KSS-950DT

Ultrasonic Homogenizer

Operation Manual

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Human · Passion · Creation

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KSS-950DT Ultrasonic Homogenizer

1. General

Our company's ultrasonic homogenizer developed with the introduction of overseas advanced technology is a new product on the market with complete functions, novel appearance and reliable performance. It has large-screen LCD and the centralized control by the central computer. The ultrasonic time and power can be set freely. All the functions, such as sample temperature display, actual frequency display, frequency computer tracking, fault auto-alarm, can be displayed on the large-screen LCD, easy for the laboratory technician to record visually. Our company has 10-plus years of manufacture experiences. The products are in accordance with Standard Q/NXZ004-1999 and reach international advanced levels. The products have passed the authentication of National Quality Supervision Center and received Certificate of Import & Export Commodity Inspection. Some products have been exported overseas.

Ultrasonic homogenizer is a multi-function and multi-purpose apparatus to apply ultrasonic treatment to substance using cavitation effect created in the liquid by ultrasonic waves. It can be used to crush animal & plant tissues, cells, bacteria, brood cells and stains, and also used for emulsification, separation, decentralization, homogenization, extraction, degasification, cleaning and acceleration of chemical reactions. It is widely used in the fields of biochemistry, microbiology, medicinal chemistry, surface chemistry, physics and zoology, etc.

2. Specifications

(1) Working frequency range: 20~25kHz, frequency auto-tracking
(2) Time control precision: ±1% can be set freely
(3) Ultrasonic time setting: 0.1~9.9s, LCD display
(4) Interval time setting: 1~10000s, LCD display
(5) Total ultrasonic time setting: 999M, LCD display
(6) Temperature protection range: 0~99℃
(7) Ultrasonic Power: 950W, LCD display (2~99%W)
(8) Duty ratio: 0.1~0.99
(9) Working voltage: 220V/110VAC±5%，50/60Hz
(10) Working environment: indoor (free from moisture, sunlight and corrosive gases)

Weight of apparatus:

Generator is around 6~8kg, energy converter around 4kg.

3. Front and rear panels

The apparatus is composed of two separated parts, ultrasonic wave generator and energy converter. The two parts are connected with special cables. So the apparatus is easy and convenient to arrange. It can be placed on the bracket, and also in the sound insulation box freely.

The housing box of ultrasonic wave generator is fair in style. All the cover plates can be disassembled if necessary except the front and rear panels.

Panel:

PR： Over current protection reset key

SET： Setting key

ENTER： Enter key

RESET： Restart key (press the key 3s plus)

▶|| ： Run/Pause key

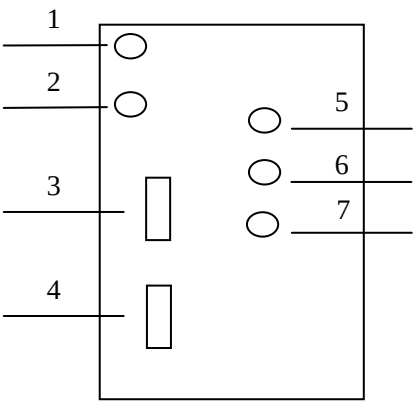
▲ ： Page Up key

▼ ： Page Down key

◀ ▶ : Power trimming keys (effective during working), setting parameters by left & right shift keys.

0- 9：numeric keys

Panel rear:



1.Variable amplitude lever selector switch

2.Energy converter connector

3.Power supply switch

4.Power supply input

5.Fuse 3-5A

6.Fuse 8-10A

7.Temperature sensor connector

The variable amplitude levers can be selected optionally according to different amounts of crushing. Φ2 is for the amount of crushing less than 2ml, Φ3 for 2~5ml, Φ6 for 5~50ml, Φ10 for 50~100ml and Φ15 for 100ml above. And the levers of Φ10 plus may be used for the amount of crushing more than 10ml according to different vessels' shapes, for example, different test tubes. The apparatus is equipped with one lever and one special wrench. The wrench is used to change levers.

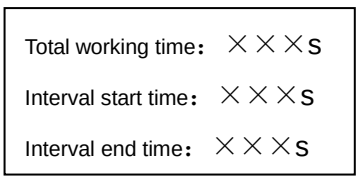
Note: The lever should insert into the liquid 10~15mm under the liquid level. When large quantity of sample, the distance between the lever end and the vessel bottom should be greater than 30mm. It is prohibited that the lever works while the lever end is out of the liquid.

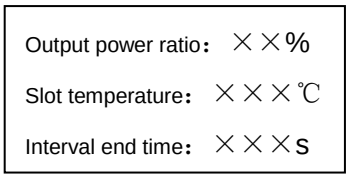
4. Installation

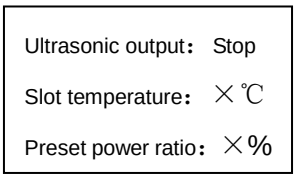
(1) Connect the power supply, energy convert and temperature sensor accordingly.
(2) Insert the lever into the sample liquid around 1cm and place the temperature sensor into the liquid.
(3) Select the proper vessel (test rubes, beakers or centrifuge tubes) according to the amount of the sample, and fix well. Adjust the height of the T clamp or lift table to make the lever end into the sample liquid 10~15mm under the liquid level. The lever should be in the center of the vessel cannot contact the vessel. The distance between the lever end and the vessel should be greater than 30mm usually. In case of small amount of liquid and low power, the distance can be greater than 10mm.
(4) The ultrasonic time should not be too long. 1s working time and 2s interval time or 2s working time and 2s interval time are commonly used. The times should be in 1~3s, and the interval time be longer than working time.
(5) Adjust the lever selector switch on the housing box rear according to the levers' sizes when changing the lever. Press RESET key to reset to initial values.

5. Setting of parameters

Switch on the power supply switch on the housing box rear and three pictures will display on the screen. Each picture holds for 2s. The setting and modification of parameters can be done when the third picture display stops.







Steps:

(1) Press SET key to enter Parameter Setting 1, Total working time: XXXX s. The unit digit flashes. Press numeric keys to enter the needed number.
(2) Press ▼key to enter Parameter Setting 2, Interval start time: XXXX s. The unit digit flashes. Press numeric keys to enter the needed number.
(3) Press ▼key to enter Parameter Setting 3, Interval end time: XXXX s. The unit digit flashes. Press numeric keys to enter the needed number.
(4) Press ▼key to enter Parameter setting 4, Preset power ratio: 0000%. The unit digit flashes. Press numeric keys to enter the needed number.
(5) Press ▼key to Parameter setting 5, Slot temperature: 0000℃.The unit digit flashes. Press numeric keys to enter the needed number.

After finishing the setting of the above 5 parameters, press ENTER key and the computer write it to the database. Press ▶|| key to start ultrasonic wave accordingly.

Example:
1). Total working time: 00100s
2). Interval start time: 0002s
3). Interval end time: 0002s
4). Preset power ratio: 50%
5). Temperature (sample temperature): 30 ^{O}C

(6) Adjust ▶◀ key to increase/ reduce power freely when ultrasonic wave works (the rest keys invalid when ultrasonic wave works). The increased/reduced power indications during operation will not be written into the database. Press RESET key to reset to initial values.

(7) Press PR key to forced reset when apparatus faults. Switch off the main power supply and restart.

If the variable amplitude levers are not purchased with the apparatus together and the lever cannot generate ultrasonic waves when the lever selector switch at corresponding position, adjust freely the lever selector switch till the ultrasonic wave are generated. (The lever selector switch is a frequency and resistance adapter and cannot generate ultrasonic waves if the frequency and resistance don't match.)

6. Notes

(1) The set point of temperature protection should be 5℃ higher than room temperature or sample temperature. Press SET key 4s to set new protection value when temperature protection activated. Press SET key 4s to reset when wrong temperature setting.

(2) It is prohibited to start when the lever is out of the liquid to avoid the damage of energy converter and ultrasonic wave generator.

(3) The user should explore and optimize the amount of cell crushing, time and power according to different cells. The apparatus output power is large. If using Φ2, Φ3 or Φ6 levers, lower output power should be chosen to avoid the lever break due to overload.

Variable Amplitude Lever Power Range

Lever Size	Power Range
Φ2	2~20%
Φ3	3~30%
Φ6	10~50%
Φ10	＞18%
Φ15	＞22%
Φ20	＞30%

(4) The lever end will become rough due to cavitation corrosion after being used for a period of time. Use oil stone or rasper to smooth. Otherwise, it will influence the working effects.

(5) Use of lever selector switch

The lever selector switch is to match the frequencies and resistances of the levers of different sizes and ultrasonic wave generator. The ultrasonic wave cannot be generated if the energy converter's frequency and generator's resistance don't match.

For the new apparatus and new levers, the selector switch should be at corresponding positions. Adjust the selector switch to achieve normal ultrasonic wave for worn levers. The selector switch position may not correspond with levers' sizes.

(6) The apparatus do not need warm up and should be grounded well when being used.

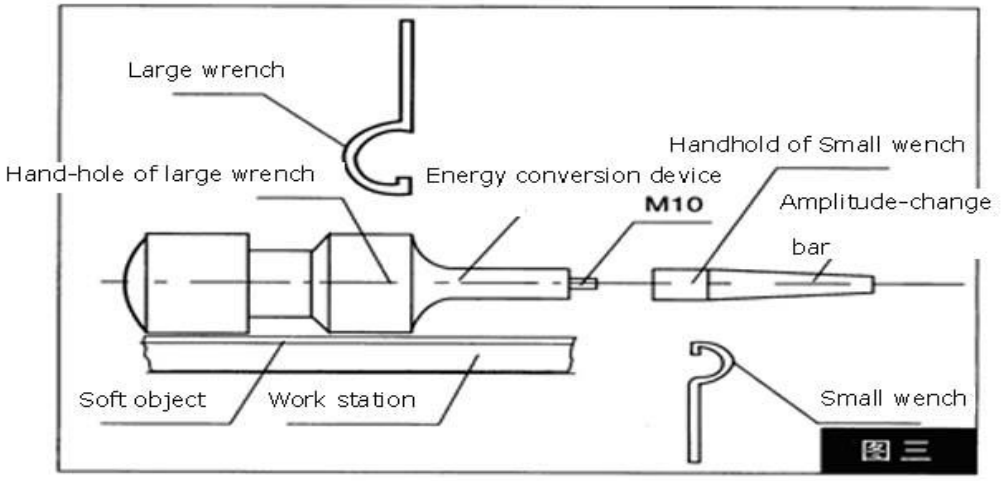
(7) The liquid temperature will increase rapidly due to the cavitation effect during crushing. The user should pay attention to the temperatures for different cells. It is suggested to adopt multiple short time crushing (not longer than 5s each time) and ice bath cooling.

(8) The apparatus adopts switching power supply without industrial frequency transformer. Don't touch randomly after opening the generator housing to avoid electroshock.

(9) The apparatus should work in the environment free from moisture, sunshine and corrosive gases.

(10) It is proved through practices that multiple short time operations, working time 1~2s and interval time 1~2s, have better effects than continuous long time operations. The long interval time can be set to avoid the heating of liquid. Additionally, continuous long time operations are subject to no load operations to shorten the apparatus service lifetime.

7. Lever disassembly



Place energy converter on the bench covered by soft materials (e.g. towels). Put small wrench into the wrench hole on the level and bid wrench into the wrench hole on the energy converter. The big wrench should be placed towards left and the small wrench towards right.

Facing the lever with big wrench in left hand and small wrench in right hand, loose by turning downwards with two hands at the same time. Facing the lever with big wrench in left hand and small wrench in right hand, tighten by turning downwards with two hands at the same time. When changing the lever, if M10 screw is attached on the lever,

manually screw out the screw from the lever and screw the screw 1/2 into the energy converter, then screw on the required lever. If the screw cannot be manually screwed out from the lever, knock the screw lightly on wooden materials so that the screw can be screwed out manually.

8. Packing list

(1)	Ultrasonic wave generator	1pc
(2)	Vibrating system (energy converter component)	1pc
(3)	Sound insulation box	1pc
(4)	T clamp (inside the sound insulation box)	1pc
(5)	Test tube clamp (inside the sound insulation box)	1pc
(6)	Power supply cable	1pc
(7)	Special wrench (for lever disassembly)	1set
(8)	Fuses	4pcs
(9)	Operating instruction	1pc

Optionals:
Various levers, Special crushing bottles, and Cell breaking beads.