



INDUSTRIAL EQUIPMENTS PVT. LTD.

CBS10M

Battery Tab Spot Welder – Pedal Type

10 kVA | Dual-pulse energy welding | 0.02 – 0.3 mm nickel strip | Mechanical foot-pedal drive



USER MANUAL

Read this manual carefully before installing and operating the machine. Keep it for future reference.

Cruxweld Industrial Equipments Pvt. Ltd.

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Overview

The Cruxweld **CBS10M** foot-operated spot welding machine is a precision pulse spot welder designed for the production and assembly of high-quality battery packs (nickel-cadmium, nickel-metal hydride and lithium-ion cells). It is controlled by a single-chip microcomputer, which gives stable and repeatable welding energy. Its main characteristics are:

1. Attractive and lightweight design with a sturdy stand and a large worktable.
2. Clean, uniform weld spots with minimal sparks and no blackening; stable welding current and uniform weld size.
3. Overcomes the low-voltage and leakage problems that can follow poor spot welding of lithium-ion cells, making it an ideal machine for battery production and assembly.
4. All parameters are set digitally, so adjustment is intuitive and accurate.
5. Foot-pedal operation leaves both hands free for accurate positioning; ideal for welding small-capacity cells with a high pass rate.
6. The pressure of the two welding electrodes can be adjusted independently and conveniently, ensuring stable and reliable welding pressure.
7. The welding trigger uses a photoelectric switch inside the welding head, eliminating the wear and replacement problems of mechanical contact switches.
8. Dual-pulse welding: a pre-pulse cleans the contact surface and the main pulse makes the weld, giving a firmer joint.

Main technical parameters

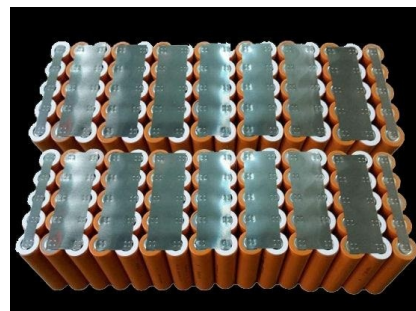
Model	CBS10M
Output power	10 kVA
Working voltage	AC 230 V $\pm$ 10 %
Frequency	50/60 Hz
Control mode	Pedal type
Drive style	Mechanical (foot pedal and pull rod)
Welding method	Double pulse
Welding current	00 – 99 % adjustable
Maximum output current	3500 A
Electrode pressure	0.5 – 4 kgf

Welding thickness	0.02 – 0.3 mm
Welding material	Pure nickel or nickel alloy strip
Electrode diameter	Ø 3 mm
Electrode travel length	15 mm
Operation temperature	–20 to 48 °C
Workbench size	800 L x 580 W mm
Dimensions	800 x 580 x 1100 mm
Weight	58 kg
Compliance	CE
Power connection	Earthed 230 V socket, 16 A

Scope of application

Combination welding of laptop and power-tool battery packs (18650 and other cylindrical lithium cells); welding of nickel and nickel-aluminium composite strip to lithium-ion cell terminals; welding of protection plates and tabs; combination welding of nickel-metal hydride and nickel-cadmium cells; both mobile-phone battery and battery-pack welding.

Not suitable for welding copper, aluminium or steel sheet thicker than 0.3 mm.



18650 battery pack with welded nickel strip

Standard scope of supply

No.	Item	Qty	No.	Item	Qty
1	CBS10M welding head with control unit	1	4	Welding tips Ø3 mm (fitted) + spare pair	1 + 1
2	Stand with worktable 800 x 580 mm, foot pedal and pull rod	1	5	Power cable with plug, spare fuses	1 set
3	Hexagon wrench set and small file	1 set	6	User manual, certificate of conformity and warranty card	1

Check the delivery against the packing list on receipt and report any damage to the carrier and to Cruxweld within 3 days.

Safety

▲ WARNING - read before use

- Connect the machine only to an earthed 230 V socket. Switch off and unplug before opening the housing, changing electrodes or carrying out maintenance.
- Lithium cells can short-circuit, overheat and catch fire. Never let the electrodes or a nickel strip bridge the two poles of a cell. Keep cells away from the electrodes except at the moment of welding. Keep a Class D or CO₂ extinguisher at hand.
- Wear safety glasses; sparks and small hot particles may be thrown out. Keep flammable material away from the worktable.
- Keep fingers away from the electrode tips when the pedal is pressed. Only one person operates the pedal.
- Persons with pacemakers must not operate or stand next to the machine while welding.

Controls and indicators



Welding head panel: pressure adjustment knobs (top), current regulation switches, pilot lamp, power switch and the two electrode holders

Relationship between welding current and welding time

The welding current is set by the user. The welding time is calculated automatically by the program from the set current, so only one value has to be set. Generally the welding current is kept below 60 and the welding time follows automatically.

Control / indicator	Function
Power switch	Switches the machine on and off. The switch is illuminated when the machine is on.
Pilot lamp (operation indicator)	Flashes continuously in normal stand-by; stays on during the weld. If it does not light, or lights without flashing, switch the machine off and on again.
Current regulation	Two digit switches (tens and units) set the welding current in the range 00 – 99. In normal welding mode press the '+' or '-' side of the switch to set the required value. A setting around 38 is a good starting point for 0.1 mm nickel strip.
Welding switch	Two photoelectric switches inside the welding head, connected in series. When the welding tips press on the workpiece and both switches close, the machine discharges and welds. The weld is therefore triggered by electrode pressure, not by the pedal position.
Welding pressure adjustment knobs	One knob for each electrode. Turn clockwise to increase the pressure and counter-clockwise to decrease it.
Foot pedal	Lowest the welding head through the pull rod. Press smoothly until the electrodes rest on the workpiece and the weld is fired; release to raise the head.

Operation steps

1. **Adjustment of welding tip height:** loosen the welding-tip height adjustment screw with a wrench. Adjust (or replace) the welding tip so that about 20 mm of tip projects below the electrode holder; a tip that projects too far is prone to bending. Tighten the screw.
2. **Adjustment of electrode (welding tip) width:** loosen the welding-tip width adjustment screw with a wrench. Set the two electrodes to the distance required by the weld pattern (typically 2 – 4 mm for 18650 cells). Tighten the screw.
3. **Adjustment of worktable height:** loosen the worktable locking screw with a wrench. Adjust the height so that the distance between the battery to be welded and the welding tips is about 4 mm, then tighten the screw.
4. **Adjustment of welding pressure:** turn the welding-pressure adjustment knobs by hand. Clockwise increases the pressure, counter-clockwise decreases it. Set both electrodes to the same, suitable pressure for the strip thickness (light pressure for thin strip, higher pressure for thick strip).
5. **Adjustment of pedal stroke:** the pedal is connected to the welding head by a pull rod. If the electrodes do not reach the workpiece at the end of the pedal travel, or reach it too early, loosen the rod lock nut, adjust the rod length so that the electrodes touch the workpiece at about two-thirds of the pedal travel, and tighten the lock nut. Check that the head returns fully when the pedal is released.
6. **Power connection:** plug the machine into an earthed 230 V socket rated for the machine (do not use light-duty extension leads). Switch on the power switch. The pilot lamp flashing continuously indicates normal operation. If the lamp does not light, or lights without flashing, switch off and switch on again.
7. **Test welding:** place a nickel strip on a test cell or on a scrap piece of the same material. Press the pedal to lower the welding head. When the welding tips press on the workpiece both welding switches close and the discharge weld is made. Adjust the welding current and the welding-tip pressure according to the weld result until the optimum weld is achieved: the strip must not tear off by hand, and the weld spots must show no burn-through or discolouration.
8. **Production:** keep the same settings for the whole batch. Check a sample weld by peeling at the start of every shift and whenever the electrodes have been dressed or replaced.
9. **Electrode care:** to ensure good welding quality the welding tips must be dressed regularly. Use a small fine file to file the end face of each tip flat and smooth, then re-check the tip height and width settings.



Electrode holders with Ø3 mm welding tips

Setting guide (reference values, pure nickel strip)

Strip thickness	Current setting	Electrode pressure	Electrode gap	Result to expect
0.05 mm	20 – 30	0.5 – 1 kgf	2 mm	Two small bright spots, no discolouration
0.10 mm	35 – 45	1 – 2 kgf	2 – 3 mm	Strip tears around the spot when peeled
0.15 mm	45 – 60	2 – 3 kgf	3 mm	Firm weld, slight grey ring acceptable
0.20 – 0.30 mm	60 – 85	3 – 4 kgf	3 – 4 mm	Use two spot pairs per tab; check for burn-through

Values are starting points only. Increase the current in steps of 3 – 5 and test after each change. Too much current or too little pressure causes sparks and burnt strip; too little current gives a weak weld that peels off.

General fault diagnosis

No.	Fault phenomenon	Cause of failure	Elimination method
1	No power indication when switched on	1. Fuse blown. 2. Input power failure.	1. Replace the fuse with one of the same specification. 2. Repair the power line / socket.
2	Power indication present, but the pilot lamp stays on without flashing	1. Control board dislodged or not seated.	1. Switch off; insert the control board fully in the correct direction.
3	Power indication present, no welding spark	1. Pedal not pressed far enough – electrodes not pressing on the workpiece. 2. Welding current set too low. 3. Lower end face of the welding tip too far from the battery. 4. Welding switch wiring disconnected. 5. Photoelectric switch damaged. 6. Pilot lamp not on or flickering, mainly caused by mains interference.	1. Adjust the pedal stroke (step 5) and increase electrode pressure. 2. Increase the welding current value. 3. Adjust the distance between battery and tip end face to about 3 – 4 mm. 4. Re-connect the wire to the welding switch terminals. 5. Replace the photoelectric switch. 6. Switch the power off and on again; use a separate, well-earthed supply.
4	Unstable welding (sometimes good, sometimes bad)	1. Welding tip not tightened. 2. Looseness at a joint in the welding circuit. 3. Connection between control board and thyristor not tight.	1. Tighten all connections. 2. Dress the tips and re-set tip height.
5	Excessive sparking during welding, even burning the battery casing	1. Welding tip pressure too small. 2. Foreign matter on the lower end face of the welding tip. 3. Incorrect welding material (not nickel / nickel alloy).	1. Increase the welding pressure. 2. File the tip end face flat and smooth with a small file. 3. Select suitable welding material; reduce current.

Maintenance

- Switch off and unplug before any maintenance.
- Dress the welding tips daily; replace them when they can no longer be filed to a flat Ø3 mm face.
- Keep the worktable and electrode area free of nickel off-cuts and dust; blow out the welding head with dry air weekly.
- Check the tightness of the electrode holders, the secondary copper connections and the pull-rod lock nut monthly.
- Oil the pedal pivot and pull-rod joints lightly every month.
- Have the electrical system inspected by a qualified technician once a year.

Certificate of Conformity

Product name Battery Tab Spot Welder

Product model CBS10M

Serial number

Production date

Inspector

This product has been inspected and tested and conforms to the Cruxweld specification for the CBS10M.

Warranty Card

Customer

Invoice no. / date

Serial number

Dealer stamp

Warranty as per the sales contract from the date of invoice. Consumables (welding tips, fuses) and damage from misuse, wrong supply voltage or unauthorised repair are excluded. For service contact support@cruxweld.com.



Welded samples - dual-pulse energy welding in milliseconds



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Cruxweld improves its products continuously. The technical and hardware data in this manual may change without notice.