g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-IS200TRPAH1Axx**

Test Procedure for a

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	Dan Waddy	12\20\2017
B	Added E-Stop/TRP Input testing (Step 7.2)	Dan Waddy	4/8/2020
C			

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D. Waddy			L. Groves
DATE	**DATE**	**DATE**	**DATE**
12/20/2017			12/20/2017

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 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		Tenma Dual Output Supply

6. Initial Testing

6.1 This test is intended for TRPAH1 only. These testing procedures cover TMR functionality testing with 24VDC contacts. Testing of cards in the H2, H3, or H4 groups will require further test development.

6.2 Begin testing by inspecting the card for damaged components such as blown fuses, shorted MOV's, missing parts, or any other visible defects.

6.3 Verify ID chips.

6.4 Verify continuity between the following points listed below in ***Table 1.***

From	To
PR3 (pins 20, 23, 41, and 43)	JR4 (pins 1 and 18)
PR3 (pins 1, 21, 22, and 42)	JR4 (pins 2, 17, and 21)
PS3 (pins 20, 23, 41, and 43)	JS4 (pins 1 and 18)
PS3 (pins 1, 21, 22, and 42)	JS4 (pins 2, 17, and 21)
PT3 (pins 20, 23, 41, and 43)	JT4 (pins 1 and 18)
PT3 (pins 1, 21, 22, and 42)	JT4 (pins 2, 17, and 21)

Table 1.

7. Testing Process

7.1 Apply 28VDC to pin 1 of JR4, JS4, and JT4 connectors. Connect 28VDC com (PCOM) to pin 2 of the same connectors.

7.2 Verify E-Stop/TRP input by connecting a jumper between TB1-16 and TB1-18.

7.2.1 With a voltmeter across TB1-17(+) and TB1-15(-) there should be approximately 24VDC.

7.2.1.1 ***If the 24VDC is not present C94 is likely defective.***

7.2.2 Disconnect the jumper and voltmeter.

7.3 The ESTOP circuit needs to be energized for testing by applying a 24VDC input. Connect the positive 24VDC lead to TB1-16. Connect the negative 24VDC lead to TB1-15.

7.3.1 Verify that the ESTOP circuitry is operating by measuring approximately 6.5VDC between JR4-33, JS4-33, or JT4-33 and PCOM.

7.4 Connect a multimeter set to measure resistance to pins TB1-9 and TB1-10.

7.4.1 The multimeter should read approximately 193K ohms before the relay is engaged. Once the pins are grounded the meter should read as a short (less than 1 ohm).

7.4.2 K1 relays are measured at TB1-9 and TB1-10 while K2 relays are measured at TB1-13 and TB1-14.

7.5 Leaving 28VDC applied and the ESTOP circuit energized, verify TMR relay functionality by grounding at least two of the three pins JR4-28, JS4-28, or JT4-28. The same relay can also be energized by grounding at least two of the three pins PR3-35, PS3-35, or PT3-35. Verify the remaining relay circuitry listed below in ***Table 2.***

Relay	Input	Output
K1	JR4-28, JS4-28, or JT4-28	TB1-9 and TB1-10
K1	PR3-35, PS3-35, or PT3-35	TB1-9 and TB1-10
K2	JR4-29, JS4-29, or JT4-29	TB1-13 and TB1-14
K2	PR3-14, PS3-14, or PT3-14	TB1-13 and TB1-14

Table 2.

7.6 Post Testing Burn-in Required ___ Yes _x__ No

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

7.7 ***TEST COMPLETE ***

8. Notes

8.1 None at this time?

9. Attachments

9.1 None at this time?