DETAILED SPECIFICATIONS

# Fluke 114, 115, 116 and 117 Digital Multimeters

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity of 0 % to 90 %.

| General specifications | |
|---|---|
| Maximum voltage (between any terminal and earth ground) | 600 V rms |
| Safety | IEC 61010-1, Pollution Degree 2<br>IEC 61010-2-033 CAT III 600 V, 10 A<br>EMC IEC 61326-1: Portable |
| Fuse for A input (115, 117 only) | 11 A, 1000 V, IR 17 kA (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 (IEC 6LR61) |
| Battery life | 400 hours typical, without backlight |
| Certifications | CE, CSA, RCM |
| 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<br>60.00 V<br>600.0 V | 0.001 V<br>0.01 V<br>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 (114, 116, 117 only) | 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 V | 0.1 V | 1.0 % + 3 | 2.0 % + 3 | 114, 115, 116, 117 |
| AC volts[1] true-rms | 6.000 V<br>60.00 V<br>600.0 V | 0.001 V<br>0.01 V<br>0.1 V | 1.0 % + 3 | 2.0 % + 3 | 114, 115, 116, 117 |
| Continuity (115, 116 only) | 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<br>6.000 kΩ<br>60.00 kΩ<br>600.0 kΩ<br>6.000 MΩ<br>40.00 MΩ | 0.1 Ω<br>0.001 kΩ<br>0.01 kΩ<br>0.1 kΩ<br>0.001 MΩ<br>0.01 MΩ | 0.9 % + 2<br>0.9 % + 1<br>0.9 % + 1<br>0.9 % + 1<br>0.9 % + 1<br>5.0 % + 2 | | 114, 115, 116, 117 |
| Diode test | 2.000 V | 0.001 V | 0.9 % + 2 | | 115, 116, 117 |
| Capacitance (115, 116, 117 only) | 1000 nF<br>10.00 µF<br>100.0 µF<br>9999 µF<br>- | 1 nF<br>0.01 µF<br>0.1 µF<br>1 µF<br>- | 1.9 % + 2<br>1.9 % + 2<br>1.9 % + 2<br>100 µF to 1000 µF: 1.9 % + 2<br>> 1000 µF: 5 % + 20 | | 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)

| Function | Range | Resolution | Accuracy ± ([% of Reading]+ [Counts]) | Model |
|---|---|---|---|---|
| LoZ capacitance (power-up option) (114, 116, 117 only) | 1 nF to 500 µF | | 10 % + 2 typical | 115, 116, 117 |
| Temperature – K-Type thermocouple (116 only) | -40 °C to 400 °C<br>-40 °F to 752 °F | 0.1 °C<br>0.2 °F | 1 % + 10[2]<br>1 % + 18[2] | 116 |
| AC amps true-rms[1] (45 Hz to 500 Hz) (115, 117 only) | 6.000 A<br>10.00 A<br>20 A overload for 30 seconds maximum | 0.001 A<br>0.01 A | 1.5 % + 3 | 115, 117 |
| AC µAmps true-rms[1] (45 Hz to 1 kHz) (116 only) | 600.0 µA | 0.1 µA | 1.5 % + 3 (2.5 % + 3 > 500 Hz) | 116 |
| DC amps (115, 117 only) | 6.000 A<br>10.00 A<br>20 A overload for 30 seconds maximum | 0.001 A<br>0.01 A | 1.0 % + 3 | 115, 117 |
| DC µAmps true-rms (116 only) | 600.0 µA | 0.1 µA | 1.0 % + 2 | 116 |
| Hz (V or A input)[2] (Hz A 115, 117 only) | 99.99 Hz<br>999.9 Hz<br>9.999 kHz<br>50.00 kHz | 0.01 Hz<br>0.1 Hz<br>0.001 kHz<br>0.01 kHz | 0.1 % + 2 | 115, 117 |
| Hz (V input)[3] (115, 116, 117 only) | 99.99 Hz<br>999.9 Hz<br>9.999 kHz<br>50.00 kHz | 0.01 Hz<br>0.1 Hz<br>0.001 kHz<br>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 | V<br>60 V<br>600 V | 0.2 V<br>2 V<br>20 V | 0.2 V to 0.3 V<br>2 V to 3 V<br>20 V to 30 V | 0.3 V to 0.4 V<br>3 V to 4 V<br>30 V to 40 V | 0.4 V to 1.0 V<br>4 V to 10 V<br>40 V to 100 V |
| AC Amps (115, 117 only) | 6 A<br>10 A | N/A<br>N/A | 0.4 A<br>0.5 A | N/A<br>N/A | N/A<br>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 (114, 116, 117 only) | ~3 kΩ < 500 pF | > 60 dB at dc, 50 or 60 Hz | | |
| | Open circuit test voltage | Full scale voltage | | Short circuit current |
| | | To 6.0 MΩ | 40 MΩ | |
| Ohms | < 2.7 V dc | < 0.7 V dc | < 0.9 V dc | < 350 µA |
| Diode test (115, 117 only) | < 2.7 V dc | 2.000 V dc | | < 1.2 mA |

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**Fluke Corporation**
PO Box 9090, Everett, WA 98206 U.S.A.

**For more information call:**
In the U.S.A. (800) 443-5853
In Canada (800) 36-FLUKE
From other countries +1 (425) 446-5500
www.fluke.com

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