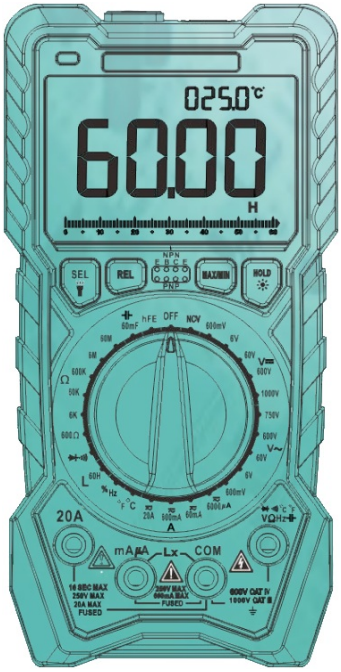
UNI-T UT61B Digital Multimeter User Manual

Contents

User Manual



LIMITED WARRANTY AND LIMITATION OF LIABILITY

Customers enjoy one-year warranty from the date of purchase.
This warranty does not cover fuses, disposable batteries, damage from misuse accident, neglect, alteration, contamination, or abnormal conditions of operation or handling, including failures caused by use outside of the product's specifications, or normal wear and tear of mechanical components.

Summary

This product is a battery-powered, manual range digital multimeter with true rms. The instrument has a 6000 counts display, using an LCD display with a backlight function for clear readings.

Safety Instructions

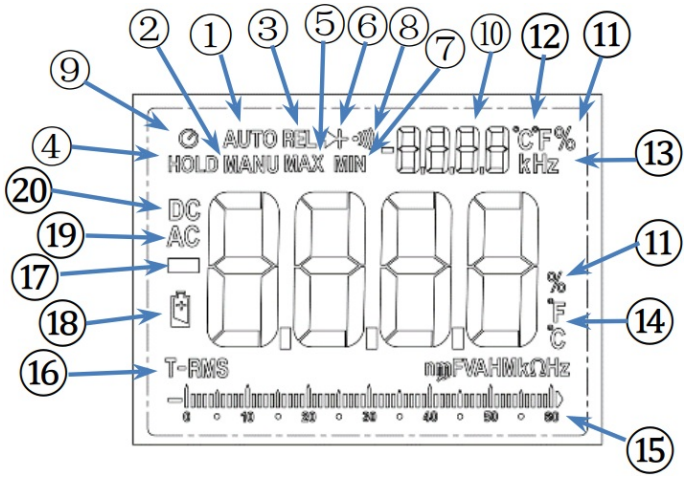
To avoid possible electric shock, fire, and personal injury, please read the safety precautions before use. Use the product only for its intended purpose, otherwise the protection provided by the product may be impaired.

- Please check the case before using the product.
  Check for cracks or plastic defects. Please double check the insulators near the input port.
- Please follow this "User Manual", use the correct input port and the correct gear setting, and measure within the range specified in this "User Manual".
- Do not use this product around explosive gases and vapors or in humid environments.
- Please keep your fingers behind the guard of the test lead probe
- When this product is connected to the circuit under test, do not touch the unused input port.
- Please disconnect the test lead and the circuit before changing the measure gear.
- When the DC voltage to be measured is higher than 36V, or the AC voltage is higher than 25V, it may cause serious injury to the human body, and the user should pay attention to avoid electric shock.
- Please select the correct measure gear and range to avoid instrument damage or personal injury. When the measured parameter exceeds the range of the instrument, the screen will display "OL"

- When the battery voltage is low, it may affect the accuracy of the test results. Please replace the battery in time. Do not use this product without the battery cover closed properly.

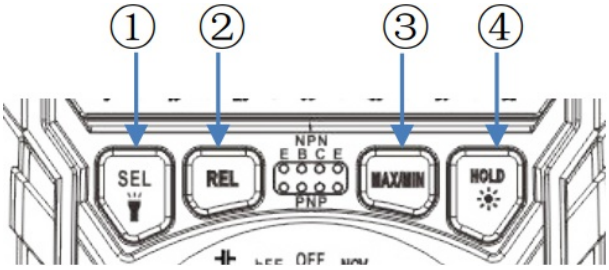
product description

LCD



①	AUTO	The product automatically selects the range with the best resolution
②	MANU	User manually selects the range
③	REL	**Relative value measurement: When entering REL mode, the display screen will save t he current reading as a reference value, which will be automatically subtracted from e ach subsequent measurement.**
④	HOLD	Display freezes current reading
⑤	MAX	The display shows the maximum reading
⑥		Diode test
⑦	MIN	The display shows the minimum reading
⑧		Continuity test
⑨		Automatic shutdown display symbol
⑩	-8.8.8.8	Secondary Display Screen
	%	Duty cycle test
	°F°C	Temperature Test – Fahrenheit
	Hz	Frequency Test (Hertz)
	°F °C	Temperature Test – Celsius
		Analog bar chart
	T-RMS	The product can accurately measure alternating current that conforms to the sine wave wav eform and does not conform to the sine wave waveform
	-8.8.8.8	Main Display Screen
		The battery is low, please replace the battery
	AC	AC
	DC	DC
nmFVAHMkΩHz		Units of measurement

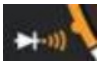
function button



①	Selection key: Pressing this key can switch between the gear modes currently indicated by the knob switch, as follows: 1. Diode/Continuity Test 2. DC current (A)/AC current (A) 3. DC current (mA)/AC current (mA) 4. DC current (μA)/AC current (μA) 5. Press and hold for 2 seconds to turn on the flashlight, and press and hold again to turn off the flashlight.
②	measurement key: Press this key in the capacitance, triode, voltage, current measurement mode to enter th e relative value measurement mode; if you need to cancel, press it again to exit
③	measurement key: Press this key once to enter the maximum value measurement mode, press it again to s witch to the minimum value measurement mode; press and hold for 2 seconds or switch gears to exit.
④	Press this key briefly to keep the current reading on the screen, and press it again briefly to cancel the hold; press and hold this key for 2 seconds to turn on the screen backlight, and press and hold again to turn off th e backlight.

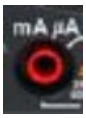
knob switch

	Turn off the product in gear this position. • If there is no function switching or knob operation within 15 minutes after turning on, this product wil l automatically shut down. • One minute before the automatic shutdown, the product's built-in buzzer will sound five "beeps" to r emind. • If you want to restart the instrument after automatic shutdown, turn the dial switch to restart. • To disable the auto shutdown function, press and hold the SEL key before turning on the device. If t he cancellation is successful, the built-in buzzer will sound four "beep" tones, and the clock icon " on the screen will disappear.
	Non-contact voltage detection
	DC voltage≤600mV
	DC voltage≤6V

	DC voltage≤60V
	DC voltage≤600V
	DC voltage≤1000V
	AC voltage≤750V
	AC voltage≤600V
	AC voltage≤60V
	AC voltage≤6V
	AC voltage≤600mV
	DC current mode: ≤6000uA AC current mode: ≤6000uA
	DC current mode: ≤60mA AC current mode: ≤60mA
	DC current mode: ≤600mA AC current mode: ≤600mA
	DC current mode: ≤20A AC current mode: ≤20A
	Celsius: -20~1000 Fahrenheit: -4~1832
	Low voltage high frequency gear, duty cycle gear: 1%~99%
	Inductance gear: ≤60H, automatic range
	Diode gear: more than 3.3V will display "OL" Continuity gear: the buzzer sounds when it is less than 50Ω
	Resistance gear: ≤600Ω
	Resistance gear: ≤6KΩ
	Resistance gear: ≤60KΩ
	Resistance gear: ≤600KΩ
	Resistance gear: ≤6MΩ

	Resistance gear: ≤60MΩ
	Capacitance gear: ≤60mF, automatic range
	Transistor hFE value measurement gear: 0~1000β

input port

	Input port for current measurement (≤20A)
	Input port for current mA/uA and inductance measurement mA≤600mA,uA≤6000uA Inductance automatic measurement ≤60H
	Common port for all measurements
	Input ports for the following measurements: AC/DC voltage resistance capacitance frequency temperature Continuity diode

Measurements Instruction

Measure DC Voltage

1. Insert the black test lead into the COM port and the red test lead into the  port.
2. Rotate the knob to the  DC voltage range, and select the appropriate measurement range (there are five ranges from 600mV to 1000V) based on the magnitude of the signal being measured. Touch the probes to the correct test points of the circuit to measure the voltage.
3. Make sure to use the test leads to make contact with the correct testing point on the circuit.
4. Read the voltage value displayed on the screen.

Measure AC Voltage

1. Insert the black test lead into the COM port and the red test lead into the  port.
2. Rotate the knob to the  AC voltage range and select the appropriate measurement range (there are five ranges from 600mV to 750V) based on the magnitude of the signal being measured. Touch the probes to the correct test points of the circuit to measure the voltage.
3. Make sure to use the test lead probe to make contact with the correct testing point on the circuit.
4. Read the voltage value displayed on the screen.

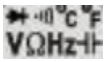
***Do not measure a voltage that exceeds the maximum rated testing value, as doing so may damage the instrument and potentially cause harm to yourself.**
***When measuring high-voltage circuits, it is necessary to avoid touching the high-voltage circuits.**

Measure AC/DC Current

1. Rotate the knob to  the current measurement area, and the current range indicator light  will light up.
2. Select the appropriate measurement range based on the type and magnitude of the current being measured (with a range of 6000uA to 20A, divided into 5 ranges). Press the SEL button to switch between AC and DC current measurement.
3. Black test lead should be inserted into the COM port. When measuring current in the range <600mA, the red test lead should be inserted into the mAuA port. If the measured current is in the range of 600mA~20A, the red test lead should be inserted into the 20A port.
4. Disconnect the circuit path to be measured, and insert the meter probes into the
5. To read the current value displayed on the screen.

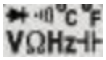
*** The measured current should not exceed the maximum rated test value, otherwise there is a risk of damaging the instrument and endangering personal safety.**
*** If the magnitude of the current to be measured is unknown, it should be tested and determined using the 20A range first. Then, according to the displayed value, select the corresponding test terminal and current range.**
*** Do not input voltage in this gear position.**

Measure Resistance

1. Insert the black test lead into the COM port, and the red test lead into the  port.
2. Turn the knob to the resistance range, and rotate the knob switch to select the appropriate range (0Ω~60MΩ, divided into 6 ranges) according to the resistance value to be measured.
3. Connect the test leads to the desired test points in the circuit. 3. Read the resistance value displayed on the screen.

***Before measuring resistance, it is necessary to confirm that all power sources of the circuit being tested are turned off, and all capacitors have been completely discharged. It is strictly forbidden to apply voltage in this mode.**

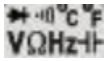
Measure continuity

1. Insert the black probe into the COM port and the red probe into the  port.

2. Turn the knob switch to the  gear, and press the SEL key to enter the continuity test mode
3. Connect the test leads to the two points of the circuit being tested.
4. If the resistance value is less than 50Ω, the buzzer will sound, indicating a short circuit. If there is no response, it means an open circuit..

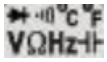
***Do not input the voltage in this gear position.**

Test Diodes

1. Insert the black test lead into the COM port and the red test lead into the  port.
2. Turn the knob switch to the 
3. Use the red test probe to connect to the positive pole of the diode being tested, and the black test probe to connect to the negative pole of the diode being tested.
4. Read the forward voltage displayed on the screen.

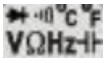
***Do not input the voltage in this gear state.**
***Before testing, the power should be disconnected and all high-voltage capacitors should be discharged.**

Measure Capacitance

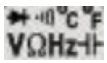
1. Insert the black test lead into the COM port and the red test lead into the  port.
2. Turn the knob switch to the  gear.
3. Connect the red test lead to the positive terminal of the capacitor to be measured, and connect the black test lead to the negative terminal of the capacitor. The instrument will automatically select the appropriate range based on the measured capacitance value
4. After the reading is stable, read the capacitance value displayed on the screen..

***If you want to measure a high-voltage capacitor, you should discharge it before testing.**

Measure Frequency

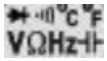
1. Insert the black test lead into the COM port, and insert the red test lead into the  port.
2. Turn the knob switch to  “measure low-voltage high-frequency” mode, or when measuring in AC voltage/current mode, the secondary display will show the frequency reading value (for high-voltage low-frequency measurement).
3. Use the test probe of the meter to contact the circuit test point you want to test..
4. Read the frequency value displayed on the screen..

Measure Duty Cycle

1. Insert the black test lead into the COM port and the red test lead into the  port.
2. Turn the knob switch to the  gear, press the Hz % button once to toggle to the Duty Cycle Mode.

3. Use the test probes to touch the desired test point in the circuit.
4. Read the duty cycle value displayed on the secondary screen.

Measure Temperature

1. Insert the black plug of the thermocouple into the COM port and insert the red plug into the  port.
2. Turn the knob switch to the  mode for measuring temperature. At this time, the screen will display ambient temperature by default, with the primary display in Celsius (℃) and the secondary display in Fahrenheit (℉).
3. Use the temperature measuring probe of the thermocouple to contact the point to be measured.
4. Read the temperature value displayed on the screen.

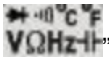
***Do not input the voltage in this gear position.**
***When measuring high temperature, it is prohibited to touch the test point with the human body to avoid burns**

Measure inductance

1. Insert the black test lead into the COM port, and insert the red test lead into the “mAuA/Lx” port.
2. Turn the knob switch to the “L” inductance mode.
3. Use the red and black test leads to respectively detect the two ends of the inductor to be tested. The instrument will automatically select the appropriate range based on the measured inductance value.
4. After the reading is stable, read the inductance value displayed on the screen.

- **Do not input the voltage in this gear position.**

Test NCV

1. Turn the rotary switch to  .
2. Hold the product and move it around, the built- in beeper will beep when the inner sensor detects AC voltage nearby. The stronger the voltage is, the quicker the beeper beeps.
3. If the red test pen is inserted into the “  ” end alone, and the test probe of the test pen is used to contact the detection power plug respectively, if the buzzer alarms strongly, it is the live wire; otherwise, it is the neutral wire or ground wire.

Test triode hFE value

1. Turn the rotary switch to 
2. Determine whether the triode to be measured is NPN or PNP type, respectively insert the base (B), emitter (E), and collector (C) into the  triode measurement socket.
3. Read the approximate hFE value on the display (range 0~1000β).

Maintenance

Except for battery and fuse replacement, please do not attempt to repair or modify the circuit of the product unless you have the appropriate qualifications, calibration, performance testing, and maintenance instructions.

Cleaning instructions:

Please use a damp cloth and mild cleaning agent to clean the exterior of the product. Do not use corrosive agents or solvents. Dust or moisture on the test ports may affect the accuracy of the readings.
*Before cleaning the product, please remove all input signals.

Replace the Batteries

When the symbol “  ” appears on the display screen, the battery should be replaced. Please follow the steps below:

1. Before replacing the battery, please disconnect the test leads and turn off the unit.
2. Unscrew the screw that secures the battery cover and open the battery door.
3. Remove the old battery and replace it with a new one of the same type.
4. Install the battery door and tighten the screw.

Replace the Fuses

When the fuse is blown or faulty, follow the steps below to replace it:

1. Before replacing the fuse, remove the test leads and turn off the device.
2. Unscrew the four screws on the back cover and one screw that secures the battery door. Remove the back cover.
3. Replace the old fuse with a new fuse of the same model.
4. Reattach the back cover and battery door, and tighten the screws.

Specifications

General Specifications	
Display (LCD)	6000 counts
Ranging	Auto/Manual
Material	ABS/PVC
Update Rate	3 times/second
Ture RMS	√
Data Hold	√
Backlight	√
Low Battery Indication	√
Auto Power Off	√

Mechanical Specifications	
Dimension	176*91*47mm
Weight	330g (no battery)
Battery Type	1.5V AA Battery * 3
Warranty	One year

Environmental Specifications		
Operating	Temperature	0~40℃
	Humidity	< 75%
Storage	Temperature	-20~60℃
	Humidity	< 80%

Electrical Specifications

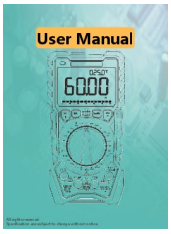
Function	Range	Resolution	Accuracy
DC Voltage (V) (mV)	600.0mV	0.1mV	±(0.5%+3)
	6.000V	0.001V	
	60.00V	0.01V	
	600.0V	0.1V	
	1000V	1V	
AC Voltage (V) (mV)	600.0mV	0.1mV	±(1.0%+3)
	6.000V	0.001V	
	60.00V	0.01V	
	600.0V	0.1V	
	750V	1V	
DC Current (A)	20.00A	0.01A	±(1.2%+3)
DC Current (mA)			±(1.2%+3)
	60.00mA	0.01mA	
	600.0mA	0.1mA	
DC Current (μA)	6000μA	1μA	
AC Current (A)	20.00A	0.01A	±(1.5%+3)
AC Current (mA)			
	60.00mA	0.01mA	
	600.0mA	0.1mA	

AC Current (μA)	6000μA	1μA	
Resistance	600.0Ω	0.1Ω	±(0.5%+3)
	6.000kΩ	0.001kΩ	
	60.00kΩ	0.01kΩ	
	600.0kΩ	0.1kΩ	
	6.000MΩ	0.001MΩ	
	60.00MΩ	0.01MΩ	±(1.5%+3)
Capacitance	9.999nF	0.001nF	±(5.0%+20)
	99.99nF	0.01nF	±(2.0%+5)
	999.9nF	0.1nF	
	9.999μF	0.001μF	
	99.99μF	0.01μF	
	999.9μF	0.1μF	
	9.999mF	0.001mF	±(5.0%+5)
	60.00mF	0.01mF	
Frequency	9.999Hz	0.001Hz	±(0.1%+2)
	99.99Hz	0.01Hz	
	999.9Hz	0.1Hz	
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
	999.9kHz	0.1kHz	
	9.999MHz	0.001MHz	
Duty Cycle	1%~99%	0.1%	±(0.1%+2)
Temperature	(-20~1000)℃	1℃	±(2.5%+5)
	(-4~1832)℉	1℉	
Diode	√		
Continuity	√		

NCV	√
Triode	hFE approximation value 0~1000β

Function	Range	Resolution	Accuracy
inductance	6.000mH	0.001mH	±(5.0%+50)
	60.00mH	0.01mH	±(3.0%+10)
	600.0mH	0.1mH	
	6.000H	0.001H	
	60.00H	0.01H	±(5.0%+50)

Documents / Resources

	UNI-T UT61B Digital Multimeter [pdf] User Manual UT61B Digital Multimeter, UT61B, Digital Multimeter, Multimeter

References

- User Manual