

Sunstone CD200DP

The ideal product for many spot welding applications.

Features

Sunstone spot welders are simple to use with an intuitive and user-friendly interface. Each of the dual pulse, capacitive discharge welders can be adjusted and fine-tuned to match the requirements of countless applications. When combined with Sunstone's line of weld heads or hand attachments, dual pulse, capacitive discharge welders, such as the Sunstone CDDP, perform strong and repeatable welds for high levels of consistency and quality control.

The Sunstone CDDP welders include the following general features and benefits:

- Removes surface inconsistencies and contaminants
- Available with 200, 400, 600, 1000 Ws, and 1100 Ws of energy
- Single or dual pulse operation
- Microprocessor controlled.
- Thermal protection circuit for internal monitoring
- Audible 'Ready' notification
- Adjustable pulse width
- Energy storage adjustable from 9% to 100% capacity
- Up to 600 welds per minute
- 110/220VAC switching power supply
- Simple, user-friendly interface
- Quick energy release for highly conductive metals
- Small heat effected weld zones
- Repeatable energy release independent of line voltage fluctuations
- Extremely fine energy adjustment
- Infinitely adjustable pulse width

The amount of energy to be released by the welder is displayed here in Ws (or Joules).



Applications

Capacitive Discharge (CD) resistance welders have many advantages over other welder types. Operators achieve quick energy release for welding highly conductive metals. The quick energy release is concentrated into a small area, which means more delicate projects, such as welding a battery, will maintain the integrity of the cell's chemistry when using Sunstone's dual pulse CD spot welding technology.

Typically, the Sunstone CDDP welder is a suitable solution for the following types of applications:

- Battery pack welding
- Honeycomb welding
- Aerospace welding
- Automotive welding
- Cross wire welding
- Thermocouple welding
- Electronic component welding
- Copper, aluminum, brass, and steel thin sheet and wire welding
- Miscellaneous resistive welding applications

Whether you are manufacturing battery packs or microscopic assemblies, Sunstone CDDP spot welders are the most effective, precision fine-spot resistance welders on the market.

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What is Capacitive Discharge resistance welding?

What is Capacitive Discharge Resistance Welding? Capacitive discharge resistance welding uses capacitors to store energy for quick release. Capacitive resistance welders, also called capacitive discharge or CD welders, have many advantages over other welder types:

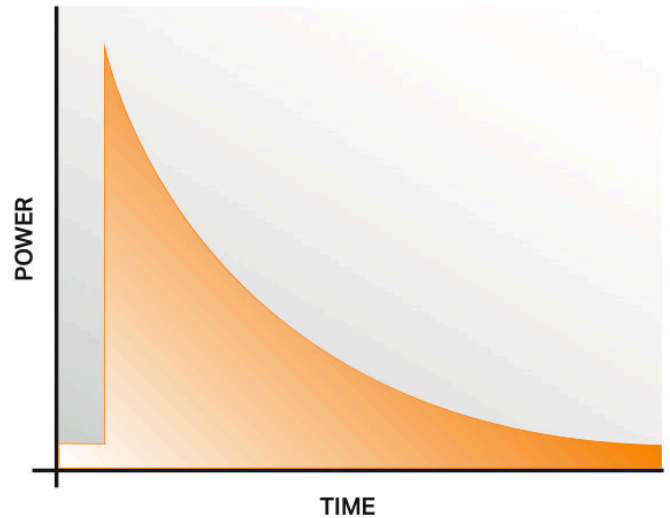
- Quick energy release for welding highly conductive metals;
- Small heat effected weld zones;
- Repeatable energy release independent of line voltage fluctuations;
- Capable of extremely fine energy adjustment.

With a CD welder, weld nugget formation takes place during the first few milliseconds of the welding process. A CD welder provides for an 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 rapid heating and cooling have changed the properties of the metal, is localized to a small area around the weld spot. The quick discharge rate of CD welders also allows electrically and thermally conductive materials to be welded. CD welders deliver repeatable welds even during line voltage fluctuations because weld energy is stored before use.

With energy in a stored state, your Sunstone CDDP welder provides control over how the energy is released. The typical capacitor discharge, as illustrated in Figure 3.1, reflects a classic curve. But with adjustments to your welder's controls, you will be able to control how much energy is released in two pulses. See Chapter 3 on page 10 for more information.

Weld Formation

Spot welding relies on metal resistivity (resistance) to heat and fuse metal. A large current is passed through the work piece metal. Energy is dissipated due to metal resistance in the form of heat which melts and fuses the weld materials. There are two phases to the melting process. The welder must overcome both the material contact resistance and the bulk resistance of the material.



Sample capacitor discharge curve

Tips

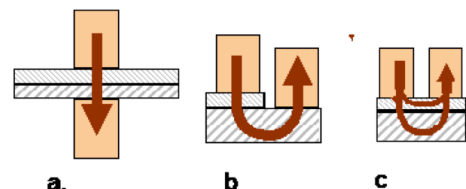
Weld pressure

Several other factors play a part in the contact resistance. The larger the contact resistance the hotter the resultant weld.

On the micro-scale, contact resistance is reduced when more metal bridges or contact points are formed (see Figure 3.2). Using more electrode pressure creates more metal bridges. This results in a lower contact resistance and a cooler weld. Conversely, light electrode pressure results in less metal contact, higher resistance, and a hotter weld. An appropriate amount of pressure should be used to insure good weld strength.

Electrode configurations

Figure 3.3 shows several electrode configurations used in resistance welding. Figure 3.3a is called a direct weld. Current is passed from one electrode through both work pieces and out an opposing electrode. Figure 3.3b shows a step electrode configuration. This configuration is used when there is access to only one side of the work piece and an electrode can be placed on both materials. Figure 3.3c is a series configuration. Electrodes can only be placed on one metal surface from one side. Current is divided between the two parts. This weld configuration requires more weld energy.



Examples of resistance welding electrode configurations.

A: Direct B: Step C: Series

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CDDP Welder Data

	CD200DP	CD400DP	CD600DP	CD1000DP	CD1100DP
Footprint (HXWXD)	26.7X30.5X34.3 cm 10.5X12X13.5 in.	26.7X30.5X34.3 cm 10.5X12X13.5 in.	26.7X30.5X34.3 cm 10.5X12X13.5 in.	28X47.6X35.6 cm 11X18.75X14 in.	28X47.6X35.6 cm 11X18.75X14 in.
Weight	34 lbs./16kg	39 lbs./18kg	39 lbs./18kg	55 lbs./26kg	56 lbs./26kg
Input Voltage	85 - 260 VAC	85 - 260 VAC	85 - 260 VAC	85 - 260 VAC	85 - 260 VAC
Frequency Range	47-63Hz	47-63Hz	47-63Hz	47-63Hz	47-63Hz
Power Factor (typ.)	PF>0.94/230VAC PF>0.99/115VAC	PF>0.94/230VAC PF>0.99/115VAC	PF>0.94/230VAC PF>0.99/115VAC	PF>0.94/230VAC PF>0.99/115VAC	PF>0.94/230VAC PF>0.99/115VAC
AC Current (typ.)	8.5A/115VAC 5A/230VAC	8.5A/115VAC 5A/230VAC	8.5A/115VAC 5A/230VAC	8.5A/115VAC 5A/230VAC	8.5A/115VAC 5A/230VAC
Min/Max Output	5 Ws - 200 Ws	5 Ws - 400 Ws	5 Ws - 600 Ws	5 Ws - 1000 Ws	5 Ws - 1100 Ws
Pulse Width	0.53 - 43.2 ms	0.37 - 48.1 ms	0.29 - 51.1 ms	0.23 - 54.7 ms	0.23 - 55.4 ms
Rise Time (to Max Voltage)	0.2 ms	0.2 ms	0.2 ms	0.2 ms	0.2 ms
Min Pulse Height	2.5 V	2.04 V	2.04 V	2.2 V	2.2 V
Max Pulse Height	15.8 V	18.3 V	22.4 V	20.5 V	21.5 V
Peak Current for 1 AWG 4'	7905	9130	11180	10250	10750
Peak Current for 4 AWG 6'	6081	7023	8600	7885	8269
Peak Current for 8 AWG 6'	3162	3652	4472	4100	4300

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Weld Speeds (welds per minute) with PG2 Copper Wheel or Weld Head (1 AWG @ 1.8 mΩ)

WS	CD200DP	CD400DP	CD1000DP	CD1100DP
10	185	167	149	149
20	150	135	125	125
40	118	105	96	96
100	84	73	68	68
200	62	54	51	51
400	-	38	36	36
600	-	-	29	29

Weld Speeds (welds per minute) with DPHP-MP (4 AWG @ 4.2 mΩ)

WS	CD200DP	CD400DP	CD1000DP	CD1100DP
10	188	182	164	164
20	158	145	134	134
40	122	111	102	102
100	88	76	71	71
200	66	56	51	51
400	-	39	36	36
600	-	-	30	30

Weld Speeds (welds per minute) with DPHP-LP (8 AWG @ 8.8 mΩ)

WS	CD200DP	CD400DP	CD1000DP	CD1100DP
10	215	196	177	177
20	177	170	148	148
40	132	121	117	117
100	93	81	76	76
200	69	60	56	56
400	-	30	39	39
600	-	-	30	30

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