



## TOPT92-IIL

# Ultrasonic Crusher With LCD Display

## Instruction manual

Thank you for choosing TOPTION ultrasonic crusher with LCD display, our mission: make your research more accurate and efficient.

TOPTION GROUP CO., LIMITED

Web: [www.toptionlab.com](http://www.toptionlab.com) (for solution)

[www.toption-china.com](http://www.toption-china.com) (for instrument)

Email: [info@toptionlab.com](mailto:info@toptionlab.com)

[info@toption-china.com](mailto:info@toption-china.com)

Tel: 0086-88763980

Fax: 0086-88990306 ext 8006

TOPTION is professional lab solution provider, and all devoted to provide the best solutions & products for global customers, who are work in biology, chemistry, pharmaceutical, environment analysis, food, academic research, etc. Regardless of the field you work in, we keep striving for the same goal: to provide you with the most suitable solutions & products, to make your research more accurate & efficient.

Our mission: make your research more accurate and efficient.

Our vision: Become the world's most competitive lab solution provider.

Our value: Sharing & win-win, customer success, be thankful, keep growing, innovation and responsible.

### **1. Description:**

LCD series ultrasonic crusher (dispenser) is a new instrument which is independently developed by TOPTION. Complete functions, excellent appearance, reliable performance, large screen LCD display and central microcomputer centralized control, and its advantages also include: ultrasonic output, interval time, ultrasonic power, duty cycle, temperature all can be set arbitrary, sample temperature detection display, frequency automatic tracking, automatic fault alarm, program automatic store.

### **2. Function & constitute:**

1) This instrument use strong ultrasonic to produce cavitation effect in liquid, it's a multi-function and multi-purpose instrument to do ultrasonic treatment. This instrument is applied in plant & animal tissues, cells, strains of bacteria, spores broken, at the same time could be used to emulsify, separation, dispersing, homogenization, extraction, degassing, cleaning and accelerate chemical reaction, etc. Biochemistry, microbiology, drug chemistry, surface chemistry, physical chemistry, zoology and so on, this instrument is the top option for these area.

2) This instrument contains ultrasonic generator (power), transducer component and soundproof box, these are connected by cable.

### **3. Attentions before use:**

1) Check supply voltage: this instrument use  $110V \pm 5\%$  alternating voltage (frequency is 60Hz), the power socket is located in the instruments' back panel and at the lower lift, please attention the power source color.

Warm reminding: please use ground connection to avoid lighting stroke, so as to guarantee safe use. When change fuse please unplug the attaching plug.

2) Instrument working environment: please place this instrument at drafty environment and its normal operating room temperature range is 0℃--40℃. Please pay attention to anti-corrosion、moisture proof、prevent sunlight and dust.

3) Installation

① Connect the power line according to each socket, transducer, temperature probe.

② Insert the transducer in soundproof box, choice vessel based on sample quantity, pour sample into vessel and put it on lift tables in soundproof box. Adjust the height of lift tables, so as to let the end of amplitude transformer insert sample liquid about 10-15mm and at the central of vessel. Amplitude transformer and vessel both could not touch the wall, the distance between the end of amplitude transformer and container bottom need above 4cm (if not will cause no-load when ultrasonic power is big), so as to got more better ultrasonic effect, long and thin vessel is recommended. Small sample amount, could adjust the ultrasonic power some smaller (the end of horn insert depth is 8-10mm, and couldn't contact with vessel bottom).

**4. Each types horns' applied area and best power ratio:**

Horn (mm)	Φ2	Φ3	Φ6	★Φ10	Φ12
Crushing capacity (ml)	0.2-5	3-10	10-100	<b>50-300</b>	100-500
power ratio 1-99%	1-30%	1-40%	1-60%	10-90%	20-95%

**5. Parameters and functions description:**

1) Technical parameters:

Operating frequency range: **20-25KHz**

Time precision: ±1%

Ultrasonic time setting: 0.1-9.9S

Interval setting: 0.1-9.9S

Ultrasonic total time setting: 999M

Duty ratio: 0.1-99.9%

Temperature protective range: Room temperature -60°C

Ultrasonic power ratio: 1%-99%

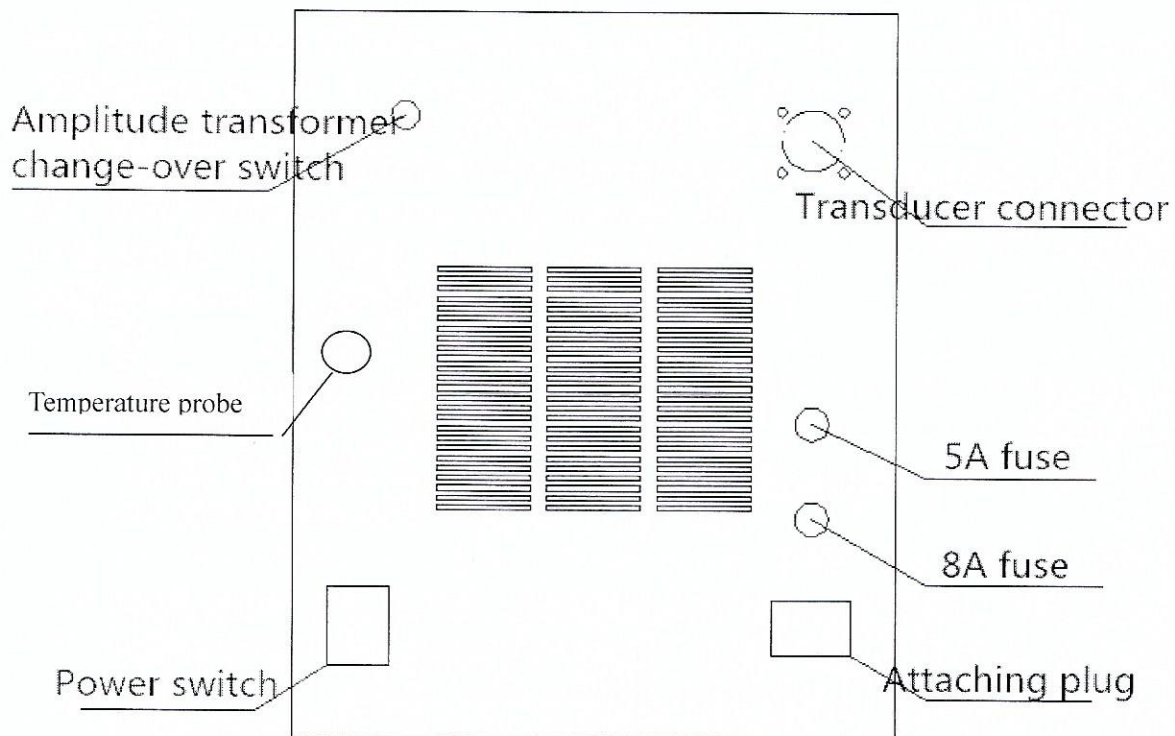
Ultrasonic power: 650W

Crushing capacity : 0.2-500ml

Standard configuration horn: 10MM

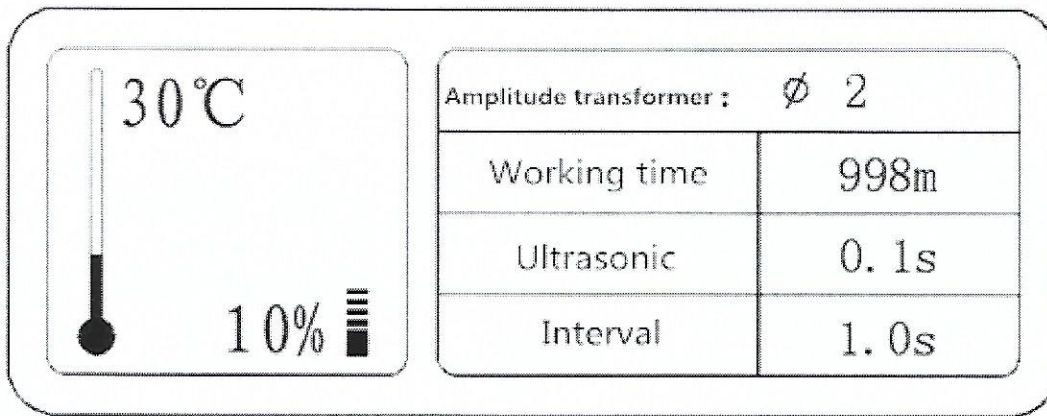
Optional horn:  $\Phi 2$ ,  $\Phi 3$ ,  $\Phi 6$ ,  $\Phi 10$ ,  $\Phi 12$  mm

2). Instrument connector description (back panel):



Picture 1. Instrument connector (back panel)

3). General operation instructions ( **Starting up**→“▲or▼” choice horn→ “set” key to lock horn→ **Press again “set” key to set parameters**→ **Press again “set ok” key to lock parameters**→ “on/off” key instrument start working )

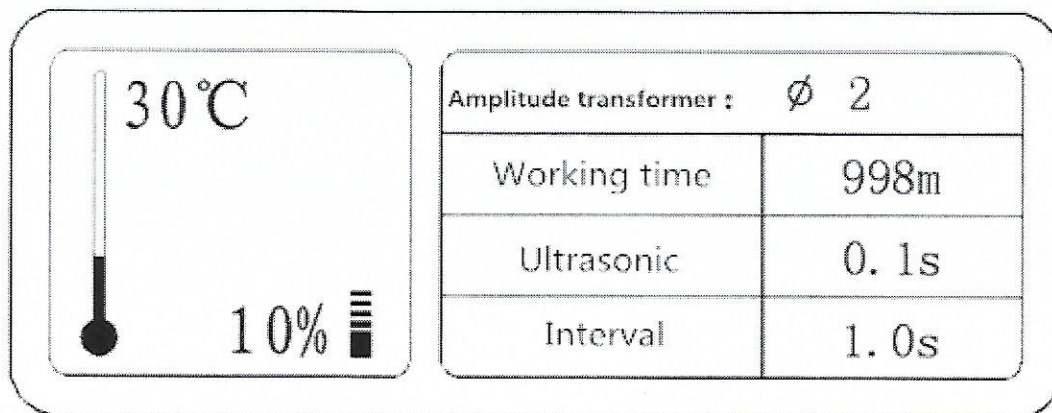


Picture 2. Horn choice

Start power switch ( instrument back panel lower right corner), then come into initial interface (as picture 2), through initial interface come into horn choice interface, firstly choice the type of horn, just same as picture 2 "horn:  $\phi X$ ", the X will bounce constantly, please choice your amplitude transformer type (our company has these types:  $\phi 2$ 、 $\phi 3$ 、 $\phi 6$ 、 $\phi 8$ 、 $\phi 10$ 、 $\phi 12$  total six types size) , through ( $\blacktriangle$ ) or ( $\blacktriangledown$ ) key on the interface to choice the amplitude transformer type. After finish choice, please press "set" key to come into working interface (picture 3).

**★As different horn type choice, its input and output power is different, especially when choice  $\phi 10$ 、 $\phi 15$  horn, please pay attention never choice wrong interface, practical horn size must be fitted with LCD display interface, or will damage the horn as bigger power.**

Horn after long period operating will appear alveolate, please use file to recover its flat, if ultrasonic couldn't work normally, you could change horn switch choice, actual horn and choose on/off stage are different, you could try this method continuously until ultrasonic work normally. This method is only suitable for horn  $> \phi 6$ . If this method is not available, please contact TOPTION ([info@toptionlab.com](mailto:info@toptionlab.com)) directly, thanks.



Picture 3. Working interface

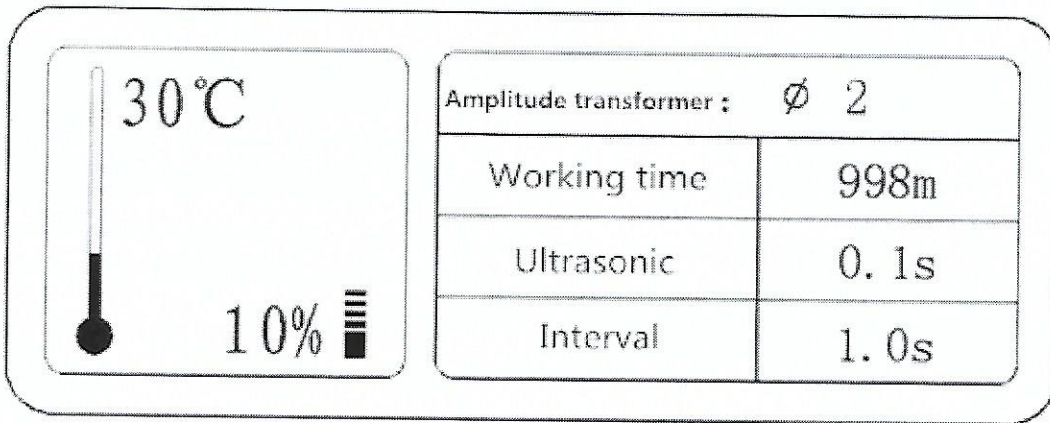
Press “set” key come into setting state (please refer below parameters setting introduction). Press “on” key come into working state.

4). Parameter setting

Press “set” key come into parameters setting.

Then through (▲), (▼) or (◀), (▶) choice different setting, if this setting number bounce constantly, this means you already come into setting state.

Such as : **Total working time setting**



Picture 4.Total working time setting

Total time setting, on interface “time setting 998m”, the first number of “998m” is bounce, this means you already could start setting time, you only need to enter the time number which you need. (Max total working time could be set 999min).

★ **Ultrasonic time setting**

Through (◀) or (▶) & (▲) or (▼) choice ultrasonic time setting (“ultrasonic 0.1s” the first number is bounce), you also just need to enter the number which you need. (best is 1-3s)

★ **Interval time setting**

Through (◀) or (▶) & (▲) or (▼) choice ultrasonic interval time setting (“interval 1.0s” the first number is bounce), then just enter the number which you need.

★ **Temperature setting**

Through (◀) or (▶) & (▲) or (▼) choice temperature setting (on setting interface thermometer “30°C” the first number is bounce), then just enter the number which you need.

★ **Ultrasonic output power setting**

Through (◀) or (▶) & (▲) or (▼) choice ultrasonic output power setting (Setting interface

ultrasonic output power “10%” display place the first number is bounce), then just enter the number which you need.

★ (After finish setting all parameters, please press “set” key again to ensure, then press “on/off” key.)

★ ***Setting parameters memory and save***

On the working interface, press ( ► ) key, come into pre-setting parameters call, choice related pattern number (storage unit), press “set” key to start call using.

Call using one storage unit, if you have change some parameter, the system will save automatic.

5) .Setting during ultrasonic working

***Power adjustment during ultrasonic working***

During ultrasonic working, users only need to press ( ▲ ) or ( ▼ ) to adjust ultrasonic power output ( ▲ to increase power, ▼ to decrease power, this function is used to micro power adjust), instruments' power output couldn't stop when you adjust, after you finish adjustment, then power begin output.

***Ultrasonic stop output.***

You just need to press “on/off”, so as to stop ultrasonic output.

6). Recovery settings after over temperature protection

Under normal circumstances, appear over temperature alarm, must wait the temperature down below the temperature you setting, then the instrument could continue normally working, if you want to solve this problem more quickly, you could power off the instrument, after 1 seconds, power on again, re-setting the temperature is ok.

## **6. Operating guide**

1). Setting temperature protection temperature number must be higher 1-3°C than room temperature or sample temperature.

2). Strictly prohibit power on the instrument when horn is not insert in liquid (no-load situation), or will damage instrument.

3). For different cell crush capacity, different time long or short, different power, need customer ensure these according to different types cell, and then choice best parameters.

4). After using a period time, the end of horn maybe cavitation and beard hair, you could file flat by oil or file, or will effect working effect.

5). When ultrasonic crushing ( ultrasonication ), the liquid temperature will raise as cavitation effect, so customer should pay attention to different cellular temperature. Short time (not over 5s) many times crushing is recommend, and at the same time could add ice bath to cooling at the outside. (Suggest ultrasonic working 1-4s, interval 2-8s working).

Warning: During working, if you want to change horn, must power off, and re-choice amplitude transformer type when pow on again, or will damage amplitude transformer.

Warm reminding

★ **Repeatedly working in short time, working time is 1-3s, interval time is 2-6s, this method is more better than continuous working for a long time. You could set longer interval time to avoid liquid be hot. Otherwise, long time continuous working will cause no-load which will damage instruments.**

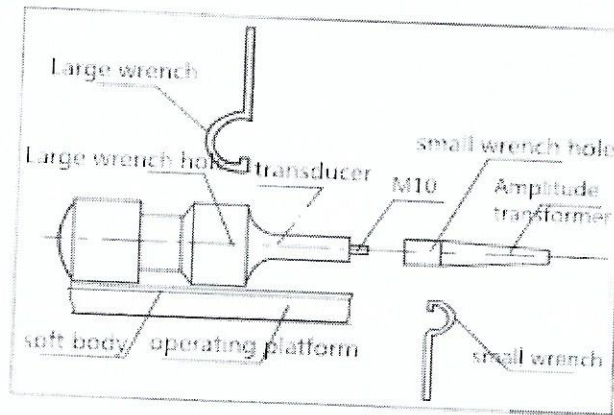
★ **Maximum power output should be controlled below 70% when you use  $\Phi$ 6mm horn.**

★**How to use horn option switch**

1) Horn option switch is used to match different size horn and generator frequency, the consistency of impedance. If the frequency of transducer is not same with the impedance of generator, then ultrasonic will not work.

2) After amplitude transformer be used for a long time, alveolate situation will be appeared, please make it flat by file, if ultrasonic could not be normal, you could adjust the amplitude transformer switch which is at the back panel of instrument, until ultrasonic could work normally.

7. Dismantling procedure of amplitude pole is as Figure 3:



Put the transducer unit on chair covered with soft substance, (such as towel), put small wrench on the wrench hole of amplitude pole, and then put large wrench in the wrench hole of energy conversion unit; make sure large and small wrench shall be put horizontally.

Hold the small wrench with left hand, and the large wrench with right hand, energize at the same time to turn down, the energy conversion device will be loosed; hold the large wrench with left hand, and the small with right hand, energize at the same time to turn down, the device will be tightened.

For replacing the amplitude pole, take the M10 screws on the pole with hand, turn the screws on the transducer device by 1/2, and then screw on the amplitude pole tightly; if screws on the amplitude pole can be tightened by hand, knock the pole on wood several times, and then screws can be tightened by hand.

8. Experiment items and data ( Φ6 horn FYI )

Test items	Ultrasonic time (s)	Interval time (s)	Total time (min)	Power (%)	Vessel (ml)	Crush rate (%)
Syphilis spirochete	1.5	2	10—20	35	20	>90%
Staphylococcus	1.5	2	10—25	40	20	>90%
Rat sciatic nerve	2	3	10—15	45	20	>92%
Rat liver	2	3	5—15	50	20	>95%

Liver cell enzyme extraction	2	3	5—10	50	30	>95%
Escherichia coli	2	3	10—15	50	50	>93%
Pseudomonas aeruginosa	2	3	5—10	55	50	>92%

### 9. Packing list

- |   |        |
|---|--------|
| 1) Ultrasonic generator                             | 1 set  |
| 2) Oscillatory system ( Transducer module +10MM )   | 1set   |
| 3) Sound-proof box                                  | 1 set  |
| 4) Lifting platform ( inside sound-proof box )      | 1pcs   |
| 5) Power line                                       | 1pcs   |
| 6) Fuse   | 2pcs   |
| 7) Operation manual                                 | 1 copy |
| 8) Warranty card (Include certificate of soundness) | 1copy  |
| 9) Temperature probe                                | 1pcs   |

#### ● Warranty and service

The warranty period for this product is one year. Within the warranty period, if the product breaks down under the premise of users' usage according to the provisions, our Company shall be responsible for the maintenance. While, beyond the warranty period, our Company shall also provide the maintenance service, you will be charged with cost of components and maintenance fees.

Before using the product, users must carefully read the product manual, and operate strictly according to regulations. In case of finding the quality problem, you can contact us in time, and we are all ready to provide consulting and maintenance services so as to meet customer requirements.

**Inspection date:**

**The delivery date:**

**Qualified product after inspection, allowed for output.**

**Toption Group Co., Limited**

**Address: TaiBai Road, YanTa District, P.C.710061,XI'AN CHINA**

**Tel: 0086-29-88763980**

**Fax: 0086-2988990306-8006**

**E-mail: [info@toptionlab.com](mailto:info@toptionlab.com)**

**[info@toption-china.com](mailto:info@toption-china.com)**

**Web: [www.toptionlab.com](http://www.toptionlab.com) (for solution)**

**[www.toption-china.com](http://www.toption-china.com) (for instrument)**