



GE Energy

Functional Testing Specification

Parts & Repair Services
Louisville, KY

LOU-GED-DS5220CMAx

Test Procedure for the Cycloconverter Power Assembly

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	James Archibald	7/20/2009
B			
C			

© COPYRIGHT GENERAL ELECTRIC COMPANY

Hard copies are uncontrolled and are for reference only.

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

PREPARED BY James Archibald	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL <i>Charlie Wade</i>
DATE 7/20/2009	DATE	DATE	DATE 7/20/2009

<p>LOU-GED-DS5220CMAx REV. A</p>	<p>g</p> <p>GE Energy Parts & Repair Services Louisville, KY</p>	<p>Page 2 of 8</p>
---	--	---------------------------

1. SCOPE

1.1 This is a functional testing procedure for a SCR 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 68A7628 Silicon Control Rectifier

3.1.3 DS5220HSAA – 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	Connected to Test Stand	GE FireBox H188812
1		Load Cart H188761
1	Connected to Test Stand	GE SCR Load Station

6. TESTING PROCESS

6.1 Assembly

6.1.1 Refer to assembly drawing DS5220HSA for proper cell stack configuration and assembly. See Test procedure LOU-GED-DS5220HSAA for proper cell stack pressure.

6.1.2 See DS5220CMAx directory for more information (Picture in DS5220\picture\Amtrak)

6.2 Electronic Testing

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

6.2.1 Setup

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

6.2.2 Test Stand Setup

6.2.2.1 Initial Switch settings Test Stand (Side Panel)

6.2.2.1.1 Load switch to "Parallel".

6.2.2.1.2 Turn fan power switch to "ON"

6.2.2.2 Initial Switch settings GE SCR Load Station

6.2.2.2.1 Master Power Switch to "OFF".

6.2.2.2.2 Pulse Select Switch to "ISOLATED".

6.2.2.3 Initial Switch settings GE Firebox

6.2.2.3.1 Firing Knob is fully counterclockwise.

6.2.2.3.2 Power On Switch "ON".

6.2.2.3.3 Input Voltage Select Switch "480"

6.2.2.3.4 Switch by Red LED & Firing Knob "ON"

6.2.2.3.5 Boost/Normal switch to "NORMAL".

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

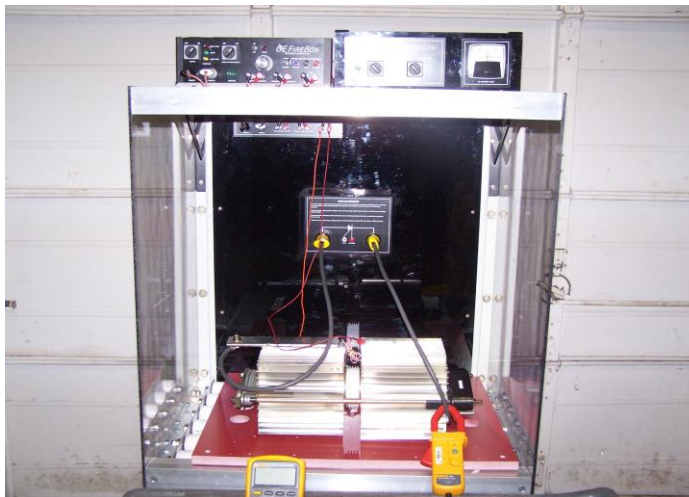
6.2.2.4.1 Phase 1 on GE Firebox to Phase 1 on Test Stand Rear Wall.

<p>LOU-GED-DS5220CMAx REV. A</p>	<p>g</p> <p>GE Energy Parts & Repair Services Louisville, KY</p>	<p>Page 4 of 8</p>
---	--	---------------------------

- 6.2.2.4.2** Phase 2 on GE Firebox to Phase 2 on Test Stand Rear Wall.
- 6.2.2.4.3** Transformer Primary on the GE Firebox White wire to white connector on both GE Firebox and Test Stand.
- 6.2.2.4.4** Transformer Primary on the GE Firebox Red wire to red connector on both GE Firebox and Test Stand.
- 6.2.2.4.5** Transformer Secondary on the GE Firebox White wire to white connector on both GE Firebox and Test Stand.
- 6.2.2.4.6** Transformer Secondary on the GE Firebox Red wire to red connector on both GE Firebox and Test Stand.
- 6.2.2.4.7** White SCR Gate Lead on GE Firebox white gate connector on test stand.
- 6.2.2.4.8** Red SCR Cathode Lead on GE Firebox red gate connector on test stand.
- 6.2.2.4.9** Additional white lead from test stand's Gate lead to the white SCR lead under test.
- 6.2.2.4.10** Additional red lead from test stand's cathode lead to the red SCR lead under test.

6.2.2.5 Place unit under test into chamber.

- 6.2.2.5.1** Connect white gate & red cathode lead to SCR's white and red leads.
- 6.2.2.5.2** 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.
- 6.2.2.5.3** Close front panel.



6.2.2.6 Volt and current Meters

6.2.2.6.1 Connect volt meter across the SCR

6.2.2.6.2 Connect current clamp on one end of the load.

6.2.3 Power ON

6.2.3.1 Turn GE SCR Load Station On/Off switch to "ON"

6.2.3.2 Slowly adjust the GE Firebox Firing Knob to 100 amps across current meter.

Voltmeter should read about 306 +-15V. Run for one minute.

6.2.3.3 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.

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

6.3 *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.

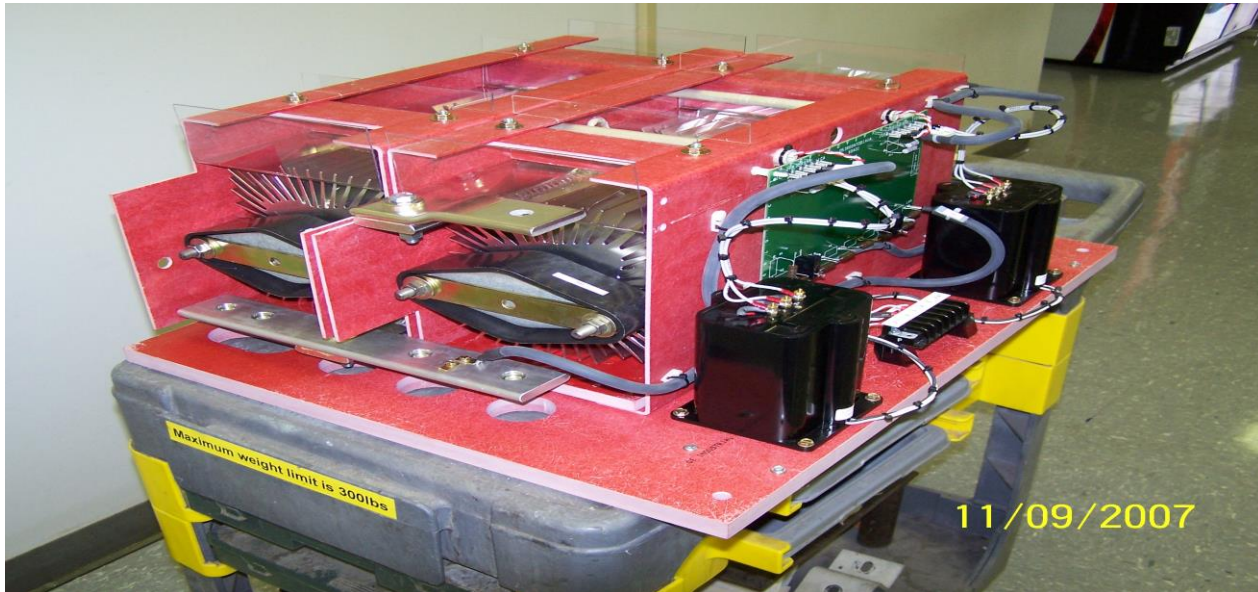
7.1.1.2 If voltage has been selected that is too high for the Firing Box the Fault High Light will illuminate.

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

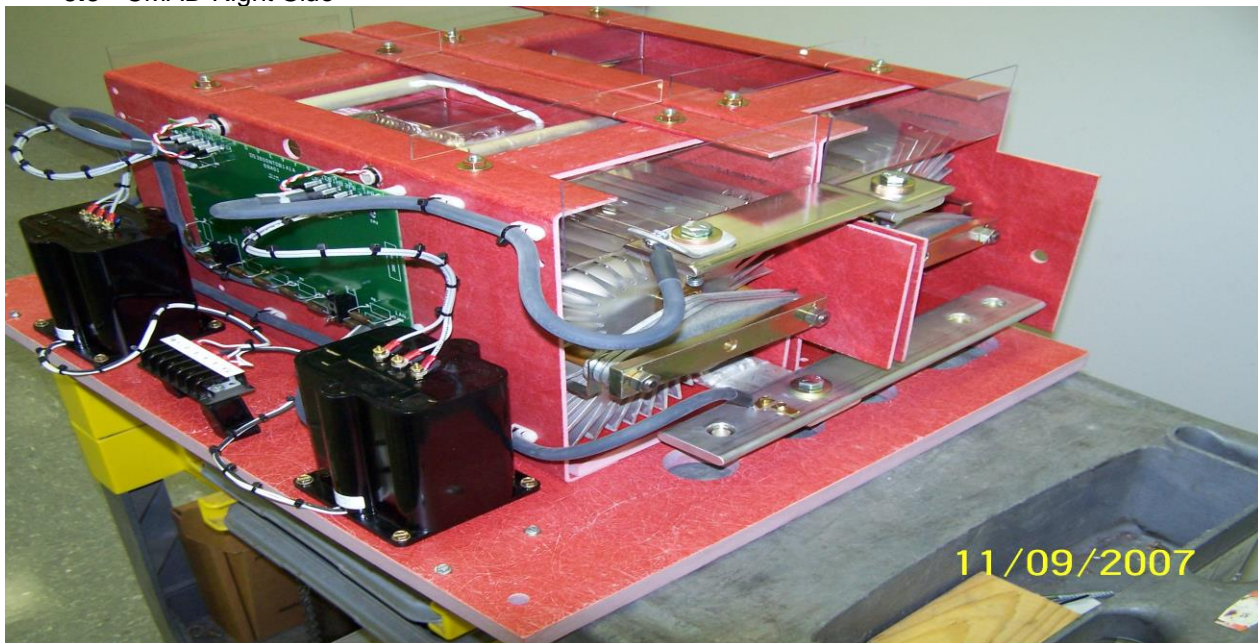
8. ATTACHMENTS

8.1 Check sheet for inspectors on page 8.

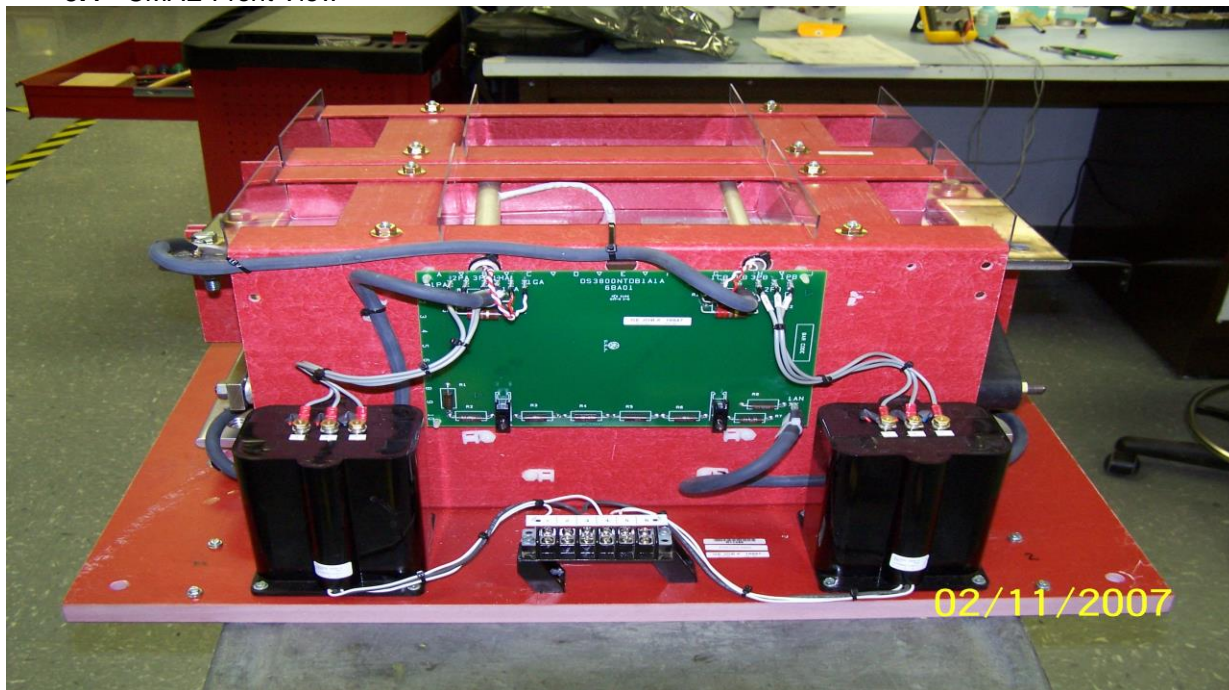
8.2 CMAD Left Side



8.3 CMAD Right Side




8.4 CMAE Front View



8.5 CMAE Right Side



LOU-GED-DS5220CMAx REV. A	<div style="text-align: center;">  <p>GE Energy Parts & Repair Services Louisville, KY</p> </div>	Page 8 of 8
--------------------------------------	---	--------------------

Check sheet for DS5220CMAD & DS5220CMAE power assemblies.

- ☐ Model Number
- ☐ Serial Number
- ☐ Job Number
- ☐ SCR Stack Number
- ☐ SCR Stack Orientation – Black Boot to Anode end of SCR Stack.
- ☐ Pulse Transformer Connections
- ☐ Pulse Transformer Terminal Connection Marking Strip
- ☐ Pulse Transformer Hardware (Check tightness of terminal connections)
- ☐ High Voltage Wire Orientation, Do not cross wires. (See attached drawings)
- ☐ High Voltage Wire ends are properly insulated.
- ☐ Check Buss Bar Orientation & Connections (See attached drawings) Side buss bars should be on top of heat sink buss bars.
- ☐ Buss Bar should be aluminum
- ☐ Bottom buss bars should have two faston terminals, mounted 90 degrees from one another.
- ☐ No welding splatter on buss bars
- ☐ Are all wire tags labeled?
- ☐ Do not forget Air Dam Screws
- ☐ Lexan Air Dams 2 each (237B7181P3 & P4), should ship along with units.

DS3800NTBD1A1A

Check the following solder connections on this card.

- | | |
|------------------------------|--|
| <input type="checkbox"/> 1PA | <input type="checkbox"/> 1CB |
| <input type="checkbox"/> 2PA | <input type="checkbox"/> 1HB |
| <input type="checkbox"/> 3PA | <input type="checkbox"/> 1PB |
| <input type="checkbox"/> 1HA | <input type="checkbox"/> 2PB |
| <input type="checkbox"/> 1CA | <input type="checkbox"/> 3PB |
| <input type="checkbox"/> 1GA | <input type="checkbox"/> 1AN |
| <input type="checkbox"/> 1GB | <input type="checkbox"/> All resistors |