

ST Series

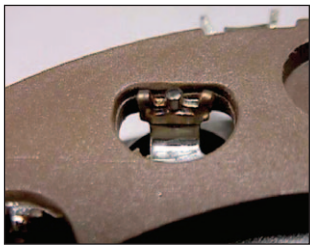
Single Phase AC Spot Weld Control

The ST Series welders are the most advanced, yet simplest welding controls on the market. They feature an intuitive, easy-to-use programming interface and is designed to control and integrate projection welders, press welders, multi-gun machines, portable guns, seam welders, robotic systems, rocker arm welders and special purpose machines.

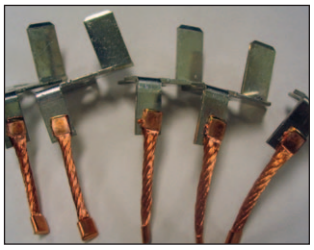
KEY FEATURES

- Primary and secondary constant current – provide closed-loop feedback and deliver superior control and improved welding results.
- Built-in weld monitoring – the control will monitor the delivered RMS current for the weld period and conduction angle. Limits can be set and alarms generated if out of limits.
- Dual Pulse with programmable upslope/downslope – upslope and downslope can be programmed for both Weld 1 and 2 to accurately control the heating rates of the materials and provide success with difficult welding combinations.
- Voltage monitoring option card – when welding in constant current the RMS voltage can be monitored to provide a useful quality indicator.
- Current stepping – a versatile stepping function allows the current to step automatically to compensate for electrode wear and ensure consistent welds.
- Electronic pressure regulator and differential pressure monitoring option – force can be set electronically as part of the weld schedule, limits can be set on actual firing force.
- Simple, intuitive programming – large LCD, logical software and push button layout allows easy programming and viewing of weld schedule information.
- Spot, seam and roll spot capability
- Communication option

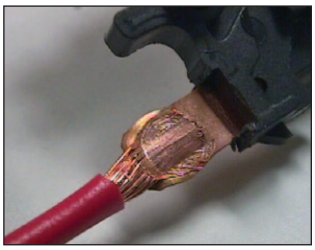
TYPICAL APPLICATIONS



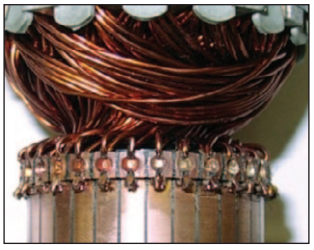
Automotive assembly



Relay



10 gauge wiring harness assembly



Motor fusing

SECONDARY VOLTAGE MONITORING OPTION

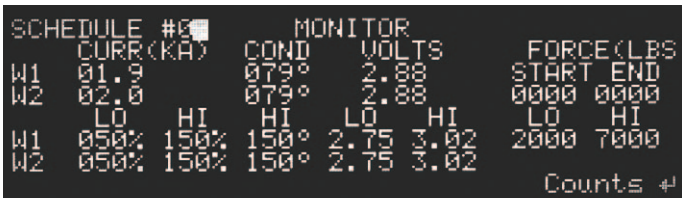
When welding in Constant Current mode the current is held constant during the weld by the ST Series control algorithms. Monitoring the secondary voltage can provide useful quality indicators, as voltage changes can be associated with resistance changes during the weld.

Pre-Weld Check – The ST Series control allows the user to program a low energy current welding pulse prior to the main welding pulse. The voltage during this first pulse can be monitored and limits applied. As the current is constant the voltage represents the resistance during the check pulse. Limits allow the unit to detect the following:

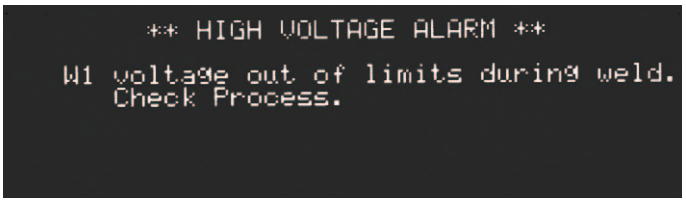
- Missing parts
- Material changes or misalignment
- Nut/projection incorrect or upside down

Advanced Functions – The STA voltage monitor can be set to measure either RMS or PEAK voltage during the weld. An advanced setting allows the monitor to measure just the last cycle of the weld. This can provide a more focused measurement reflecting the final resistance during the last cycle and provide a greater degree of measurement resolution.

Current, Voltage, and Conduction Angle – The ST Series' built in monitor keeps track of all electrical variables which reflect the changes in resistance from weld to weld. Data is sent via RS-485 for every weld and can be collected from multiple controls in a network. The WeldLab™ software facilitates two-way communication between a host computer and the welding controls.



Monitor and limit screen showing voltage

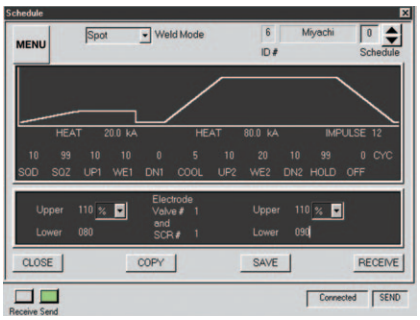


Secondary voltage alarm

NETWORKING, REMOTE PROGRAMMING

The ST Series can be equipped with a communications option board that provides two-way RS-485 communication protocol. Users can remotely send commands to the control and collect weld data. Multiple ST Series welding controls can be connected to a network host computer. The WeldLab software accomplishes multiple remote programming and data collection functions that include:

- Remote schedule programming and transfer to the control
- Error detection and notification
- Data collection and export to Excel®
- Stepper sequence programming
- Menu modes programming
- Valve programming



Remote programming



Network welder status

The ST-100A is a compact single contactor unit designed to mount to a single weld head; the ST-200A is packaged in a NEMA style cabinet and can be fitted with multiple SCRs for cascading multiple weld heads or gun assemblies. The standard ST Series includes valve drivers for up to four user-programmable valves; an optional valve driver expansion board can take this number to twelve. The ST-200A includes a water-cooling assembly tailored for the number of SCRs. All welders have 64 weld schedules and a unique linking function that allows the user to program complete welding sequences, including multiple weld schedules, providing complete flexibility in production. All ST Series are equipped with comprehensive I/O for easy interface to a PLC or machine.



Operation Modes

- Percent heat – allows programming of the percent of each half cycle during the individual weld periods in 1% increments. The control software will automatically scale output percentages over the number of cycles for up and downslope.
- Primary constant current RMS – acquires feedback from an internal primary coil and therefore requires no secondary coil. Useful for robotics, programs in RMS values. Current can be set in kA. The control software will scale output for up and downslope.
- Secondary constant current – acquires feedback from a secondary coil. Most accurate control of current and response to weld dynamics. Current can be set in kA. Provides the best welding control. The control software will scale output for up or downslope.

Model	No. of SCR
ST-100A	1
ST-200A	1 – 2

Typical Coils	Description
MB-400K	Toroidal coil – 1X sensitivity, flexible, 5 in inner diameter with a metal fastener
MB-400L	Toroidal coil – 1X sensitivity, flexible, approx 4 in inner diameter with leather cover. 400 mm laid out flat
MB-800K	Toroidal coil – 1X sensitivity, flexible, 10 in inner diameter with a metal fastener
MB-800L	Toroidal coil – 1X sensitivity, flexible, approx 9 in inner diameter with leather cover. 800 mm laid out flat

APPLICATION OF TECHNOLOGY

Constant Current

The ST Series can be programmed for Secondary Constant Current, where the control will take measurements of current every half cycle and adjust the output in order to maintain current at the set level during the weld period.

Advantages

- Delivers the same current regardless of resistance changes
- Compensates for part thickness changes
- Programmable upslope for round parts or to reduce splash or marking
- When welding in Constant Current, monitor current or voltage

Built-In Monitor

The ST Series will monitor the actual RMS current delivered during the weld period. This can be a useful quality indicator as secondary circuit degradation or inductance may cause the actual value not to match the set value. Percentage limits can be set on monitored RMS current; also a conduction angle limit can be set which is another useful indicator of changes in the process.

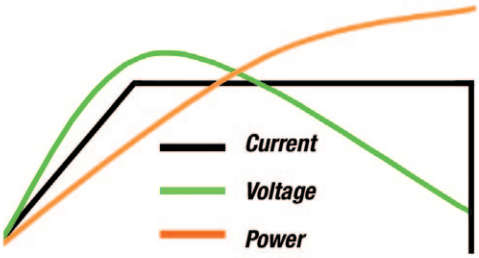
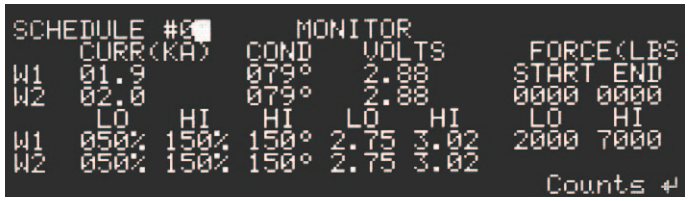


Illustration shows a typical weld for round wires.

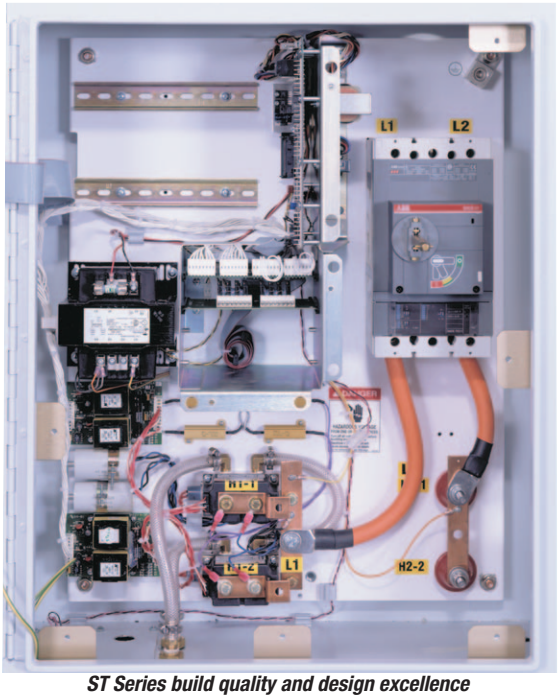


ST Series monitor screen – displayed in run mode.

DESIGNED FOR RELIABILITY & PERFORMANCE

The ST Series is designed to perform in the harshest of environments. Inside the NEMA style cabinet, the power supply is logically laid out in a modular fashion and manufactured to the highest quality standards. Key features are as follows:

- **Accessory Mounting –** space has been allowed in the design to accommodate PLC controls and ancillary devices for automation purposes.
- **I/O –** All I/O is labeled and located on removable terminal strips.
- **Robustness –** AMADA WELD TECH's products are well respected within all types of manufacturing industries for their durability and robust performance over time, a reputation that is well deserved and valued by our customers.
- **Reliability –** AMADA WELD TECH's controls are designed with reliability in mind. Component selection and unit testing is completed to the highest standards, ensuring years of trouble-free service.
- **Easy Maintenance –** with ease of maintenance in mind, the ST series was designed with modules that perform specific tasks. Each module can easily be extracted with minimal fasteners and quick-disconnect wire harnesses. Any module can be changed in less than 7 minutes. Given this unique design, down time is minimized.

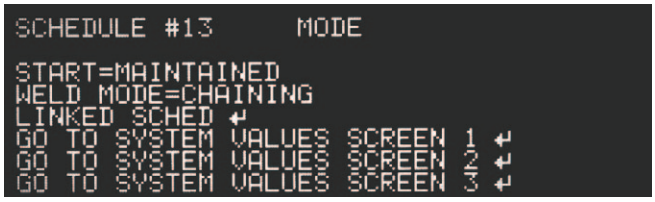


ST Series build quality and design excellence

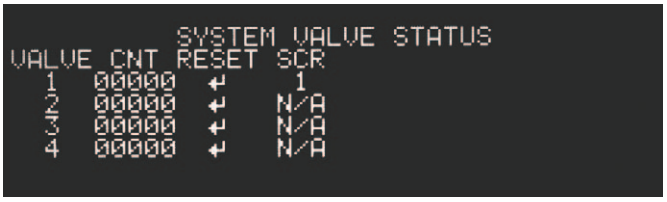
PROGRAMMING MADE EASY

- **Precise Energy Delivery and Timing –** The ST Series provides the user complete flexibility in waveform programming. All time periods are programmed in cycle increments. Single or dual pulse waveforms with upslope and downslope can be tailored to the needs of the application. Cool time can be programmed between pulses.
- **Schedule Screen –** 64 schedules can be set. Valves can be dedicated to schedules. Linking schedules permits complex machine control to be easily achieved.
- **Squeeze Delay, Squeeze, Hold and Off –** Complete valve timing sequences can be set.
- **Valve Screen –** Enables specific valves for each schedule. Chaining schedules provides Forge capability.
- **Mode Screen –** Allows programming for spot, successive and chaining functions. Seam and roll spot are also available.
- **Monitor Screen –** Allows monitoring variables to be viewed and limits set.





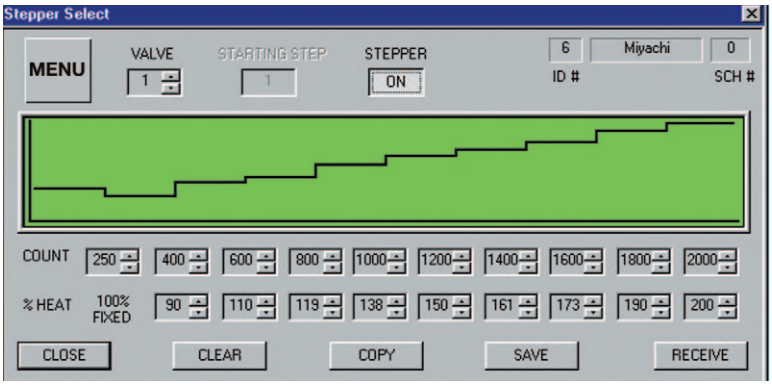
Mode screen



Valve status screen

STEPPER FUNCTIONS

The ST Series controls have sophisticated steppers for varying the heat delivered to the weld over multiple welding sequences. Users who are familiar with their electrode wear and oxidation cycles are able to further increase the time between routine electrode maintenance by taking advantage of the advanced stepping functions. The ST Series is able to execute up to nine steps in a single sequence with user programmable step counts. Steps can be a fixed percentage heat increase or decrease after a certain number of welds. Step routines can be programmed directly using the ST Series' front panel or remotely using WeldLab™ software.



WeldLab stepper screen

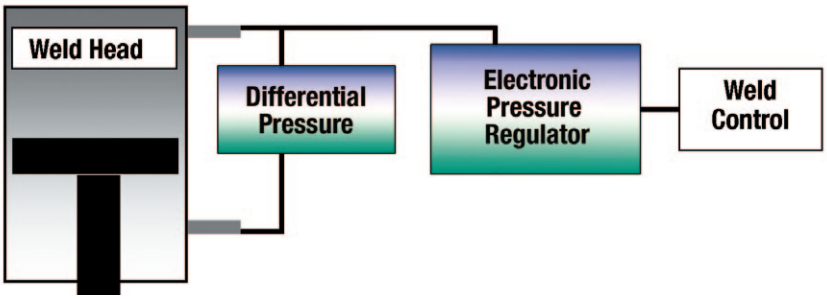
```
VALVE NUM=0
SCR #1          STEPPER=ON
    COUNT    HEAT%        COUNT    HEAT%
1   0250     FIXED    6   1200     120%
2   0400     090%     7   1400     125%
3   0600     100%     8   1600     125%
4   0800     105%     9   1800     125%
5   1000     110%     10  2000     125%
```

ST Series stepper screen

FORCE CONTROL AND MONITORING OPTIONS

One of the most important variables in the weld process is electrode force. AMADA WELD TECH offers two options which allow the user to control force using an electronic pressure regulator and monitor and/or set firing force using the force board's built-in differential pressure sensor.

- **Electronic Pressure Regulator –** Force can be programmed as part of a weld schedule. The ST Series will output a 0 –10 volt signal to an electronic pressure regulator. Simple calibration allows force to be programmed in lbs.
- **Differential Pressure Monitoring –** Firing force can be programmed as part of a weld schedule. The ST Series pressure sensor will measure the differential pressure on the top and bottom of the cylinder and fire the control when the correct force is reached. Simple calibration allows firing force to be programmed in lbs. Limits can be set to alert operators to potential force problems. Welder may be fired without squeeze time to enhance the cycle time.



Simplistic system layout

```
SCHEDULE #00
SQD SQZ UP1 W1 DN1 CO UP2 W2 DN2 HLD OFF
 90  90  00 05  00 00  00 05  00  00  00
        02.0KA          02.0KA
CH=N/A FORCE=0250Lb ElecValve=01 SCR=1
IMPULSE=01      COPY TO # 00 PLUS 00 ↵
SCR     1
VALVES 1 2 3 4
```

Force is part of the weld schedule

```
        *** FORCE CALIBRATION ***
      (All Force Entries in Pounds)
Channel-------Valve   Channel-------Valve
# 30 Psi 80 Psi  #    # 30 Psi 80 Psi  #
F1 0112   0403   1    F5 0000   0001   N/A
F2 0200   0600   3    F6 0000   0001   N/A
F3 0230   056_   3    F7 0000   0001   N/A
F4 0000   0001  N/A   F8 0000   0001   N/A
```

Force calibration in lbs

TECHNICAL SPECIFICATIONS

	ST Series	
Power source	201 to 270 VAC or 402 to 540 VAC, 50/60 Hz, single phase	
Control method	AVC	
Weld schedules	64	
Time settings	Squeeze delay	0 - 99 cycles
	Squeeze	0 - 99 cycles
	Upslope 1, 2	0 - 99 cycles
	Weld 1, 2	0 - 99 cycles
	Downslope 1, 2	0 - 99 cycles
	Cool	0 - 99 cycles
	Hold, Off	0 - 99 cycles
	Impulses	25
Heat settings	Heat 1	80 kA
	Heat 2	80 kA
Current monitor	High limit 100 - 150%, low limit 50 - 100%	
Conduction degree monitor	0 to 180°	
Current steppers	1 stepper per valve	
Valve outputs	4 standard valve driver outputs	
Modes	Chaining, Successive, Spot, Roll Spot, Seam, Repeat	

WEIGHT & DIMENSIONS

	ST-100A	ST-200A*
Dimensions (W x D x H)	10 in x 10 in x 18 in (254 mm x 254 mm x 457 mm)	25.4 in x 10 in x 30 in (645 mm x 254 mm x 762 mm)
Weight	35 lb (16 kg)	134 lb (61 kg)

*Custom sizes available.

OPTIONAL FEATURES

Primary Current Control	**Primary current control w/current transformer**
Secondary Current Control	Secondary current control w/toroidal coil
Secondary Current Coils	MB-400K, MB-400L, MB-500-15, MB-800K, MB-800L
Multi-Valve Driver	8 additional valve outputs
Valve Power Supply	24 VAC
Power Transformers	50 VA (STA-100A only), 150 VA, 250 VA (500 VA available for STA-200)
Security Lock	Program lockout
SCR	300 A air cooled (ST-100A only)
	600 and 1200 A water cooled (1800 A available for ST-200)
Terminal Block	L2 terminal
Voltage Monitor Card	4-channel card for secondary voltage mesurement
Force Output Card	8-channel 0-10V outputs for electronic pressure regulator
Force Input Card	Single channel card for differential pressure measurement (up to 8 channels)

USA Headquarters and Western Technical Center
AMADA WELD TECH
1820 S. Myrtle Ave. • Monrovia, CA 91016 US • T: (626) 303-5676
info@amadaweldtech.com • www.amadaweldtech.com
ISO 9001:2015 Certified Company • 24/7 Repair Service: 1-866-751-7378

AMADA WELD TECH (Eastern Technical Center)
High Point, North Carolina
T: (941) 544-5762
southsales@amadaweldtech.com

AMADA WELD TECH (Midwest Technical Center)
Detroit, Michigan
T: (248) 313-3078
midwestsales@amadaweldtech.com

AMADA WELD TECH GmbH
Puchheim, Germany
T: +49-89-839403-0
infode@amadaweldtech.eu

AMADA WELD TECH SHANGHAI CO., LTD.
Shanghai, China
T: +86-21-6448-6000
jwu@amadaweldtech.com.cn

AMADA WELD TECH KOREA CO., LTD.
Seoul, Korea
T: +82-31-8015-6810
sales@amadaweldtech.co.kr

AMADA TAIWAN CO., LTD.
Taipei, Taiwan
T: +886-3-328-3511

AMADA (THAILAND) CO., LTD.
Bangkok, Thailand
T: +66-2170-5900
info@amada.co.th

AMADA VIETNAM CO., LTD.
Ha Noi, Vietnam
T: +84-24-6261-4583
thuyet@amada.co.jp

AMADA WELD TECH INDIA PVT., LTD.
Bangalore, India
T: +91-80-4092-1749
info@amadaweldtech.in

follow us on:

Specifications subject to change without notice. Copyright© 2026 AMADA WELD TECH INC. The material contained herein cannot be reproduced or used in any other way without the express written permission of AMADA WELD TECH INC. All rights reserved.

991-503 06/25