7.1. Troubleshooting Guide

List of main problems during the use and actions to be done are presented in the following table:

Common problem	Possible cause	Action(s)
No display on the screen.	No power on the main power plug.	<ol style="list-style-type: none"> <li>1. Check main power voltage.</li> <li>2. Check the voltage of the unit matches that delivered by the main power supply.</li> <li>3. Check the unit is plugged in properly.</li> </ol>
	Faulty fuse.	Replace fuse.
	Faulty display system.	<ol style="list-style-type: none"> <li>1. Turn off the unit.</li> <li>2. Contact technical assistance.</li> </ol>
One or several tubes are not tight.	The cap is not properly screwed or the tube is faulty.	If a dangerous or potentially-dangerous product is contained in the tube, apply the proper decontamination procedure.

## 7.2.Replacing Spare Parts

This paragraph lists the maintenance actions to be done by user on a regular basis, to ensure MINILYS runs properly.

Wearing parts are:

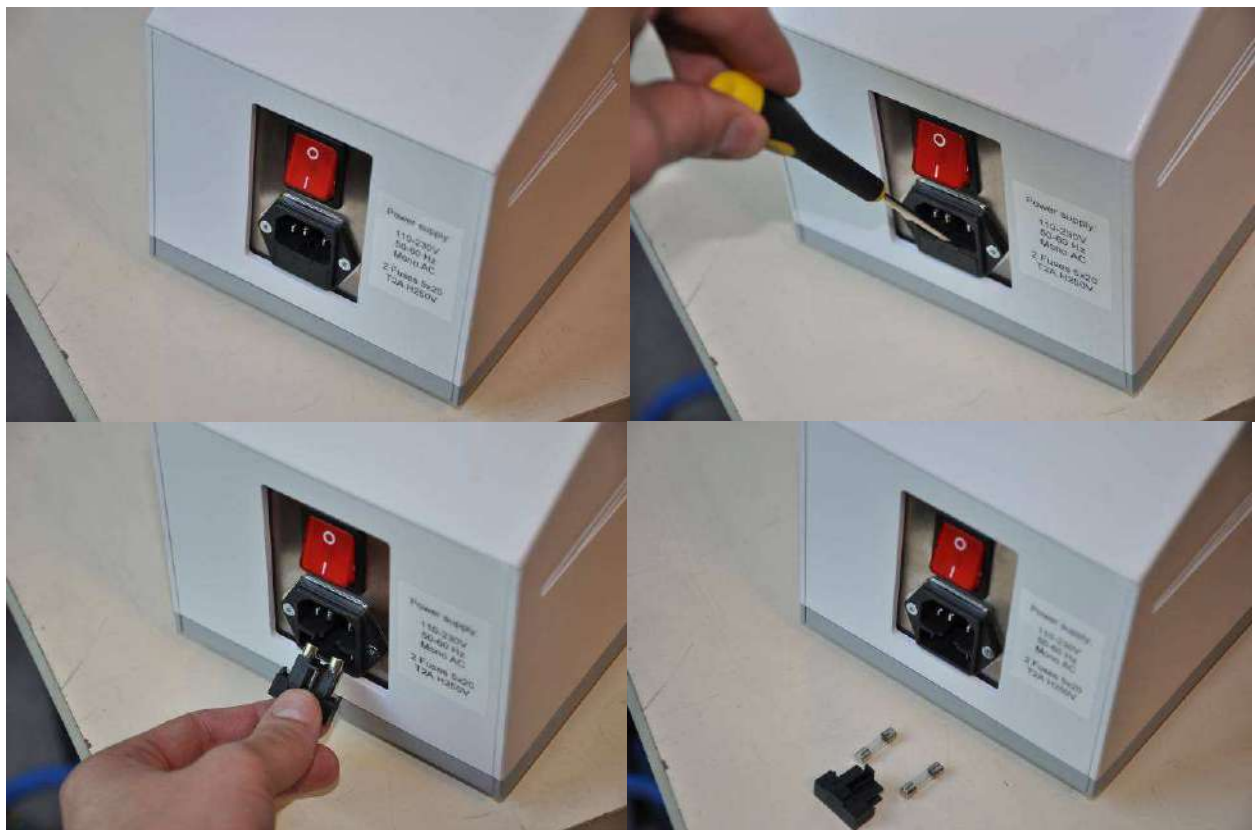
Wearing parts	Reference	Frequency of replacement	Why?
2mL adapter set	06404.810.NC004	6 months or to destruction	Necessary to maintain tubes during homogenisation
7mL adapter set	06404.810.NC005	6 months or to destruction	Necessary to maintain tubes during homogenisation
Tubes blocking rod with tool	06404.810.NC001	1 year or to destruction	Necessary to maintain tubes during homogenisation

### 7.2.1. Replacing Tube Blocking Rod

The tube blocking rod can show signs of wear over time. It should be replaced at least once every year.

### 7.2.2. Replacing Fuse

A scew driver is required to replace the fuse.



#### **WARNING:**

Turn off the system and unplug power cord before replacing the fuse.

## 7.3. Service Menu

### 7.3.1. Firmware Version

By pressing the “Stop” button while switching ON the unit, the screen displays the firmware version.

To return into the main status, the user must press “Start” or “Stop” button.

### 7.3.2. Number of Cycles

When the unit is switch on, by pressing the “Stop” button during 5 seconds, the screen displays the accumulated number of cycles done by the unit. The 3 lights of the speed are on and the status light is orange

The number displayed has to be multiplied by 10 to know the number of cycles.

To return into the main status, the user must press “Start” or “Stop” button.

## 7.4. Cleaning and Decontamination

### 7.4.1. Recommendations

The casing of the unit can be cleaned up with a sponge or a damp cloth, moistened with water or alcohol.

#### **WARNINGS:**

**For safety purposes and to prevent any damage of the unit, the recommendations listed below should be strictly followed:**

- ▶ **Do not spray water or alcohol directly on the unit, especially in the air openings.**
- ▶ **Always disconnect the power cord before cleaning.**
- ▶ **Do not use any type of scrapers.**
- ▶ **Do not use caustic soda or acetone.**
- ▶ **Do not use an aerial decontamination process.**

### 7.4.2. Example of Decontamination Procedure

If a tube breaks when a run is in progress, decontaminate parts that may have been contaminated with an appropriate disinfectant.

The decontamination procedure is of the sole responsibility of the user.

Parts that may have been contaminated can be cleaned with a sponge or a damp cloth moistened with bleach at 6°CI.

In case another decontamination procedure is to be applied, please first contact technical assistance to ensure the compatibility of the new procedure with the instrument.