UNI-T

UT60B/C/E
Operating Manual

Modern Digital Multimeters

Overview

This Operating Manual covers information on safety and cautions. Please read the relevant information carefully and observe all the **Warnings** and **Notes** strictly.

⚠Warning
To avoid electric shock or personal injury, read the "Safety Information"carefully before using the Meter.

Digital Multimeter UT60B, UT60C and UT60E(True RMS) (hereafter referred to as "the Meter") are 4000-count auto -ranging digital instruments featuring stable performance, high reliability and overloaded protection for all ranges. The Meter is designed with large-scale integrated circuits and dual integral A/D converter as the core, which can measure AC&DC voltage, AC&DC current, resistance, diode, continuity, frequency/duty cycle and temperature. it is double-moulded for the casing to ensure perfect insulation and offers backlit function to facilitate measur -ements on dark sites. All combined features just in one instrument make the meter a perfect tool for users.

Except where noted, the descriptions and instructions in this Operating Manual apply to all **Model UT60B/UT60C /UT60E**

Unless otherwise identified, all figures show the **Model UT60B.**

Unpacking Inspection

Open the package case and take out the Meter. Check the following items carefully for any missing or damaged part:

Item	Description	Qty
1	Operating Manual	1 pc
2	Test Leads	1 pair
3	Test Clips	1 pair
4	**Model UT60C/UT60E:**Point Contact Temperature Probe	1 pc
5	9V Battery (NEDA1604, 6F22 or 006P) (installed)	1 pc
6	**Model UT60E:**RS232C Interface Cable	1 pc
7	**Model UT60E:**CD-ROM (Installation Guide & Computer Interface Software)	1 pc

In the event you find any missing or damaged part, please contact your dealer immediately.

Safety Information

This Meter complies with IEC61010 Pollution Degree 2, Overvoltage Category(CATIII1000V,CATIV600V) and Double Insulation.

CAT. III: Distribution level, fixed installation, with smaller transient overvoltages than CAT. IV

CAT IV: Primary supply level, overhead lines, cable systems etc.

Use the Meter only as specified in this operating manual, otherwise the protection provided by the Meter may be impaired.

In this manual, a **Warning** identifies conditions and actions that pose hazards to the user, or may damage the Meter or the equipment under test.

A **Note** identifies the information that user should pay attention to.

⚠Warning
To avoid possible electric shock or personal injury, and toavoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

- **Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.**
- **Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads with identical model number or electrical specifications before using the Meter.**
- **Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.**
- **The rotary switch should be placed in the right position and no any changeover of range shall be made when measurement is conducted to prevent damage of the Meter.**
- **When the Meter is working at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken for there is danger of electric shock.**
- **Use the proper terminals, function, and range for your measurements.**
- **Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after dampened.**
- **When using the test leads, keep your fingers behind the finger guards.**
- **Disconnect circuit power and discharge all high -voltage capacitors before testing resistance, continuity, diodes, current, or capacitance.**
- **Before measuring current, check the Meter's fuses and turn off power to the circuit before connecting the Meter to the circuit.**
- **Replace the battery as soon as the battery indicator " " appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.**
- **Remove test lead, temperature probe, RS232C interface cable and test clip from the Meter and turn the Meter power off before opening the Meter case.**
- **When servicing the Meter, use only the replacement parts with the same model number or identical elec -trical specifications.**
- **The internal circuit of the Meter shall not be altered at will to avoid damage of the Meter and any accident.**
- **Soft cloth and mild detergent should be used to clean the surface of the Meter when servicing. No abrasive and solvent should be used to prevent the surface of the Meter from corrosion, damage and accident.**
- **The Meter is suitable for indoor use.**
- **Under the environment with high (+/-4kV) electro -static discharge, the Meter may not be operated as normal condition. The user may require resett -ing the Meter.**
- **Please take out the battery when it is not being used for a prolonged period to avoid damages to the Meter.**
- **Please constantly check the battery as it may leak when it has been using for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.**

International Electrical Symbols

~	AC (Alternating Current)		Low Battery Indication
⎓	DC (Direct Current)	•))	Continuity Test
≂	AC or DC	▶|	Diode
⏚	Grounding	⊣⊢	Capacitance Test
⧈	Double Insulated	▭	Fuse
⚠	Warning. Refer to the Operating Manual	CE	Conforms to Standards of European Union

The Meter Structure (See Figure 1)

① LCD Display
② Functional Buttons
③ Rotary Switch
④ **HzVΩ** Input Terminal:
Input for voltage, frequency/ duty cycle, resistance, diode, continuity and capacitance measurements.
⑤ **COM** Input Terminal:
Return terminal for all measurements.
⑥ **Model UT60B**:**μAmA** Input Terminal:
Input for 0.1μA to 400.0mA current measurements.
Model UT60C/UT60E: μAmA°C Input Terminal:
Input for 0.1μA to 400.0mA current measurements tand emperature testing.
⑦ **10A** Input Terminal:
Input for 0.01A to 10.00A current measurements.

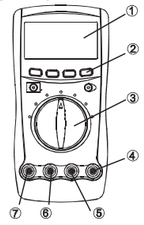

Figure 1

Rotary Switch

Below table indicated for information about the rotary switch positions.

Rotary Switch Position	Function
V≂	DC voltage measurement range from 400.0mV to 1000V or AC voltage measurement range from 4.000V to 750.0V.
•))▶|Ω⊣⊢	•)) Continuity test.
	▶| Diode test.
	Ω Resistance measurement range from 400.0Ω to 40.00MΩ.
	⊣⊢ Capacitance test range from 40.00nF to 100.0μF.
°C	**Model UT60C/UT60E:** Temperature in celsius from –40°C ~ 1000°C.
Hz	Frequency measurement range from 10.00Hz to 10.00MHz.
μA≂	AC or DC current measurement range from 400.0μA to 4000μA.
mA≂	AC or DC current measurement range from 40.00mA to 400.0mA.
A≂	AC or DC current measurement range from 4.000A to 10.00A.

Functional Buttons

Below table indicated for information about the functional button operations.

Button	Measuring Function	Description
POWER	Any rotary switch position	Turn the power on and off.
◯ (BLUE)	V≂	Switches between AC and DC voltage; the Meter beeps. DC is default.
	•))▶|Ω	**Model UT60B:**Switches between continuity and diode and resistance measurements; the Meter beeps. Resistance is default.
	•))▶|Ω⊣⊢	**Model UT60C/UT60E:**Switches between continuity and diode and resistance and capacitance measurements; the Meter beeps. Resistance is default.
	μA≂	Switches between AC and DC current range from 400.0μA to 4000μA; the Meter beeps. DC is default.
	mA≂	Switches between AC and DC current range from 40.00mA to 400.0mA; the Meter beeps. DC is default.
	A≂	Switches between AC and DC current range from 4.000A to 10.00A; the Meter beeps. DC is default. Disable Sleep Mode feature.
RANGE	Any rotary switch position except **Hz** and ⊣⊢	● Press **RANGE** to enter the manual ranging mode; the Meter beeps. Manually selecting a range causes the Meter to exit the Hold and REL modes. ● Press **RANGE** to step through the ranges available for the selected function; the Meter beeps. ● Press and hold **RANGE** for 2 seconds to return to autoranging; the Meter beeps.
Hz %	Hz	1. Press to start the frequency counter; the Meter beeps. 2. Press again to enter duty cycle mode; the Meter beeps. 3. Press again to return to the frequency counter mode; the Meter beeps.
	V≂, μA≂, mA≂ or A≂	1. Press to start the frequency counter; the Meter beeps. 2. Press again to enter duty cycle mode; the Meter beeps. 3. Press again to return to the previous measurement mode; the Meter beeps.
REL Δ	Any rotary switch position except **Hz**	Press **REL** Δ to enter and exit the REL mode in any measuring mode except in frequency/duty cycle; the Meter beeps.
HOLD H	Any rotary switch position	Press **HOLD** H to enter and exit the Hold mode in any mode, the Meter beeps.

Display Symbols (See Figure 2)

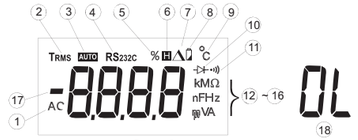

figure 2

Number	Symbol	Description
①	**AC**	Indicator for AC voltage or current. **Model UT60B/UT60C:**The displayed value is the mean value. **Model UT60E** The displayed value is the true rms value.
②	**TRMS**	**The Model UT60E:** Indicator for true rms value.
③	**AUTO**	The Meter is in the auto range mode in which the Meter automatically selects the range with the best resolution.
④	**RS232C**	Data output. It is always on the LCD, but data output is only in progress when the Meter is connected to the computer via the included RS232C Interface Cable.
⑤	**%**	Percent: Used for duty cycle measurements.
⑥	**H**	Data hold is active.
⑦	**Δ**	The REL is on to display the present value minus the stored value.
⑧		The battery is low. **⚠Warning To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.**
⑨	**°C**	Centigrade. The unit of temperature.
⑩	▶|	Test of diode
⑪	•))	The continuity buzzer is on.
⑫-⑯	**Ω, kΩ, MΩ**	**Ω:** Ohm. The unit of resistance. **kΩ:** kilohm. 1 x 10^3or 1000 ohms. **MΩ:** Megaohm. 1 x 10^6or 1,000,000 ohms.
	F, μF, nF	**F:** Farad. The unit of capacitance. **μF:** Microfarad. 1 x 10^{-6}or 0.000001 **nF:** farads. Nanofarad. 1 x 10^{-9}or 0.000000001 farads.
	Hz, kHz, MHz	**Hz:** Hertz. The unit of frequency in cycles/second. **kHz:** Kilohertz. 1 x 10^3or 1,000 hertz. **MHz:** Megahertz.1 x 10^6or1,000,000 hertz.
	V, mV	**V:** Volts. The unit of voltage. **mV** Millivolt. 1 x 10^{-3} or 0.001 volts.
	A, mA, μA	**A:** Amperes (amps). The unit of current. **mA:** Milliamp. 1 x 10^{-3}or 0.001 amperes. **μA:** Microamp. 1x 10^{-6}or 0.000001 amperes.
⑰	▬	Indicates negative reading.
⑱	**OL**	The input value is too large for the selected range.

Measurement Operation

A.Measuring DC Voltage(See Figure 3)

⚠Warning
To avoid harm to you or damage to the Meter from electric shock, please do not attempt to measure voltages higher than 1000VDC / 750VAC rms although readings may be obtained.

The DC Voltage ranges are: 400.0mV, 4.000V, 40.00V, 400.0V and 1000V. To measure DC voltage, connect the Meter as follows:

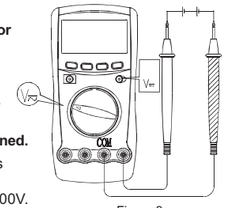

Figure 3

1. Insert the red test lead into the **HzVΩ** terminal and the blacktest lead into the **COM** terminal.
2. Set the rotary switch to V≂ ; DC measurement is default or press **BLUE** button to select DC measurement mode.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- In each range, the Meter has an input impedance of 10MΩ This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10kΩ , the error is negligible (0.1% or less).
- When DC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

B. Measuring AC Voltage(See Figure 4)

⚠Warning
To avoid harm to you or damage to the Meter from electric shock, please do not attempt to measure voltages higher than 1000VDC / 750VAC rms although readings may be obtained.

The AC voltage ranges are: 4.000V, 40.00V, 400.0V and 750.0V. To measure AC Voltage, connect the Meter as follows:

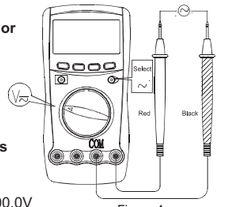

Figure 4

1. Insert the red test lead into the **HzVΩ** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **V≂** and press **BLUE** button to select **AC** measurement.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- In each range, the Meter has an input impedance of 10MΩ .This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to 10kΩ , the error is negligible (0.1% or less).
- When AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.
- True RMS value stability period **(Model UT60E):** When the reading obtained is less than 100 digits, the True RMS value converter needs a longer time to stabilize. When there is no input voltage, the maximum reading displayed is 10 digits.

C.Measuring Resistance (see Figure 5)

⚠Warning
To avoid damage to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

The resistance ranges are: 400.0Ω, 4.000kΩ, 40,00kΩ 400.0kΩ,4.000M Ω and 40.00MΩ.To measure resistance, connect the Meter as follows:

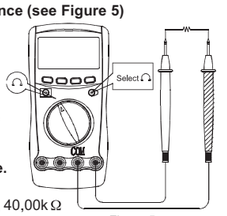

Figure 5

1. Insert the red test lead into the **HzVΩ** terminal and the black test lead into the **COM** terminal.
2. **Model UT60C/UT60E:**
Set the rotary switch to Ω•))▶\|⊣⊢ ;resistance measurement (Ω) is default or press **BLUE** button to select Ω mode.

Model UT60B:
Set the rotary switch to Ω•))▶\| ,resistance measurement (Ω) is default or press **BLUE** button to select Ω mode.

3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- The test leads can add 0.1Ω to 0.2 Ω of error to resistance measurement. To obtain precision readings in low-resistance measurement, that is the range of 400.0Ω,short-circuit the input terminals beforehand, using the relative measurement function button **REL** Δ to automatically subtract this shorted value from the reading.
- If Ω reading with shorted test leads is not ≤0.5Ω , check for loose test leads, incorrect function selection, or enabled Data Hold function.
- For high-resistance measurement (>1MΩ), it is normal to take several seconds to obtain a stable reading.
- The LCD displays **OL** indicating open-circuit for the tested resistor or the resistor value is higher than the maximum range of the Meter.
- When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

D.Testing for Continuity (See Figure 6)

⚠Warning
To avoid damage to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before testing for continuity.

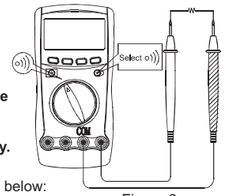

Figure 6

To test for continuity, connect the Meter as below:

1. Insert the red test lead into the **HzVΩ** terminal and the black test lead into the **COM** terminal.
2. **Model UT60C/UT60E:** Set the rotary switch to Ω•))▶\|⊣⊢ and press **BLUE** button to select •)) measurement mode.
Model UT60B: Set the rotary switch to Ω•))▶\| and press **BLUE** button to select •)) measurement mode.
3. The buzzer sounds if the resistance of a circuit under test is less than around 70 Ω.

Note

- The LCD displays **OL** indicating the circuit being tested is open.
- When continuity testing has been completed, discon -nect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

E. Testing Diodes (See Figure 7)

⚠Warning
To avoid possible damage to the Meter and to the device under test, disconnect circuit power and discharge all high-voltage capacitors before testing diodes.

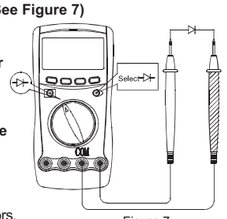

Figure 7

Use the diode test to check diodes, transistors, and other semiconductor devices.
The diode test sends a current through the semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test a diode out of a circuit, connect the Meter as follows:

1. Insert the red test lead into the **HzVΩ** terminal and the black test lead into the **COM** terminal.
2. **Model UT60C/UT60E:** Set the rotary switch to Ω•))▶\|⊣⊢ and press **BLUE** button to select ▶\| measurement mode.
Model UT60B: Set the rotary switch to Ω•))▶\| and press **BLUE** button to select ▶\| measurement mode.
3. For forward voltage drop readings on any semiconductor component, place the red test lead on the component's anode and place the black test lead on the component's cathode. The measured value shows on the display.

Note

- In a circuit, a good diode should still produce a forward

voltage drop reading of 0.5V to 0.8V; however, the reverse voltage drop reading can vary depending on the resistance of other pathways between the probe tips.

- Connect the test leads to the proper terminals as said above to avoid error display.The LCD will display **OL** indicating diode being tested is open or polarity is reversed.The unit of diode is Volt (V), displaying the forward voltage drop readings.
- When diode testing has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

F.Measuring Capacitance (See Figure 8)

⚠Warning

To avoid damage to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC Voltage function to confirm that the capacitor is discharged.

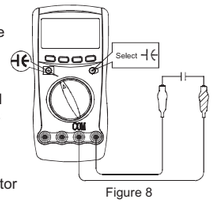

Figure 8

The Meter's capacitance ranges are: 40.00nF, 400.0nF, 4.000μF, 40.00μF, and 100.0μF. To measure capacitance, connect the Meter as follows:

1. Insert the red test lead into the **HzVΩ** terminal and the black test lead into the **COM** terminal.
2. Model UT60C/UT60E: Set the rotary switch to Ω•))) and press **BLUE** button to select nF measurement mode. Model UT60B: Set the rotary switch to .
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- For testing the capacitor with polarity, connect the red clip to anode & black clip to cathode instead of using test leads as mentioned above.
- To minimize the effect of capacitance stored in the test leads,the test lead should be as short as possible. To measure a small value of capacitance, use REL mode to remove the leads capacitance. Remaining voltage, insulated impedance, & dielectric absorption from the capacitor may cause the measurement error.
- It takes a longer time when testing a high capacitor value, the testing time is around 15 seconds in 100μF range.
- The LCD displays **OL** indicating the tested capacitor is shorted or it exceeds the maximum range.
- When capacitance measurement has been completed, disconnect the connection between the testing leads and the circuit under test and remove the testing leads away from the input terminals of the Meter.

G. Measuring Frequency (See Figure 9)

The measurement range is from 10Hz to 10MHz. To measure frequency, connect the Meter as follows:

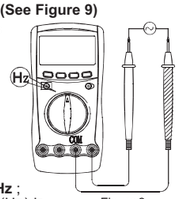

Figure 9

1. Insert the red test lead into the **HzVΩ** terminal and the black test lead into the **COM** terminal.
2. Set the rotary switch to **Hz** ; frequency measurement (Hz) is default or press **Hz** % to select Hz measurement mode.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- When frequency measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.
- To obtain a stable reading when measuring input scope >30V rms frequency signal:
  Set the rotary switch to **V≂** .
  Then press **Hz%** to select Hz measurement mode to obtain frequency value.
  When input scope ≤ 30V rms, please follow the above step 2. carrying out the measurement.
- When making frequency measurement at voltage or current range, please mind the following signal requir-ement table:

Range	Signal Requirement	Frequency Range
≂4V	≥1.0V	5Hz~10kHz
≂40V	≥5.0	5Hz~20kHz
≂400V	≥45V	45Hz~4kHz
⎓1000V/~750V	≥420	45Hz~1.6kHz
≂mA	≥45mA	5Hz~5kHz
≂A	≥4A	45Hz~1kHz

H. Measuring Duty Cycle (See Figure 9)

The duty cycle measurement range is: 0.1%~99.9%. To measure duty cycle, do the following:

1. Set up the Meter to measure frequency.
2. To select duty cycle, press **Hz %** until the % symbol is shown on the display.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- The LCD displays 000.0% indicating the input signal is high or low level.
- When duty cycle measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.
- To obtain a stable reading when measuring input scope > 30V rms frequency signal:
  Set the rotary switch to **V≂** .
  Then press **Hz%** to select % measurement mode to obtain duty cycle value.

When input scope≤ 30V rms, please follow the above step 2. to carry out the measurement.

I. Measuring Temperature(UT60C/UT60E, See Figure 10)

The temperature measurement range is -40°C~1000°C. To measure temperature, connect the Meter as follows:

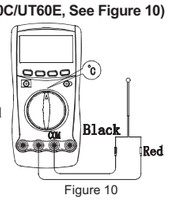

Figure 10

1. Insert the red temperature probe into the **μAmA℃** terminal and the black temperature probe into the **COM** terminal.
2. Set the rotary switch to °**C**.
3. Place the temperature probe to the object being measured.
   The measured value shows on the display.

Note

- The Meter automatically displays the temperature value inside the Meter when there is no temperature probe connection.
- The included point contact temperature probe can only be used up to 250°C. For any measurement higher than that, the rod type temperature probe must be used instead.
- When temperature measurement has been completed, remove the temperature probe away from the measured object, and disconnect the the probe from the input termi-nals of the Meter.

J. Measuring DC/AC Current (See Figure 11)

⚠Warning

Never attempt an in-circuit current measurement where the open-circuit voltage between the circuit and ground is greater than 250V.

If the fuse burns out during measurement, the Meter may be damaged or the operator himself may be hurt. Use proper terminals, function, and range for the measurement. When the testing leads are connected to the current terminals, do not parallel them across any circuit.

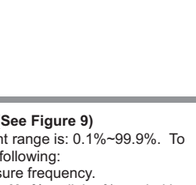

Figure 11

Three current positions around the rotary switch: μA≂, mA≂ and A≂.

The μA≂ has a 400.0μA and 4000μA range, with auto ranging; the mA≂ has a 40.00mA and 400.0mA range, with auto ranging; A≂position has a 4.000A and 10.00A range, with auto ranging.

To measure current, do the following:

1. Turn off power to the circuit. Discharge all high-voltage capacitors.
2. **Model UT60C/UT60E:**Insert the red test lead into the **μAmA℃**or **10A** terminal and the black test lead into the **COM** terminal.
   Model UT60B: Insert the red test lead into the **μAmA**or **10A** terminal and the black test lead into the **COM** terminal.Use the **10A** terminal and **A≂**range if the current value to be tested is unknown.
3. Set the rotary switch to **μA≂, mA≂,** or **A≂** .
4. The Meter defaults to DC current mode. To toggle between DC and AC current modes, press **BLUE** button.
   Model UT60B/UT60C: AC current is displayed as RMS value of sine wave (mean value response).
   Model UT60E AC current is displayed as true rms value.
5. Break the current path to be tested. Connect the red test lead to the more positive side of the break and the black test lead to the more negative side of the break.
6. Turn on power to the circuit.
   The measured value shows on the display.

Note

- True RMS value stability period: **(Model UT60E)**
  When the reading obtained is less than 100 digits, the True RMS value converter needs a longer time to stabilize. When there is no input voltage, the reading displayed is 10 digits.
- For safety sake, each measurement time for high current should be less than 10 seconds and the interval time be -tween 2 measurements should be greater than 15 minutes.
- When current measurement has been completed, disco -nnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

Operation of Hold Mode

⚠Warning

To avoid possibility of electric shock, do not use Hold mode to determine if circuits are without power. The Hold mode will not capture unstable or noisy readings.

The Hold mode is applicable to all measurement functions.

- Press **HOLD** H to enter Hold mode; the Meter beeps.
- Press **HOLD** H again or **RANGE**or **Hz %** or turn the rotary switch to exit Hold mode; the Meter beeps.
- In Hold mode **H** is displayed.

The Use of Relative Value Mode

The REL mode applies to all measurement functions except frequency/duty cycle measurement. It subtracts a stored value from the present measurement value and displays the result.

For instance, if the stored value is 20.0V and the present measurement value is 22.0V, the reading would be 2.0V. If a new measurement value is equal to the stored value then display 0.0V.

To enter or exit REL mode:

- Use rotary switch to select the measurement function before selecting **REL Δ**. If measurement function changes manually after **REL Δ** is selected, the Meter exits the REL mode.
- Press**REL Δ** to enter REL mode, auto ranging turns off except under capacitance testing mode, and the present measurement range is locked and display "0" as the stored value.
- Press**REL Δ** again or turn the rotary switch to reset the stored value and exit REL mode.
- Pressing **HOLD** H in REL mode makes the Meter stop updating. Pressing **HOLD** H again to resume updating.

The POWER button

This is a self-lock switch use to turn on or off the power of the Meter.

The BLUE button

It uses to select the required measurement function when there is more than one function at one position of the rotary switch.

Turning on the Display Backlight

⚠Warning

In order to avoid the hazard arising from mistaken readings in insufficient light or poor vision, please use Display Backlight function.

- Press and hold **HOLD** H for over 2 seconds to turn the Display Backlight on.
- Press and hold **HOLD** H again for over 2 seconds to turn the Display Backlight off, otherwise it will stay on continuously.

Sleep Mode (Model UT60B/UT60C)

To preserve battery life, the Meter automatically turns off if you do not turn the rotary switch or press any button for around 30 minutes.

To disable the Sleep Mode function, press **BLUE** button while turning on the Meter.

General Specifications

- Maximum Voltage between any Terminals and Grounding:1000V.
- ⚠ Fused Protection for**μAmA**Input Terminal: **Model UT60B:** Glass fuse, 0.5A, 250V, fast type, ϕ5x20mm.
- ⚠ Fused Protection for**μAmA℃**Input Terminal: **Model UT60C/E:** Glass fuse, 0.5A, 250V, fast type, ϕ5x20mm.
- ⚠ Fused Protection for **10A** Input Terminal:
  UT60B/C/E: Glass fuse, 10A, 250V, fast type, ϕ5x20mm.
- Maximum Display: 3999
- Measurement Speed: Updates 3 times/second.
- Temperature: Operating : 0°C~40°C (32°F ~104 °F).
  Storage : -10°C~50°C (14°F~122°F).
- Relative Humidity:≤75% @ 0°C - 30°C;≤50% @ 31°C - 40°C;
- Altitude: Operating: 2000 m.
  Storage : 10000 m.
- Battery: One piece of 9V (NEDA1604 or 6F22 or 006P).
- Low Battery Indication: Display
- Dimensions (HxWxL): 177 x 85 x 40 mm.
- Weight: Approximate 300g (battery included).
- Safety/Compliances: IEC61010 CAT.III 1000V, CAT.IV 600V and Double Insulation.
- Certifications: CE ,UL & CUL

Accuracy Specifications

Accuracy± (a% reading + b digits), guarantee for 1 year.
Operating temperature: 23°C ± 5°C.
Relative humidity: <75%.
Temperature coefficient: 0.1 x (specified accuracy)/1°C

A. DC Voltage

Range	Resolution	Accuracy	Overload Protection
400mV	0.1mV	± (0.8%+3)	1000V DC 750V AC rms continuous.
4V	1mV	± (0.8%+1)	
40V	10mV		
400V	100mV		
1000V	1V	±(1%+3)	

Remarks: Input impedance ≥ 10MΩ.

B. AC Voltage

Range	Resolution	Accuracy	Overload Protection
4V	1mV	± (1%+5)	1000V DC 750V AC rms continuous.
40V	10mV		
400V	100mV		
750V	1V	±(1.2%+5)	

Remarks:

- Input impedance ≥ 10MΩ .
- **Model UT60B/UT60C:** displays RMS value of sine wave (mean value response).
  Model UT60E: displays true rms value.
- Frequency response 40Hz~400Hz.

C. Resistance

Range	Resolution	Accuracy	Overload Protection
400Ω	0.1Ω	Measure at REL mode ± (1.2%+2)	1000Vp
4kΩ	1Ω	±(1%+2)	
40kΩ	10Ω		
400kΩ	100Ω		
4MΩ	1kΩ	±(1.2%+2)	
40MΩ	10kΩ	±(1.5%+2)	

Remarks Open circuit voltage approximate 0.45V.

D Continuity Test

Range	Resolution	Accuracy	Overload Protection
400.0Ω	0.1Ω	Approximate≤70 Ω	1000Vp

Remarks:

- Buzzer beeps continuously.
- Open circuit voltage approximate 0.45V.

E. Diode Test

Range	Resolution	Overload Protection
Diode	1mV	1000Vp

Remarks:

- Open circuit voltage approximate 1.48V.
- Displays approximate forward voltage drop reading 0.5V~0.8V.

F. Capacitance

Range	Resolution	Accuracy	Overload Protection
40nF	10pF	Measure at REL mode ±(3%+10)	1000Vp
400nF	100pF	±(3%+5)	
4μF	1nF		
40μF	10nF		
100μF	100nF	±(4%+5)	

G. Frequency & Duty Cycle

Range	Resolution	Accuracy	Overload Protection
10Hz~10MHz		±(0.1%+3)	1000Vp
0.1%~99.9%	0.01%		

Remarks:

- **10Hz~10MHz Range:**
  ≤1MHz:300mV rms ≤ input sensitivity ≤30V rms;
  >1MHz:600mV rms ≤ input sensitivity ≤ 30V rms.
- **0.1%~99.9%:**
  Reading is only for reference purpose.

H.Temperature (Model UT60C/UT60E)

Range	Resolution	Accuracy	
-40°C~ 1000°C	1°C	-40°C ~0°C	±(3%+4)
		0°C ~400°C	±(1%+3)
		400°C ~1000°C	±(2%+10)

Overload Protection:

Glass fuse 0.5A, 250V, fast type, ϕ 5x20mm.

I. DC Current

Range	Resolution	Accuracy	Overload Protection
400μA	0.1 μA	±(1%+2)	0.5A, 250V, fast type Glass fuse, ϕ5x20 mm.
4000μA	1μA		
40mA	0.01mA	±(1.2%+3)	
400mA	0.1mA		
4A	0.001A	±(1.5%+5)	10A, 250V, fast type Glass fuse, ϕ5x20 mm.
10A	0.01A		

Remarks:

- **4A & 10A Range:**
  For continuous measurement ≤ 10 seconds and interval not less than 15 minutes.

J. AC Current

Range	Resolution	Accuracy	Overload Protectoin
400μA	0.1 μA	±(1.5%+5)	0.5A, 250V, fast type Glass fuse, ϕ 5x20 mm.
4000μA	1μA		
40mA	0.01mA	±(2%+5)	
400mA	0.1mA		
4A	0.001A	±(2.5%+5)	10A, 250V, fast type Glass fuse, ϕ5x20 mm.
10A	0.01A		

Remarks:

Frequency response 40Hz ~ 400Hz.
Model UT60B/UT60C displays RMS value of sine wave (mean value response).
Model UT60E displays true rms value.

- **4A & 10A Range:**
  For continuous measurement ≤ 10 seconds and interval not less than 15 minutes.

Maintenance

This section provides basic maintenance information including battery and fuse replacement instruction.

⚠Warning

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information.

To avoid electrical shock or damage to the Meter, do not get water inside the case.

A. General Service

- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.
- To clean the terminals with cotton bar with detergent, as dirt or moisture in the terminals can affect readings.
- Turn off the power of the Meter when it is not in use and take out the battery when not using for a long time.
- Take out the battery when it is using for a long time.
- Do not use or store the Meter in a place of humidity, temperature, explosive, inflammable and strong magnetic field.

B. Testing the Fuses

⚠Warning

To avoid electrical shock or personal injury, remove the test leads and any input signals before replacing the battery or fuse.

To prevent damage or injury, install ONLY replacement fuses with identical amperage, voltage, and speed ratings.

To test the fuse:

1. **Model UT60C/UT60E:** Set the rotary switch to Ω •))) and press**BLUE** button to select•))).
   Model UT60B: Set the rotary switch to Ω•))) and press **BLUE** button to select •))) .
2. Plug a test lead into the terminal **HzV** Ωand touch the probe to the **10A** terminal.
   - If the Meter beeps, the fuse is good.
   - If the display shows **OL** , replace the fuse and test again.
   - If the display shows any other value, have the Meter serviced and contact your dealer immediately.

If the Meter does not work while the fuse is all right, send it to your dealer for repair.

C. Replacing the Battery (See Figure 12)

⚠Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator "" appears.

Make sure the test leads are disconnected from the circuit being tested before opening the case bottom.

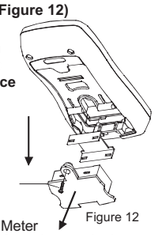
Figure 12

To replace the battery:

1. Press the **POWER** to turn the Meter off and remove all connections from the terminals.
2. Remove the screw from the battery compartment, and separate the battery compartment from the case bottom.
3. Remove the battery from the battery compartment.
4. Replace the battery with a new 9V battery (NEDA1604, 6F22 or 006P)
5. Rejoin the case bottom and battery compartment, and reinstall the screw.

D. Replacing the Fuses (See Figure 13)

⚠Warning

To avoid electrical shock or arc blast, or personal injury or damage to the Meter, use specified fuses ONLY in accordance with the following procedure.

To replace the Meter's fuse:

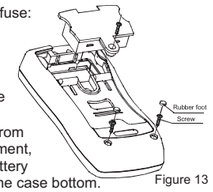

Figure 13

1. Press the **POWER** to turn the Meter off and remove all connections from the terminals.
2. Remove the screw from the battery compartment, and separate the battery compartment from the case bottom.
3. Remove the 2 rubber feet and 2 screws from the case bottom, and separate the case top from the case bottom.
4. Remove the fuse by gently prying one end loose, then take out the fuse from its bracket.
5. Install ONLY replacement fuses with the identical type and specification as follows and make sure the fuse is fixed firmly in the bracket.
   Fuse 1: Glass fuse 0.5A, 250V, fast type, ϕ5x20mm.
   Fuse 2: Glass fuse 10A, 250V, fast type, ϕ 5x20mm.
6. Rejoin the battery compartment and the case top, and reinstall the screw.
7. Rejoin the case bottom and case top, and reinstall the 2 screws and 2 rubber feet.

Replacement of the fuses is seldom required. Burning of a fuse always results from improper operation.

RS232C Serial Port (Model UT60E)

A.RS232C Port Cable

The Meter		Computer		
D-sub		D-sub 9 Pin Female	D-sub 25 Pin Female	Pin Name
2	----	2	3	RX
3	----	3	2	TX
4	----	4	20	DTR
5	----	5	7	GND
6	----	6	6	DSR
7	----	7	4	RTS
8	----	8	5	CTS

B.Setting of RS232C Serial Ports

Default of RS232C serial port for communication is set as:
Baud Rate 2400
Start bit 1 (always 0)
Stop bit 1 (always 1)
Data bits 7
Parity Odd

C.System Requirements for Installing the UT60E Interface Program

To use**UT60E Interface Program**,you need the following hardware and software:

- An IBM PC or equivalent computer with 80486 or higher processor and 640 x 480 pixel or better monitor.
- Microsoft Windows 95 or above.
- At least 8MB of RAM.
- At least 8MB free space in hard drive.
- Can access to a local or a network CD-ROM.
- A free serial port.
- A mouse or other pointing device supported by Windows.

Please refer to the included CD-ROM **"Installation Guide & Computer Interface Software"** for installing and operating instructions of the **UT60E Interface Program**

~ END ~

This operating manual is subject to change without notice.

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