Agilent

U1241A/U1242A Handheld Digital Multimeter

Data Sheet

Agilent Technologies

The U1240 Series: Helping You Check and Fix More Installation and Maintenance Bugs

Key Features

Check more, fix more

- 10,000-count display
- 0.09% basic DCV accuracy
- True RMS AC measurement
- Basic functions — ACV, DCV, ACI, DCI, resistance, frequency, diode, continuity tests
- Advanced functions — Capacitance, temperature, MINMAX recording

Ease of use

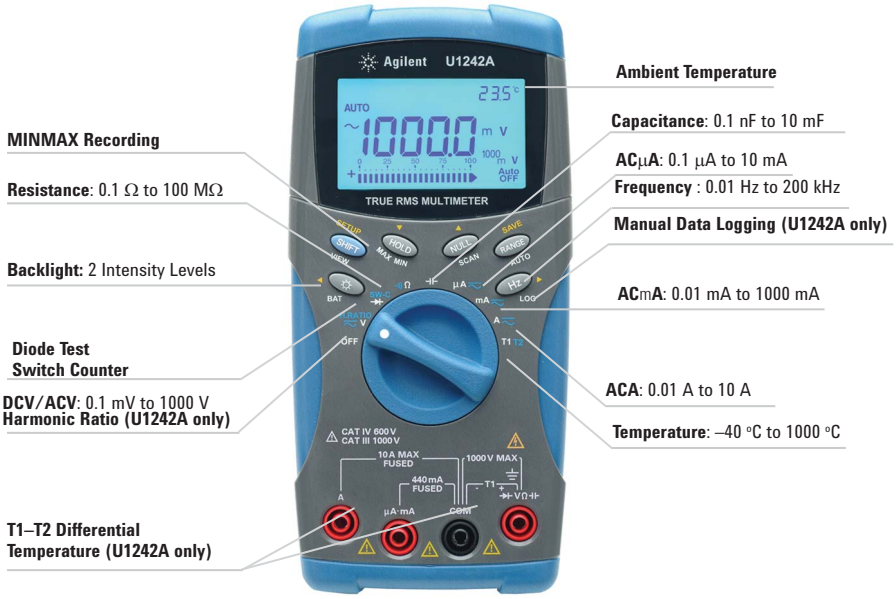
- Adjustable backlighting — 2 intensity levels
- Manual data logging (U1242A only)
- Built-in switch counter, harmonic ratio (U1242A only), dual/ differential temperature capabilities (U1242A only)

Built to last

- Overmold body casing
- CAT III 1000 V and CAT IV 600 V safety protection
- Certified to CE and CSA standards
- Operating temperature: –10 °C to 55 °C

The Agilent U1240A Series handheld digital multimeters enable you to check more with wider measurement ranges. They feature true RMS readings on their 10,000-count displays. The adjustable backlighting allows you to complete your jobs even in subdued lighting conditions, at the same time prolonging the battery life. Your maintenance tasks are greatly simplified due to the built-in switch counter, harmonic ratio, dual and differential temperature capabilities, with just a press of the button. The meters have a high safety rating with CAT III 1000 V and CAT IV 600 V protection and are certified to CE and CSA standards. On top of that, the U1240A Series comes with a certificate of calibration and test report – at no extra cost.

Functions and ranges at a glance



DC SPECIFICATIONS

FUNCTION	RANGE	RESOLUTION	TEST CURRENT/ BURDEN VOLTAGE	ACCURACY ± (% of Reading + No. of Least Significant Digit)	
				U1241A	U1242A
VOLTAGE[1]	1000.0 mV	0.1 mV	–	0.09% + 5	
	10.000 V	0.001 V	–	0.09% + 2	
	100.00 V	0.01 V	–		
	1000.0 V	0.1 V	–	0.15% + 5	
CURRENT	1000.0 µA	0.1 µA	< 0.06 V (50 Ω)	0.1% + 3	
	10000 µA	1 µA	< 0.55 V (50 Ω)	0.1% + 3	
	100.00 mA	0.01 mA	< 0.18 V (0.5 Ω)	0.2% + 3	
	440.0 mA[2]	0.1 mA	< 0.8 V (0.5 Ω)	0.5% + 3	
	10.000 A[3]	0.001 A	< 0.4 V (0.01 Ω)	0.6% + 5	
RESISTANCE[4]	1000.0 Ω[5]	0.1 Ω	0.5 mA	0.3% + 3	
	10.000 kΩ[5]	0.001 kΩ	50 µA		
	100.00 kΩ	0.01 kΩ	4.91 µA		
	1000.0 kΩ	0.1 kΩ	447 nA		
	10.000 MΩ	0.001 MΩ	112 nA	0.8% + 3	
	100.00 MΩ[6]	0.01 MΩ	112 nA	1.5% + 3	
DIODE TEST[7]	1 V	0.001 V	approximately 0.5 mA	0.3% + 2	

AC SPECIFICATIONS

FUNCTION	RANGE	RESOLUTION	TEST CURRENT/ BURDEN VOLTAGE	ACCURACY ± (% of Reading + No. of Least Significant Digit)		
				40 Hz to 500 Hz	500 Hz to 1 kHz	1 kHz to 2 kHz
AC VOLTAGE[8][12] TRUE RMS	1000.0 mV	0.1 mV	–	1% + 5	2% + 5	–
	10.000 V	0.001 V	–		1% + 5	2% + 5
	100.00 V	0.01 V	–			
	1000.0 V	0.1 V	–			–
AC Current[9][12] TRUE RMS	1000.0 µA	0.1 µA	< 0.06 V (50 Ω)	1% + 5	1.5% + 5	–
	10000 µA	1 µA	< 0.55 V (50 Ω)			
	100.00 mA	0.01 mA	< 0.18 V (0.5 Ω)			
	440.0 mA[10]	0.1 mA	< 0.8 V (0.5 Ω)			
	10.000 A[11]	0.001 A	< 0.4 V (0.01 Ω)			

[1] Input impedance: 10 MΩ (nominal).

[2] Current can be measured up to 440 mA continuously. An additional 0.2% needs to be added to the specified accuracy if the signal measured is in the range of 440 mA to 1100 mA for 30 seconds maximum. After measuring a current of > 440 mA, leave the meter to cool down for twice the measuring time used before applying a low current measurement.

[3] Current can be measured up to 10 A continuously with a maximum operating temperature of 50 °C. An additional 0.3% needs to be added to the specified accuracy if the signal measured is in the range of 10 A to 19.999 A for 15 seconds maximum. After measuring a current of > 10 A, leave the meter to cool down for 60 seconds before applying a low current measurement.

[4] The maximum open voltage is < 2.8 V. For instant continuity, the built-in buzzer sounds when resistance is < 10.0 Ω.

[5] The accuracy of 1 kΩ and 10 kΩ is specified after Null function, which is used to substrate the test lead resistance and the thermal effect.

[6] For the range of 100 MΩ, the R.H. is specified for < 60%. The temperature coefficient will be 0.15 times of specified accuracy as > 50 MΩ.

[7] Overload protection: 1000 V RMS for circuits < 0.3 A short circuit current. The built-in buzzer sounds when reading is approximately below 50 mV and audible single tone for normal forward biased diode or semiconductor junction as 0.3 V ≤ Reading ≤ 0.8 V.

[8] Input impedance: 10 MΩ (nominal) in parallel with <100 pF, with overload protection of 1000 V RMS

[9] Crest factor ≤ 3. For non-sinusoidal waveforms with crest factor up to 3, add 2% reading + 2% full scale typical.

[10] Current can be measured from 50 mA to 440 mA continuously. An additional 0.2% needs to be added to the specified accuracy if the signal measured is in the range of 440 mA to 1100 mA for 30 seconds maximum. After measuring a current of > 440 mA, leave the meter to cool down for twice the measuring time used before application of low current measurement.

[11] Current can be measured from 0.5 A up to 10 A continuously with a maximum operating temperature of 50 °C. An additional 0.3% needs to be added to the specified accuracy if the signal measured is in the range of 10 A to 19.999 A for 15 seconds maximum. After measuring a current of >10 A, leave the meter to cool down for 60 seconds before applying a low current measurement.

[12] AC voltage and AC current specifications are AC coupled. True R.M.S. Measurement is valid from 5 % of range to 100 % of range.

TEMPERATURE SPECIFICATIONS

THERMOCOUPLE TYPE	RANGE	RESOLUTION	ACCURACY ± (% of Reading + Offset Error)
K (for U1241A and U1242A)	–40 to 1000 °C/ –48 to 1832 °F	0.1 °C/ 0.1 °F	1% + 1 °C/ 1% + 1.8 °F
J (for U1242A only)	–40 to 1000 °C/ –48 to 1832 °F	0.1 °C/ 0.1 °F	1% + 1 °C/ 1% + 1.8 °F

CAPACITANCE SPECIFICATIONS

RANGE	RESOLUTION	ACCURACY ± (% of Reading + No. of Least Significant Digit)
1000.0 nF	0.1 nF	1.2% + 4
10.000 µF	0.001 µF	
100.00 µF	0.01 µF	
1000.0 µF	0.1 µF	2% + 4
10.000 mF	0.001 mF	

HARMONIC RATIO SPECIFICATIONS

RANGE	FREQUENCY	VOLTAGE
0.0% to 99.9%	40 Hz to 500 Hz	100 mVAC to 1000 VAC

SWITCH COUNTER DEFINITION

SWITCH CONDITION[1][2]	CIRCUIT SWITCH	DISPLAY[3]	SWITCH THRESHOLD
Low Level	Normally Close	Lo	< 370 Ohms
Intermittent[4]	Close to Open	Number of switch count	Low to high transition
High Level	Normally Open	Hi	> 430 Ohms
Intermittent[5]	Open to Close	Number of switch count	High to low transition

[1] Detects intermittent Opens or Closes lasting for at least 250 µsec.
[2] Test current of 0.5 mA with maximum open circuit voltage of 2.8 V is used.
[3] Maximum count reading: 199.99 M (display "OL" when achieving 2 x 10^8 and thereafter).
[4] Count only low to high transition for initial switch condition of Low.
[5] Count only high to low transition for initial switch condition of High.

FREQUENCY SPECIFICATIONS

RANGE	RESOLUTION	ACCURACY	MINIMUM INPUT FREQUENCY
100.00 Hz	0.01 Hz	0.03%+3	1 Hz
1000.0 Hz	0.1 Hz		
10.000 kHz	0.001 kHz		
100.00 kHz	0.01 kHz		
1000.0 kHz[1]	0.1 kHz		

[1] Effective frequency measurement of up to 200 kH; refer to frequency sensitivity table below for details.

FREQUENCY SENSITIVITY DURING VOLTAGE MEASUREMENT

INPUT RANGE	MINIMUM SENSITIVITY (RMS Sine Wave)	
(Maximum input for specified accuracy = 10 x Range or 1000 V)	20 Hz - 50 kHz	50 kHz to 200 kHz
1000.0 mV	0.3 V	0.6 V
10.000 V	0.5 V	1.8 V
100.00 V	5 V	10 V (<100 kHz)
1000.0 V	50 V	100 V (<100 kHz)

FREQUENCY SENSITIVITY DURING CURRENT MEASUREMENT

INPUT RANGE	MINIMUM SENSITIVITY (RMS Sine Wave) 20 Hz to 20 kHz
1000.0 µA	100 µA
10000 µA	500 µA
100.00 mA	10 mA
440.00 mA	50 mA
10.000 A	1 A

MEASURING RATE

FUNCTION	TIMES/SECOND
ACV	7
DCV (V or mV)	7
Ω	14
Diode	14
Capacitance	4 (< 100 µF)
DCA (µA, mA, A)	7
ACA (µA, mA, A)	7
Temperature	7 (single)
Frequency	1 (> 10 Hz)

GENERAL SPECIFICATIONS

DISPLAY Dual display (secondary display is intended for temperature function display only) consists of 4-digit liquid crystal display (LCD) with maximum reading of 11,000 counts. Automatic polarity indication.
POWER CONSUMPTION 0.22 VA maximum
BATTERY TYPE AND LIFE 4 single standard 1.5 V AAA batteries (Alkaline or Zinc Chloride type); 200 hours typical
OPERATING ENVIRONMENT • Full accuracy at –10 °C to 55 °C; and to 80% RH for temperatures up to 30 °C, decreasing linearly to 50% RH at 55 °C • 0 – 2000 meters per IEC 61010-1 2nd Edition CAT III, 1000 V / CAT IV, 600 V IEC 61010-1 2nd Edition
STORAGE COMPLIANCE –20 °C to 70 °C
SAFETY COMPLIANCE • IEC 61010-1:2001 / EN61010-1:2001 • Canada: CSA C22.2 No. 61010-1:2004
MEASUREMENT CATEGORY CAT III 1000 V / CAT IV 600 V Overvoltage Protection, Pollution Degree 2
EMC COMPLIANCE • Certified to IEC 61326:2002/EN 61326: 2003 • CISPR 11:1990/EN55011:1990 • Canada: ICES-001:2004 • Australia/New Zealand: AS/NZS CISPR11:2004
COMMON MODE REJECTION RATIO (CMRR) > 90 dB at DC, 50/60 Hz ± 0.1% (1 kΩ unbalanced)
NORMAL MODE REJECTION RATIO (NMRR) > 60 dB at 50/60 Hz ± 0.1%
CREST FACTOR < 3.0
TEMPERATURE COEFFICIENT 0.1 × (specified accuracy) / °C (from –10 °C to 18 °C or 28 °C to 55 °C)
SHOCK and VIBRATION Tested to IEC/EN 60068-2
DIMENSIONS (HxWxD) 193.8 mm x 92.2 mm x 58.0 mm
WEIGHT 450 g with batteries 400 g without batteries
WARRANTY 3 years

STANDARD SHIPPED ITEMS

- Four 1.5 V AAA Alkaline Batteries
- Certificate of Calibration (CoC)
- Test Probe Leads (19-mm and 4-mm tips)
- Quick Start Guide
- Product Reference CD

OPTIONAL ACCESSORIES

MEASURING ACCESSORIES (NON-TEMPERATURE)

U1160A Standard test lead kit

U1161A Extended test lead kit

U1162A Alligator clips

U1163A SMT grabbers

U1164A Fine-tip test probes

U1165A Test probe leads

U1168A Standard test lead kit (19-mm and 4-mm tips)

U1169A Test probe leads (19-mm and 4-mm tips)

U1583A AC current clamp

MEASURING ACCESSORIES (TEMPERATURE)

U1180A Thermocouple adapter+lead kit, J and K types

U1181A Immersion temperature probe

U1182A Industrial surface temperature probe

U1183A Air temperature probe

U1184A Temperature probe adapter

U1185A J-type thermocouple and adapter

U1186A K-type thermocouple and adapter

CARRYING CASE

U1172A Transit case (aluminium-clad)

U1174A Soft carrying case

HANGING KIT

U1171A Magnetic hanging kit

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