UT33L
Operating Manual

Palm Size Digital Multimeters

I. Overview

UT33L is a small hand held 3 1/2 digit multimeter with stable performance, new design and great safety ratings. It can be used to measure AC/DC voltage, DC current, resistance, diode voltage drop, circuit continuity, an ideal maintenance tool for users to carry. This manual contains safety information and warnings, please read relevant contents carefully and strictly follow all warnings and notes.

⚠ **Warning: Before using the meter, please read "Safety Rules" carefully.**

II. Unpacking Check

Open the package box and take out the meter.Please check whether the following accessories are missed or damaged. If any missing or damage is found, contact your supplier immediately .

1. Instruction Manual	1
2. Probe	1 Pair
3. Protection Cover	1
4. Warranty Card	1

If any item is lost or damaged, please contact your supplier.

III. Safety Rules

Please pay attention to Warnings. Warning indicates situations or actions that may cause danger to users and damage to meters or equipments. UT33 series meters are designed and produced following IEC61010 safety standard, complying with dual insulation, over voltage standard (CAT I 600V, CAT II 300V) and pollution level 2 safety standard. Please use the meter only according to the instructions in this manual.

1. Before using the meter, check the probe insulation layer. If probe line or meter cover insulation is damaged, or you think meter cannot work normally, please do not use the meter anymore.
2. When using probes, it must be held behind probe finger protection rings.
3. Do not measure voltages higher than 600V in order to avoid electical shock and damage to the meter.
4. Be careful in occasions with measured voltage higher than 60V and 42Vrms AC to avoid electrical shock.
5. Do not use the meter when back cover is not closed to avoid the risk of electrical shock.
6. Measurement shall not exceed specified limit values to avoid electrical shock and meter damage.
7. Prohibit changing range switch stall in measurement to avoid meter damage.
8. Cannot use current measurement terminal or current stall to test voltage.
9. Must use same type standard specification quick response fuse to replace damaged fuse.
10. Please do not randomly change meter internal connection lines to avoid meter damage and personal injury.
11. When LCD displays symbol, replace batteries in time to ensure measurement accuracy.
12. Please do not use the meter in high temperature and high humidity temperature environments, especially do not store the meter in wet environment, for meter performance will be inferior after get wet.
13. Please use wet cloth or soft cleaning agent to clean meter cover, do not use abrasive agent or solvent.

IV. Electrical Symbols

Low Battery	Grounding
AC	DC
Dual Insulation	Buzzer Continuity
AC or DC	Fuse
Diode	Warning
Comply with European Union Standard	

V. Specifications

1. Maximum voltage between voltage input terminal and grounding: 600Vrms.
2. ⚠ 10A terminal: No fuse.
3. ⚠ mA terminal fuse: ϕ5×20 F 315mA/250V.
4. Range Selection: Manual.
5. Backlight Function: Manual on and off
6. Maximum Display: 1,999, refresh 2 to 3 times per second.
7. Polarity Display: Negative polarity input displays "-" symbol.
8. Over Range Display: "OL"
9. Data Hold Function: LCD displays " " symbol at the upper left.
10. Low Battery: LCD displays symbol.
11. Batteries in the meter: 9V NEDA1604, 6F22 or 006F
12. Operation Temperature: 0℃~40℃(30℉~104℉)
    Storage Temperature: -10℃~50℃(14℉~122℉)
13. Dimension: 130mm×73.5mm×35mm
14. Weight: About 156g (including batteries)

VI. Configuration (Figure1)

1. LCD Display
2. Data Hold Button
3. Backlight Button
4. Range Switch
5. Common Input Terminal
6. 10A Current Input Terminal
7. Other Measurement Input Terminal

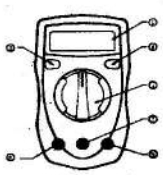


Figure 1

VII. Button Functions

1. Data Hold Display:

Press yellow "HOLD" button, hold on LCD displays the current measurement value, press this button again to exit data hold display function.

2. Backlight Control

Press blue button to turn on LCD backlight, press it again to turn off backlight, or backlight will be on for a long time.

VIII. Measurement Operation Instructions

Please check 9V batteries first and turn range switch to required measurement position. If it is low battery, LCD screen will display symbol. Pay attention to " ⚠ " symbol beside the test probe jack, it warns that test voltage and current cannot exc eed specified values.

1. DC Voltage Measurement (Figure 2)

(1) Insert red probe into "VΩmA" jack and black probe into "COM" jack.
(2) Turn function range switch to DC voltage stall and parallel connect probe to power supply or load to be measured.
(3) Read measurement result from screen.

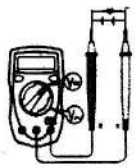


Figure 2

⚠ **Note**

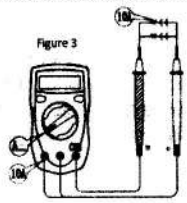
Do not measure voltages higher than 600V. Readings may be displayed, but internal circuits will be damaged and may cause personal injury. Before measurement, if measured voltage is unknown, turn range switch to highest range stall and turn down measurement stall gradually according to readings. LCD only displays "OL" at high bit indicates that range has been exceeded and need to turn up range. In every range stall, meter input impedance is 10MΩ. This load effect will cause measurement error when measuring high resistance circuit. If measured circuit impedance is less than 10kΩ, error can be ignored (less than 0.1%).

2. AC Voltage Measurement (see Figure 2)

⚠ Warnings and operation instructions are the same as DC voltage measurement.

3. DC Current Measurement (Figure 3)

(1) Insert red probe into "VΩmA" or 10A jack and black probe into "COM" jack.
(2) Turn function range switch to DC current stall and parallel connect power supply or load to be measured.
(3) Read measurement result from screen.



⚠ **Note:**

UT33L has set over voltage protection for current measurement lower than 200mA, but please do not try to measure DC current when voltage between input terminal and grounding exceeds safety voltage of 60V, to avoid meter or measured equipments damage or personal injury.Please ensure power supply disconnect before any measurement takes place, check whether input terminal and range switch are in the right position, then power on the meter and start measurements. If current value is unknown, turn range switch to highest range stall and turn down measurement range stall gradually according to readings. Internal fuse may be melted by mA input jack and input overload and needs to be replaced. Fuse size:ϕ5×20mm, electrical specifications: F 315mA/250V; there is no internal fuse for 10A input jack. To use the meter safely,each measurement time should be no more than 10 seconds and rest interval time should be no less than 15 minutes.

4. Resistance Measurement (Figure 4)

(1) Insert red probe into "VΩmA" and black probe into "COM" jack.
(2) Turn function range switch to resistance measurement stall and parallel to resistance to be measured.
(3) Read measurement result from screen.

⚠ Note:

When checking online resistance, in order to avoid meter damage, please ensure measured circuit is powered off, then start measurement.When measuring at 200Ω stall, test probe will make resistance measurement error of 0.1Ω to 0.3Ω . In order to get accurate readings, subtract the shorting probe value from the actual result.If measured resistance value is more than 1MΩ , readings will be stable after a few seconds.

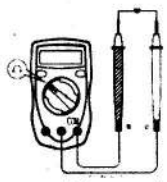


Figure 4

5. Diode and Continuity Measurement (Figure 5)

(1)Insert red probe into "VΩmA" and black probe into "COM" jack.
(2) Turn function range switch to diode measurement stall, parallel connect red probe to positive polarity of measured diode and black probe to the negative polarity.
(3) Read measurement result from screen.
(4) UT33L has continuity function. Connect probes to two ends of circuit to be measured. If resistance value between these two ends is lower than 70Ω, buzzer will sound.

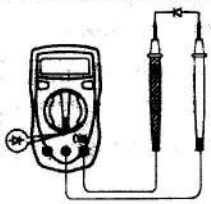


Figure 5

⚠ Note:

To avoid meter damage, before measuring diode, please ensure that power to circuit is off and capacitor has been discharged. Diode stall can measure diode and PN junction voltage drop of other semiconductor devices. For a silicon semiconductor with normal structure, positive voltage drop reading should be between 0.5 to 0.8V. Reverse display "OL" is open circuit, and the polarity of black probe is "+" and red probe is "-".

⚠ Note:

Do not input voltage higher than 60V DC or 30V AC to avoid meter damage and personal injury.

6. Square Wave Test Signal

Turn function range stall to square wave stall, then meter outputs square wave between "VΩmA" and "COM" terminals.

⚠ Note:

Harmonic waves of square wave test signal can be used as simple signal source to repair sound equipments. Frequency is about 50Hz and output amplitude is more than 3V when connecting 1MΩ load. To avoid meter damage, prohibit connecting voltage higher than 10V to output terminal (red probe).

IX. Technical Specifications

Accuracy:±(a% reading+ b number),
Environmental Temperature:23℃±5℃
Relative Temperature: <75%

1. DC V ltage

Range	Resolution	Accuracy: ±(a% reading+ b number)
200mV	100uV	±(0.5%+2)
2000mV	1mV	
20v	10mV	
200v	100mV	
600v	1V	±(0.8%+2)

⚠ Input impedance: All range is 10MΩ
Overload protection: 200mV range is 250V DC or AC, all other ranges are 600V DC or AC.

2. AC Voltage

Range	Resolution	Accuracy: ±(a% reading+ b number)
200V	100mV	±(1.2%+10)
600V	1V	

⚠ Input impedance: About 5MΩ
Frequency Response: 40Hz ~ 400Hz
Display: Sine wave RMS (average value response)
Overload protection: 600V DC or AC.

3. DC Current

Range	Resolution	Accuracy: ±(a% reading+ b number)	
200μA	1μA	±(1%+2)	
20mA	10μA		
200mA	0.1mA	±(1.2%+2)	
10A	10mA	±(2%+5)	

⚠ Overload protection: F 315mA/250V fuse. 10A range stall does not have fuse, measurement time requires no more than 10 seconds and rest interval time is no less than 15 minutes.

4. Resistance

Range	Resolution	Accuracy: ±(a% reading+ b number)	
200Ω	0.1Ω	±(0.8%+5)	
2000Ω	1Ω	±(0.8%+2)	
20kΩ	10Ω		
200kΩ	100Ω		
20MΩ	10kΩ	±(1%+5)	
200MΩ	100kΩ	———	±[5%(reading -10)+10]

⚠ Overload protection: All range is 250V DC or AC.

5. Square Wave Output

Range	Description
⎍	Output square test signal of about 50Hz. As simple signal source, output resistance is 47kΩ.

⚠Note: This range has not been set over voltage protection. Input level of calibrated equipments must be less than 10V to avoid meter damage.

6. Diode Test, Continuity Test

Function	Range	Resolution	Remark
Diode	⊣⊢	1mV	Display positive voltage drop approximate value.
Continuity Test	◀	1Ω	If <70Ω, buzzer sounds.

⚠ Overload protection: 250V DC or AC

X. Battery Repalcement (Figure 8)

When LCD displays " ▭ "symbol, batteries need to be replaced. Please operate according to the following steps:
1. Remove probe from measured circuit and input jack, then turn knob switch to "OFF" stall topower off meter.
2. Unscrew screws on bottom case with screwdriver and remove back cover.
3. Take out the old batteries and replace new 9V batteries.

Figure 8

XI. Maintenance and Repair

⚠ Warning:

1. Before opening back cover, ensure that power supply has been cut off and probes has been remove from measured circuit.
2. Use wet cloth and a little detergent to clean the meter, but cannot use chemical solvent.
3. If you find meter is abnormal, should stop using the meter immediately and send it for maintenance.
4. If the meter needs to be checked or maintained, please ask for qualified professional maintenance personnel or specified maintenance departments.

*** END ***

This opeating manual is subject to change without notice

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