

Using capacitor energy storage for spot welding

What is capacitor discharge resistance welding?

Capacitive discharge resistance welding uses large capacitors to store energy for quick release. Figure 1 shows a typical capacitor discharge curve. Capacitive resistance welders have many advantages. Weld nugget formation takes place during the first few milli-seconds.

What is a capacitive welder?

Capacitive welders deliver repeatable welds even during line voltage fluctuations. Spot welding relies on the principle of metal resistivity to heat and fuse metal. A large current is passed through the work piece. Energy is dissipated due to the metal resistance in the form of heat which melts and fuses weld materials. There are two phases to

What is a capacitive discharge welder?

Capacitive discharge welders allow extremely fast energy release with large peak currents. More of the energy goes into weld formation and less into heating surrounding material. The heat affected zone, where the properties of the metal have been changed from rapid heating and cooling, is localized to a small area around the weld spot.

Does a spot welder need a microcontroller?

This spot welder, unlike many available DIY projects, doesn't need a microcontroller to work: the welding pulse is triggered using relay module and a timing capacitor. Welding current is switched with an old recycled industrial thyristor module. Pulse energy can be adjusted with a potentiometer, which changes the voltage of capacitor bank.

Can supercapacitors be used in a spot welder?

Of course It certainly is possible to use supercapacitors in a spot welder, as I saw some existing designs, but they usually have precise pulse control with MOSFETs and microcontrollers, and these supercaps are treated in similar way as batteries. Regular electrolytic capacitors are easier to use without sophisticated pulse control system.

What are the advantages of a capacitive resistance welder?

Capacitive resistance welders have many advantages. Weld nugget formation takes place during the first few milli-seconds. Capacitive discharge welders allow extremely fast energy release with large peak currents. More of the energy goes into weld formation and less into heating surrounding material.

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The outstanding features of the energy storage spot projection welding machine are short discharge time and large instantaneous current, so the thermal effects such as deformation and discoloration after welding are minimal. The low-power energy storage welding machine is suitable for welding precision parts, and the high-power energy storage ...

To determine the optimal operating mode of the welding machine [9], the energy stored in the capacitors was calculated. The main characteristics of the device depend exactly on this value, such as, for example, welding current, max welding power [10]. Energy stored in capacitors:

Quickly replenishes power, and works continuously without interruption, greatly improving the stability of continuous spot welding. (3) All-metal aluminum shell body, fast heat dissipation, super farad energy storage capacitor, large energy, long life, ...

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