HT-LS02G

Gantry Laser Welding Machine

User Manual



Thanks for choosing HELTEC series produces.It will bring you convenience and efficiency for spot welding work.For optimal user experience,please read the manual carefully before using and store it properly for future reference.

HELTEC has the right to upgrade the machine and modify the manual without prior notice. Thanks for understanding!

Summarizes

HT-LS02G Gantry Laser Welding Machine For Lithium Battery adapts automated gantry structure. It can flexibly weld lithium battery modules of various types and sizes on the operating console.Precise and reliable welding reduces the contact resistance of lithium batteries during assembly and improves the output and performance of lithium battery modules. Automated operation improves production efficiency, and the specially designed operating system makes operation easier and reduces the skill requirements of operators. The output power is1500W ,which can weld vehicles battery easily and marking the shell nameplate of lithium battery modules.

Features

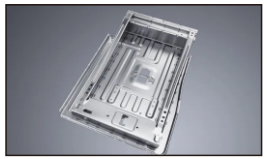
1. The gantry structure realizes automatic positioning of workpieces and automation of the welding process, improving production efficiency.
2. The welding speed is faster than the traditional method and improves production efficiency.
3. The high-precision control system can achieve precise laser control and positioning.
4. Achieve multi-shape welding through program control, and flexibly adapt to the welding requirements of various complex shapes
5. Equipped with software of graphics processing functions, which makes operation easier.
6. It uses an advanced control system and high-quality lenses ,which have very good stability.It can work continuously for a long time with stable welding quality.
7. Diversified welding, not only can weld single pattern ,but also mark and draw. It is easy and efficient.
8. According to different welding materials, the output energy waveform can be set and controlled to achieve a more ideal welding effect.

Parameters

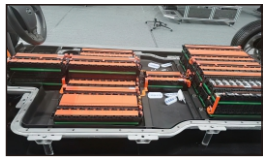
Product name	Gantry Laser Welding Machine	Model	HT-LS02G
Supply voltage	AC220V±10%	Output power	1500W/2000W/3000W
Power consumption	≤6KW	Laser wavelength	1070±10nm
Cooling system	Water cooling	Gantry movement range	800*770*410mm
Size	205*148*119cm	Machine weight	350kg

Application

Applicable to new energy vehicle maintenance, lithium battery dealers, and battery pack manufacturers, stainless steel nameplate marking.



Energy storage lithium battery pack



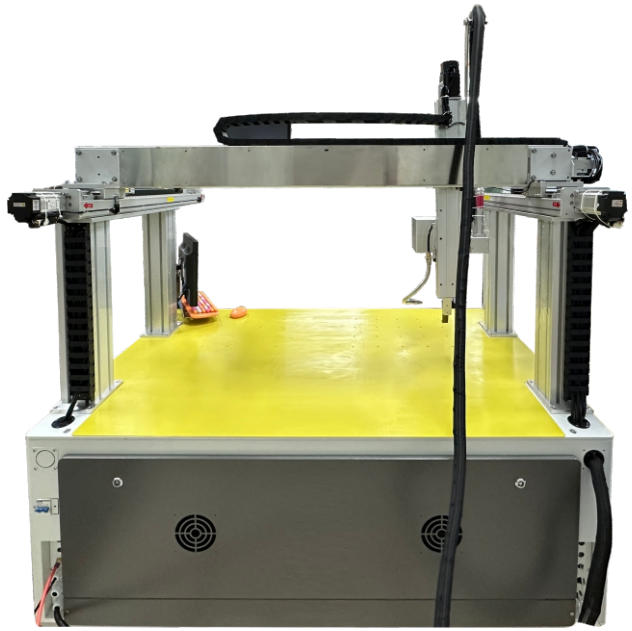
Battery pack of new energy vehicle



Power battery shell nameplate marking

Product Diagram

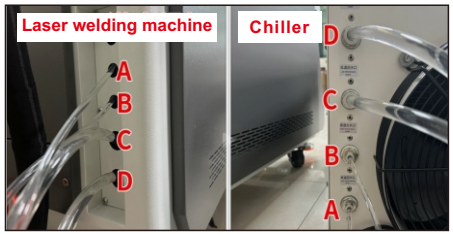




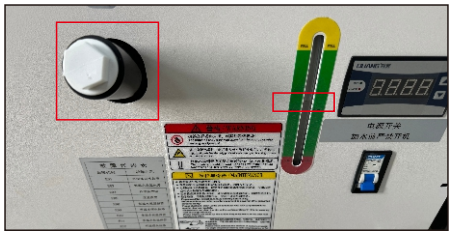
Preparation Before Use



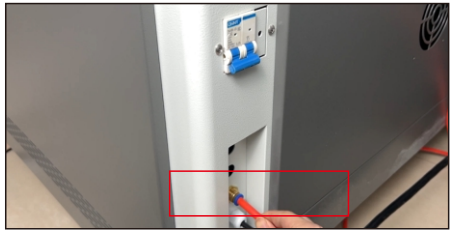
1.Connect the gantry and chiller power harness to the air switch and ensure that the switch can withstand the maximum power of the machine 1500W.



2.Connect the chiller connecting pipe to the back of the laser welding machine in sequence.



3.Remove the chiller cover and add purified water until the water level reaches the green range.



4.Connect the air compressor connecting pipe to the back of the laser welding machine. We provide pressure-down gas and blow-on protective lenses.

Lithium Battery Welding Mode

Start operation



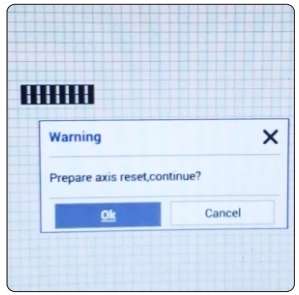
1.Turn on the switch at the back of the chiller.



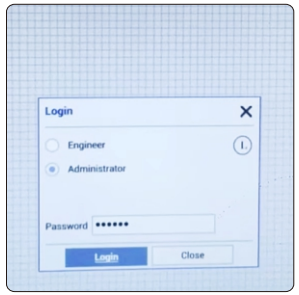
2.Rotate the emergency stop button to turn on the machine.



3.Light up in sequence:
a. Gantry system button
b.Laser system button
c.Valve control button
(Won't light up)



4.Click "OK" to axis reset .



5.Click "Login" and choose "Administrator".(Password default:"111111".)



6.Remove the lens protective cover.

Locator usage:



1.Rotate the "Emergency Stop Switch" to unlock the positioner.



2.Turn the knob to X and turn the handwheel to control the gantry move left and right.(Clockwise left, Counterclockwise right)



3.Turn the knob to Y and turn the handwheel to control the gantry move front and back. (Clockwise front , Counterclockwise back)



4.Turn the knob to Z and turn the handwheel to control the gantry move up and down. (Clockwise down, Counterclockwise up)

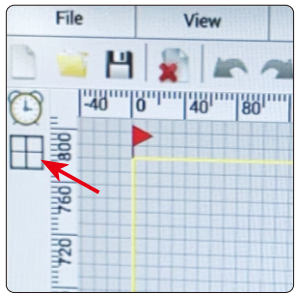


5.Gantry movement speed adjustment knob is on the right: there are three speed adjustments.

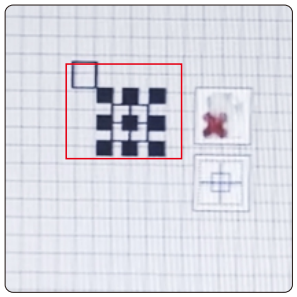


6.Press the "Enable Switch" button on the left side after adjusting the position.

Single welding settings:



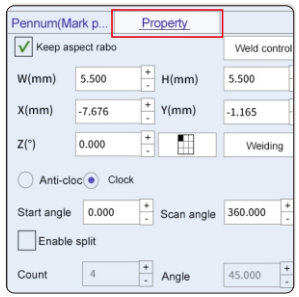
1.Add a new len weld group.



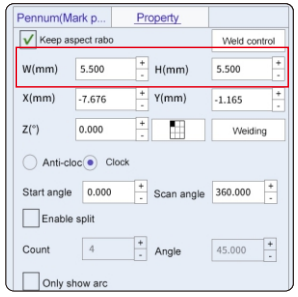
2.Double-click the len weld group to enter the "Len platform ".



3.Choose the path、graphic and text for laser welding of the left of the page.



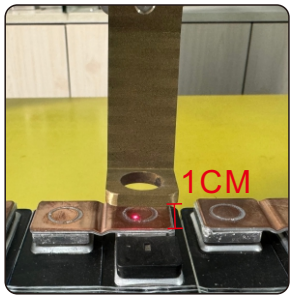
4.Draw the shape that needs to be welded, and left-click button to select the shape. Click " Property " on the right.



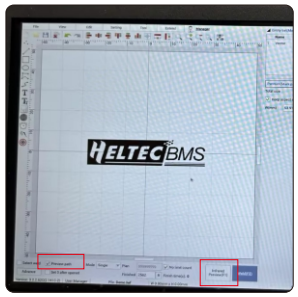
5.Set the graphic size .



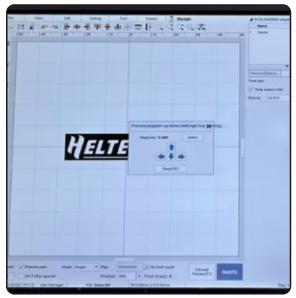
6.Use the locator handwheel to move the laser welding head to the welding position.



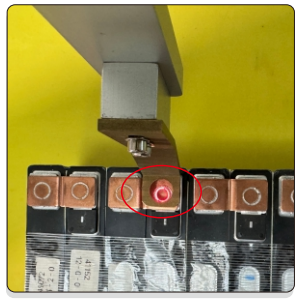
7.The distance between the laser welding head limiter and the welded object should be kept at 1cm.



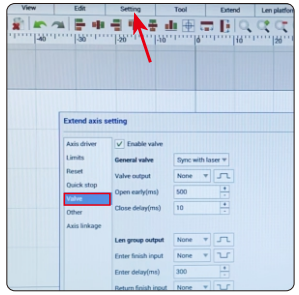
8.Tick "Preview path" below and click "Infrared Preview".



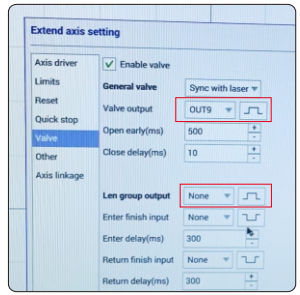
9.Adjust the red light path according to the size of the graphic.



10.Make sure the red light position is on the welded object and is not blocked by the limiter.



11.Click "Setting——Extend axis config ——Valve".



12.Valve output : choose "OUT9" Len group output: choose "None"



13.Set the welding parameter in "PenNum/Mark parameter) ".(Please refer to the recommended parameter setting table on the following page.)

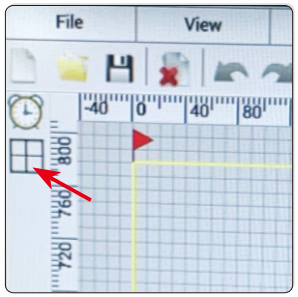


14.Press the yellow button to allow laser emission after confirming the red light position and welding parameters.

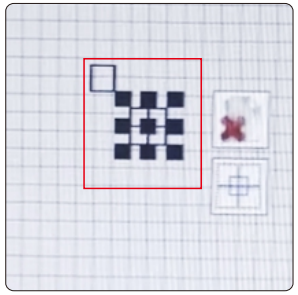


15.Press the foot pedal switch, and the machine starts to emit laser for welding.

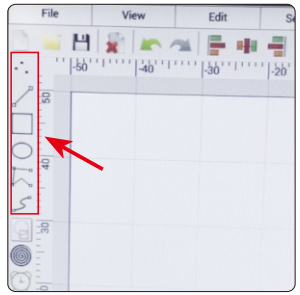
Batch welding settings:



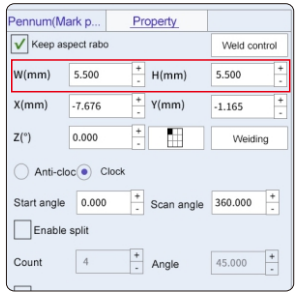
1.Add a new len weld group.



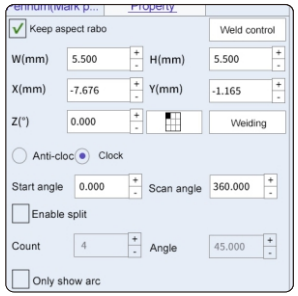
2.Double-click the len weld group to enter the "Len platform".



3.Choose the path、graphic and text for laser welding of the left page.



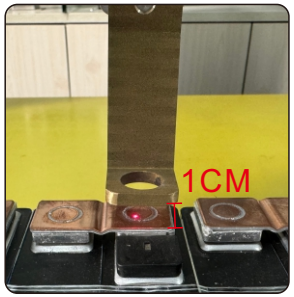
4.Draw the welded shape , and left-click to select the shape. Click " Property " on the right.



5.Set the graphic size in “Property ” .



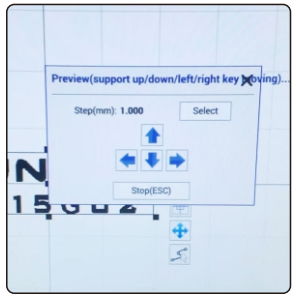
6.Use the locator handwheel to move the laser welding head to the welding position.



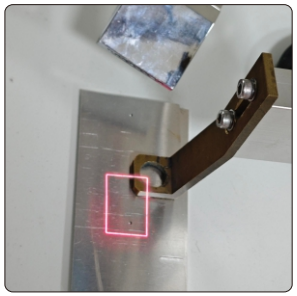
7.The distance between the laser welding head limiter and the welded object should be kept at 1cm.



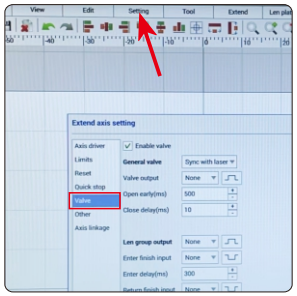
8.Tick "Preview path" below and click "Infrared Preview" .



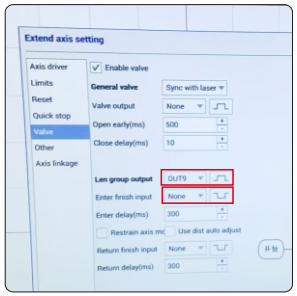
9.Adjust the red light path according to the size of the graphic.



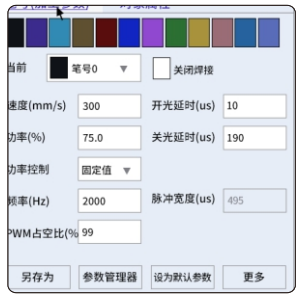
10.Make sure the red light position is on the welded object and is not blocked by the limiter.



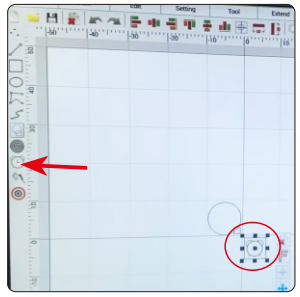
11.Click "Setting——Extend axis config ——Valve".



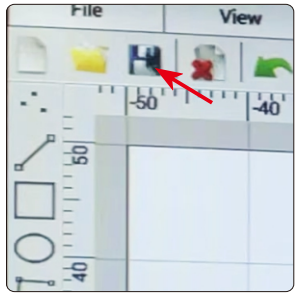
12.Valve output : choose "None" Len group output: choose "OUT9"



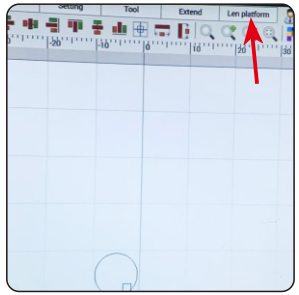
13.Set the welding parameter in "PenNum、Mark parameter) ".(Please refer to the recommended parameter setting table on the following page.)



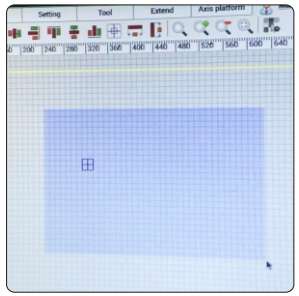
14.Click “Delayer” and add it on the page.



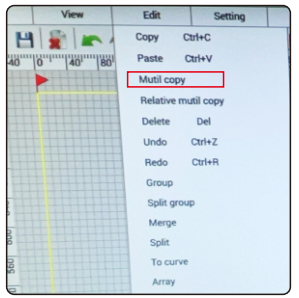
15.Click "Saved" in the upper left corner.



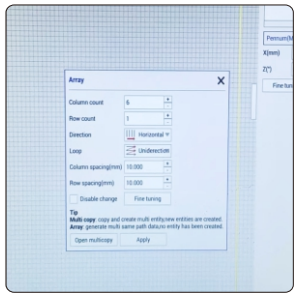
16.Switch to the axis platform.



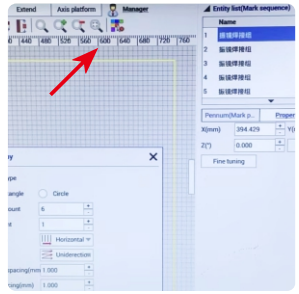
17.Left-click to select the len weld group.



18.Click "Edit——Mutil copy".



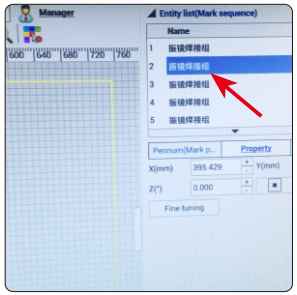
19.Edit the number of welded points in "Column count" and click "Apply". (Assuming 6 points need to be welded, enter 6.)



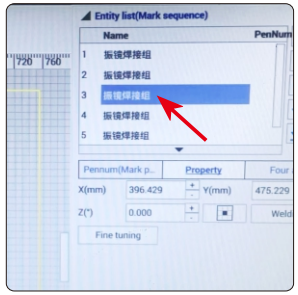
20.Click the first len weld group on the right "Entity list".



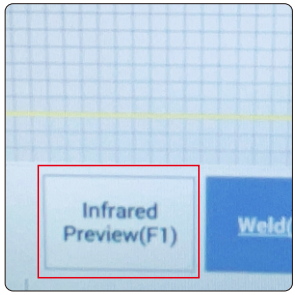
21.Press the "Enable Switch" button of the locator on the left side.(In step 6, the first welding position is adjusted alignly. If it is not aligned, you need to align it and press the button.)



22.Click the second len weld group,use the locator handwheel to move the laser welding head to the second welding position and press the "Enable Switch" .



23.Click the third len weld group and repeat the previous step until all len weld groups are positioned.



24.Click "Infrared Preview" and the gantry will automatically simulate an automatic welding process, and you can observe whether the positioning is accurate.



25.Press the yellow button to allow laser emission after confirming the red light position and welding parameters.



26.Press the foot pedal switch, and the machine starts to emit laser for welding.



27.Please wear goggles during the welding process and do not look directly at the laser with naked eyes.

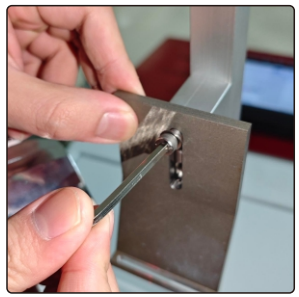
Replace the welding height limit device



1.If you need to weld soft pack batteries, you can replace the professional head for welding soft pack batteries.

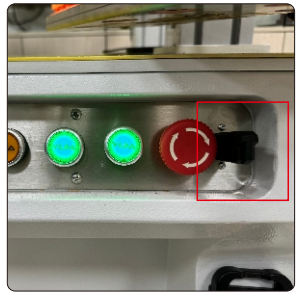


2.Use the No. 4 hexagonal wrench to remove the original height limit device.

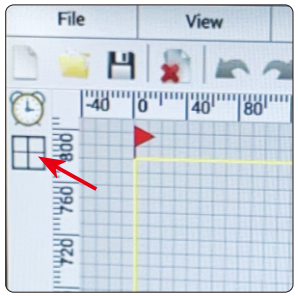


3.When assembling, make sure the top of the welding head is flush to avoid problems with too high/low focal length.

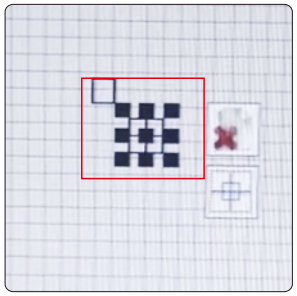
Pattern Marking Operation



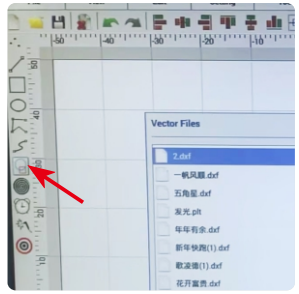
1.Insert the USB flash drive to import DXF format pictures for marking.



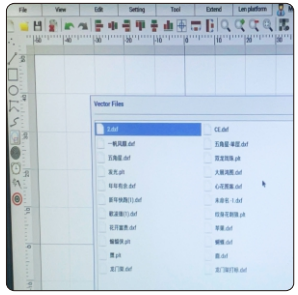
2.Add a new len weld group.



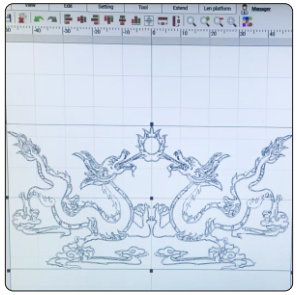
3.Double-click the len weld group to enter the the "Len platform".



4.Click on the "Vector files" on the left side of the page.



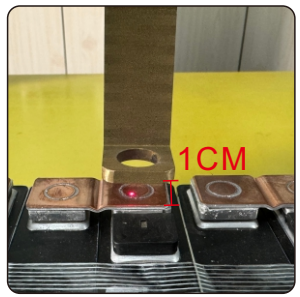
5.Import the vector files in the USB flash drive, or export the images in the laser welding machine system to the USB flash drive.



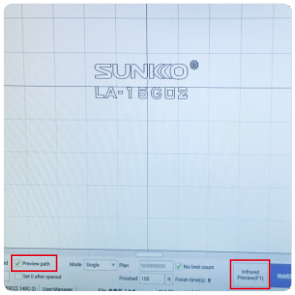
6.Adjust the size of the vector image files so that the welding range is within the white grid range.



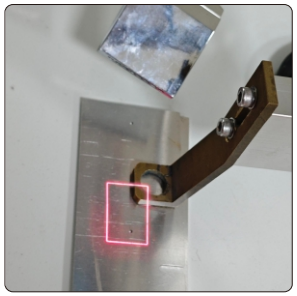
7.Use the locator handwheel to move the laser welding head to the first welding position.



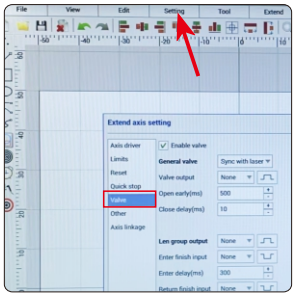
8.The distance between the laser welding head limiter and the welded object should be kept at 1cm.



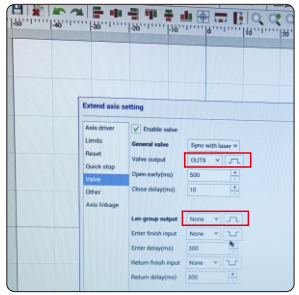
9.Don't tick "Preview path" but click "Infrared Preview" ,It will display the welding range and position.



10.Move the red light to the appropriate position by clicking the direction key. (avoid scanning the red light on the limiter).



11.Click "Setting—Extend axis config —Valve".



12.Valve output : choose "OUT9" Len group output: choose "None"



13.Adjust the power ,speed and frequency. (Recommended power for marking stainless steel : 10 , Speed: 800-1000 ,Frequency: 5000.)



14.You can choose whether to fill the text during welding. (If you choose to fill, the power needs to be adjusted smaller)



15.Fill VS Non-fill



16.Press the yellow button to allow laser emission and the handle switch button, the machine starts to emit laser for welding.

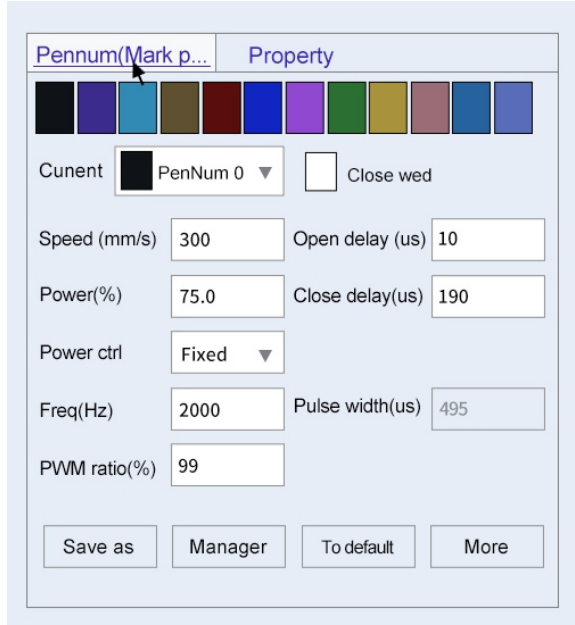


17.If batch marking is required, please refer to the previous page for batch welding operations. Set up multiple galvanometer welding groups



18.Please wear goggles during the welding process and do not look directly at the laser with naked eyes.

Introduction To Parameter Setting Page



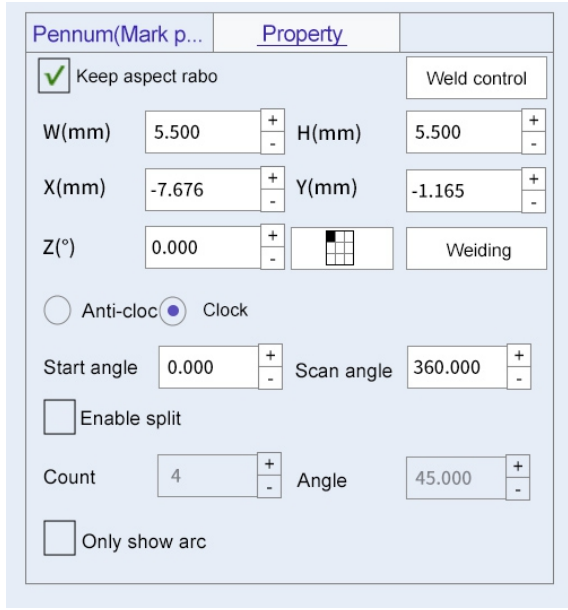
PenNum(Mark parameter)

1.Speed(mm/s):The speed at which the laser completes graphics; the slower the speed, the higher the output and the higher the heat .
(Recommended setting is 100.)

2.Power(%): Setting the laser power
(1% -100% adjustable)

3.Freq(Hz):The lower the frequency, the higher the laser penetration.
(Recommended setting is 2000.)

4.PWM ratio(%):Laser waveform laser duty
(Normally recommended setting is 99.)



Property

1.H(mm) / W(mm):set the laser graphics size.

2.Weld control :Choose whether to use sprial.
(Tick "Enable"to use sprial / Don't tick means disable the use of sprial.)

3.Line type:Select the spiral shape during welding .
(No setting required if disabled.)

4.Spiral dist(mm)/Spiral diameter(mm): the size of spiral.
(No setting required if disabled.)

Welding Parameter :

Copper aluminum composite sheet → aluminum			
Thickness(mm)	**Power(W)**	**Speed(mm/s)**	**Frequency(Hz)**
1	40%	100	1000
1.5	55%	100	1000
2	75%	100	1000
2.5	90%	100	1000

Pure aluminum→ aluminum			
Thickness(mm)	**Power(W)**	**Speed(mm/s)**	**Frequency(Hz)**
1	40%	100	1000
1.5	55%	100	1000
2	75%	100	1000
2.5	90%	100	1000

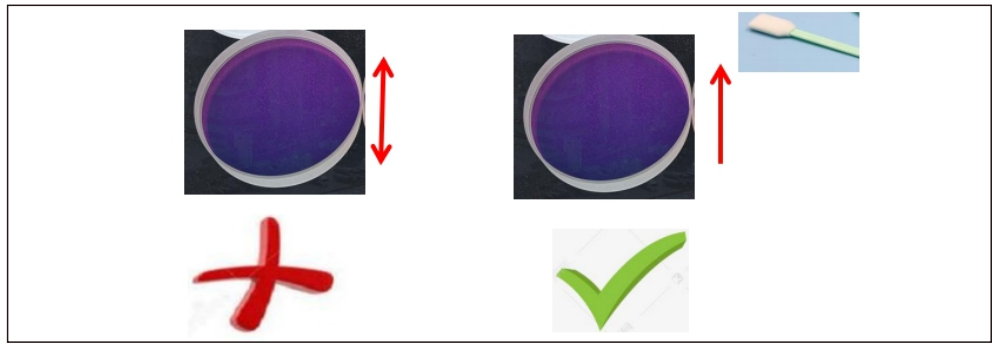
Copper→ Copper			
Thickness(mm)	**Power(W)**	**Speed(mm/s)**	**Frequency(Hz)**
1	50%	100	2000
1.5	85%	100	2000

Precautions

1.To ensure personal safety, please wear special fiber laser protective glasses before operation.

2. Keep the product clean to prevent coolant, condensation or other foreign matter from intruding into the machine, otherwise it will cause functional contamination and functional impact on related parts.

3.When cleaning optical lenses, you need to prepare dust-free gloves or finger cots, dust-free cotton swabs, isopropyl alcohol, and filled with dry and pure compressed air.Spray isopropyl alcohol onto a dust free swab with the lenses facing the eyes.Gently hold the side edge of the lens with your left thumb and index finger, hold a dust-free wiping cotton swab in your right hand, and gently wipe the front and back of the lens in one direction from bottom to top or from left to right.(Do not wipe back and forth to avoid secondary contamination of the lenses.)And blow the surface of the lenses with filling, dry and pure compressed air to confirm that there is no foreign matter on the surface of the lens after cleaning. As shown below.



Packing List



Gantry Laser Welding Machine*1



Chiller *1



Wireless mouse and keyboard set (random style)



Protective lens*20



Communication lines



Welding tools for soft pack batteries*1



Communication lines



Laser protective glasses*1 pair