

GLOBAL CALIBRATION SERVICES

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CERTIFICATE OF CALIBRATION #148477

Issued To:

**CUSTOMER VIEW SAMPLE
502 SOUTH LUCILE STREET
SEATTLE, WA 98108**



Certificate No. 2367.01

Item ID: S1026

Item Description: DMM

Item Size: 5½ DIGIT

Manufacturer: FLUKE

Model Number: 45

Serial Number: 7691039

Assigned Department: N/A

Item Location: N/A

Calibration Location: INHOUSE LAB

Instrument S1026 As Found: In Tolerance

Instrument S1026 As Left: In Tolerance

Date Certificate Issued: 09/21/2011

Purchase Order Number: 35928

Calibration Date: 09/21/2011

Calibration Due: 09/21/2012

Temperature (Deg F): 73

Humidity (%): 48

Procedure: 33K8-4-999-1

SAMPLE

Steve Koski, Technical Specialist

See Page 2 for Calibration Data Sheet.

Global Calibration Services' quality management system conforms to ISO 9001:2008, AS9100 Rev. B, ANSI/NCSL Z540-1, ISO/IEC 17025-2005, ISO 10012:2003, and the technical requirements of the customer's order. All calibrations are performed using internationally recognized standards traceable to the SI Units. Traceability is achieved through the National Institute of Standards and Technology (NIST), other National Measurement Institutes (NMIs), or by using natural physical constraints, Intrinsic standards or ratio calibration techniques. Unless otherwise indicated, the combined estimated uncertainty of the measurement has a coverage factor of k-2 at a confidence level of 95%. Any number of factors may cause the instrument to drift out of specification before the recommended recalibration date contained in this certificate. The information shown on this certificate applies only to the instrument identified above and may not be reproduced, except in full, without prior written consent from Global Calibration Services.

Data Sheet

Certificate Number: 148477

INSTRUMENT SPECIFICATION

DC VOLTAGE:(0 to 1000) VDC @ $\pm (0.025\% + 2 \text{ COUNTS})$
DC CURRENT:30 mADC $\pm(0.05\% + 3 \text{ COUNTS})$
:100 mADC $\pm(0.05\% + 2 \text{ COUNTS})$
:10 ADC $\pm(0.2\% + 5 \text{ COUNTS})$
AC VOLTAGE:(20 to 50) Hz $\pm(1\%iv + 10 \text{ COUNTS})$
:50 Hz to 10 kHz $\pm(0.2\%iv + 10 \text{ COUNTS})$
:(10 to 20) kHz $\pm(0.5\%iv + 10 \text{ COUNTS})$
:(20 to 50) kHz $\pm(2\%iv + 20 \text{ COUNTS})$
:(50 to 100) kHz $\pm(5\%iv + 50 \text{ COUNTS})$
db MEASUREMENT: $\pm 0.08\text{dB}$ 50 Hz to 10 kHz
: $\pm 0.11\text{dB}$ (10 to 20) kHz
: $\pm 0.29\text{dB}$ (20 to 50) kHz
: $\pm 0.7\text{dB}$ (50 to 100) kHz
AC CURRENT:(20 to 50) Hz $\pm(2\%iv + 10 \text{ COUNTS})$ mA RANGES
:50 Hz to 10 kHz $\pm(0.5\% + 10 \text{ COUNTS})$ mA RANGES
:(20 to 50) Hz $\pm(2\%iv + 10 \text{ COUNTS})$ 10 AMP RNG
:50 Hz to 2 kHz $\pm(1\%iv + 10 \text{ COUNTS})$
RESISTANCE:300 Ohm $\pm(0.05\%iv + 2 \text{ COUNTS} + 0.02 \text{ Ohm})$
:(3 and 300) kOhm $\pm(0.05\%iv + 5 \text{ COUNTS})$
:3 MOhm $\pm(0.06\% + 2 \text{ COUNTS})$
:30 MOhm $\pm(0.25\%iv + 3 \text{ COUNTS})$
:300 MOhm $\pm 2\%iv$
FREQUENCY:5 Hz to 1 MHz $\pm(0.05\%iv + 1 \text{ COUNT})$

MEASUREMENT DATA UNCERTAINTIES:

PARAMETER	RANGE	BEST UNCERTAINTY	SOURCE	
DC Voltage			FLUKE 5520A/SC1100	
	(0 to 330) mV	55 $\mu\text{V/V}$ + 1.2 μV		
	(0 to 3.3) V	20 $\mu\text{V/V}$ + 2.4 μV		
	(3.3 to 33) V	31 $\mu\text{V/V}$ + 24 μV		
	(33 to 330) V	24 $\mu\text{V/V}$ + 174 μV		
(330 to 1000) V	23 $\mu\text{V/V}$ + 1800 μV			
DC Current			FLUKE 5520A/SC1100	
	(3.3 to 33) mA	0.02 % + 0.024 μA		
	(33 to 330) mA	0.02 % + 0.024 μA		
(3 to 11) A	0.08 % + 580 μA			
AC Voltage			FLUKE 5520A/SC1100	
	(33 to 330) mV	(10 to 45) Hz	0.05 % + 9.3 μV	
		(10 to 20) kHz	0.03 % + 9.3 μV	
	330 mV to 3.3 V	45 Hz to 10 kHz	0.03 % + 9.3 μV	
	(3.3 V to 33 V)	(50 to 100) kHz	0.13 % + 2400 μV	
(33 to 330) V	(1 to 10) kHz	0.04 % + 7000 μV		
(330 to 1020) V	(1 to 5) kHz	0.04 % + 12 000 μV		
AC Current			FLUKE 5520A/SC1100	
	(33 to 330) mA	45 Hz to 1 kHz	0.21 % + 0.12 μA	
(3 to 11) A	100 Hz to 1 kHz	4.1 % + 2400 μA		
Resistance			FLUKE 5520A/SC1100	
	(110 to 330) Ohm	34 $\mu\text{Ohm/Ohm}$ + 0.0023 Ohm		
	(1.1 to 3.3) kOhm	0.01 % + 0.024 Ohm		
	(110 to 330) kOhm	0.01 % + 2.6 Ohm		
	(1.1 to 3.3) MOhm	0.01 % + 37 Ohm		
(11 to 33) MOhm	0.05 % + 3000 Ohm			

INSTRUMENT CONDITION

RECEIVED IN TOLERANCE

STANDARDS USED FOR THIS CALIBRATION

2038

CALIBRATOR

Due Date
01/31/2013

CALIBRATION MEASUREMENT DATA

MEASUREMENT	NOMINAL	LOW LIMIT	HIGH LIMIT	AS FOUND	AS LEFT	DEVIATION	UNCERTAINTY
90 mVDC	90.000	89.971	90.029	89.990	89.990	-0.010	0.001660 mV
900 mVDC	900.00	899.71	900.29	899.93	899.93	-0.07	0.013000 mV
9.0 VDC	9.0000	8.9971	9.0029	8.9994	8.9994	-0.0006	0.000064 V
90 VDC	90.000	89.971	90.029	89.991	89.991	-0.009	0.000453 V
300 VDC	300.00	299.90	300.10	299.95	299.95	-0.05	0.002140 V
1000 VDC	1000.0	999.5	1000.5	999.9	999.9	-0.1	0.008401 V
300 mVAC @ 20 Hz	300.00	296.90	303.10	298.38	298.38	-1.62	0.137560 mV
300 mVAC @ 19 kHz	300.00	298.40	301.60	299.93	299.93	-0.07	0.061034 mV
3.0 VAC @ 50 kHz	3.000	2.938	3.062	2.998	2.998	-0.002	0.000369 V
30 VAC @ 99 kHz	30.00	28.45	31.55	29.59	29.59	-0.41	0.005202 V
200 VAC @ 9 kHz	200.00	199.50	200.50	199.83	199.83	-0.17	0.016198 V
400 VAC @ 1 kHz	400.0	398.2	401.8	399.8	399.8	-0.2	0.031795 V
30 mADC	30.000	29.982	30.018	29.997	29.997	-0.003	0.001990 mA
100 mADC	100.00	99.93	100.07	99.99	99.99	-0.01	0.007301 mA
10 AAC	10.000	9.975	10.025	9.999	9.999	-0.001	0.003134 A
100 mAAC @ 1 kHz	100.00	99.40	100.60	100.00	100.00	0.00	0.037219 mA
190 Ohm	190.00	189.86	190.14	190.05	190.05	0.05	0.003928 Ohm
1.9 kOhm	1.9000	1.8988	1.9012	1.9000	1.9000	0.0000	0.000019 kOhm
190 kOhm	190.00	189.88	190.12	190.00	190.00	0.00	0.002470 kOhm
1.9 MOhm	1.9000	1.8987	1.9013	1.9001	1.9001	0.0001	0.000048 MOhm
19 MOhm	19.000	18.949	19.051	18.998	18.998	-0.002	0.001064 MOhm

End of Report 148477

SAMPLE