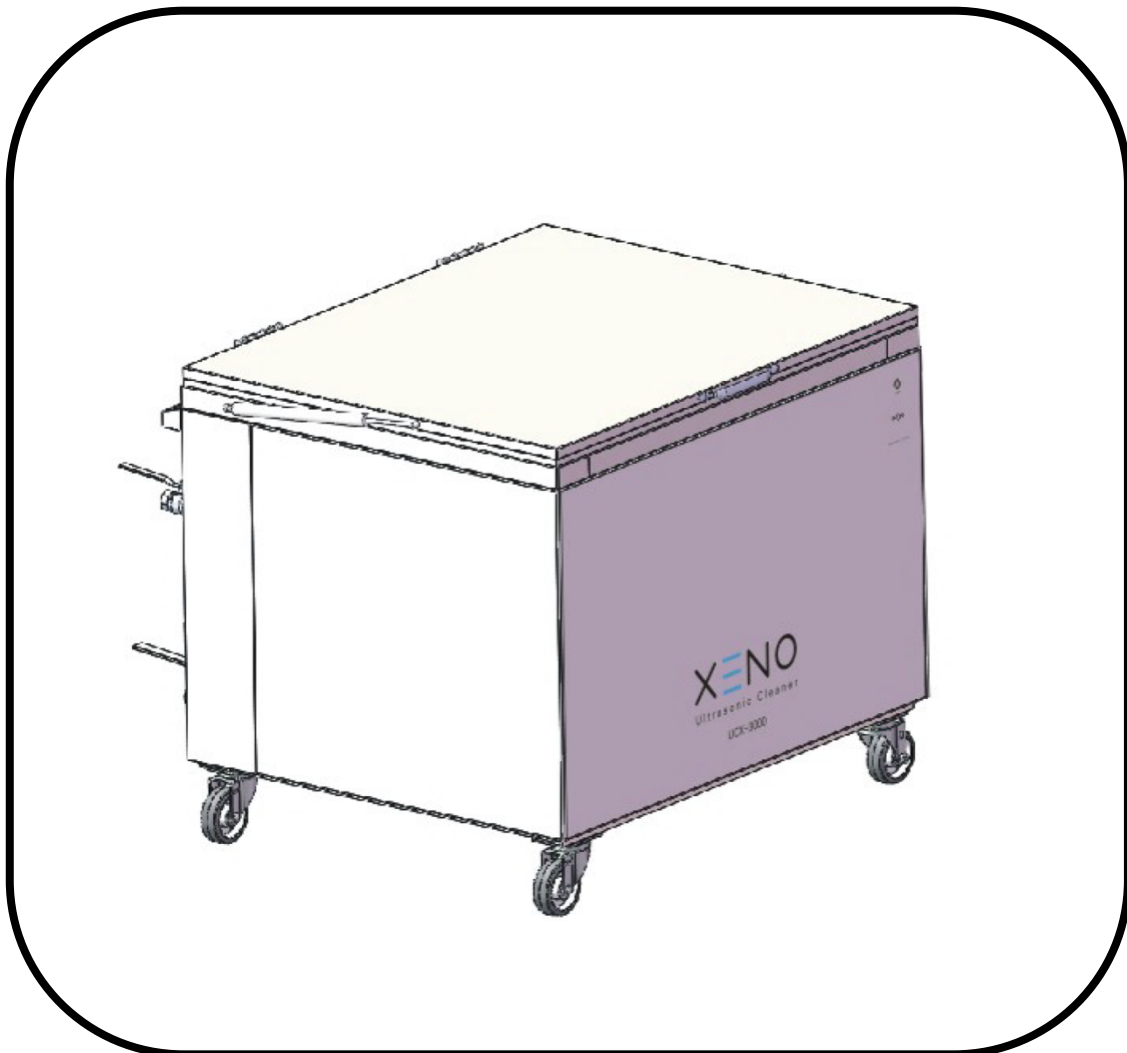




**ULTRASONIC CLEANER INSTRUCTION MANUAL**

**Ultrasonic Cleaner**  
**UCX-3000**

**Manual**





## ULTRASONIC CLEANER INSTRUCTION MANUAL

### Contents

PREFACE.....	3
1. Cleaning Principle.....	4
2. Working Principle.....	5
3. Technical Parameters.....	6
4. Installation.....	7
5. Operation.....	10
6. Introduction of Ultrasonic Controller.....	11
7. Cautions.....	12
8. Marks.....	13
9. Maintenance.....	15
10. Common Faults and Solutions.....	16
11. Acceptance Records.....	17
12. Warranty.....	18



## ULTRASONIC CLEANER INSTRUCTION MANUAL

### **PREFACE**

Thank you for using ultrasonic cleaner manufactured by XENO.

Please read this manual carefully before installing and operating, and please comply with the manual. If you have any questions, please contact us without any hesitation. We will provide assistance and service to you in timely manner.

This manual mainly describes the structure features, working principle, installation & debugging, usage & maintenance, failure analysis & solution, delivery, storage etc.

Product image may slightly differ from the actual product.

With constant technology innovation of our company, operation manual will change in correspondence. Data are subject to change without notice.



## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 1**

### **Cleaning Principle**

The main principle of the ultrasonic cleaner refers to the “cavitation effect” of ultrasound which means when the ultrasonic wave is applied on the liquid in cleaning tank of the cleaner, the pressures on media are changed alternately due to its dense vibratility same as sonic wave. Consequently, the vibration of liquid within the area of negative pressure caused by ultrasonic wave occurs and bubbles are produced accordingly, which then burst due to the subsequent compressing force. The vibration of ultrasonic wave is powerful. When the sound pressure reaches certain cavitation value, the bubbles surge; with the sudden stop of ultrasonic wave, atmospheric pressure reaching thousands of Pa is produced around the objects due to the powerful impulse waves caused by collision between liquid. This phenomenon is called ultrasonic cavitation effect.

The mechanism of ultrasonic cleaner is to effectively transfer the ultrasonic electric energy into ultrasonic mechanical energy. Such ultrasonic mechanical energy can cause cavitation effect on liquid and produce fine cavitated bubbles. Powerful impact force can be produced as the cavitated bubbles disappear. When the impact force is applied on the objects to be cleaned, the dirt attached to the surface of objects can be flushed out.

UCX-3000 ultrasonic cleaner features high efficiency, low noise, good cleaning performance, high speed and flexible combination. It can clean the inaccessible parts, such as blind hole, micro hole and deep hole. The series products have been used and acknowledged by more and more clients due to the special features and widely applied in fields like space & aviation, military, machinery, watch, optics, medical treatment, optical fiber and electroplating.

#### **Warning:**

1. The ultrasonic cleaner can only clean the attachments on the surface of objects;
2. Cleaning effect can be achieved only in the case that the objects are submerged under the cleaning liquid.



## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 2**

### Working Principle

The ultrasonic cleaner consists of two parts:

- (1) Stainless-steel-made cleaning tank of transducer and vibrator box;
- (2) Controller cabinet / Ultrasonic generator.



The ultrasonic generator is equipped with PWM switch circuit, which is installed to generate switching signal. This signal is amplified by the full-bridge amplifier circuit made up of high-powered modules. Then, the amplified signal is isolated by high-frequency transformer and coupled to transducer array after being matched to inductance. Thus, the 220V electric energy shall be converted into high-frequency mechanical energy to achieve non-destructive cleaning effect.

This ultrasonic generator utilizes advanced PWM technology, featuring:

1. With the application of off-line converter technique, it features small size, light weight, high frequency and well isolation performance, which thereby enhance the security of the ultrasonic generator.
2. A variety of filtrations, including high and low frequency filtrations, are employed in circuits to achieve well interference-resistance and low interference in feed power network.
3. High-power modules are utilized to avoid the second breakdown of the switch; It is capable of high switching frequencies.
4. By virtue of PWM IC, such circuit-protecting functions as under-voltage locking, delayed soft starting and over-current protection, etc. are achieved to improve the reliability of the cleaner.
5. Output power is adjustable. The principle is to adjust PWM IC by adjusting the duty ratio with the adjustment scope ranging from zero to max.



## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 3**

### Technical Parameters

Model	Tank dimension	Ultrasonic Power	Heating Power
UCX-3000	750×550×480 mm	3.0kw	8kw

Note:

- (1) If large-sized cleaning tank is required, it is recommended to use vibration type to increase the ultrasonic power.
- (2) Corresponding timer and temperature control system can be equipped in accordance with requirements.
- (3) The "Frequency of Transducer" as read in the panel refers to the frequency of tandem vibration of transducer in the air.
- (4) Before power connection, please make sure that the heating power supply voltage is 220V.

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## ULTRASONIC CLEANER INSTRUCTION MANUAL

UCX-3000 Ultrasonic Cleaner

Part 4

### Installation

➤ **Step 1: Open the package**

Place the equipment on the level ground, and then separately remove the screws outside the package. Open the outer package and check if the equipment is good and intact, including the buttons and instruments.



➤ **Step 2: Connect the circuits**

1. Connect cleaning tank and ultrasonic generator:

Place the main body of cleaning tank and generator in a proper position, find the aviation plug, and insert it into the plug connector of the ultrasonic generator, as shown in the figure. The connector is in the lower right corner behind the ultrasonic generator. Note that the groove surface of the aviation plug faces up, and then tighten it up.

**Don't touch here after switching on the power.**



Aviation Plug



Plug Connector



After Connection

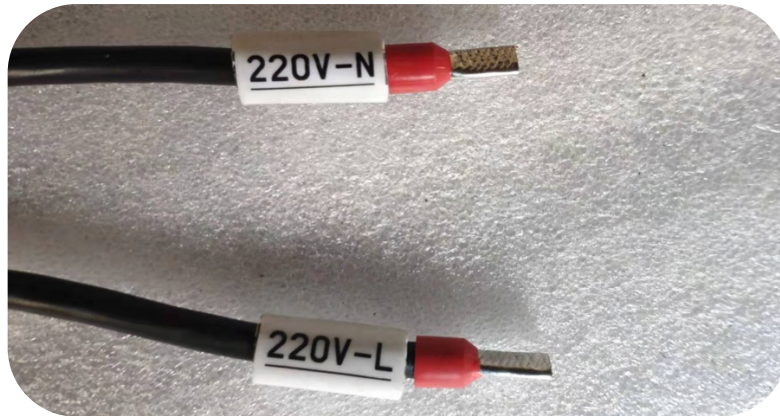


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## ULTRASONIC CLEANER INSTRUCTION MANUAL

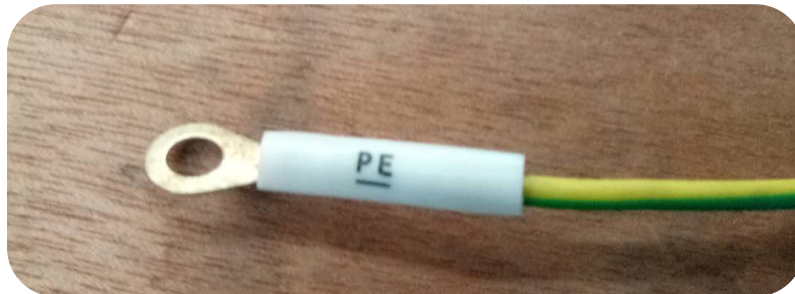
2. Connect the heating circuits of cleaning tank main body:

As shown in the figure, find the heating tube power line 220V-L, 220V-N. Make sure the main cabinet power is off before connection and connect 220V-L, 220V-N with the circuit breaker of electronic cabinet. The power state is 220V power.



3. Connect the grounding wire of cleaning tank main body:

As shown in the figure, find the grounding wire of cleaning tank main body, the wire marking is PE. Connect it with the main grounding wire.



4. Power-on

As shown in the figure, find the power line of ultrasonic generator. Connect the power line of ultrasonic generator with the main power. The power state is 220V and in plug method.





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### ➤ Step 3: Connect the pipes



1. Connect the sewage pipe. The size of sewage valve: 1.1/4 inch.
2. Connect the overflow pipe. The size of overflow valve is 1 inch.
3. Connect the liquid inlet pipe. The size of inlet valve is 1/2 inch.

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## ULTRASONIC CLEANER INSTRUCTION MANUAL

### UCX-3000 Ultrasonic Cleaner

### Part 5

#### Operation

➤ **Step 1: Cleaning liquid injection of cleaning tank**

1. Shut the sewage valve and open the overflow valve.
2. Inject water into the cleaning valve or pour water into cleaning tank directly.
3. Add cleaning agent or water aqua cleaning agent can be added proportionally, which should be prepared by the user.

➤ **Step 2: Heating of cleaning liquid**

Turn on the temperature control switch and turn the 60°C.

The cleaning temperature can be adjusted as different cleaning technical process.



➤ **Step 3: Start ultrasonic wave**

1. Turn on the ultrasonic generator power switch.
2. Adjust ultrasonic power control knob. Usually, it has been adjusted well before leaving the factory and requires no operation. If not, please adjust the power to 06.0 ~ 06.5A. If the ultrasonic cleaner is operating at maximum power for a long time, the lifetime of the ultrasonic transducer will be shortened.

➤ **Step 4: Prepare the objects**

1. Prepare the objects to be cleaned, such as high-pressure washing, removing dirt and greases, brushing away adhesives and severe oxide coatings.
2. Place the objects into the cleaning basket and then place the cleaning basket into the cleaning tank.
3. Close the lid for heat preservation and noise reduction.
4. Wait for about 30-40 mins. (Cleaning time is different according to different dirt level and cleanliness requirement. User can decide it according to different situation.)

➤ **Step 5: Cleaning Finish**

1. After completion of cleaning, turn off the ultrasonic generator switches.
2. Take out the cleaning basket and then take out the cleaned objects from the cleaning basket. (Pay attention to prevent scald.) CAUTION! The cleaned objects, the ultrasonic cleaner and the accessories related to the ultrasonic may be hot!



➤ **Step 5: Rinse & Drying**

1. Rinse cleaning parts by water, if necessary.
2. Dry the cleaning parts by compressed air, if necessary.

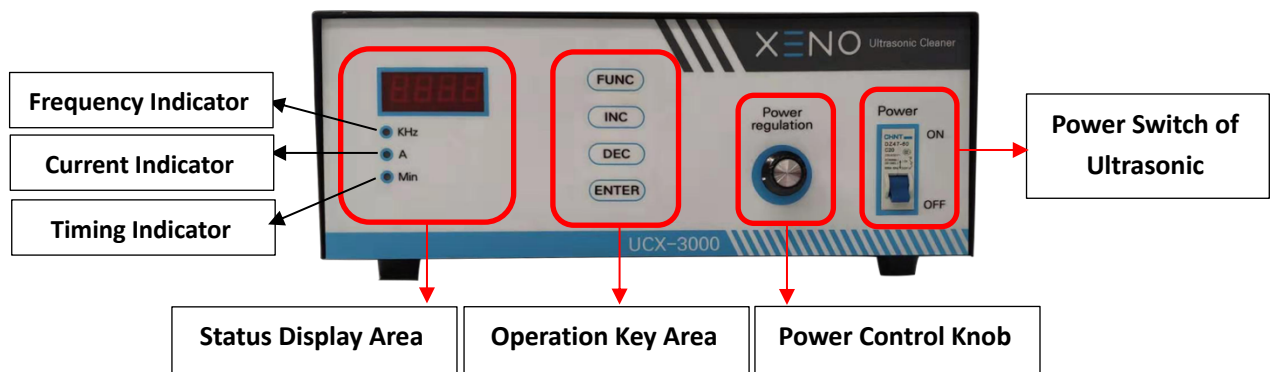


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UCX-3000 Ultrasonic Cleaner

Part 6

### Introduction of Ultrasonic Controller



1. Ultrasonic generator power switch: turn on or off the generator.
2. Power control knob: ultrasonic power can be self-adjusted.
3. Operation key area:
  - FUNC key: can be used for switching among current, frequency and timing time, and display on the display of status area (the timing function needs to be customized by the customer).
  - INC key: increase the timer (customized by the customer)
  - DEC key: decrease the timer (customized by the customer)
  - ENTER key: If the timer is up, press confirm key to reset or restart the ultrasonic cleaner (customized by the customer)
4. Status display area:
  - Display: the content displayed on the display includes magnitude of current, ultrasonic wave and a timer. (customized by the customer). The display can be switched with the function key.
  - Frequency indicator: When it illuminates, the display indicates the frequency;
  - Current indicator: When it illuminates, the display indicates the current;
  - Timing indicator: When it illuminates, timing can be adjusted, and the remaining time will be displayed (customized by the customer).



## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 7**

### **Cautions**

1. Power on the ultrasonic generator with the AC current 220V  $\pm$  10%, 60Hz.
2. The cleaning tank should be well-grounded.
3. Please place/remove the cleaning parts or cleaning basket with caution to avoid any strong collision with the cleaning tank.
4. The cleaner shall not start up before the cleaning liquid is poured into the cleaning tank. The cleaning liquid should submerge the transducer and overtop it by at least 50mm. If the cleaning tank has heating function, the minimum liquid level must submerge the heating tube and the cleaning tank must be kept horizontal. As to the cleaner with side-installed transducers, the cleaning liquid must submerge the transducers completely, or the cleaner will be damaged.
5. After cleaning, it is required to turn off the functional buttons first and then switch off the power supply in order to avoid the operate the breaker in loaded.
6. It is recommended to suspend the cleaner for 1-2 hours after a continual service for 12 hours in order to prolong service life of the cleaner.

### **Attentions:**

1. To save both cleaning agent and cleaning time, a pre-cleaning treatment is required, such as high-pressure washing, removing dirt and grease, brushing away adhesives and severe oxide coatings.
2. While the cleaner is in the pre-heating process, the objects needs to be submerged into the cleaning tank in order for the object to have the maximum cleaning effect.








## ULTRASONIC CLEANER INSTRUCTION MANUAL

UCX-3000 Ultrasonic Cleaner


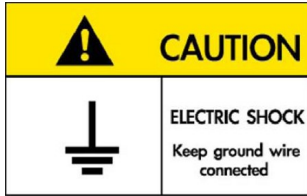
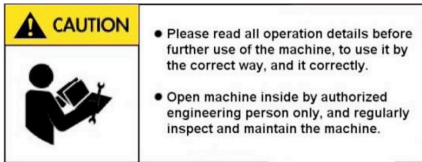


Part 8

### Marks

No.	Sign	Description
1		Inlet Valve
2		Sewage Valve
3		Overflow Valve
4		Warning: This equipment is to be serviced by trained personnel only
5		Please turn off the power before opening the door.

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6		Authorized People Only
7		Keep ground wire connected shock!
8		Limited to authorized people to open/check the interior of the machine. Please read thoroughly the manual document.
9		Warning: High temperature. Don't touch.
10		Warning: Wear protective gloves When operation.



## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 9**

### **Maintenance**

If any damage or defect results from (i) misuse, abuse, neglect, ingestion of foreign material, or improper installation; (ii) disasters such as fire, flood, lightning or improper electric current; or (iii) service or alteration by anyone other than an authorized technician. The repairs will be billed regardless of the age of the product. In this event, an estimate of the repair costs will be submitted and authorization of these charges will be required before the product is repaired and returned.

1. In case of damage or defect, anyone other than an authorized technician familiar with the operating principle of the ultrasonic cleaner, is forbidden to repair the cleaner at his/her will.
2. It is recommended that the cleaner be placed in a ventilated dry place to ensure its normal operating environment. To improve ventilation, it is suggested to clean the fan holes on the generator regularly and maintain clearance between the generator and the rest of the parts by no less than 50mm.
3. When the cleaning tank is at ambient temperature, do not pour cleaning liquid whose temperature exceeds that of cleaning tank by more than 45 °C; when the cleaning process is completed, do not drain the cleaning liquid whose temperature exceeds ambient temperature more than 45 °C immediately. In this way, the normal working of the transducer shall be ensured by being prevented from loosening resulting from great changes in temperature.





## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 10**

### Common Faults and Solutions

Fault	Possible Causes	Solutions
The power indicator is on while the fan doesn't work.	No supply voltage; the fuse is blown out.	Check the supply voltage and recover it; check the IGBT module, and if it's undamaged, replace the fuse with a new one of the same specifications.
While both the power indicator and the supply voltage function well, the fan doesn't work.	The fan is broken.	Replace the fan immediately. Otherwise, the IGBT module will be damaged due to overheating.
The ultrasonic cleaning effect declines	Ultrasonic frequency drift; isolation of the transducer is damaged or individual capacitance decreases.	Check if the operating frequency is changed; check if the isolation of the ultrasonic transducer array and the capacitor parameters are normal.
Frequent burnout of IGBT module.	A short or open output circuit.	Check if the cables connected to the input end of the transducer and the output end of the generator, both fixed at the bottom of the vibration box or the tank (generally, their isolation resistance is 500 MΩ), and check if corresponding aviation plugs are short-circuited or spark-striking; then remove the faults, if any.



**ULTRASONIC CLEANER INSTRUCTION MANUAL**

**UCX-3000 Ultrasonic Cleaner**

**Part 11**

**Acceptance Records**

Category \ Item	Ultrasonic Generator	Ultrasonic Cleaning Tank
Appearance and Marks	Up to standard	Up to standard
Insulation Resistance		500MΩ
Dielectric Strength	Class E	
Operating Frequency	20Khz/ 28kHz / 40Khz	
Static Capacitance	5.2 PF	



## ULTRASONIC CLEANER INSTRUCTION MANUAL

**UCX-3000 Ultrasonic Cleaner**

**Part 12**

### Warranty

Dear Clients

Thank you very much for purchasing "XENO" ultrasonic cleaners.

This warranty covers only normal use of the equipment. XENO shall not be liable under this warranty if any damage or defect results from misuse, abuse, neglect, ingestion of foreign material, or improper installation; disasters such as fire, flood, lightning or improper electric current; or service or alteration by anyone other than an authorized technician. This warranty only covers manufacturer related defects, and any misuse by the customer will void the warranty.

In this event, an estimate of the repair costs will be submitted and authorization of these charges will be required before the product is repaired and returned.

The listed conditions of the ultrasonic cleaner below will void the warranty:

- (1) Short circuit and element corrosion arising from environmental corrosivity and extreme humid circumstances;
- (2) Faults arises because the supply voltage range outranges 220V  $\pm$ 10%;
- (3) Burn-out because cleaning liquid level in the cleaning tank is lower than the requirement of Operation Manual when heated;
- (4) Cleaning effect declines because of loose transducer caused by temperature difference between the cleaning liquid and the tank exceeds 45°C when replacing cleaning liquid.
- (5) Loosening and disconnection of the joint of the transducer due to movement by external forces;
- (6) Other faults due to improper use of the equipment.

Please fill in the Warranty Card, marked "Warranty Card" on the envelope, and mail it to the Sales Service Department of our company in order that we can quickly arrive at your place to perform the reparation.

## XENO

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