

Title: Standard Operating Procedure for Fluke Portable Voltage Calibrator		
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1. INTRODUCTION AND SCOPE

This procedure describes the operation and maintenance of the Fluke Model 515A portable voltage calibrator. This device is used to generate accurate AC and DC voltages and resistances to check proper operation of digital voltmeters and multimeters. The versatility of this calibrator provides a means to test other voltage measuring devices such as data acquisition systems, digital or strip chart recorders, etc. Either line voltage or internal rechargeable batteries can power the 515A calibrator. The battery operation easily facilitates field calibrations where line power is not available.

2. PRINCIPLE OF THE METHOD

The 515A utilizes a stable power supply fed through the internal rechargeable battery system. This power is then run through various circuits, transformers, and generators built in to the calibrator to generate various voltages and resistances. The front panel of the unit provides the switching capability and terminal connections for the generation of all available voltages and resistances. Generally the connections to the unit being tested are made once for a variety of tests. The different capabilities are controlled using color-coded selector buttons found on the front panel.

3. MEASUREMENT RANGE AND SENSITIVITY

The 515A outputs voltages and resistances in the ranges and accuracies outlined in the tables below.

DC voltage:

Unit	Range Low	Range High	Step	Accuracy
microvolts	zero	999	continuous	±2µV
millivolts	100	1000	100	±0.003% of setting
volts	1	10	1	±0.003% of setting
volts	100	100	none	±0.003% of setting

AC voltage:

Set Point	Voltage Accuracy	Frequency	Frequency Accuracy
1 volt	±0.05%	400Hz	±1%

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10 volts	±0.04%	400Hz & 4KHz	±1%
10 volts	±0.1%	50KHz	±5%
100 volts	±0.06%	400Hz	±1%

Resistance

Set Point	Accuracy	Set Point	Accuracy
Zero Ω	< 0.15 Ω	10K Ω	±0.015%
10 Ω	±0.06%	100K Ω	±0.015%
100 Ω	±0.06%	1M Ω	±0.015%
1K Ω	±0.015%	10M Ω	±0.075%

All pushbutton selection switches are mechanically interlocked so that only a single function can be selected at a time.

For further information, please refer to the operations manual.

4. EQUIPMENT AND APPARATUS

The Fluke model 515A portable calibrator is the only piece of equipment applicable to this procedure. Associated equipment may include:

Various connecting test cables

Various power supply cords

5. INTERFERENCES

There are two external influences on the performance of the Fluke 515A.

1 – Electro Magnetic Frequencies (emf) can introduce noise to certain outputs. Refer to the manual to ensure all connections are properly grounded.

2 – Operating temperature – The 515A is calibrated to operate at 23°C ±5°C. Ensure the ambient temperature is within this range when conducting tests.

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6. PRECISION AND ACCURACY

Accuracy for each output setting is listed in section 3.0 above.

7. SITE REQUIREMENTS

All calibration equipment should be set up inside a temperature controlled structure to avoid influence of temperature drift. It is not recommended to set up calibration equipment outdoors due to effects of the weather, i.e. rain, wind, dust, temperature, etc. The calibrator should be set up so that the controls and display are easily accessible as changes need to be made throughout the calibration.

8. INSTALLATION REQUIREMENTS

This calibrator is designed as a portable device. As such it should be situated on a firm surface like a workbench or desktop when in use. Use good quality connections/test cables in good repair.

9. OPERATIONAL REQUIREMENTS

The Fluke model 515A is capable of producing a variety of voltages and resistances for the testing of field electronic measuring devices. Connections are made from the 515A at the high and low terminal points to the device being tested. Figure 8.1 and table 8.1 show the various output selections for testing. Consult the operations manual for further information on generating outputs.

10. CALIBRATION

On site calibration of the Fluke 515A generator cannot be completed. The unit should be returned to the factory or authorized service depot annually for recertification.

There are maintenance tasks that can be conducted by the user. These are outlined in the operations manual under the following sections:

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4-3 Service Information

4-6 General Maintenance

4-13 Maintenance Access

There is additional information available under section 4 – Maintenance of the manual, but is not recommended that users complete these tasks. If problems are noted with the 515A, return the unit to a factory authorized Fluke representative for service.

11. APPLICABLE DOCUMENTS

EM-033 Fluke model 515A Portable Calibrator Instruction Manual

12. LITERATURE REFERENCES

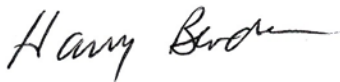
None

13. REVISION HISTORY

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14. APPROVAL



Approved by: Harry Benders
Title: Air Monitoring Manager

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