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GE Energy

Functional Testing Specification*Parts & Repair Services
Louisville, KY***LOU-GED-DS3820SVRx****Test Procedure for a Static Voltage Regulator****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	S. Pharris	6/15/2009
B	Changed step 6.16.and 6.17 around, also changed step from CCW to CW.	D. Bush	3/17/2010
C	Amended to improve flow of test and include new fixture	F. Howard	05/25/2011
D	Clarified operating instructions for fixture, added asset number, and added step 6.1 special note.	F. Howard	06/28/2011
E	New Requirement section 6.2	C. Wade	10/10/2013
F	Added a picture and comments to section 7 about vertical mounting of the UUT.	G. Chandler	11/20/2013

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PREPARED BY S. Pharris	REVIEWED BY D. Bush	REVIEWED BY Steve Pharris	QUALITY APPROVAL <i>Charlie Wade</i>
DATE 6/15/2009	DATE 3/17/2010	DATE 11/16/2010	DATE 6/16/2009

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1. SCOPE

- 1.1 This is a functional testing procedure for a Static Voltage Regulator. This includes both the DS3820SVRA & DS3820SVRB modules.

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 Check board's electronic folder for more information

4. ENGINEERING REQUIREMENTS

- 4.1 Equipment Cleaning
- 4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.
- 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

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
2		Fluke 87 DMM (or Equivalent)
1	H188983	DS3820SVRA Test Fixture
1	H033963	Big Blue Inductive Load

6. TESTING PROCESS

6.1 Special Note: Since this unit can be mounted to a vibrating generator, periodic light tapping of the assembly should be done to ensure unit will performed as required. Unit should be stable, if not inspect solder connections for breaks. Be sure to apply all safety procedures/concerns when power is applied to the unit.

6.2 **Special Requirement for ALL UNITS:**

Change both 15V power supplies and all potentiometers on unit.

6.3 Testing Procedure

6.3.1 Connect test fixture to 240VAC three phase outlet, Make appropriate connections from test fixture to UUT. Three phase 120VAC line-to-line source from left of side fixture to TB1-1, TB1-2 and TB1-3. And harness marked TB-2 and TB-3 to corresponding connector on UUT. Make sure the red power push-button and variable AC power on fixture are off and apply 3-phase power to fixture.

6.3.2 Connect an AC voltmeter to jacks labeled Variable AC source. Switch on the AC input power (red push-button), turn on the Variable AC source and set AC meter to 120VAC using dial on upper right side of test fixture. Check the +/-15-volt power supply voltages at TB3-1 (P15) and TB3-3 (N15) of NEPF card. The voltage magnitudes should be between 15.0VDC and 15.5VDC. A small adjustment pot on the power supplies will adjust the P15 and N15 voltages if needed. TP1 or TB3-2 on NEPF is the reference point for these voltages. Switch off the Variable AC source and AC input power when this adjustment is complete.

6.3.3 Turn the manual pot fully CW

6.3.4 Turn the auto pot fully CCW.

6.3.5 Set switch in the MANUAL position.

6.3.6 Place the berg jumpers on NVRC and DVRC (if used) in the positions shown.

NVRC Jumper	Position	DVRC Jumper	Position
BJ1	H	BJ1	MID
BJ2	1	BJ2	MIN
BJ3	D		
BJ4	D		

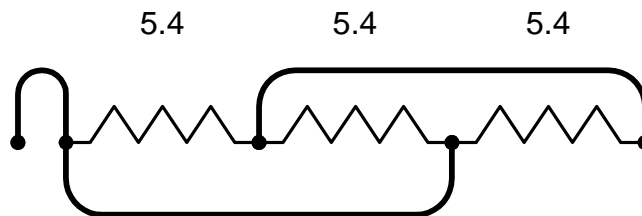
6.3.7 Adjust the pots on NVRC and DVRC (if used) to the positions shown.

NVRC Pot	Setting	DVRC Pot	Setting
R2	70%	R1	50%
R3	50%	R2	50%
R4	50%	R3	50%
R5	50%		
R7	50%		
R8	50%		

6.3.8 Attach a digital voltmeter set to measure millivolts between TP2 and TP3 on the NEPF card. With the load disconnected, energize the three-phase AC supply and read the voltage indicated on the DVM. **Using a plastic screwdriver**, adjust the setting on pot R18 so that the indicated voltage is zero millivolts. This adjusts the offset voltage of U1 on NEPF to zero volts. After this is completed, deenergize the three-phase supply.

6.3.9 Connect output of inductive load to banana jacks on left side of test fixture. Positive to orange banana jack and 90V SCR to black banana jack on the left side of test fixture. Connect 2 jumpers on load using drawing. The short jumper between first black jack and yellow jack should already be attached to load.

Inductive Load Setup



6.3.10 Switch on the input three-phase AC and slowly rotate the MANUAL pot CCW until the output current reaches 10 amps. Use meter on load cart.

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6.4 Switch on the variable single phase AC source and adjust the Auto pot until the TVM output is approximately zero volts.

SPECIAL NOTE: Make sure turn power off when switching between Manual and Auto Then turn power back on to keep from smoking Auto/Manual Switch.

6.5 Switch the relay from the Manual to the Auto position. Verify that the automatic regulator is stable by varying the AC source +/- 3volts. The output current of the regulator should change in the opposite direction. If the 120-volt reference is decreased, the output DC current should increase.

6.6 De-energize 120V AC sensing.

6.6.1 Rotate R2 on NVRC until the DC output current starts to decrease. This should happen at a pot setting between 50 and 60. This verifies that the current limit circuit functions correctly in the HIGH range with the AUTO regulator active. Set the pot to 30 on the dial and make a note of reading on meter of load.

6.6.2 Switch on the 120V AC. Adjust the AUTO regulator pot until the output current is 5 Amps DC or less. De-energize the 120 volt AC sensing. The output current should increase to the limit set by the current limit pot.

6.6.3 Restore the 120V AC sensing and adjust the output current to 5 amps DC using the Auto pot. Adjust the MANUAL regulator pot until the TVM output is 0 V. This step is very sensitive.

6.6.4 Switch the variable AC source OFF. Turn 3-phase power off.

6.6.5 Switch the relay from the AUTO to the MANUAL position

6.6.6 Remove jumpers across resistor on the inductive load.

6.6.7 Adjust R2 to 80.

6.6.8 Switch BJ1 on NVRC to the L (low) position.

6.6.9 Turn input power and variable AC source back on.

6.6.10 Increase the setting of the MANUAL regulator pot until current limit is reached, then decrease the setting of R2 on NVRC slowly to zero on the dial. Output current should be approximately 2.5 amps. This verifies that the current limit functions correctly in the LOW range with the manual regulator active.

6.6.11 Switch the 120 volt three-phase source OFF and single-phase OFF.

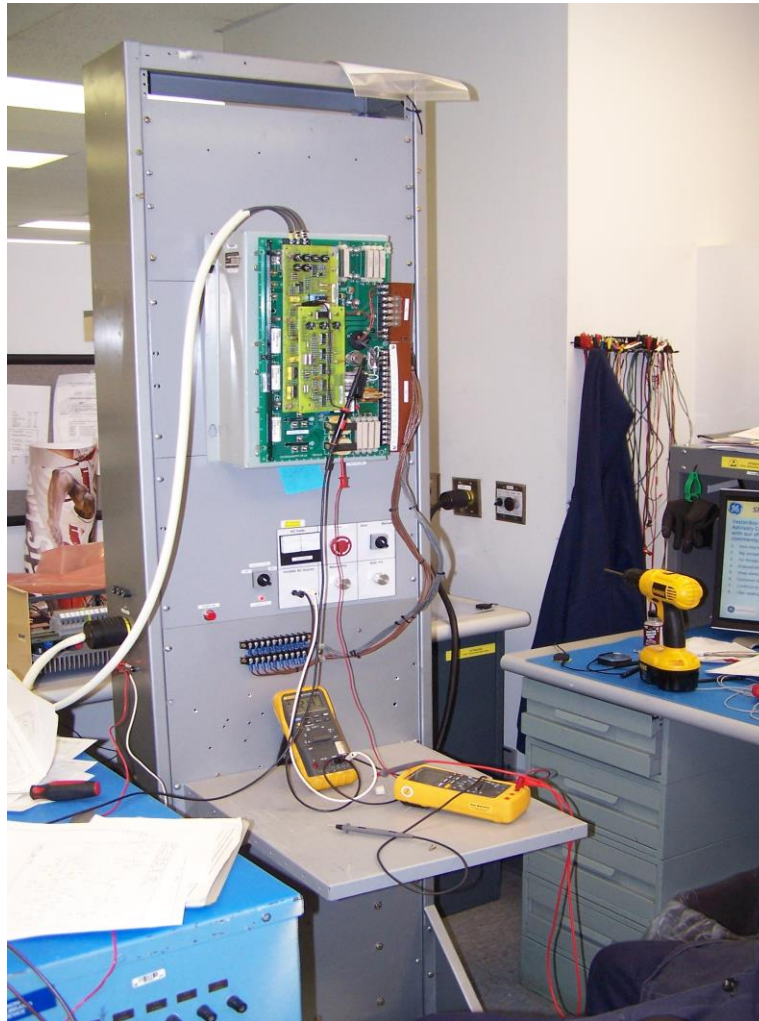
6.6.12 Increase the setting of R2 on NVRC to 90.

6.6.13 Switch BJ1 on NVRC to the H (High) position.

6.7 *TEST COMPLETE *****

7. Notes

- 7.1 During a recent repair customer found transformer T1 had a broken connection. This was noticed when the unit was lying flat/horizontal. To correct this, the unit shall be tested vertically and periodic tapping with a non-conductive tool shall be applied to validate that there are no loose connections. See picture below of unit mounted vertically.



8. Attachments

- 8.1 None at this time.