g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-DS3826SSHR**

Test Procedure for a Cell Stack Assembly

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	G. Chandler & C. Wade	7/20/2009
B			
C			

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
G. Chandler			Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
7/20/2009			7/20/2009

1. SCOPE

1.1 This is a functional test and assembly procedure for the listed Cell Stack assembly.

2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.

3.1.1 Silicon Power Corporation Mounting Instructions

3.1.2 68A7649P22 Silicon Control Rectifier

3.1.3 DS3826SSHR – Assembly of Thyristor Stack

3.1.4 C781 – Silicon Power High Power 77mm Thyristors

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning

4.1.1 Plated surfaces and PRESSPAKS should be clean and free of debris. They should be lightly sanded with 600 grit-paper and then oil or grease compound (G322L) applied before assembly. Refer to SPCO mounting instructions for more information.

4.2 Equipment Inspection

4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.2.1.1 Wires – broken, cracked, or loosely connected

4.2.1.2 Terminal strips / connectors – broken or cracked

4.2.1.3 Components – visually damaged

4.2.1.4 Capacitors – bloated or leaking

4.2.1.5 Solder joints – damaged or cold

4.2.1.6 Circuit board – burned or de-laminated

4.2.1.7 Printed wire runs / Traces – burned or damaged

4.2.1.8 Improperly pressed cell stack

4.2.1.9 Loose hardware

4.2.1.10 Solder splash on aluminum buss bars

5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
1	H188791	SCR Press
1	H188773	SCR Stack alignment plate
1	H188792	SCR Pressure Adaptor
1	H188686	Torque Wrench
1	H188812	GE Firebox
2		480VAC with cables
1	H188761	Load Cart
1		115VAC Power Cord

6. TESTING PROCESS

6.1 Assembly

6.1.1 Refer to assembly drawing DS3826SSHR for proper configuration and assembly. See attached drawing at the end of this document.

6.1.2 Tighten the top nuts on the assembly to keep unit together until proper pressing has been accomplished.

6.2 Applying pressure to SCR cell stacks

6.2.1 Since the fully assembled SCR stack with plate weighs over 40 pounds, have someone assist in moving the assembly into and out of SCR press. The second person will also be used to validate SCR pressure readings on assembly.

6.2.2 Place one each 3/8 inch aluminum spacer plate#1 and #2 under the bottom fixture where the SCR stack sits. Be sure that this plate allows for movement of the buss bar.

6.2.3 Place SCR stack with connected plate into the SCR Press. See following picture for proper placement.

SCR Assembly

SCR Pressure Adaptor

6.2.4 The SCR Pressure adaptor and washer/spacer shall be placed at the top of the assembly. The washer goes in the middle of the springs and the pin on the pressure adaptor goes into the washer. Two sockets with finger adjustors shall be placed into the side holes. See picture of SCR Pressure Adaptor on this page.

6.2.5 Visually line up aluminum heat sinks.

6.2.6 Once sinks are aligned, apply pressure to ram until it aligns up and fits into hole on the Pressure Adaptor.

6.2.7 Once unit is fully aligned, apply pressure to assembly until it reaches 8200 +/- 50 pounds. Be sure to let the meter, reading the applied pressure to the SCR Stack settle out before end nuts are tighten.

6.2.8 Finger-tighten both sides of the SCR stacks.

6.2.9 Insert torque wrench into each socket and tighten both sides in quarter turn increments alternating between sides until both nuts reach 75 inch pounds. **Note: Once the SCR stack has a chance to equalize, it should read approximately 8000 lbs, +/- 500 lbs. This can only be measured if a load cell has been inserted between heat sinks in place of the SCR.**

6.2.10 Visually verify that sinks are still aligned.

6.2.11 Release pressure on ram.

6.2.12 Remove pressure adaptor, washer, and sockets.

6.2.13 Remove SCR Cell Stack from press.

6.2.14 Torque both nuts at opposite end from the boot to 205 inch/pounds and place tamper cream on both nuts. This is only at the cathode end of the assembly, opposite from the black boot. This should be witness by the addition helper.

6.2.15 Have second person apply pressure verification sticker to the assembly, with their Compas ID Code Number and today's date.

6.3 Electronic Testing

Warning closest disconnect for main power is the STB01 Trip Breaker.

6.3.1 Setup

6.3.1.1 Connect two cables from 480VAC to Inductor plugs on the Motor Panel wall.

6.3.2 Test Stand Setup

6.3.2.1 Initial Switch settings Test Stand (Side Panel)

6.3.2.1.1 Load switch to "Parallel".

6.3.2.1.2 Turn fan power switch to "ON"

6.3.2.2 Initial Switch settings GE SCR Load Station

6.3.2.2.1 Master Power Switch to "OFF".

6.3.2.2.2 Pulse Select Switch to "ISOLATED".

6.3.2.3 Initial Switch settings GE Firebox

6.3.2.3.1 Firing Knob is fully counterclockwise.

6.3.2.3.2 Power On Switch "ON".

6.3.2.3.3 Input Voltage Select Switch "480"

6.3.2.3.4 Switch by Red LED & Firing Knob "ON"

6.3.2.3.5 Boost/Normal switch to "NORMAL".

6.3.2.4 Connect cables from the GE Firebox to SCR Test Stand Rear Wall.

6.3.2.4.1 Phase 1 on GE Firebox to Phase 1 on Test Stand Rear Wall.

6.3.2.4.2 Phase 2 on GE Firebox to Phase 2 on Test Stand Rear Wall.

6.3.2.4.3 Transformer Primary on the GE Firebox White wire to white connector on both GE Firebox and Test Stand.

6.3.2.4.4 Transformer Primary on the GE Firebox Red wire to red connector on both GE Firebox and Test Stand.

6.3.2.4.5 Transformer Secondary on the GE Firebox White wire to white connector on both GE Firebox and Test Stand.

6.3.2.4.6 Transformer Secondary on the GE Firebox Red wire to red connector on both GE Firebox and Test Stand.

6.3.2.4.7 White SCR Gate Lead on GE Firebox white gate connector on test stand.

6.3.2.4.8 Red SCR Cathode Lead on GE Firebox red gate connector on test stand.

6.3.2.4.9 Additional white lead from test stand's Gate lead to the white SCR lead under test.

6.3.2.4.10 Additional red lead from test stand's cathode lead to the red SCR lead under test.

6.3.2.5 Place unit under test into chamber.

6.3.2.5.1 Connect white gate & red cathode lead to SCR's white and red leads.

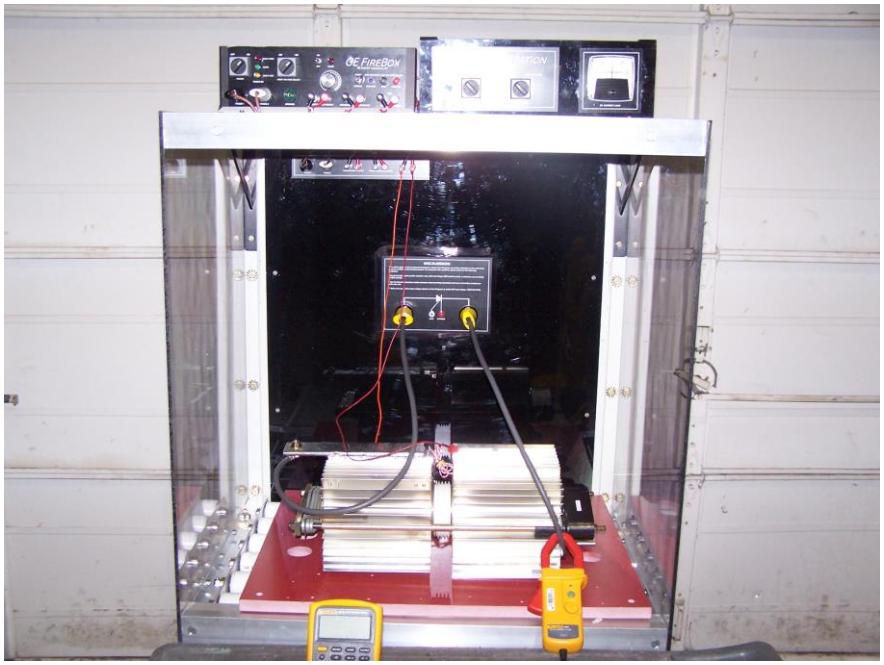
6.3.2.5.2 Connect large buss cables to each side of SCR cell being tested and to the black plugs of the test stand's rear inside wall. Does not matter which side they are connected.

6.3.2.5.3 Close front panel.

6.3.2.6 Volt and current Meters

6.3.2.6.1 Connect volt meter across the SCR

6.3.2.6.2 Connect current clamp on one end of the load.



6.3.3 Power ON

6.3.3.1 Turn GE SCR Load Station On/Off switch to “ON”

6.3.3.2 Slowly adjust the GE Firebox Firing Knob to 100 amps across current meter. Voltmeter should read about 306 +-15V. Run for one minute.

6.3.3.3 After one minute reduce the GE Firebox Firing Knob to read 50 amps across current meter by turning the firing knob counterclockwise. Voltmeter should read about 419 +-15V. Run for nine more minutes.

6.3.3.4 Once time has elapsed, turn Firing Knob completely counterclockwise and turn GE SCR Load Station On/Off Switch to “OFF”

6.4 ***TEST COMPLETE ***

7. NOTES

7.1 GE Firing Box Fault Lights

7.1.1 There are three LEDs on the GE Firebox, Fault High, Good, and Fault Low.

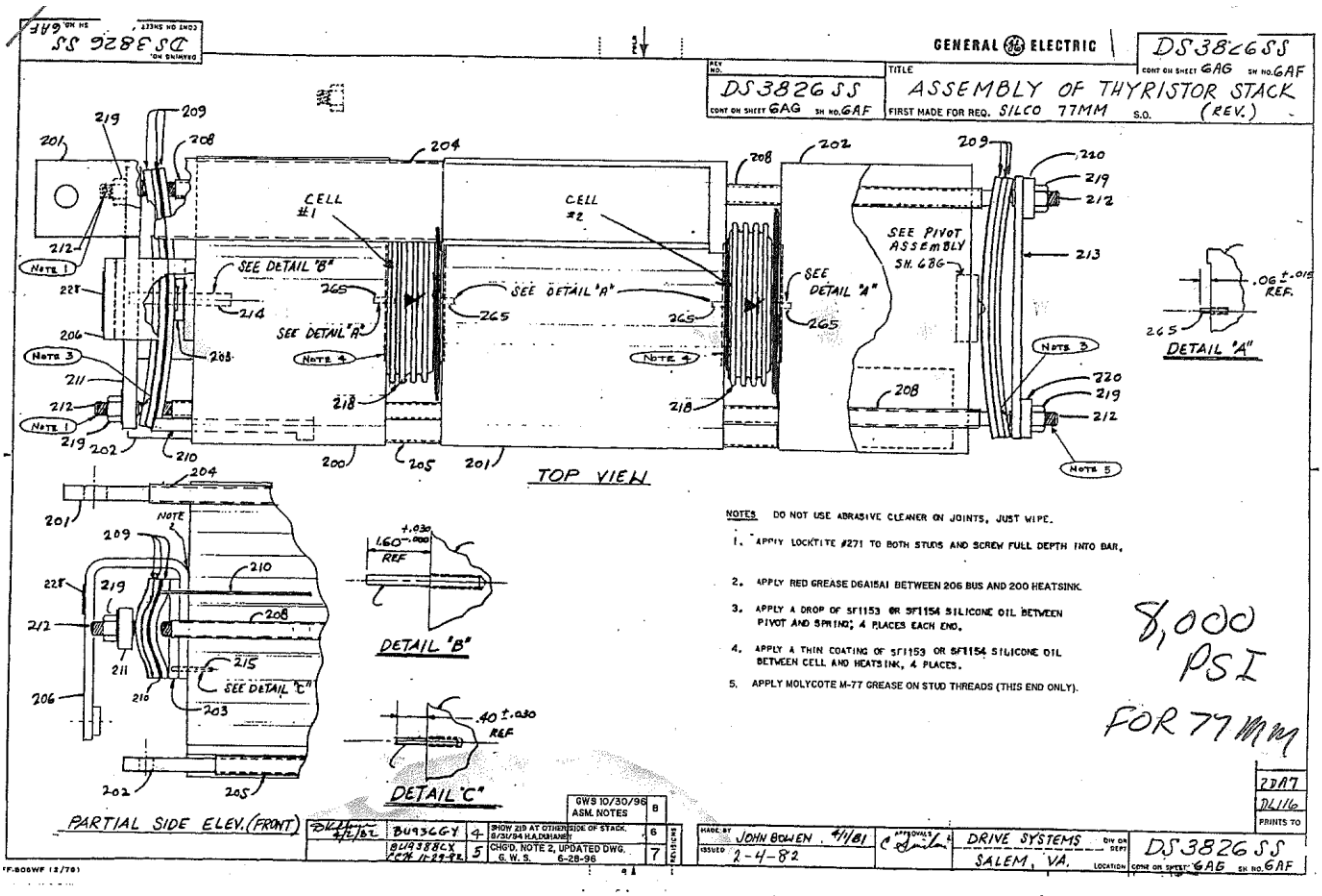
7.1.1.1 Ideal condition is “GOOD”, where voltages are not too high or too low for the Firing Box.

7.1.1.2 If voltage has been selected that is too high for the Firing Box the Fault High Light will illuminate.

7.1.1.3 If voltage has been selected that is too low for the Firing Box the Fault Low Light will illuminate.

8. Attachment

8.1 See attached assembly drawings

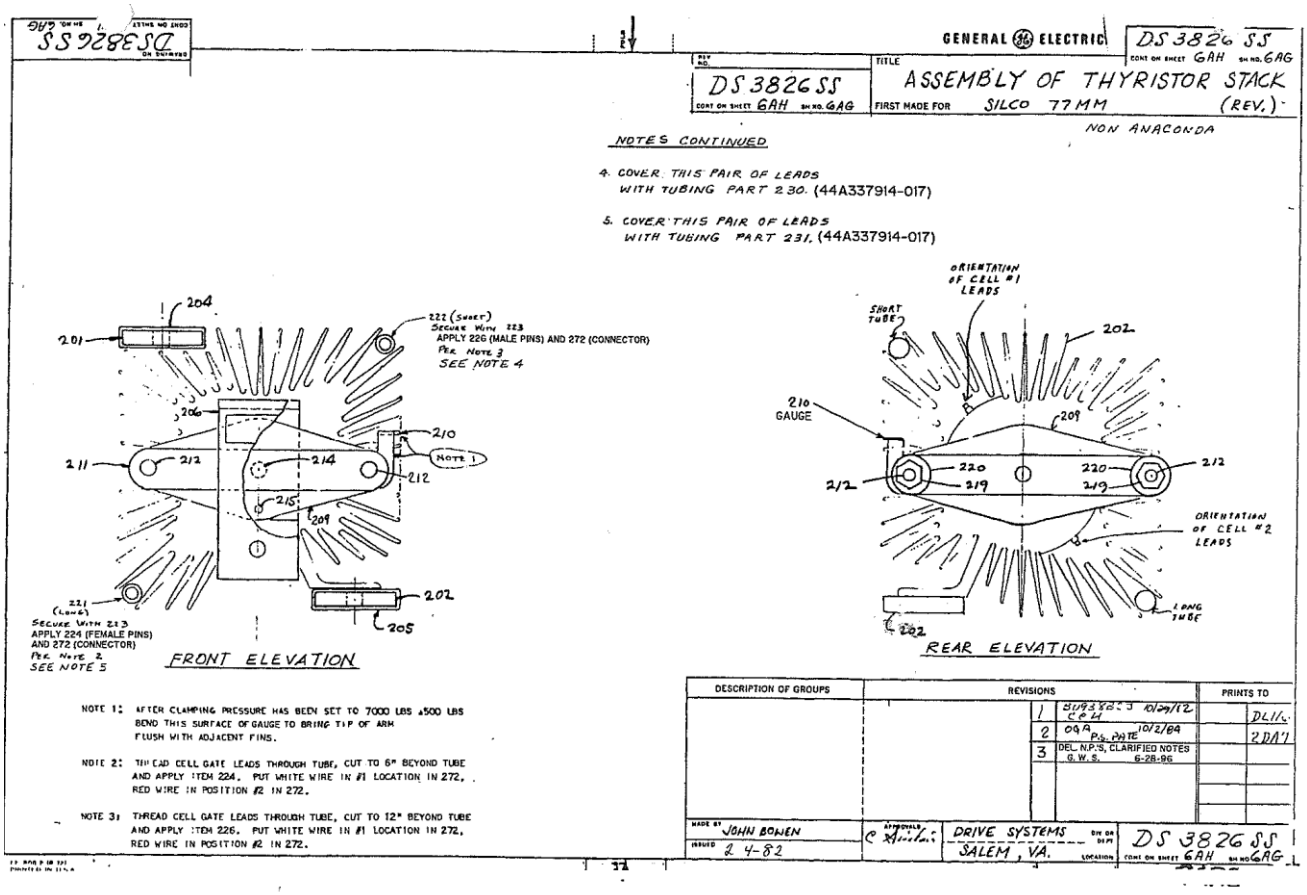


Note 1: Locktite #271 shall be added to both studs and screwed fully into backplate and end nuts shall be tightened. Later on these end nuts shall be torque to 205 inch/pounds, but this shall be done after compression of the SCR.

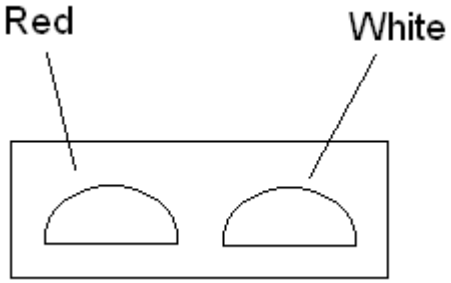
Note 3: Apply a dab of G322L silicone cream between spring and pivot point of clamping bar, four places 2 at each end.

Note 4: Apply a thin coating of G322L between cell and sink. Plated surfaces and PRESSPAKS should lightly sanded with 600 grit-paper. Then apply a very thin layer of grease compound (G322L) and rotate the PRESSPAK to properly distribute.

Cells must be compressed to 7000 to 9000 pounds per Silicon Power (vendor).



SCR Gates for this stack. See drawing below for wire configuration



Cell 1 will have Short Tube with Male Connectors
Cell 2 will have Long Tube with Female Connectors