FLUKE ® Everett Service Center

ISO 9001

1420 75th St. SW
Everett, Washington 98203
USA

Calibration Certificate

Description:	DUAL DISPLAY MULTIMETER	**Certificate Number:**	**827543-7733007:1127404274**
Manufacturer:	FLUKE	**Date of Calibration:**	22 September 2005
Model:	45	**Date of Certificate:**	22 September 2005
Serial Number:	7733007	**Date Due:**	22 September 2006
Customer Name:	STATE OF SOUTH CAROLINA	**Procedure Name:**	FLUKE 45: (1 YEAR) RS-232C CAL VER/ALT FLUKE 5700A
City, State:	COLUMBIA, SC	**Procedure Revision:**	1.2
		Temperature:	23.00 °Celsius
Customer Item ID:	7733007	**Relative Humidity:**	40 %
PO Number:	60533	**Data Type:**	FOUND-LEFT
RMA Number:	3273176	**Test Result:**	PASS

In the attached measurement results, deviation may be expressed with units, *Measured Value (MV) - Nominal Value (NV)* or as a proportion of the nominal value (*(MV-NV)/NV*), expressed without units with a scalar multiplier such as % (0.01), or as a ratio of the units (mW/W, mA/A,mV/V, etc.) Descriptions such as mW/W, mV/V, and others, where used to annotate results or measurement uncertainties, are the preferred replacements for what was historically labeled as "ppm" or parts-per-million and describe the results in that column, unless otherwise noted by units symbols.

The Data type that could be found in this certificate must be interpreted as:

- As Found - Calibration data collected before the unit is adjusted and/or repaired.
- As Left - Calibration data collected after the unit is adjusted and/or repaired.
- As Found/ As Left - Calibration data collected without any adjustment and/or repair performed.

Unless otherwise stated the TUR (Test Uncertainty Ratio) of this calibration is 4:1 or greater.

This Calibration conforms to MIL-STD-45662A and ANSI/NCSL Z540-1-1994(R2002)

Results are reviewed to establish where any measurement results exceeded the manufacturer's specifications.
Measured values greater than the Manufacturer's specification are indicated by "!".

This certificate applies only to the item identified and shall not be reproduced other than in full, without the specific written approval by Fluke Corporation. The user is obliged to have the object recalibrated at appropriate intervals. Calibration certificates without signature are not valid.

Comments:

Long Le
Metrology Technician

Jorge Martins
Technical Manager

Traceability Information

DC Voltage
This calibration was conducted using an unbroken chain of standards to the Voltage Reference standard group, traceable to the Fluke Primary Standards Laboratory, which is traceable to the U.S. representation of the volt, through the internationally accepted value of the Josephson constant Kj=483597.9 GHz/V and a 10 Volt Josephson Array Voltage Standard.

Frequency
This calibration was conducted using an unbroken chain of standards to the GPS-Rubidium Disciplined oscillator frequency standard, traceable to the United States Naval Observatory (USNO), which is traceable to the National Institute of Standards and Technology.

AC Voltage, Resistance, DC Current, AC Current, Capacitance, Inductance, Phase and Temperature
This calibration was conducted using an unbroken chain of standards to the Fluke Primary Standards Laboratory, which is traceable to the National Institute of Standards and Technology.

Humidity
This calibration was conducted using an unbroken chain of standards, traceable to Vaisala Measurement Standards Laboratory Primary Salt calibration bath, which traceability is based on the physical phenomena in which the equilibrium relative humidity values associated with certain saturated salt solutions are known.

Standards Used

Asset #	Instrument Model	Cal Date	Cal Due
10029	FLUKE 5700A CALIBRATOR	19 April 2005	19 April 2006
9513	FLUKE 5725A AMPLIFIER	17 May 2005	17 November 2005

Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications Lower Limit	Manufacturer's Specifications Upper Limit
DIRECT VOLTAGE PERFORMANCE VERIFICATION					
100mV Range					
0.000 mV	0.0000	-0.002		-0.006	0.006
90.000 mV	90.0000	89.997		89.971	90.029
1000mV Range					
900.00 mV	900.000	900.00		899.71	900.29
300mV Range					
0.00 mV	0.000	0.00		-0.02	0.02
300.00 mV	300.000	300.00		299.90	300.10
3V Range					
3.0000 V	3.00000	3.0000		2.9990	3.0010
-3.0000 V	-3.00000	-3.0000		-3.0010	-2.9990
30V Range					
30.000 V	30.0000	30.000		29.990	30.010
-30.000 V	-30.0000	-29.999		-30.010	-29.990
300V Range					
300.00 V	300.000	300.01		299.90	300.10
-300.00 V	-300.000	-299.99		-300.10	-299.90
1000V Range					
1000.0 V	1000.00	1000.0		999.5	1000.5

Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications Lower Limit	Manufacturer's Specifications Upper Limit
-1000.0 V	-1000.00	-999.8		-1000.5	-999.5
DIODE TEST PERFORMANCE VERIFICATION					
0.0000 Ohm	0.00000	0.0000		-0.0008	0.0008
0 Ohm	1000000000.0	1000000000		999999999	1000000001
ALTERNATING VOLTAGE PERFORMANCE VERIFICATION					
300mV Range					
0.00 mV	0.000	0.12		0.00	0.75
15.00 mV @ 1 kHz	15.000	15.00		14.87	15.13
15.00 mV @ 100 kHz	15.000	13.99		13.75	16.25
300.00 mV @ 1 kHz	300.000	299.97		299.30	300.70
300.00 mV @ 100 kHz	300.000	290.60		284.50	315.50
3V Range					
3.0000 V @ 1 kHz	3.00000	2.9998		2.9930	3.0070
30V Range					
30.000 V @ 1 kHz	30.0000	29.998		29.930	30.070
300V Range					
300.00 V @ 1 kHz	300.000	299.99		299.30	300.70
750V Range					
750.0 V @ 1 kHz	750.00	750.1		747.5	752.5
RESISTANCE PERFORMANCE VERIFICATION					
300Ohm Range					
0.00 Ohm	0.000	0.00		0.00	0.04
190.00 Ohm	189.991	190.01		189.86	190.13
3kOhm Range					
0.0000 kOhm	0.00000	0.0001		0.0000	0.0002
1.9000 kOhm	1.89998	1.9001		1.8988	1.9012
30kOhm Range					
19.000 kOhm	18.9997	19.001		18.988	19.012
300kOhm Range					
190.00 kOhm	190.002	190.02		189.88	190.12
3MOhm Range					
1.9000 MOhm	1.89993	1.8997		1.8986	1.9012
30MOhm Range					
19.000 MOhm	18.9989	18.995		18.948	19.050

Calibration Results

Function/Range	Nominal Value	Measured Value	TUR	Manufacturer's Specifications Lower Limit	Manufacturer's Specifications Upper Limit
300MOhm Range					
100.0 MOhm	100.02	99.9		98.0	102.0
FREQUENCY PERFORMANCE VERIFICATION					
9.000 kHz @ 1 V	9.0000	9.000		8.995	9.005
LOW CURRENT PERFORMANCE VERIFICATION					
30mA Range					
30.000 mA	30.0000	30.001		29.982	30.018
30.000 mA @ 1 kHz	30.0000	29.999		29.840	30.160
100mA Range					
100.00 mA	100.000	100.00		99.93	100.07
100.00 mA @ 1 kHz	100.000	99.98		99.40	100.60
HIGH CURRENT PERFORMANCE VERIFICATION					
10A Range					
10.000 A	10.0000	10.000		9.975	10.025
10.000 A @ 1 kHz	10.0000	9.994		9.890	10.110

End of Report