Ultrasonic cleaning machine

Instructions

1、 Performance introduction:

The advanced microcomputer control technology and new circuit design concept are applied to the ultrasonic field, and a new generation of special power source for multi-functional ultrasonic cleaning machine is launched:

（1） This power supply adopts digital frequency synthesis technology and signal processing technology of a new generation of microcomputer chip, and cooperates with the monitoring circuit to easily realize automatic adjustment and automatic frequency tracking, making the work more stable and debugging simpler;

（2） The output power is controlled by pulse width, which completely solves the disadvantages of other control methods. The output power is more accurate and stable, the power is more powerful, the effective conversion rate is higher, and the use of digital power regulation is more flexible;.

（3） It has perfect protection functions: overheat protection and overcurrent protection, making it more reliable.

（4） Four bit timer, time control accurate to seconds, to ensure the quality of your work.

（5） It can display data such as working frequency, current or time at the same time to make the working status clear at a glance;

（6） Provide external control interface to facilitate connection with other control equipment.

2、 Main technical indicators:

Working voltage: 220V ±10%

Working current: **please note that the equipment cannot operate for a long time under the condition of greater than the rated current**

Rated power	600W	900W	1200W	1500W	1800W
Working current	2.5A	3.5A	4.5A	5A	6A

Ambient temperature: 0-40C °

Relative humidity: 40% - 90%

Operating frequency: 28KHz-135KHz, etc ±5%

Time control: 0-59min and 59s

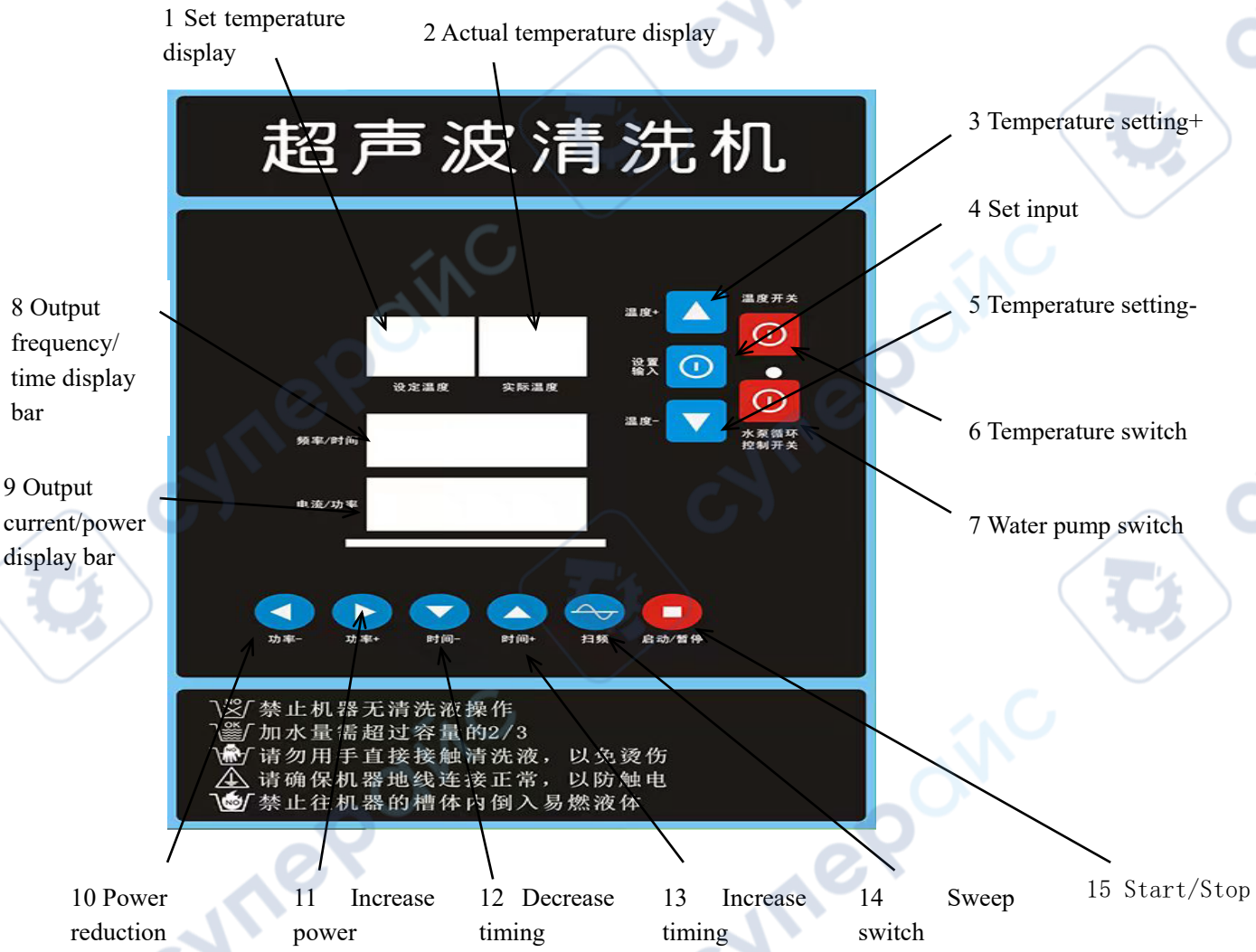
Power control range: 0-100% 16 level digital control pulse width adjustment

Internal overheat protection: 65 C °

Overall dimension: (unit: mm)

H x W x L = 160 x 300 x 360

3、 Panel function description:



1. Set temperature display bar: used to display the preset temperature.
2. Actual temperature display bar: used to display the actual working temperature.
3. Temperature setting+: use to increase the setting temperature
4. Temperature setting+: use to increase the setting temperature
6. Temperature switch: switch used to control temperature
7. Water pump switch: the switch used to control the water pump
8. Output frequency/time display bar: display working frequency and timing time

9. Output current/power display bar: display working status

10. Reduce power: reduce output power.(Set Item -)

11. Increase power: increase output power.(Set item+);

12. Decrease timing: set the timing working value.(Set parameter -);

13. Add timing: set the timing working value.(Set parameter+);

14. Frequency sweeping switch: used to control the start and stop of frequency sweeping function and automatic frequency scanning (parameter setting status);

15. Start/stop: used to control the operation and suspension of work.

Note: The switch function in brackets can be used only when it is set.

4、 Instructions:

1. Place the machine in a ventilated and dry place, and connect the power supply and output connector.When the power is turned on, the production serial number of the product will be displayed in the display window.

2. Normal operation mode:

Turn on the power supply, the upper display window or display "- OFF". If it is a timing number, press the "Increase Timing" or "Decrease Timing" key to make the display window display "- OFF", and then press the "Start/Stop" key to enter the normal operating mode and display the current operating frequency or "- ON -".The "start/stop" switch directly controls the operation of the machine, and the lower display window displays the current;

3. Timed working mode:

When the power is turned on, the display window should display "XXXX". If it displays "- OFF" or shows that the time is not what you need, when the machine is working in the suspended state (if not, press the "Start/Stop" key to make the machine work in the suspended state "OFF"), press the "Increase Timing" or "Decrease Timing" key to make the display window display the working time you need,Then press "Start/Stop" to enter the timed working mode, and the display window displays the corresponding timed value "XXXX", which decreases by seconds.When the clock drops to zero, the machine stops working and the display window displays the original setting.Please press the "Start/Stop" key to restart.

4. Power adjustment:

In the working state, press the ″increase power″ or ″decrease power″ key to make it reach the required state, and the machine will save your power setting value in about 10 seconds.

5. Sweeping mode:

By changing the frequency rule of a certain section of the power supply, the ultrasonic vibration can simulate the scouring effect, so as to enhance the cleaning effect.However, this mode may cause damage to parts, so please use it as appropriate.

6. Automatic constant current working mode

High frequency machine (68KHz and above) can use this mode to stabilize the cleaning effect and working current of the equipment in some places where the environment has a great impact on ultrasonic, such as water temperature, water level, cleaning medium, etc.a) Adjust the machine according to the normal commissioning steps, and increase the optimal working current of the machine appropriately;b) Properly raise the operating frequency point, and then its current will decrease until it reaches the required operating current;c) Set the No. 5 setting switch to the ″ON″ position and restart the machine (note: please turn off this switch when the machine is in other working modes).

7. Selection of working status and display mode:

As shown in the following table, press the "sweep frequency" key before turning on the power, and then turn on the power, the machine will enter the function setting state.Change the item number in the upper display window through the power "+" and "-" keys, and change the function content in the lower display window through the time "+" and "-" keys.

Upper display window	Lower display window		remarks
	0000	0001	
C001	Standby state during power on	On state at power on	
C002	Display frequency	Display character	
C003	Display actual frequency	Display the set frequency	
C004	Display current	Display power	
C005	Display the actual current machine power	Display the set current and power	
C010	Set the maximum working current value of the machine (unit value: A)		
C011			
C012			

8. Status setting of 6-position DIP switch on display board:

There is a 6-position setting switch on the display board. Please set it according to the actual load and working requirements, and the 4-position switch is the factory setting value of the equipment. Do not change it at will.

Switch serial number	1	2	3		4	5	6
OFF	Normal working state	Frequency setting	spare	working frequency	spare	Standard operating mode	spare
ON	Cancel timing function: At this time, "Time+", "Time-" and "Start/Stop" keys are invalid	OFF		65-80KHz		Constant current mode	
		ON		80-140KHz			

*Some machines have been set to the constant current mode when leaving the factory (No. 5 switch has been turned on), so it is impossible to manually adjust the frequency and match the inductance. If adjustment is required, please turn off the No. 5 switch and exit the constant current mode. After debugging, start the constant current mode!

10. Fault alarm:

If "E-1" is displayed in the display window, the machine has overtemperature fault;

If "E-2" is displayed in the display window, the machine is overloaded.

5、 Precautions:

Please place the machine in a dry and ventilated place. The distance from the rear of the machine to the shelter is more than 30cm for heat dissipation. In case of abnormal operation, please contact the maintenance personnel and do not open the cover at will to avoid danger.

The power protection ground wire of the chassis must be well grounded to avoid accidental electric shock!!!

Commissioning instructions

80KHZ ultrasonic generator debugging method:

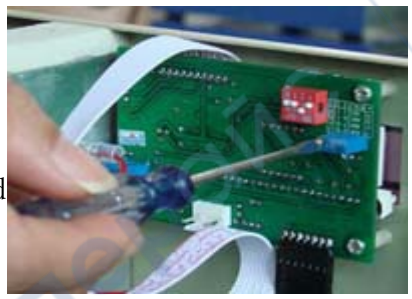
The performance of the ultrasonic cleaning machine depends not only on the performance of the generator, but also on the matching with the vibration plate. Different shock plates, different installation forms and different working environments will change the electrical performance of shock plates, so correct debugging is the basic guarantee for stable ultrasonic work. The specific methods are as follows:

Open the upper cover of the case, connect the power supply and load of the electric control box, and connect a 10A AC ammeter or clamp ammeter at the power incoming line (power switch).

Turn on the power supply and adjust the power to the maximum. Observe that the reading of the ammeter should be close to the working current of the machine

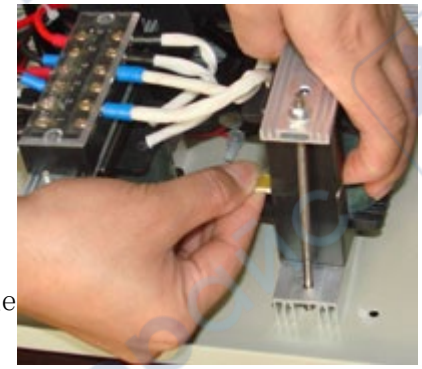
1) Place the machine in "frequency display mode" (see "7. Display selection under normal operation mode" in "Operation instructions" in the manual)

2)Adjust the frequency adjustment on the display board, find the maximum current point within the range of (75-85) KHZ, and record the current and frequency at this point.There are generally three situations:



Adjust frequency

A) If the current is too small and the frequency is too low (less than 75K - 85KHZ), the thickness of the spacer of the inductance core can be appropriately increased (using highland barley paper or glue wood sheet), and the frequency can be fine adjusted again while observing the current to reach the maximum point



Adjust inductance

B) If the current is greater than the rated current and the frequency is too high (greater than 75-85KHZ), the shim thickness of the inductance core can be reduced, and the frequency can be fine adjusted again to make the working current reach the maximum point

C) If the current is close to the rated current and the frequency is close to 75-85KHZ

3) Please turn off the power supply when adjusting the air gap of the magnetic core.During the adjustment process, pay attention to the change trend of current at any time to prevent excessive current, observe the actual effect of ultrasound, and pay attention to the heating of power devices

4) After adjusting the matching inductance every time, the frequency shall be adjusted again to make the working current at the maximum point.

In general, when the air gap of the magnetic core increases, the current will increase, and the resonance frequency will increase;When the air gap of the magnetic core is small, the current will decrease and the resonance frequency will decrease