g GE Energy ***Parts & Repair Services*** ***Louisville, KY***	**Functional Testing Specification** **LOU-GEF-AC200 3-Axis PS**

Test Procedure for AC200 3 Axis Power Supplies

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	Added previously assumed details and corrected grammar.	C. Edlin	10/28/2009
C	Added attachment	C. Edlin	1/8/2010
D	Added note to section 7 on temperature sensors	C. Wade	5/28/2013

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
Charlie Wade	C. Edlin		Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
06/06/2005	10/28/2009		6/6/2005

Functional test procedure for AC200 3 Axis Power Supplies

1. SCOPE

1.1 This is a functional test procedure for testing an AC200 3 Axis Power Supply. The process applies only to 3 Axis Power Supplies 44A963099-G01 & G02.

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.

3.2

GEK-83477	**Instruction Book for AC200 Instruction Manual**
GEK-25393	**Instruction Book for AC200 Application Manual**
44C721905	**Schematic for ACPS1**

4. ENGINEERING REQUIREMENTS

4.1 Description

4.1.1 The AC200 servo and spindle drives are multi-axis high performance velocity controller to power an ac squirrel cage induction motor. The servo induction motor combination is often used as a position controller in which a position error discriminator supplies the velocity command. The spindle drive can stand alone or used in combination with one or more servo drives. Combination systems using up to four AC200 drives may be mounted in one rack and operated simultaneously from one power supply.

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 and test ratios are equivalent or better.

Qty	Reference #	Description
1	H033742	AC200 4 Axis Power Supply Test Fixture
1	H188653	AC200 Servo Drive Test Fixture
1	Oscilloscope	Oscilloscope
1	DVM	Set for AC
1	DVM	Set for DC
1	Hand-held DVM	For measuring the 24VDC output

6. Testing

6.1 Static Test

6.1.1 Verify proper fuse values and continuity according to table 1.

Component Location	Amperage	Voltage	Revision
FU-1	7 Amp	250 Volt	All Units
FU-2	2 Amp	600 Volt	All Units
FU-3	10 Amp	600 Volt	G01 only
FU-3	15 Amp	600 Volt	G02 only

Table 1

6.1.2 Set the multimeter to the diode check setting.

6.1.3 For the TB200 and TB300 diagram, refer to the copy of GEK-25393, which is on the last page of this procedure.

6.1.4 Verify readings according to table 2.

Meter lead on TB300	TB300 terminal	TB200 terminal	Reading
Negative	B	A	.47
Negative	B	B	.47
Negative	B	C	.47
Negative	C	A	OL
Negative	C	B	OL
Negative	C	C	OL
Positive	B	A	OL
Positive	B	B	OL
Positive	B	C	OL
Positive	C	A	.47
Positive	C	B	.47
Positive	C	C	.47

Table 2

6.1.5 Using the Huntron Tracker on the solder side of the ACPS card, very signatures of the customers unit against signatures of the shop unit across the test points in the listed in table 3.

Form Test Point	To Test Point
TP1	TP2
TP1	TP3
TP1	TP4
TP7	TP8
TP12	TP8
TP12	TP7
TP12	TP13
TP13	TP7
TP13	TP8
Ground	TP9
TP17	TP15
Buss Bar 3	TP14
Buss Bar 3	TP16

Table 3

6.2 Connections and Setup

6.2.1 Remove FU3 from power supply.
6.2.2 Make sure that the servo drive is disconnected.
6.2.3 Slide Module into the 3-Axis test rack of the 4-Axis fixture.
6.2.4 Set the scope to 5V/division and 20uSec.
6.2.5 Connect the 1PL (80KHz Output) signal cable to the unit.
6.2.6 Connect scope to the end of the signal cable, which is labeled “80KHz Signal”.
6.2.7 The 325VDC and 230VAC output connectors are located at the top of the fixture.
6.2.8 Connect a DVM to the 325VDC output connectors.
6.2.9 Connect a DVM to the 230VAC output connectors.
6.2.10 Connect the four-wire 230VAC input to the terminals according to table 4.

Connect this wire	To
Green ground	Wing-Nut Connector
Black	Terminal 1
White	Terminal 2
Red	Terminal 3

Table 4

6.3 Power Up Supply in Signal Axis Servo Rack

6.3.1 Turn on AC power.
6.3.2 Monitor the AC and DC busses.
6.3.3 Slowly turn up the variac and verify that the 325VDC buss tracks up along with the 230VAC buss.

6.3.4 NOTE: If unit growls (sounds like it is binding) turn the power off and verify internal board connections.
6.3.5 Verify that the 80KHz signal (30V p-p square wave) is present.
6.3.6 Turn the power off.
6.3.7 **Caution: With FU-3 removed the 325VDC buss will drain slowly.** Verify buss voltage drops below 25VDC before proceeding with the next section of this test.

6.4 Test capacitor Fast Discharge Circuit

6.4.1 Reinsert FU3 into the unit.
6.4.2 The variac should already be set for 230VAC from step 5.4.3.
6.4.3 Turn the power on.
6.4.4 Ensure that the unit powers up to 325VDC immediately.
6.4.5 If the 325VDC does not come up immediately, check connections and power resistor.
6.4.6 Turn the power off.
6.4.7 Verify that the 325VDC buss drops to approximately +30 volts immediately and then slowly drains to 0VDC from there.
6.4.8 Remove unit from rack.

6.5 Power Up in AC200 Servo Drive Fixture

6.5.1 Install the unit into the AC200 Servo Drive Fixture.
6.5.2 Connect the scope to the 80KHz output jacks of the fixture.
6.5.3 Connect a meter to the 325VDC output jacks of the fixture.
6.5.4 Turn the power on.
6.5.5 Verify that the 325VDC is present.
6.5.6 Verify that the 80Khz waveform is present.
6.5.7 Turn the power off.
6.5.8 Verify that the 325VDC buss drops to approximately +30 volts immediately and then slowly drains to 0VDC from there.
6.5.9 Turn the power on.
6.5.10 Verify that the 80KHz signal is present.
6.5.11 Turn the power off.

6.6 AC200 Servo Drive Running Test

6.6.1 Place either a 50AMP or 75AMP Servo Drive on the front shelf of the Servo Drive Fixture.
6.6.2 Connect the 180-frame cable to 4PL of the Servo Drive.
6.6.3 Connect the 1PL cable of the fixture to the 1PL connector of the Servo Drive.
6.6.4 Connect the 325VDC cable to the left side TB connector of the Servo Drive.
6.6.5 Connect the motor drive input cable of the fixture to the right side TB connector of the Servo Drive.
6.6.6 Connect a meter to the 335VDC jacks on the fixture.
6.6.7 Connect a meter to the Velocity Command monitor jacks on the fixture.
6.6.8 Connect a scope to the 80KHz Signal output jacks on the fixture.

6.6.9 Ensure that the Servo Enable switch on the fixture is in the disable position (up).
6.6.10 Turn the power on.
6.6.11 Verify that the LEDs on the Servo Drive light and that the 80KHz signal and 325VDC are present.
6.6.12 Turn the Velocity Command voltage up to 10VDC.
6.6.13 Enable the Servo Drive.
6.6.14 Verify that the 180-frame motor begins running.
6.6.15 Verify that the 325VDC buss does not spike to over 390VDC when the Servo Drive gets disabled.
6.6.16 Reverse the polarity of the Velocity Command.
6.6.17 Enable the Servo Drive.
6.6.18 Verify that the 180-frame motor begins running in the opposite direction from which it ran before.
6.6.19 Verify that the 325VDC buss does not spike to over 390VDC when the Servo Drive gets disabled.
6.6.20 Enable the Servo Drive again.
6.6.21 While the motor is running, verify that the 325VDC buss does not spike to over 390VDC when reversing the polarity of the Velocity Command at least ten times in semi rapid succession.
6.6.22 Adjust the Velocity Command to 5VDC.
6.6.23 Allow the motor to run for a total of thirty minutes, reversing the Velocity Command polarity at the end of the first fifteen minutes.
6.6.24 Disable the Servo Drive.
6.6.25 Turn the power off.
6.6.26 ***TEST COMPLETE ***

7. NOTES

7.1 Starting May 24 2013, add temperature sensors to all 3-axis power supplies. This shall be done for at least the next year and reviewed yearly after that.

8. Attachment

8.1 See next page.

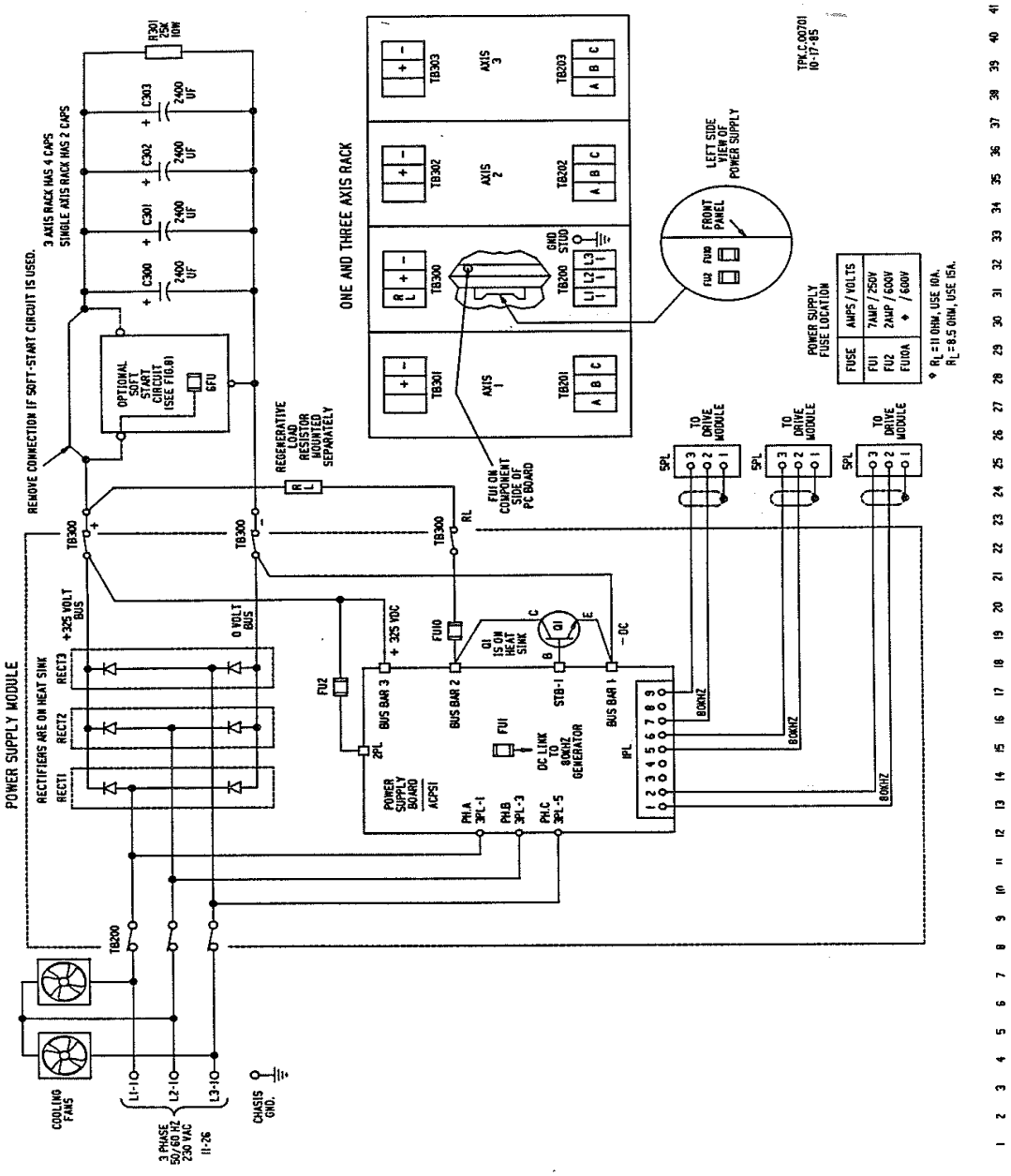

Figure 8.4
CONNECTION DIAGRAM
POWER SUPPLY MODULE FOR SINGLE AXIS AND THREE-AXIS RACKS