

**g**

GE Energy

**Functional Testing Specification**

*Inspection & Repair Services  
Louisville, KY*

**LOU-GEF  
PWMC3/4 Control Board**

**Test Procedure for PWMC3/4 Control Card**

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	C. Wade	06/06/2005
B			
C			

© COPYRIGHT GENERAL ELECTRIC COMPANY

Hard copies are uncontrolled and are for reference only.

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

<b>PREPARED BY</b> Charlie Wade	<b>REVIEWED BY</b>	<b>REVIEWED BY</b>	<b>QUALITY APPROVAL</b> <i>Charlie Wade</i>
<b>DATE</b> 06/06/2005	<b>DATE</b>	<b>DATE</b>	<b>DATE</b> 6/6/2005

<p>LOU-GEF PWMC3/4 Control Card REV. A</p>	<p><b>g</b></p> <p><b>GE Energy</b></p> <p><i>Inspection &amp; Repair Services Louisville, KY</i></p>	<p>Page 2 of 3</p>
----------------------------------------------------	-----------------------------------------------------------------------------------------------------------	--------------------

Functional test procedure for PWMC3 and PWMC4 control cards.

## 1. **SCOPE**

- 1.1 This specification provides the Engineering Requirements for testing PWMC3 and PWMC4 control cards. The process applies only to control cards model number 44A398795-G01 thru G04.

## 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 **GEK-45605** PWM Model II Drives
  - 3.1.2 **44C283831** PWMC3 & PWMC4 Schematics

## 4. **ENGINEERING REQUIREMENTS**

### 4.1 Description


- 4.1.1 PWM Model II drives are used in conjunction with GE controls to provide power and control for their complement DC motors. There are generally two power boards and one control board use with each drive. The control board in each drive interprets the signals from the control and applies them to the power board that then applies the correct power and direction to the DC motor.

### 4.2 Equipment Cleaning

- 4.2.1 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.

### 4.3 Equipment Inspection

- 4.3.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:
- 4.3.1.1 Wires broken or cracked
  - 4.3.1.2 Terminal strips / connectors broken or cracked
  - 4.3.1.3 Loose wires
  - 4.3.1.4 Components visually damaged
  - 4.3.1.5 Capacitors leaking
  - 4.3.1.6 Solder joints damaged or cold
  - 4.3.1.7 Circuit board burned or de-laminated
  - 4.3.1.8 Printed wire runs burned or damaged

LOU-GEF PWMC3/4 Control Card REV. A	 <b>GE Energy</b> <i>Inspection &amp; Repair Services</i> Louisville, KY	Page 3 of 3
-------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------

## **EQUIPMENT REQUIRED**

- 4.4** 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.

<b>Qty</b>	<b>Reference #</b>	<b>Description</b>
1	GE MC550 Control	550 Control with PWM Drives Attached
1	GE MC2000 Control	2000 Control with PWM Drives Attached
1	Huntron Tracker	Signal Analyzer
1	Fluke 77 or equivalent	Ohm Meter

## **5. TESTING PROCESS**

### **5.1 Pre Test Requirement**

- 5.1.1** Check and compare active circuits using a Huntron Tracker, if needed compare BUT (board under test) to a KGB (known good card). Check resistance values of resistors.

### **5.2 Functionally testing a PWM control cards.**

- 5.2.1** It is recommended that the control be tested to check its integrity prior to installing the BUT.
- 5.2.2** Install board into Y or Z axis drive on our MC550/PWM control.
- 5.2.3** Close disconnect on MC550, turn on control, enable drives, press cycle start and tape reader should begin to read and axis should begin to spin. If control is noisy you may have to adjust gain pot or change out gain components.
- 5.2.4** Verify that drives run smoothly and LED has not tripped.
- 5.2.5** After tape finishes reading and rewinds, disable drives, turn off control.
- 5.2.6** Shut down disconnect switch on front and remove BUT and reinstall KGB and verify control still functions properly. Go to MC2000 control next.
- 5.2.7** Install board into X, Y or A axis drive on our MC2000/PWM control.
- 5.2.8** Close disconnect, turn on control, once control boots up press control on again and you should hear the loop contactors engage, go to INDEX and select the Scooby program, then press POSN, then AUTO, and then press CYCLE START and axis' should begin to spin. If control is noisy you may have to adjust gain pot or change out gain components.
- 5.2.9** Verify that drives run smoothly and LED has not tripped.
- 5.2.10** Board should run for at least one hour, then power down control.

### **5.3 \*\*\*TEST COMPLETE \*\*\***

## **6. REFERENCES**

- 6.1** You can not always depend on the Huntron to tell you whether or not the MC672 op amps are bad. You may have to install a socket and test the chip. The only replacement I have heard of is ECG.
- 6.2** On power boards if card is covered with oil you may have to remove all power transistors and clean out underneath the heat sinks. Oil can cause all kinds of faults when spread throughout the heat sinks.