P/N:110401108881X

UNI-T

UT203+/UT204+ AC/DC Clamp Meters User Manual

Preface

Thank you for purchasing the new *clamp meter*. In order to use this product safely and correctly, please read this manual thoroughly, especially the *Safety Instruction* part.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Limited warranty and liability

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination and improper handling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device. As some countries or regions do not allow limitations on implied warranties and incidental or subsequent damages, the above limitation of liability may not apply to you.

1. Overview

The UT203+/UT204+ are portable true RMS AC/DC clamp meters with automatic range. They are designed according to EN61010-1 CAT II 600V/CAT III 300V safety standards, and come with full-function protection which ensures users a safe and reliable measurement experience. Aside from basic measurement functions, they also have high precision current scale and high voltage frequency measurement extension. UT204+ also comes with live/neutral wire detection. These meters are great tools for electrical measurements up to 1000A current.

2. Features

- True RMS measurement
- Audio visual NCV electric field detection
- High voltage frequency range: 10Hz~60kHz; low voltage frequency range: 60Hz~10MHz
- UT203+ AC/DC current range: 40A, 400A, frequency response: 45Hz~400Hz
- UT204+ AC/DC current range: 60A, 600A, frequency response: 45Hz~400Hz, live/neutral wire detection
- ACA/DCA mode memory function for current measurement
- Large capacitance (UT203+: 40mF, UT204+: 60mF) and temperature measurement (UT204+)
- Large LCD and fast refresh rate (3 times/s), capacitance measurement response time:
  ≤1mF: less than 3s; ≤10mF: about 6s; ≤60mF: about 8s
- Full-function false detecting protection for up to 600V (3.6kVA) energy surge; overvoltage and overcurrent alarm
- The power consumption without backlight is about 1.8 mA. The circuit has an automatic power saving function. The consumption in sleep state is <11uA, which effectively extends the battery life to 400 hours.

Please read the safety and warning parts in this manual thoroughly.

⚠ Caution: Please read the safety instructions carefully before use.

3. Standard Accessories

Open the package and check the below items, if any is missing or damaged, please contact your supplier immediately:
User manual ---------- 1 pc
Test leads ---------- 1 pair
K-type temperature probe ------ 1 pc (Only UT204+)
Cloth bag ---------- 1 pc

4. Safety Instructions

The meter is designed according to EN61010-1, 61010-2-032/033 and electromagnetic radiation protection EN61326-1 safety standards, and conforms to double insulation, CAT II 600V, CAT III 300V and pollution grade II. In case the meter is not used properly as instructions, the protection provided may be weakened or lost.

- Do not use the tester or test leads if they appear to be damaged.
- Do not use the meter if the rear or battery cover is open.
- Keep fingers behind finger guard and do not touch the live parts to prevent electric shock.
- The function switch should be correctly set before measurement. It is forbidden to switch scale during measurement or damage may occur!
- Do not apply AC/DC voltage over 600V to any terminal to prevent electric shock or damage.
- Use caution to avoid shock hazard when working with voltages above DC 60V, or AC 30Vrms.
- Never input voltage or current which exceeds the specified limit. Maximum range should be selected if measured value is unknown. Before measuring resistance, diode and continuity, please disconnect all power and fully discharge all capacitors to avoid inaccuracy.
- When the " " symbol appears on the LCD, please replace the batteries in time to ensure measurement accuracy. Batteries should be removed If the meter is long-term idle.
- Do not change the internal circuit of the meter to avoid damage to the meter and user!
- Do not expose the meter in high temperature/humidity, flammable, explosive or intense magnetic environments.
- Clean the meter casing with a soft cloth and mild detergent. Do not use abrasives or solvents!

5. Symbols

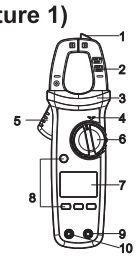
Symbol	Description
⚠	Caution, possibility of electric shock
~	Alternating current
⎓	Direct current
⧈	Equipment protected throughout by double insulation or reinforced insulation
⏚	Earth (ground) terminal
⚠	Warning or caution

6. General Specifications

- Max LCD display counts: 4099 (UT203+), 6099 (UT204+)
- Polarity display: Auto
- Overload display: "OL" or "- OL"
- Low battery indication: " " means low battery
- Low battery shutdown prompt: The "Lo.bt" interface appears on LCD and lasts for about 10s, the buzzer beeps 3 times, and the meter automatically shuts down.
- Test position error: If the source under test is not placed at the center of the clamp jaws when measuring current, ±1.0% additional error in reading may be produced.
- Drop protection: 1m
- The maximum size of jaw opening: 28mm in diameter
- Battery: AAA 1.5V battery × 2
- Auto power off (adjustable): The meter will auto power off if there is no operation for 15 min.
- Dimensions: 215mm × 63.5mm × 36mm
- Weight: About 235g (including batteries)
- Altitude: 2000m
- Operating temperature and humidity: 0°C~30°C (≤80%RH), 30°C~40°C (≤75%RH), 40°C~50°C (≤45%RH)
- Storage temperature and humidity: -20°C~+60°C (≤80%RH)
- Electromagnetic compatibility: RF=1V/m, overall accuracy=specified accuracy+5% of range; RF>1V/m, no specified calculation

7. External Structure (Picture 1)

1) NCV sensing end
2) Clamp jaws
3) Hand guard
4) LED indicator
5) Jaw opening trigger
6) Function scale knob
7) LCD display
8) Function buttons
9) Signal input jack (red and positive +)
10)COM input jack (black and negative -)



Picture 1

8. Button Description

SELECT Button
In composite scale, press this button to switch between the corresponding functions or ranges;
HOLD/BACKLIGHT Button
Short press this button to enter/exit the data hold mode, and long press (about 2s) this button to turn on/off the backlight.
MAX/MIN Button
(valid for ACV/DCV, ACA/DCA, "C/"F, resistance and capacitance scales)
Short press this button to enter the maximum/minimum measurement mode and long press this button to exit.
REL Button
(valid for ACV/DCV, DCA, "C/"F and capacitance scales).
Press this button to store the current reading as a reference for future readings. When the LCD display value is reset to zero, the stored reading will be subtracted from the future readings. Press this button again to exit the relative value mode.

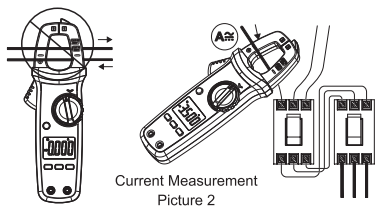
9.Operating Instructions

9.1 AC/DC Current Measurement (Picture 2)

- Select the corresponding current range.
- Press the trigger to open the clamp jaws, and fully enclose one conductor.
- Only one conductor can be measured at a time, or the measurement reading will be wrong.

⚠ Caution:

- Do not insert the testing leads during current measurement to avoid electric shock.
- The current measurement must be taken with safeguard protection.
- Press the REL button to return to zero before the DC current measurement, and meanwhile the center hole of jaw should be perpendicular to the current direction to ensure accuracy.
- The open circuit zeroing reading may be relatively large after (high) DC current measurement. Please perform the AC current detection again to counteract the remanence signal by alternating electric field.

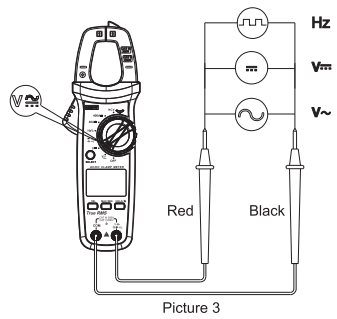

Current Measurement
Picture 2

9.2 AC/DC Voltage and Voltage Frequency (% duty cycle) Measurement (Picture 3)

- Select the corresponding function scale.
- Insert the red test lead into the "positive" jack, and the black into the "COM" jack.
- Connect test leads with both ends of the measured objects.

Caution:

- Do not input voltage above 600V to prevent electric shock or damage. The input impedance of each range scale is 10MΩ, this load effect in high resistance measurement may cause error. If the input impedance is lower than 10kΩ, the error can be ignored (≤0.1%).
- Be cautious to avoid electric shock when measuring high voltage.
- Please check the functions by applying a known voltage before use.



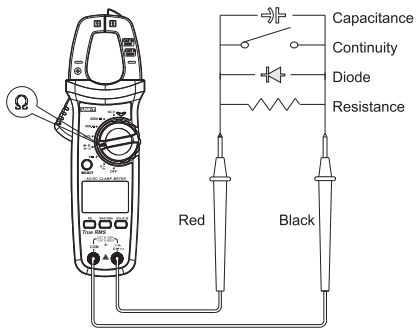
Picture 3

9.3 Continuity Test/Resistance/Diode/Capacitance Measurement (Picture 4)

- Select the corresponding function scale.
- Insert the red test lead into the " V Ω Hz " jack, and the black into the "COM" jack.
- Connect test leads with both ends of the measured object.

⚠ Caution:

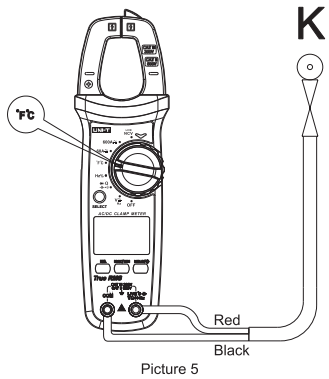
- Do not input voltage above DC 60V or AC 30V to avoid personal injury.
- Please disconnect all the other parts of the circuit to avoid inaccuracy.
- Before the resistance online measurement, please do disconnect all the power and fully discharge all capacitors to avoid injury or device damage.
- If the resistance is over 0.5Ω when the test leads are short-circuited, please check the test leads for looseness or other abnormalities.
- If the measured resistor is open or the resistance exceeds the maximum range, the LCD will display "OL".
- Measured value = displayed value – probe short circuit value
- It is recommended to use "REL" measurement mode for capacitance less than 100nF.



Picture 4

9.4 Temperature Measurement (UT202+ only, Picture 5)

- Select the temperature measurement function scale.
- Insert K-type thermocouple to the meter, fix the temperature probe on the measured object, and read after the value is stable.



Picture 5

9.5 NCV AC Electric Field Sensing and Live/Neutral Wire Measurement (Picture 6a)

9.5.1 AC Electric Field Sensing

The electric field sensing sensitivity is divided into two levels ("EFHI" and "EFLo"). The meter defaults to "EFHI". Users can select different sensitivity levels according to the intensity of the measured electric field. Select "EFHI" of NCV when electric field is around 220V AC 50Hz/60Hz. Bring the NCV sensing end close to a charged electric field (socket, insulated wire, etc.). The LCD will display the segment "-" with beeps and red LED flashing. As the intensity of the measured electric field increases, the more segments (----) display, the higher frequency of buzzer beeps and LED flashes. Select "EFLo" when the electric field is around 110V AC 50Hz/60Hz.

⚠ **Caution:**

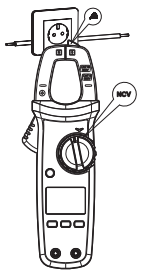
Use the NCV sensing end to approach measured electric field, otherwise the measurement sensitivity will be affected. When the measured electric field voltage is over 100V AC, observe whether the conductor is insulated to avoid personal injury.

9.5.2 Live/Neutral Wire Measurement (only UT204+) (Picture 6b)

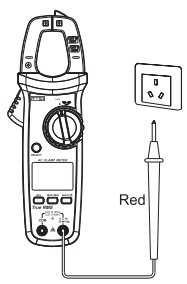
a. Select the LIVE function scale.
b. Insert the red test lead into the " V⊣⊢ Ω ⊳|⊲ Hz " jack, make the black test lead suspended, and use the red test lead to touch the socket or bare wire to distinguish the live/neutral wire.
c. When the neutral wire or uncharged object is detected, the "----" is displayed.
d. When the >60V AC "live wire" is detected, the LCD will display "LIVE" accompanied by audio/visual indication.

⚠ **Caution:**

- When using this function, in order to avoid the COM input interference, which will affect the electric field and the accuracy, please pull the black test lead out of the COM input.
- Do keep your hand away from the meter casing. The accuracy may be unstable under the dense high-voltage. In this case, it should be judged by LCD and sound frequency together.



Picture 6a



Picture 6b

9.6 Others

- Auto power off: The meter will automatically power off to save power if there is no operation for 15 min. You can wake it up by pressing any button or restart it after turning the switch to OFF.
- Press and hold the SELECT button in off state and then turn on the meter again to disable the auto power off function. Restart the meter after shut it down to resume this function.
- Buzzer: When any button is pressed or the function switch is turned, if it is valid, the buzzer will make one beep (about 0.25s). The buzzer will also beep intermittently to indicate the over range during the voltage or current measurement.
- Low battery detection: The battery voltage will be automatically detected as long as the meter is on. If it is lower than 2.6V, the LCD will display the "🪫" symbol.
- Low battery shutdown function: When the battery voltage is lower than 2.5V, the LCD displays the "🪫" symbol, the "Lo.bt" interface appears and lasts for about 10s, the buzzer makes consecutive beeps 3 times, and then the meter automatically shuts down (no interface is displayed).

10. Technical Specifications

Accuracy: ± (%reading + counts), the calibration period is 1 year.

Ambient temperature and humidity: 23°C±5°C; ≤80%RH.

Temperature coefficient: the accuracy assured temperature condition is 18°C-28°C, the range of ambient temperature fluctuation is stable within ±1°C. When the temperature is less than 18°C or over 28°C, the additional temperature coefficient error is 0.1 x (specified accuracy)/°C.

10.1 Current Measurement

AC Current

Range		Resolution	Accuracy
UT203+	UT204+		
40.00A	60.00A	0.01 A	±(2%+5)
400.0A	600.0A	0.1 A	

DC Current

Range		Resolution	Accuracy
UT203+	UT204+		
40.00A	60.00A	0.01 A	±(2%+5)
400.0A	600.0A	0.1 A	

⚠ **Caution:**

- Accuracy guarantee range: 5%~100% of range
- When the measured current reaches the warning value, there will be an alarm sound (UT203+: 410A, UT204+: 610A)
- With DC current DCA mode, LCD may display non-zero value in open circuit state, users can press "REL" button to clear display to zero before each measurement.

10.2 Voltage Measurement

DC Voltage

Range		Resolution	Accuracy
UT203+	UT204+		
400.0mV	600.0mV	0.1mV	±(0.7%+3)
4.000V	6.000V	0.001V	±(0.5%+2)
40.00V	60.00V	0.01V	
400.0V	600.0V	0.1V	
600V		1V	

AC Voltage/Voltage Frequency

Range		Resolution	Accuracy
UT203+	UT204+		
4.000V	6.000V	0.001V	±(1.0%+5)
40.00V	60.00V	0.01V	±(0.8%+5)
400.0V	600.0V	0.1V	
600V		1V	
Voltage Frequency 10Hz~60KHz		0.01Hz~0.01kHz	±(0.5%+2)

⚠ **Caution:**

- UT203+: short press "SELECT" in AC voltage/Hz scale to enter the Hz function;
  UT204+: long press "SELECT" to enter/exit the Hz function, the input range over 5V.
- The input impedance is about 10MΩ
- Current/voltage frequency response: 45Hz ~ 400Hz, displays true RMS value
- Accuracy guarantee range: 1%~100%
- AC crest factor of non-sinusoidal wave can reach 3.0 at 4000 counts while can only reach 1.8 at 6000 counts, the additional error should be added for the corresponding crest factor as follows:
  A. Add 3% when the peak factor is 1 ~ 2
  B. Add 5% when the peak factor is 2 ~ 2.5
  C. Add 7% when the peak factor is 2.5 ~ 3

10.3 Continuity/Diode Measurement

Function	Range	Resolution	Accuracy
•))	400.0Ω/600.0Ω	0.1Ω	≤10Ω: Consecutive beeps ≥31Ω: No beep The median: uncertain
▶|	4.000V/6.000V	0.001V	The open circuit voltage is about 4V For the silicon PN junction diode, the voltage value is generally about 0.5~0.8V.

10.4 Resistance Measurement

Range		Resolution	Accuracy
UT203+	UT204+		
400.0Ω	600.0Ω	0.1Ω	±(1.0%+2)
4.000kΩ	6.000kΩ	0.001KΩ	±(0.8%+2)
40.00kΩ	60.00kΩ	0.01KΩ	
400.0kΩ	600.0kΩ	0.1KΩ	
4.000MΩ	6.000MΩ	0.001MΩ	±(2.5%+5)
40.00MΩ	60.00MΩ	0.01MΩ	

⚠ **Caution:**

- Measured resistance value = displayed value – resistance value of short circuited test leads
- Open circuit voltage is about 1V
- Overload protection: 600Vrms

10.5 Capacitance Measurement

Range		Resolution	Accuracy
UT203+	UT204+		
40.00nF	60.00nF	0.01nF	±(4%+5)
400.0nF	600.0nF	0.1nF	
4.000uF	6.000uF	0.001μF	
40.00uF	60.00uF	0.01μF	
400.0uF	600.0uF	0.1μF	
4.000mF	6.000mF	0.001mF	±10%
40.00mF	60.00mF	0.01mF	

⚠ Caution:

- Measured value = displayed value - open circuit value of the test leads (For capacitance ≤100nF, "REL" mode is recommended, open circuit has residual reading). The guaranteed accuracy is 1%~100%.
- Overload protection: 600Vrms

10.6 Frequency Measurement

Range	Resolution	Accuracy
10Hz~10MHz	0.01Hz~0.01MHz	±(0.1%+4)

10.7 Duty Ratio Measurement

Range	Resolution	Accuracy
0.1%~99%	0.1%	±(3%+5)

⚠ **Caution:**

Measurement sensitivity:
≤100kHz: 200mVrms≤ input range≤30Vrms;
>100kHz~1MHz: 600mVrms≤ input range≤30Vrms;
>1MHz~10MHz: 1Vrms≤ input range≤30Vrms.

Duty ratio is only applicable to ≤10kHz square wave measurement with a range of 1Vp-p:
If frequency≤1kHz, duty cycle will be 10.0%-95.0%;
If frequency>1kHz, duty cycle will be 30.0%-70.0%.

10.8 Temperature Measurement (UT204+ only)

Range	Resolution	Accuracy
−40°C~40°C	1°C	±4°C
40°C~500°C		±(1.5%+5)
500°C~1000°C		±(2.0%+5)
−40°F~104°F	1°F	±6°F
104°F~932°F		±(2.0%+6)
932°F~1832°F		±(2.5%+4)

⚠ **Caution:**

The meter displays "OL" after startup, it is only suitable for K-type thermocouple (Nickel-Chromium ~ Nickel-Silicon temperature sensor) and temperature measurements below 1000°C/1832°F. The formula for Celsius to Fahrenheit is °F =1.8°C + 32.

10.9 NCV

Range	Electric field sensing sensitivity level	Accuracy
NCV	EFLo	The electric field sensing sensitivity is divided into two levels ("EFHI" & "EFLo"). The meter defaults to "EFHI". a) AC voltage above 24V±6V can be sensed. "EFLo" mode is recommended when the power frequency voltage is 110V. b) "EFHI" can be set in 220V condition. AC voltage above 74V±12V can be sensed with getting close to wires, and identify whether the main socket is charged or to judge the live/neutral wire of socket according to the intensity of sensing. Note: Test results may be affected by different socket designs or wire I nsulation thickness.
	EFHI	

10.10 LIVE Function (UT204+ only)

Range	Live wire measurement	Accuracy
LIVE	Triggered voltage≥AC 60V (50Hz/60Hz)	1) Display "- - - -" and "AC" symbol before startup 2) Display "- - - -" when test neutral wire. 3) Display "LIVE" and ⚠ symbol when test live wire, and change sound and LED flashing frequency according to the live wire voltage intensity.

11. Maintenance

⚠ Warning: Before opening the rear cover of meter, remove test leads to avoid electric shock.

11.1 General Maintenance

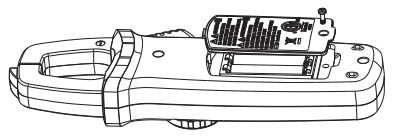
- Clean the meter casing with a soft cloth and mild detergent. Do not use abrasives or solvents!
- Do not use the tester or test leads if they appear to have any abnormality.
- The maintenance and service must be implemented by qualified professionals or designated departments.

11.2 Battery Replacement (Picture 7)

When the "🪫" symbol appears on the LCD, please replace the batteries in time to ensure measurement accuracy. Batteries specification:
2 standard AAA 1.5V batteries.

Operation

- Turn off the meter and remove the test leads from the input terminals.
- Unscrew the screw of the battery compartment, remove the battery cover, and take out the used batteries as shown.
- Replace the 2 standard AAA batteries according to the polarity indication.


Picture 7

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