FLUKE®

Fluke 114, 115, 116 and 117 Digital Multimeters

Extended specifications

Technical Data

General specifications (all models)

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity of 0 % to 90 %.	
Maximum voltage between any terminal and earth ground	600 V
Surge protection	6 kV peak per IEC 61010-1 600 V CAT III, Pollution Degree 2
Ω Fuse for A input	11 A, 1000 V FAST 17 kA Fuse (Fluke PN 803293)
Display	Digital: 6,000 counts, updates 4/sec; Bar Graph: 33 segments, updates 32/sec
Temperature	Operating: -10 °C to +50 °C; Storage: -40 °C to +60 °C
Humidity	0 % to 90 % to 35 °C; 75 % to 40 °C; 45 % to 50 °C
Temperature coefficient	0.1 x (specified accuracy/°C) (< 18 °C or > 28 °C)
Operating altitude	2,000 meters
Battery	9 Volt Alkaline, NEDA 1604A/IEC 6LR61
Battery life	Alkaline: 400 hours typical, without backlight
Safety compliances	ANSI/ISA 82.02.01 (61010-1) 2004, CAN/CSA C22.2 No 61010-1-04, UL 6101B (2003) and IEC/EN 61010-1 2nd Edition for measurement Category III, 600 V, Pollution Degree 2, EMC EN61326-1
Certifications	UL, CSA, TUV, N10140, VDE
IP rating (dust and water protection)	IP42

Accuracy specifications (all models)

Function	Range	Resolution	Accuracy ± ([% of Reading] + [Counts])		Model
DC millivolts	600.0 mV	0.1 mV	0.5 % + 2		114, 115, 116, 117
DC volts	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	0.5 % + 2		114, 115, 116, 117
			DC, 45 Hz to 500 Hz	**500 Hz to 1 kHz**	
Auto-V LoZ[1] true-rms	600.0 V	0.1 V	2.0 % + 3	4.0 % + 3	114, 116, 117
			45 Hz to 500 Hz	**500 Hz to 1 kHz**	
AC millivolts[1] true-rms	600.0 mV	0.1 mV	1.0 % + 3	2.0 % + 3	114, 115, 116, 117
AC volts[1] true-rms	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	1.0 % + 3	2.0 % + 3	114, 115, 116, 117
Continuity	600 Ω	1 Ω	Beeper on < 20 Ω, off > 250 Ω; detects opens or shorts of 500 µs or longer		114, 115, 116, 117
Ohms	600.0 Ω 6.000 kΩ 60.00 kΩ 600.0 kΩ 6.000 MΩ 40.00 MΩ	0.1 Ω 0.001 kΩ 0.01 kΩ 0.1 kΩ 0.001 MΩ 0.01 MΩ	0.9 % + 2 0.9 % + 1 0.9 % + 1 0.9 % + 1 0.9 % + 1 1.5 % + 2		114, 115, 116, 117
Diode test	2.000 V	0.001 V	0.9 % + 2		115, 116, 117
Capacitance	1000 nF 10.00 µF 100.0 µF 9999 µF	1 nF 0.01 µF 0.1 µF 1 µF	1.9 % + 2 1.9 % + 2 1.9 % + 2 100 µF to 1000 µF: 1.9 % + 2 > 1000 µF: 5 % + 20		115, 116, 117
LoZ capacitance (power-up option)	1 nF to 500 µF		10 % + 2 typical		115, 116, 117

[1] All ac ranges except Auto-V LoZ are specified from 1 % to 100 % of range. Auto-V LoZ is specified from 0.0 V. Because inputs below 1 % of range are not specified, it is normal for this and other true-rms meters to display non-zero readings when the test leads are disconnected from a circuit or are shorted together. For volts, crest factor of ≤ 3 at 4000 counts, decreasing linearly to 1.5 at full scale. For amps, crest factor of ≤ 3. AC volts is ac-coupled. Auto-V LoZ, ac mV, and ac amps are dc-coupled.

Accuracy specifications (all models) cont.

Function	Range	Resolution	Accuracy ± ([% of Reading] + [Counts])	Model
Temperature (K-Type thermocouple)	-40 °C to 400 °C -40 °F to 752 °F	0.1 °C 0.2 °F	1 % + 10[2] 1 % + 18[2]	116
AC amps true-rms[1] (45 Hz to 500 Hz)	6.000 A 10.00 A 20 A overload for 30 seconds maximum	0.001 A 0.01 A	1.5 % + 3	115, 117
AC µAmps true-rms[1] (45 Hz to 1 kHz)	600.0 µA	0.1 µA	1.5 % + 3 (2.5 % + 3 > 500 Hz)	116
DC amps	6.000 A 10.00 A 20 A overload for 30 seconds maximum	0.001 A 0.01 A	1.0 % + 3	115, 117
DC µAmps true-rms	600.0 µA	0.1 µA	1.0 % + 2	116
Hz (V or A input)[2]	99.99 Hz 999.9 Hz 9.999 kHz 50.00 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 2	115, 117
Hz (V input)[3]	99.99 Hz 999.9 Hz 9.999 kHz 50.00 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 2	116

[1] All ac ranges except Auto-V LoZ are specified from 1 % to 100 % of range. Auto-V LoZ is specified from 0.0 V. Because inputs below 1 % of range are not specified, it is normal for this and other true-rms meters to display non-zero readings when the test leads are disconnected from a circuit or are shorted together. For volts, crest factor of ≤ 3 at 4000 counts, decreasing linearly to 1.5 at full scale. For amps, crest factor of ≤ 3. AC volts is ac-coupled. Auto-V LoZ, ac mV, and ac amps are dc-coupled.

[2] AC Volts Hz is ac-coupled and specified from 5 Hz to 50 kHz. AC Amps Hz is dc-coupled and specified from 45 Hz to 5 kHz. Amps input burden voltage (typical): 6 A input 2 mV/A, 10 A input 37 mV/A.

[3] Frequency is ac-coupled, 45 Hz to 50 kHz.

Frequency counter sensitivity (models 115, 116, 117)

Input range		Typical sensitivity (rms sine wave)			
		5 Hz to 45 Hz	45 Hz to 5 kHz	5 kHz to 10 kHz	10 kHz to 50 kHz
Volts AC	6 V 60 V 600 V	0.2 V 2 V 20 V	0.2 V to 0.3 V 2 V to 3 V 20 V to 30 V	0.3 V to 0.4 V 3 V to 4 V 30 V to 40 V	0.4 V to 1.0 V 4 V to 10 V 40 V to 100 V
AC Amps (115, 117 only)	6 A 10 A	N/A N/A	0.4 A 0.5 A	N/A N/A	N/A N/A

Input characteristics (all models)

Function	Input impedance (nominal)	Common mode rejection ratio(1 kΩ unbalanced)		Normal mode rejection
Volts AC	> 5 MΩ < 100 pF	> 60 dB at dc, 50 or 60 Hz		
Volts DC	> 10 MΩ < 100 pF	> 100 dB at dc, 50 or 60 Hz		> 60 dB at 50 or 60 Hz
Auto-V LoZ	~3 kΩ < 500 pF	> 60 dB at dc, 50 or 60 Hz		
	Open circuit test voltage	**Full scale voltage**		**Short circuit current**
Ohms	< 2.7 V dc	**To 6.0 MΩ**	**40 MΩ**	< 350 µA
		< 0.7 V dc	< 0.9 V dc	
Diode Test	< 2.7 V dc	2.000 V dc		< 1.2 mA

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1AC-II Non-Contact Voltage Detector
The Most Innovative Pocket-sized Voltage Detector

The next generation VoltAlert™ ac voltage testers from Fluke are easy to use - just touch the tip to a terminal strip, outlet, or cord. When the tip glows red and the unit beeps, you know there's voltage present. Electricians, maintenance, service, safety personnel, and homeowners can quickly test for energized circuits at work or in the home.

The 1AC-II continually tests its battery and its circuit integrity with a periodic double flash visual indication using Fluke Voltbeat™ technology.

The VoltAlert™ (1AC-II) is a Category IV – 1000 V overvoltage rated product for added user protection**, the highest rated of its kind.**

It is rugged and reliable and replaces the successful Fluke-1AC

Features

- Dual visual & audible indication for ease of use
- Voltbeat™ technology & system self-test for added user protection
- Compact design fits easily into pocket
- Agency Approvals/Ratings – CE, CSA (US&CAN), C-tick, TUV/GS

Warranty

The Fluke 1AC-II comes with a 2 year warranty

Specifications	
Operating principle	Senses the steady state electrostatic field produced by ac voltage through insulation without requiring contact to the bare conductor. A red glow at the tip and a beeping noise (if not switched OFF) indicates the presence of voltage.
Voltage sensing ranges	Nominally, 90 V AC to 1000 V AC or 200 V AC to 1000 V AC depending on model, 45 Hz to 405 Hz; also a 20 V to 90 V control circuit model
Detector tip style	Blade or round, depending on model
Light source	One high intensity red LED
Agency Approvals	c CSA us, CE, TUV, C-

	Tick
Safety Rating	1000 V, CAT IV
IP Rating	IP 40
Operating temperature	-10 °C to 50 °C
Operating humidity ranges	**0 % to 95 %** (0 °C to 30 °C) **0 % to 75 %** (30 °C to 40 °C) **0 % to 45 %** (40 °C to 55 °C)
Operating Altitude	3000 meters
Batteries	2 AAA alkaline batteries included