

US-510 Ultrasonic Rotary Welding Machine

Operation Manual



is powered by

H&H Asia Group Limited

➤ **Introduction**

Thank you for choosing US-510 ultrasonic rotary welding machine by H&H.

The US-510 ultrasonic rotary welding machine was specially designed for cutting and welding different type of fabric. Various operations such as 'line bonding', anti-fray cutting, button hole opening can be carried out using US-510.

In order to fully understand how to use this machine properly, and avoid damage to both the machine and operating personnel, please read this manual carefully and keep it safe for future reference.

➤ **Specifications**

Model	US-510
Voltage	220 V, single phase
Frequency	50/60 Hz
Power Consumption	800 W
Compressed Air	0.4~0.6Mpa
Sonic Frequency	28 kHz
Overall Dimensions	1100mm (L) x 500mm (W) x 1200mm (H)
Overall Weight	120 kg

Note: due to continuous improvement, specifications are subjected to change without prior notification.

➤ **Features**

- ✧ Quiet Ultrasonic System
- ✧ Microprocessor control with large panel touch screen operator interface
- ✧ Unique welding technique ensuring consistent welding energy control.
- ✧ Precise timing control resulted in no marking, over welding and skip welding during start and stop operation.
- ✧ Excellent control in constructing curved seams.
- ✧ 3D seam construction.
- ✧ Easy to adopt sewing machine platform

Principle of Seam Sealing

Ultrasonic energy is a form of physical vibration. The commonly used vibration frequencies are 20 kHz, 30 kHz, 35kHz and 40 kHz. Different materials exhibit different behaviors under ultrasonic vibration. Synthetic material generates internal heat under ultrasonic vibration. The US-510 machine generates vibration on the surface of the horn. Fabric with at least 50% synthetic material is placed on the surface of the horn. A special tool called cutter bit is press against the horn so that fabric between the horn and the cutter bit is exposed to vibration. The heat generated in the fabric portion under pressure is heated up instantly and the temperature is high enough to melt the fabric, hence resulting in an ultrasonic cut.

US-510 is engineered to careful manage this vibrating energy in order to slice fabric consistently in single layer or multi-layer application.

During single layer operation, fabric is melted and separated resulting in a fray free edge. While during multi-layer operation, layers of fabrics are cut but at the same time the edges of the fabric are melted and fused together resulting in a 'weld'. This process is sometimes referred as a 'cut and seal' or 'line bonding' operation.

➤ Preparation for Installation

Installation must be carried out by authorized personnel. Follow the steps below:

1. Position the machine on a flat surface and allow at least 50cm clearance on both sides as well as the back side, this is essential for the hot air ventilation and also to allow enough room for maintenance personnel to carry out necessary service and maintenance
2. Adjust the foot stand so that the machine is level and stable.
3. Loosen all packing cable ties and materials in order to free up all machine movements.
4. Connect the power plug to a suitable outlet with at least 10A capacity. Make sure grounded and reliable.
5. Locate the air hose supplied with the machine. Connect one end to the inlet of the compressed air water filter at the back side of the machine; connect the other end to a compressed air supply such as air compressor or central air supply. Make sure the compressed air supply has at least 0.4 Mpa (4 bar) of pressure.
6. Install the tensioner at the top of the machine and align the tape spool at right angle to the working table of machine. (see diagram below)
7. The control center internal parameter setting is the factory value parameter (shown in Figure 1)

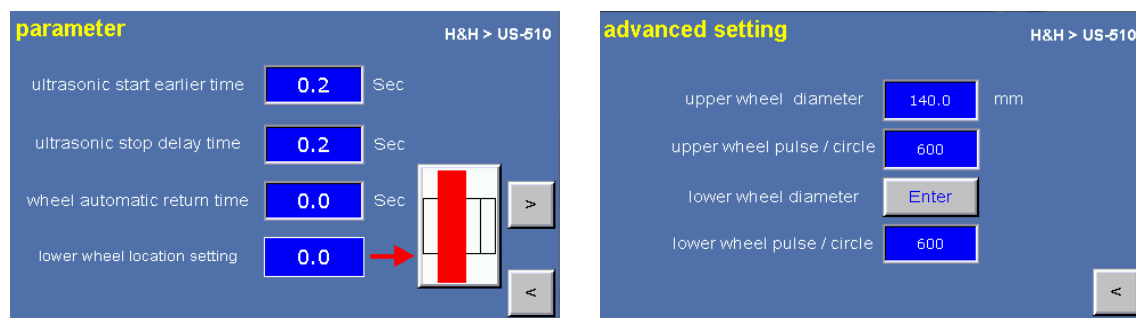


Fig. 1

Note: "parameter setting" factory password is 888888, "advanced settings" parameter for the manufacturers to adjust the machine set the parameters, not free to change, otherwise it will affect the machine running performance.

➤ Operation & Controls

■ **Adjust the cutter wheel pressure**

Adjust the top of the cylinder adjustable screw and lock cover

Press the foot switch of upper and lower mold at the same time

Gradually adjust the distance between the cutter wheel and the lower mold to change the pressure until you can completely cut the current work piece.

Counterclockwise adjustment adjustable screw, cutter wheel pressure increases, adjust the adjustable screw clockwise, cutter wheel pressure decreases. According to the different fabric to adjust the pressure, long time of high pressure work, likely to cause the cutter and ultrasonic tool head wear. (as shown in picture 2);

A: the role of adjustable cylinder screw: adjust the distance between the upper wheel and the lower mold, to changing the working pressure;

B: the role of the lock cover: when the knife wheel and the lower mold spacing is better, tighten the fixed cylinder screw.



Fig. 2

■ **Detect ultrasonic waves**

When the machine is powered on (make sure the cutter wheel does not come into contact with the ultrasonic tool head), press the "Sound wave" test button on the panel of the ultrasonic control box. Normally, the ammeter is shown as 0.6 ~ 1A, and the voltmeter will show is 0V after swing one time. (shown in Figure 3).

If the alarm indicator light or the voltmeter and ammeter readings outside the normal range, you need to adjust the upper part of the control box of the fine-tuning knob for correction (shown in Figure 4), the correction process, rotate the fine-tuning knob every 60 degrees (clockwise or counterclockwise), press the "Sound Run" test button once to check whether the voltage and current display are normal and repeat until it is normal.

Note: Before the start of working must test the ultrasonic current and voltage, and make sure there are normal.



Fig. 3

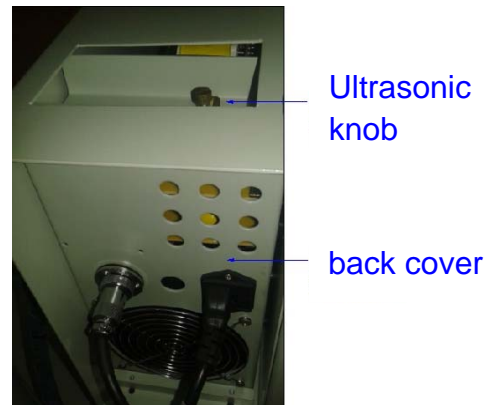


Fig. 4

➤ Selection and replacement of cutting wheel

■ Selection of the cutter wheel

According to different fabrics and process, you can choose to buy a cutter wheel with different angle. Straight knife is 0 degree angle knife. Normally, the straight knife easy to cut the fabric, and the cutting surface is smooth, but have small incision fusion point. The greater opposite blade angle, the better incision adhesion will achieve. (as shown in Figure 5).

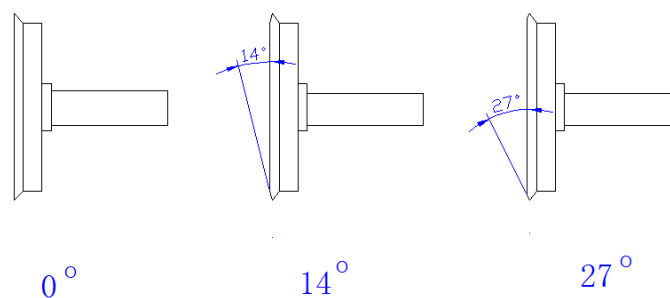


Fig. 5

■ Replace of the cutter wheel (as shown in Figure 6)

Cutter wheel is a vulnerable product. When it is difficult to cut even the pressure is increased, or fusion point becomes very large, you should replace the cutter wheel, otherwise, high work pressure will speed up the mold wear.

Remove the three screws which fix the wheel, then, you can change the cutter wheel. (as shown in Figure 6).

Change the position of the gasket next to the cutter wheel can move the position of the cutting wheel. The lower cutting wheel must be adjusted at the same time once the position of the upper cutter wheel is changed. Otherwise it will lead to different speed in upper and lower wheel which affecting the cutting effect.

Continuous click on the box with red and white color on the screen, until the display of

the box and the actual wheel position are the same. The larger box with red color on behalf of the wheel, while, the smaller box with white color on behalf of the gasket (shown in Figure 7).

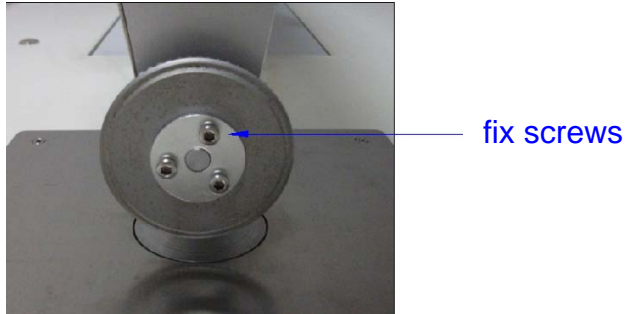


Fig. 6

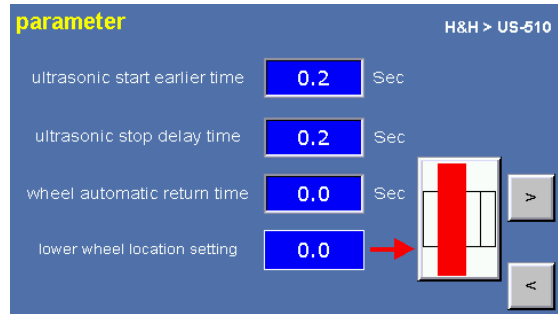


Fig. 7

➤ Operation steps

1. Adjust the working speed (Figure 8);
2. Press the foot switch #1, the upper wheel will press down. (as shown in Figure 9)
3. Press the foot switch #2, the machine starts.
4. Press the foot switch #1 again, the upper wheel will lift up.

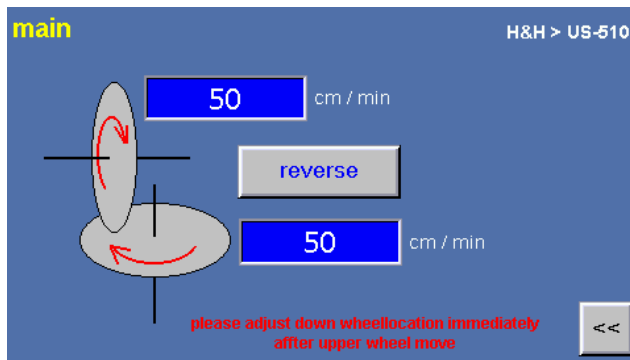


Fig. 8



Fig. 9

➤ **Maintain**

■ **Preventative**

In order to keep the machine in top running condition, regular maintenance is important for trouble free operation. This will minimize possible down time and to prolong machine life.

- Check the motion of the machine for smoothness and strange noise.
- Check the air hoses for leakage or damage.
- Check the cutter wheel for worn or damaged.
- Check whether the current of ultrasonic wave is between 0.6 and 1A, and whether the voltage is 0V or not.
- If there have abnormal sound when the ultrasonic current and voltage are normal, you can adjust the ultrasonic screws to change the tightness, the specific operation, please contact us.
- Check the tightness of the upper and lower wheel timing belt every 3 months, adjust the internal timing belt tension wheel can change the tightness of the belt;
- Check the bottom of the table whether there are cloth and other debris and keep clean.

➤ **Appendix Wiring Scheme**

