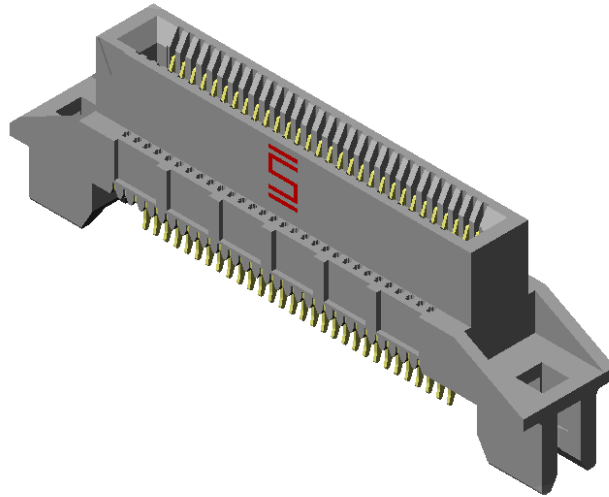




Project Number: NA		Tracking Code: TC033--0078				
Requested by: Jeremy Wooldridge		Date: 1/13/2003		Product Rev: 2		
Part #: NR-MEC8-130-01-L-D-EM2			Lot #: N/A		Tech: TC	Eng: JT
Part description: MEC8					Qty to test: 30	
Test Start: 02/13/2003		Test Completed: 3/14/2003				



**Gas Tight  
Summary Report**

**PART DESCRIPTION**

**NR-MEC8-130-01-L-D-EM2**

## CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to ISO 10012-1 and ANSI/NCSL 2540-1, as applicable.

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### SCOPE

To perform the following tests: Gas Tight.

### APPLICABLE DOCUMENTS

Standards: EIA Publication 364

### TEST SAMPLES AND PREPARATION

- 1) All materials were manufactured in accordance with the applicable product specification.
- 2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
- 3) After soldering, the parts to be used for LLCR testing were cleaned according to TLWI-0001:
  - a) Sample test boards are to be ultrasonically cleaned after test lead attachment, preparation and/or soldering using the following process.
  - b) Sample test boards are immersed into Branson 3510 cleaner containing Kyzen Ionox HC1 (or equivalent) with the following conditions:
    - i) Temperature: -----55° C +/- 5° C
    - ii) Frequency:-----40 KHz
    - iii) Immersion Time: -----5 to 10 Minutes
    - iv) Sample test boards are removed and placed into the Branson 3510 cleaner containing deionized water with the following conditions:
      - v) Temperature: -----55° C +/- 5° C
      - vi) Frequency:-----40 KHz
      - vii) Immersion Time: -----5 to 10 Minutes
      - viii) Sample test boards are removed and placed in a beaker positioned on a hot plate with a magnetic stirrer containing deionized water warmed to 55° C +/- 5° C for 1/2 to 1 minute
  - c) Upon removal, the sample test boards are rinsed for 1/2 to 1 minute in room temperature free flowing deionized water.
  - d) After the final rinse, the sample test boards are dried in an air-circulating oven for 10 to 15 minutes at 50° C +/- 5° C
  - e) Sample test boards are then allowed to set and recover to room ambient condition prior to testing.
- 4) Parts not intended for testing LLCR and DWV/IR are visually inspected and cleaned if necessary.
- 5) Any additional preparation will be noted in the individual test procedures.

**FLOWCHART**

TEST STEP	GROUP A 200 Points (min)
01	LLCR-1
02	Gas Tight
03	LLCR-2

Gas Tight = EIA-364-36A

LLCR = EIA-364-23, LLCR

use Keithley 580 in the dry circuit mode, 10 mA Max

**ATTRIBUTE DEFINITION**

Following is a brief, simplified description of attributes.

**GAS TIGHT:**

To provide method for evaluating the ability of the contacting surfaces in preventing penetration of harsh vapors which might lead to oxide formation that may degrade the electrical performance of the contact system.

- 1) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 2) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 3) The following guidelines are used to categorize the changes in LLCR as a result from stressing
  - a)  $\leq +5.0$  mOhms: ----- Stable
  - b)  $+5.1$  to  $+10.0$  mOhms: ----- Minor
  - c)  $+10.1$  to  $+15.0$  mOhms: ----- Acceptable
  - d)  $+15.1$  to  $+50.0$  mOhms: ----- Marginal
  - e)  $+50.1$  to  $+2000$  mOhms: ----- Unstable
  - f)  $>+2000$  mOhms: ----- Open Failure
- 4) Procedure:
  - a) Reference document: EIA-364-36, *Test Procedure for Determination of Gas-Tight Characteristics for Electrical Connectors, Sockets and/or Contact Systems*.
  - b) Test Conditions:
    - i) Class II--- Mated pairs of contacts assembled to their plastic housings.
    - ii) Reagent grade Nitric Acid shall be used of sufficient volume to saturate the test chamber
    - iii) The ratio of the volume of the test chamber to the surface area of the acid shall be less than 10.
    - iv) The chamber shall be saturated with the vapor for at least 15 minutes before samples are added.
    - v) Exposure time – 55 to 65 minutes.
    - vi) The samples shall be no closer to the chamber walls than 1 inches and no closer to the surface of the acid than 3 inches.
    - vii) The samples shall be dried after exposure for a minimum of 1 hour.
    - viii) Drying temperature  $50^{\circ}$  C
    - ix) The final LLCR shall be conducted within 1 hour after drying.

**SUPPLEMENTAL TESTS:**

**Qual Report # 203024A-1 Test Report**

**RESULTS****LLCR Gas Tight (200 LLCR test points)**

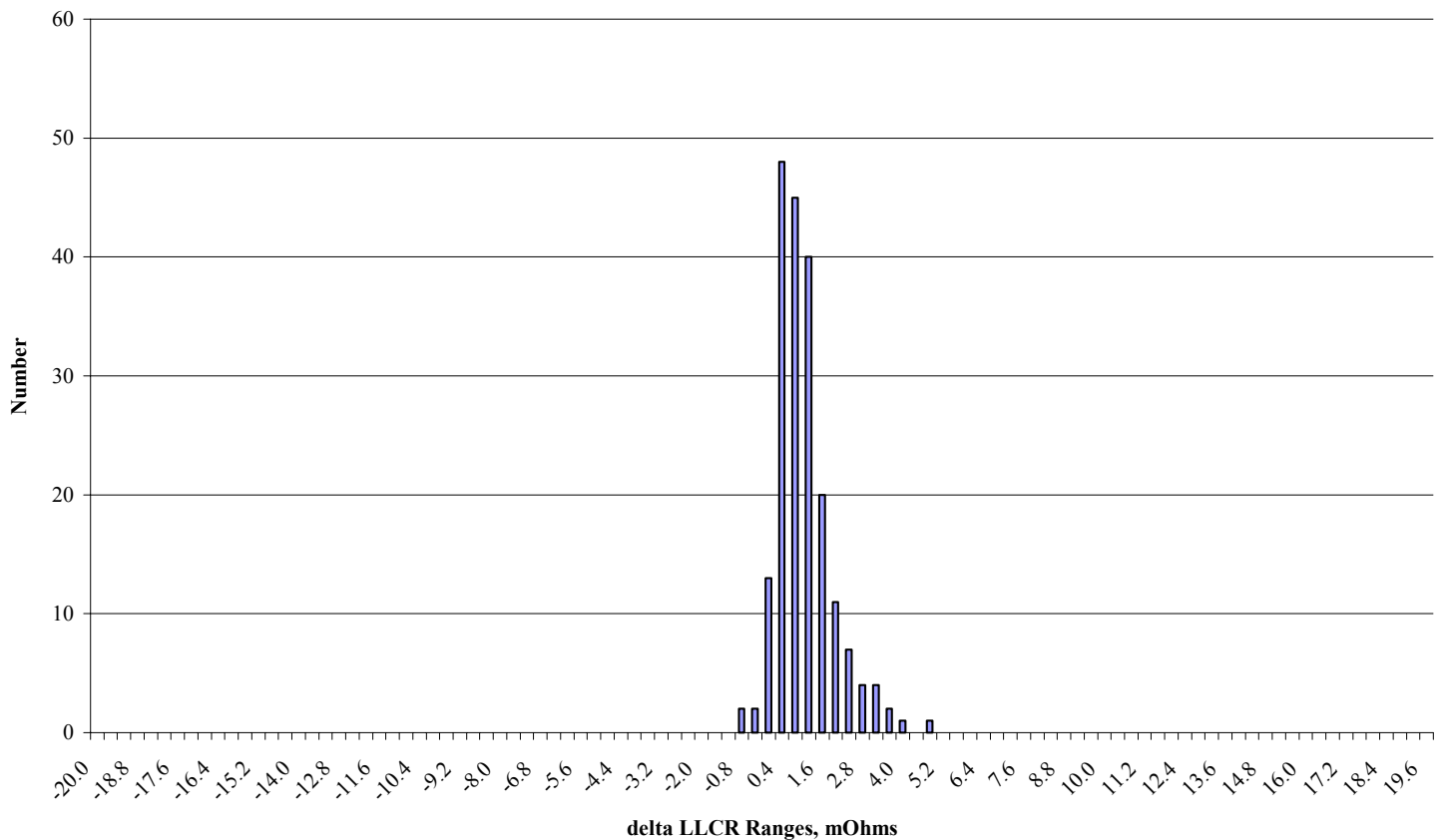
- **Initial** ----- 20.9 mOhms Max
- **Gas-Tight**
  - **<= +5.0 mOhms** ----- 200 Points ----- Stable
  - **+5.1 to +10.0 mOhms** ----- 0 Points ----- Minor
  - **+10.1 to +15.0 mOhms** ----- 0 Points ----- Acceptable
  - **+15.1 to +50.0 mOhms** ----- 0 Points ----- Marginal
  - **+50.1 to +2000 mOhms** ----- 0 Points ----- Unstable
  - **>+2000 mOhms** ----- 0 Points ----- Open Failure

**DATA SUMMARIES****GAS TIGHT:**

- 1) A total of 200 points were measured.
- 2) EIA-364-23, *Low Level Contact Resistance Test Procedure for Electrical Connectors and Sockets*.
- 3) A computer program, *LLCR 221.exe*, ensures repeatability for data acquisition.
- 4) The following guidelines are used to categorize the changes in LLCR as a result from stressing.
  - a)  $\leq +5.0$  mOhms: ----- Stable
  - b)  $+5.1$  to  $+10.0$  mOhms:----- Minor
  - c)  $+10.1$  to  $+15.0$  mOhms: ----- Acceptable
  - d)  $+15.1$  to  $+50.0$  mOhms: ----- Marginal
  - e)  $+50.1$  to  $+2000$  mOhms: ----- Unstable
  - f)  $>+2000$  mOhms:----- Open Failure

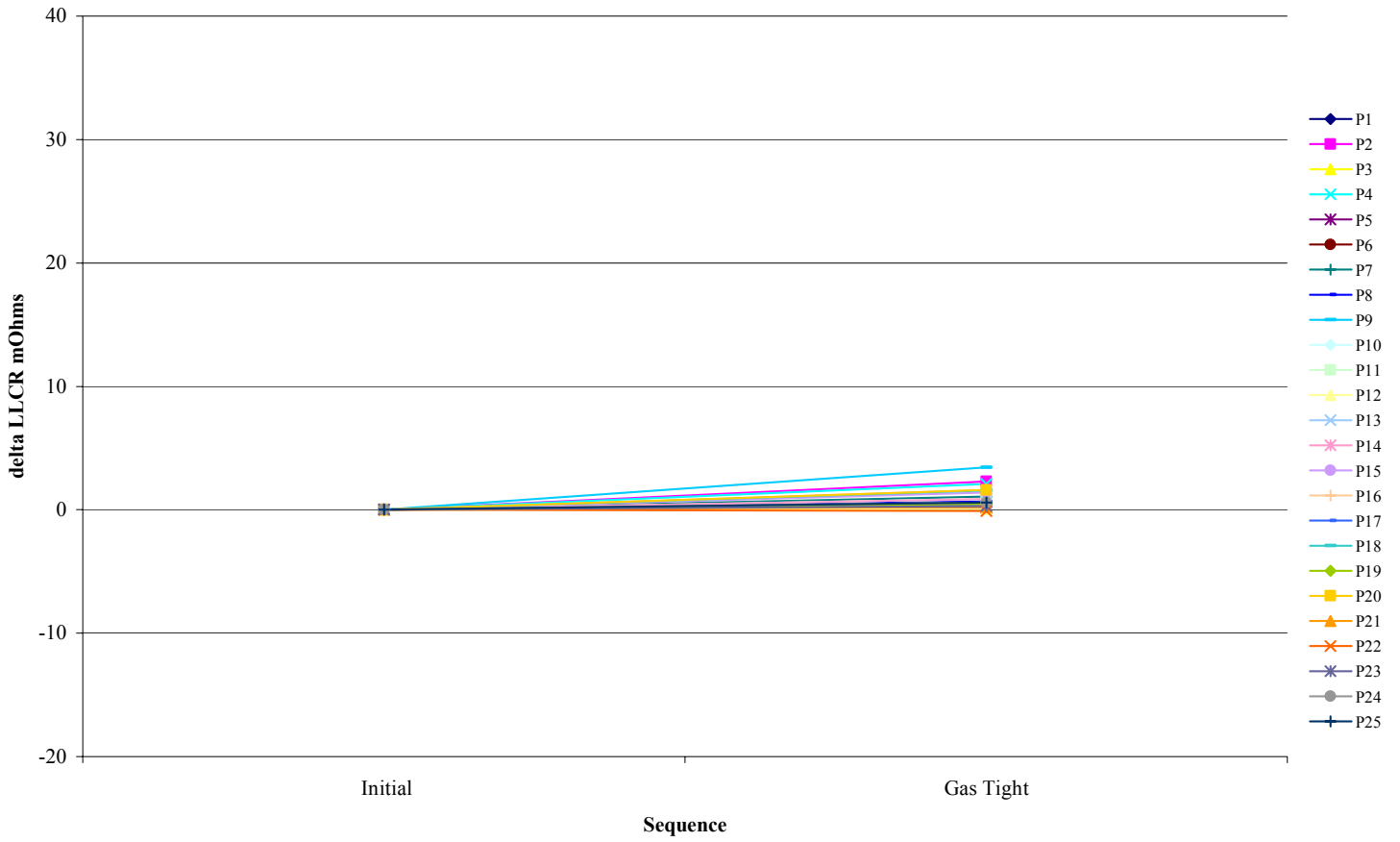
mOhm values	Actual Initial	Delta Gas Tight
Average	17.9	0.9
St. Dev.	0.8	0.9
Min	16.5	-1.2
Max	20.9	4.7
Count	200	200

**Count  
Gas Tight**



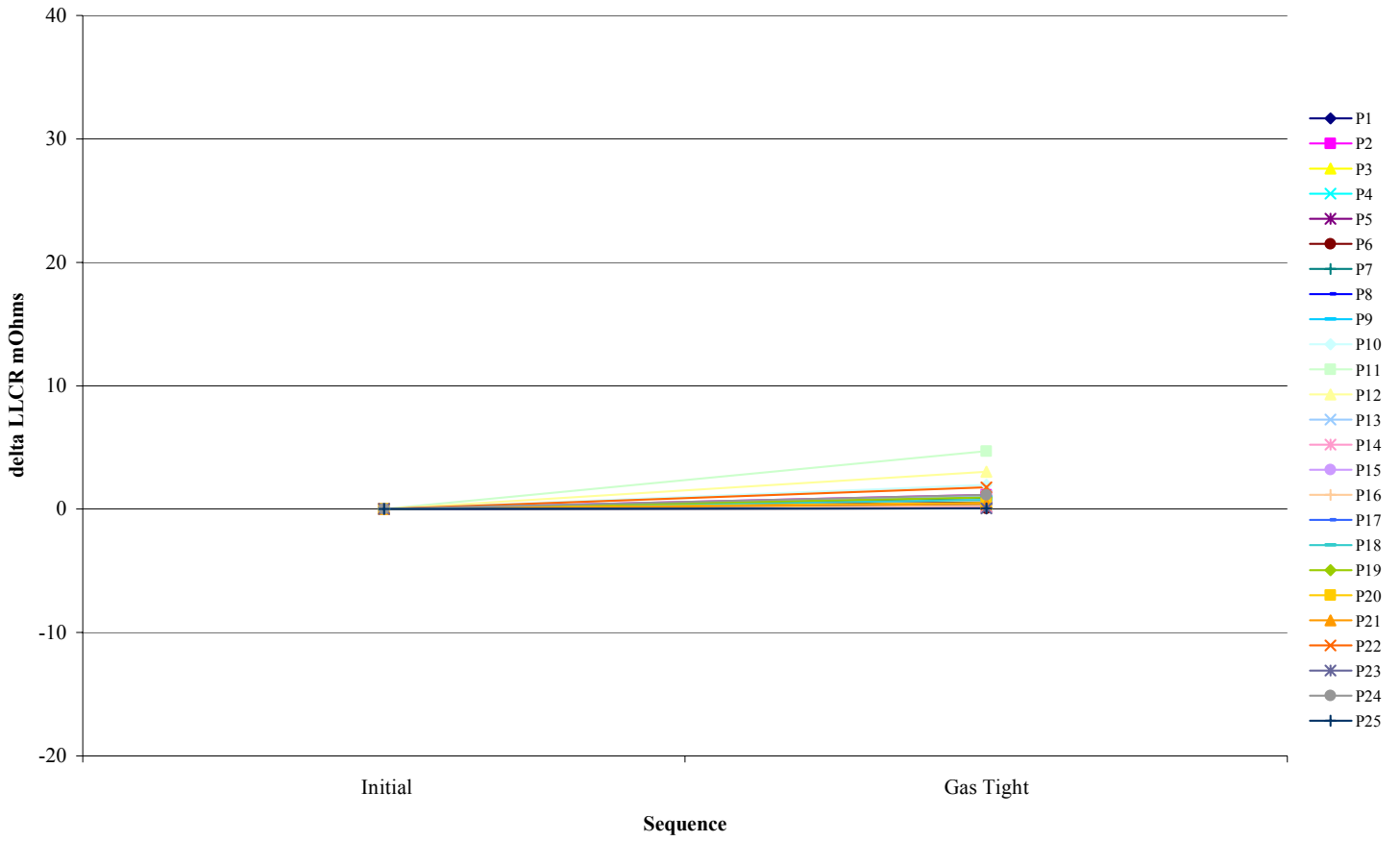
### DATA SUMMARIES Continued

#### Board #1



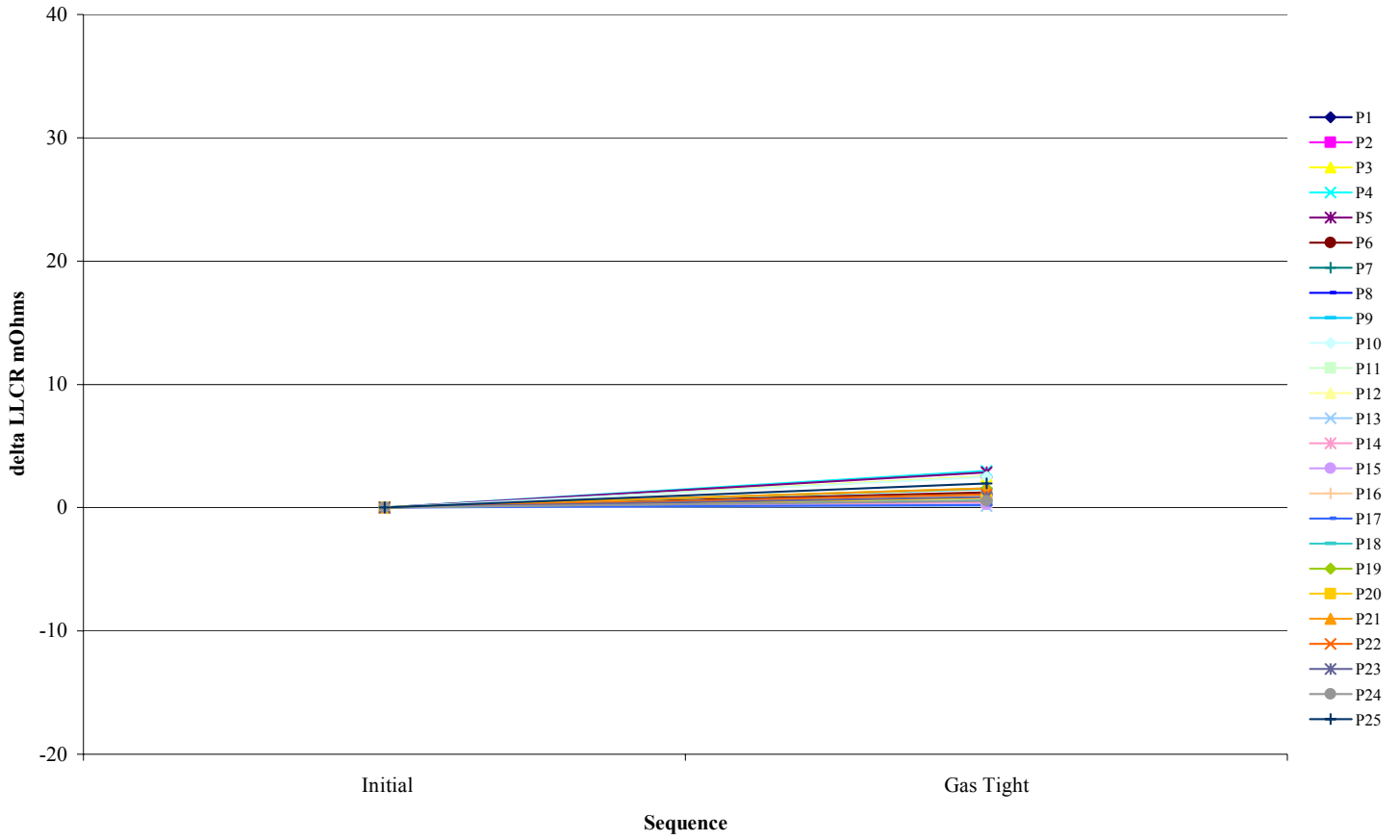
### DATA SUMMARIES Continued

#### Board #2



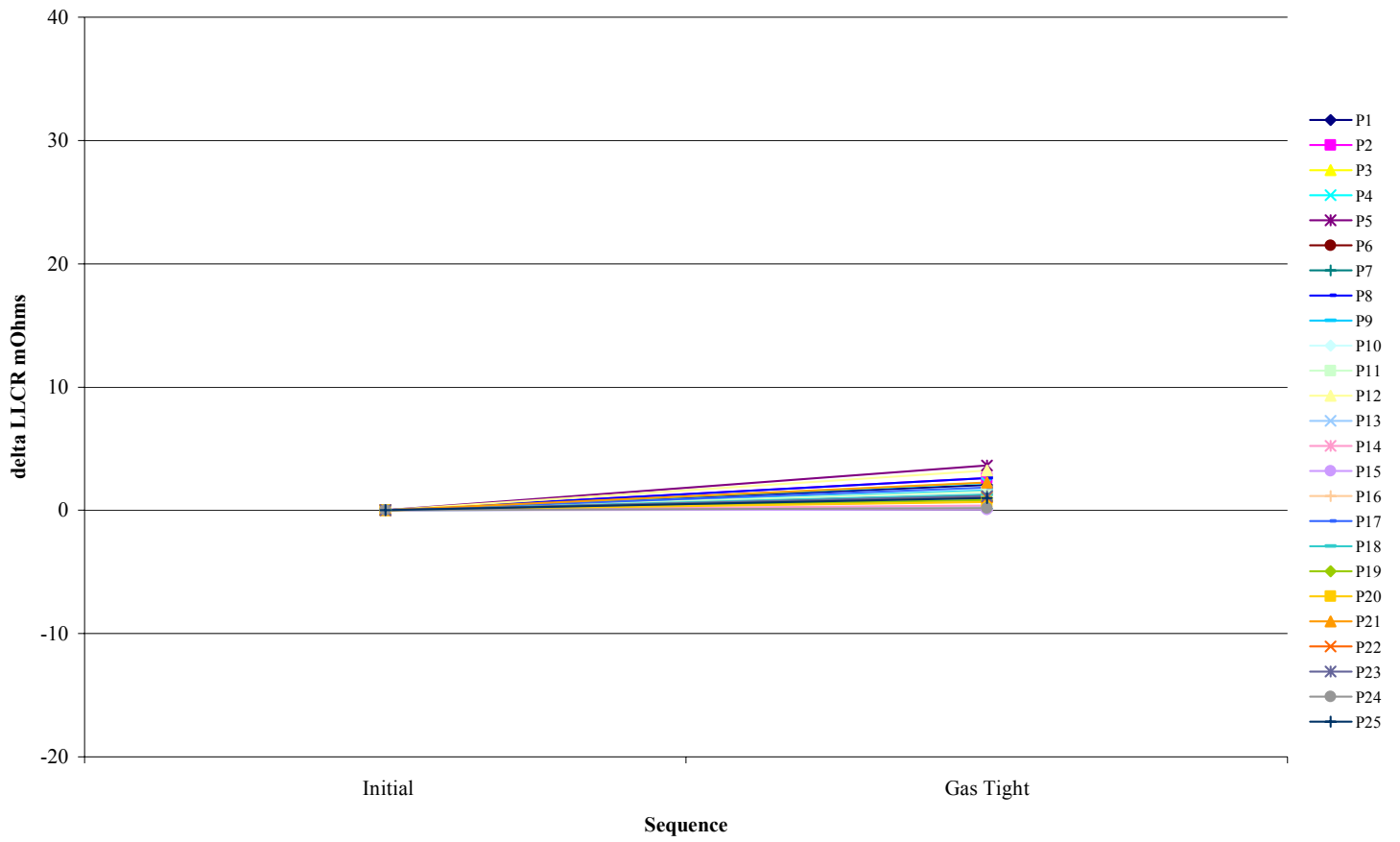
### DATA SUMMARIES Continued

#### Board #3



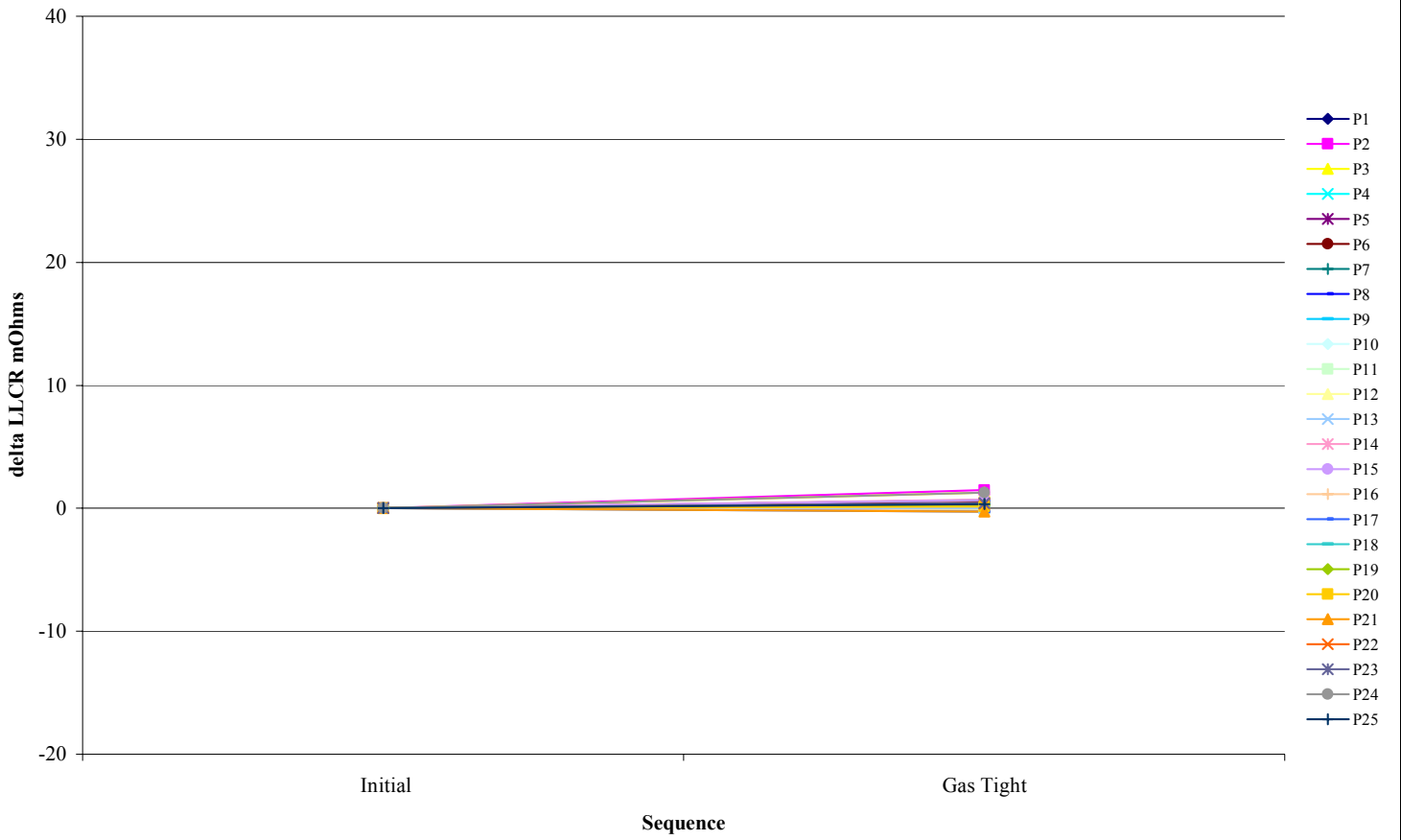
### DATA SUMMARIES Continued

#### Board #4



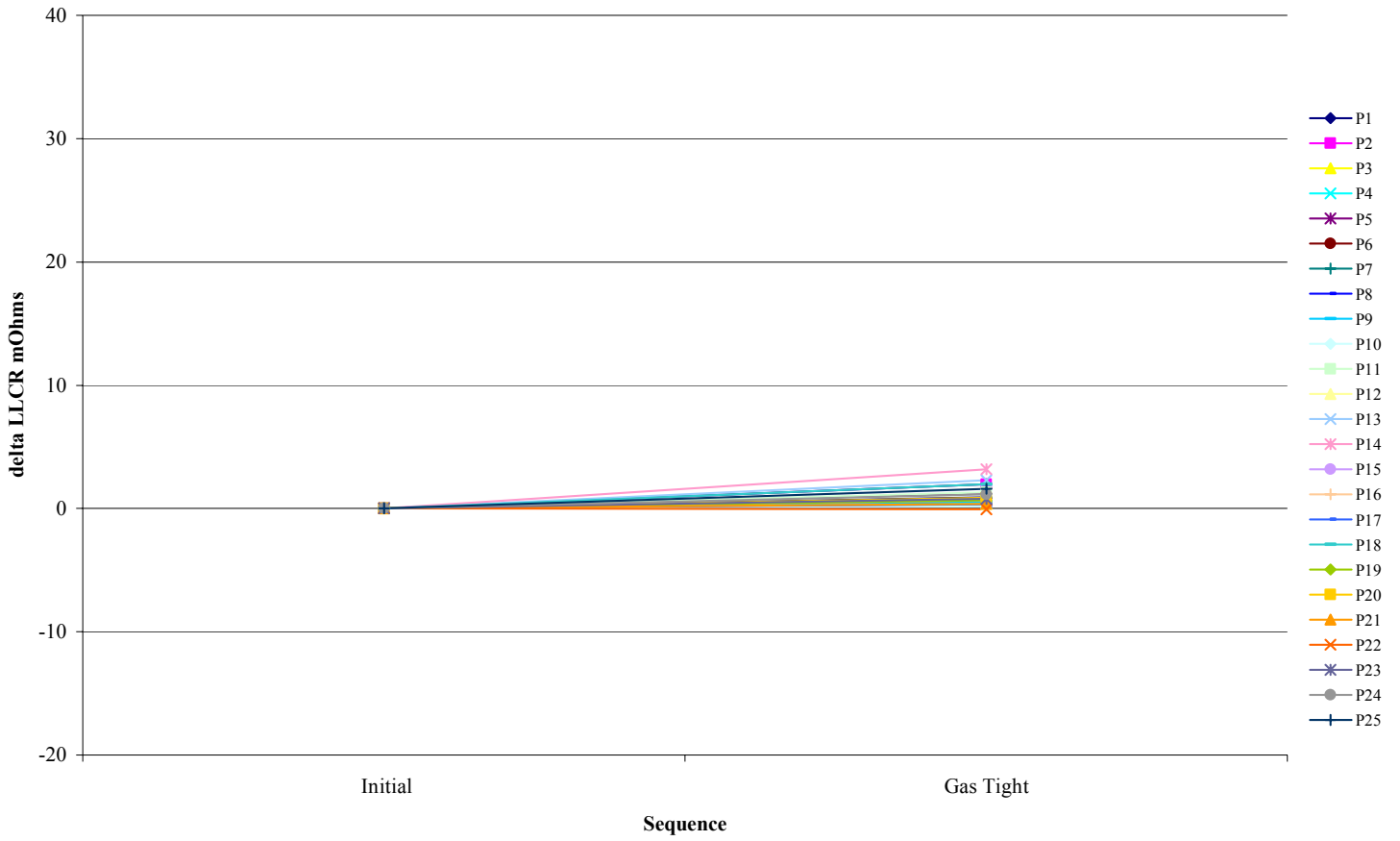
### DATA SUMMARIES Continued

#### Board #5



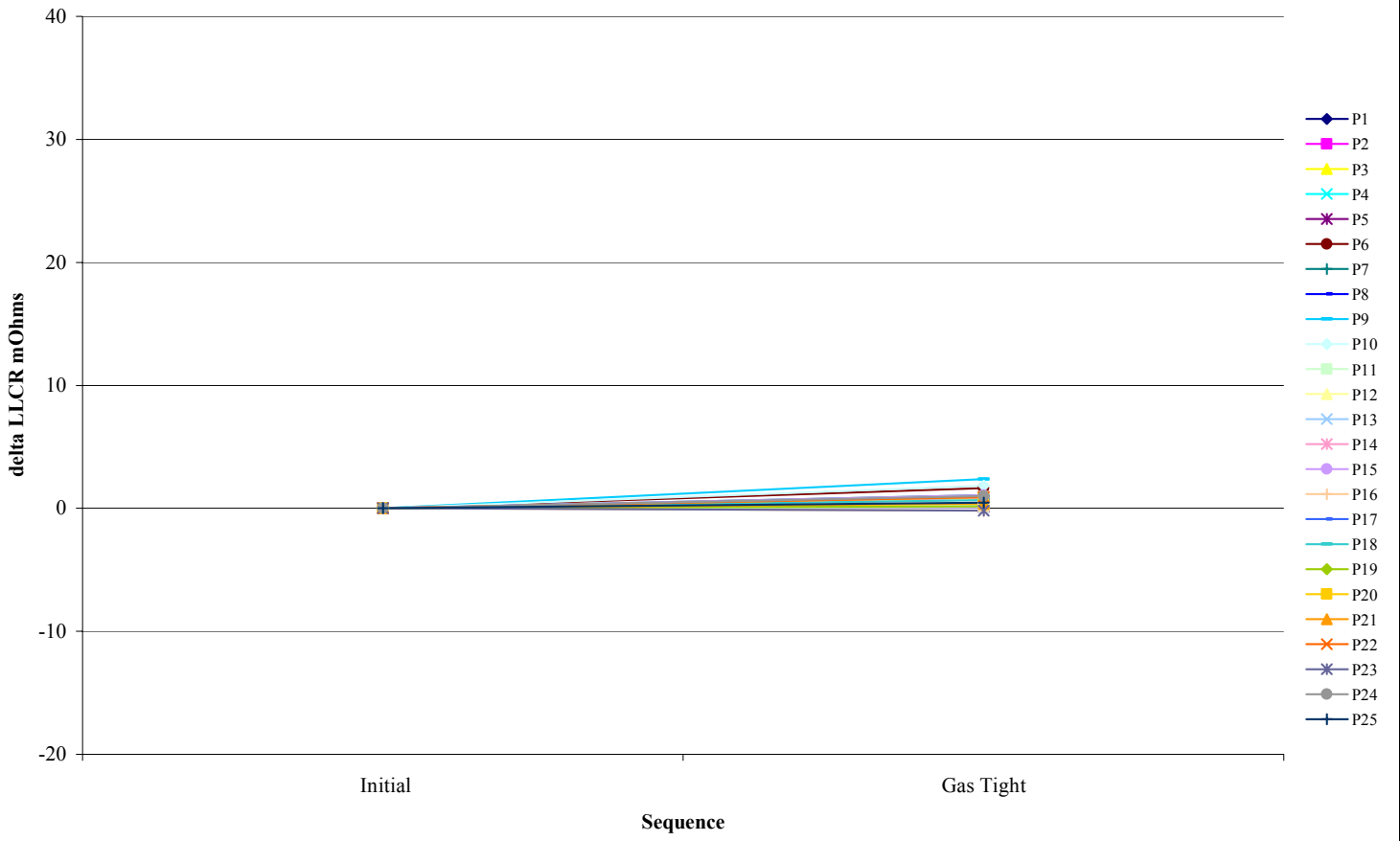
### DATA SUMMARIES Continued

#### Board #6



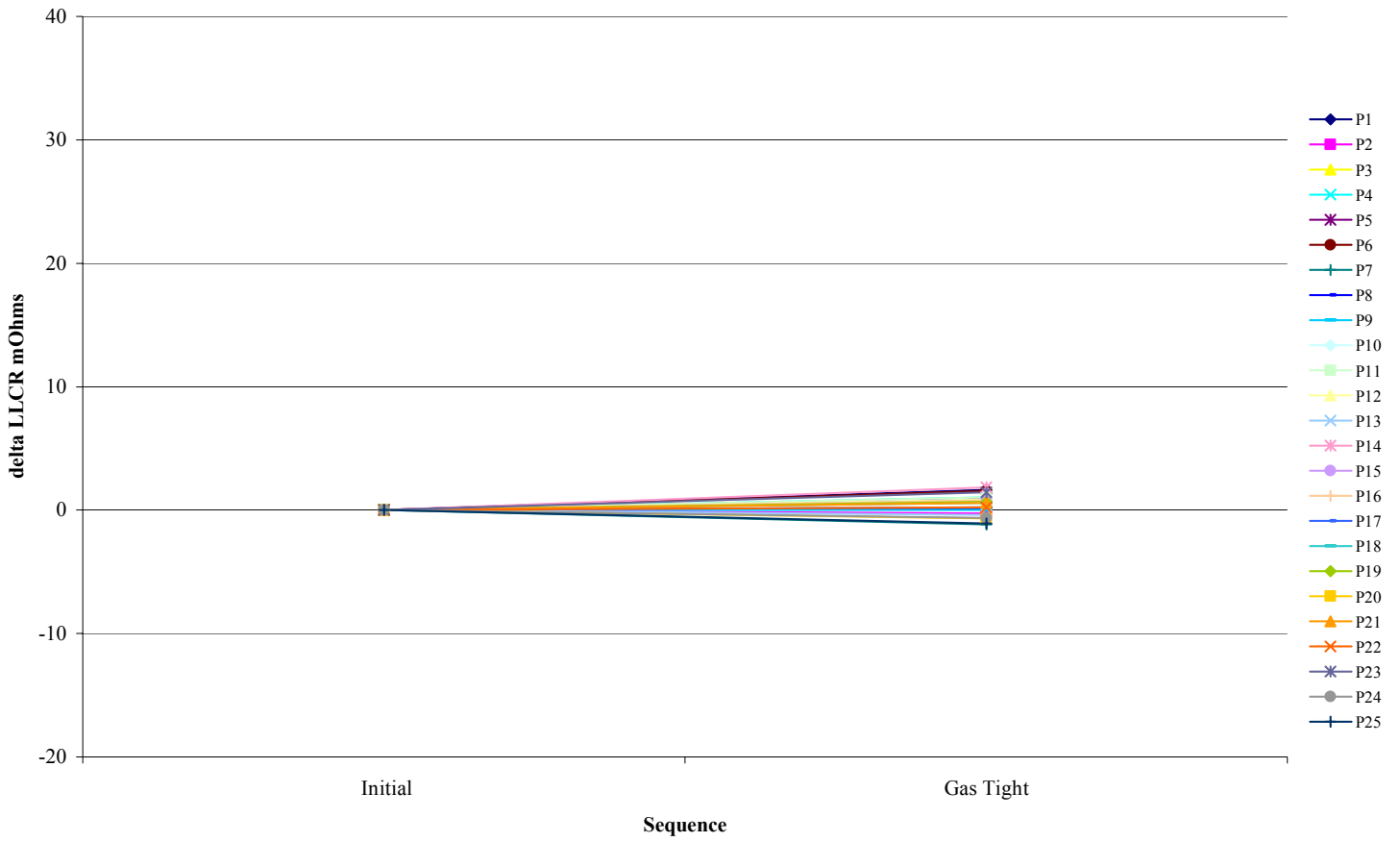
### DATA SUMMARIES Continued

#### Board #7



### DATA SUMMARIES Continued

#### Board #8



**DATA****GAS TIGHT:**

Date	Feb. 05 2003	Feb. 11 2003
Room Temp C	21	23
RH	22%	21%
Name	Troy Cook	Troy Cook

mOhm values		Actual	Delta
Board	Position	Initial	Gas Tight
1	P1	18.4	0.2
1	P2	17.8	2.3
1	P3	17.5	0.1
1	P4	18.0	2.1
1	P5	18.4	0.1
1	P6	16.8	0.4
1	P7	16.5	1.1
1	P8	17.0	0.7
1	P9	16.9	3.4
1	P10	16.8	0.4
1	P11	17.3	0.9
1	P12	17.0	0.1
1	P13	16.7	0.6
1	P14	17.1	0.9
1	P15	16.9	1.4
1	P16	17.2	1.6
1	P17	17.1	0.5
1	P18	17.1	1.6
1	P19	16.9	0.5
1	P20	17.2	1.6
1	P21	18.5	0.2
1	P22	18.0	-0.1
1	P23	17.6	0.3
1	P24	18.1	0.6
1	P25	18.0	0.6
2	P1	18.2	0.5
2	P2	17.8	1.2
2	P3	17.6	0.5
2	P4	17.9	0.4
2	P5	18.1	0.2
2	P6	17.4	0.1
2	P7	17.6	0.9
2	P8	17.7	0.4
2	P9	17.4	1.0
2	P10	16.9	2.0
2	P11	17.2	4.7
2	P12	17.3	3.0

Tracking Code: TC033--0078

Part #: NR-MEC8-130-01-L-D-EM2

Part description: MEC8

2	P13	17.3	1.1
2	P14	17.0	0.2
2	P15	17.2	0.3
2	P16	17.4	0.3
2	P17	16.9	0.4
2	P18	17.5	0.7
2	P19	17.4	1.0
2	P20	17.6	0.5
2	P21	17.9	0.4
2	P22	17.7	1.7
2	P23	18.4	0.1
2	P24	17.7	1.1
2	P25	18.4	0.0
3	P1	18.2	1.1
3	P2	17.8	0.8
3	P3	17.4	2.6
3	P4	17.9	3.0
3	P5	18.3	2.9
3	P6	17.4	1.2
3	P7	17.1	1.1
3	P8	17.7	1.0
3	P9	17.0	1.5
3	P10	17.4	2.5
3	P11	17.0	0.9
3	P12	17.1	0.6
3	P13	16.8	0.1
3	P14	17.6	0.4
3	P15	17.6	0.2
3	P16	17.1	1.0
3	P17	17.6	0.2
3	P18	17.3	0.6
3	P19	17.5	1.5
3	P20	17.5	0.8
3	P21	18.1	1.6
3	P22	18.8	1.1
3	P23	18.1	0.9
3	P24	18.7	0.5
3	P25	18.8	2.0
4	P1	18.8	2.1
4	P2	17.5	2.6
4	P3	17.5	1.0
4	P4	17.8	2.2
4	P5	18.0	3.6
4	P6	17.0	1.2
4	P7	17.0	0.1
4	P8	17.2	2.6
4	P9	17.2	1.6
4	P10	16.7	1.0
4	P11	16.7	1.5
4	P12	16.7	3.2

Tracking Code: TC033--0078

Part #: NR-MEC8-130-01-L-D-EM2

Part description: MEC8

4	P13	16.8	0.3
4	P14	16.9	0.4
4	P15	16.9	0.1
4	P16	16.5	0.7
4	P17	16.6	1.8
4	P18	17.0	1.3
4	P19	16.7	0.8
4	P20	17.3	0.7
4	P21	17.8	2.3
4	P22	17.7	1.1
4	P23	17.8	1.2
4	P24	18.5	0.2
4	P25	18.0	1.0
5	P1	18.5	0.7
5	P2	18.7	1.5
5	P3	18.2	1.3
5	P4	18.5	0.1
5	P5	18.9	0.1
5	P6	17.2	0.4
5	P7	17.6	-0.1
5	P8	17.6	-0.1
5	P9	16.9	0.1
5	P10	17.1	-0.1
5	P11	17.4	-0.1
5	P12	16.6	0.3
5	P13	17.1	0.0
5	P14	16.8	0.7
5	P15	17.1	0.7
5	P16	17.3	-0.2
5	P17	17.1	-0.3
5	P18	17.2	0.3
5	P19	17.5	0.3
5	P20	17.3	0.1
5	P21	19.2	-0.3
5	P22	18.9	0.4
5	P23	18.9	0.4
5	P24	18.3	1.3
5	P25	19.4	0.4
6	P1	18.9	0.9
6	P2	19.0	2.0
6	P3	18.1	0.7
6	P4	18.2	0.5
6	P5	18.2	1.2
6	P6	17.3	0.6
6	P7	17.5	2.0
6	P8	17.4	0.2
6	P9	17.4	0.5
6	P10	17.2	0.2
6	P11	17.0	1.3
6	P12	17.1	0.3

Tracking Code: TC033--0078

Part #: NR-MEC8-130-01-L-D-EM2

Part description: MEC8

6	P13	17.4	2.3
6	P14	17.2	3.2
6	P15	17.2	0.7
6	P16	17.2	0.7
6	P17	17.5	0.3
6	P18	17.5	2.0
6	P19	17.7	0.7
6	P20	17.5	0.9
6	P21	18.7	0.4
6	P22	18.6	-0.1
6	P23	18.8	0.8
6	P24	17.9	1.1
6	P25	18.3	1.6
7	P1	18.9	0.0
7	P2	18.5	0.1
7	P3	18.2	0.4
7	P4	18.4	0.1
7	P5	18.5	0.2
7	P6	18.2	1.6
7	P7	18.4	1.1
7	P8	18.0	0.7
7	P9	17.5	2.4
7	P10	17.8	1.8
7	P11	18.2	0.1
7	P12	18.2	0.7
7	P13	18.0	0.9
7	P14	18.0	0.9
7	P15	18.4	1.1
7	P16	18.9	-0.2
7	P17	17.7	1.0
7	P18	18.7	0.7
7	P19	18.8	0.2
7	P20	18.5	0.9
7	P21	18.6	0.4
7	P22	18.3	0.9
7	P23	18.6	-0.2
7	P24	18.7	1.0
7	P25	19.3	0.5
8	P1	18.8	1.6
8	P2	19.2	-0.3
8	P3	19.0	0.8
8	P4	19.2	1.0
8	P5	18.8	1.0
8	P6	18.7	1.5
8	P7	19.2	-1.2
8	P8	18.2	0.1
8	P9	18.5	0.0
8	P10	18.9	0.9
8	P11	18.2	1.0
8	P12	18.7	0.8

Tracking Code: TC033--0078

Part #: NR-MEC8-130-01-L-D-EM2

Part description: MEC8

8	P13	19.1	-0.4
8	P14	18.2	1.8
8	P15	18.7	0.7
8	P16	18.9	0.8
8	P17	18.2	0.2
8	P18	18.1	0.6
8	P19	18.4	0.7
8	P20	19.8	-0.7
8	P21	19.3	0.6
8	P22	19.8	0.2
8	P23	19.1	1.4
8	P24	19.8	-0.6
8	P25	20.9	-1.1

**EQUIPMENT AND CALIBRATION SCHEDULES****Equipment #:** THL-01**Description:** Temperature/Humidity Chart Recorder**Manufacturer:** Dickson**Model:** THDX**Serial #:** 9316255**Accuracy:** Temp: +/- 1C; Humidity: +/-2% RH (0 - 60%) +/- 3% RH (61 - 95%).

... Last Cal: 7/15/02, Next Cal: 7/15/03

**Equipment #:** HPM-01**Description:** Hipot Megommeter**Manufacturer:** Hipotronics**Model:** H306B-A**Serial #:** M9905004**Accuracy:** 2 % Full Scale Accuracy

... Last Cal: 6/25/02, Next Cal: 6/25/03

**Equipment #:** MO-01**Description:** Micro-Ohmmeter**Manufacturer:** Keithley**Model:** 580**Serial #:** 0772740**Accuracy:** See Manual

... Last Cal: 6/25/02, Next Cal: 6/25/03

**Equipment #:** MO-03**Description:** Multimeter /Data Acquisition System**Manufacturer:** Keithley**Model:** 2700**Serial #:** 0791975**Accuracy:** See Manual

... Last Cal: 6/25/02, Next Cal: 6/25/03