HT-LS02

Lithium Battery-Specific Handheld Galvanometer Laser Welding Machine

User Manual



Thank you for choosing HELTEC ENERGY series products. They will bring you convenient and efficient user experience. To fully exert the excellent performance of the product andfacilitate your smooth operation, this manual is specially compiled. Please keep it properly for future reference.

Due to the continuous improvement of products, our company reserves the right to modify the manual without prior notice. Thank you for your understanding!

Product Overview

The LA-15L02 lithium battery-specific handheld galvanometer laser welding machine adopts handheld welding with a built-in dual-axis galvanometer device, enabling spot welding of various materials such as aluminum, nickel, and copper on lithium battery electrodes. Precise and reliable welding reduces the contact resistance of lithium batteries during assembly and improves the output and performance of lithium battery packs. The 8-meter-long cable allows the machine to weld freely when facing large-size battery packs of new energy vehicles, lowering the requirements for operating equipment.

Product Features

❶ The welding torch is equipped with a built-in dual-axis galvanometer device to achieve precise positioning of micro welding points, ensuring welding quality and accuracy.

❷ High-speed oscillating lenses guide the laser for welding, with a faster welding speed than traditional methods, improving production efficiency.

❸ Multi-shape welding is realized through program control, flexibly adapting to various complex shape welding requirements.

❹ Equipped with software with graphic processing functions, making operation simpler and reducing skill requirements for operators.

❺ Adopting advanced control systems and high-quality lenses, the galvanometer laser welding machine has good stability and can work continuously for a long time while maintaining stable welding quality.

❻ Suitable for simple welding and cutting of various metal materials.

❼ According to different welding materials, the output energy waveform can be set and waveform control can be performed to achieve more ideal welding results.

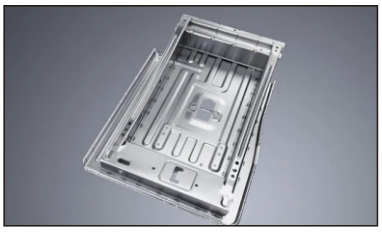
❽ Multiple welding copper nozzles can be switched, making it easy to weld special-shaped materials.

Product Parameters

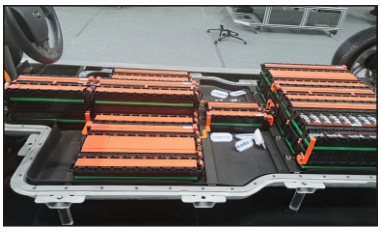
Product Model	LA-15L02	Output Power	1500W/2000W/3000W
Product Name	Handheld Galvanometer Laser Welding Machine		
Power Supply Voltage	AC 220V(1500W/2000W) AC 380V(≥3000W)		
Power Consumption	≤6KW (for 1500W model)	Laser Wavelength	1070±10nm
Cooling Method	Water Cooling	Welding Torch Weight	1.5KG
Product Size	90*75*41.5cm	Overall Weight	133KG

Product Application Scope

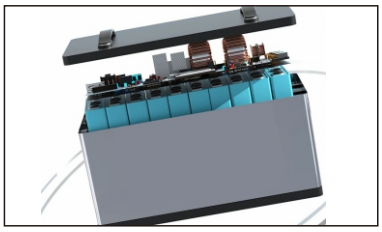
Applicable to major new energy vehicle maintenance companies, lithium battery distributors, and battery pack manufacturers.



Aluminum profile shell materials for new energy vehicles



New energy vehicle battery packs.



Power battery housing

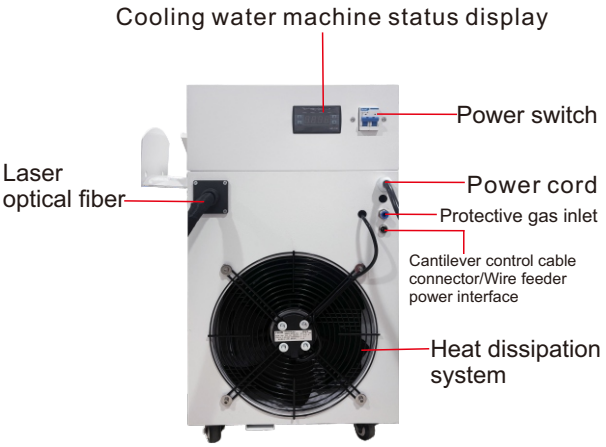
product diagram



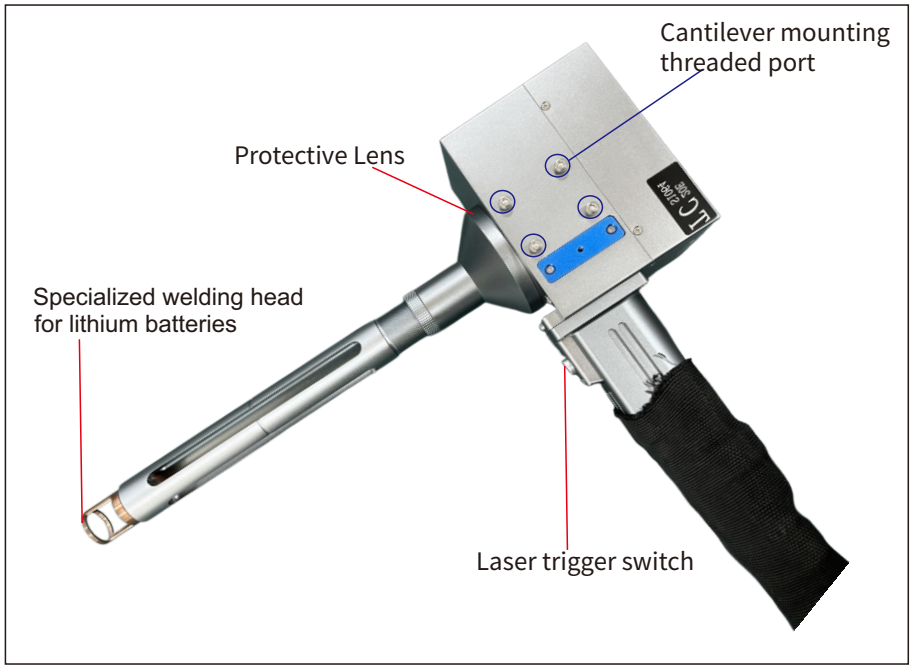
Handheld Mode



Cantilever Mode



Gun barrel





Lithium Battery Welding Mode

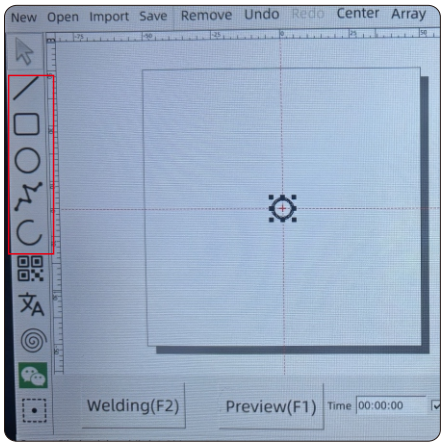
Basic operation and settings



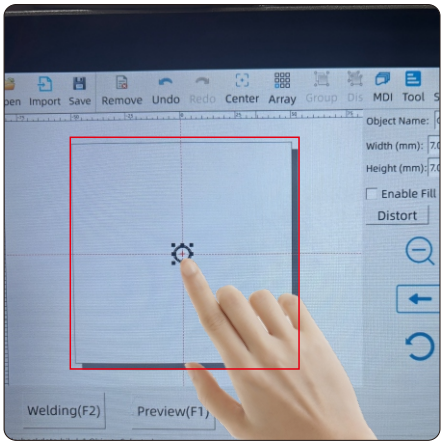
1.Use the lithium battery-specific welding head.(The focal length of the welding head is pre-adjusted at the factory; no adjustment Is needed during use. The factory-set focal length is marked on the welding torch.)



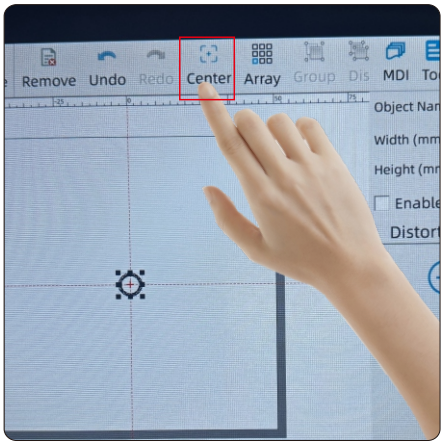
2.Power on after power is supplied, rotate the emergency stop button and press the “System Start" button.



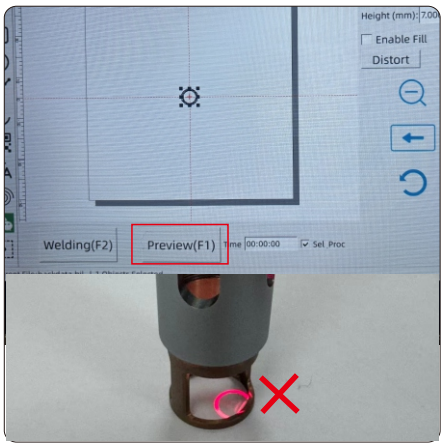
3.Select the required welding pattern. for energy storage welding mode, you can choose circular or square.



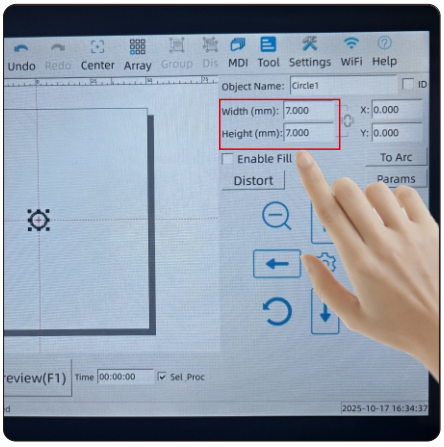
4.After selecting the pattern, click the blank area of the canvas to display the pattern.



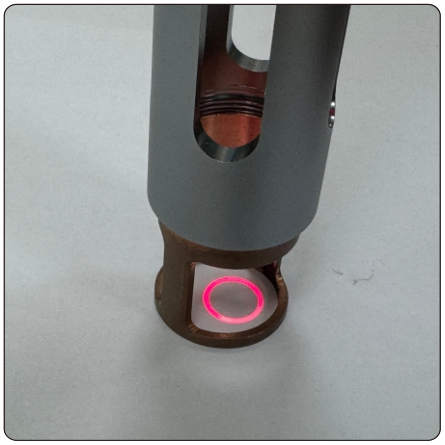
5.Select the pattern and click "Center" in the top menu bar of the screen.



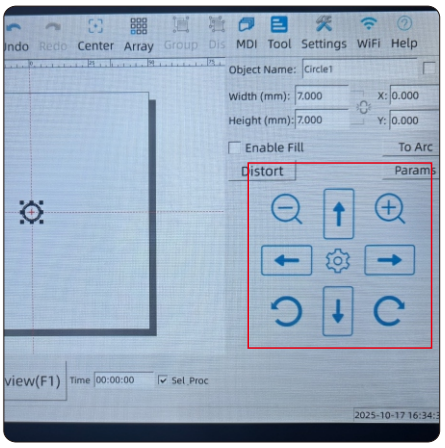
6.Tap the "Red Light" function on the screen.observe the emitted red light—it indicatesthe laser welding path. Ensure there are no obstacles along the path.



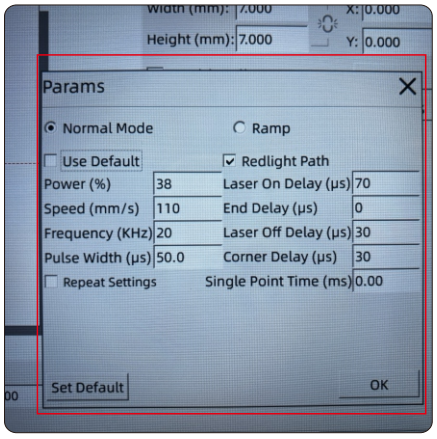
7.Adjust the pattern size according to the actual size of the red light output.



8.When welding with the handheld torch, the pattern size should not exceed 8mm; otherwise, the laser output may damage the torch.



9.Adjust the pattern position through the "↑↓←→" buttons on the screen according to the actual position of the red light output.



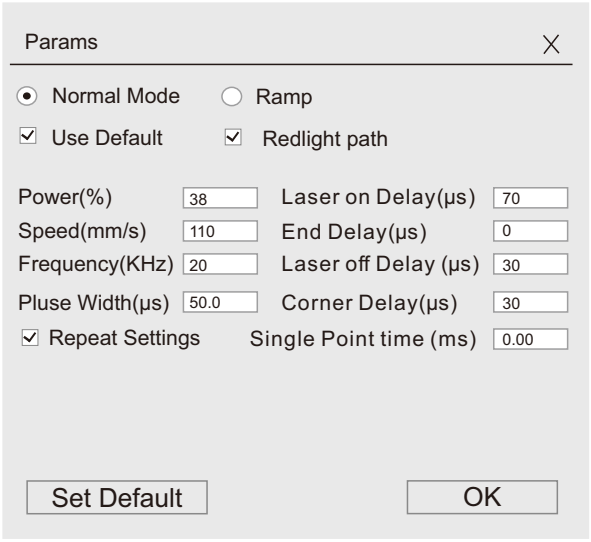
10.Adjust the laser output parameters according to the thickness of the welding connecting piece. (Refer to the recommended parameters below.)



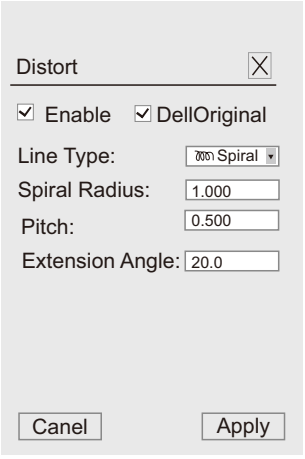
11.After confirming the laser parameters and red light position, press the "Energy Output" button to prepare for welding.



12.Click the torch button to emit the laser.



1.Speed: The speed at which the laser completes the pattern; the slower the speed, the higher the heat input .(Suggested setting: 120; do not set it lower than 100)
2.Power: Percentage setting of laser power output. (Adjustable range: 1~100)
3.Red Light Path: Check the box to display the laser welding pattern path.The remaining parameters are factory default settings and do not require adjustment.



When welding lithium batteries, the "Differentiation Mode" (or "Specialized Mode") normally needs to be enabled. (For special batteries or materials, please consult technical personnel to adjust the "Differentiation Mode".)
1.Wire Type: For square battery welding, a spiral wire is generally selected.
2.Spiral Radius: The dimensional radius of the spiral loops
3.Pitch: The distance between adjacent spiral loops

Welding parameters

Copper-Aluminum Composite Sheet → Aluminum				
Thickness (mm)	**Power (W)**	**Speed (mm/s)**	**Aberration pattern**	**Aberration Size**
1	**45%**	**120**	**Spiral**	**Pitch: 0.5mm Spiral diameter: 1.2mm**
1.5	**65%**	**120**		
2	**85%**	**120**		

Pure Aluminum Sheet → Aluminum				
Thickness (mm)	**Power (W)**	**Speed (mm/s)**	**Aberration pattern**	**Aberration Size**
1	**45%**	**120**	**Spiral**	**Pitch: 0.5mm Spiral diameter: 1.2mm**
1.5	**65%**	**120**		
2	**85%**	**120**		

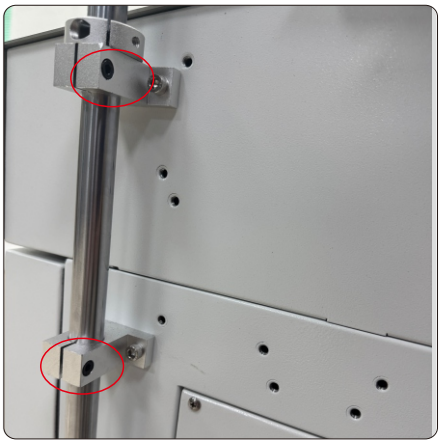
Copper Sheet → Copper				
Thickness (mm)	Power (W)	Speed (mm/s)	Aberration pattern	Aberration Size
1	60%	120	Spiral	Pitch: 0.5mm Spiral diameter: 1.2mm

Cantilever Welding Mode

Cantilever Assembly Tutorial



1.Be careful when cutting the cantilever fixed cable ties to prevent the cantilever from popping open!



2.Raise the column on the side of the machine to an appropriate height and fasten the two side screws.



3.Secure the limit buckle on the column.



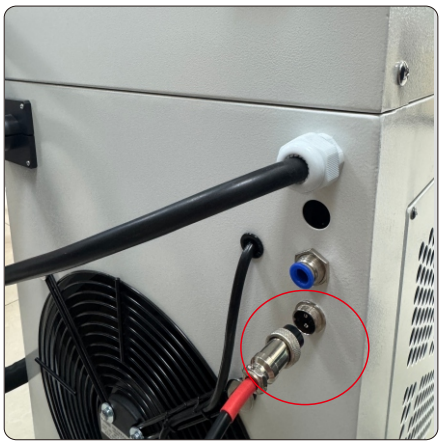
4.Install the cantilever onto the column.



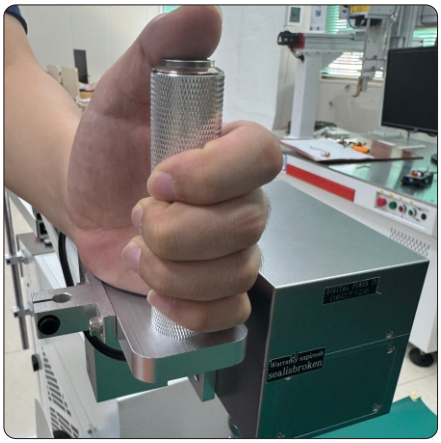
5.Remove the four side screws of the handheld torch.



6.Align the four screw holes on the side with the cantilever bracket and tighten the screws.



7.Connect the cantilever control cable to the interface on the back of the machine.



8.After assembly, the laser output can be triggered by the cantilever button.



9.Do not press the cantilever accessories below the maximum height of the machine.

Precautions

1.For personal safety, wear specialized fiber laser protective goggles before operation.
2.Keep the product clean to prevent coolant, condensed water, or other foreign objects from entering the cavity, which may contaminate related parts and affect their functionality.
3.Before emitting laser, ensure a complete red light path is visible to avoid burning the galvanometer lens or motor due to excessive red light size during laser output.



4.To clean optical lenses, prepare dust-free gloves or finger cots, dust-free cleaning swabs, isopropyl alcohol, and canned dry and pure compressed air. Spray isopropyl alcohol onto the dust-free cleaning swab, hold the lens by its side edges gently with the thumb and index finger of the left hand, and wipe the lens gently in a single direction (from bottom to top or left to right) with the swab in the right hand. Then blow the lens with canned dry and pure compressed air. (Do not wipe back and forth to avoid secondary contamination of the lens.)

