



Ultrasonic Welding Generator

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# **Intelligent Ultrasonic Generator**

## **Instruction Manual**

**Model: SD-UG2000**



Thank you very much for selecting our Ultrasonic Power Supply!  
This manual contains important information and suggestion about  
installation, operation and trouble shooting. Please read them carefully  
before you use it!

**Zhejiang Sandi Electric Co., Ltd**

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# SD-UG2000 Ultrasonic welding generator

## 1. Operation notes

### 1.1 Safety requirements and warnings

This section explains the meaning of the various "safety caution" symbols and signs on the manual, and provides general safety precautions for ultrasonic welding generators. The following two signs are often mentioned in the manual, please pay special attention:

#### **Attention**

"Attention" is used to identify possible dangers and give tips, and give special tips on some key information for correct use and details that are easily overlooked. The user should have a certain understanding of it.

#### **Warning**

"Warning" mark is used to pay attention to potentially dangerous situations. If ignored, it may cause different levels of personal injury accidents and different levels of equipment damage.

**Note that the following precautions must be taken when using the ultrasonic generator:**

- Before making any electrical connections, make sure that the power supply is OFF state. Use power outlet with ground terminal to prevent electric shock accidents.
- Ultrasonic generator will generate high voltage. Before operating it, pay attention:
  - ① Turn off the power switch;
  - ② Unplug the main power plug;
  - ③ Wait 5 minutes for the capacitor to be fully discharged.
- Ultrasonic generator will generate high voltage, non-professionals should not open the cabinet.
- Do not put your hand under the welding head. The downward pressure of the cylinder and ultrasonic vibration may cause injury.
- Do not perform welding and testing operations when the high-frequency cable and the transducer are disconnected.
- When using a large welding head, do not put your hand between the welding head and the mold.
- The welding head must be replaced when it is turned off.
- Ensure that the workplace where the ultrasonic generator is located has good ventilation.

- This model must be operated by one person. It is forbidden to operate and debug by multiple persons at the same time.

### **Attention**

The noise level and noise frequency generated by ultrasonic generator in the process of work are directly related to many factors. Large noise may be generated during the welding process. If you find that the equipment has a lot of noise, you can install a soundproof cover. Too much noise will make people feel irritable, in this case it is necessary to wear protective devices.

### **Warning**

In the production process of welding certain materials, some products will produce harmful gases (such as PVC materials) during ultrasonic welding. When processing these materials, you must ensure good air circulation.

## **2. Brief introduction of intelligent SD-UG2000 ultrasonic welding generator**

The intelligent SD-UG2000 ultrasonic generator of plastic welding machine has the advantages of compact structure, simple and elegant appearance, easy operation, flexible movement, and easy maintenance.

The whole circuit is independently developed by our company. Adopted



American TI DSP283 series CPU has the characteristics of wide frequency tracking range, high frequency tracking accuracy, large instantaneous ultrasonic energy output, strong force, fast response, high control accuracy, and strong anti-interference ability.

The Intelligent SD-UG2000 plastic welding machine ultrasonic generator changes the input AC220V 50 / 60Hz AC power through the IGBT module to amplify the signal to a few thousand volt high voltage AC signal to drive the transducer to make it at its own resonance frequency resonance vibration. The control module can cut off the ultrasonic output when the ultrasonic generator fails, thus providing extremely high security for the ultrasonic equipment generator and the entire welding equipment.

### **3. Main features:**

1. Using 4.3-inch touch color LCD screen, friendly man-machine interface, easy to set up and save debugging time
2. Adopt American smart chip DSP283 series chip control, find frequency and track frequency quickly, and have strong anti-interference ability.
3. Long Vibration Wave and point control dual mode can be selected
4. Infineon IGBT scheme design, high power, stable and reliable, long life

5. One-click frequency search is convenient and fast
6. Multi-protocol can choose RS485, CAN, can be compatible with fully automatic system
7. Overvoltage and overcurrent protection
8. The chassis is made of 1.5-thick cold-rolled plate sprayed with plastic, which is durable
9. Automatic frequency scanning / storage can save the time of each startup and commissioning.
10. Pure copper transformer has sufficient power and high efficiency

### **4. Application field**

Ultrasound has a very wide range of applications. Generally, we are familiar with being used in medicine and the military. Among them, the industrial field is also widely used. Such as ultrasonic cleaning, ultrasonic flaw detection, ultrasonic grinding and polishing; ultrasonic welding is commonly used for welding, rivets, implant molding of engineering plastic products such as nonwoven fabric face mask N95 welding, clothes, ABS, PC, PS, PA, PP, PET, acrylic etc, automotive parts, mobile phone shells, musical instruments , Headphones, chargers, toys, electronic watches, folders, kettles, mobile phone batteries, medical parts, etc.

Standard ultrasonic welding machine Non-woven standard mask

machine, SD-UG2000 ultrasonic welding machine Non-woven welding,

plastic welding, welding, PVC leather spot welding, ribbon cutting, heat sealing and other multi-functional welding equipment, outer ear tape The mask machine fuses the elastic bands on both sides of the mask body in an ultrasonic manner to complete the finished earband mask. Only one operator needs to place the mask body on the conveyor belt fixture, and the rest of the subsequent actions until the finished product is completed The machine operates automatically, and the output of this machine is higher than that of ordinary earband machines.

## 5. Installation requirements

### 5.1 Environmental requirements

The use / storage / transportation of the equipment must meet the following environmental requirements

Table 4.1 list of environmental requirements for plastic welding machine

Environmental factors	Scope of application
Operating / operating temperature	-20°C to +65°C
Storage / transportation temperature	-20°C to +75°C
relative humidity	30% to 95%, no condensation

### 5.2 Power input range



## Ultrasonic Welding Generator

The power plug must be inserted into the single-phase three hole socket with the grounding terminal, and the power range suitable for the plastic welding machine is 220VAC  $\pm$  10% @ 50 / 60Hz.

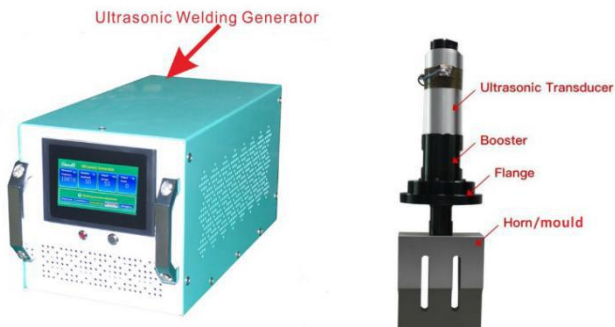
The input voltage of the generator is 220VAC. To use 110VAC, please contact the relevant service personnel for guidance and support.

Do not use 110VAC as input power without consulting, otherwise serious damage may be caused to the equipment!

### 5.3 System connection

The system requires the user to provide a single-phase input power supply with grounding terminal, voltage of 220VAC @ 50 / 60Hz, and load current of no less than 10A. Confirm that the socket of the power supply matches the power plug provided with the machine, and then insert the power plug on the machine into the socket. Before inserting the power plug, make sure that the voltage is 220VAC and the red power switch behind the ultrasonic power supply is off!

## 6. Ultrasonic Welding System Diagram










**7 List of main technical parameters of ultrasonic generator**

Item	Feature	Description
1	Dimensions	380mm×205mm×202mm (L*W*H)
2	Net weight of host	7Kg
3	Output power	Rated 2000W (100-4000W for spot welding mode)
4	Display	4.3 inch high resolution color LCD touch screen
5	Working temperature	-20°C ~ +65°C
6	THD	≤0.2%
7	Input power factor	≥80%
8	Working frequency	14-30KHz
9	Working power	AC190-AC240V 50Hz/60Hz
10	Mold frequency range	4000Hz (Taking 20KHz ultrasonic as an example, the mold frequency can be automatically tracked at 22000-18500KHz)
11	Automatic frequency tracking accuracy	0.1Hz
12	Power repeat consistency	≥97%
13	Remote terminal dynamic response time	≤10ms
14	communication method	CAN, RS485communication, support standard MODBUS RTU

## 8 Ultrasonic generator commissioning and working settings

- 1) First, connect the output wire of transducer to the output wire of the generator, taking care not to connect the positive and negative poles in reverse. (The wire on the transducer communicates with the transducer cabinet is the negative pole, if you are not sure, you can use a multimeter to measure it). **Note: The connection between the transducer and the steel mould must be tight and not loose, and the connection surface between the transducer and the steel mold shall be smooth and free of sundries, Otherwise it will affect the sweep frequency cannot find or protection.**
- 2) Turn on the power switch at the back and wait for 2 seconds for the machine to self-check. The generator displays the default frequency of 20000HZ. If the frequency has been found last time, use them directly to run the previous frequency. If it is the first time to use, it is necessary to scan the frequency. **Attention that when sweep frequency, please select the intermittent wave mode for the working mode.**
- 3) Steps of frequency scan: First press the reset / scan key for 2-3 seconds, see the display screen shows the maximum frequency set and wait for about 3 seconds. It will start to find the frequency at the lowest frequency set. When found the frequency is stopped, it means the frequency is already found, and you can click the sonic test, then the machine can work. If the fault light is on when

scanning the frequency, it means that the frequency is not between the maximum and minimum frequencies you set. Please change the maximum and minimum frequency to rescan the frequency.

- 4) If the overload protection is happened again during use, press the reset button to reset. If there are continuous failures, please check that the connection between the transducer and the steel mold is not loose. In order to ensure your efficiency, the steel mold will change after use. It is recommended to rescan the frequency so that the performance of the product will be more stable.
- 5) Amplitude adjustment, the default is 30%. This value can be adjusted according to the actual situation. It is not required to adjust too big. The machine is overloaded for a long time and the life is shortened. The appropriate is the best.
- 6) In the intermittent wave mode, you can use  on the LCD screen to start and  to stop, or you also can use an external switch to control the generator. The generator working time is the same as the switch closing time.
- 7) Use  in  mode to start,  to stop, and remember the last time power on / off. If the last time is the power-on state, the power is on then generator is automatically started, and if the last time is the power-off state, when the power-on generator is stopped, then must need press the start button to start.

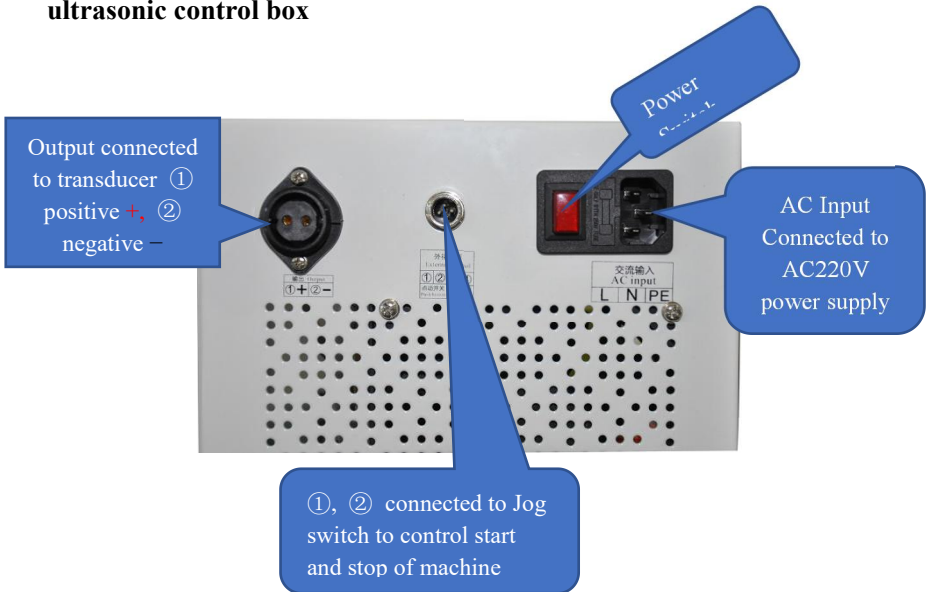
## 9. Operation panel instructions



**1, Run/Fault LED light: when running the LED light is dim, when fault the LED light is bright**

**2, Reset / Frequency sweep button: Press and hold for 3 seconds to automatically sweep the frequency, press once to clear the fault when there is a fault**

**10. Wiring instructions on the back of the ultrasonic control box**



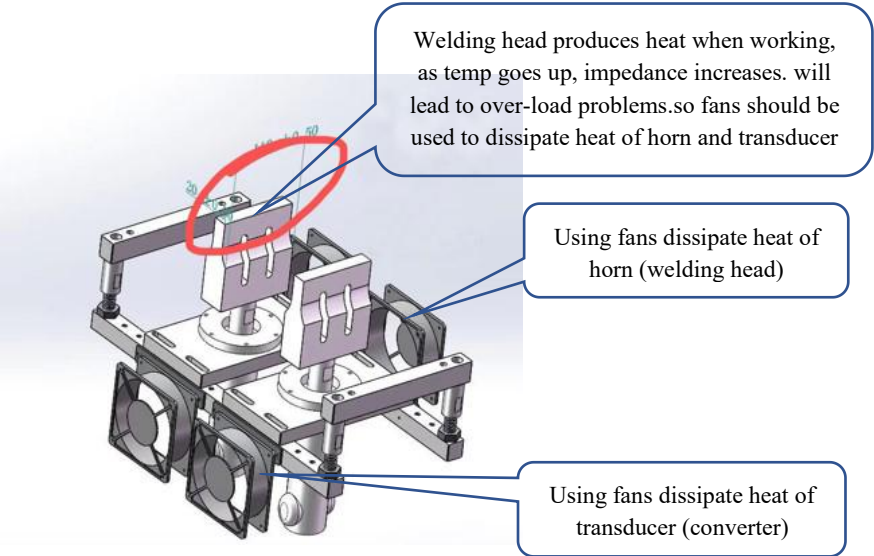
**1, Output connector:** ① is connected to the positive pole (+), ② is connected to the negative pole (-) of the transducer

**2, External control connector:** ①, ② is connected to the jog switch to control the start and stop of the machine. ③, ④ are connected to the fault dry contact output (increase according to customer demand, default is no)

**3, AC input:** Connected to AC220V power supply

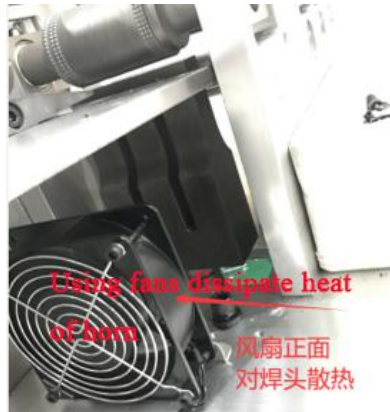
**4, Red button switch:** When the AC220V input plug is inserted, then press the Power switch to start the ultrasonic power supply.

11. Notice & Using tips of ultrasonic system working.



The better the heat-dissipating effect is more stability the continuously work !

The longer of the service life of ultrasonic system.



**12. Care and maintenance:**

1. The welding head, bottom mold and working objects are always kept clean.
2. Regularly check whether the cable connector is loose.
3. Keep the air in the workplace unblocked and the surrounding temperature not too high. (Below 40°C)
4. Open the upper cover of the ultrasonic control box every month and use a clean air gun without moisture to remove the dust in the box to keep the good heat dissipation and ventilation of the parts..



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