Keysight Technologies
U1240 Series Handheld Digital Multimeters

Data Sheet



KEYSIGHT TECHNOLOGIES

Introduction

For technicians or industrial test engineers, your ultimate goal is to keep the production line running seamlessly to prevent any unplanned shutdown. The strong and solid Keysight Technologies, Inc. U1240B and U1240C Series are just the DMMs you need to work efficiently, on the bench or in the field. Certified to IP 67 and with the durability to withstand drops up to 10 feet (3 meters) to suit harsh working environments, the U1240C can work longer for you with up to 400 hours of battery life. Better yet, you can optimize productivity with the unique remote data logging functionality via USB or *Bluetooth*®. Perform test confidently and efficiently – everything you need to get the job done.



Key Features

- 10,000-count display
- Up to 0.09% basic DCV accuracy
- Longer battery life up to 400 hours[3]
- Certified to IP 67 for water and dust protection[3]
- Tested to withstand a 3-meter (10-ft) drop[3]
- CAT III 1000 V / CAT IV 600 V overvoltage protection
- Special features:
  - Harmonic ratio[2] measurement to quickly identify the presence of harmonics in AC signals
  - Z_{LOW}, low impedance mode[1] to eliminate false readings caused by stray voltages
  - Vsense[1] for non-contact voltage detection
  - T1 – T2 differential temperature[2] measurement
  - Built-in flashlight[3]
- For Keysight Remote Link solution, add optional Infrared (IR)-to-*Bluetooth* adapter to get instant wireless *Bluetooth* connection[4]

1. U1242C only
2. U1242B & U1242C only
3. U1240C Series only
4. Additionally, the U1240B Series also requires the U1179A IR connectivity bracket.

Test Confidently and Efficiently

Harmonics ratio

In real life, harmonics are present in AC power due to the fact that many electronic devices are powered by switched mode current pulses which travel back into the power source. If these unwanted harmonics become too large, the undesirable side effects include: overheating that shortens the lifespan of motors, generators and transformers, premature tripping of circuit breakers, and blown fuses. One of the fastest ways to detect and gauge the percentage of distortion due to harmonics is by measuring the harmonic ratio of the incoming AC voltage. You can perform this very easily on the U1242B/C handheld DMM, with just a button press. The percentage helps you to decide if further analysis of the power source is required with an oscilloscope or a spectrum analyzer.

Low impedance mode (Z_{low})

Stray voltages are usually encountered in non-energized electrical wiring adjacent to powered wires due to capacitive or inductive coupling between these wires. The low impedance mode helps to reduce false readings by dissipating these stray voltages thus improving safety and measurement efficiency during voltage measurement.

Vsense for non-contact voltage detection

Vsense is a unique method of non-contact voltage detection that safeguards users from exposure to hot or live wires while making measurements in dangerous working environments. Upon detection of high AC voltage, it produces a unique combination of beeping audio and blinking LED light to alert users.

Dual and differential temperature

In the installation, maintenance and troubleshooting of heating, ventilation and air-conditioning (HVAC) systems, temperature measurements are essential. As an example, to ensure boiler temperature adheres to safety requirements, you would need to measure both boiler and air temperature simultaneously to achieve accurate real-time readings. With a faulty air conditioning system, viewing the temperature difference between warm return air and cool air supply helps to reveal the cooling behavior of the evaporator with respect to time. Now with the convenience of the U1242B/C DMM, you need only one instrument to efficiently get dual and differential measurements.

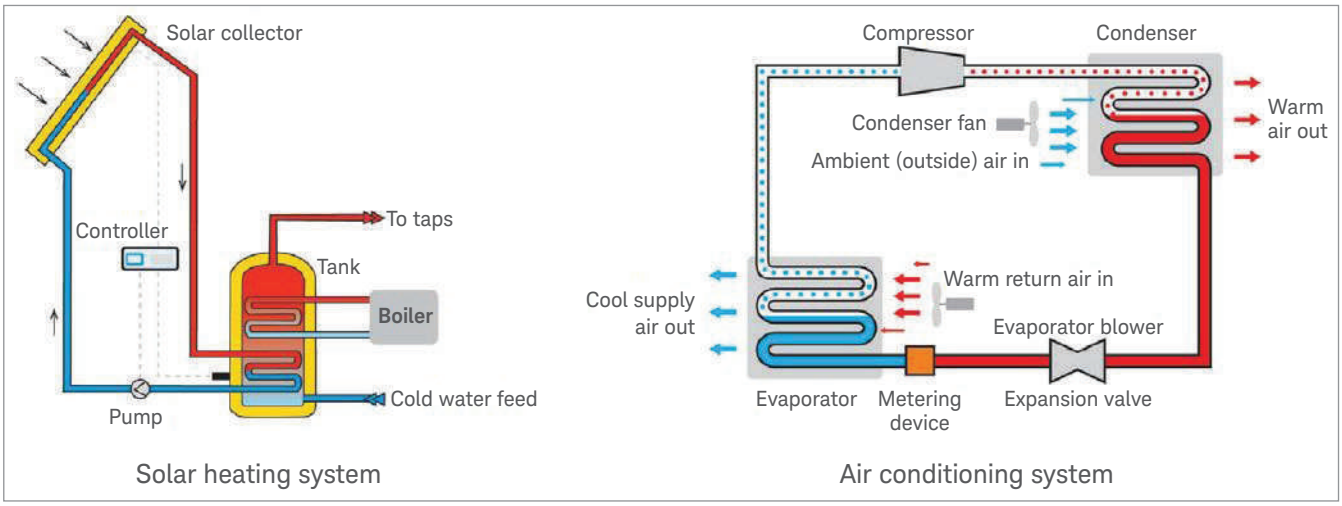


Figure 1. Dual and differential temperature for efficient testing of HVAC systems

Built-in flashlight with ergonomics in mind

Designed for handheld users working in poorly lit environments, the U1240C Series fits comfortably in your palm allowing you to single-handedly illuminate the test area with its easily activated built-in LED flashlight. With ergonomics in mind, you can swiftly make more measurements without straining your hands even over a longer period of time.



Figure 2. Ergonomically shaped with a built-in flashlight

Prolonged battery life and rugged build

The last thing you want is for your tools to run out of juice when you need it the most. The U1240C Series of handheld DMMs lets you carry out test and measurements over a prolonged duration. With up to 400 hours of battery life, you don't have worry about the hassles of battery change, and just focus on maximum productivity.

When operating in harsh environments, you need tools which are strong and solid enough to stand up to the task. The U1240C Series DMMs are housed in robust overmold enclosures and certified to IP 67 for dust and water resistance. Better yet, it is also designed to absorb the impact of a 3-meter (10-foot) drop – especially useful in case of accidental drops during installation and maintenance work.

Perform data logging on-DMM, wired or wirelessly

Keep the production lines running smoothly with the U1240 Series DMMs' data logging capabilities. Users have two options to record individual readings. The first option is to simply record data into the main DMM unit by utilizing the built-in internal memory of up to 2,000 readings storage. The second option is to transmit data to a PC with the IR-USB cable utilizing the Keysight Handheld Meter Logger software or to do so wirelessly with the optional Keysight Remote Link solution. With this capability, you can ensure every reading gets recorded accurately at intervals you specify. Better yet, you can eliminate the conventional data entering process and generate error-free automated test reports in various forms such as graph, table, and statistical information or limit test results.



Figure 3. Easily capture test readings with the Keysight Handheld Meter Logger software



Figure 4. U1240C Series is compatible with Keysight Remote Link solution to safely measure, view and log test measurements

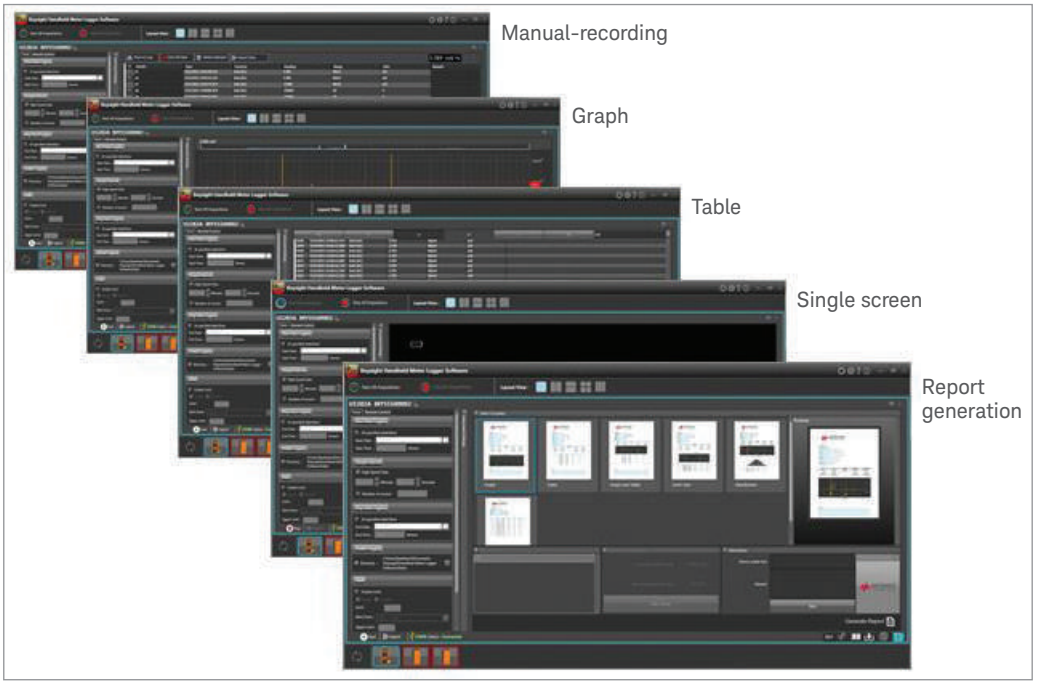


Figure 5. Get automatic report generated in various formats via PDF

Take a Closer Look at the U1240C Series

Front panel

10,000-count dual display

Data logging:
- Manual data logging up to 100 readings, or,
- Auto/event data logging up to 2,000 readings

Harmonics ratio* to detect the presence of harmonics content

Z_{LOW} (low input impedance)* to remove ghost or induced voltage from your measurement



Vsense* red LED indicator for non-contact voltage detection



Press-and-hold to switch on the built-in flashlight

T1-T2 differential temperature* measurement

Broad range of measurement functions: voltage, current, frequency, capacitance, resistance, continuity, diode test and temperature

CAT IV 600 V CAT III 1000 V overvoltage protection

* U1242C only

Back panel



Built-in flashlight

Probe holder/storage





Ergonomically designed for better grip





IR-USB connectivity



Easy access to battery and fuse compartment

Take a Closer Look at the U1240B Series

Front panel



U1240C Series Comparison

Basic features		**U1241C**	**U1242C**
Display resolution		10,000	10,000
Auto/manual ranging		Yes	Yes
Analog bar graph		Yes	Yes
Backlight		Yes	Yes
AC bandwidth		2 kHz	2 kHz
True RMS		AC	AC (Switchable to averaging sense)
Measurements			
Voltage DC	Range	100 mV to 1000 V	100 mV to 1000 V
	Accuracy	0.09% + 2 cnts	0.09% + 2 cnts
Voltage AC	Range	100 mV to 1000 V	100 mV to 1000 V
	Accuracy	1.0% + 3 cnts	1.0% + 3 cnts
Current DC	Range	1000 µA to 10 A	1000 µA to 10 A
	Accuracy	0.1% + 2 cnts	0.1% + 2 cnts
Current AC	Range	1000 µA to 10 A	1000 µA to 10 A
	Accuracy	1% + 3 cnts	1% + 3 cnts
Resistance	Range	1000 Ω to 100 MΩ	100 Ω to 100 MΩ
	Accuracy	0.2% + 2 cnts	0.2% + 2 cnts
Frequency	Range	100 Hz to 10 MHz	100 Hz to 10 MHz
	Accuracy	0.02% + 1 cnts	0.02% + 1 cnts
Capacitance	Range	1000 nF to 10 mF	1000 nF to 10 mF
	Accuracy	1% + 5 cnts	1% + 5 cnts
Temperature (K-type thermocouple	Range	–200°C to 1372°C	–200°C to 1372°C
	Accuracy	1% + 1°C	1% + 1°C
Continuity with beeper		Yes	Yes
Diode test		Yes	Yes
Data management			
Min/Max recording		Yes	Yes
Display hold		Yes	Yes
Auto hold		Yes	Yes
Null		Yes	Yes
PC-Connectivity		Infrared (IR)-USB; IR-*Bluetooth* (optional)	Infrared (IR)-USB; IR-*Bluetooth* (optional)
Special features			
Harmonic ratio		–	Yes
Vsense: non-contact voltage detection		–	Yes
Z_{LOW} - low impedance mode		–	Yes
T1 - T2 differential temperature measurement		–	Yes
Safety and regulatory			
Over-voltage safety protection		CAT III 1000 V / CAT IV 600 V	CAT III 1000 V / CAT IV 600 V
EN/IEC 61010-2-030: 2010 compliance		Yes	Yes
EN/IEC 61010-1: 2010 compliance		Yes	Yes
General			
Operating temperature		–20°C to 55°C 0% to 80% R.H.	–20°C to 55°C 0% to 80% R.H.
Battery (included)		4 x 1.5 V AAA	4 x 1.5 V AAA
Battery life		400 hours	400 hours
Warranty		3-year	3-year
Calibration		One year, or; Two years (with 1.5 times of one year specification)	One year, or; Two years (with 1.5 times of one year specification)
Dimensions (H x W x D)		198 x 96 x 57 mm	198 x 96 x 57 mm

U1240C Series General Specifications

Display	4 ½-digit liquid crystal display (LCD) with maximum reading of 11,000-count Automatic polarity indication
Power consumption	530 mVA maximum with backlight and flashlight.
Battery type	4x 1.5 V AA alkaline batteries (ANSI/NEDA 24A or IEC LR03), or; 4x 1.5 V AA zinc chloride batteries (ANSI/NEDA 24D or IEC R03), or; 4x 1.5 V AA lithium batteries (ANSI/NEDA 24-LF or IEC FR03)
Battery life	400 hours typical based on new alkaline batteries for DC voltage measurement
Connectivity	Infrared (IR) port, connect with: – IR-USB cable, or; – U1117A IR-to-*Bluetooth* adapter (*Bluetooth* Class 1), or; – U1177A IR-to-*Bluetooth* adapter (*Bluetooth* Class 2)
Fuse	10 x 35 mm, 440 mA / 1000 V, 10 kA minimum fast-acting fuse 10 x 38 mm, 11 A / 1000 V, 20 kA minimum fast-acting fuse
Operating environment	Full accuracy from –20°C to 55°C; and up to 80% R.H. for temperature up to 30°C decreasing linearly to 50% R.H. at 55°C Pollution degree II Altitude up to 3000 meters
Storage compliance	–40 OC to 70°C, 0 to 80% R. H. (with battery removed)
Safety compliance	IEC 61010-1:2010 / EN 61010-1:2010, IEC 61010-2-033:2012 / EN 61010-2-033:2012 Canada: CAN/CSA-C22.2 No.61010-1-12, CAN/CSA-C22.2 No. 61010-2-033-12 USA: ANSI/UL Std. No. 61010-1 (3rd Edition), ANSI/UL Std. No. 61010-2-033 (1st Edition)
Measurement category	CAT III 1000 V / CAT IV 600 V
Electromagnetic compatibility (EMC)	Commercial limits compliance with EN61326-1 Influence of radiated immunity: In RF electromagnetic fields of 3 V/M DC voltage measurement typical accuracy: 100 mV & 600 mV range; ±0.1% of range DC current measurement typical accuracy: 1000 uA & 10 mA range; ±0.3% of range 10 A range; ±0.7% of range Note: If used in close proximity to an RF transmitter or when subjected to continuously present electromagnetic phenomena, some recoverable degradation of performance may occur.
Ingress protection rating	IP-67, protected against dust and the effect of immersion between 15 cm and 1 m
Temperature coefficient	0.05 x (specified accuracy)/°C (from –20°C to 18°C or 28°C to 55°C)
Common mode rejection ratio (CMRR)	> 120 dB at DC, 50/60 Hz ±0.1% (1 kΩ unbalanced)
Normal mode rejection ratio (NMRR)	> 60 dB at 50/60 Hz ±0.1%
Dimensions (H x W x D)	198 x 96 x 57 mm
Weight	545 grams (with batteries)
Warranty	Three years for main unit. Three months for standard shipped accessories
Calibration cycle	One year, or; Two years (with 1.5 times of one year specification)

Specification assumptions

- Accuracy is given as ±(% of reading + counts of least significant digit) at 23°C ±5°C, with relative humidity less than 80% R.H.
- Accuracy is specified for 1-year after calibration, at operating temperature of room temperature. Multiply 1.5 times of the accuracy for 2-year after calibration, example ±(1.5 x% of reading + 1.5 x counts of least significant digit).
- AC V/mV and AC µA/mA/A specifications are AC coupled.
- True RMS measurement is valid from 5% of range to 100% of range.
- For non-sinusoidal waveforms, add (0.5% of reading +0.3% of full scale) typically
- The crest factor may be up to 3.0 at full scale except for the 1000 V and 600 mV ranges where these ranges are 1.5 at full scale.
- Specification is based on 5 times/second of data refresh rate
- CMRR and NMRR are based on 5 times/second of data refresh rate
- After Z_{LOW} voltage measurement, wait for at least 20 minutes to cool down thermal impact before making next measurement.

U1240C Series DC Specifications

Function	Range	Resolution	Accuracy ±(% of reading + counts of least significant digit)	Test current / burden voltage
Voltage	100 mV[1,3]	0.01 mV	0.09% + 2	–
	600 mV[1,3]	0.1 mV	0.09% + 2	–
	1000 mV[4]	0.1 mV	0.09% + 2	–
	10 V[4]	0.001 V	0.09% + 2	–
	100 V[4]	0.01 V	0.09% + 2	–
	1000 V[4]	0.1 V	0.09% + 2	–
	Z_{LOW}[2,4] (applicable to 1000 V range)	0.1 V	1% + 4	–
Current[5]	1000 µA[3]	0.1 µA	0.1% + 2	0.032 V (30 Ω)
	10 mA[3]	0.001 mA	0.1% + 2	0.32 V (30 Ω)
	100 mA[1,3]	0.01 mA	0.2% + 2	0.2 V (0.5 Ω)
	600 mA[1,3]	0.1 mA	0.2% + 2	0.88 V (0.5 Ω)
	10 A[2,4]	0.001 A	0.3% + 5	0.5 V (0.01 Ω)
Diode test	–	0.001 V	0.5% + 10	< 1.6 mA
Function	**Range**	**Resolution**	**Accuracy ±(% of reading + counts of least significant digit)**	**Continuity threshold**
Resistance / audible continuity	100 Ω[3,4,7]	0.01 Ω	0.2% + 5	28 ±10 Ω
	1000 Ω[4]	0.1 Ω	0.2% + 2	28 ±10 Ω
	10 kΩ	0.001 kΩ	0.2% + 2	0.151 ±0.05 kΩ
	100 kΩ	0.01 kΩ	0.2% + 2	1.38 ±0.5 kΩ
	1000 kΩ	0.1 kΩ	0.2% + 2	13.8 ±4.3 kΩ
	10 MΩ[5]	0.001 MΩ	0.8% + 2	0.12 ±0.04 MΩ
	100 MΩ[5,6]	0.01 MΩ	1.5% + 3 (<50 MΩ) 3.0% + 3 (>50 MΩ)	0.12 ±0.04 MΩ

Notes for DC specifications

A. Notes for voltage specification.

1. 100 mV and 600 mV ranges available on Temperature T1 terminal. The accuracy is specified for 10 MΩ (nominal) input impedance. The accuracy is specified after NULL function is used to zero out thermal effect (by shorting test leads).
2. Only available in U1242C only. 1.8 kΩ typical input impedance for Z_{LOW} mode.
3. Overload protection for 100 mV and 600 mV ranges: 1000 Vrms for circuits < 0.3 A short circuit current.
4. Overload protection: 1000 Vrms.

B. Notes for current specification

1. Current can be measured up to 440 mA continuously. Maximum of 20 hours for measuring current more than 440 mA and up to 600 mA. 100 mA and 600 mA ranges have thermal effect of 0.35 µA/mA to be offset after current applied to these ranges. Cool down the meter for at least 6 seconds if 100 mA was applied, and at least 3 minutes if 600 mA was applied; or alternatively use the NULL function to zero-out thermal effect with open test lead before measuring the signal.
2. Current can be measured up to 10 A continuously. Maximum of 30 seconds for measuring current more than 10 A to 20 A, add 0.3% to specified accuracy. The multimeter needs to be cool down after measuring current that is more than 10 A. Cool down the meter for twice the duration of the measured time and use NULL function to zero-out thermal effect before proceeding with lower current measurement.
3. 1000 µA to 600 mA ranges (connection with mA terminal) overload protection by 10 x 35 mm, 440 mA/1000 V, and 10 kA minimum fast-acting fuse.
4. 10 A ranges (connection with A terminal) overload protection by 10 x 38 mm, 11 A / 1000 V, 20 kA minimum fast-acting fuse.
5. Ensure good ventilation and no heat element close to the meter.

C. Notes for diode test specification

1. Overload protection: 1000 Vrms for circuits < 0.3 A short circuit current.
2. Built-in buzzer sounds when reading is below 0.05 V approximately, and single tone for normal forward-biased diode or semiconductor junction as 0.3 V ≤ reading ≤ 0.8 V.
3. The maximum threshold voltage display is less than +2 V.

D. Notes for resistance/audible Continuity specification

1. Maximum open voltage: < +2.4 V
2. Built-in buzzer sounds as transient when resistance less than 28 ±10 Ω. It may capture the intermittent for longer than 1 ms.
3. 100 Ω range is for U1242C only
4. The accuracy is specified after Math Null, which is used to subtract the test lead resistance and the thermal effect. Ensure good ventilation and no heat element close to the meter.
5. For 10 MΩ and 100 MΩ ranges, the R.H. is specified for < 60% at 30°C.
6. For 100 MΩ range: temperature coefficient is 0.1 x (specified accuracy) /°C.
7. Resistance range 100 Ω is typical characteristic.

U1240C Series AC Voltage Specifications

Function	Range	Resolution	Accuracy ±(% of reading + counts of least significant digit)	
			40 Hz to 1 kHz	1 kHz to 2 kHz
AC voltage[1,4] True RMS	100 mV[2]	0.01 mV	1.0% + 3	1.5% + 3
	600 mV[2]	0.1 mV	1.0% + 3	1.5% + 3
	1000 mV	0.1 mV	1.0% + 3	1.5% + 3
	10 V	0.001 V	1.0% + 3	1.5% + 3
	100 V	0.01 V	1.0% + 3	1.5% + 3
	1000 V	0.1 V	1.0% + 3	1.5% + 3
	Z_{LOW}[3] (applicable to 1000 V range)	0.1 V	2.0% + 4	N/A
AC voltage[1,4] Averaging sense	100 mV[2]	0.01 mV	1.0% + 5	1.5% + 5
	600 mV[2]	0.1 mV	1.0% + 5	1.5% + 5
	1000 mV	0.1 mV	1.0% + 5	1.5% + 5
	10 V	0.001 V	1.0% + 5	1.5% + 5
	100 V	0.01 V	1.0% + 5	1.5% + 5
	1000 V	0.1 V	1.0% + 5	1.5% + 5

1. Overload protection: 1000 Vrms.
2. 100 mV and 600 mV ranges available on Temperature T1 terminal. The accuracy is specified for 10 MΩ (nominal) input impedance. The accuracy is specified after NULL function is used to zero out thermal effect (by shorting test leads).
3. Only available in U1242C only. 1.8 kΩ typical input impedance for Z_{LOW} mode.
4. The input signal is lower than the product of 20,000,000 V x Hz.

U1240C Series AC Current Specifications

Function	Range	Resolution	Accuracy ±(% of reading + counts of least significant digit)	
			40 Hz to 1 kHz (True RMS)	40 Hz to 1 kHz (Averaging sense)[6]
AC current[5]	1000 µA[3]	0.1 µA	1.0% + 3	1.2% + 5
	10 mA[3]	0.001 mA	1.0% + 3	1.2% + 5
	100 mA[3]	0.01 mA	1.0% + 3	1.2% + 5
	1000 mA[1,3]	0.1 mA	1.0% + 3	1.2% + 5
	10 A[2,4]	0.001 A	1.2% + 5[4]	1.2% + 5

1. Current can be measured up to 440 mA continuously. Maximum of 20 hours for measuring current more than 440 mA and up to 600 mA. 100 mA and 600 mA ranges have thermal effect of 0.35 µA/mA to be offset after current applied to these ranges. Cool down the meter for at least 6 seconds if 100 mA was applied, and at least 3 minutes if 600 mA was applied; or alternatively use the NULL function to zero-out thermal effect with open test lead before measuring the signal.
2. Current can be measured up to 10 A continuously. Maximum of 30 seconds for measuring current more than 10 A to 20 A, add 0.3% to specified accuracy. The multimeter needs to be cool down after measuring current that is more than 10 A. Cool down the meter for twice the duration of the measured time and use NULL function to zero-out thermal effect before proceeding with lower current measurement.
3. 1000 µA to 1000 mA ranges (connection with mA terminal) overload protection by 10 x 35 mm, 440 mA / 1000 V, 10 kA minimum fast-acting fuse.
4. 10 A ranges (connection with A terminal) overload protection by 10 x 38 mm, 11 A / 1000 V, 20 kA minimum fast-acting fuse.
5. Ensure good ventilation and no heat element close to the meter.
6. The averaging sense is calibrated for sine wave only. Add additional 0.05 counts /°C to accuracy from –20 0C to 18 0C or –28°C to 55°C.

U1240C Series Temperature Specifications

Thermal type	Range	Resolution	Accuracy ±(% of reading + as specified below)
K	–200°C to 1372°C	0.1°C	1% + 1°C
	–328°F to 2502°F	0.1°F	1% + 1.8°F
J[5]	–210°C to 1200°C	0.1°C	1% + 1°C
	–346°F to 2192°F	0.1°F	1% + 1.8°F

1. The specification above is specified after 60 minutes of warm-up time.
2. The accuracy does not include the tolerance of the thermocouple probe.
3. Do not allow the temperature sensor to contact a surface hat is energized above 30 Vrms or 60 V DC. Such voltages pose a shock hazard.
4. The temperature calculation is specified according to the safety standards of EN/IEC-60548-1 and NIST 175.
5. Only for U1242C.

U1240C Series Capacitance Specifications

Range	Resolution	Accuracy ±(% of reading + counts of least significant digit)
1000 nF	0.1 nF	1.0% + 5
10 µF	0.001 µF	1.0% + 5
100 µF	0.01 µF	1.0% + 5
1000 µF	0.01 µF	1.2% + 5
10 mF	0.001 mF	1.2% + 5

1. Overload protection: 1000 Vrms for short circuits with < 0.3 A current.
2. The accuracy for all ranges is specified based on a film capacitor or better, and after the Null function is used to subtract the test lead resistance and thermal effect (by opening the test leads).
3. The maximum display is 12000 counts selectable

U1240C Series Frequency Specifications

Range	Resolution	Accuracy ±(% of reading + counts of least significant digit)	Minimum input frequency
100.00 Hz	0.01 Hz	0.02% + 1[1]	0.5 Hz
1000.0 Hz	0.1 Hz	0.02% + 1	
10.000 kHz	0.001 kHz	0.02% + 1	
100.00 kHz	0.01 kHz	0.02% + 1	
1000.0 kHz	0.001 kHz	0.02% + 1	
10.000 MHz	0.001 MHz	0.02% + 1, < 1 MHz	

1. The frequency measurement is susceptible to error when measuring low-voltage, low-frequency signals. Shielding inputs from external noise pickup is critical for minimizing measurement errors. Turning on LPF (low pass filter) may help to filter out the noise and achieve a stable reading

U1240C Series Sensitivity for Voltage Measurement

Input range	Minimum sensitivity (RMS sine wave)		
Maximum input[1] for specified accuracy	**0.5 Hz to 20 kHz**	**20 kHz to 50 kHz**	**50 kHz to 100 kHz**
100 mV[2]	15 mV	7.2 mV	15 mV
600 mV[2]	15 mV	7.2 mV	15 mV
1000 mV	125 mV	60 mV	125 mV
10 V	1.25 V	0.6 V	1.25 V
100 V	12.5 V	6 V	12.5 V
1000 V	60 V	60 V	60 V

U1240C Series Sensitivity for Current Measurement

Input range	Minimum sensitivity (RMS sine wave)	
Maximum input[1] for specified accuracy	**0.5 Hz to 20 kHz**	**20 kHz to 30 kHz**
100 µA	175 µA	60 µA
10 mA	1.75 mA	0.6 mA
100 mA	17.5 mA	6.0 mA
600 mA	100 mA	38 mA
10 A	N/A	1.15 A (< 10 kHz)

1. Refer to 'AC specification' for specified accuracy of maximum input.
2. 100 mV and 600 mV ranges available on Temperature T1 terminal.

U1240C Series Harmonic Ratio (U1242C only)

Range	Frequency	Voltage
0.0% to 99.9%	40 Hz to 1 kHz	100 mVAC to 1000 VAC

U1240C Series Multimeter Data Refresh Rate

Function	Slow (times/second)	Fast (times/second)
ACV (V or mV)	5	40
DCV (V or mV)	5	40
Ω	5	40
Diode	5	40
Auto diode	1	
Capacitance	0.8 (<1000 µF)	–
DC µA, mA or A	5	40
AC µA, mA or A	5	40
Temperature	5	40
Frequency	1 (>10 Hz)	–

U1240B Series DC Specifications

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

U1240B Series 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[1, 5] True RMS	1000.0 mV	0.1 mV	–	1% + 5	2% + 5	–
	10.000 V	0.001 V	–	1% + 5	1% + 5	2% + 5
	100.00 V	0.01 V	–	1% + 5	1% + 5	2% + 5
	1000.0 V	0.1 V	–	1% + 5	1% + 5	–
AC current[2, 5] True RMS	1000.0 µA	0.1 µA	< 0.06 V (50 Ω)	1% + 5	1% + 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[3]	0.1 mA	< 0.8 V (0.5 Ω)			
	10.000 A[4]	0.001 A	< 0.4 V (0.01 Ω)			

1. Input impedance: 10 MΩ (nominal) in parallel with < 100 pF, with overload protection of 1000 V RMS.
2. Crest factor ≤ 3. For non-sinusoidal waveforms with crest factor up to 3, add 2% reading + 2% full scale typical.
3. 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.
4. 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.
5. AC voltage and AC current specifications are AC coupled. True RMS measurement is valid from 5% of range to 100% of range.

U1240B Series 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

U1240B Series 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	

U1240B Series Harmonic Ratio Specifications

Range	Frequency	Voltage
0.0% to 99.9%	40 to 500 Hz	100 mVAC to 1000 VAC

U1240B Series 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 108 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.

U1240B Series 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.

U1240B Series 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)

U1240B Series 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

U1240B Series 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)

U1240B Series 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 0 – 2000 meters per IEC 61010-1 3rd edition CAT III, 1000 V/CAT IV, 600 V IEC 61010-1 3rd edition
Storage compliance	–20 to 70°C
Safety compliance	IEC 61010-1:2010 / EN 61010-1:2010, IEC 61010-2-033:2012 / EN 61010-2-033:2012 Canada: CAN/CSA-C22.2 No.61010-1-12, CAN/CSA-C22.2 No. 61010-2-033-12 USA: ANSI/UL Std. No. 61010-1 (3rd Edition), ANSI/UL Std. No. 61010-2-033 (1st Edition)
Measurement category	CAT III 1000 V/CAT IV 600 V Overvoltage Protection, Pollution Degree 2
EMC compliance	Commercial limits compliance with EN61326-1 Influence of radiated immunity: In RF electromagnetic fields of 3 V/M DC voltage measurement typical accuracy: 1000 mV to 1000 V range; ±0.2% of range DC current measurement typical accuracy: 1000 uA & 10000uA range; ±0.7% of range 100 mA range; ±0.22% of range 440 mA range; ±0.5% of range 10 A range; ±0.11% of range Note: If used in close proximity to an RF transmitter or when subjected to continuously present electro-magnetic phenomena, some recoverable degradation of performance may occur.
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 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 x 92.2 x 58.0 mm
Weight	450 g with batteries 400 g without batteries
Warranty	Three years for main unit. Three months for standard shipped accessories

U1240B Series Ordering Information

Standard shipped accessories

Four 1.5 V AAA alkaline batteries, Certificate of Calibration (CoC), test probe leads (4-mm tips), Quick Start Guide, free test data (Option UK6)



U1241B



U1242B

U1240C Series Ordering Information

Standard shipped accessories

Four 1.5 V AAA batteries, Certificate of Calibration (CoC), test leads, infrared (IR)-to-USB cable, Quick Start Guide



U1241C



U1242C

Optional accessories

U1117A infrared(IR)-to-*Bluetooth* adapter
- Enable *Bluetooth* connection to Keysight handheld digital multimeters
- Up to 100 meter operating rage



U1115A remote logging display
- Displays up to 4 Keysight handheld digital multimeters measurements
- 60,000 points interval logging
- Extend measurement distance of up to 100-meter



U1179A IR connectivity bracket
- Connects the U1240B Series handheld DMM to the IR-to-USB cable or IR-to-*Bluetooth* adapter



U1171A magnetic hanging kit
- For fastening the DMM to a steel surface so both hands are free



U1583B AC current clamp
- Dual range 40 A and 400 A
- BNC-to-banana plug adapter provided for use with handheld digital multimeters



Optional accessories (continued)

U1174A carrying case, soft
- For handheld digital multimeters



U1172A transit case (aluminium-clad)
- The robust casing to transport your DMM and accessories
- Aluminum-clad, black panel construction
- Dimension: 18 inches (H) x 13 inches (W) x 6 inches (D)
- Weight: 4 kg



U1595A rugged carrying case
- High quality, water and dust proof carrying case designed to store up to two handheld and accessories



U1161A extended test lead kit
Includes two test leads (red and black), two test probes, medium sized alligator clips and 4-mm banana plugs.
- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probe (4-mm tips): CAT III 1000 V, CAT IV 600 V, 15 A
- Medium-sized alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A
- 4-mm banana plugs: CAT II 600 V, 10 A



U1168B standard test lead kit
Includes two test leads (red and black), 4-mm test probes, alligator clips, fine-tip test probes, SMT grabbers and mini grabbers.
- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probe (19-mm tips): CAT II 1000 V, 15 A
- Test probe (4-mm tips): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment)
- Alligator clips: CAT III 1000 V, CAT IV 600 V, 15 A
- Fine-tip test p[robes: CAT II 300 V, 3 A
- SMT grabber: CAT II 300 V, 3 A
- Mini grabber: CAT II 300 V, 3 A



U1162A alligator clips
- One pair of insulated alligator clips (red and black). Recommended for use with Keysight standard test leads.
- Rated CAT III 1000 V, CAT IV 600 V, 15 A



U1163A SMT grabbers
- One pair of SMT grabbers (red and black). Recommended for use with Keysight standard test leads.
- Rated CAT II 300 V, 3 A



Optional accessories (continued)

U1164A fine-tip test probes
- One pair of fine-tip test probes (red and black). Recommended for use with Keysight standard test leads.
- Rated CAT II 300 V, 3 A



U1169A test probe leads
- Includes two test leads (red and black), and a pair each of 19-mm and 4-mm test probes.
- Test leads: CAT III 1000 V, CAT IV 600 V, 15 A
- Test probes (19-mm tip): CAT II 1000 V, 15 A
- Test probes (4-mm tip): CAT III 1000 V, CAT IV 600 V, 15 A (highly recommended for CAT IV environment)



U1180A temperature sensors and probes
Includes thermocouple adapter, thermocouple bead J-type and thermocouple bead K-type.
- T/C adapter J/K type
- T/C bead J-type: –20 to 200°C
- T/C bead K-type: –20 to 200°C



U1181A immersion temperature probe
- Type K T/C for use in oil and other liquids
- Measurement range: –50 to 700°C
- Includes adapter U1184A for connection to DMM



U1182A industrial surface temperature probe
- Type K T/C for use on still surfaces
- Measurement range: –50 to 400°C
- Includes adapter U1184A for connection to DMM



U1183A air temperature probe
- Type K T/C for use in air and non-caustic gas
- Measurement range: –50 to 800°C
- Includes adapter U1184A for connection to DMM



U1184A temperature probe adapter
- Mini-connector-to-banana-plug adapter for use with DMM



U1185A thermocouple (J-type) and temperature probe adapter
- T/C adapter J/K type
- T/C bead J-type: –20 to 200°C

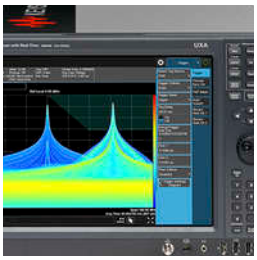


U1186A thermocouple (K-type) and temperature probe adapter
- T/C adapter J/K type
- T/C bead J-type: –20 to 200°C



Evolving Since 1939

Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology.
From Hewlett-Packard to Agilent to Keysight.


myKeysight

myKeysight
www.keysight.com/find/mykeysight
A personalized view into the information most relevant to you.

http://www.keysight.com/find/emt_product_registration
Register your products to get up-to-date product information and find warranty information.

KEYSIGHT SERVICES
Accelerate Technology Adoption.
Lower costs.

Keysight Services
www.keysight.com/find/service
Keysight Services can help from acquisition to renewal across your instrument's lifecycle. Our comprehensive service offerings—one-stop calibration, repair, asset management, technology refresh, consulting, training and more—helps you improve product quality and lower costs.

CALIBRATION UP TO 10 YEARS WARRANTY
ASSURANCE PLANS

Keysight Assurance Plans
www.keysight.com/find/AssurancePlans
Up to ten years of protection and no budgetary surprises to ensure your instruments are operating to specification, so you can rely on accurate measurements.

Keysight Channel Partners
www.keysight.com/find/channelpartners
Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

Bluetooth® and the *Bluetooth*® logos are registered trademarks owned by *Bluetooth* SIG, Inc., and any use of such marks by Keysight Technologies is under license.

www.keysight.com/find/handhelddmm

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at:
www.keysight.com/find/contactus

Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 11 2626
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353 Opt. 1 (DE) Opt. 2 (FR) Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:
www.keysight.com/find/contactus
(BP-9-7-17)

DEKRA Certified
ISO9001 Quality Management System

www.keysight.com/go/quality
Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2015
Quality Management System

KEYSIGHT TECHNOLOGIES

This information is subject to change without notice.
© Keysight Technologies, 2015 - 2017
Published in USA, December 21, 2017
5992-2704EN
www.keysight.com