Ultrasonic Homogenizer

NUH-101

User Manual

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1. Safety Measures

1) The temperature protection set point should be 1-3℃ higher than the room temperature or the sample temperature. The machine will stop in case of overheating.
2) Don't start the machine when the horn is not inserted into the liquid (no load), otherwise it will damage the instrument.
3) Process capacity, ultrasonic time, and power, waiting for the user to explore according to a variety of different cells and select the best value.
4) After using for a long time, the end of the horn will be cavitation corrosion and hairy, and can use oil stone or file to make it flat; otherwise, it will affect the work effect.
5) In the working process, due to ultrasonic cavitation in the liquid effect, the liquid temperature will rise rapidly, the user should pay more attention to the temperature of various cells, recommended to use short ultrasonic time (less than 5 seconds each time) while also can connect cooling bath for cooling (ultrasonic time 1-4 seconds and gap time 2-8 seconds).

Warning:

Turn off the power supply when you change the horn. Please re-select the correct horn specification on the interface after a restart; otherwise, it may cause the horn to be damaged.

Reminder:

- Practices prove that the instrument will have a better performance at working 1-3 seconds and intervals of 2-6 seconds. you may set a longer gap time to avoid liquid temperature increase. In addition, continuous working may cause an empty load, which will shorten the life of the instrument.
- Φ10mm horn's maximum output power should not exceed 70% for the new instrument.
- The horn selection switch at the back of the machine(must be same as the actual installation of horn for new machine)
- After the horn is used for a long time, when it appears worn out, make it flat with a file. If the ultrasonic wave cannot be generated normally, you can change the horn switch on the back board until the ultrasonic wave is normal.

2. Introduction

Ultrasonic Homogenizer NUH-101 also known as sonicator is employed cavitation and ultrasonic waves to, lyse/disrupt cells, reduce particle size, extract biological material, refine chemical processes. Equipped with acoustic enclosure helps reduce the noise levels, thereby allowing the user work without any disturbance. These Homogenizers are appropriate for application in both laboratory and industrial settings and are valuable tools to mix and homogenize solid-liquid and liquid-liquid suspensions.

3. Features

- Single-chip technology
- 4.3-inch TFT touch screen
- PID control with timer
- Audio alarm in case of any malfunction
- Variable temperature range

4. Specifications

Model No.	NUH-101
Mixing capacity	0.1 ml - 300 ml
Standard probe	Φ 6 mm
Ultrasonic power	2.5 W - 250 W
Single stop timer	0.1 – 99.9 sec
Timer	1 hr - 99 hr 59 min 59 sec
Frequency range	20 - 25 KHz
Temperature range	0 °C -100 °C
Display Mode	TFT LCD
Data storage	20 sets
Power supply	AC 110V / 220V; 50Hz / 60Hz
Exterior Dimension	410 × 225 × 290 mm

5. Applications

Widely utilized for many applications such as for homogenizing, emulsification disintegration, sonochemistry, degassing or cleaning.

6. Installation

6.1 Power supply

Check power supply: This machine is powered by a 220V ± 5% AC voltage (50Hz frequency); the power socket is located on the lower left side of the instrument's rear panel. Please pay attention to the color of the power supply that is fitted at the lower left section of the backboard.
Warning: Kindly use a grounded AC power supply to avoid lightning and for safe use, and remove the plug when replacing the fuse.

6.2 Working environment

1) The instrument should be placed in a well-ventilated place to work; the normal working room temperature range is 0° to 35°C.
2) To ensure that the instrument can work normally.
   Note: Anti-corrosion, moisture-proof, sun protection, dust prevention.

6.3 Instrument Installation

1) Connect the power cord, transducer, and temperature probe according to each socket.
2) Insert the transducer into the soundproof box and select a suitable container according to the sample size. Pour the sample, and put it on the lifting platform of the soundproof box. adjust the lift height, the end of the horn inserted into the sample surface is generally 10-20mm, and place it in the center of the container.
3) The horn cannot touch the wall of the container, the end part of the horn and the bottom of the container should be more than 4cm (or will case no load when with bigger power), to ensure a good break effect.
4) Recommended for use with elongated containers. When processing small-capacity samples, using small ultrasonic power, the horn can never contact the bottom of the container.

6.4 Removal and installation of the horn

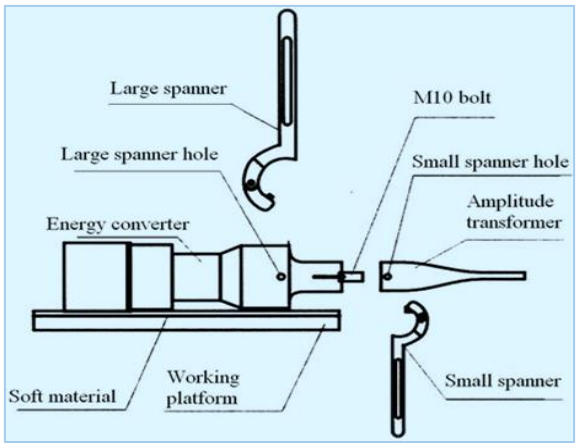

Figure-1 Removal and installation

1) Push the energy converter on the chair with soft materials (such as a towel). Put the small spanner into the horn spanner hole and the large spanner into the transducer spanner hole. the large and small spanners shall be oriented to the left and right.
2) You stand facing the horn, and hold the large spanner with your left hand and the small spanner with your right hand. Tighten downward with both hands (must be tightened).
3) When changing the horn, such as the M10 screw on the horn, remove the bolt by hand, and then fasten the bolts on the transducer, which must be tightened. If the bolts on the horn are tight, the Hex wrench cannot be twisted. You can knock the bolts on the wooden materials a few times, then you can twist.

7. Instrument Introduction

7.1 Function and main parameters

1) For the first time use, add water in a 50ml beaker, then put it on the lifting table of the soundproof box, place the transducer on the top hole of the soundproof box, adjust the lift to make the liquid surface immersion horn end face 1-3cm.
2) Connect the power supply, temperature, and transducer interface of the ultrasonic generator, and turn on the power switch on the back of the instrument.
3) Click the password box after turning on the machine, then type **"123456"** to enter the factory standby state (usually remove the password before leaving the factory), refer to Figure "**Standby interface A**".

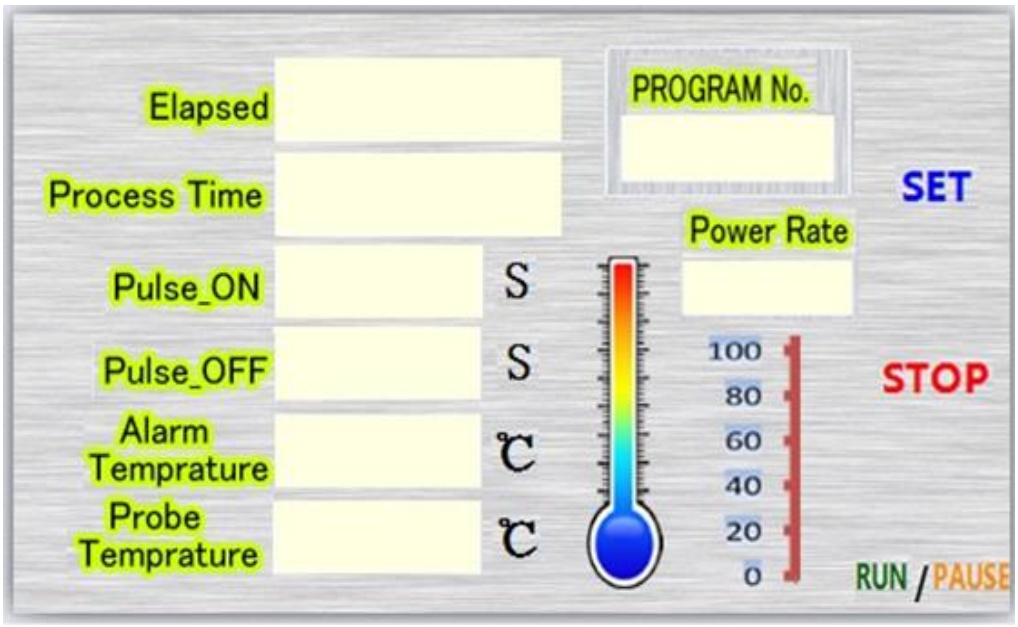

Figure-2

4) Check if the horn size on the screen consistent with the actual one, if need to reset, please click **"SET"** button, enter the setting state, as shown in the following figure "**Setting interface B**", at this time can modify the parameters according to your requirement, click on the box to set your needed parameters, modify it when the numeric keypad jump out, usually cannot set "**0**".

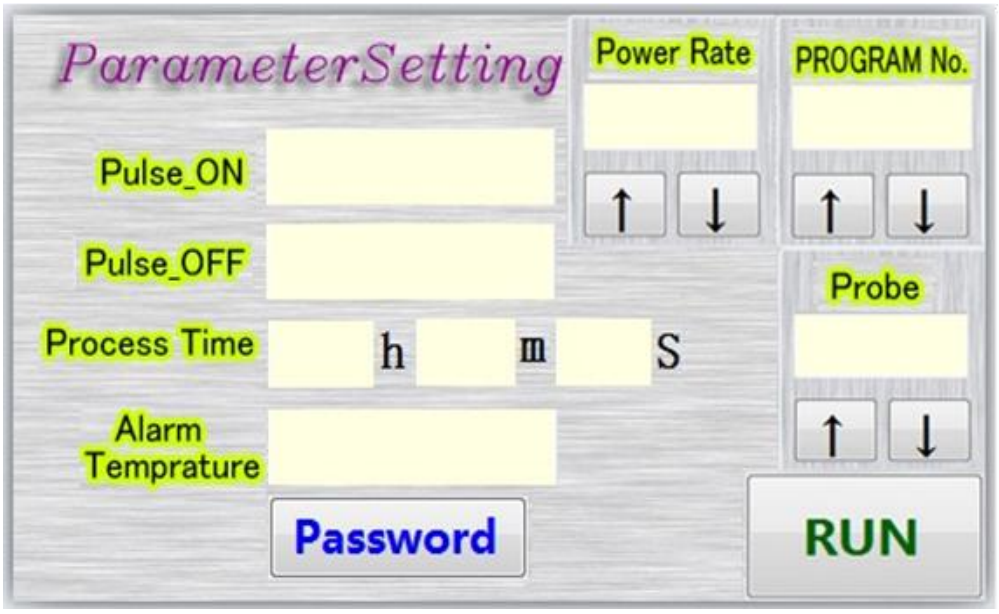

Figure-3 "Setting interface B"

5) After setting the parameters and click the **"RUN"** button, the interface into standby state, then click the **"RUN"** button again, the instrument begin to work, if need to stop the ultrasound can click the **"PAUSE"** button, If one cycle of work finished, you need to continue to work, please click **"STOP"** button, then click **"RUN"** button, to ensure user's experimental data preservation, this instrument has 20 sets of parameters stored (0-19) and call function, adjust above **"Settings interface B" PROGRAM No."** is okay.
6) If the **"RESET"** key box becomes yellow during the working process, it's for the over-temperature alarm. Please check whether the set temperature is too low, it's for overload, or a fault alarm. If it turns red, then click the "**reset**" key to cancel the alarm.

7.2 Instrument Interface Description (Rear panel)

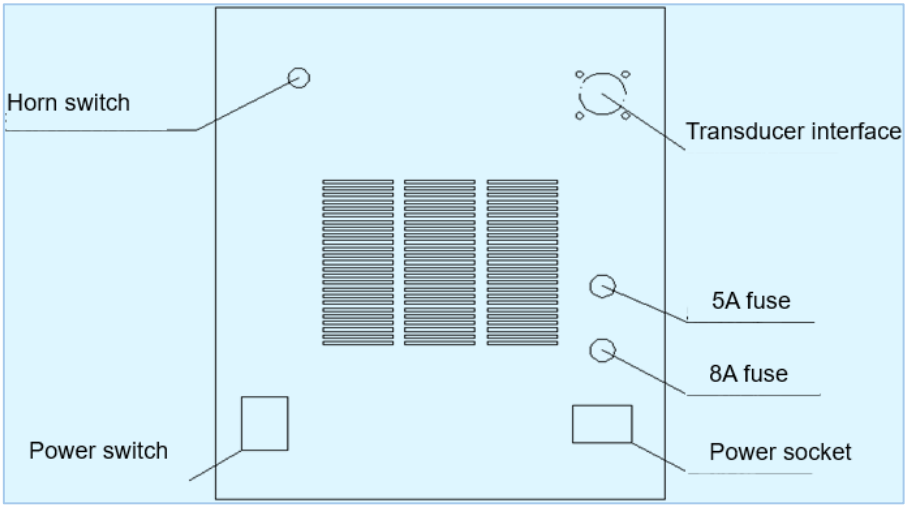

Figure-4

7.3 Examples of experimental data for some samples (Please refer to φ20 mm horn)

Experimental content	Ultrasonic time (S)	Interval time (S)	Total working time (Minute)	Power (%)	Container (ml)	Broken rate (%)
Treponema pallidum	1.5	2	10—20	50	200	Above 90
staphylococcus	1.5	2	10—25	50	200	Above 90
Mouse sciatic nerve	2	3	10—15	40	200	Above 92
Mouse liver	2	3	5—15	45	300	Above 95
Liver cell enzyme extraction	2	3	5—10	60	300	Above 95
Escherichia coli	2	3	10—15	70	500	Above 93
Pseudomonas aeruginosa	2	3	5—10	70	500	Above 92