

UT136A/B/C/D

Handheld Digital Multimeter

Operating Manual

Safety Information

Meter UT136A/B/C/D complies with the standard IEC/EN61010-1, in pollution degree 2, overvoltage category (CAT II 600V) and double insulation. Use the meter only as specified in this operating manual, otherwise the protection provided by the meter may be impaired.

- 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 connections.
- Inspect the test leads for damaged insulation or exposed metal. Replace damaged test leads with identical model number or electrical specifications before using the meter.
- 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.
- When measurement is on / off against the correct testing position.
- Do not apply more than the rated voltage, as marked on the meter in order to avoid possible electric shock or personal injury and avoid possible damage to the meter.
- Do not change the measuring range during the testing as it causes to damage the meter.
- When each measurement has been completed, disconnect between the test leads and the circuit under test connection, then turn the meter power off and remove the test leads away from the input terminals of the meter.
- When the meter working at an effective voltage over 60V in DC and 30Vrms in AC, special care should be taken.
- Do not use or store the meter in an environment of high temperature and humidity. The performance of the meter may deteriorate after dampened.
- 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.

International Electrical Symbols

	Double Insulated
	Grounding
	Deficiency of Built in Battery
	Warning: Refer to the Operating Manual
	AC (Alternating Current)
	DC (Direct Current)
	Conforms to Standards of European Union

Overall Specification

- Maximum voltage between any terminals and grounding. Refer to different range input protection voltage.
- 10A terminal: 10A H 250V Fast Type Ceramic Fuse $\Phi 5 \times 20 \text{mm}$.
- mA terminal: 0.5 A H 250V Fast Type Ceramic Fuse $\Phi 5 \times 20 \text{mm}$.
- Maximum display 4000.
Operating temperature: $0^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ($32^{\circ}\text{F} \sim 104^{\circ}\text{F}$)
Relative Humidity: $0^{\circ}\text{C} \sim 30^{\circ}\text{C}$ below $\leq 75\%$,
 $30^{\circ}\text{C} \sim 40^{\circ}\text{C} \leq 50\%$
Storing temperature: $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$ ($14^{\circ}\text{F} \sim 122^{\circ}\text{F}$)
- Electromagnetism:
Under 1V/m emission: Best Total Accuracy= Specific Accuracy + Measurement 5%.
Over 1V/m emission do not have any specific index
- Elevation: $0 \sim 2000 \text{m}$

- Battery in meter: 9V 6F22 or NEDA 1604 or IEC6LR61
- Deficiency of Built in Battery: LCD display "  ".
- Product size: $72 \text{mm} \times 137 \text{mm} \times 35 \text{mm}$
- Net Weight: About 200g (battery include)
- Conform: CE

Button function and auto power off

- HOLD** button
Press HOLD to enter and exit hold mode in any mode except frequency measurement.
- SELECT** button
Press **SELECT** button to select the alternate functions including AC/DC voltage, AC/DC current, auto and manual ranging, frequency and duty cycle. Used as REL function button under resistance measurement.
- AUTO POWER OFF**
To preserve battery life, the Meter automatically goes into a "sleep" mode if you do not press any button for around 15 minutes. The Meter can be activated by pressing any button, then returns to the display for the function selected previously. To disable the sleep mode function, press SELECT button while turning on the meter.
- BUZZER**
The buzzer phonate go with every time button be effectual pressed. When the meter will auto power off in 1 minutes the buzzer beeps 5 times. Before power off there will be a long time buzzer beeps.

Measurement Operation

First check on 9V battery, then turn rotary switch to the measuring position. If the low battery, "  " sign will be displayed on LCD panel. Nearly to "  " sign on the meter front panel terminal input which alarm not exceed the testing voltage and current input value limitation.

A. DC / AC Voltage Measurement (See figure 1)

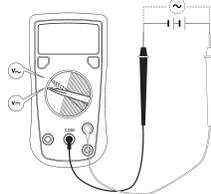


figure 1

- In each range, the meter has an input impedance of $10 \text{M}\Omega$. This loading effect can cause measurement errors in high impedance circuits. If the circuit impedance is less than or equal to $10 \text{k}\Omega$, the error is negligible (0.1% or less).
- Press SELECT to switch AC or DC voltage measurement.
- The display value of AC measurement is effective value of sine wave (average value).
- The 400mV AC range can obtain only under manual mode.

Note:
To avoid possibly damages to the meter, please do not attempt to input higher than 500V.
To avoid electrical shock, please pay attention during the high voltage measurement.

B. Capacitor Measurement (UT136B only, figure 2).

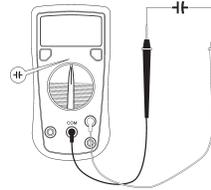


figure 2

- The Meter will display a fixed value as below which is the Meter internal fixed distributed capacitance value. To ensure accuracy when measuring a small value of capacitance, the tested value must subtract this value, REL mode can help on that.
- It is normal to take several seconds to obtain a stable reading when testing a high value capacitor.
- To avoid possibly damages to the meter, please do not attempt to input higher than 60V DC and 33V rms AC.

C. DC/AC Current Measurement (see figure 3)

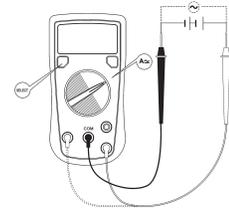


figure 3

- Press SELECT to switch AC or DC current measurement
- Turn off power to the circuit before the connection between the test leads across with the object being measured.
- Selecting the correct terminal input and turn the rotary switch to select the measuring function. In case of no any idea on the value input of the current, just simply test from the high value to low one.
- Fuses are located on mA and 10A terminal input. Never attempt the test lead connect to any circuits especially on the power supply terminal and may be hurt.
- For the safety purpose, less than 10 seconds is for each measurement duration and keep 15 minutes duration for next measurement during the current measurement over 5A.

D. Resistance Measurement (see figure 4)

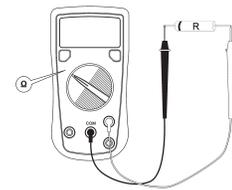


figure 4

- The LCD displays "OL" indicating open-circuit for the tested resistor or the resistor value is higher than the maximum range of the meter.
- To maintain the resistance measurement accuracy, discount circuit power and discharge all the high voltage capacitors during the measuring resistance.
- The test leads cause $0.1\Omega \sim 0.2\Omega$ resistance variation during the measurement, In order to obtain precision readings in low-resistance measurement. Need to make the short circuit on the test leads and mark the measurement value which show on LCD display. Then deduct this variation value on the measurement value which come the meter.
- If Ω reading with shortened test leads is not less than or equal to 0.5Ω , check for loose test leads, incorrect function selection or others.
- For high-resistance measurement greater than $1 \text{M}\Omega$, it is normal to take several seconds to obtain a stable reading with short test leads for measurement.
- Do not input higher than DC 60V and AC 30V rms voltage to prevent any damage and accident.

E. Diodes Measurement (see figure 5)

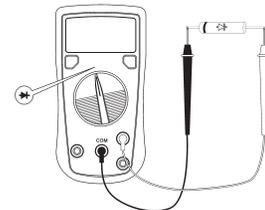


figure 5

- Disconnect circuit power and discharge all the high voltage capacitors before measuring resistance.
- Place the red test lead on the component's anode and place the back test lead on the component's cathode, a good diode should still produce a forward voltage drop reading of $500 \sim 800 \text{mV}$. The LCD displays "OL" indicating open-circuit for the tested diodes or the testing the diodes with polarity.
- The open circuit for diodes is 1.5V.
- Do not input higher than DC 60V and AC 30V rms voltage to prevent any damage and accident.

F. Continuity Measurement (see figure 6)



figure 6

1. Place the test leads to the circuit which be tested, if between both terminals show resistance >100Ω. it is a short-circuit, no buzzer. if between both terminals show resistance≤10Ω, it is a good connection with continually buzzer. if between both terminals show resistance> 10Ω, may or may not buzzer.

2. Resistance value on tested circuit display on LCD. Unit is Ω.

Note:

- To maintain the diodes measurement accuracy disconnect circuit power and discharge all the high voltage capacitors before the measuring.
- For the continuity testing, the open circuit for voltage is 0.5V.
- Do not input higher than DC 60V and AC 30V rms voltage to prevent any damage and accident.

G. Frequency and Duty Cycle Measurement (see figure 7)

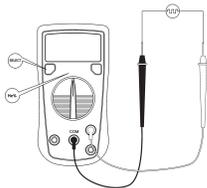


figure 7

- Connect the test leads across with the object being measured. The measured value shows on the display.
- If you need to measure duty cycle, press SELECT button to select % measurement mode.

Note:

Input Amplitude: a
When ≤100K Hz: a > 300 mV rms
When >100K Hz: a > 600 mV rms
Never input higher than 10V rms for test frequency and duty cycle.

H. Temperature Measurement (only UT136C, see figure 8)

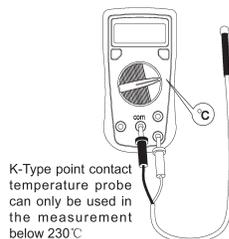


figure 8

- Turn rotary switch to "C".
- Put the multiple purpose socket into the correct terminal. K-Type point contact temperature probe can only be used in the measurement below 230°C, if you want to measure over 230°C, you need to separately buy another temperature probe
- The LCD displays "OL" indicating point contact temperature probe which take off. When short circuit between °C terminal and COM terminal, the meter show the value of room temperature.

I. NCV Function (UT136D only, see figure 9)

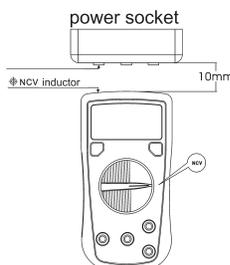


figure 9

- Set the rotary switch to NCV and remove the test lead from the input terminals.
- Place the housing front part with marking towards the 220V/50Hz being measured. Distance <10mm, the meter buzzer; 10mm<Distance <50mm, the meter may or may not buzzer; Distance >50mm, the meter not buzzer and the LCD displays "OL".

Accuracy Specifications

Accuracy: ±(a% reading + b digits), guarantee for 1 year
Operating temperature: 23°C±5°C
Relative Humidity: <75%

1. DC Voltage

Range	Resolution	Accuracy
400mV	0.1mV	±(0.8% + 3)
4V	0.001V	
40V	0.01V	
400V	0.1V	
500V	1V	

Input impedance: all range 10MΩ
Maximum input voltage: 500V AC/DC.

2. AC Voltage

Range	Resolution	Accuracy
400mV	0.1mV	±(1.2% + 5)
4V	0.001V	
40V	0.01V	
400V	0.1V	
500V	1V	

Input impedance: about 10MΩ; Maximum input voltage: 500V AC/DC
Frequency:40Hz~400Hz
Display effective value of sine wave(average value) each measurement is applicable from 5% of range as reference.

3. Capacitance (UT136B only)

Range	Resolution	Accuracy
4nF	0.001nF	For refer only
40nF	0.01nF	
400nF	0.1nF	
4μF	0.001μF	
40μF	0.01μF	
100μF	0.1μF	

Overload Protection: 500V AC / DC

4. DC Current

Range	Resolution	Accuracy
400μA	0.1μA	±(1% + 2)
4000μA	1μA	
40mA	0.01mA	±(1.2% + 3)
400mA	0.1mA	
4A	0.001A	±(1.5% + 5)
10A	0.01A	

Overload Protection:
mA range: F1 fuse φ5×20mm, F 0.5 A H 250V
10A range: F2 fuse φ5×20mm, F 10A H 250V
When ≤5A Continuous measurement is allowed, When <5A Continuous measurement less than 10 seconds at an interval more than 15 minutes.

5. AC Current

Range	Resolution	Accuracy
400μA	0.1μA	±(1.2% + 5)
4000μA	1μA	
40mA	0.01mA	±(1.5% + 3)
400mA	0.1mA	
4A	0.001A	±(2% + 3)
10A	0.01A	

Overload Protection:
mA range: F1 fuse φ5×20mm, F 0.5 A H 250V
10A range: F2 fuse φ5×20mm, F 10A H 250V
When ≤5A Continuous measurement is allowed, When > 5A Continuous measurement less than 10 seconds at an interval more than 15 minutes.
Frequency:40Hz~400Hz
Display effective value of sine wave(average value) each measurement is applicable from 5% of range as reference.

6. Resistance

Range	Resolution	Accuracy
400Ω	0.1Ω	±(1.2% + 2)
4KΩ	0.001KΩ	
40kΩ	0.01kΩ	±(1% + 2)
400kΩ	0.1kΩ	
4MΩ	0.001MΩ	±(1.2% + 2)
40MΩ	0.01MΩ	

Overload Protection: 500V AC/ DC

7. Diode, Continuity Test

Function	Resolution	Remark
→	0.001V	Display positive voltage decline
•••	0.1Ω	<10Ω buzzer, >10Ω may or may not buzzer

Overload Protection: 500V DC / AC.

8. Frequency and duty cycle

Range	Resolution	Accuracy
10Hz	0.01Hz±	(0.5%+3)
100Hz	0.1Hz	
1KHz	0.001KHz	
10KHz	0.01KHz	
100KHz	0.1KHz	
1MHz	0.001MHz	
10MHz	0.01MHz	
0.1~99.9%	0.1%	For refer only

9. Temperature Measurement(For UT136C only)

Range	Resolution	Accuracy
-40~0°C	1°C	- (8% + 5)
0~400°C		±(2.5%+3)
400~1000°C		±(3% + 3)

Overload Protection: 500V DC / AC.
Enclosed point contact K type thermocouple can only be used on less than 230°C temperature measurement.

10. NCV (For UT136D only)

Function	Range	Remarks
NCV	220V/50Hz	<10mm: buzzer beeps 10~50mm: may and may not beeps >50mm: Buzzer not sound

Maintenance And Service

⚠ Warning

Make sure the test leads take off the terminal and the circuit as well as power off the meter if want to open the meter cover.

1. General Service and Maintenance

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.
Any abnormal on the meter, stop use the meter and return to service center.

When need to have calibration on the meter, please allow certified engineer or specific service center for the service maintenance.

2. LCD display " " sign indicating battery will be run out and need to replace a new battery, if fail to do that. It causes the variance of the measuring result.
Battery Specification: 9V 6F22 or NEDA 1604/ IEC6LR61

Operating Steps:

- Turn the power in " off "situation, then remove the test lead out of the meter.
- Use screwdriver to take off the screw on the battery cover. Then you can take off old battery for replacing.
- User screwdriver to take off two pieces of screws, then you can as replacing the burned fuse(s) as replacement.

Fuse specification:
F1 Fuse φ5×20mm, F 0.5 A H 250V
F2 Fuse φ5×20mm, F 10 A H 250V