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GE Energy

**Functional Testing Specification**

*Renewal Services  
Louisville, KY*

**LOU-GED-DS3820FEX**

**Test Procedure for a Field Exciter Assembly.**

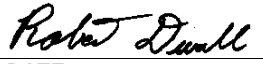
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A	Initial release	E. Rouse	05/22/00
B	Changed procedure number.	R. Duvall	6/07/02
C	Converted procedure to new format and added section for NPCPS card.	R. Duvall	10/29/02
D	Added comment to Visually check NPCPS for damage, 6.4.14	C. Wade	9/10/2008

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## Functional test procedure for a Field Exciter

### 1. SCOPE

1.1 This is a functional testing procedure for a Card.

### 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 Corresponding Documentation Folders

### 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 or cracked
- 4.2.1.2 Terminal strips / connectors broken or cracked
- 4.2.1.3 Loose wires
- 4.2.1.4 Components visually damaged
- 4.2.1.5 Capacitors leaking
- 4.2.1.6 Solder joints damaged or cold
- 4.2.1.7 Circuit board burned or de-laminated
- 4.2.1.8 Printed wire runs 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 85 DMM (or Equivalent)
1	H188521	DS3820FEX Test Fixture
1	H033779	ATE Test System
1		LCR Meter

## 6. TESTING PROCESS

### 6.1 Setup

#### 6.1.1



**Note:** WARNING! THE LOAD RESISTORS IN THE TEST FIXTURE GET VERY HOT AND HEAT UP THE CHASSIS TO A TEMPERATURE THAT CAN EASILY BURN YOU! DO NOT TEST A UNIT FOR MORE THAN 5 MINUTES TO AVOID EXCESSIVE FIXTURE HEAT.

### 6.2 Testing Procedure (NEPD)

**6.2.1** Disassemble the unit and remove the DS3800NEPD card.

**6.2.2** Take the DS3800NEPD board to the ATE system and follow test instructions on that system.

### 6.3 Testing Procedure (NPCS)

**6.3.1** Disassemble the unit and remove the DS3800NPCS card

**6.3.2** Perform a static check on the NPCS board.

**6.3.3** In addition to a standard static test perform the following measurements:

**6.3.3.1** Place BJ3, BJ4, BJ5, & BJ6 in the HIGH position and verify  $1\text{Meg} \pm 5\%$  at the following points.

From	To	Jumper = "HIGH"	Jumper = "LOW"
DD1	JAB9	1 Meg	500 K
DD2	JAB4	1 Meg	500 K
DD4	DD10	1 Meg	500 K
DD5	DD8	1 Meg	500 K

**6.3.3.2** Place BJ3, BJ4, BJ5, & BJ6 in the LOW position and verify  $500\text{ K} \pm 5\%$  using the previous points.

**6.3.3.3** With BJ1="NR" and BJ2="REV", use the LCR meter to verify a series RC circuit between JAA6 and JAA10. With the meter set to 1.0KHZ you should read approximately 50 Ohms and .1uF.

**6.3.3.4** With BJ1="REV" and BJ2="NR", use the LCR meter to verify a series RC circuit between JAA16 and JAB8. With the meter set to 1.0KHZ you should read approximately 50 Ohms and .1uF.

<p><b>LOU-GED-DS3820FEX REV. D</b></p>	<p><b>g</b></p> <p><b>GE Energy</b> <i>Renewal Services</i> <i>Louisville, KY</i></p>	<p><b>Page 4 of 5</b></p>
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#### **6.4 Testing Procedure (Whole unit)**

- 6.4.1** Re-assemble the unit.
- 6.4.2** Make sure no AC power is applied to the test fixture before making any connections.
- 6.4.3** Refer to label on the clear cover plate to record which configuration the customer has the unit setup for such as Half-Wave Reversing, Full-Wave Reversing or Full-Wave Non-Reversing.
- 6.4.4** Re-configure the unit if necessary as a Non-Reversing Full-Wave Bridge by making sure bus bar BN is wired to terminal FN but is not connected to bus bar BP.
- 6.4.5** Make sure there is a shunt resistor between the FP terminal and BP bus bar. If not, you can use a jumper wire.
- 6.4.6** Connect the yellow wires from the test fixture to the AC1 and AC2 terminals of the unit with polarity being unimportant.
- 6.4.7** Connect the red wire of the test fixture to the FP terminal of the unit and the black wire to the FN terminal.
- 6.4.8** Connect the ribbon cable from the test fixture to JE of the NEPD board.
- 6.4.9** Connect the twisted black cable from the test fixture to JX of the NEPD board.
- 6.4.10** On the fixture, make sure the power switch is in the OFF position and the Firing Angle control is turned fully CCW for minimum output.
- 6.4.11** Attach a power cord to the side of the test fixture and turn the power switch to the ON position.
- 6.4.12** Slowly turn the Firing Angle control fully CW until the full output voltage of approximately 100vdc is reached and then back fully CCW down to zero. Observe a smooth increase and decrease of the voltage on the meter while repeating this step several times.
- 6.4.13** Disconnect unit and perform a visual inspection of complete unit, especially the NPCS card for burnt or damage components.
- 6.4.14** Re-configure the unit back to the customer's original setup.

#### **6.5 \*\*\*TEST COMPLETE\*\*\***

## 7. NOTES

### Theory of Operation:

The DS3820 FEX Field Exciter Module is a single phase AC to DC converter designed to provide DC current to the field winding of a DC motor.

For this test, the two power SCR modules of the unit are setup in a non-reversing full-wave bridge configuration to check them for proper firing operation. The test fixture applies 120vac to the input side of the bridge and loads down the DC output side to approximately .7 amps at full output. The test fixture also provides isolated AC power to each of the four gate circuits on the NEPD board. Firing pulses are then sent into each of these gate circuits to fire the four SCRs of the bridge. The meter on the front of the test fixture is used to verify proper DC voltage output from the bridge.

