

Ultrasonic Generator TU Manual

I. Introduction

This manual of ultrasonic generator TU(hereinafter called generator) is composed of installation, debugging,operation and maintenance etc,and also describes the function and structure in details.It is very important to ensure the user read it carefully.

Overview

TU generator was developed for high-end industrial cleaning applications.It adopts the latest technology with four major features: full bridge phase shift,constant power output,automatic frequency tracking and load self-adaptation which would improve the stability and compatibility to different working conditions.

This generator can be individually connected to a washing tank or integrated to large ultrasonic cleaning system.Either way,it will get fast,uniform and perfect cleaning effect.

Features

- IGBT full bridge phase shift technology
- 0-100% power adjustable linearly
- Constant power output for different working conditions
- Frequency tracking
- Load self-adaption
- 2 Times peak power technology which has better cleaning effect to stubborn stains
- Frequency sweep function which can effectively eliminate stand wave and improve ultrasonic performance
- Ultrasonic conversion efficiency up to 95%
- Industrial level LCD display supporting parameters setting and status monitoring
- Internal protection for over current,over voltage and short circuit
- Remote control,connectable to PLC and HMI etc
- Support RS485 and MODBUS RTU communication
- Can be integrated into 19" cabinet

II.Attention

- Before starting,please read this manual carefully to ensure the safety of user and this device
- Keep this manual available to all the users
- Only qualified technicians can install this device
- This device can only be operated by the user who were trained professionally
- During working,heat energy from ultrasonic energy will be generated.Please ensure the heat can be dissipated well,especially for cleaning solution that may cause burning or even explosion.
- This device cannot be used in the tank without liquid which may damage ultrasonic transducer or ultrasonic generator
- Due to high voltage generated by this device during operations,please always disconnect ultrasonic generator from the mains supply and keep internal capacitor discharge for 1 min. If the user needs to contact internal structure of this device.
- If several generators are connected to one tank,please unplug high frequency output cable before opening the housing of generator
- The connector for transducer may retain high voltage charges. Before device debugging,troubleshooting or repairing,the user should connect short-circuit plate to pin 1 and pin 2 of connector for discharging

first. Otherwise, it may hurt body or measuring instruments

- Don't use the device in humid and corrosive atmosphere
- Put this device on sufficiently stable platform. Any shaking and dropping may cause serious damage
- Don't touch any inside components freely, the static electricity from body may damage them
- Ensure the right supply voltage and power to this device
- Make sure this device is grounded reliably

III. Warranty

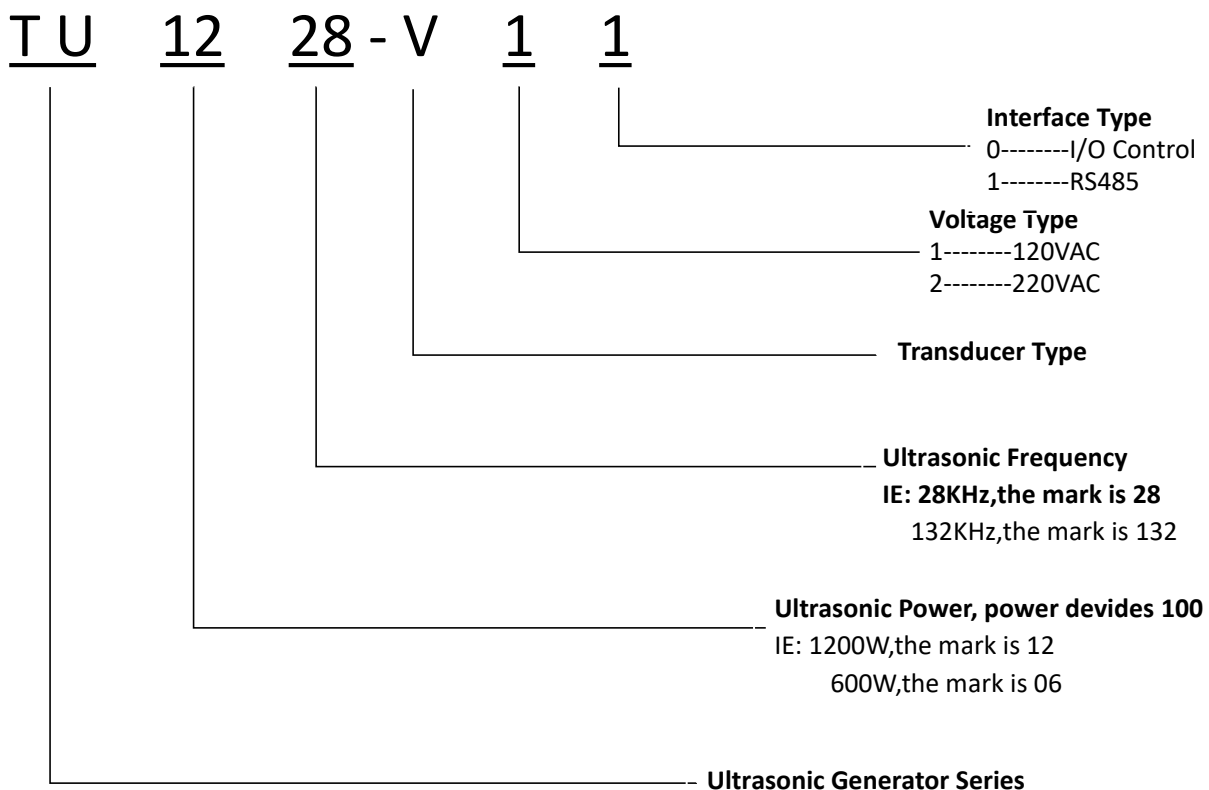
Clangsonic provides 12 months warranty from the date of factory under normal use. The manufacturer shall not be responsible for any direct or indirect loss, compensation and repair due to improper use, installation, misuse or abnormal temperature, dust and corrosive atmosphere etc.

Below are not covered by Warranty:

- Cavitation erosion on ultrasonic tank or surface of submersible transducer, which is a normal phenomenon during ultrasonic cleaning
- Damage caused by abuse, improper installation, alternation, overload or neglect of precautions

During the warranty, the device will be repaired or replaced by professional. Clangsonic reserves all the right.

IV. Model Code



Take TU1228-V11 as the example:

Ultrasonic Generator: TU

Ultrasonic Power : 1200Watts

Ultrasonic Frequency: 28KHz
Transducer Type: CN2835-59LB P4
Power Supply: 120VAC 50HZ
Communication Interface : RS485

VI. Technical Parameters

Take TU1228-V11 as the example

No.	Description	Parameters
1	Power Supply	120VAC $\pm 10\%$ (50/60HZ)
2	Ultrasonic Frequency	28KHZ
3	Ultrasonic Power	1200W
4	Power adjustable	0~100%
5	Full Bridge Phase Shift	Yes
6	Constant Power Control	Yes
7	Automatic Frequency-tracking	Yes
8	Load Self-adaption	Yes
9	Remote Control	Level: 24VDC $\pm 10\%$ Current: 20mA
10	Communication Interface	RS485 (MODBUS RTU)
11	Working Temperature	0~40℃/0~90%RH
12	Protection Class	IP21
13	Size	412*160*238 mm(L*W*H)

VII..Installation

1.Unpacking

- Check whether the items are complete or not according to packing list,if not,please contact us immediately
- Check appearance of the device and if any damage to structural parts
- Make sure the power switch is off

2.Environment

- Select a suitable place to put generator,before installation,please store the generator in the temperature -20℃-60℃,relative humidity<95%,and dry environment.To avoid being affected by moisture,water and sunlight etc.
- A lot of heat will be generated during working,please make sure enough space for heat dissipation,the air for fan is circulating and no other heat source around the device
- The bottom of device is equipped with air inlet and fan is installed at the back for induced draft. Prohibit any vapor or corrosive gas around the device.
- Keep enough space(>10cm) on the back of generator for cable connection

3.Power Supply

- Get the right power supply for generator.The device is high power,please carefully confirm if power supply is correct

- The power supply for this device should be made to either one of 120VAC(50/60Hz) ,the floating range is $\pm 10\%$,please confirm if your power supply is matched to this device
- Make sure the plug is connected rightly before powering on.
- Ensure the grounding wire of power supply meets industrial standard

4.High Frequency Cable

- High frequency is used to connect ultrasonic transducer to ultrasonic generator by aviation plug. Before connection,please make sure the transducer is right to the generator.
- During working,high frequency and high voltage signal will be through the cable,please don't intertwine the cable. Keep enough cooling space if multiple cables are connected in parallel.

5.Control Signal

Port No.	Signal	Description
1	Shield	Port for signal shielding
2	A	RS485 DATA +
3	B	RS485 DATA -
4	Output common port	Connect external +24VDC Collector output common positive pole
5	Input common port	Connect external 0VDC
6	External start port	+24VDC:rising edge ultrasonic start output 0VDC:trailing edge ultrasonic close input
7	Reserved	Reserved
8	Ultrasonic working feedback	0VDC output:ultrasonic output good ; High-impedance state:generator no output or generator in abnormal working state;
9~15	Reserved	Reserved

Please note:

Signal interface should be connected to shielded wire

5.1 Shield

Pin 1 should be single-ended grounded

5.2 RS485

Pin 2 and Pin 3 are corresponding to A and B of RS485. If communication distance is more than 5m,please use 0.5mm² twisted-pair. Parameters are following:

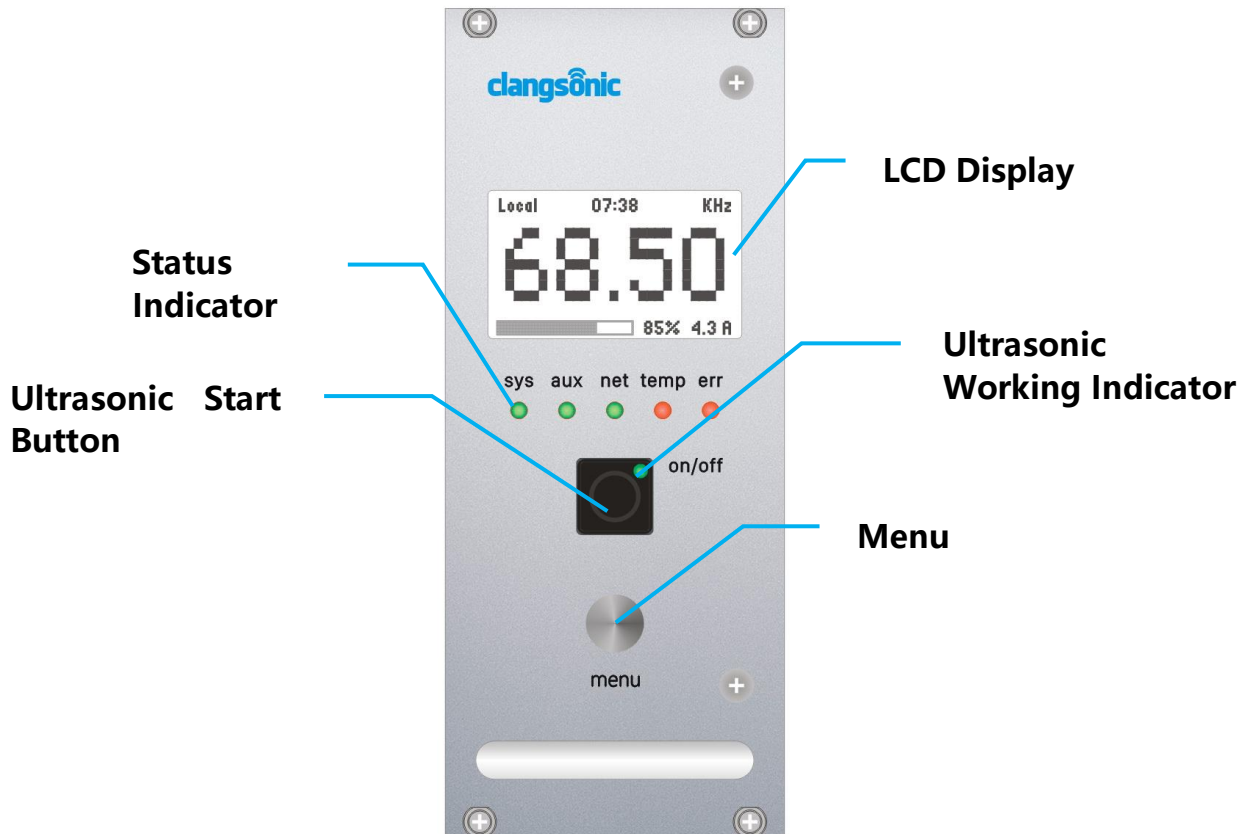
Baud Rate	9600	Date Bits	8
Stop Bit	1	Check Bit	NONE

5.3 External Start Control

Pin 5 and Pin 6 are for external start control.Ultrasonic will be output when the voltage is 24VDC and ultrasonic stops when voltage is 0VDC.

VIII.Operations

1.Front Panel



sys: System Indicator. This indicator light is on when system of this device is running normally .
It flashing shows system error,please check internal circuit

aux: External Start Control Indicator. This indicator light is on and ultrasonic start to work when 24VDC is applied.

net: External Communication Indicator Light. This indicator light is on when generator has data interaction with external control.

temp: Temperature Alarm Indicator Light. This indicator light and error light on show excess internal temperature of generator.

err: Generator Error Indicator Light. This indicator light is on when generator malfunctions.

on/off: Ultrasonic Working Indicator Light. This indicator light is on when ultrasonic is started and light is off when ultrasonic stops.

2.Back Panel

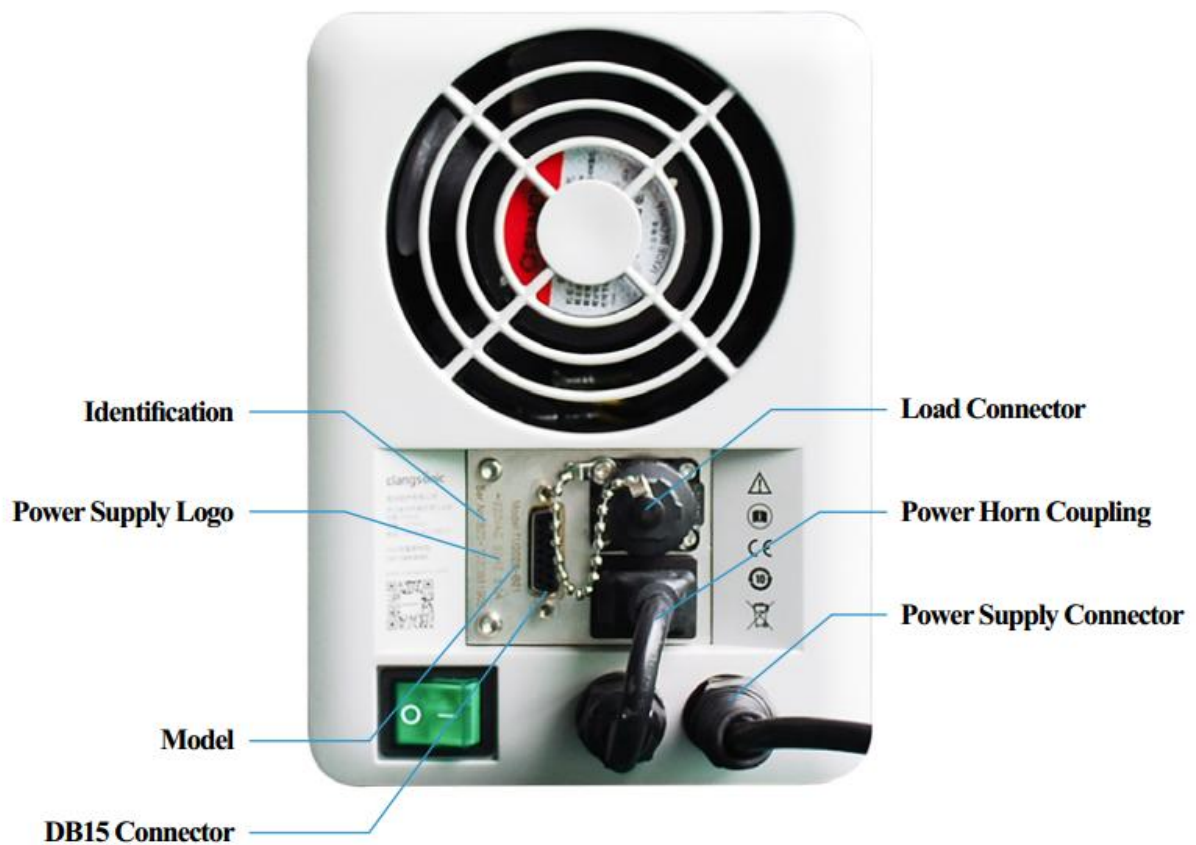
Load Connector: Connect to ultrasonic transducer

Pin 1: +

Pin 2:

-

Back Panel



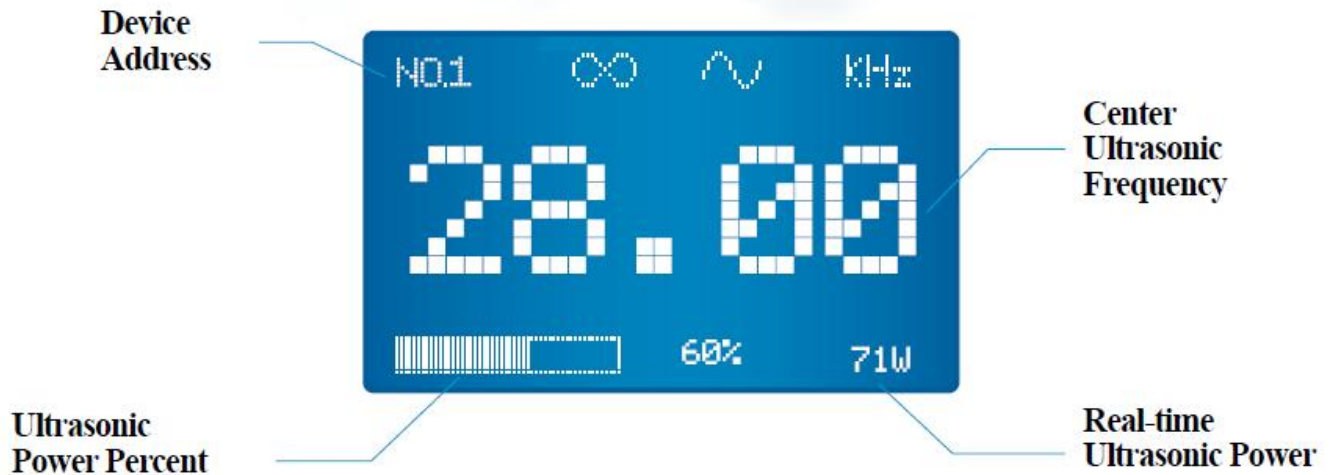
Power Supply Connector: Connect to Main Supply

Pin 1: Live Line Pin 2: Neutral Line Pin 3: Earth Wire

DB15 Interface: Connect to Control Signal Wire

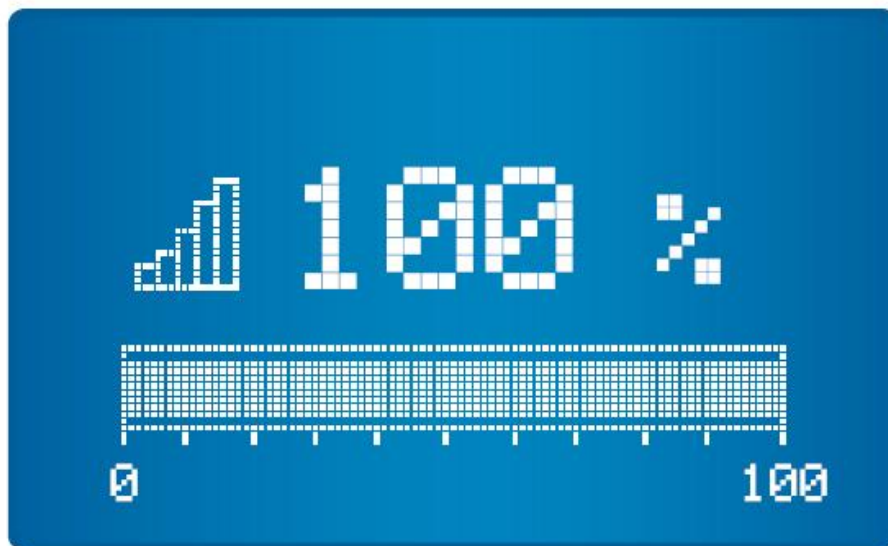
3.LCD Menu

3.1 Main Interface



- **Device Address:** The generator address for MODBUS communication
- **Center Ultrasonic Frequency:** The center frequency of ultrasonic generator
- **Ultrasonic Power Percent:** The output power percent under constant power mode
- **Real-time Ultrasonic Power:** The output effective ultrasonic power of generator

3.2 Power Adjustment

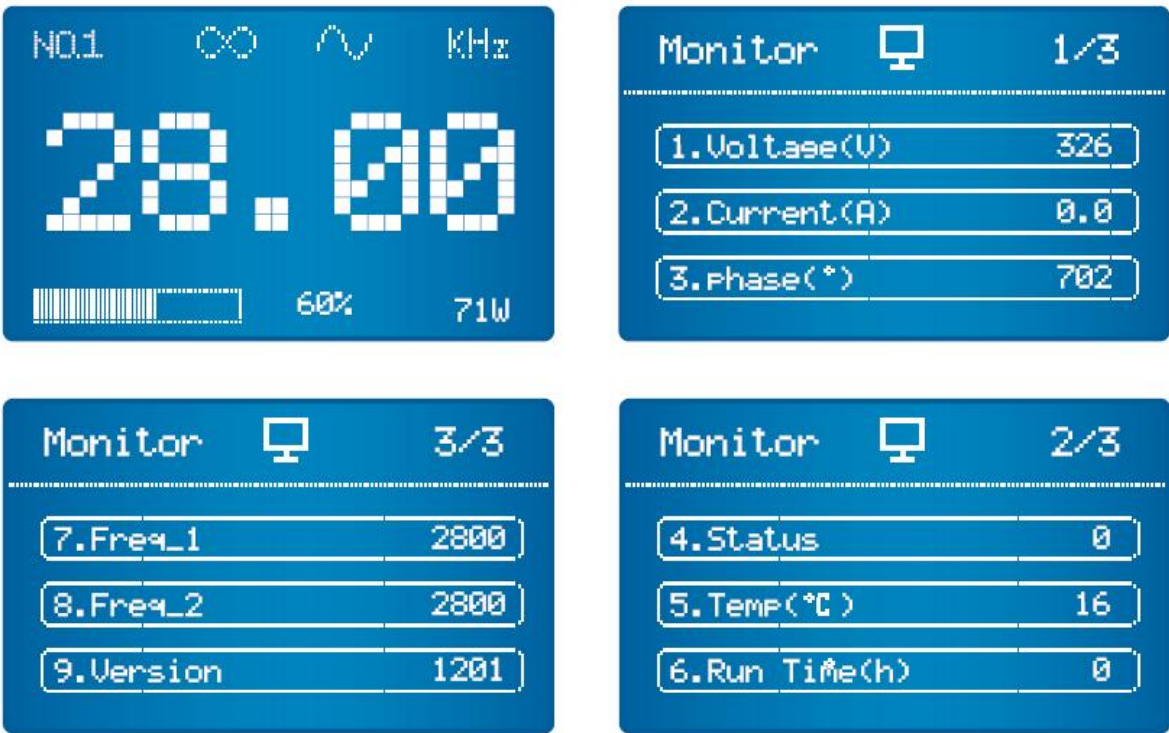


In the main interface, rotate the knob to enter into power adjustment. The power percent will be increased or decreased by clockwise or anticlockwise rotating the knob. Press the knob again, the setting power percent will be saved and back to main interface automatically.

After entering into power adjustment, it will go back to main interface automatically if there isn't any operation within 5s.

After clockwise or anticlockwise rotating the knob, it will go back to main interface automatically if there isn't any operation within 5s. And the setting power percent won't be saved.

3.3 Monitoring Interface



In the main interface,press the knob,you can switch from main interface to monitoring interface as shown above.

- Voltage(V):** Internal working voltage
- Current(A):** Output current effective value
- Phase(^):** Internal Phase Value
- Status:** Code for generator working status

No.	Code	Description
1	0	working normally,ultrasonic stops
2	1	working normally,ultrasonic starts
3	129	Internal communication problem, ultrasonic stops
4	130	load short circuit or load open, ultrasonic stops
5	131	over temperature warning, ultrasonic stops
6	132	over current protection, ultrasonic stops

- Temp(^C):** Internal Temperature
- RunTime(h):** Total Run Time For Ultrasonic
- Freq_1:** Real-time ultrasonic frequency
- Freq_2:** Locked center ultrasonic frequency
- Version:** Generator software version

4.4 Parameter Setting

Can only be used under the guidance of a professional technician.

IX.Troubleshooting

No.	Problem	Solution
1	Fan Not Working	1. Confirm if power supply is correct 2. Confirm if power switch of generator is on and fan is powered properly 3. Replace the fan
2	LCD Display Not Working	1. Confirm if fuses are well 2. Check if SPS board is powered properly 3. Check if front panel is working well
3	SYS Light Flashes	Internal System Abnormal 1. Check if front panel is connected to core board well 2. Replace front panel to check if problem solved 3. Replace core board to check if problem solved
4	TEMP Light and ERR Light on,fault code 131	Generator over temperature protection,please check if the air flue and fan are well
5	TEMP Light off and ERR Light on,fault code 132	Over current protection 1.Check if the transducer is correct 2.Check if the transducer is short-circuited
6	No Ultrasonic Output After Starting	Ultrasonic Output Abnormal 1. Check if LED on front pane shows ERR and tell us the status code 2. Confirm if load is open circuit or short circuit. Connect load to generator,check if the resistance between Pin 1 and Pin 2 of load connector is less than 100Ω, and disconnect the load to check if the resistance between Pin 1 and Pin 2 of load connector more than 50MΩ; 3. Check if IGBT or MOSFET damaged,measure GS or DS to see if short-circuited
7	External Control Connected,But AUX light off	1. Confirm if external voltage is 24VDC±10% 2. Replace front panel
8	Connect 485 Network,net light doesn't flash	1. Check if 485 wires are correct 2. Confirm if device address is right 3. Check if interaction command and parameters settings are correct

X.Service Hotline

If any doubts or questions after reading this manual,please contact us freely. To answer your questions quickly,please tell us the model and series number.

Service Hotline: 0576-87276622

FCC Caution.

This device complies with part 15 and part 18 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 and part 18 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RF warning for Mobile device:

- This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.