SOUTHWEST RESEARCH INSTITUTE

6220 CULEBRA ROAD • POST OFFICE DRAWER 28510 • SAN ANTONIO, TEXAS, 78228-0510 • TEL (210) 522-5215 • FAX (210) 522-369

OUT OF TOLERANCE

To: Don Bannon, Div20, B57

From: Walt Hill, Metrology Group Leader
Institute Calibration Laboratory

Date: May. 24, 2006

Subject: Out-of-tolerance Notice

The purpose of this notice is to alert you of a condition, which may have caused erroneous measurements affecting safety or the quality of products or services your organization provides. The attached as-found readings are provided for your evaluation to determine if the instrument listed below had an impact and if further action is required.

When the as-found results are near the specification limit, +/- a margin less than the measurement uncertainty, it is not possible to state in-tolerance or out-of-tolerance with a 95% level of confidence. It is the Institute Calibration Laboratory policy that the client is made aware of this situation because the end-user is taking some of the risk that the instrument listed below may not meet the end-user measurement requirements.

Your review/evaluation should be conducted in accordance with your organizational quality policy and procedural requirements. If we can be of further assistance, please contact the Calibration Laboratory at 522-5215.

Manufacturer: Keithley **Model:** 485

Description: Picoammeter **Serial Number:** 509163

Asset Number: 1437 **User ID Number:**

Last Calibration: June 8, 2005

Date Received for Service: May. 23, 2006 Work Order Number: 303069439

Service Requested: Scheduled calibration

Remarks: Unit failed low-end ammeter checks.

OUT OF TOLERANCE

120 --- Q200611200008
Instrument calibration record for Keithley
Picoammeter, Model # 485, Serial # 509163
(05/24/2006)

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	303069439	Mfr:	Keithley	Technician:	PRD
Asset No:	001437	Model:	485		
Serial No:	509163	Type:	Picoammeter	Cal Date:	24-May-06
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Found
DC Current	mAmp	mAmp	mAmp	mAmp	mAmp	Result
	1.9000	1.9002	0.0002	0.0020	0.00012	Pass
	uAmp	uAmp	uAmp	uAmp	uAmp	
	190.00	190.04	0.04	0.20	0.013	Pass
	19.000	19.003	0.003	0.020	0.0013	Pass
	1.9000	1.9005	0.0005	0.0030	0.00013	Pass
	nAmp	nAmp	nAmp	nAmp	nAmp	
	190.00	190.07	0.07	0.39	0.012	Pass
	19.000	18.874	-0.126	0.077	0.0018	Fail
	1.9000	1.8892	-0.0108	0.0080	0.0014	Fail

END OF REPORT

SOUTHWEST RESEARCH INSTITUTE®

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

ACCREDITED
Certificate #
0972-01

Certificate of Calibration

Submitted By:	DIV20	**Work Order:**	303069439
Address:	B57	**Date Issued:**	May 24, 2006
Contact:	DON BANNON	**Calibration Date:**	May 24, 2006
Manufacturer Model:	KEITHLEY 485	***Calibration Due:**	May 24, 2007
Description:	PICOAMMETER	**Calibration Location:**	Bldg. 64
Serial No:	509163	**Environment:**	Temp. 74.0°F Hum. 42 %RH
Asset No:	001437	****Data Type:**	AS-LEFT
Procedure:	KEITHLEY 485 - 23 MAY 2006		

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, 1999, 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: None

Standards Used

Asset No.	Serial No.	Manufacturer	Model	Description	Cal Due
000101	86052	BIDDLE	72-5346-1	DECADE RESISTOR	Jan 05, 07
000182	5200003	FLUKE	5700A/EP	CALIBRATOR	Jun 15, 06

Reviewed by: blt ( ) jrg (✓) pwc ( ) wgh ( )
Metrology Technician

Measurements by: Paul Depmore
Metrology Technician

Southwest Research Institute
Calibration Laboratory
Measurement Report

Work Order:	303069439	Mfr:	Keithley	Technician:	PRD
Asset No:	001437	Model:	485		
Serial No:	509163	Type:	Picoammeter	Cal Date:	24-May-06
Remarks:					

Function/Range	Test Point	TI Reading	Difference	+/-Limit	+/-Uncertainty	Left
DC Current	mAmp	mAmp	mAmp	mAmp	mAmp	Result
	1.9000	1.9002	0.0002	0.0020	0.00012	Pass
	uAmp	uAmp	uAmp	uAmp	uAmp	
	190.00	190.04	0.04	0.20	0.013	Pass
	19.000	19.003	0.003	0.020	0.0013	Pass
	1.9000	1.9005	0.0005	0.0030	0.00013	Pass
	nAmp	nAmp	nAmp	nAmp	nAmp	
	190.00	190.07	0.07	0.39	0.012	Pass
	19.000	19.000	0.000	0.077	0.0018	Pass
	1.9000	1.9009	0.0009	0.0080	0.0014	Pass

END OF REPORT