


 <div style="text-align: right;">GE Energy</div>		Functional Testing Specification	
<div style="text-align: right;">Parts & Repair Services Louisville, KY</div>		CAN-GEB-4006L4102	
Test Procedure for a 4006L4102AAG003			
DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column			
REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Steve Pharris	5/2/2013
B	Added to required equipment asset # H188936, changed lines 6.2.42/55/67 from .25VAC to 250mVAC, lines 6.2.47/59/71 from TTL low to common, and lines 6.2.45/57/69 from 180 to ~95 degrees.	R. Diercks	5/9/2013
C			
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PREPARED BY Steve Pharris	REVIEWED BY R. Diercks	REVIEWED BY	QUALITY APPROVAL 
DATE 5/2/2013	DATE 5/9/2013	DATE	DATE 5/7/2013

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1. SCOPE

1.1 This is a functional testing procedure for a 4006L4102AAG003.

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
1		Fluke 87 DMM (or Equivalent)
1		Dual Channel O-Scope
3		Variac
3		49.9K ohm resistors
1		Canadian Test Bench
1	H188936	Center Tap Transformer Box
1		TL00201 Universal Test Jig (51 Pin)

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6. Testing Process

6.1 Setup

- 6.1.1 Install 49.9K ohm resistors between SC7 and SC8, SC9 and SC10, SC11 and SC12
- 6.1.2 Using Canadian Test Bench make the following connections
 - +15VDC to JT8
 - 15VDC to JT19
 - Com to JT11
- 6.1.3 Connect JT5 to JT15
- 6.1.4 Set outputs of Variacs to 120VAC and connect as follows: **This is Important!!!**
 - Variac 1 Hot to 1TB1
 - Variac 1 Neutral to 1TB2
 - Variac 2 Hot to 1TB4
 - Variac 2 Neutral to 1TB3
 - Variac 3 Hot to 1TB5
 - Variac 3 Neutral to 1TB6
- 6.1.5 Install berg jumpers in position 2-3 at J1, J2, and J3

6.2 Testing Procedure

- 6.2.1 Apply DC Voltage only
- 6.2.2 Verify TP25 = +15VDC
- 6.2.3 Verify TP26 = -15VDC
- 6.2.4 Verify TP20 = 5VDC (if not check grounding on meter)
- 6.2.5 Connect one channel of scope to JW1 and other scope channel to JY10
- 6.2.6 Turn on all variacs
- 6.2.7 Verify waveforms on scope are 180 degrees out of phase
- 6.2.8 Move scope probes to JW2 and JY8
- 6.2.9 Verify waveforms on scope are 180 degrees out of phase
- 6.2.10 Move scope probes to JW3 and JY6
- 6.2.11 Verify waveforms on scope are 180 degrees out of phase
- 6.2.12 Verify TP19 = 4.3VDC (If your variacs are not connected properly this will not work)
- 6.2.13 Remove power from one variac and verify TP19 = 3.4VDC
- 6.2.14 Remove power from another variac and verify TP19 = 1.7VDC
- 6.2.15 Reapply power to all variacs

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6.2.16 Repeat steps **6.2.12** thru **6.2.15** keeping a different variac on and removing power to the other two (**what you are doing is systematically removing a different phase each time until all variacs have been used as the lone powered variac**)

6.2.17 Connect a scope probe to JT14

6.2.18 Remove power from variacs but leave the one connected to 1TB1 and 1TB2 powered up

6.2.19 Connect JT1, JT2, and JT3 to TTL Low

6.2.20 Verify Waveform is present on scope

6.2.21 Connect JT4 to TTL Low

6.2.22 Verify waveform disappears

6.2.23 Remove connection at JT4

6.2.24 Verify Waveform reappears

NOTE!!! JT1, JT2, and JT3 are address lines for the Mux output. Using whatever method you desire step thru the 8 different addresses for the Mux and verify only one address outputs the waveform. The following steps are a guideline for how to address the mux for the appropriate channel. But, In order to fully test the mux you must verify that it addresses correctly by stepping thru all eight addresses each time.

6.2.25 Remove power from variacs but leave the one connected to 1TB3 and 1TB4 powered up

6.2.26 Disconnect JT1 and Connect JT2 and JT3 to TTL Low

6.2.27 Verify Waveform is present on scope

6.2.28 Connect JT4 to TTL Low

6.2.29 Verify waveform disappears

6.2.30 Remove connection at JT4

6.2.31 Verify Waveform reappears (**Be sure to step thru the addresses**)

6.2.32 Remove power from variacs but leave the one connected to 1TB5 and 1TB6 powered up

6.2.33 Disconnect JT2 and connect JT1 and JT3 to TTL Low

6.2.34 Verify Waveform is present on scope

6.2.35 Connect JT4 to TTL Low

6.2.36 Verify waveform disappears

6.2.37 Remove connection at JT4

6.2.38 Verify Waveform reappears (**Be sure to step thru the addresses**)

6.2.39 Zero the output on all variacs and remove power from them

6.2.40 Connect one variac to center tap transformer, connect center tap to 2TB1 & X2 to 2TB2.

6.2.41 Monitor CT-Transformer with DMM for duration of test

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- 6.2.42** Use variac supply to output **250mVAC**
- 6.2.43** Connect JT2 and JT1 to common.
- 6.2.44** Connect one channel of scope to TP8 and other scope channel to JW4
- 6.2.45** Verify waveforms are ~95 degrees out of phase
- 6.2.46** Connect one channel of scope to JT14
- 6.2.47** Disconnect JT2 and JT1 and connect JT3 to common.
- 6.2.48** Verify Waveform is present on scope
- 6.2.49** Connect JT4 to TTL Low
- 6.2.50** Verify waveform disappears
- 6.2.51** Remove connection at JT4
- 6.2.52** Verify Waveform reappears **(Be sure to step thru the addresses)**
- 6.2.53** Turn variac off, move output to 2TB3 and 2TB4.
- 6.2.54** Monitor variac output with DMM for duration of test
- 6.2.55** Use variac supply to output **250mVAC**
- 6.2.56** Connect one channel of scope to TP10 and other scope channel to JW5
- 6.2.57** Verify waveforms are ~95 degrees out of phase
- 6.2.58** Connect one channel of scope to JT14
- 6.2.59** Disconnect JT3 and connect JT1 and JT2 to common
- 6.2.60** Verify Waveform is present on scope
- 6.2.61** Connect JT4 to TTL Low
- 6.2.62** Verify waveform disappears
- 6.2.63** Remove connection at JT4
- 6.2.64** Verify Waveform reappears **(Be sure to step thru the addresses)**
- 6.2.65** Turn variac off, move output to 2TB5 and 2TB6.
- 6.2.66** Monitor variac output with DMM for duration of test
- 6.2.67** Use variac supply to output **250mVAC**
- 6.2.68** Connect one channel of scope to TP12 and other scope channel to JW6
- 6.2.69** Verify waveforms are ~95 degrees out of phase
- 6.2.70** Connect one channel of scope to JT14
- 6.2.71** Disconnect JT1 and JT3 and connect JT2 to common
- 6.2.72** Verify Waveform is present on scope
- 6.2.73** Connect JT4 to TTL Low
- 6.2.74** Verify waveform disappears
- 6.2.75** Remove connection at JT4

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6.2.76 Verify Waveform reappears **(Be sure to step thru the addresses)**

6.2.77 Remove resistors installed in saddle clamps

6.3 *TEST COMPLETE *****

7. Notes

7.1 None at this time.

8. Attachments

8.1 None at this time.