# Keysight U1240 Series
# Handheld Digital Multimeters




Data Sheet

KEYSIGHT TECHNOLOGIES

## 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 — two intensity levels
- Manual data logging (U1242B only)
- Built-in switch counter, harmonic ratio (U1242B only), dual/differential temperature capabilities (U1242B 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 to 55 °C

Keysight Technologies, Inc. U1240 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, or to simply prolong 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 U1240 Series comes with a certificate of calibration and test report – at no extra cost.

The latest multimeters in this series, the U1241B and U1242B, now come in vivid orange cases, offering the capabilities and functions you need.

## Functions and ranges at a glance



# Electrical Specifications

## DC specifications

| Function | Range | Resolution | Test current/burden voltage | Accuracy ± (% of reading + counts of least significant digit) | |
|---|---|---|---|---|---|
| | | | | U1241B | U1242B |
| 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 | |

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.*

# Electrical Specifications

## AC specifications

| Function | Range | Resolution | Test current/burden voltage | Accuracy ± (% of reading + counts of least significant digit) | | |
|---|---|---|---|---|---|---|
| | | | | 40 to 500 Hz | 500 Hz to 1 kHz | 1 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) | | | |

*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 RMS measurement is valid from 5 % of range to 100 % of range.*

## Temperature specifications

| Thermocouple type | Range | Resolution | Accuracy ± (% of reading + offset error) |
|---|---|---|---|
| K (for U1241B and U1242B) | –40 to 1000 °C/–48 to 1832 °F | 0.1 °C /0.1 °F | 1% + 1 °C/1% + 1.8 °F |
| J (for U1242B 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 + counts 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 to 500 Hz | 100 mVAC to 1000 VAC |

# Electrical Specifications

## 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 kHz; refer to frequency sensitivity table below for details.*

## Frequency sensitivity during voltage measurement

| Input range (Maximum input for specified accuracy = 10 x Range or 1000 V) | Minimum sensitivity (RMS sine wave) | |
|---|---|---|
| | 20 Hz to 50 kHz | 50 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 |

# Electrical Specifications

## 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** | Four single standard 1.5 V AAA batteries (Alkaline or Zinc Chloride type); 300 hours typical |
| **Operating environment** | – Full accuracy at –10 to 55 °C; and to 80% RH for temperatures up to 30 °C, decreasing linearly to 50% RH at 55 °C<br>– 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 to 70 °C |
| **Safety compliance** | – IEC 61010-1:2001 / EN61010-1:2001<br>– 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** | – CISPR 11:1990/EN55011:1990<br>– Canada: ICES-001:2004<br>– 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 Ration (NMRR)** | > 60 dB at 50/60 Hz ± 0.1% |
| **Crest factor** | < 3.0 |
| **Temperature coefficient** | 0.1 × (specified accuracy) / °C (from –10 to 18 °C or 28 to 55 °C) |
| **Shock and vibration** | Tested to IEC/EN 60068-2 |
| **Dimensions (H x W x D)** | 193.8 mm x 92.2 mm x 58.0 mm |
| **Weight** | – 450 g with batteries<br>– 400 g without batteries |
| **Warranty** | – Three years for main unit<br>– Three months for standard shipped accessories |

# Ordering Information



*U1241B*



*U1242B*

| Standard shipped accessories |
|---|
| – Four 1.5 V AAA alkaline batteries<br>– Certificate of Calibration (CoC)<br>– Test probe leads (4-mm tips)<br>– Quick Start Guide<br>– Free test data (Option UK6) |

| Optional accessories | | |
|---|---|---|
| **Measuring accessories (non-temperature)** | | |
| U1161A<br>Extended test lead kit |  | Includes two test leads (red and black), two test probes, medium-sized alligator clips and 4-mm banana plugs.<br>– Test leads: CAT III 1000 V, CAT IV 600 V, 15 A<br>– Test probes: CAT III 1000 V, CAT IV 600 V, 15 A<br>– Medium-sized alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A<br>– 4-mm banana plugs: CAT II 600 V, 10 A |
| U1162A<br>Alligator clips |  | – One pair of insulated alligator clips (red and black). Recommended for use with Keysight standard test leads.<br>– Rated CAT III 1000 V, CAT IV 600 V, 15 A |
| U1163A<br>SMT grabbers |  | – One pair of SMT grabbers (red and black). Recommended for use with Keysight standard test leads.<br>– Rated CAT II 300 V, 3 A |
| U1164A<br>Fine-tip test probes |  | – One pair of fine-tip test probes (red and black). Recommended for use with Keysight standard test leads.<br>– Rated CAT II 300 V, 3 A |
| U1168A<br>Standard test lead kit |  | Includes two test leads (red and black), 19-mm and 4-mm test probes, alligator clips, fine-tip test probes, SMT grabbers and mini grabber (black).<br>– Test leads: CAT III 1000 V, CAT IV 600 V, 15 A<br>– Test probes (19-mm tip): CAT II 1000 V, 15 A<br>– Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment)<br>– Alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A<br>– Fine-tip test probes: CAT II 300 V, 3 A<br>– SMT grabber: CAT II 300 V, 3 A<br>– Mini grabber: CAT II 300 V, 3 A |
| U1169A<br>Test probe leads |  | Includes two test leads (red and black), and a pair each of 19-mm and 4-mm test probes.<br>– Test leads: CAT III 1000 V, CAT IV 600 V, 15 A<br>– Test probes (19-mm tip): CAT II 1000 V, 15 A<br>– Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment) |
| U1583B<br>AC current clamp |  | – Dual range: 40 A and 400 A<br>– Rated CAT III 600 V<br>– BNC-to-banana-plug adapter provided for use with DMMs |

# Ordering Information

| Optional accessories | | |
|---|---|---|
| **Measuring accessories (temperature)** | | |
| U1180A<br>Thermocouple adapter+lead kit, J and K types |  | Includes thermocouple adapter, thermocouple bead J-type and thermocouple bead K-type.<br>– T/C adapter J/K-type<br>– T/C bead J-type: –20 °C to 200 °C<br>– T/C bead K-type: –20 °C to 200 °C |
| U1181A<br>Immersion temperature probe |  | – Type-K T/C for use in oil and other liquids<br>– Measurement range: –50 °C to 700 °C<br>– Includes adapter U1184A for connection to DMM |
| U1182A<br>Industrial surface temperature probe |  | – Type-K T/C for use on still surfaces<br>– Measurement range: –50 °C to 400 °C<br>– Includes adapter U1184A for connection to DMM |
| U1183A<br>Air temperature probe |  | – Type-K T/C for use in air and non-caustic gas<br>– Measurement range: –50 °C to 800 °C<br>– Includes adapter U1184A for connection to DMM |
| U1184A<br>Temperature probe adapter |  | – Mini-connector-to-banana-plug adapter for use with DMM |
| U1185A<br>J-type thermocouple and adapter |  | – T/C adapter J/K-type<br>– T/C bead J-type: –20 °C to 200 °C |
| U1186A<br>K-type thermocouple and adapter |  | – T/C adapter J/K-type<br>– T/C bead J-type: –20 °C to 200 °C |
| **Carrying case** | | |
| U1172A<br>Transit case (aluminium-clad) |  | The robust casing to transport your DMM and accessories<br>– Aluminum-clad, black panel construction<br>– Dimension: 18 inches (H) x 13 inches (W) x 6 inches (D)<br>– Weight: 4 kg |
| U1174A<br>Soft carrying case |  | The convenient way to carry your DMM and essential accessories<br>– Dimension: 9 inches (H) x 5 inches (W) x 3 inches (D) |
| **Hanging kit** | | |
| U1171A<br>Magnetic hanging kit |  | For fastening the DMM to a steel surface so both hands are free |
| U1179A IR<br>Connectivity Bracke |  | Connect with U1177A IR-to-Bluetooth adapter or U1173A IR-USB cable |

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