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250DP

125DP

Dual Pulse Series

125DP/250DP Precision CD Welders

Wide Range of Models and Features to Match Application Requirements

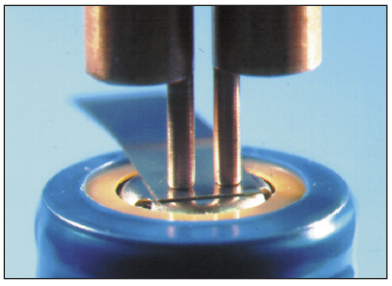
Amada Miyachi's Dual Pulse Series is a full range of capacitive discharge (CD) welding power supplies for precision resistance welding applications. Dual Pulse Series power supplies are microprocessor controlled, store multiple weld schedules, and provide consistent weld energy.

Originally designed as a battery welder, the DP Series welders deliver high peak energy with fast rise times, important when welding highly conductive materials such as copper and brass. The control system provides a highly stable output, independent of line voltage fluctuations, resulting in repeatable energy delivery from weld to weld.

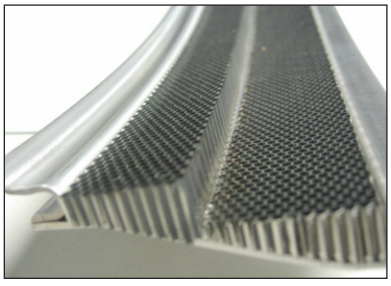
KEY FEATURES

- Dual Pulse function eliminates surface inconsistencies
- Microprocessor controlled
- Optional built-in weld monitor
- Up to 128 programmable weld schedules
- Short weld times minimize part deformation and marking

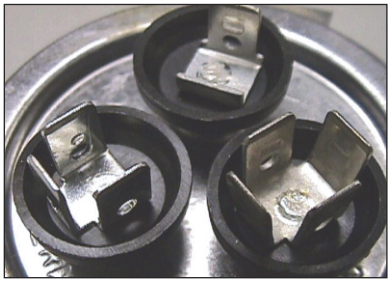
TYPICAL APPLICATION



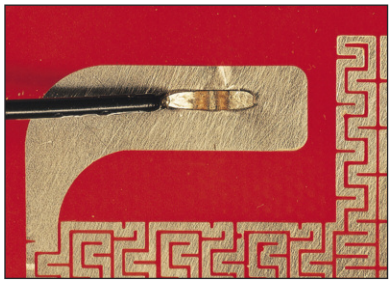
Battery tab



Honeycomb

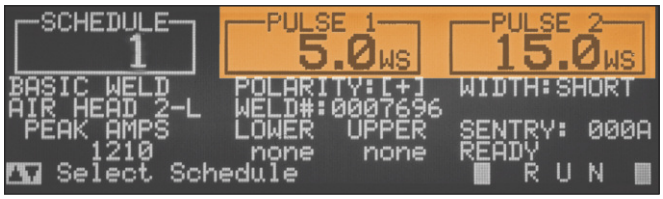


Capacitor

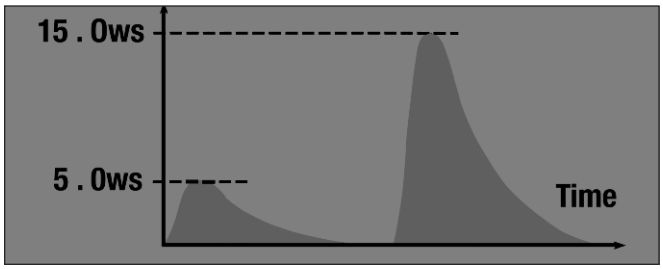


Flat heating element

MIYACHI UNITEK



*Display with Dual Pulse settings in watt-seconds (ws)**



First Pulse
- *Seats Electrodes*
- *Displaces Surface Contamination*

Second Pulse
- *Provides Weld Energy*

DUAL PULSE SERIES TECHNICAL CONTROL AND MONITORING TOOLS

Dual Pulse Function Overcomes Process Variables

Part and electrode surface inconsistencies contribute to poor welds. Plating irregularities or contaminants, including oxides and oils, affect weld reliability. The "Dual Pulse" function, featured in all DP Series power supplies, virtually eliminates these problematic variables.

Programmed in dual pulse mode, the control will fire twice from a single actuation. The first pulse (Figures 1 and 2) is set at a lower energy level relative to the second pulse. It is specifically designed to properly seat the electrodes and prepare the parts by displacing surface contamination without significantly reducing the interface resistance between the parts. The second pulse (Figures 1 and 2), or "weld pulse" joins the base metals. The second pulse energy level is typically set three to four times that of the first. This important feature, pioneered by Amada Miyachi America, produces repeatable and acceptable results in difficult-to-weld situations.

BUILT-IN WELD MONITOR PROVIDES VALIDATION, CONTROL AND SPC DATA

The Dual Pulse Series offers an optional, built-in Weld Sentry® for measuring output voltage and current (not available on the 125DP). The user can view numerical data (Figure 3), graphical data (Figure 4), and use this information to optimize the welding process. User defined alarm limits (Figure 3) are programmed to trigger Output Relays for external device control (Figure 5) such as PLC inputs in automated systems. The built-in Weld Sentry stores up to 20,000 individual weld results, which are used to provide SPC data.

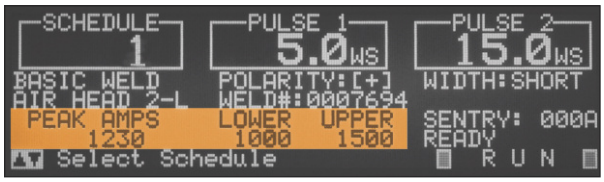


Figure 3 – *Display of peak current with lower and upper limit values**

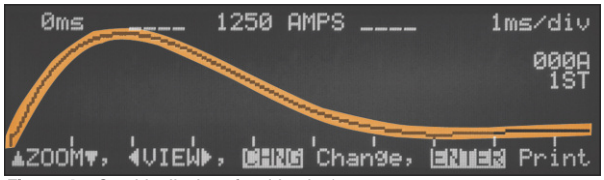


Figure 4 – *Graphic display of weld pulse**

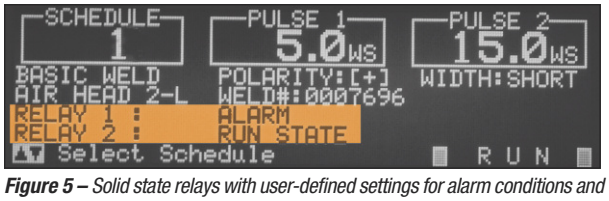


Figure 5 – *Solid state relays with user-defined settings for alarm conditions and timing control**

AUTOMATIC WELD SCHEDULE CHANGES REDUCE DOWN-TIME

Electrode wear is a major cause of process inconsistencies. Electrode tips can "mushroom" when making large quantities of welds, increasing in diameter over time due to impact force and high heat density. The Weld Sentry measures changes in weld voltage and current which can be correlated to electrode wear. Using the correlated measurement data, multiple weld schedules can be developed to compensate for these changes. The power supply can then be programmed to automatically "step" to schedules with higher weld energy at fixed intervals, i.e., 1,998 welds (Figure 6), in order to maintain constant weld heat at the electrode tips. Using this "Chain Schedules" feature reduces time consuming electrode maintenance.

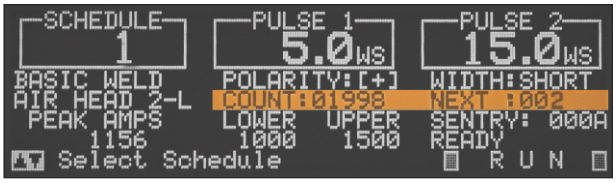
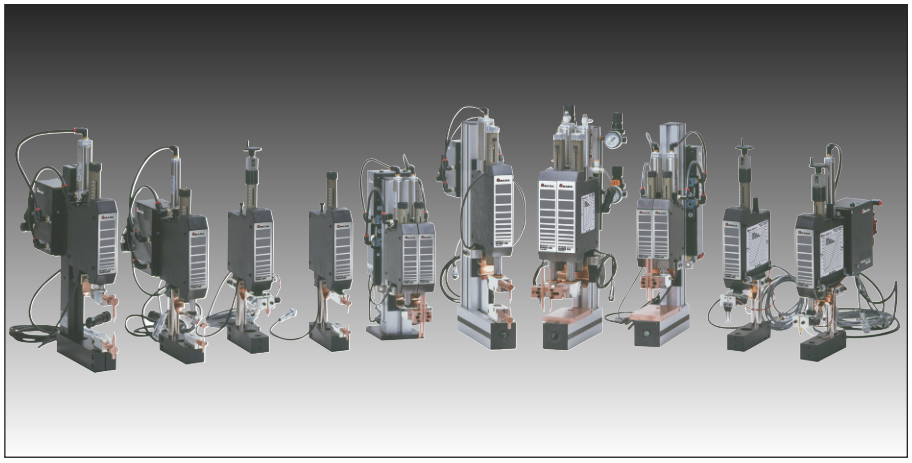


Figure 6 – *Weld schedule "1" automatically changes to "2" after 1,998 welds.**

**Highlighted area is for illustration purposes only. Actual displays are white characters on blue background.*

RESISTANCE WELDING SOLUTIONS – WELD HEAD CHOICES



Comprehensive range of weld heads to interface with precision CD Welders.

Amada Miyachi America has an extensive range of manual and pneumatic weld heads to match specific application requirements. Manual weld head actuation via a foot pedal is preferred when parts are positioned by operators. Air actuated weld heads are recommended when parts are fixtured. Actuation of a pneumatic weld head is achieved with either a footswitch or a programmable logic control (PLC). All Dual Pulse Series welders have valve drivers for controlling the complete timing sequence of an air actuated weld head. For complete information about weld heads, request our Thinline Spot Welding brochure No. 991-100.

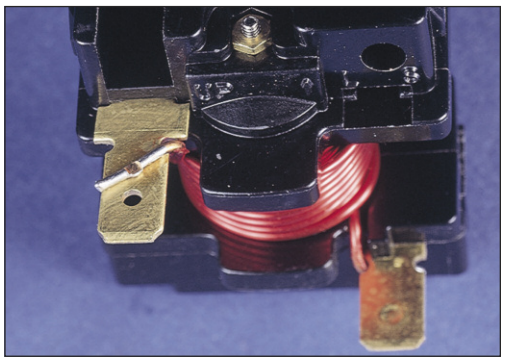
Weld Head Selection

Product Series	Minimum Force	Maximum Force
80 Series	0.25 lb (1.1 N)	40 lb (178 N)
180 Series	5 lb (22 N)	100 lb (445 N)

WIDE APPLICATION CAPABILITIES WITH DUAL PULSE WELDERS

Conductive Metals

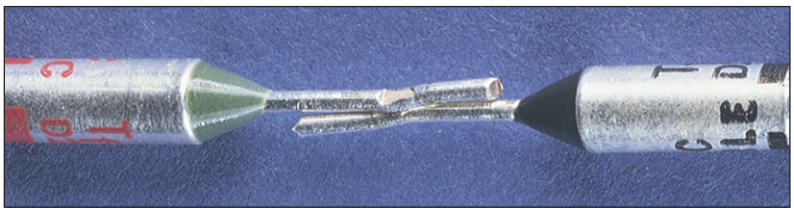
Capacitive Discharge welding technology can join many different metals and alloys. Thermally and electrically conductive materials such as brass and copper are normally difficult to weld because the weld energy is quickly dissipated, preventing adequate weld nugget formation. These materials are best welded using CD controls. A high peak energy is applied over a very short weld pulse period, thus minimizing the weld heat dissipation effect.



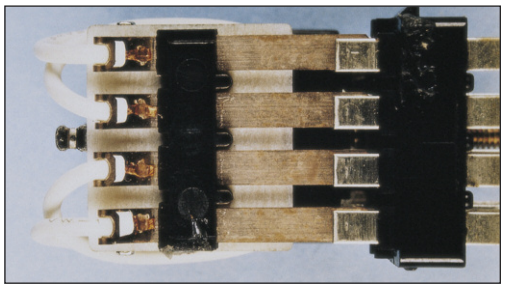
Solid copper wire to brass terminal

Resistive Metals

Thermally resistive materials such as nickel, steel, and titanium can also be easily welded using CD technology. The dual pulse feature aids in welding these resistive metals by helping to seat the electrodes with the initial pulse. Additionally, the DP Series permits the selection of longer energy pulse widths to control weld splash and expulsion.



Thermal cut-off assembly



Relay terminal connection – stranded copper wire to tin plated brass terminal

TECHNICAL SPECIFICATIONS

Feature	125DP		250DP	
Dual pulse	Yes		Yes	
Air head driver output	24/115 VAC		24/115 VAC	
Weld function basic; dual pulse; rollspot; repeat	Basic, dual pulse (only)		All	
User friendly help screens	N/A		Yes	
Weld schedules	8		128	
Chain schedules (automatic step)	N/A		Yes	
Programmable squeeze time	Yes		Yes	
Remote schedule selection	Yes		Yes	
Two head sequential control capability	N/A		Yes	
Polarity program select option	N/A		Yes	
End cycle buzzer	N/A		Yes	
Output relays	N/A		2	
Microprocessor control	Yes		Yes	
Weld counter	N/A		Yes	
Optional built-in weld Sentry	N/A		Yes	
Single pulse welding speed (welds/minute) Percent of full energy	Rep Rate under 2% 25% 50% 100%	Hit Rate 265 85 62 45	Rep Rate 305 160 120 60	Hit Rate 300 300 175 180 120 124 65 70

WELDING SPEED – Repetition ("Rep") Rate, is the average number of welds allowable in one minute based upon the thermal rating of the system components. The averaging period used to determine the Rep Rate can be as long as twenty minutes. The "Hit" Rate, or maximum intermittent welding speed, defines how fast the power supply can make consecutive welds on a non-continuous basis.

OUTPUT PULSE CHARACTERISTICS

Model	Min output	Max output	Dual pulse	Capacitor bank	Pulse width	Rise time	Minimum pulse height
125DP	0.75 ws	125 ws	Yes	1,500 mfd	Short 2.3 ms Long 4.0 ms	0.65 ms 1.05 ms	7.0 V (.001 Ω Load) 4.5 V (.001 Ω Load)
250DP	1.5 ws	250 ws	Yes	3,000 mfd	Short 6.7 ms Medium 7.8 ms Long 10.7 ms	1.6 ms 2.1 ms 2.6 ms	6.7 V (.001 Ω Load) 5.7 V (.001 Ω Load) 4.4 V (.001 Ω Load)

WEIGHT & DIMENSIONS

	125DP	250DP
Dimensions (L x W x H)	13.3 in x 13.0 in x 9.5 in (33.8 cm x 33.0 cm x 24.1 cm)	16.0 in x 15.5 in x 10.5 in (40.6 cm x 39.4 cm x 26.7 cm)
Weight	44 lbs (20 kg)	99 lbs (45 kg)

AMADA MIYACHI AMERICA, INC.
1820 S. Myrtle Ave. • Monrovia, CA 91016 US
T: (626) 303-5676 • F: (626) 358-8048
info@amadamiyachi.com • www.amadamiyachi.com
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MIYACHI UNITEK | MIYACHI PECO | MIYACHI EAPRO

AMERICAS

Amada Miyachi America Midwest
Wixom, MI 48393
T: (248) 313-3078
midwestsales@amadamiyachi.com

Amada Miyachi America Mexico
El Paso, TX 79925
T: (915) 881-8765
mxsales@amadamiyachi.com

Amada Miyachi do Brasil Ltda.
Sao Paulo, Brasil
T: +55-11-4193-3607
antonio.ruiz@amadamiyachi.com

EUROPE

Amada Miyachi Europe GmbH
Puchheim, Germany
T: +49 (0) 89 83 94 030
infode@amadamiyachi.eu

ASIA

Amada Miyachi Co., Ltd.
Noda, 278-0016 Japan
T: +81-4-7125-6177
sales@miyachi.com

Amada Miyachi Shanghai, Co., Ltd.
Shanghai, China
T: +86-21-6448-6000
zqzhang@msc.miyachi.com

Amada Miyachi Korea Co., Ltd.
Gyeonggi-do, Korea
T: +82-31-8015-6810
dykim@mkc.miyachi.com

Amada Miyachi Taiwan Co., Ltd.
Taipei, Taiwan R.O.C.
T: 886-2-2397-4778
keigaku@miyachi.com

Amada Miyachi (Thailand) Co., Ltd.
Samutprakarn, Thailand
T: +66-2751-9337-8
info@mtl.miyachi.com

Amada Miyachi Vietnam Co., Ltd.
Ho Chi Minh City, Vietnam
T: +84-8-3771-7972

Amada Miyachi India Pvt., Ltd.
Bangalore, Karnataka
T: 080-4092-1749 & 3549
info@miyachiindia.com

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