

# UT39A+/C+ Modern Digital Multimeter User Manual

## 1. Introduction

The UT39+ series digital multimeter meets CAT III 600V/CAT II 1000V requirement. These meters are designed with overvoltage and overcurrent alarm, with all modes withstanding 1kV overvoltage shock. UT39+ series is suitable for electricians and UT39C+ is perfect for HVAC technicians.

## 2. Features

Ergonomic design, comfortable and solid.  
Can withstand a drop of 2 meters height.  
3 times/second sampling rate.  
Full protection which can withstand overvoltage shock up to 1kV, and designed with overvoltage and overcurrent alarm.  
Fast capacitance measurement, response time is within 6s when capacitance  $\leq 10\text{mF}$ .  
Audio/visual alarm in continuity and NCV modes.  
Low power consumption, automatic power saving prolongs battery life up to 500 hours.

## 3. Accessories

Open the package box and take out the device. Please check whether the following items are deficient or damaged:

- 1) User manual ..... 1 pc
- 2) Test leads ..... 1 pair
- 3) Temperature probe (UT39C+) ..... 1 pc

If any of the above item is missing or damaged, please contact your supplier immediately.

**Warning:** Before using the instrument, please read the "Safety operation guidelines" carefully.

## 4. Safety Operation Guidelines

### 1) Safety Certification

Design according to IEC61010-1:2010, 61010-2-030:2012, 61010-2-033:2012, 61326-1:2013, 61326-2-2:2013.

### 2) Safety Instructions and Precautions

- Do not use the device if the rear cover is not covered up or it will pose a shock hazard.
- Do not use the device if the device or test leads appear damaged or if you suspect that the device is not operating properly. Pay particular attention to the insulation layer.
- Keep the fingers behind the finger guard during operation.
- Do not input voltage over 1000V between the instrument terminal and ground to prevent electric shocks or damages to the instrument.
- Be cautious to prevent electric shock if the measured DC voltage > 60V or AC voltage > 30Vrms.
- Do not input overrange value.
- Functional dial should be switched to proper position.
- Do not switch the functional dial during measurement.
- Do not change the internal circuit of the device in order to avoid the damage to the device and users.
- Use the same specification fast-acting fuse for replacement.
- To avoid false reading, replace the battery when the battery indicator "b" appears.
- Do not use or store the device in high temperature and high humidity environment, the performance of the device may deteriorate after exposure to moisture.
- Use damp cloth to clean the case; do not use detergent containing solvents or abrasives.

## 5. Electrical Symbols

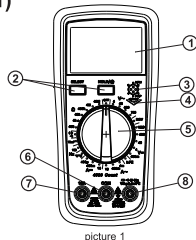
	Low battery		Fuse		High voltage hazard		AC
	Ground		Double insulation		Warning		DC

### 6. General Specifications

- 1) Max voltage between input terminal and ground: 1000Vrms.
- 2)  $\Delta$  10A terminal: Fuse 10A H 250V fast-acting fuse  $\Phi 5 \times 20\text{mm}$ .
- 3)  $\Delta$  mA/uA terminal: Fuse 500mA H 250V fast-acting fuse  $\Phi 5 \times 20\text{mm}$ .
- 4) Max Display Value: 3999; Overrange display "OL", sampling rate 3 times/second.
- 5) Measuring range: Manual range
- 6) Backlight: Manual ON/OFF. Automatic turn off backlight when 30s inactive.
- 7) Polarity: Negative input display "-" symbol.
- 8) Data hold indicator: "H" at LCD upper left corner.
- 9) Low battery indicator: "b" at LCD lower left corner.
- 10) Audio/visual alarm: During the continuity measurement (UT39A+/C+) and NCV measurement (UT39C+), the device will make sounds along with a red LED light indicator.
- 11) Battery: AA battery (zinc manganese) 1.5V x 2
- 12) Operating temperature: 0°C~40°C (32°F~104°F)  
Storage temperature: -10°C~50°C (14°F~122°F)  
Relative humidity: 0°C~below 30°C  $\leq 75\%$ ; 30°C~40°C  $\leq 50\%$ .  
Operating altitude: 0~2000m
- 13) Weight: About 328g (including batteries).
- 14) Electromagnetic compatibility:  
RF  $\leq 1\text{V/m}$ , overall accuracy=specified accuracy+5% of range.  
RF  $> 1\text{V/m}$ , no specified calculation.

## 7. External Structure (picture 1)

1	LCD display
2	Functional buttons
3	Transistor input terminal
4	Audio/visual alarm indicator
5	Functional switch
6	COM input terminal
7	10A current input terminal
8	Other measurement input terminal



picture 1

## 8. Functional Buttons

\* **SELECT/REL:** Press to switch the range mode to diode/continuity, Celsius/Fahrenheit temperature (only for UT39C+). When measuring the capacitance, voltage, current, and resistance (400 $\Omega$ scale), press this button can clear the base values.

\* **hold:** Press the button to perform data hold/ cancel data hold. Press this button  $\geq 2\text{s}$  to turn on/off the backlight.

## 9. Measurement Instructions

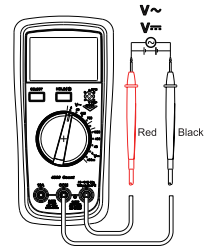
Please confirm the batteries have been installed first. To avoid false reading, replace the battery if the battery low power symbol "b" appears. Also pay special attention to the warning sign " $\Delta$ " besides the test lead plug, it indicates that the tested voltage or current must not exceed the values listed on the device.

### 1) AC/DC Voltage Measurement (see picture 2)

- Switch the dial to AC voltage position.
- Insert the red test lead to the "V $\Omega$ mA" jack, black to the "COM" jack, then connect the two test lead tips to both ends of the measured voltage (parallel to the load).

#### Notes:

- \* Do not input voltage over 1000Vrms, or it may pose shock hazard. If the measured voltage range is not known before the measurement, set the switch to the highest range, and then gradually reduce the measuring range according to the actual reading (LCD display OL indicates over-range, need to increase the measuring range). Measurement accuracy might be affected when large circuit impedance is present.
- \* Be cautious when measuring high voltage.
- \* Before using the device, it is suggested to measure a known voltage for verification.



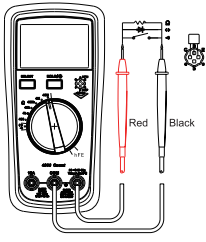
picture 2

### 2) Resistance Measurement (see picture 3)

- Switch the dial to resistance position.
- Insert the red test lead to the "V $\Omega$ mA" jack, black to the "COM" jack, then connect the two test lead tips to both ends of the measured resistor (parallel to the measured resistor).

#### Notes:

- \* To avoid instrument damage and injury to users, before measuring the resistance online, all power supplies in the circuit must be turned off and the residual charge on all capacitors must be released.
- \* If the resistance when shorted is more than 0.5 $\Omega$ , please check if test leads are loosened or damaged.
- \* If the resistor is open or over the range, the "OL" symbol will be displayed on the screen.
- \* When measuring low resistance, the test leads may produce 0.1 $\Omega$ ~0.2 $\Omega$  measurement error. To obtain accurate measurement, please measure at the 400 $\Omega$  scale, the device will automatically subtract the resistance of test leads.
- \* When measuring high resistance, it may take a few seconds to stabilize the reading, which is a normal phenomenon.
- \* Do not input over 60V DC or 30V AC.



picture 3

### 3) Continuity Measurement (see picture 3)

- Switch the dial to continuity position.
- Insert the red test lead to the "V $\Omega$ mA" jack, black to the "COM" jack, then connect the two test lead tips to both measured ends.
- When measured resistance > 51 $\Omega$ , circuit is in open status and the buzzer will make no sound. When measured resistance  $\leq 10\Omega$ , circuit is in good conduction status and the buzzer will be beeping continuously, along with a red LED light indicator.

#### Notes:

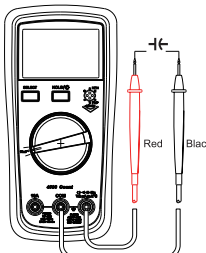
- \* To avoid instrument damage and injury to users, before measuring the continuity online, all power supplies in the circuit must be turned off and the residual charge on all capacitors must be released.

### 4) Diode Measurement (see picture 3)

- Switch the dial to diode position.
  - Insert the red test lead to the "V $\Omega$ mA" jack, black to the "COM" jack, then connect the two test lead tips to both ends of the PN junction.
  - "OL" symbol appears when the diode is open or polarity is reversed.
  - For silicon PN junction, normal value: 500 ~ 800mV (0.5 ~ 0.8V).
- Notes:**
- \* To avoid instrument damage and injury to users, before measuring the PN junction online, all power supplies in the circuit must be turned off and the residual charge on all capacitors must be released.
  - \* UT39C+ diode's test voltage range is about 4.0V/1.4mA
  - \* UT39A+ diode's test voltage range is about 2.2V/0.7mA

### 5) hFE Measurement (see picture 3)

- Switch the dial to "hFE" position.
- Insert the transistor (PNP or NPN type) poles (B, E, C) into the corresponding socket, the hFE value will be displayed on the screen.



picture 4

### 6) Capacitance Measurement (see picture 4)

- Switch the dial to capacitance position.
- Insert the red test lead to the "V $\Omega$ mA" jack, black to the "COM" jack, then connect the two test lead tips to both ends of the measured capacitor.
- When there is no input, the screen will also show a fixed reading which is the inherent capacitance value of the device. For small capacitance measurement, the measured value must subtract the inherent capacitance value to ensure the measurement accuracy, please use the relative measurement function (REL) to measure (The device will automatically subtract the inherent value for easier reading).

#### Notes:

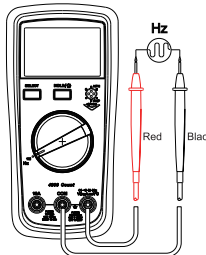
- \* If the tested capacitor is shorted or its capacitance is over the specified range, "OL" symbol will be displayed on the screen.
- \* When measuring large capacitance, it may take a few seconds to obtain steady readings.
- \* Please fully discharge the capacitors before measuring. This is extremely important for capacitors with high voltage to avoid shock hazard.

### 7) Frequency Measurement (only for UT39C+, see picture 5)

- Switch the dial to Hz position.
- Insert the red test lead to the "V $\Omega$ mA" jack, black to the "COM" jack, then connect the two test lead tips to both ends of the measured signal source.

#### Notes:

- \* When there is no input, the device may be influenced by the strong power frequency. There may be a reading of 50Hz or 60Hz which will not affect the measurement accuracy.
- \* Do not input over 60V DC or 30V AC.



picture 5

