



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-DS3820FE3x

Test Procedure for a regulated current supply.

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REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Transferred from GEDS procedure – DS3820FE3 sheets 9AA-9DD	D. Bush	5/18/2009
B	Clarified content in sections 6.1, 6.5, 6.7, 6.8	D. Bush	3/10/2010
C			

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DATE 5/18/2009	DATE	DATE	DATE 5/18/2009

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1. SCOPE

1.1 This is a functional testing procedure for a Regulated Current Supply.

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 Elementary Section 9Aas

3.1.2 Check 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 the local documented procedures 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
1		Fluke 87 DMM (or Equivalent)
1	H033722	DS3820FE3 Tester
1	H033963	Blue Load Cart

6. TESTING PROCESS

6.1 Input Voltage and Connections (Do Not Apply Power)

- 6.1.1 Note:** DA indicates daughter board connection. If no pin number is given, the name of the connecting point will be visible.
- 6.1.2 Note:** HI Current MODs have a jumper at TB1-11 to TB1-12, remove it for test.
- 6.1.3** Connect YA (DA) to YB (DA), berg jumpers on DFEB board
- 6.1.4** Connect YC (DA) to YD (DA), berg jumpers on DFEB board
- 6.1.5** Connect PW (TB4-3) to MP (TB4-7), TB4 is located inside housing close to top of unit.
- 6.1.6** Connect NW (TB4-9) to MN (TB4-13), TB4 is located inside housing close to top of unit.
- 6.1.7** Connect TS (DA7) to DC (DA6).
- 6.1.8** Connect TAX (DA3) to TN (DA4)
- 6.1.9** Connect TI (DA5) to TC (DA16).
- 6.1.10** Connect TB5-1 to TB5-4, TB5 located by power transformer,
- 6.1.11** For form H connect MOV assembly (68A947257G5) – CR1, CR2, CR3, CR5 per sheet 6HF.
- 6.1.12** Connect a highly inductive load in series with a 0-10amp ammeter between FPOS(TB2-3) and FNEG(TB2-4). The inductive load must have the following characteristics.

L/R = .36 +/- .03 seconds (nominal),
R MIN = 30 +/- 1.5 Ohms at 3000 Watts
R MAX = 45 +/- 2.25 Ohms at 2000 Watts
L = 10.8 Henries nominal

Large blue inductive load between positive and 41 ohms

Note: The ammeter positive terminal should be connected to FPOS (TB2-3) and its negative terminal connected to the load.

- 6.1.13** Connect a three phase AC input voltage rated at 460 +/- 46 VRMS, at 20 amps, 60 +/- 3 HZ between L1, L2, and L3, observe phase sequence.
- 6.1.14** Do not connect, but have available, a 0-400 VDC power supply rated a 100 mA, set at zero volts.
- 6.1.15** SW1 Down

*****NOTE UNIT WILL NOT SHUT DOWN ON FAULT *****

6.2 Initial Potentiometer Settings

Preset the following components, which are located on DFEB board.

1	MFB GAIN (R1) Fully CW
2	CROSS (R2) Fully CW
3	FMAX (R3) Fully CCW
4	FLOSS (R4) Fully CCW
5	SCAL (R5) Fully CW
6	SLIM (R6) Fully CW
7	FMIN (R8) Fully CCW

6.3 Power Tests

- 6.3.1 Apply power to the fixture.
- 6.3.2 Set load for approx 36 ohm.
- 6.3.3 Measure the DC voltage between (P15) TB8-3 and ACOM (TB8-6) and adjust R9 (P15 ADJ) for +15 +/- .05 VDC.
- 6.3.4 Measure the DC voltage between (N15) TB8-5 and ACOM (TB8-6) and adjust R10 (N15 ADJ) for -15 +/- .05 VDC.
- 6.3.5 Observe that load current flows through the ammeter connected in series with the load (here after referred to as load current).
- 6.3.6 Adjust "FMAX (R3) CW and observe that there is a deviation of at least 3 amps on the ammeter.
- 6.3.7 Apply -15 +/- .1VDC between FC1 (TB1-5) and ACOM (TB8-6) and measure the output voltage between FPOS (TB2-3) and FNEG (TB2-4). Push PB1. Adjust "MIN Volts"(R7) for minimum output voltage. The minimum voltage must be +16 +/- .5 VDC.
- 6.3.8 Reduce the voltage applied to FC1 (TB1-5) to zero volts, PB1 out.

6.4 Current Regulation

- 6.4.1 Monitor the output between FPOS (TB2-3) and FNEG (TB2-4) and adjust "FMAX"(R3) complete CW. Output current must be greater **then 8.5 amps.**
- 6.4.2 Continue to monitor the output voltage and adjust "FMAX"(R3) for +150 +/- VDC.
- 6.4.3 Observe load current and record. _____Approx 4.18A_____
- 6.4.4 Increase the load resistance from 30 to 41 ohms and record load current. _____
- 6.4.5 The load current recorded in step 6.4.3 must be within +/- 4% of the load current recorded in step 6.4.4.
- 6.4.6 Decrease the load resistance from 41 to 36 ohms.

6.5 Crossover and Field Weakening

- 6.5.1 Connect the 0-400 VDC power supply between MP (TB3-3), and MN (TB3-2) with positive terminal connected to MP (TB3-3).
- 6.5.2 Observe the output voltage between FPOS (TB2-3) and FNEG (TB2-4). Adjust "FMAX"(R3) for +150 +/- 1 VDC.
- 6.5.3 Observe load current and adjust the 0-400 VDC power supply slowly until the load current starts to decrease.
- 6.5.4 Measure the voltage from MP (TB3-3) to MN (TB3-2). It should be +330 +/- 25VDC, record voltage _____. Measure the voltage from CRE (TB8-2) to ACOM (TB8-6), it must be **+5 +/- .49 VDC.**
- 6.5.5 Decrease the 0-400 VDC output voltage to zero volts and reverse its polarity (+ terminal to MN). Measure the voltage from CRE (TB8-2) to ACOM (TB8-6). It must be +14.5 +/- .6 VDC.
- 6.5.6 Repeat steps 6.5.3 and 6.5.4. The voltage where the current starts to decrease for either polarity must be within 4% of each other.
- 6.5.7 Adjust the 0-400 VDC output voltage to 240 +/-1 VDC. Adjust "CROSS" (R2) completely CCW.
- 6.5.8 Observe load current while adjusting "CROSS" (R2) CW (very slowly). Adjust "CROSS" (R2) until the load current transition from Min to Max, ammeter reading shall be approx 4A.
- 6.5.9 Increase the 0-400 VDC supply to 255 +/- 1VDC and adjust "FMIN"(R8) to obtain a load current equal to 25% of the value recorded in step 6.5.8, approx 1A.
- 6.5.10 Decrease the 0-400 VDC supply to zero volts and disconnect.

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6.6 Field Loss

- 6.6.1 Observe the load current should be approx 4A. Adjust the voltage applied between FC1 (TB1-1) and ACOM (TB8-11) toward zero volts until the load current equals 20% of the recorded value (this step). Shall be approx. 0.835A
- 6.6.2 Depress SW1 momentarily to reset the system.
- 6.6.3 Observe the status light located on the PWB and ascertain that it is "OFF".
- 6.6.4 Adjust "FLOSS"(R4) very slowly until the status light comes "ON".
- 6.6.5 Increase the voltage applied between FC1 (TB1-1) and ACOM (TB8-11) to +9 +/- .1 VDC, light should go "OFF".

6.7 Tach Monitor (Omit for DS3820FE4I)

- 6.7.1 Set "SLIM"(R6) fully CW.
- 6.7.2 Put SW1 in the UP position.
- 6.7.3 Connect the 0-400 VDC power supply between MP (TB3-3) and ACOM (TB8-11). Connect the positive terminal to MP (TB3-3). Adjust the 0-400 VDC supply to +200 +/- 1VDC.
- 6.7.4 Measure the voltage between TA (TP3) and ACOM (TB8-11). Adjust "SCAL (R5) for 0 +/- .2 VDC between TA (TP3) and ACOM (TB8-11). Depress SW1 momentarily and observe status light, it should be "OFF".
- 6.7.5 Continue to observe the status light and increase the 0-400 VDC power supply output to +253 +/-2 VDC. Adjust "SLIM (R6) CCW slowly until the status light just comes on. Reduce PS to 200V. Reset with S1. Increase PS until light comes on. Record the 0-400 VDC power supply setting approx 450V-480V.
- 6.7.6 Decrease the 0-400 VDC power supply output to zero volts and reverse its polarity – i.e., with positive terminal going to ACOM (TB8-11),
- 6.7.7 Depress SW1 momentarily to reset the system.
- 6.7.8 Leave "SLIM (R6) set as in step 6.7.5.
- 6.7.9 Increase PS until light comes on. The absolute value of the two-recorded values must be within +/- 4% of each other.
- 6.7.10 Remove the 0-400 VDC power supply from between MP (TB3-3) and ACOM (TB8-11) or MN (TB3-4).

6.7.11 Test Fault Relay by causing fault. This can be done by adjusting 0-400 VDC supply up to cause light to come on and SYSH (TB8-7) to SYSL (TB8-8) will measure 0 ohms. From SYSL (TB8-8) to NSYS (TB8-12) will be open. Clear fault with SW1 and recheck above, should switch conditions. NOTE: Relay Picks Up On Power Up and No Fault.

6.7.12 Use Reset

6.8 Test Per M1 (See table below). Be sure to read all steps in section 6.8 before starting test for better understanding.

6.8.1 POTS not specified on M1 should be left as set in standard test. If no POTS setting are specified, contact product line engineer.

6.8.2 SW1 in down position

6.8.3 Apply power.

6.8.4 To set FCL (R8) apply REF (9 volts on FC1) to FC1 temporarily. Adjust FMAX CW. Adjust REF at FC1 for M1 (FCL) volts at TP1. Reset SW1 R8 located on bottom of board. Adjust FCL POT CW until status light just comes on.

6.8.5 Apply +9 volts to FC1 (TB1-1). Set FMAX for M1 volts at TP1 using a height impedance meter like DVM. Status light should be out.

6.8.6 Apply +255 VDC between MP+ (TB3-3) and MN- (TB3-2). Set FMIN for M1 volts at TP1.

6.8.7 Remove +255 VDC REF. Set FLOSS CCW. Reset SW1. Decrease voltage at FC1 (TB1-1) to produce M1 (FLOSS) volts specified at TP1. Turn FLOSS until status light just comes on.

6.8.8 Set CROSS for M1 volts DA17 to ACOM. (Test point on daughter card).

6.8.9 Set SLIM for M1 volts DA29 to ACOM. (Test point on daughter card)

6.8.10 Remove power; set MFB for M1 ohms from AUX-2 (TB8-4) to ACOM.

6.8.11 Remove all jumpers applied during test and connect all jumpers per M1. Inspect VDM nameplate.

M1 Settings	
FMAX	5.33 VDC
FMIN	1.76 VDC
FLOSS	1.58 VDC
SLIM	11.0 VDC
FCL	5.86 VDC
MFB	0 ohms
CROSS	10.0 VDC

6.9 Jumper Setting on DS3800NFEB Daughter Board

6.9.1 TB4 is located on inside of housing, TB4-16 (PH) to TB4-14 (PW) and TB4-4 (NW) to TB4-2 (NH).

Daughter Board Settings
YA to YB
YC to YD
TS to DC
TI to TAX

6.9.2 If removed in the beginning return Jumper to TB1-11 to TB1-12.

6.10 *TEST COMPLETE *****

7. NOTES

7.1 None at this time

8. ATTACHMENTS

8.1 None at this time