

UT58A/B/C Operating Manual



Modern Digital Multimeter

Overview

Warning

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

Digital Multimeters Model UT58A, UT58B and UT58C are 2000-count hand-held instruments with remarkable features: ex-large LCD, steady operations, overload protection for all ranges and unique structure. The Meter can measure AC/DC voltage, AC/DC current, resistance, capacitance, temperature, frequency, transistor, diode and continuity, and is equipped with data hold, full icon display and sleep mode functions.

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	English Operating Manual	1 pc
2	Test Lead	1 pair
3	Multi-Purpose Socket	1 pc
4	Point Contact Temperature Probe (UT58B/UT58C only)	1 pc
5	9V Battery (NEDA 1604, 6F22 or 009P)	1 pc

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

Safety Information

This Meter complies with the standards IEC61010: Pollution Degree 2, Overvoltage Category (CAT. II 1000V, CAT. III 600V) and Double Insulation. CAT. II: Local level, appliance, PORTABLE EQUIPMENT etc., with smaller transient voltage overvoltages than CAT. III

CAT. III: Distribution level, fixed installation, with smaller transient overvoltages than CAT. IV 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 to avoid 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 during measurement to prevent damage of the Meter.
- When the Meter 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.
- If the value to be measured is unknown, use the maximum measurement position and reduce the range step by step until a satisfactory reading is obtained.
- 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.

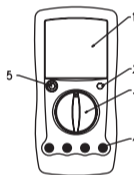
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, capacitance or current.
- Before measuring current, check the Meter's fuses and turn off power to the circuit before 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 leads, test clips and temperature probe from the Meter and turn the Meter power off before opening the Meter case.
- When servicing the Meter, use the replacement parts with the same model or identical electrical specifications.
- To avoid any damage to the meter or any accident, do not alter the internal circuit of the Meter randomly.
- 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.
- Turn the Meter power off when it is not in use and take out the battery when not using for a long time.
- 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).
	DC (Direct Current).
	Grounding.
	Double Insulated.
	Low Battery Indication.
	Warning. Refer to the Operating Manual.
	Conforms to Standards of European Union.

The Meter Structure (See Figure 1)

1. LCD Display.
2. HOLD Button.
3. Rotary Switch.
4. Input Terminals.
5. POWER



(Figure 1)

Rotary Switch

Below table indicated for information about the rotary switch positions.

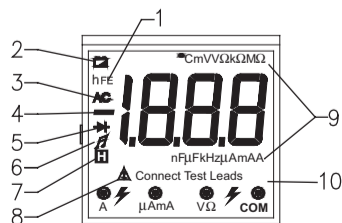
Rotary Switch Position	Function
	DC voltage measurement.
	AC voltage measurement.
	Capacitance Test
	Resistance measurement.
	Diode test.
	Continuity test.
	Frequency Test
	AC Current Measurement
	DC Current Measurement
	Temperature
	Transistor Test

Functional Buttons

Below table indicated for information about the functional button operations.

Button	Description
POWER (Yellow Button)	Turn the Meter on and off. <ul style="list-style-type: none"> • Press down the POWER to turn on the Meter. • Press up the POWER to turn off the Meter.
HOLD (Blue Button)	<ul style="list-style-type: none"> • Press HOLD once to enter hold mode. • Press HOLD again to exit hold mode. • In Hold mode, is displayed and the present value is shown.

Display Symbols (See Figure 2)

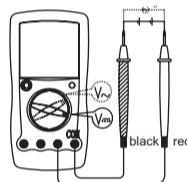


(Figure 2)

No.	Symbol	Description
1		The unit of transistor test
2		The battery is low. Δ Warning: To avoid false readings, replace the battery as soon as the battery indicator appears.
3		Indicator for AC voltage or current. The displayed value is the mean value.
4		Indicates negative reading.
5		Test of diode.
6		The continuity buzzer is on.
7		Date hold is active.
8		Indicator of connecting test leads into different input terminals. Ω : Ohm. The unit of resistance. $k\Omega$: kilohm. 1×10^3 or 1000 ohms. $M\Omega$: Megaohm. 1×10^6 or 1,000,000 ohms.
9		V: Volts. The unit of voltage. mV: Millivolt. 1×10^{-3} or 0.001 volts.
		F: Farad. The unit of capacitance. μF : Microfarad. 1×10^{-6} or 0.000001 farads. nF: Nanofarad. 1×10^{-9} or 0.000000001 farads.
		A: Amperes (amps). The unit of current. mA: Milliamp. 1×10^{-3} or 0.001 amperes. μA : Microamp. 1×10^{-6} or 0.000001 amperes.
		$^{\circ}C$ Centigrade temperature
		The unit of frequency in cycles/second. KiloHertz. 1×10^3 or 1,000 hertz.

Measurement Operation

A. Measuring DC and AC Voltage (See Figure 3)



(Figure 3)

Warning

To avoid harms to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 1000V although readings may be obtained.

The DC Voltage ranges are: 200mV, 2V, 20V, 200V and 1000V.

The AC Voltage ranges are: 2V, 20V, 200V and 750V

To measure DC or AC Voltage, connect the Meter as follows:

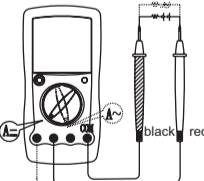
1. Insert the red test lead into the $H_z V \Omega \rightarrow$ (UT58C) or $V \Omega \rightarrow$ (UT58A/UT58B) terminal and the black test lead into the COM input terminal.
2. Set the rotary switch to an appropriate measurement position in $V \sim$ or $V \rightarrow$ range.
3. Connect the test leads across with the object to be measured.

The measured value shows on the display.

Note

- If the value of voltage to be measured is unknown, use the maximum measurement position (1000V) and reduce the range step by step until a satisfactory reading is obtained.
- The LCD displays "1" indicating the existing selected range is overloaded, it is required to select a higher range in order to obtain a correct reading.
- In each range, the Meter has an input impedance of approx. $10M\Omega$. This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to $10k\Omega$, 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.

B. Measuring DC and AC Current (See Figure 4)



(figure 4)

Warning

Never attempt an in-circuit current measurement where the open circuit voltage between terminals 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.

The DC Current ranges are:
 Model UT58A/ UT58B: $20\mu A, 2mA, 20mA, 200mA$ and 20A.
 Model UT58C: 2mA, 200mA, 20A

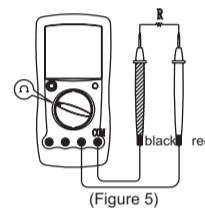
The AC Current ranges are: 2mA, 200mA and 20A
 To measure current, do the following:

1. Turn off power to the circuit. Discharge all high-voltage capacitors.
2. Insert the red test lead into the A or μAmA (UT58A) or mA (UT58B/UT58C) terminal and the black test lead into the COM terminal.
3. Set the rotary switch to an appropriate measurement position in A \rightarrow or A \sim range.
4. 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.
5. Turn on power to the circuit.
 The measured value shows on the display.

Note

- If the value of current to be measured is unknown, use the maximum measurement position, and reduce the range step by step until a satisfactory reading is obtained
- For safety sake, the measuring time for high current ($>10A$) should be less than 10 seconds and the interval time between 2 measurements should be greater than 15 minutes
- When current measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

C. Measuring Resistance (See Figure 5)



(Figure 5)

Warning

To avoid damages 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:
 Model UT 58A/UT58B: $200\Omega, 2k\Omega, 20k\Omega, 2M\Omega, 20M\Omega$ and $200M\Omega$.

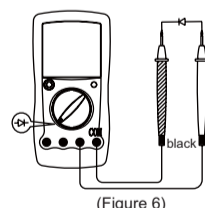
Model UT 58C: $200\Omega, 2k\Omega, 20k\Omega, 2M\Omega$ and $20M\Omega$.

1. Insert the red test lead into the $H_z V \Omega \rightarrow$ (UT58C) or $V \Omega \rightarrow$ (UT58A/UT58B) terminal and the black test lead into the COM terminal.
2. Set the rotary switch to an appropriate measurement position in Ω range.
3. Connect the test leads across with the object being measured.
 The measured value shows on the display.

Note

- The test leads can add 0.1to 0.2 Ω of error to the slow-resistance measurement. To obtain accurate readings in low-resistance, short-circuit the input terminals beforehand and record the reading obtained (called this reading as X). (X) is the additional resistance from the test lead. Then use the equation:
 measured resistance value (Y) - (X) = accurate readings of resistance.
- If the input terminal short-circuit reading ≥ 0.5 , check the test leads for any looseness or other cause.
- For high resistance ($>1M\Omega$), it is normal taking several seconds to obtain a stable reading; select short test leads for stable and precise readings.
- When the resistance is higher than the maximum range or in open circuit condition, the Meter displays "1".
- When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test.

D. Measuring Diodes (See Figure 6)



(Figure 6)

Warning

To avoid damage to the Meter or to the equipment under test, disconnect circuit power and discharge all high-voltage capacitors before measuring diodes.

To avoid harms to you, please do not attempt to input voltages higher than 60V DC or 30V rms AC.

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

1. Insert the red test lead into the $H_z V \Omega \rightarrow$ (UT58C) or $V \Omega \rightarrow$ (UT58A/UT58B) terminal and the black test lead into the COM terminal
2. Set the rotary switch to \rightarrow .
3. For forward voltage drop readings on any semiconductor component, place the red test lead on the component's

