

**SOUTHWEST RESEARCH INSTITUTE
CALIBRATION LABORATORY
MEMORANDUM**

August 7, 2008

To: DON BANNON DIV20 B51

From: Institute Calibration Laboratory

Subject: Status of Calibration Supplier

Manufacturer/Model: KEITHLEY 617

Description: ELECTROMETER

Serial Number: 537418

Asset Number: 001044

Work Order Number: 303082211

Date Calibrated: August 4, 2008

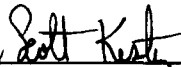
Supplier: ROTHE DEVELOPMENT, SAN ANTONIO TX - AUDIT - 648-3

Remarks:

- Supplier is on the Approved Suppliers List (ASL).
- Supplier is not on the Approved Suppliers List.
- Calibration is ISO 17025 accredited.
- Calibration is not ISO 17025 accredited.
- There is no known supplier to meet ISO 17025 accreditation at this time.

Please contact the Institute Calibration Laboratory, extension 5215, if you have any questions about the condition of this equipment or calibration documentation.

Attachment(s) 3



Reviewed by: srk mar wgh



Rothe Development, Inc.

METROLOGY SERVICES DIVISION

4614 SINCLAIR RD., SAN ANTONIO, TEXAS 78222 PH:210-648-3131

CERTIFICATE OF CALIBRATION

ISSUED TO: Southwest Research Institute (30)
6220 Culebra
San Antonio, TX 78284

MFG: Keithley
MODEL: 617
NOMEN: PROG ELECTROMETER
S/N: 537418
CUST. ID:

CAL DATE: 8/4/2008
DUE DATE:

CONTROL NO: 103 - 15981

TECHNICIAN: 4

SPECIFICATIONS: MFG

PROCEDURE: MFG

WORK ORDER: 781012657

CUSTOMER P.O.: 01882R/ST303082210/1.20.O

RECEIVED CONDITION: IN TOLERANCE

RETURNED CONDITION: IN TOLERANCE

CALIBRATION PERFORMED AT: RDMSD

CALIBRATION INTERVAL: 0

TEMPERATURE: 73.0°F

RELATIVE HUMIDITY: 38%

DATE RECEIVED: 7/28/2008

COMMENTS:

ATTACHMENTS: CALIBRATION DATA 2 SHEETS

All calibrations performed at Rothe Development, Inc. Metrology Services Division meet the requirements of ANSI / NCSL Z540-1-1994, ANSI / ISO / IEC 17025, ISO / IEC GUIDE 25, and ISO 10012-1, and are traceable to the National Institute of Standards and Technology. The collective uncertainty of the measurement(s) does not exceed 25% (TUR ≥ 4:1) of the instrument specification(s) unless noted in the COMMENTS section.

TR#	MFG	MODEL	SERIAL NO.	DUE DATE
186	GEN RAD	1689	7241583008	1/18/2009
20	FLUKE	5700A/EP	4605002	8/7/2008
235	GUILDLINE	6500A	59660	4/18/2009
258	FLUKE	5725A	6585002	8/7/2008
350	HP	3457A	2703A04894	10/28/2008
75	JRL	NMN	75	4/8/2009

APPROVED BY: 

CMS

QCO

DATE: 8/4/2008

RDMSD 1001
11/03

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ROTHER DEVELOPMENT METROLOGY SERVICES

Calibration Data: KEITHLEY 617 ELECTROMETER

Work Order # 781012657

Serial # 537418

Inst # 15981

Cust ID #

Date: 4-Aug-08

Tech: *[Signature]*

Cal Data Taken: Incoming X
Outgoing X

Condition of UUT: In Tolerance X
Out of Tolerance

INPUT CURRENT VERIFICATION

RANGE	INPUT	MIN	READING	MAX	
2 pA	CAPPED	-0.0066	0.0002	0.0066	pA

CURRENT ACCURACY

RANGE	INPUT	MIN	READING	MAX	
2 mA	ZERO CHECK	-0.001	0.000	0.001	mA
	19 mA	18.970	19.000	19.030	
2 mA	1.9 mA	1.8967	1.8996	1.9033	
200 uA	190 uA	189.70	190.01	190.30	uA
20 uA	19 uA	18.970	19.001	19.030	
2 uA	1.9 uA	1.8967	1.9000	1.9033	
200 nA	190 nA	189.51	190.01	190.49	nA
20 nA	19 nA	18.951	18.995	19.049	
2 nA	1.9 nA	1.8947	1.8996	1.9053	
200 pA	190 pA	186.95	189.97	193.05	pA
20 pA	19 pA	18.689	19.020	19.311	
2 pA	1.9 pA	1.8630	1.9042	1.9370	

COULOMB ACCURACY

RANGE	INPUT	MIN	READING	MAX	
2 nC	1V / 1000 pF	0.9949	1.0003	1.0051	nC

VOLTAGE ACCURACY

RANGE	INPUT	MIN	READING	MAX	
200 mV	190 mV	189.87	189.99	190.13	mV
	-190 mV	-189.87	-189.98	-190.13	
2 V	1.9 V	1.8990	1.8999	1.9010	
	-1.9 V	-1.8990	-1.9000	-1.9010	V
20 V	19 V	18.990	18.999	19.010	
	-19 V	-18.990	-19.000	-19.010	
200 V	190 V	189.86	189.99	190.14	
	-190 V	-189.86	-190.01	-190.14	

RESISTANCE ACCURACY

RANGE	INPUT	MIN	READING	MAX	
2 kΩ	1.8998 kΩ	1.8956	1.8998	1.9040	kΩ
20 kΩ	18.999 kΩ	18.970	18.999	19.028	
200 kΩ	190.00 kΩ	189.52	189.98	190.49	
2 MΩ	1.9000 MΩ	1.8952	1.8997	1.9049	MΩ
20 MΩ	18.997 MΩ	18.949	18.999	19.045	
200 MΩ	100.00 MΩ	99.69	100.00	100.31	
2 GΩ	.9959 GΩ	.9809	.9961	1.0109	GΩ
20 GΩ	9.978 GΩ	9.827	9.972	10.129	
200 GΩ	98.86 GΩ	97.37	98.44	100.35	

OUTPUT VOLTAGE SOURCE ACCURACY

OUTPUT SETTING	MIN	READING	MAX	
00.00 V	-0.050	0.032	0.050	V
01.00 V	0.948	1.015	1.052	
-01.00 V	-0.948	-0.970	-1.052	
10.00 V	9.93	10.00	10.07	
-10.00 V	9.93	-9.96	-10.07	
25.00 V	24.90	24.99	25.10	
-25.00 V	-24.90	-24.95	-25.10	
50.00 V	49.85	49.97	50.15	
-50.00 V	-49.85	-49.93	-50.15	
100.00 V	99.75	99.94	100.25	
-100.00 V	-99.75	-99.91	-100.25	