User's Manual

Model KM-ZL1526

Content

• Website: www.knmsonic.com • Email: mfrlucy@vip.163.com • Tel: +86 0512 - 57403727

Preface

Dear users,

Thank you for using KnMTech ultrasonic systems, a smart, digital control ultrasonic power supply developed by our company.

Before using this product, please read this manual carefully and be familiar with the operation regulations and parameter scopes.

Only Professional technicians or trained personnel can commission or maintain this product.

1. Precautions:

Please read this manual in details before operation to guarantee a smooth operation and self-safety.

Only professional personnel is allowed to install this system. Operators must be trained before work.

Protection measures have to be taken for operation in hazardous environment. As some energy will be transformed into heat during the operation, be cautious that the accumulation of heat will lead to explosion or burning without any protection.

Peripheral electric device electromagnetic compatibility must meet the requirement of the related country. All the operation parameters can be set by user, but the parameters protected by passwords shall be kept at factory default parameters. For any support, please contact our technical personnel. It is strictly prohibited to turn on the machine with a loose welding horn.

When moving or maintaining the device, it has to be handled by professional personnel under condition when power is off.

For repairing or maintaining the generators, dust has to be removed by compressed air blower or brush. Please don't use cleansing reagent to clean the case or LCM interface. Cloth with slight water can be used for rubbing the dirt.

High-load driving cables can control or signal monitoring cables shall be screened stranded conductors. Please don't install it close to high-current devices. The screened cables shall be connected to power supply grounded line. All the driving cables can control cables shall be grounded, and the generator's ground line shall be connected to the ground line of power supply.

Pay more attention to the malfunction codes on the generator to facilitate early action to prevent expansion of the malfunction.

The generator shall be installed in correct direction to assure firmness without loosening. Power supply specs must meet the demand of the generator.

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Warning: The ultrasonic generator will produce high voltage. Non-professionals should not open the casing. Ultrasonic safety requirements and warning generators will produce high voltage, and the high-voltage common terminal is not connected to the earth. Therefore, when testing, please use a multimeter that is not grounded and uses a battery as a power source. Testing with other methods may result in electric shock.

Do not put your hands on or under the welding head. The ultrasonic vibration may cause serious injury. Do not perform welding and testing operations when the high-frequency cable or transducer is disconnected.

This model allows one person to operate it. Simultaneous operation and debugging by multiple people is prohibited.

2. Power Supply

The power plug must be inserted into a single-phase three-prong socket with a grounding terminal. The adaptable power range of the ultrasonic degating machine is 220VAC±10% 50/60Hz, and a 10A slow-blow fuse tube is used.

The power input of the ultrasonic degating machine is 220VAC. If you want to use 110VAC as the input power supply, please contact the relevant service personnel for guidance and support! Never use 110VAC as the input power supply without consultation, otherwise it may cause serious damage to the equipment! The system connection system requires the user to provide a power supply with a single-phase input with a ground terminal, a voltage of 220VAC 50/60Hz, and a load current of not less than 10A. Make sure that the socket of the power supply matches the power plug provided with the machine, and then connect the power supply to the machine. Plug into the applicable range socket. Before inserting the power plug, be sure to check and confirm that the voltage is 220VAC and that the power switch located on the left side of the electrical box is turned off!

List of Environmental Requirements For Ultrasonic Degating Machine

Environmental factors	Scope of application
Operating/usage temperature	+5°C to +50°C
Storage/transport temperature	-25°C to +70°C
Relative humidity	30% to 95%, non-condensing

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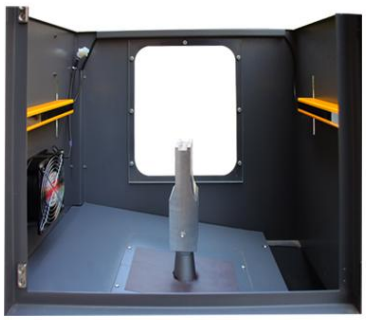
3. Ultrasonic Degating Principle

The ultrasonic generator converts 50/60hz electric current into 15khz,20khz, 30khz or 40khz or higher frequency energy, and output to the piezoelectric ceramics inside the converter, to make same frequency vibrations by the converter, and the mechanical movement will be transmitted to the booster that can change the vibration amplitude, and to the ultrasonic horn. The horn will transmit the received vibration energy to the plastic parts.

4. Pictures Of Machine

<table>
<tr>
<td>  </td>
<td>  </td>
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5. Features of Ultrasonic Generator

* Fully automatic frequency tracking (AFC), suitable for various sizes and shapes of molds. Automatic tracking frequency range: ±400Hz (taking 15KHz ultrasonic as an example, the mold frequency can be used for automatic frequency tracking between 14.40-15.20KHz). Frequency tracking accuracy: ±5Hz

* Smart chips for real-time monitoring and built-in "system protection monitoring" functions of various protection systems

Alarm reminders will occur when the following situations occur:

◆ Excessive pressure leading to overloading

◆ The ultrasonic generator current is too large

◆ The ultrasonic horn, amplifier or transducer is loose or has other faults

◆ Generator circuit failure

◆ Cable failure between generator and transducer

The "auto-tuning" function enables the ultrasonic generator to automatically track and compensate for changes in the frequency of the ultrasonic horn. When the temperature is too high, the surface of the ultrasonic horn is worn or there is debris stuck to the ultrasonic horn, the above frequency changes will occur.

* The built-in fully automatic constant amplitude system automatically compensates for different air pressure changes and voltage fluctuations, and can continuously adjust the ultrasonic amplitude from 50% to 100% to adapt to the requirements of different plastic parts.

* Using IGBT for power amplification, the response is fast, more than 100 times faster than traditional silicon power tubes, so the protection function is better.

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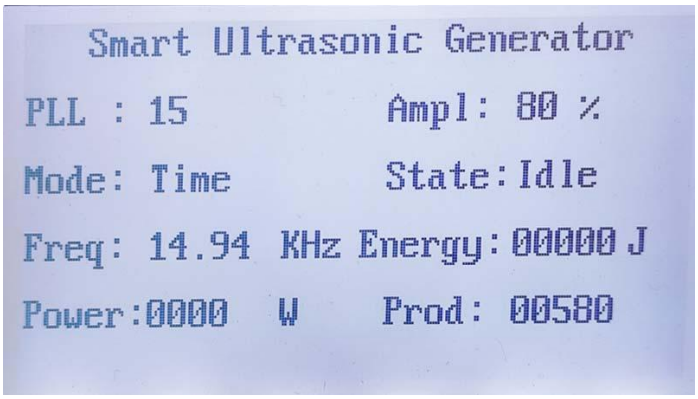
6. Main Technical Parameters of Generator

Dimension	L380*W290*H110mm
Net Weight	3kg
Output Power	0-4200W
Voltage	0-3000V AC
Working Temperature	5° C to 50° C
Sinusoidal harmonic parameters	≥97%
Input power factor	≥80%
Working Frequency	15KHz/20KHz/28KHz/30KHZ/35KHz/40KHz
Power supply	AC220V 50Hz
Mold frequency range	±400HZ (taking 15KHZ ultrasonic as an example, the mold frequency can be used for automatic frequency tracking at 14.40-15.20KHZ.)
Automatic frequency tracking accuracy	±5HZ
Output stability	≤ 5%
Remote terminal dynamic response time	≤10ms
Overcurrent protection current	15A
Overcurrent protection time	100ms
Communication	485 communication

7. Operation Panel

7.1 Main panel



7.1.1 PLL Frequency Range

Displays the resonant frequency position of the transducer or mold tracked by the generator, frequency band range (0-20), 0-20 indicates that the ultrasonic mold frequency is low or high, it is best to adjust the mold, transducer, and generator to the position in the middle of the frequency point.

7.1.2 Mode

There are two working modes, one is auto, the process is controlled by the set time; the other is debug mode, for adjusting the ultrasonic mold.

7.1.3 Frequency

Displayed as the current actual resonant frequency in KHz.

7.1.4 Power

Display the maximum output power immediately after vibrating.

7.1.5 Amplitude

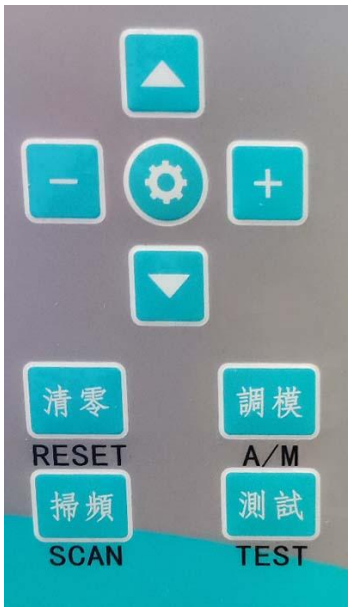
Displays the percentage of ultrasonic output amplitude and power.

7.1.6 Status: Idle

7.1.7 Energy

7.1.8 Prod: Display the total counts of the ultrasonic vibrating process.

7.2 Key-Press Button



1. **RESET:** After pressing this key, the production quantity will be reset to zero. (To prevent accidental touch, press and hold for 5 seconds to clear)

2. **A/M:** Switch between automatic mode and mold adjustment mode.

3. **SCAN**: Automatically track the frequency. After changing the mold, please press the frequency scan key and the system will automatically scan the frequency. After the scan is normal, the system will automatically save the ultrasonic mold frequency data; if the scan is abnormal, the system will alarm and prompt the corresponding fault information.

4.  **SET**: Press the set key to enter the setting interface, where you can adjust the corresponding parameters. After the adjustment is completed, press this key again to confirm and save.

5. 

TEST: It is used to check the power consumption of the transducer/booster/ultrasonic horn assembly in the no-load state. It can also test whether the ultrasonic horn is normal. If the ultrasonic horn is abnormal, an overload alarm may be generated even in the no-load state.

6.  **UP**: Move up in the settings page

7.  **DOWN**: Move down in the setting page

8.  **ADD**: Add value in the setting page

9.  **MINUS**: minus value in the setting page

10. Enter parameter interface button:

Press the two buttons at the same time

11. Enter Password: **123321**

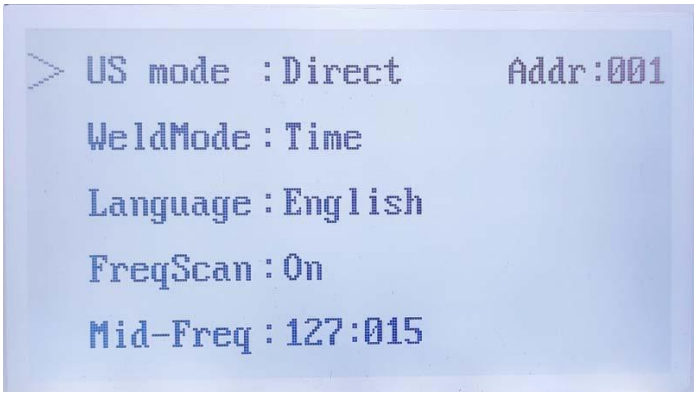
Note: 

press RESET means 1; 

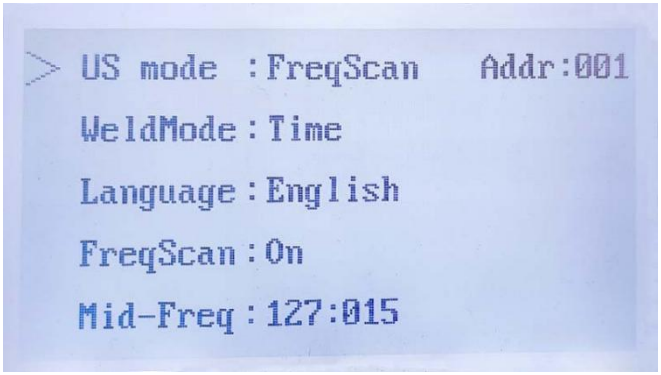
press A/M means 2;  **press MINUS means 3.**

7.3 Three Ultrasonic Modes

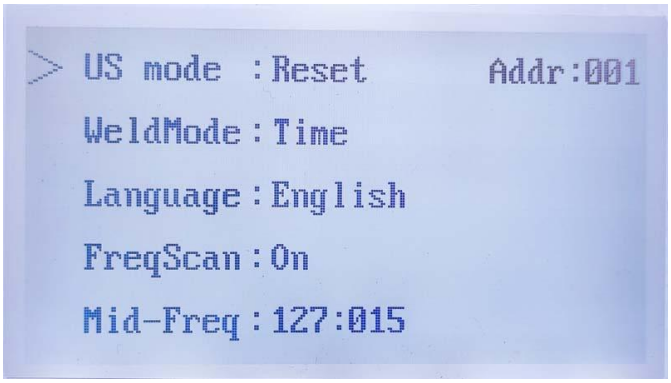
7.3.1 Direct: Direct ultrasonic mode after signal start



7.3.2 FreqScan: Frequency Scan + ultrasonic mode after signal starts



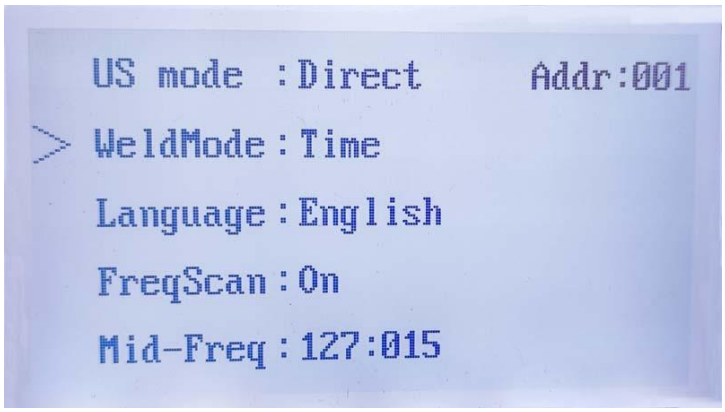
7.3.3 Reset: Reset after signal start + frequency scan + ultrasonic mode



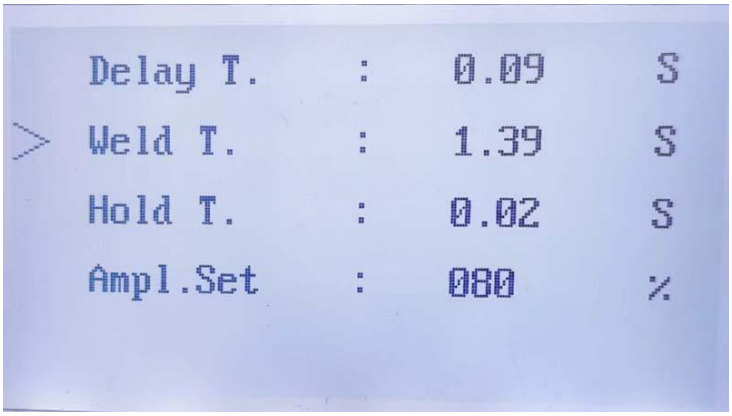
7.4 Five Working Mode

7.4.1 Time mode: choose time control for ultrasonic vibration

Input password:123321 to enter the setting panel, press **UP** and **DOWN** to move the cursor,press **ADD** and **MINUM** to set the value, then press the **SET** to confirm and exit.



Then press **SET** again to enter the parameter setting.



In parameter setting panel, move **UP** and **DOWN** to choose parameter, and press **ADD** and **MINUS** to set the value, then press the **SET** to save and exit.

Delay T.: Show the delay time to trigger ultrasonic wave

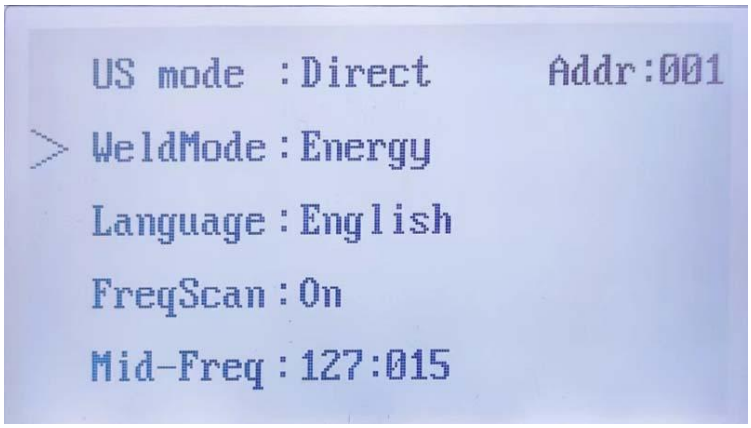
Weld T.: Show the time of ultrasonic wave

Hold T.: Show the hold time after ultrasonic wave

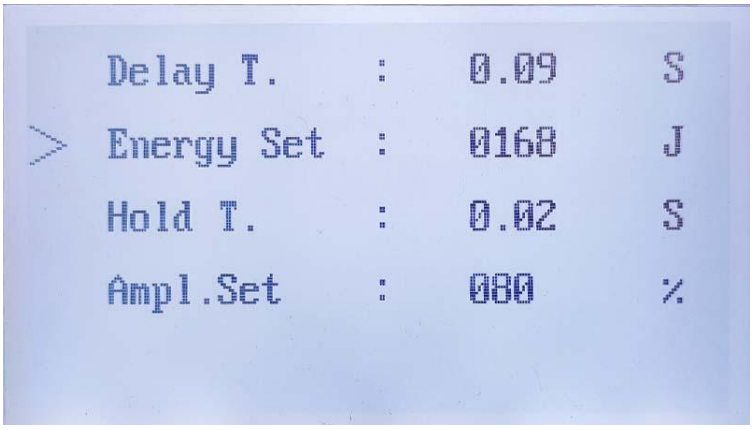
Amplitude: The amplitude can be adjusted from 50% to 100%. When the setting value is lower than 60%, the ultrasonic output power may be too low due to the amplitude value being too low, resulting in poor welding. When setting the amplitude value, you can set it according to the product. The amplitude is set according to the degating requirements. While ensuring the quality of the product, appropriately reducing the amplitude can extend the service life of the ultrasonic transducer and ultrasonic mold.

7.4.2 Energy Mode: When up to the set energy, ultrasonic vibration stop.

Input password:123321 to enter the setting panel, press **UP** and **DOWN** to move the cursor,press **ADD** and **MINUM** to set the value, then press the **SET** to confirm and exit.



Then press **SET** again to enter the parameter setting.



In parameter setting panel, move **UP** and **DOWN** to choose parameter, and press **ADD** and **MINUS** to set the value, then press the **SET** to save and exit.

Delay T.: Show the delay time to trigger ultrasonic wave

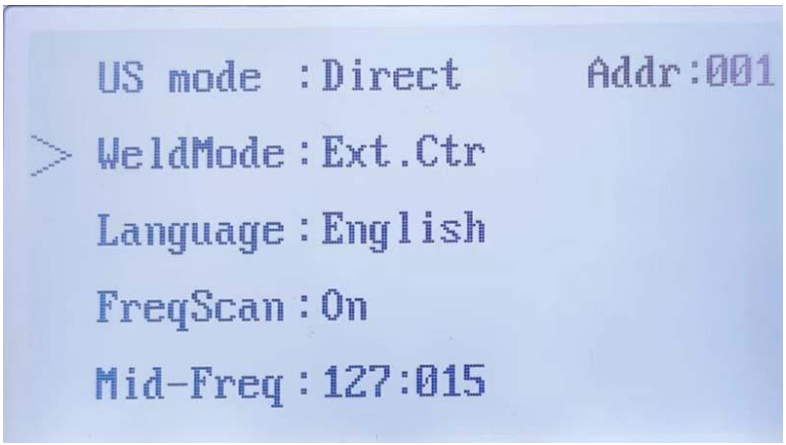
Energy Set: Show the energy needed for plastic degating

Hold T.: Show the hold time after ultrasonic wave

Amplitude: The amplitude can be adjusted from 50% to 100%. When the setting value is lower than 60%, the ultrasonic output power may be too low due to the amplitude value being too low, resulting in poor welding. When setting the amplitude value, you can set it according to the product. The amplitude is set according to the degating requirements. While ensuring the quality of the product, appropriately reducing the amplitude can extend the service life of the ultrasonic transducer and ultrasonic mold.

7.4.3 Ext. Ctr mode: In this mode, the ultrasonic vibrates continuously and the time is controlled by the micro controller or PLC.

Input password:123321 to enter the setting panel, press **UP** and **DOWN** to move the cursor,press **ADD** and **MINUM** to set the value, then press the **SET** to confirm and exit.



Then press **SET** again to enter the parameter setting.

Amplitude: The amplitude can be adjusted from 50% to 100%. When the setting value is lower than 60%, the ultrasonic output power may be too low due to the amplitude value being too low, resulting in poor welding. When setting the amplitude value, you can set it according to the product. The amplitude is set according to the degating requirements. While ensuring the quality of the product, appropriately reducing the amplitude can extend the service life of the ultrasonic transducer and ultrasonic mold.

8. Quality Guarantee

The following statement has to be observed for quality guarantee：

Warranty scope: 12 months since purchase for the machine, 3 months for ultrasonic horns.

If the malfunction happens due to following reasons, the maintenance has to be paid even it is in warranty period:

Problem due to incorrect operation or repairing without our permission；

Problem due to application exceeding the standard;

Damage due to falling down or moving with violence after purchase;

Using our equipment in the environment that does not confirm with the requirement in this user's manual, which results in aging of the components or other malfunction；

Foreign materials go inside the machine (such as bugs) , which results in the damage of the machine；

Incorrect cable connection resulted in damage of the machine;

Malfunction caused by earthquake, fire, wind or flood, thunder, abnormal voltage or other natural disasters.

9. Additional Information

Declaration of exempt of liability;

1.Any liability caused by using our products while violating the regulations in this user's manual, will not be born by our company.

2.Any loss or involvement of loss, consequent damage caused by using our machines will not be our responsibility to compensate such a loss or damage.

We preserve the right to update the above specifications in case of any improvement of the products, we will not otherwise inform due to above change.

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