



# SOUTHWEST RESEARCH INSTITUTE®

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Institute Calibration Laboratory  
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Calibration Laboratory  
Certificate #0972-01

## Certificate of Calibration

**Submitted By:** DIV20

**Address:** B57

**Contact:** DON BANNON

**Manufacturer / Model:** KEITHLEY / 617

**Description:** ELECTROMETER

**Serial No:** 537418

**Asset No:** 001044

**Procedure:** KEITHLEY 617 - 3 MAY 2006

**Work Order:** 303073851

**Date Issued:** May 8, 2007

**Calibration Date:** May 8, 2007

**\*Calibration Due:** Nov 8, 2007

**Calibration Location:** Bldg. 64

**Environment:** Temp. 68.0°F Hum. 50 %RH

**\*\*Data Type:** FOUND-LEFT

**DivID/Location:** N/A

This certificate documents traceability to the National Institute of Standards and Technology (NIST) and the International System of Units (SI). The Laboratory quality system conforms to ISO/IEC 17025, 2005, ANSI/NCSL Z540-1-1994 and relevant requirements of the ISO 9000-2000 standard. This certificate shall not be reproduced, except in full, without the written approval of the Southwest Research Institute Calibration Laboratory. This certificate shall not be used to claim product endorsement by Southwest Research Institute, American Association for Laboratory Accreditation (A2LA) or any agency of the U. S. Government. Results of this calibration relate only to the instrument described above at the time of calibration and does not imply any long term stability of the instrument.

\*Determined by the customer, does not imply the instrument will remain within tolerance as any number of factors may cause an out-of-tolerance condition before this date. \*\*Found/Left = adjustment and/or repair was not required, As Left = adjusted and/or repaired was required. The client has sole responsibility for determination of in-/out-of-tolerance or compliance/noncompliance. See Remarks or attached Measurement Report with the same Work Order number for data.

Reported uncertainty calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM) and represents an expanded uncertainty with a coverage factor of k=2 to approximate a 95% confidence level.

**Remarks:** Limited Calibration: 2pA, 20pA and nC not calibrated.

### Standards Used

Asset No.	Serial No.	Manufacturer	Model	Description	Cal Due
012066	MY45040419	HEWLETT-PACKARD	3458A/OPT 002	MULTIMETER	Apr 20, 08
000101	86052	BIDDLE	72-6346-1	DECADE RESISTOR	Apr 20, 08
000182	5200003	FLUKE	5700A/EP	CALIBRATOR	Jun 01, 07
000108	7993	GENERAL RADIO	1433G	DECADE RESISTOR	Apr 06, 08

Reviewed by: ( ) wgh ( ) srk ( ) jrg ( ) blt ( ) pwc

Metrology Technician

m:\a2la1.rpt Rev date August 15, 2005

Measurements by: Joe Greagrey

Metrology Technician

Southwest Research Institute  
Calibration Laboratory  
Measurement Report

Work Order:	303073851	Mfr:	KEITHLEY	Technician:	JRG
Asset No:	001044	Model:	617	Cal Date:	08-May-07
Serial No:	537418	Type:	ELECTROMETER		
Remarks:	nC Not Cal'd				
	2 pA and 20 pA not calibrated.				

Function/Range	Test Point	TI Reading	Difference	+/-Test Limits	+/-Uncertainty	Found/Left
DC Amps	pAmps	pAmps	pAmps	pAmps	pAmps	Result
200 pA	190.00	189.44	-0.56	3.05	0.031	Pass
	nAmps	nAmps	nAmps	nAmps	nAmps	
2 nA	1.9000	1.8980	-0.0020	0.0053	0.00022	Pass
20 nA	19.000	18.990	-0.010	0.049	0.0022	Pass
200 nA	190.00	190.00	0.00	0.49	0.031	Pass
	uAmps	uAmps	uAmps	uAmps	uAmps	
2 uA	1.9000	1.8997	-0.0003	0.0033	0.00019	Pass
20 uA	19.000	19.002	0.002	0.030	0.0019	Pass
200 uA	190.00	190.04	0.04	0.30	0.019	Pass
	mAmps	mAmps	mAmps	mAmps	mAmps	
2 mA	1.9000	1.8995	-0.0005	0.0033	0.00014	Pass
20 mA	19.000	18.993	-0.007	0.030	0.0014	Pass
	nC	nC	nC	nC	nC	
2 nC	1.000	Not Cal'd	#VALUE!	0.005	0.0012	##### #####
DCV	mVolts	mVolts	mVolts	mVolts	mVolts	
200 mVolt	190.00	190.01	0.01	0.14	0.012	Pass
	Volts	Volts	Volts	Volts	Volts	
2 Volt	1.9000	1.9000	0.0000	0.0011	0.00012	Pass
20 Volt	19.000	19.000	0.000	0.011	0.0012	Pass
200 Volt	190.00	190.01	0.01	0.14	0.012	Pass
Resistance	MOhm	MOhm	MOhm	MOhm	MOhm	
20 GOhm	9961	9963	2	4	1.2	Pass
2 GOhm	1000.2	1000.1	-0.1	1.6	0.16	Pass
200 MOhm	100.00	100.05	0.05	0.31	0.10	Pass
20 MOhm	10.000	10.003	0.003	0.026	0.0012	Pass
2 MOhm	1.0000	0.9999	-0.0001	0.0026	0.00012	Pass
	kOhm	kOhm	kOhm	kOhm	kOhm	
200 kOhm	100.00	99.99	-0.01	0.26	0.012	Pass
20 kOhm	10.000	10.000	0.000	0.016	0.0017	Pass
2 kOhm	1.0000	1.0006	0.0006	0.00211	0.00010	Pass
Voltage Source	Volts	Volts	Volts	Volts	Volts	
	0.000	0.033	0.033	0.050	0.0012	Pass
	1.000	1.016	0.016	0.052	0.0012	Pass
	10.000	10.013	0.013	0.070	0.0012	Pass
	25.000	25.018	0.018	0.100	0.0015	Pass
	50.000	50.023	0.023	0.150	0.0015	Pass
	100.000	100.038	0.038	0.250	0.0012	Pass

END OF REPORT