

BioSonicator

User Manual

Please read this user manual carefully before operating the machine.

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1. Overview

The BioSonicator is a device that continuously generates cavitation within liquids using ultrasound. Cavitation creates microscopic bubbles that collapse under high pressure, dispersing cells, tissues, or particles in the sample. It is primarily used for cell extraction, lysis, homogenization, and degassing. This product operates with a dry, non-contact method, where sealed tubes are inserted and indirectly exposed to ultrasound, preventing sample contamination. It enables processing of up to four tubes simultaneously.

2. Principle of Ultrasonic Operation

The ultrasonic transducer converts electrical energy into mechanical energy. It generates ultrasound by converting electric signals into physical vibrations. These vibrations are transferred into the liquid through the horn, generating strong pressure waves. These pressure waves form millions of microbubbles that expand and collapse rapidly. When the bubbles collapse, a powerful shock wave is produced with pressures reaching thousands of atmospheres—this phenomenon is known as ultrasonic cavitation. Ultrasonic cavitation produces various effects:

- Thermal effect
- Discharge effect
- Luminescence
- Jet effect
- Shock and pressure effects

This energy is strong enough to break down or disperse cells, organic matter, and nanoparticles.

3. Symbol Descriptions

These special messages emphasize important information or indicate potential hazards to individuals or the device. Users must thoroughly understand them before operating the system.

Symbol	Explanation
 Warning	May cause injury or serious property damage if mishandled.
 Caution	May damage the system or impact performance if ignored.
 Information	Important notes for using the system.

4. Safety and Regulations

The safety information described in this section must be fully understood by the user before operating the system. Please ensure that all safety precautions are carefully reviewed to ensure safe and proper use. Improper use of the system may shorten its lifespan and could lead to injury. Systems damaged due to improper usage environments or user negligence are not covered under the free service warranty.

	The system owner is responsible for ensuring that all safety precautions, protective measures, and maintenance procedures are properly carried out.
	Only genuine parts approved or provided by the manufacturer should be used with this system. Any equipment failures or issues resulting from the use of non-genuine parts are not covered under the system's warranty.



When using this system, Electromagnetic Compatibility (EMC) requirements and Electrostatic Discharge (ESD) protection measures must be taken into consideration.



Electrostatic discharge may cause damage to the system or lead to unintended outcomes. Please follow procedures to prevent static buildup on your body and to discharge any accumulated static electricity. Static can be eliminated by touching a grounded or metallic object.

5. Product Components

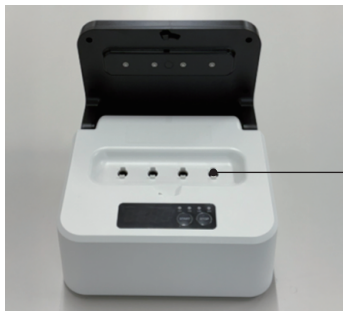


DOOR LOCK HANDLE

DISPLAY

POWER INPUT PORT

POWER SWITCH



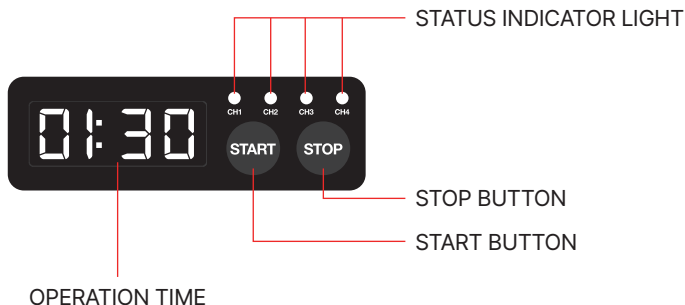
TEST TUBE PLACEMENT
SONICATION CHANNEL

6. Product Features and Specifications

- Prevention of cross-contamination: Destroys chromosomes and cells using a non-contact method.
- To reduce the workload caused by using conventional handheld or fixed probes, a built-in clamping mechanism is provided.
- Simple and user-friendly interface.
- Product Specifications
 - BioSonicator

Specification	Details
Model	NXCH-38K-4CH
Size	236.1mm X 212.2mm X 142.2mm (H)
Weight	3.5kg
Input voltage	24Vdc, 5.0A
Sonication Frequency Range	38 KHz $\pm$ 2

7. Instructions for Use



1. Connect the adapter to the BioSonicator and press the power switch (On/Off) located on the side of the unit. Wait until the buzzer stops sounding.
2. Turn the Door Lock Handle counterclockwise to open the Door upward, and insert sealed tubes of the appropriate specification into each sonication channel.



Turn the DOOR LOCK HANDLE counterclockwise to unlock, then open the DOOR



Ensure that the tubes are free from moisture or foreign substances on the surface before use.

3. Close the Door and press 'START' to start the instrument.
4. When the operation is complete, the timer resets to its initial setting, and the device stops automatically. (Wait until the buzzer that sounds at the end of the operation stops)
5. After the operation is complete, the status indicator light stops blinking and displays the operation result. (Normal completion: Green / Error during operation: Red)

Equipment Status According to Indicator Light Color and Type

Color	Type	Status Description
GREEN	Flash	Equipment operating (normal operation)
	Solid	Before/after operation (normal status)
RED	Flash	Equipment operating (abnormal operation)
	Solid	After completion, error state
BLUE	Solid	Standby (door open state)



If an error indication appears on the status light for a specific channel, remove the tube from the device and leave it at room temperature for at least 5 minutes before retrying.

6. Turn the door lock handle counterclockwise to open the door upward, and remove the tubes.



Use only the designated tubes. Excessive reuse of the same tube may cause tube damage.

8. Instructions for Use

1. Operating ambient temperature: 15 to 35°C
2. Relative humidity: $\leq 85\%$ (at 20°C)
3. Power supply: 100–240VAC / 50–60Hz
4. Processing target: Solution or solution mixtures
5. Installation Location: Indoor use only
6. Operating Altitude: Up to 2,000 meters above sea level
7. Environment: For use in dry conditions only
8. Pollution Degree: Pollution Degree 2
9. Overvoltage Category: Category II (CAT II)

9. Maintenance

Maintenance Interval	Description
Daily	Clean the area around the Test Tube Placement Sonication Channel using a cloth soaked in 70% ethanol or isopropyl alcohol to remove dust and foreign substances.
	Be sure to turn off the system and disconnect the cables before cleaning. Take care to prevent any liquid or foreign substances from entering the Test Tube Placement Sonication Channel.

- 1) The equipment is intended for indoor use only and should be installed in a clean, dry, and well-ventilated environment.
- 2) Do not place the system on an unstable surface.
An unstable placement may cause the system to fall, resulting in injury or damage to the equipment.
- 3) If the transducer or device becomes hot, allow it to cool before reuse.
- 4) Unplug the power cord to shut off power after use.
- 5) If a malfunction occurs, contact the manufacturer immediately. Do not allow unqualified personnel to repair the equipment.
- 6) If contamination occurs during use, wipe the surface with a cloth soaked in 70% ethanol.
- 7) If any liquid enters the sonication channel, turn off the power immediately. Wipe the interior to remove moisture, then allow it to dry completely before using the device again.

10. Packing List

BioSonicator Host	1
Instructions	1
Power Adapter	1

11. Service Commitment

- Free consultation and technical support provided
- Lifetime tracking system established for the device
Detailed quality records are maintained from the time the device is shipped until it is disposed of by the user.

1. Service

We respond promptly to customer repair requests and provide fast, high-quality repair services either through on-site visits or remote guidance, depending on the actual situation.

2. Repair Costs:

Repair costs due to product quality issues during the warranty period (1 Year) are covered by our company. After the warranty period, related costs will be charged at cost price.

3. Manufacturer Information

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