

# User Manual

## DW08-II

### Non Touch Type Ultrasonic Homogenizer



Please read the manual before installation and operation.

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# 1. Overview

SCIENTZ08-II Non Touch Type Ultrasonic Homogenizer is a multi-functional and multi-purpose instrument that uses strong ultrasound to produce cavitation effect in liquid and ultrasonically treats substances. It can be used for crushing various animal and plant cells and virus cells. At the same time, it can be used for emulsification, separation, homogenization, extraction, defoaming, cleaning and accelerating chemical reactions, etc. It is widely used in biochemistry, microbiology, medicinal chemistry, surface chemistry, physics, zoology and other fields.

## 2. Working principle

This machine is composed of two parts: ultrasonic generator and ultrasonic transducer assembly. The ultrasonic generator (power supply) converts the 220VAC, 50HZ single -phase power into 20-25k Hz, about 600V alternating power through the frequency converter, and drives the transducer to work with proper impedance and power matching. For longitudinal mechanical vibration, the vibration wave produces a cavitation effect on the broken cells through the titanium alloy horn immersed in the sample solution, so as to achieve the purpose of breaking the cells. Its electrical principle consists of rectifying power supply, switching power supply, frequency conversion system, power amplifier, phase-locked frequency automatic tracker, power regulator, power detector, power protector and microcomputer control.

# 3. Parameters and panel description

## 3.1 Technical parameters

Operating Frequency: 40 KHz                      Time Accuracy: ±1%  
Ultrasonic Time Setting: 0.1-99.9S              Gap Setting: 0.1-99.9S  
Ultrasound Total Time Setting: 999min          Duty Cycle: 0.1% -99.9%  
Temperature Protection: 0 - 99°C              Ultrasonic Power Ratio: 1%-99%  
Maximum Ultrasonic Power: 1800W

## 3.2 Function keys and interfaces

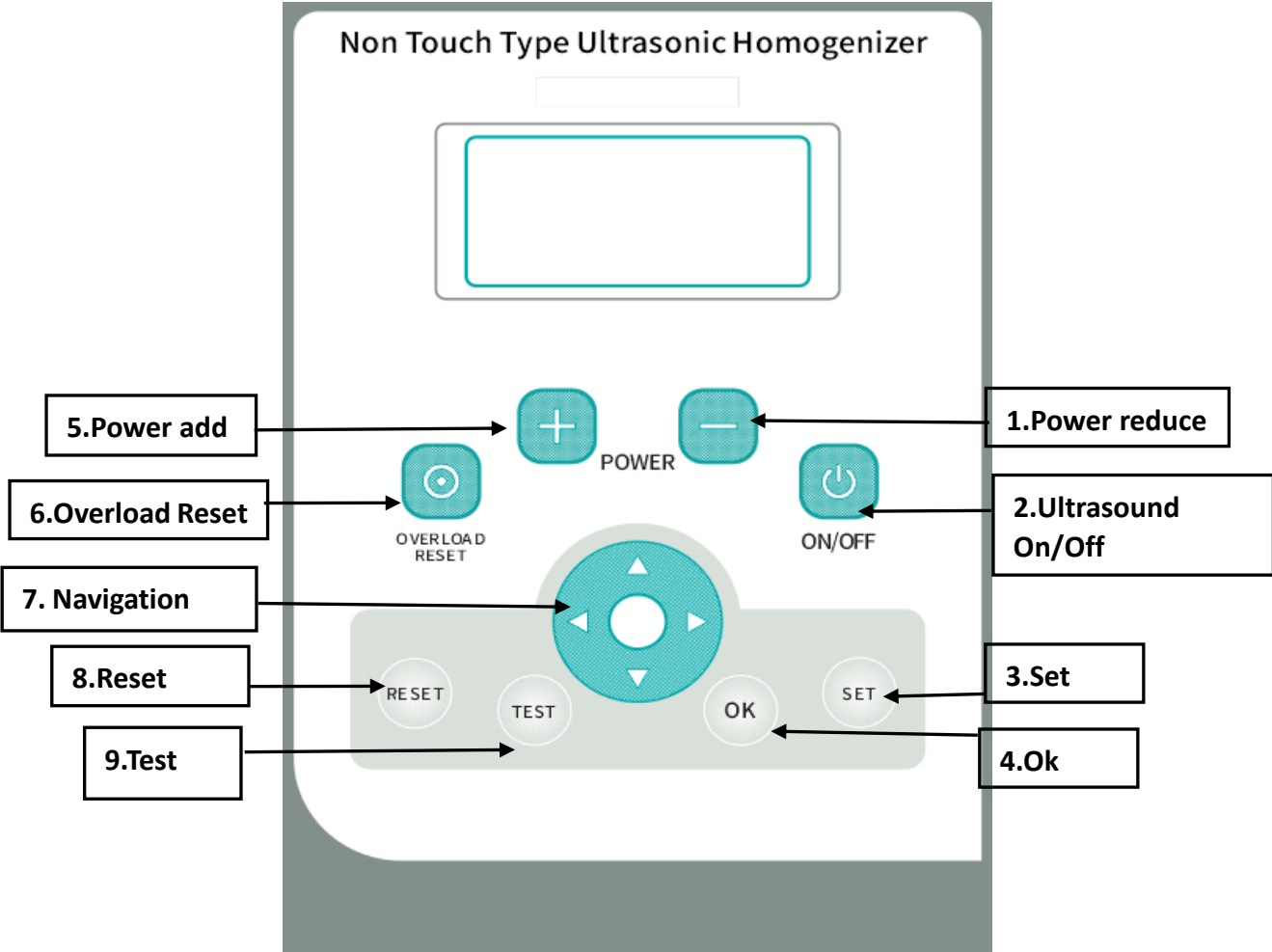


Figure 1. Panel operation diagram

3.3.1. Install and place the instrument, connect the power socket on the back of the generator with a dedicated power cord, and connect the signal input connector of the transducer component to the signal output interface.

3.3.2. Turn on the power, and the display window will display the parameters of the engineering group (as shown in Figure 2)



Figure 2. Parameter selection

Press the up and down keys of <7. Navigation key> to switch the parameters of the project group, the selection range: Pro00-19, a total of 20 groups of parameters  
 Press <4. Confirm key> to confirm the project group parameters

3.3.3 Introduction to the standby interface (as shown in Figure 3)



Figure 3. Standby interface

Press the left and right keys of <7. Navigation key> to switch the time display of work/gap, r means work, P means gap

Press the up button of <7. Navigation key> to display the software version of the device (new function of V4.0.4)

Press <3. Setting key> to enter parameter setting (see 5.5 for details)

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Press <2. Ultrasound On/Off> to enter Ultrasound Start (see 5.6 for details)

Press <9. Test key> to enter ultrasonic test (see 5.8 for details)

### 3.3.4 Parameter setting (as shown in Figure 4)



Figure 4. Parameter settings

Press <3. Set key> to switch parameter items,

Symbol	Illustrate	Scope	Unit
Set - 1	Total time	1-999	Minute
Set - 2	Ultrasound working time	0.1-99.9	Second
Set - 3	Ultrasonic gap time	0.1-99.9	Second
Set - 4	Temperature alarm	0-99	°C
Set - 5	Ultrasonic power	1-99	%

Press the up/down keys of <7. Navigation keys> to add/reduce parameters

Press the left/right key of <7. Navigation key> to move left/right

Press <4. Ok key> to confirm and save the parameters, and return to the standby interface

**Example:** Ultrasound working time setting

Press <3. Set key> to switch to Set-2, use <7. Navigation key> to shift, add and subtract parameters, after setting

Press <4. OK key> to confirm the parameters and return to the standby interface

## 5. Start the ultrasound (as shown in Figure 5)



Figure 5. Working interface

Press <1. Power-minus>/<5. Power-plus> key to adjust real-time power

Press <2. Ultrasound On/Off> to turn off the ultrasound and return to the standby interface

Press <9. Test key> to pause the ultrasound (the pause function is only available when the ultrasound is started) (see 5.7 for details)

When the total time of ultrasound work is over, the screen pauses at the last moment, press any key to return to the standby interface

6. Ultrasonic gap (as shown in Figure 6)



Figure 6. Ultrasonic gap

Press <9. Test key> to resume ultrasonic work

Press <2. Ultrasonic On/Off> to turn off the ultrasound and return to the standby interface

7. Ultrasonic test (as shown in Figure 7)



Figure 7. Test

In the standby interface, press and hold the <9. Test key> key, the ultrasound will work, and release the <9. Test key> key to turn off the ultrasound.

8. Error alarm interface (as shown in Figure 8)



Figure 8. Error interface

Symbol	Parameter	Illustrate	Cause
error	-1	Over temperature protection prompt	When the actual temperature of the sample is higher than the set protection temperature, an alarm will be generated
error	-2	Overload Protection Tips	When the output power is too large, the hardware generates protection

When " temperature protection occurs ", press <2. Ultrasonic On/Off> to turn off the ultrasonic and reset the parameters

Wait for the sample temperature to be 2°C lower than the set temperature, and then automatically resume ultrasonic

When " Ultrasonic Power Generation " press <2. Ultrasonic On/Off> to turn off the ultrasonic and reset the parameters

Press <6. Overload Reset> to restore hardware protection and

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automatically restore ultrasound

#### 9. Program reset

Press <8. Reset> key to reset the program.

## **4. Matters needing attention**

1. It is strictly forbidden to start the machine when there is no liquid in the cleaning tank, otherwise the transducer or ultrasonic generator will be damaged.
2. The transducer should be placed flat to prevent it from sliding down on the table, and the plexiglass should not be collided to prevent deformation or damage.
3. The amount of various crushed samples, the length of time, and the size of the power need to be determined by the user according to different media, and the best value can be selected. (It is recommended to take a sample every 5 minutes in the case of working for 1 second with an interval of 1 second to explore the experimental conditions).
4. The machine does not need to be preheated, and it should be well grounded when in use.
5. During ultrasonic crushing, due to the cavitation effect produced by ultrasonic waves in the liquid, the temperature of the liquid will rise rapidly. Users should pay more attention to the temperature requirements of various cells. It is recommended to use multiple crushing in a short time, and add ice at the same time Bath cooling (recommended sonication time within 3-5 seconds , interval time under 3-5 seconds).



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6. The machine should be placed in a dry place without humidity, direct sunlight and corrosive gas.

7. The choice of container capacity and shape should be coordinated with the number of samples. It has been proved by practice that the container should be slender and the crushing effect is better.

8. It has been proved by practice that multiple short-time work, 1-2 seconds working time, and 1-2 seconds gap time are better than continuous long-time work. In order to prevent the liquid from heating up, a longer gap time can be set. In addition, uninterrupted long-term work is easy to cause no-load and shorten the service life of the instrument.

## **5. Unpacking list**

1、 Host	1 set
2、 Lid	1 pc
3、 Power cable	1 pc
4、 Fuse (5A)	2 pcs
5、 Manual	1 pc
6、 Test tube tray	3 pcs
7、 Broken needles	3 pcs
8、 Drain pipe	1 pc
9、 Motor	1 set

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Configure the test tube plate specification comparison table:

Number	Specification	Number of holes
1	1-2ml	16
2	5ml	8
3	10-15ml	8

Configuration comparison table of broken needle specifications:

Number	Specification	Quantity
1	0.8*8	50
2	0.8*15	20
3	0.8*50	30

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