



**PRECISION
MEASUREMENTS
INC.**

CERTIFICATE OF CALIBRATION

Report No. 1895979

CUSTOMER

Old ABC, Company
333 Moffett Park Drive
Sunnyvale, CA
94089

Cal Date: 11/18/2011
Due Date: 11/18/2012
Cal Int: 12 Mo.

INSTRUMENT/ID

Manufacturer: Fluke

Serial No: 916704319

Acct No: 4532

Model No: 179

Asset/ID No: 4569

PMC No: 2012

Description: Multimeter, Digital

Department: Manufacturing

Code No: 02

Location: Bldg. 3

CALIBRATION CONDITIONS

Received: In Tolerance

Cal Spec: Manufacturer

Temp: 22 °C

Returned: In Tolerance

Cal Procedure: 179.pdf

Humidity: 47 %

Cal'd At: PMI Lab

CALIBRATION EQUIPMENT USED

Asset No.	Manufacturer	Model No.	Calib. Date	Due Date
2752	Fluke	5520A	09/09/11	09/09/12

REMARKS/COMMENTS

See Attached Range And Accuracy

PRECISION MEASUREMENTS, INC. Quality System complies with ISO 9001:2008 and certifies that all calibration has been performed using standards traceable to the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY (NIST), or an acceptable value of a natural physical constant or ratio Calibration technique per MIL-STD-45662A, or current versions of ANSI-Z-540 , or ISO/IEC 17025 as applicable. Uncertainty of Standards has a 4:1 ratio or greater than the instrument under test or otherwise accounted for by analysis or quantitatively documented on this Certificate. This certificate applies only to the instrument identified above and shall not be reproduced, except in full, without specific written approval by PRECISION MEASUREMENTS, INC.

TECHNICIAN: Miller By Miller

QC: Shimeg

PM-COC-102A

•333 Moffett Park Drive • Sunnyvale, CA 94089 • (408) 733-8600•

Function	Range ¹	Resolution	Accuracy ± ([% of Reading] + [Counts])		
			Model 175	Model 177	Model 179
DC Amps ⁶	60.00 mA 400.0 mA 6.000 A 10.00 A	0.01 mA 0.1 mA 0.001 A 0.01 A	1.0 % + 3	1.0 % + 3	1.0 % + 3
Hz (AC- or DC- coupled, V or A ^{2,3,4,5} input)	99.99 Hz 999.9 Hz 9.999 kHz 99.99 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 1	0.1 % + 1	0.1 % + 1
Temperature	-40 °C to +400 °C -40 °F to +752 °F	0.1 °C 0.1 °F	NA	NA	1 % + 10 ⁷ 1 % + 18 ⁷
MIN MAX AVG	For DC functions, accuracy is the specified accuracy of the measurement function ± 12 counts for changes longer than 275 ms in duration. For AC functions, accuracy is the specified accuracy of the measurement function ± 40 counts for changes longer than 1.2 s in duration.				
<ol style="list-style-type: none"> All AC voltage and AC current ranges are specified from 5 % of range to 100 % of range. Frequency is specified from 2 Hz to 99.99 kHz in Volts and from 2 Hz to 30 kHz in Amps. For serial number 83911000 and below, frequencies < 10 kHz are not specified in 600 mV ac, 60 mA ac, and 6 A ac ranges. For Serial numbers between 83911001 – 83911240 and 84060001 and above, this note does not apply. Below 2 Hz, the display shows zero Hz. Noise at frequencies below 4.5 Hz and amplitude below 600 mV may exceed the frequency specification. Amps input burden voltage (typical): 400 mA input 2 mV/A, 10 A input 37 mV/A. Does not include error of the thermocouple probe. 					

Function	Overload Protection ¹	Input Impedance (Nominal)	Common Mode Rejection Ratio (1 kΩ Unbalanced)		Normal Mode Rejection
Volts AC	1000 V rms	> 10 MΩ < 100 pF	> 60 dB @ dc, 50 Hz or 60 Hz		
Volts DC	1000 V rms	> 10 MΩ < 100 pF	> 120 dB @ dc, 50 Hz or 60 Hz		> 60 dB @ 50 Hz or 60 Hz
mV/μ	1000 V rms ²	> 10 MΩ < 100 pF	> 120 dB @ dc, 50 Hz or 60 Hz		> 60 dB @ 50 Hz or 60 Hz
		Open Circuit Test Voltage	Full Scale Voltage To: 600 kΩ 50 MΩ		Short Circuit Current
Ohms	1000 V rms ²	< 8.0 V dc	< 660 mV dc	< 4.6 V dc	< 1.1 mA
Continuity/Diode test	1000 V rms ²	< 8.0 V dc	2.4 V dc		< 1.1 mA
<ol style="list-style-type: none"> 10⁷ V-Hz maximum. For circuits < 0.3 A short circuit. 660 V for high energy circuits. 					

Function	Overload Protection	Overload
mA	Fused, 44/100 A, 1000 V FAST Fuse	600 mA overload for 2 minutes maximum
A	Fused, 11 A, 1000 V FAST Fuse	20 A overload for 30 seconds maximum

**True RMS Multimeters
Specifications**

Function	Range ¹	Resolution	Accuracy ± ([% of Reading] + [Counts])		
			Model 175	Model 177	Model 179
AC Volts ^{2,3}	600.0 mV 6.000 V 60.00 V 600.0 V 1000 V	0.1 mV 0.001 V 0.01 V 0.1 V 1 V	1.0 % + 3 (45 Hz to 500 Hz)	1.0 % + 3 (45 Hz to 500 Hz)	1.0 % + 3 (45 Hz to 500 Hz)
			2.0 % + 3 (500 Hz to 1 kHz)	2.0 % + 3 (500 Hz to 1 kHz)	2.0 % + 3 (500 Hz to 1 kHz)
DC mV	600.0 mV	0.1 mV	0.15 % + 2	0.09 % + 2	0.09 % + 2
DC Volts	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	0.15 % + 2	0.09 % + 2	0.09 % + 2
	1000 V	1 V	0.15 % + 2	0.15 % + 2	0.15 % + 2
Continuity	600 Ω	1 Ω	Meter beeps at < 25 Ω, beeper turns off at > 250 Ω; detects opens or shorts of 250 μs or longer.		
Ohms	600.0 Ω	0.1 Ω	0.9 % + 2	0.9 % + 2	0.9 % + 2
	6.000 kΩ	0.001 kΩ	0.9 % + 1	0.9 % + 1	0.9 % + 1
	60.00 kΩ	0.01 kΩ	0.9 % + 1	0.9 % + 1	0.9 % + 1
	600.0 kΩ	0.1 kΩ	0.9 % + 1	0.9 % + 1	0.9 % + 1
	6.000 MΩ	0.001 MΩ	0.9 % + 1	0.9 % + 1	0.9 % + 1
	50.00 MΩ	0.01 MΩ	1.5 % + 3	1.5 % + 3	1.5 % + 3
Diode test	2.400 V	0.001 V	1 % + 2		
Capacitance	1000 nF	1 nF	1.2 % + 2	1.2 % + 2	1.2 % + 2
	10.00 μF	0.01 μF	1.2 % + 2	1.2 % + 2	1.2 % + 2
	100.0 μF	0.1 μF	1.2 % + 2	1.2 % + 2	1.2 % + 2
	9999 μF ⁴	1 μF	10 % typical	10 % typical	10 % typical
AC Amps ⁵ (True RMS) (45 Hz to 1 kHz)	60.00 mA	0.01 mA	1.5 % + 3	1.5 % + 3	1.5 % + 3
	400.0 mA	0.1 mA			
	6.000 A	0.001 A			
	10.00 A	0.01 A			
<ol style="list-style-type: none"> 1. All AC voltage and AC current ranges are specified from 5 % of range to 100 % of range. 2. Crest factor of ≤ 3 at full scale up to 500 V, decreasing linearly to crest factor ≤ 1.5 at 1000 V. 3. For non-sinusoidal waveforms, add -(2% reading + 2% full scale) typical, for crest factors up to 3. 4. In the 9999 μF range for measurements to 1000 μF, the measurement accuracy is 1.2 % + 2 for all models. 5. Amps input burden voltage (typical): 400 mA input 2 mV/mA, 10 A input 37 mV/A. 					