

# Fluke 116 HVAC Multimeter

with Temperature and Microamps

## **Technical Data**



### **Actual size**















# Compact true-rms meter for HVAC troubleshooting

The Fluke 116 was specifically designed for the HVAC professional. It has everything needed in an HVAC meter including temperature and microamp measurements to quickly troubleshoot problems with HVAC equipment and flame sensors.

### **Features include:**

- Built in thermometer for HVAC applications
- Microamps to test flame sensors
- LoZ: helps prevent false readings due to ghost voltage
- Large white LED backlight to work in poorly lit areas
- Resistance, continuity, frequency and capacitance
- Min/Max/Average with elapsed time to record signal fluctuations
- Compact ergonomic design for one-handed operation
- Compatible with optional magnetic hanger (ToolPak™)
- CAT III 600 V safety rated

### **General specifications**

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity at 0 % to 95 %.

The accuracy specifications take the form of:  $\pm$  ( [ % of reading ] + [ counts ] )

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	
Display	Digital: 6,000 counts, updates 4/sec	
Bar graph	33 segments, updates 32/sec	
Operating temperature	-10 °C to + 50 °C	
Storage temperature	-40 °C to + 60 °C	
Battery	9 volt Alkaline, NEDA 1604A/ IEC 6LR61	
Battery life	400 hours typical, without backlight	



# **Accuracy specifications**

	Measurement	Range	Resolution	<b>Accuracy</b> $\pm$ ([% of reading] + [counts])
Harmonia   Good V   Good V	DC millivolts	600.0 mV	0.1 mV	2.0 % + 3
Auto volts   600.0 V   0.1 V   2.0 % + 3   dc, 45 Hz to 500 Hz   4.0 % + 3   500 Hz to 1 kHz   1 true-rms   600.0 mV   0.1 mV   1.0 % + 3   500 Hz to 1 kHz   1 true-rms   600.0 V   0.001 V   60.00 V   0.01 V   600.0 V   0.1 V   600.0 W   0.01 kΩ   600.0 kΩ   0.001 kΩ   0.001 kΩ   600.0 kΩ   0.001 kΩ   600.0 kΩ   0.001 kΩ   600.0 kΩ   0.001 kΩ   0.001 kΩ   600.0 kΩ   0.001 kΩ   0.001 kΩ   0.000 kΩ   0.001 kΩ   0.000 kΩ   0.001 kΩ   0.000 kΩ   0.000 kΩ   0.001 kΩ   0.000 kΩ   0	DC volts	6.000 V	0.001 V	
Act movits         600.0 V         0.1 V         2.0 % + 3 (60.0 Hz to 1 kHz)           AC millivolts¹ true-rms         600.0 mV         0.1 mV         1.0 % + 3 (60.0 Hz to 1 kHz)           AC volts¹ true-rms         6.000 V         0.001 V         1.0 % + 3 (60.0 Hz to 1 kHz)           600.0 V         0.01 V         1.0 % + 3 (60.0 Hz to 1 kHz)           600.0 V         0.01 V         1.0 % + 3 (60.0 Hz to 1 kHz)           600.0 V         0.1 V         1.0 % + 3 (60.0 Hz to 1 kHz)           Continuity         600.0 V         0.1 V           600.0 Ω         1.Ω         Beeper on < 20 Ω off > 250 Ω; detects opens or shorts of 500 μs or longer.           Ohms         600.0 Ω         0.1Ω         0.9 % + 2           600.0 kΩ         0.001 kΩ         0.9 % + 2           600.0 kΩ         0.01 kΩ         0.9 % + 2           600.0 kΩ         0.01 kΩ         0.9 % + 2           Diode test         2.000 V         0.001 W         0.9 % + 2           Capacitance         1000 μF         0.1 μF         1.9 % + 2           100.0 μF         0.1 μF		60.00 V	0.01 V	
AC millivolts¹ true-rms   6.00.0 mV   0.1 mV   1.0 % + 3 (fs. 45 Hz to 500 Hz) true-rms   6.000 V   0.001 V   1.0 % + 3 (fs. 45 Hz to 500 Hz) true-rms   6.000 V   0.001 V   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 3 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz to 1 kHz)   1.0 % + 2 (fs. 00 Hz)   1.0 % + 2 (fs. 0		600.0 V	0.1 V	
true-rms $2.0 \% + 3 (500 \text{ Hz to 1 kHz})$ AC volts¹ true-rms $6.000 \text{ V}$ $0.001 \text{ V}$ $1.0 \% + 3 (45 \text{ Hz to 500 Hz})$ $60.00 \text{ V}$ $0.01 \text{ V}$ $1.0 \% + 3 (45 \text{ Hz to 500 Hz})$ Continuity $600.0 \text{ V}$ $0.1 \text{ V}$ Beeper on < 20 Ω off > 250 Ω; detects opens or shorts of 500 µs or longer.           Ohms $600.0 \Omega$ $0.1\Omega$ $0.9 \% + 2$ $6.000 \text{ kΩ}$ $0.01 \text{ kΩ}$ $0.9 \% + 2$ $6.000 \text{ kΩ}$ $0.01 \text{ kΩ}$ $0.9 \% + 2$ $6.000 \text{ MΩ}$ $0.01 \text{ MΩ}$ $1.5 \% + 2$ Diode test $2.000 \text{ V}$ $0.001 \text{ MΩ}$ $1.5 \% + 2$ Diode test $2.000 \text{ V}$ $0.01 \text{ µF}$ $1.9 \% + 2$ $10.00 \text{ µF}$ $0.1 \text{ µF}$ $1.9 \% + 2$ $10.00 \text{ µF}$ $0.1 \text{ µF}$ $1.9 \% + 2$ $100 \text{ µF}$ $1 \text{ µF}$ $1.9 \% + 2$ $100 \text{ µF}$ $1 \text{ µF}$ $1.9 \% + 2$ $100 \text{ µF}$ $1 \text{ µF}$ $1.9 \% + 2$ $100 \text{ µF}$ $1.9 \% + 2$ $1.9 \% + 2$ $100 \text{ µF}$ $1.0 \% + 2$	Auto volts	600.0 V	0.1 V	
		600.0 mV	0.1 mV	
	AC volts1 true-rms	6.000 V	0.001 V	
Continuity         600.0 V         0.1 V         Beeper on < 20 Ω off > 250 Ω; detects opens or shorts of 500 μs or longer.           Ohms         600.0 Ω         0.1Ω         0.9 % + 2           6.000 kΩ         0.001 kΩ         0.9 % + 1           6.000 kΩ         0.01 kΩ         0.9 % + 1           6.000 MΩ         0.001 MΩ         1.5 % + 2           Diode test         2.000 V         0.001 V         0.9 % + 2           Capacitance         1 000 μF         0.01 μF         1.9 % + 2           100.0 μF         0.1 μF         1.9 % + 2           1000 μF         0.1 μF         1.9 % + 2           Lo-Z capacitance         1 nF to 500 μF         1.9 % + 2           Lo-Z capacitance         1 nF to 500 μF         10 % + 2 typical           Temperature (Type-K thermocouple)         -40 °C to 400 °C         0.1 °C         1 % + 102           AC μamps true-rms (45 Hz to 500 Hz)         600.0 μA         0.1 μA         1.5 % + 3 (2.5 % + 3 > 500 Hz)           DC μamps         600.0 μA         0.1 μA         1.0 % + 2           Hz (V or A input)²         99.99 Hz         0.01 Hz         0.1 Hz           99.99 kHz         0.01 kHz		60.00 V	0.01 V	
Ohms         600.0 Ω         0.1Ω         0.9 % + 2           6.000 kΩ         0.001 kΩ         0.9 % + 2           6.000 kΩ         0.01 kΩ         0.9 % + 1           60.00 kΩ         0.1 kΩ         0.9 % + 1           6.000 MΩ         0.001 MΩ         1.5 % + 2           Diode test         2.000 V         0.001 W         0.9 % + 2           Capacitance         1000 nF         1 nF         1.9 % + 2           1000 μF         0.1 μF         1.9 % + 2           1000 μF         1 μF         1.9 % + 2           100 μF to 1000 μF         1 μF         1.9 % + 2           100 μF to 1000 μF         5 % + 20         10 % + 2 typical           Lo-Z capacitance         1 nF to 500 μF         10 % + 2 typical           Temperature (Type-K thermocouple)         -40 °C to 400 °C         0.1 °C         1 % + 18z           AC μamps true-rms (45 Hz to 500 Hz)         600.0 μA         0.1 μA         1.5 % + 3 (2.5 % + 3 > 500 Hz)           DC μamps         600.0 μA         0.1 μA         1.0 % + 2           Hz (V or A input)²         99.99 Hz         0.1 Hz         0.1 Hz           9.999 kHz         0.001 kHz         0.1 % + 2		600.0 V	0.1 V	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Continuity	600 Ω	1 Ω	Beeper on < 20 $\Omega$ off > 250 $\Omega$ ; detects opens or shorts of 500 $\mu$ s or longer.
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ohms	600.0 Ω	0.1Ω	0.9 % + 2
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		6.000 kΩ	0.001 kΩ	
		60.00 kΩ	0.01 kΩ	0.00% + 1
		600.0 kΩ	0.1 kΩ	0.9 % + 1
Diode test         2.000 V         0.001 V         0.9 % + 2           Capacitance         1000 nF         1 nF         1.9 % + 2           100.0 μF         0.1 μF         1.9 % + 2           9999 μF         1 μF         1.9 % + 2           100 μF to 1000 μF         1.9 % + 2           > 1000 μF         5 % + 20           Lo-Z capacitance         1 nF to 500 μF         10 % + 2 typical           Temperature (Type-K thermocouple)         -40 °C to 400 °C         0.1 °C         1 % + 102           AC μamps true-rms (45 Hz to 500 Hz)         600.0 μA         0.1 μA         1.5 % + 3 (2.5 % + 3 > 500 Hz)           DC μamps         600.0 μA         0.1 μA         1.0 % + 2           Hz (V or A input)²         99.99 Hz         0.01 Hz           99.99 kHz         0.1 Hz         0.1 % + 2           9.999 kHz         0.001 kHz         0.1 % + 2		6.000 MΩ	0.001 ΜΩ	
Capacitance $1000 \text{ nF}$ $1 \text{ nF}$ $1.9 \% + 2$ $100.0 \text{ μF}$ $0.01 \text{ μF}$ $1.9 \% + 2$ $100.0 \text{ μF}$ $0.1 \text{ μF}$ $1.9 \% + 2$ $9999 \text{ μF}$ $1 \text{ μF}$ $1.9 \% + 2$ $1000 \text{ μF}$ $1.9 \% + 2$ $1.9 \% + 2$ $1.9 \% + 102$ $1.9 \% + 102$ $1.9 \% + 182$ $1.9 \% + 102$ $1.9 \% + 182$ $1.9 \% + 102$ $1.9 \% + 182$ $1.9 \% + 102$ $1.9 \% + 182$		40.00 MΩ	0.01 ΜΩ	1.5 % + 2
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Diode test	2.000 V	0.001 V	0.9 % + 2
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Capacitance	1000 nF	1 nF	1.9 % + 2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		10.00 μF	0.01 μF	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		100.0 μF	0.1 μF	
		9999 μΓ	1 μF	
Lo-Z capacitance       1 nF to 500 μF       10 % + 2 typical         Temperature (Type-K thermocouple)       -40 °C to 400 °C       0.1 °C       1 % + 102         AC μamps true-rms (45 Hz to 500 Hz)       600.0 μA       0.1 μA       1.5 % + 3 (2.5 % + 3 > 500 Hz)         DC μamps       600.0 μA       0.1 μA       1.0 % + 2         Hz (V or A input)²       99.99 Hz       0.01 Hz         999.9 Hz       0.1 Hz         99.99 kHz       0.001 kHz		100 μF to 1000 μF		1.9 % + 2
Temperature (Type-K thermocouple)         -40 °C to 400 °C       0.1 °C       1 % + 102         -40 °F to 752 °F       0.2 °F       1 % + 182         AC μamps true-rms (45 Hz to 500 Hz)       600.0 μA       0.1 μA       1.5 % + 3 (2.5 % + 3 > 500 Hz)         DC μamps       600.0 μA       0.1 μA       1.0 % + 2         Hz (V or A input)²       99.99 Hz       0.01 Hz         999.9 Hz       0.1 Hz         9.999 kHz       0.001 kHz		> 1000 μF		5 % + 20
Type-K thermocouple   -40 °F to 752 °F   0.2 °F   1 % + 182    -40 °F to 752 °F   0.1 μA   1.5 % + 3 (2.5 % + 3 > 500 Hz)    -40 °F to 752 °F   0.2 °F   1 % + 182    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F to 752 °F   0.1 µA   1.0 % + 2    -40 °F to 752 °F to	Lo-Z capacitance	1 nF to 500 μF		10 % + 2 typical
thermocouple)       -40 °F to 752 °F       0.2 °F       1 % + 182         AC μamps true-rms (45 Hz to 500 Hz)       600.0 μA       0.1 μA       1.5 % + 3 (2.5 % + 3 > 500 Hz)         DC μamps       600.0 μA       0.1 μA       1.0 % + 2         Hz (V or A input)²       99.99 Hz       0.01 Hz         99.99 kHz       0.1 Hz         9.999 kHz       0.001 kHz	(Type-K	-40 °C to 400 °C	0.1 °C	1 % + 102
true-rms (45 Hz to 500 Hz)     600.0 μA     0.1 μA     1.0 % + 2       Hz (V or A input)²     99.99 Hz     0.01 Hz       999.9 Hz     0.1 Hz       99.99 kHz     0.001 kHz       0.1 % + 2		-40 °F to 752 °F	0.2 °F	1 % + 182
Hz (V or A input) <sup>2</sup> 99.99 Hz 0.01 Hz 99.99 kHz 0.10 Hz 0.10 Hz 0.10 W + 2	true-rms	600.0 µА	0.1 µА	1.5 % + 3 (2.5 % + 3 > 500 Hz)
999.9 Hz 0.1 Hz 9.999 kHz 0.001 kHz 0.1 % + 2	DC µamps	600.0 μΑ	0.1 μΑ	1.0 % + 2
9.999 kHz 0.001 kHz 0.1 % + 2	Hz (V or A input) <sup>2</sup>	99.99 Hz	0.01 Hz	0.1 % + 2
9.999 kHz 0.001 kHz		999.9 Hz	0.1 Hz	
E0.00 kHz 0.01 kHz		9.999 kHz	0.001 kHz	
JOUUNE U.O.I KEZ		50.00 kHz	0.01 kHz	

#### Notes:

<sup>2</sup> Temperature uncertainty (accuracy) does not include the error of the thermocouple probe.

# Ordering information

Fluke-116

**HVAC Multimeter** with Temperature and Microamps

#### Included

TL75 Test Leads, 80BK Integrated Temperature Probe, holster, User's manual and 9V battery (installed).



Fluke. Keeping your world up and running.

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 $<sup>^1</sup>$  All ac voltage ranges are specified from 1~% to 100~% of range. 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  $\leq 3$  at 4000 counts, decreasing linearly to 1.5 at full scale. AC volts is ac-coupled. Auto-V LoZ, and ac mV are dc-coupled.

<sup>&</sup>lt;sup>3</sup> Frequency is ac coupled, 5 Hz to 50 kHz for ac voltage. Frequency is dc coupled, 45 Hz to 5 kHz for ac current.