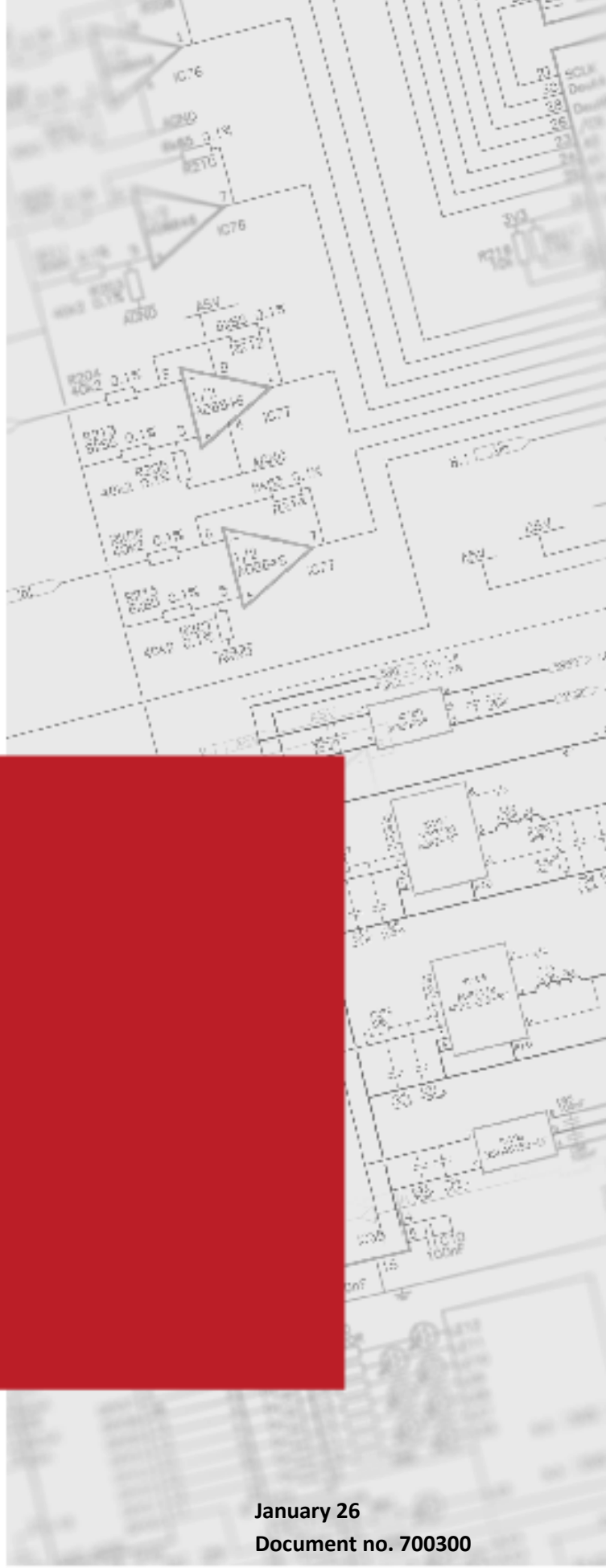

ENTRON™

Manual

EN6001 Band Saw Welder Control

January 26

Document no. 700300

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Document Revisions

Date	Document Number	Approved By	Document Changes
1/21/2026	700300	ZJC	Initial release

Languages

This document is only published in the English language.

Table of Contents

1 BACKGROUND

1.1 Description of the User

This manual has been written to inform qualified custom equipment manufacturers, integrators, control engineers, weld engineers, and/or maintenance technicians how to safely install, setup, operate, and maintain the weld control.

DANGER!

Qualified Personnel Only

The information contained in this manual is intended for Qualified Personnel, as defined by the National Electrical Code (NEC). Always follow Electrical Safety in the Workplace per NFPA 70E or equivalent standard in your location.

This manual has been written for the EN6001 BSW AC resistance welding control product line with an EN6001 BSW weld timer. The manual applies to the V1.0 version of firmware on the EN6001 timer.

This document should be carefully read before installing and operating the weld control. Failure to follow the instructions defined in this manual could create a safety hazard or impact the warranty on the product.

1.2 Conventions Used in This Manual

The following style conventions are used in this document:

Bold Italics type font is used for emphasis

- Bulleted lists generic lists and do not define a sequence or procedures

1) Numerical lists define a sequence or procedures

`Courier` text is used for system output, such as an error message or script
URLs, complete paths, filenames, prompts, and syntax

1.3 Explanation of Symbols

This section defines the symbols used throughout this document.

DANGER!

DANGER!

Danger indicates a hazard with a high level of risk which, if not avoided, will result in immediate, serious personal injury or loss of life. Examples are: exposed high voltage; exposed fan blades.

WARNING!

WARNING!

The Warning symbol indicates a hazard with a potential hazard which ***could result*** in personal injury or loss of life. Examples are: not using proper personal protect; removal of guards.

CAUTION!

CAUTION!

The Caution symbol indicates a hazard which ***could result*** in non-life threating personal injury or damage to equipment. CAUTION may also be used to alert against unsafe practices.

PACEMAKER

Individuals with cardiac devices should maintain a safe distance due to strong magnetic fields arising from resistance welding. The function of cardiac pacemakers and defibrillators may be disturbed, which may cause death or considerable health damages! These persons should avoid the welding system unless authorized by a licensed physician.

NOTICE

NOTICE

The Notice symbol is used for making recommendations on use or supplementary information. Non-compliance with these recommendations may result in damage to the control, welding machine or workpiece and voiding of the warranty.

HELPFUL TIP

The Helpful Hint symbol is used to provide additional information on a topic that may be helpful to the user.

1.4 Important Safety Instructions

Before installing, starting up, or operating the EN7000v2, carefully read all safety instructions to ensure safe use of the product.

SAVE THESE INSTRUCTIONS

The safety instructions are part of the product. Keep the instructions in a safe and easily accessible place near the product.

DANGER! 	Never open the enclosure door when the breaker is in the ON position.
DANGER! 	Never operate control with the door open.
DANGER! 	Always disconnect power to the weld control before servicing or establishing electrical connections with the product.
DANGER! 	Use product only as described in this manual.
DANGER! 	Stop Operation if any problems occur. If the equipment is not working as it should, has been dropped, damaged, left outdoors, or has been in contact with water, contact ENTRON.
DANGER! 	Only apply the specified power. Application of a voltage or current beyond the specified range can cause electric shock or fire.
DANGER! 	Upon receipt of unit, inspect unit for damage from shipping. Before applying power to product, inspect electrical connections to verify the connections are secure.

DANGER!

Except for the internal water-cooling system, keep water and water containers away from product. Water ingress can cause a short circuit, electric shock, or fire.

DANGER!

Keep free of dust and debris.

DANGER!

Do not install the product in any of the following environments:

damp environments where humidity is 90% or higher;

dusty environments; environments where chemicals are handled;

environments near a high-frequency noise source;

hot environments where temperatures are above 40° C / 104° F;

cold environments where temperatures are below 0° C / 32° F;

environments where water will condense.

DANGER!

It is not recommended that holes be drilled into the cabinet. Metal debris inside the cabinet can cause a short circuit, electric shock, or fire. If holes must be drilled is imperative that all components are protected from debris. Drilling holes in the cabinet may allow dust and other materials to enter the cabinet.

DANGER!

Individuals with cardiac devices should maintain a safe distance due to strong magnetic fields arising from resistance welding. The function of cardiac pacemakers and defibrillators may be disturbed, which may cause death or considerable health damages! These persons should avoid the welding system unless authorized by a licensed physician.

WARNING!

Always ensure cooling water is adequately flowing at the proper rate, temperature, and is of sufficient quality. For water quality requirements, refer to AWS J1.2M/J1.2.2016 Guide Installation and Maintenance of Resistance Welding Machines.

1.5 Technical Support

1.5.1 Internet

The latest version of the documentation and other helpful resources in the ENTRON Document Library page found in the Resource section of the ENTRON website: https://www.entroncontrols.com

1.5.2 Documentation Request

Documentation, user instructions and technical information can be requested by emailing ENTRON Controls at customerservice@entroncontrols.com or support@bfentron.co.uk

Please include your name and email

1.5.3 Service and Technical Support

For service and technical support, we request that customers fill out the Technical Support Form found on our website at link below:

TECHNICAL SUPPORT FORM LINK

https://www.entroncontrols.com/resources/technical-support.html

After the web form has been completed, your case will be assigned to one of our technical specialists who will contact you directly.

For all other questions, our customer service team is available to assist. The contact information for each our manufacturing and service sites is shown in the table below. Please contact the site for your specific region.

	Country	Phone	Email	Regions Supported
ENTRON US	USA	+1-864-416-0190	tech.support@entroncontrols.com	USA, Canada

2 Introduction

The EN6001 BSW is a Single Phase 50/60 Hz AC Weld control. It has been developed for the FLASH Welding of Band-Saw Blades. It is a simplified version of the EN6001. It includes only the inputs to operate a Band Saw welder's Heat Control.

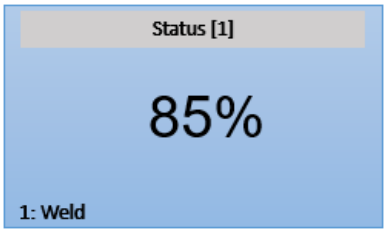
- Single Program
- Flash Weld Heat Sequence
- Two Stage Anneal Heat Sequence
- Manual Adjust for % Heat

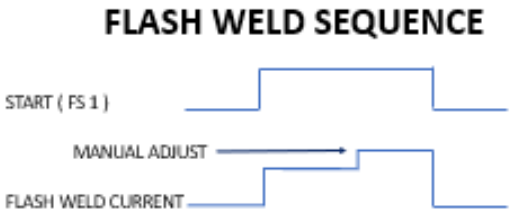
It is available in the S+ cabinet, suitable to mount near or on a standard Band Saw welder. It has a simple configuration, with adjustable Power Factor setting and 87 Degree enable configuration settings. The bandsaw welder must perform the mechanical process sequence and command the EN6001 BSW to Flash or Anneal.

2.1 Application background Flash Weld

The EN6001 is programmable to perform FLASH and UPSET to join the blade. In addition, it is programmable to perform a 2-Stage ANNEAL sequence.

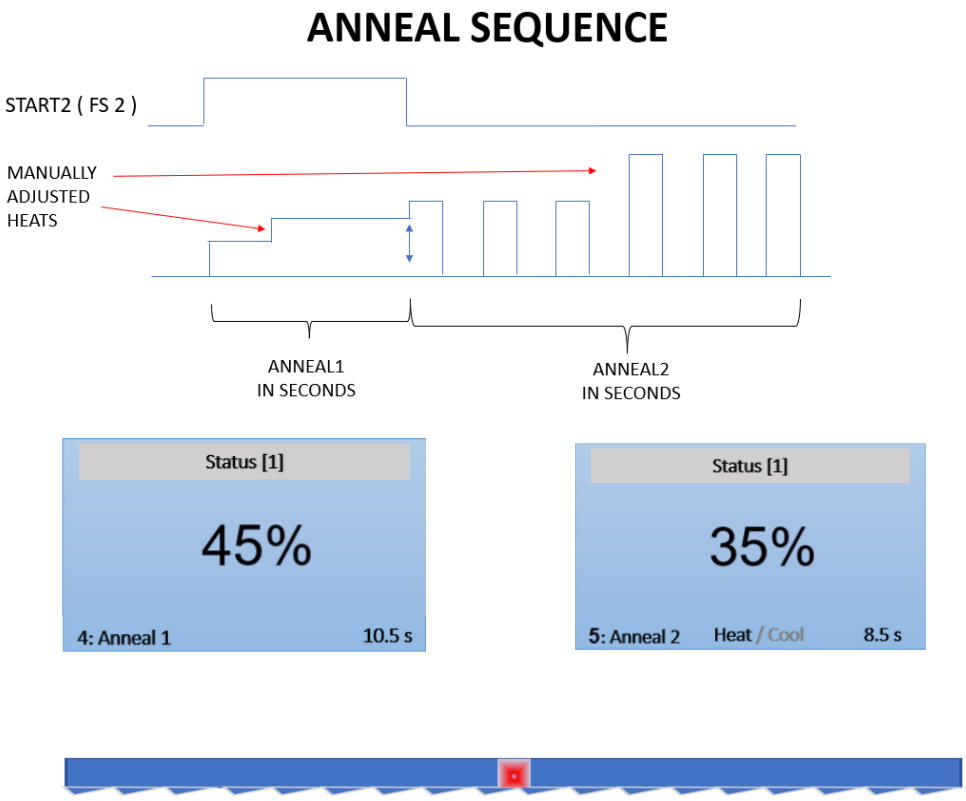
- In order to form a continuous BAND. The Band saw blades are sheared and flash welded.





2.2 Application background - Anneal

- Alloys in a welded part can cause brittleness. Very little effort is required to break a welded band.
- To ensure blade ductility, it is necessary to ANNEAL the area near the welded portion.

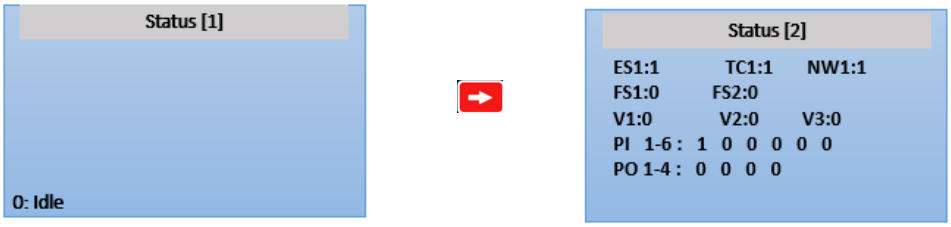


3 EN6001 BSW – Display Panel and Programming.

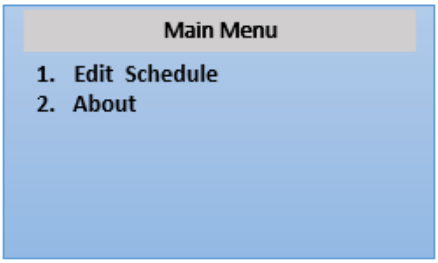
KEYPAD FUNCTIONS	
ESC	The ESCAPE key. Used to return to the previous menu.
↓ → ← ↑	The ARROW keys. Used to navigate. If in the menu screens, the down and right arrows move the cursor/selection down, while the up and left arrows move the cursor/selection up. If in the Status screens, the up and left arrows navigate to the previous Status screen, while the down and right arrows navigate to the next Status screen.
↵	The ENTER key. Used to select menus and confirm changes to parameters.
+ −	The PLUS and MINUS keys. Used to make changes to parameters. If the input for the parameter to be changed is a number, PLUS will increase the number by one and MINUS will decrease the number by one. If the input for the parameter to be changed is a menu of different options, either key can be used to scroll through the menu options. Holding the buttons down will cause the control to increment/decrement at a faster rate.
F	The FUNCTION key. Used to navigate from the Status screens to the Main Menu.
WELD ●	Enables weld current. If not on, then an ER35 (Panel no-weld error) is displayed.

3.1 Status & Schedule Edit Navigation

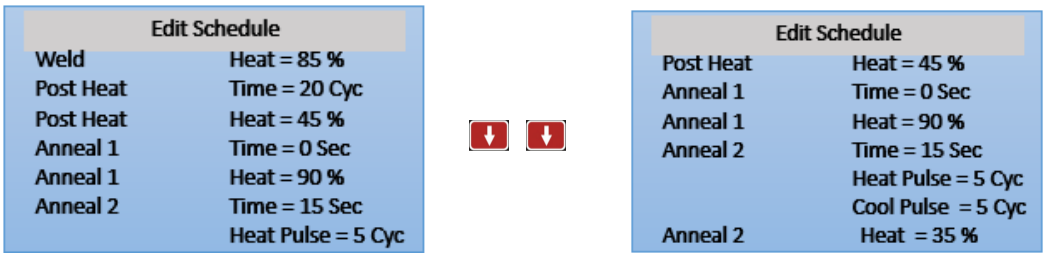
- Pressing the Right Arrow → brings up STATUS [2]
  - STATUS [2] Screen is a good DIAGNOSTIC tool and shows the logical status of inputs and outputs in the control hardware. For example, FS1 will change from a 0 to a 1 when it closes.



Programming the EN6001 BSW:
From the STATUS [1] screen, Press the F button to access the MAIN MENU



Highlight EDIT SCHEDULE and press the ENTER button ↩ to display the parameters.

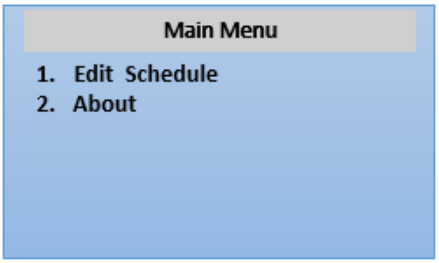


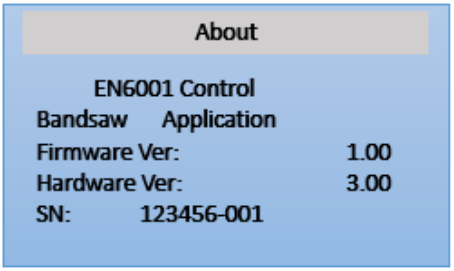
Use the UP or Down Arrows to select each parameter.
Use the Use the Manual Adjust knob or the + and − buttons to change values.
Press the ENTER ↩ button to Store and retain the new value.
Use the ↓ to find the last 2 parameters Cool Pulse and Anneal 2 Heat and adjust as needed.

3.2 Configuration functions:

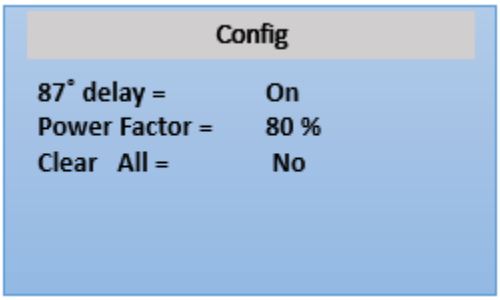
On the Main Menu, selecting **2. About** and pressing ENTER, will show control ID and Version no's.

Select **2. About** to highlight. Then Press ENTER.



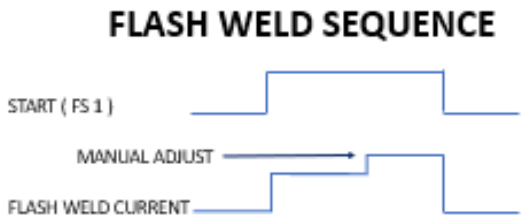


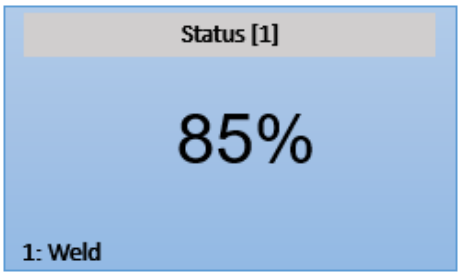
To adjust configuration parameters: Select to highlight **2. About**. Hold +, and Press ENTER



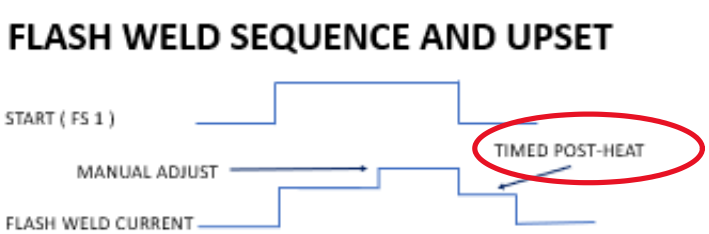
3.3 FLASH WELD and POST HEAT Sequence FS1

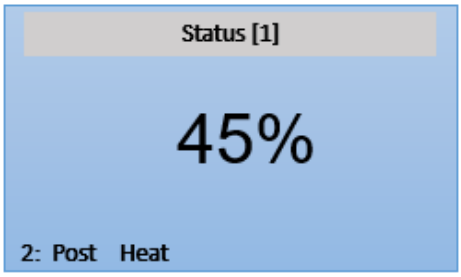
FLASH WELD sequence begins upon the closure of Weld Input FS1. The Flash current stops when the Weld Input FS1 is released (opened). It is possible to manually adjust the current while the current is flowing.





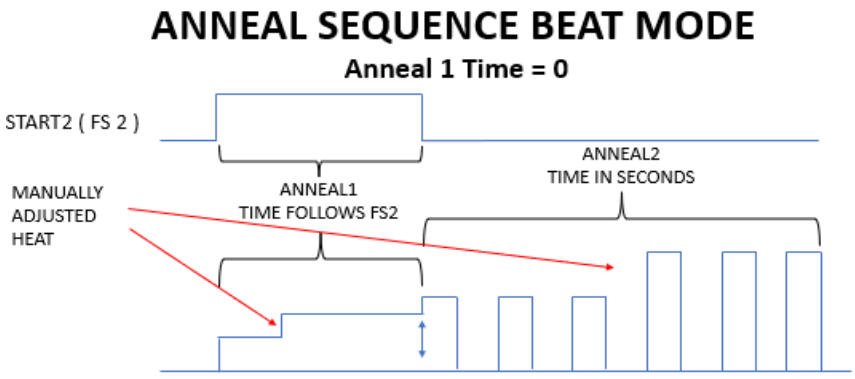
POST-HEAT can be programmed as a timed interval. Post-heat automatically follows Flash Weld when FS1 is released.



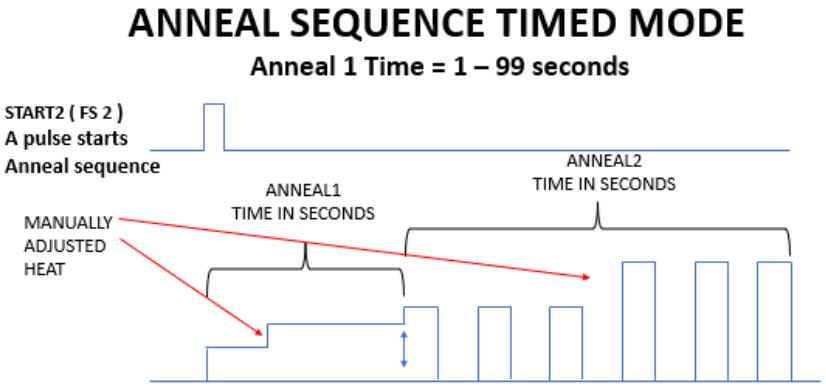


3.4 2-STAGE ANNEAL Sequence FS2

Beat Mode. FS2 ON governs the First Stage. [Anneal 1 Time = 0]
Upon initiation of the Anneal Input FS2, Anneal-1 stage begins. This stage is continuous and can be timed in Seconds. If Anneal-1 time is set to 0, simply opening FS2 ends Anneal-1. Anneal2 time Begins immediately after.
Current can be manually adjusted by rotating the ADJUST knob on the panel or optional remote box while current flows. See picture below.



Timed Mode. A Pulse on FS2 starts a Timed Anneal 1. [Anneal 1 > 0 Time in Seconds]
Whether Anneal 1 is in BEAT or TIMED mode, Anneal-2 stage follows automatically at the end of the first Anneal stage. Anneal2 sequence is also timed in Seconds. During this time in seconds, current flows as HEAT pulses alternated by COOL periods. Heat and Cool are timed in cycles of the line frequency. Note:- The Manual Adjust knob can be used to modulate current output during this period as well.



4 EN6001-BSW INSTALLATION

Refer to Customer Connection page for Line voltage Settings and Power connection points.

IMPORTANT: Set the Internal Transformer to the local voltage.

Install the power connections:

DANGER!

- PE Protective Earth / GROUND
- L1 Line 1 Feed from 575/480/380/230 VAC Single Phase
- L2 Line 2 Feed from 575/480/380/230 VAC Single Phase
- H1 SCR Output to Welding Transformer
- L2 12 AWG fire from welding transformer H2

Control Inputs:

The EN6001 BSW includes only the inputs and outputs to operate a Band Saw welder.

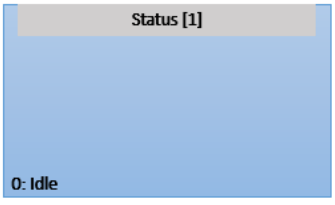
Install the Input Connections. Note: All inputs require 24VDC. This is provided by the 24VDC Power supply on the terminals designated FSC(24 VDC) and SVC (0 VDC)

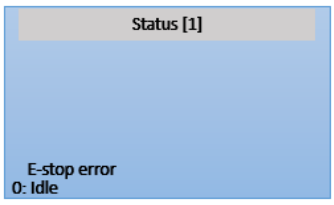
DANGER!

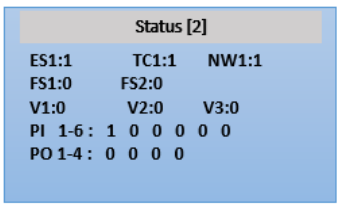
- FS1 Weld sequence
- FS2 Anneal sequence
- ES1 Emergency Stop input
- TC1 SCR Contactor Thermal Switch
- NW1 External Weld on/off input
- TT1/WFS Transformer Thermal/Water Flow Switch

The programmable panel consists of an LCD display and membrane keys. Upon Power up, the control shows STATUS Screen [1]

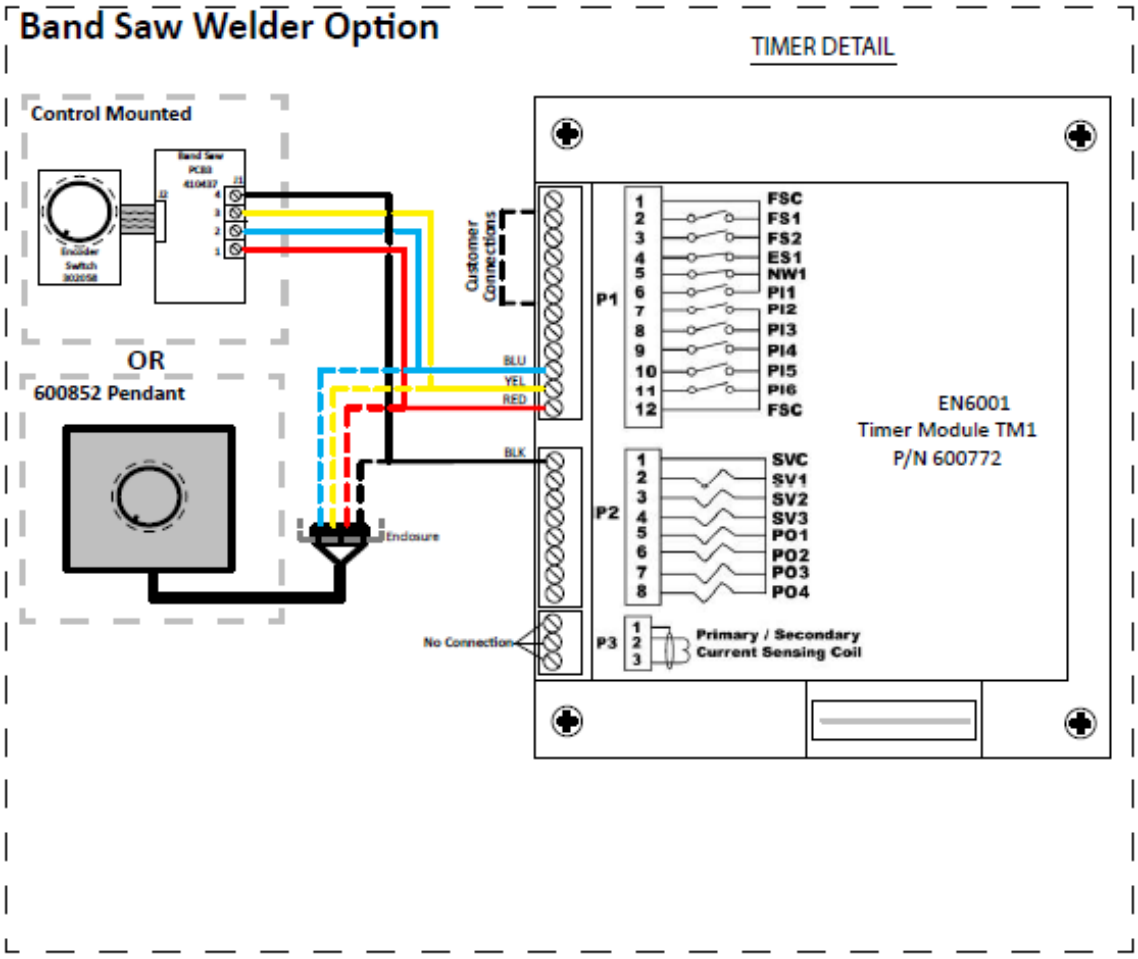
- STATUS [1] Screen shows activity while the control is in sequence and describe each portion of the sequence as it occurs.
- When idle, STATUS[1] Screen will display “Idle” and error codes and operating conditions if any are present. Such as ESTOP, No Weld, TT1/WFS Error if transformer thermostat or water flow switch are off.
- STATUS [2] Screen can help to confirm that Input contacts like FS1, or FS2 are on the correct terminals, as well as confirming required inputs (ES1,TC1,NW1 and TT1/WFS) are installed or bypassed by Jumping them to FSC.







4.1 EN6001-BSW OPTION DIAGRAM



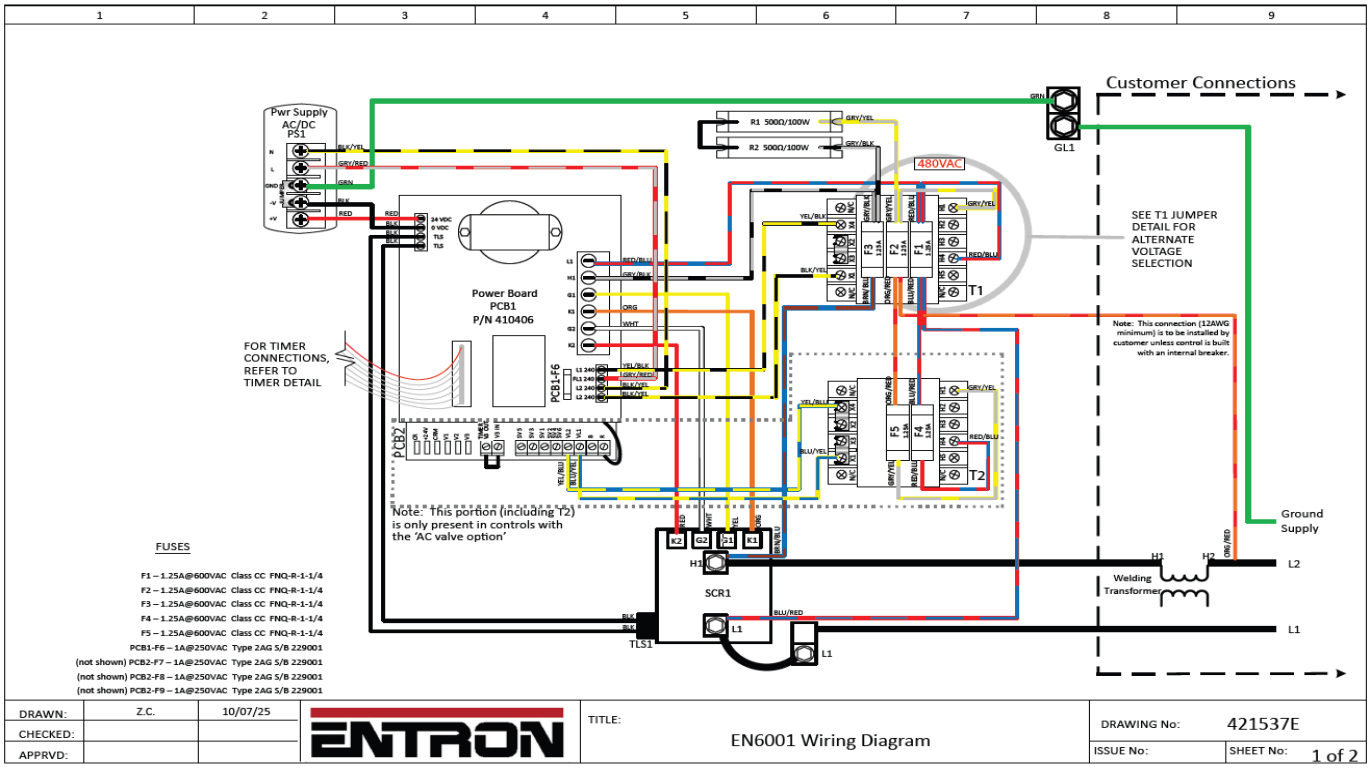
INPUTS – All inputs are 24VDC from FSC (Footswitch Common**) :**

- FS1 Weld sequence
- FS2 Anneal sequence
- ES1 Emergency Stop input
- TC1 SCR Contactor Thermal Switch
- NW1 External No Weld input
- TT1/WFS Transformer Thermal/Water Flow Switch
- Manual Adjust Panel Mounted Rotary current adjustment
- Manual Adjust Pendant manual adjust option

OUTPUTS – No digital outputs. The only functional output is the SCR Phase Angle control:

- SCR Firing output AC Phase Shift Weld current.

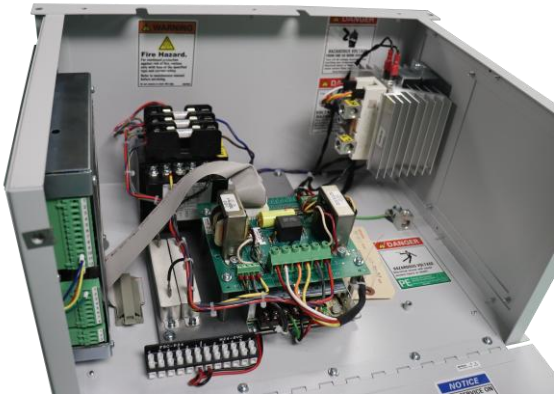
4.2 EN6001-BSW CONTROL WIRING DIAGRAM



WIRING DIAGRAM - CUSTOMER POWER CONNECTIONS:

DANGER!

- PE — Protective Earth / GROUND
- L1 — Line 1 Feed from 575/480/380/230 VAC Single Phase
- L2 — Line 2 Feed from 575/480/380/230 VAC Single Phase
- H1 — SCR Output to Welding Transformer
- L2 — 12 AWG fire from L2 (welding transformer H2)



4.3 EN6001-BSW CONTROL WIRING DIAGRAM