

Calibration Certificate

This space has been reserved for the logo of your accrediting body.

Certificate Number: 2023000014

Customer:

My First Customer
456 Poplar Avenue
Somewhere ST 50001

My Lab
6920 Seaway Blvd
Everett WA 98203
USA

Job Number		ID	SAMPLE-179
Procedure Name	179 Handheld DMM Validation	Description	True RMS Multimeter
Technician	System Administrator	Manufacturer	Fluke
Temperature	23	Model Number	179
Humidity	40	Serial Number	
WO Results	Pass	Service Date	7/21/2023
Received		Due Date	7/21/2023

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2019.

The quality system is registered to ISO 9001:2015.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

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Standards Used			
Description	Service Date	Due Date	ID
Calibrator	7/21/2023	7/21/2024	PRE0000018

179 Handheld DMM Validation						
MET/CAL Results	Pass	FOUND LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR

179 Handheld DMM Validation						
AC VOLTS	Pass	FOUND LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR

Results Run: 2.00

AC VOLTS

600 mV Range						
300.0 mV @ 45 Hz	300.00 mV	296.7 mV	300.0 mV	303.3 mV	Pass	64.08
500.0 mV @ 500 Hz	500.00 mV	494.7 mV	498.8 mV	505.3 mV	Pass	39.26
500.0 mV @ 1 kHz	500.00 mV	489.7 mV	495.8 mV	510.3 mV	Pass	76.30

6 V Range						
5.000 V @ 45 Hz	5.0000 V	4.947 V	4.995 V	5.053 V	Pass	39.26
5.000 V @ 500 Hz	5.0000 V	4.947 V	4.995 V	5.053 V	Pass	39.26
5.000 V @ 1 kHz	5.0000 V	4.897 V	4.956 V	5.103 V	Pass	76.30

60 V Range						
50.00 V @ 45 Hz	50.000 V	49.47 V	49.96 V	50.53 V	Pass	46.09
50.00 V @ 500 Hz	50.000 V	49.47 V	50.10 V	50.53 V	Pass	46.09
50.00 V @ 1 kHz	50.000 V	48.97 V	50.10 V	51.03 V	Pass	89.57

600 V Range						
300.0 V @ 45 Hz	300.00 V	296.7 V	299.9 V	303.3 V	Pass	55.93
500.0 V @ 500 Hz	500.00 V	494.7 V	500.4 V	505.3 V	Pass	33.13
500.0 V @ 1 kHz	500.00 V	489.7 V	500.3 V	510.3 V	Pass	64.38

1000 V Range						
1000 V @ 45 Hz	1000.0 V	987 V	996 V	1013 V	Pass	41.94
1000 V @ 500 Hz	1000.0 V	987 V	1001 V	1013 V	Pass	41.94
1000 V @ 1 kHz	1000.0 V	977 V	1001 V	1023 V	Pass	74.19

AC VOLTS FREQUENCY

99.99 Hz Range						
45.00 Hz @ 1 V	45.000 Hz	44.94 Hz	45.00 Hz	45.06 Hz	Pass	468.09

999.9 Hz Range						
900.0 Hz @ 1 V	900.00 Hz	899.0 Hz	900.0 Hz	901.0 Hz	Pass	443.46

9.999 kHz Range						
9.000 kHz @ 1 V	9.0000 kHz	8.990 kHz	9.000 kHz	9.010 kHz	Pass	444.35

99.99 kHz Range						
50.00 kHz @ 5 V	50.000 kHz	49.94 kHz	50.00 kHz	50.06 kHz	Pass	479.98

179 Handheld DMM Validation						
DC VOLTS	Pass	FOUND LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR

Results Run: 3.00

Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
DC VOLTS						
6 V Range						
5.000 V	5.0000 V	4.994 V	4.999 V	5.006 V	Pass	81.25
60 V Range						
50.00 V	50.000 V	49.94 V	49.99 V	50.06 V	Pass	61.90
600 V Range						
300.0 V	300.00 V	299.5 V	300.1 V	300.5 V	Pass	84.68
1000 V Range						
1000 V	1000.0 V	996 V	1000 V	1004 V	Pass	179.49
-1000 V	-1000.0 V	-1004 V	-1000 V	-996 V	Pass	179.49
DC VOLTS FREQUENCY						
45.00 Hz @ 3 V	45.000 Hz	44.94 Hz	45.00 Hz	45.06 Hz	Pass	468.09
50.00 kHz @ 30 V	50.000 kHz	49.94 kHz	50.00 kHz	50.06 kHz	Pass	479.98
DC MILLIVOLTS						
30.0 mV	30.00 mV	29.8 mV	30.0 mV	30.2 mV	Pass	141.87
-300.0 mV	-300.00 mV	-300.5 mV	-299.9 mV	-299.5 mV	Pass	67.14
600.0 mV	600.00 mV	599.3 mV	599.8 mV	600.7 mV	Pass	86.05

179 Handheld DMM Validation						
RESISTANCE	Pass	FOUND_LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR

Results Run: 4.00

RESISTANCE						
600 Ω Range						
500.0 Ohms	500.00 Ohm	495.3 Ohm	500.2 Ohm	504.7 Ohm	Pass	293.75
6 kΩ Range						
5.000 kOhms	5.0000 kOhm	4.954 kOhm	5.001 kOhm	5.046 kOhm	Pass	287.50
60 kΩ Range						
50.00 kOhms	50.000 kOhm	49.54 kOhm	50.00 kOhm	50.46 kOhm	Pass	287.50
600 kΩ Range						
500.0 kOhms	500.00 kOhm	495.4 kOhm	500.0 kOhm	504.6 kOhm	Pass	255.56
6 MΩ Range						
5.000 MOhms	5.0000 MOhm	4.954 MOhm	4.998 MOhm	5.046 MOhm	Pass	65.71
50 MΩ Range						
19.00 MOhms	19.000 MOhm	18.68 MOhm	18.98 MOhm	19.32 MOhm	Pass	43.45

179 Handheld DMM Validation						
CAPACITANCE	Pass	FOUND_LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR

Results Run: 5.00

CAPACITANCE						
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Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
1000 nF Range						
900 nF	900.0 nF	887 nF	900 nF	913 nF	Pass	3.94
10 µF Range						
9.00 µF	9.000 µF	8.87 µF	9.00 µF	9.13 µF	Pass	3.94
100 µF Range						
90.0 µF	90.00 µF	88.7 µF	90.0 µF	91.3 µF	Pass	2.53
9999 µF Range						
900 µF	900.0 µF	887 µF	899 µF	913 µF	Pass	2.53

179 Handheld DMM Validation						
CONTINUITY	Pass	FOUND_LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 6.00						
CONTINUITY						
Continuity: Beeper On					Pass	
Continuity: Beeper Off					Pass	

179 Handheld DMM Validation						
DIODE	Pass	FOUND_LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 7.00						
DIODE						
2.000 V	2.0000 V	1.978 V	2.000 V	2.022 V	Pass	916.67

179 Handheld DMM Validation						
CURRENT - AC MILLIAMPS	Pass	FOUND_LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 8.00						
AC MILLIAMPS						
60 mA Range						
3.00 mA @ 45 Hz	3.000 mA	2.92 mA	3.01 mA	3.08 mA	Pass	23.81
50.00 mA @ 1 kHz	50.000 mA	49.22 mA	49.98 mA	50.78 mA	Pass	19.50
400 mA Range						
400.0 mA @ 1 kHz	400.00 mA	393.7 mA	399.3 mA	406.3 mA	Pass	21.00

179 Handheld DMM Validation						
CURRENT - AC AMPS	Pass	FOUND_LEFT		PC-EVT-HGJ6TD2		
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 9.00						
AC AMPS						
6 A Range						
4.000 A @ 45 Hz	4.0000 A	3.937 A	4.000 A	4.063 A	Pass	14.32
10 A Range						
9.00 A @ 1 kHz	9.000 A	8.56 A	9.00 A	9.44 A	Pass	39.55

179 Handheld DMM Validation						
CURRENT - DC MILLIAMPS		Pass	FOUND_LEFT		PC-EVT-HGJ6TD2	
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 10.00						
DC MILLIAMPS						
60 mA Range						
3.00 mA	3.000 mA	2.94 mA	3.00 mA	3.06 mA	Pass	171.43
50.00 mA	50.000 mA	49.47 mA	49.98 mA	50.53 mA	Pass	70.67
400 mA Range						
-400.0 mA	-400.00 mA	-404.3 mA	-400.0 mA	-395.7 mA	Pass	35.83

179 Handheld DMM Validation						
CURRENT - DC AMPS		Pass	FOUND_LEFT		PC-EVT-HGJ6TD2	
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 11.00						
DC AMPS						
6 A Range						
4.000 A	4.0000 A	3.957 A	4.001 A	4.043 A	Pass	17.20
10 A Range						
-9.00 A	-9.000 A	-9.12 A	-9.00 A	-8.88 A	Pass	24.00

179 Handheld DMM Validation						
TEMPERATURE		Pass	FOUND_LEFT		PC-EVT-HGJ6TD2	
Test Description	True Value	Lower Limit	Test Results	Upper Limit	Status	TSR
Results Run: 12.00						
TEMPERATURE						
0.0 degC	0.00 °C	-1.0 °C	1.0 °C	1.0 °C	Pass	6.25
-40.0 degC	-40.00 °C	-41.4 °C	-38.8 °C	-38.6 °C	Pass	7.78
400.0 degC	400.00 °C	395.0 °C	400.7 °C	405.0 °C	Pass	19.23

-- End of measurement results--

Signatory: _____