

# Report of Calibration



Keithley Instruments Inc.

28775 Aurora Rd.

Cleveland, Ohio 44139

UNIT UNDER TEST: Keithley 2420 3A SourceMeter

PREPARED for:

SERIAL NUMBER: 0965201

PROCEDURE NAME: QSIW-2420 REV. A

CALIBRATED BY: Tom Horvath

DATA TYPE: AFTER DATA

TEMPERATURE: 22.50 °C

HUMIDITY: 35 %

PERFORMED ON: 26 January 2006

TEST RESULT: PASS

P.O. NUMBER:

**CERTIFICATE NUMBER : 0965201:1138268662**

Keithley Instruments Inc. certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with ANSI/NCSL Z540-1-1994.

This calibration process is a direct comparison of the UUT ( Unit Under Test) to the listed reference standards and did not involve any sampling plan to complete. The test limits used to judge this instrument are the most recent published 1 year specifications, and apply only to the unit listed above. The measurements were conducted in a controlled environment maintained as shown above and monitored to an uncertainty of +/- .2 deg. C and +/- 2% RH.

Note: Any Test Uncertainty Ratio (TUR) that is less than ten to one will appear under the "TUR" heading on the data record. If the TUR meets or exceeds 10 :1 , the field is left blank.

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REMARKS:

## Standards Used

<u>Asset #</u>	<u>Description</u>	<u>Cal Date</u>	<u>Due Date</u>
6364	HEWLETT PACKARD 3458A MULTIMETER	12/20/2005	3/20/2006
7444	Fluke 5700A Multifunction Calibrator	1/9/2006	4/9/2006

**Test Results**

<u>Test Description</u>	<u>True Value</u>	<u>Test Result</u>	<u>Lower limit</u>	<u>Upper limit</u>	<u>Status</u>	<u>TUR</u>
OUTPUT VOLTAGE ACCURACY (FRONT INPUTS)						
200.000 mV		199.9688	199.3600	200.6400	Pass	
-200.000 mV		-200.0404	-200.6400	-199.3600	Pass	
2.00000 V		1.999978	1.999000	2.001000	Pass	
-2.00000 V		-2.000036	-2.001000	-1.999000	Pass	
20.0000 V		20.00027	19.99360	20.00640	Pass	
-20.0000 V		-20.00019	-20.00640	-19.99360	Pass	
60.0000 V		60.00068	59.98080	60.01920	Pass	
-60.0000 V		-60.00125	-60.01920	-59.98080	Pass	
VOLTAGE MEASUREMENT ACCURACY (FRONT INPUTS)						
200.000 mV	199.9712	199.998	199.647	200.295	Pass	
-200.000 mV	-200.0410	-200.003	-200.365	-199.717	Pass	
2.00000 V	1.999980	1.99997	1.99944	2.00052	Pass	
-2.00000 V	-2.000039	-1.99997	-2.00058	-1.99950	Pass	
20.0000 V	20.00031	19.9998	19.9963	20.0043	Pass	
-20.0000 V	-20.00020	-19.9997	-20.0042	-19.9962	Pass	
60.0000 V	60.00082	59.9994	59.9888	60.0128	Pass	
-60.0000 V	-60.00125	-59.9999	-60.0133	-59.9893	Pass	
OUTPUT CURRENT ACCURACY (FRONT INPUTS)						
10.0000 µA		10.00027	9.99470	10.00530	Pass	
-10.0000 µA		-9.99998	-10.00530	-9.99470	Pass	
100.000 µA		100.0038	99.9490	100.0510	Pass	
-100.000 µA		-100.0021	-100.0510	-99.9490	Pass	
1.00000 mA		1.000015	0.999460	1.000540	Pass	
-1.00000 mA		-1.000028	-1.000540	-0.999460	Pass	
10.0000 mA		10.00030	9.99350	10.00650	Pass	
-10.0000 mA		-10.00020	-10.00650	-9.99350	Pass	
100.000 mA		100.0040	99.9140	100.0860	Pass	
-100.000 mA		-100.0027	-100.0860	-99.9140	Pass	
1.00000 A		0.999963	0.998430	1.001570	Pass	
-1.00000 A		-0.999968	-1.001570	-0.998430	Pass	
3.00000 A	3.000076	3.00000	2.99561	3.00455	Pass	
-3.00000 A	-3.000169	-3.00000	-3.00464	-2.99570	Pass	
CURRENT MEASUREMENT ACCURACY (FRONT INPUTS)						
10.0000 µA	10.00021	10.0000	9.9968	10.0036	Pass	
-10.0000 µA	-9.99998	-9.9999	-10.0034	-9.9966	Pass	
100.000 µA	100.0038	100.000	99.973	100.035	Pass	
-100.000 µA	-100.0025	-100.000	-100.034	-99.972	Pass	
1.00000 mA	1.000028	0.99999	0.99970	1.00036	Pass	
-1.00000 mA	-1.000044	-0.99999	-1.00037	-0.99971	Pass	
10.0000 mA	10.00043	10.0000	9.9963	10.0045	Pass	
-10.0000 mA	-10.00035	-9.9999	-10.0045	-9.9963	Pass	
100.000 mA	100.0052	100.000	99.944	100.066	Pass	
-100.000 mA	-100.0042	-99.999	-100.065	-99.943	Pass	
1.00000 A	0.999983	1.00002	0.99901	1.00095	Pass	8.82
-1.00000 A	-0.999967	-1.00005	-1.00094	-0.99900	Pass	8.82
3.00000 A	3.000092	3.00000	2.99682	3.00336	Pass	
-3.00000 A	-3.000246	-2.99997	-3.00352	-2.99698	Pass	
RESISTANCE MEASUREMENT ACCURACY (FRONT INPUTS)						
19.00000 Ohm	18.999825	18.99986	18.97783	19.02183	Pass	
190.0000 Ohm	189.99920	190.0010	189.7182	190.2802	Pass	
1.900000 kOhm	1.9000429	1.900063	1.898023	1.902063	Pass	
19.00000 kOhm	18.999150	18.99932	18.97965	19.01865	Pass	

Test Results

<u>Test Description</u>	<u>True Value</u>	<u>Test Result</u>	<u>Lower limit</u>	<u>Upper limit</u>	<u>Status</u>	<u>TUR</u>
190.0000 kOhm	189.98999	189.9924	189.7910	190.1890	Pass	
1.900000 MOhm	1.8999302	1.899949	1.897150	1.902710	Pass	
19.00000 MOhm	18.998426	19.00258	18.97423	19.02263	Pass	

\*\*\*\*\* End of Certificate \*\*\*\*\*

Report Authorized by:



Timothy W. Martin

Service Manager