



SOUTHWEST RESEARCH INSTITUTE®

6220 Culebra Road, P.O. Drawer 28510
Institute Quality Systems
Institute Calibration Laboratory
Phone: 210-522-5215 Fax 210-522-4834



Calibration Laboratory
Certificate #0972-01

Certificate of Calibration

Submitted By: DIV20

Address: B57

Contact: DON BANNON

Manufacturer / Model: KEITHLEY / 614

Description: ELECTROMETER

Serial No: 467374

Asset No: 001438

Procedure: KEITHLEY 614 - 10 MAY 06

Work Order: 303078512

Date Issued: Jan 21, 2008

Calibration Date: Jan 21, 2008

***Calibration Due:** Jan 21, 2009

Calibration Location: Bldg. 64

Environment: Temp. 73.0°F Hum. 40 %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/NC SL 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: nC Function not calibrated

Standards Used

Asset No.	Serial No.	Manufacturer	Model	Description	Cal Due
009829	A20602851959A	ESI	SR1050-10M	DECADE RESISTOR	Feb 15, 08
010748	20709891030E	ESI	SR1030 10 KOHM/	STANDARD RESISTOR	Apr 10, 08
000101	86052	BIDDLE	72-6346-1	DECADE RESISTOR	Apr 20, 08
000182	5200003	FLUKE	5700A/EP	CALIBRATOR	Feb 12, 08

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

Metrology Technician

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

Measurements by: Bob Trollinger

Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	303078512	Mfr.	KEITHLEY	Technician	blt
Asset No.	001438	Model	614	Cal Date.	21-Jan-08
Serial No.	467374	Type.	Electrometer		

Remarks:

nC not calibrated per customer.

Function/Range	Test Point	TI Reading	Difference	+/-Test Limits	+/-Uncertainty	Found/Left
Zero	mVolts 0.00000	mVolts 0.00000	mVolts 0.00000	mVolts 0.00001	mVolts 0.0000012	Results Pass
DCV	Volts	Volts	Volts	Volts	Volts	
0.2 V	0.19000 -0.19000	0.19000 -0.19002	0.00000 -0.00002	0.00017 0.00017	0.000022 0.000022	Pass Pass
2 Volt	1.9000 -1.9000	1.8998 -1.8997	-0.0002 0.0003	0.0016 0.0016	0.00012 0.00012	Pass Pass
20 Volt	19.000 -19.000	18.997 -18.996	-0.003 0.004	0.016 0.016	0.0012 0.0012	Pass Pass
DC Amps	uAmps	uAmps	uAmps	uAmps	uAmps	
200 uAmp	190.0 nAmps	189.9 nAmps	-0.1 nAmps	0.7 nAmps	0.120 nAmps	Pass
200 nAmp	190.0 pAmps	190.3 pAmps	0.3 pAmps	1.0 pAmps	0.12 pAmps	Pass
2000 pAmp	1900	1898	-2	29	1.2	Pass
Resistance	kOhm	kOhm	kOhm	kOhm	kOhm	
20 kOhm	19.00	18.99	-0.01	0.11	0.012	Pass
200 kOhm	190.0	189.8	-0.2	1.1	0.12	Pass
20 MOhm	10.00 MOhm	9.98 MOhm	-0.02 MOhm	0.10 MOhm	0.012 MOhm	Pass
20 GOhm	10.00 GOhm	10.00 GOhm	0.00 GOhm	0.02 GOhm	0.014 GOhm	Pass

END OF REPORT