



GE Energy

## Functional Testing Specification

*Parts & Repair Operations  
Louisville, KY*

**LOU-GED- IC3655A105  
Protect Module**

### Test Procedure for an IC3655A105 Protect Module

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<b>PREPARED BY</b> Dan Laemmle	<b>REVIEWED BY</b>	<b>REVIEWED BY</b>	<b>QUALITY APPROVAL</b> Charlie Wade
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## 1. SCOPE

1.1 This is a functional testing procedure for a Protect Module.

## 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 Shop Documentation

## 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		Power Supply 0-30VDC

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## 6. TESTING PROCESS

### 6.1 Setup

- 6.1.1** Make note of customer settings of jumpers on SSND card because jumpers are removed to test card on ATE. Static test the regulator transistor on the heat sink on the base unit before powering up module. A shorted Q10 will damage parts on the SSND card.



**Note: This procedure is used to test the complete module after the five circuit boards have been repaired. Test the cards on the appropriate ATE system, except for the “TEST” card, which is static tested.**

### 6.2 Testing Procedure

- 6.2.1** Jumper LPF to LPF1 and +27 to 400 on the SSND card. Turn the control knobs on the SSNE and SPFA cards fully counterclockwise. Install cards in module.
- 6.2.2** Jumper H1 to H3 and H2 to H4 on TB1 terminal strip. Connect 120VAC power cord to H1 and H4.
- 6.2.3** Preset a DC power supply to 27VDC and connect the + side to –VF and the – side to +VF terminals on TB1 terminal strip.
- 6.2.4** Apply 120VAC and 27VDC simultaneously to module. The Trip relay will close and the light inside it will come on. If other relays come on, pressing reset button on TEST card should cause Trip only to remain on. No lamps on the TEST card should be on and the meter on the SPFA card should be centered on 1. If not, adjust R65 pot through hole in SPFA card front. Check for approx. 27VDC from com to 27V terminals on SSND card.
- 6.2.5** Verify that TRP1 to TRP2 on TB2 terminal strip is less than .5 ohm. Best policy is to replace all three relays as part of module repair.
- 6.2.6** Verify that FAR1 to FAR2 and FCX1 to FCX2 terminals on TB2 are open circuit.
- 6.2.7** Press and hold down the TEST SCP button on the TEST card and verify that after approx. 3 seconds, SCP light comes on and TRP relay opens (relay lamp goes out). Release button. Verify that TRP1 to TRP2 terminals are open circuit.
- 6.2.8** Press and release the reset button on TEST card and SCP lamp will go out and TRP relay will close.
- 6.2.9** Turn off the 27VDC power supply and, first the FAR relay, then, after approx 3 seconds, the FCX relay will close. Verify with an ohmmeter that FAR1 to FAR2 and FCX1 to FCX2 terminals are less than .5 ohm.

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**6.2.10** With all relays closed, turn the TRIP PF adjustment on the SPFA card full clockwise and verify that the TEST PFR lamp on the TEST card lights and that the FAR relay mostly stays on but every 3-5 seconds cycles off with the FCX relay momentarily closing and releasing. The TRP relay drops out and stays off.

**6.2.11** Remove power and return all jumpers on SSND card to original customer settings.

**6.3 Post Testing Burn-in**                      **Required**    ☐ **Yes**   ☒ **No**



**Note:** All MARK I, II, & III Turbine related cards require a post testing burn-in of 100 hours.

**6.3.1** Apply BUS or Operational power to the card for a period of 100 hours.

**6.3.2** Re-test card while warm using the above procedure.

**6.4 \*\*\*TEST COMPLETE \*\*\***

## **7. NOTES**

**7.1**

## **8. ATTACHMENTS**

**8.1**