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GE Energy

**Functional Testing Specification***Parts & Repair Operations  
Louisville, KY***LOU-GEF-DFBM2000****Test Procedure for DFBM2000\*3 and DFBM200\*6 Feedback Boards****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column

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## Functional test procedure for DFBM2000\*3 and DFBM2000\*6 Printed Circuit Boards

### 1. **SCOPE**

1.1 This is a functional test procedure for testing the MC2000 DFBM2000\*3 and DFBM2000\*6 printed circuit boards.

### 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 **DFBM2000 DESCRIPTION OF OPERATION.**

### 4. **ENGINEERING REQUIREMENTS**

#### 4.1 Description

4.1.1 The DFBM2000 Board monitors the integrity of the PA and –PA, PB and –PB, and PZ and –PZ signals on a per phase basis.

#### 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 site specific SRA's 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

## 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	MC2000 Control	Test Control with Axis cart
1	MB:3 Board	MB3: 7.59MC.Exec
1	DFBM2000 Tester	Test Box with Cables
1	Cable Break-out 44A718650-G01	PL Cable break-out and Jumpers
1	Dual DC Power Supply	+5V and +24V outputs

## 6. **TESTING PROCESS**

### 6.1 **Pre Test Procedure**

- 6.1.1** Install DFBM2000\*3 or \*6 Board into MC2000 Rack next to AXS03 Board.
- 6.1.2** Set up DFBM2000 and Test Cables with are marked as to which PL it is connected to. To DFBM200 Board, Tester, and AXS03 board. At this time connect Test Cables only to PL1-7 on DFBM2000 Board. PL8-PL14 is on DRBM2000\*6 Board which will be tested later.
- 6.1.3** Set up Power Supply for +5 volt and +24 Volt output, connected +5V, +24V, and – (COM) to DFBM200 Input Banana Jacks as marked.
- 6.1.4** Connect Axis Cart ENCORED to DFBM2000Tester, PL3 to Axis1, PL4 to Axis 2, and PL5 to Axis3. \*\*\*All Cables should be connected to DFBM200 Test from AXIS Cart, AXS03 Board, DFBM2000 Board, and Power Supply.
- 6.1.5** IF YOU ARE TESTING A \*6 AXIS BOARD CONNECT 14PL CABLE FROM DFBM2000 TESTER TO CABLE BREAK-OUT THE 3PL and INPUT TO 14PL ON DFBM2000 Board.

### 6.2 **Test DFBM2000\*3 and DFBM2000\*6 AXIS1-3.**

- 6.2.1** Ensure power is OFF by depressing the “Red Off” push button on the NCCS and that the motion cart inhibit is “ON” and Power Off. .
- 6.2.2** Turn MC2000 Control on by depressing “Green On” push button on the NCCS
- 6.2.3** Turn on Power Supply; All PUSH BOTTON SHOULD BE ON Except SERVORUN. NOTE: AXIS1, 2, 3 will be on for a 3 Axis board and AXIS1-6 will be on for a \*6 Axis board.

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NOTE: All LEDs on the boards in the logic rack should be on. If any LED fails to come on, turn power off and then back on. If any LED still fails to come on at the end of this time, turn power off and remove BUT.

**6.2.4** Turn on Axis Cart

**6.2.5** Depress Push Buttons AXS1, AXS2, and AXS3 should clear and lights stay off. If testing DFBM200\*3 lamps Servo run lamp will light. If testing \*6 board AXS4, AXS5, and AXS6 will turn off only when Button is held down. If Axs1-3 lights are off and Servo run will stay off. continue

**6.2.6** Testing DFBM200\*6 you have to jumper out AXS5, AXS5, and AXS6 to clear, turn off lamps and turn on Servo run. Using PL BREAK-OUT (PL14) Jumper Pin 6 to 5 to clear and turn off AXS4, jumper Pin 9 to 8 to clear and turn off AXS5, Jumper Pin12 to 11 to clear and turn off AXS6.

**6.2.7** All AXS Lamps should be off and Servo-run Light ON.

**6.2.8** Depress Control ON to take Control out of E-Stop.

**6.2.9** Jog X, Y, Z Axis.

**6.2.10** On DFBM2000 Test Box, Place Axis test Switch down to fault Axis. AXS1-3 Lights should turn on, Servo-run light goes out and MC2000 E-Stop will turn on. Test each AXS1 PA switches, AXS2 PB switches, and AXS3 PZ switches.

**6.2.11** After AXS1, AXS2, AXS3 lights are on Place all Test Switches back up and Depress AXS push buttons to clear faults (all AXS Light are off Servo-run light is on).

**6.2.12** Depress Control On to take Control out of E-Stop, JOG Axis.

### **6.3 TEST PROGRAM RUN**

**6.3.1** Control is up and on line with the 7.59MC application, then select "INDEX" on the white keys at the top of the keyboard. This should cause the control to display two or three part programs, select "MCLOOP Program" with the gray buttons, and then press POSN, one of the white keys. This should take you back to the position page.

**6.3.1.1** Run Part Program for @ 1Hour.

**6.3.1.2** IF YOU ARE TESTING A DFBM200\*3 **TEST IS COMPLETE TURNOFF CONTROL, AXIS CART AND REMOVE BOARD**, If DFBM2000\*6 **CONTINUE**.

**6.3.1.3** Turn Off Control and Axis Cart

**6.3.2** Remove all cables EXCEPT from Axis cart to DFBM2000 Tester.

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**6.3.3** Connect Cables AXS3PL to DFB9PL, AXS4PL to DFB11PL, AXS5PL to DFB13PL, Yellow Cables from Test Box DFB1 to DFB8, DFB3 to DFB10, DFB5 to DFB12, DFB14 from Test Box to DFB14, DFB7 from Test Box to PL BREAK-OUT 3 PL connection, and BREAK-OUT Input Cable to 7PL.

**6.3.4** Turn MC2000 Control on by depressing "Green On" push button on the NCCS.

**6.3.5** Turn on Power Supply; All PUSH BOTTON SHOULD BE ON Except SERVO-RUN.

NOTE: All LEDs on the boards in the logic rack should be on. If any LED fails to come on, turn power off and then back on. If any LED still fails to come on at the end of this time, turn power off and remove BUT.

**6.3.5.1** Turn on Axis Cart

**6.3.5.2** Depress Push Buttons AXS4, AXS5, and AXS6 should clear and lights stay off. AXS1, AXS2, and AX3 will turn off only when Button is held down. If Axs4-6 lights are off and Servo run will stays off. continue

**6.3.5.3** Testing DFBM200\*6 you have to jumper out AXS1, AXS2, and AXS3 to clear, turn off lamps and turn on Servo run. Using PL BREAK-OUT (PL7) Jumper Pin 12 to 8 to clear and turn off AXS1, jumper Pin 9 to 8 to clear and turn off AXS2 Jumper Pin 6 to 8, to clear and turn off AXS3

**6.3.5.4** All AXS Lamps should be off and Servo-run Light ON.

**6.3.5.5** Depress Control ON to take Control out of E-Stop.

**6.3.5.6** Jog X, Y, Z Axis.

**6.3.5.7** On DFBM2000 Test Box, Place Axis test Switch down to fault Axis. AXS4-5 Lights should turn on, Servo-run light goes out and MC2000 E-Stop will turn on. Test each AXS1 PA switches, AXS2 PB switches, and AXS3 PZ switches.

**6.3.5.8** After AXS1, AXS2, AXS3 lights are on Place all Test Switches back up and Depress AXS push buttons to clear faults (all AXS Light are off Servo-run light is on).

**6.3.5.9** Depress Control On to take Control out of E-Stop, JOG Axis.

## **6.4 TEST PROGRAM RUN**

**6.4.1** Control is up and on line with the 7.59MC application, select "INDEX" on the white keys at the top of the keyboard. This should cause the control to display two or three part programs, select "MCLOOP Program" with the gray buttons, and then press POSN, one of the white keys. This should take you back to the position page.

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**6.4.1.1** Run Part Program for @ 1Hour.

**6.4.1.2** TURNOFF CONTROL, AXIS CART AND REMOVE BOARD

**6.4.2    \*\*\*TEST COMPLETE\*\*\***

## **7.   NOTES**

**7.1**   Card can be run in either MC2000 control.