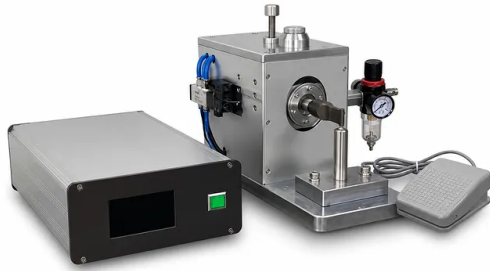


Ultrasonic Metal Welding Machine Battery Cap Aluminum Strip Single Spot Welding

Item Number: YZ05



Introduction

Ultrasonic metal welding machine for battery cap and aluminum strip single spot welding delivers 40kHz precision bonding fast cycle control adjustable pressure and quality monitoring for reliable battery manufacturing research and advanced materials assembly workflows.

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Application	Description	Key Benefit
Battery cap and aluminum tab assembly	Single-point welding of a single-layer 0.1 mm aluminum tab to a nickel-plated steel battery-cap substrate.	Produces a defined 3 mm x 3 mm weld point for battery cap joining operations.
Lithium battery cell manufacturing	Uses ultrasonic mechanical energy to join conductive metal interfaces during cap-related assembly.	Fast specified welding time of up to 0.4 S per operation supports efficient process flow.
Battery research and development	Evaluates pressure, time, energy, power, and amplitude conditions for battery tab-to-cap material combinations.	Adjustable pressure and time provide controlled process-development variables.
Pilot-line battery assembly	Supports pre-production verification of weld appearance, tensile strength, and process alarm limits.	Energy, time, and power quality alarms help establish repeatable operating windows.
Advanced materials joining studies	Investigates ultrasonic bonding behavior at metal-sheet interfaces where molecular interpenetration is required.	Automatic frequency tracking and constant-amplitude capability support stable test conditions.
Battery quality-control testing	Verifies weld integrity through specified visual requirements and tensile-strength assessment.	The stated weld tensile strength of at least 25 N provides a measurable acceptance reference.

Parameter	Specification
Site-facing identifier	YZ05
Equipment type	Ultrasonic metal welding system
Main components	Ultrasonic generator, transducer, tooling, pneumatic components, frame
Operating principle	The transducer converts ultrasonic high-power oscillation signals into mechanical energy of the corresponding frequency. Applied at the interface of metal sheets, the energy generates instantaneous heat and activates particles in the metal lattice, allowing molecules at the joined interface to interpenetrate and bond.
Ultrasonic frequency	40KHz
Ultrasonic power	800W
Air pressure / air consumption requirement	$\geq 0.6\text{MPa}$ 80L/min
General welding time	Within 0.2S
Supply voltage	220V/50Hz
System weight	45kg
Generator dimensions (W x D x H)	260mm x480mm x168mm

Parameter	Specification
Generator weight	15~20KG
Welding head dimensions (L x W x H)	190mm x460mm x350mm
Welding head weight	30~35KG
Workbench dimensions (L x W x H)	900mm x800mm x (720~820 adjustable height)mm
Tab material	Aluminum sheet
Tab thickness	0.1mm
Cap substrate material	Nickel-plated steel
Cap substrate thickness	0.6mm (subject to the customer's actual material)
Tab welding method	Single-layer 0.1mm aluminum tab welding
Tab welding capability	>0.1mm
Weld point length	3mm
Weld point width	3mm
Welding time per operation	Within 0.4S/time
Weld-point quantity	Single point 3*3mm
Welding pressure	0MPa~1MPa, adjustable
Time control	0~60S, adjustable
Welding head service life	>=120,000 cycles
Welding head material	Imported high-speed steel
Weld-point height	0.08mm
Weld-point / pattern distribution	Mesh pattern / straight pattern
Height from welding surface to welding head	>6mm
Welding head length	>=65mm
Usable welding faces	2
Welding head installation direction	Longitudinal
Amplitude adjustment range	Half cycle 3~10um
Frequency difference between transducers	<=400Hz
Impedance difference between transducers	<=40hm
Capacitance difference between transducers	<=400PF
Insulation resistance between transducer and housing	>=30MOhm
Transducer power capacity	Output power >=800W
Generator frequency-control method	Automatic frequency tracking
Constant-amplitude function	Switching power supply constant voltage and constant current (constant amplitude)
Amplitude adjustment	Continuously adjustable
Circuit technology	Intelligent digital circuit with advanced CPU central processing system; energy mode, power mode, time mode, automatic frequency tracking, and upper/lower quality-control limit alarm functions
Weld appearance requirement	No false welding, burn-through, or missed connection; firm welding; full and clear weld points; after destructive tearing, 80% of foil remains on the tab

Parameter	Specification
Weld tensile strength	>=25N

Product pass rate >=99.8% (under qualified material conditions)