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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