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Overview

This Operating Manual covers information on safety and cautions. Please read the relevant information carefully and observe all the **Warnings** and **Notes** strictly.

⚠ Warning

To avoid electric shock or personal injury, read the “Safety Information” and “Rules for Safety Operation” carefully before using the Meter.

The **Model UT212** (hereafter referred to as “the Meter”) are a 3999 counts 3 3/4 digits auto clamp multimeter, they auto sense on AC & DC voltage, AC current and resistance measurement. They have full range overload protection and special outlook design. They are such a smart electrical testing clamp meter.

It also equips with data save, data recall, low battery display and auto power off features.

Unpacking Inspection

Open the package case and take out the Meter. Check the following items carefully to see any missing or damaged part:

Item	Description	Qty
1	Operating Manual	1 piece
2	Test Lead	1 pair
3	9V Battery (NEDA 1604, 6F22 or 0006P) (installed inside the Meter)	1 piece

In the event you find any missing or damage, please contact your dealer immediately.

Safety Information

This Meter complies with the standards IEC61010: in pollution degree 2, overvoltage category (CAT. II 600V / CAT III 300V) and double insulation.

CAT II: Local level, appliance, PORTABLE EQUIPMENT etc., with smaller transient voltage overvoltages than CAT. III
CAT. III: Distribution level, fixed installation, with smaller transient overvoltages than CAT. IV.

Under the influence of Radiated, Radio-Frequency Electromagnetic Field phenomenon, the UT212 may malfunction and can self-recover after the test.

Use the Meter only as specified in this operating manual, otherwise the protection provided by the Meter may be impaired.

In this manual, a **Warning** identifies conditions and actions that pose hazards to the user, or may damage the Meter or the equipment under test.

A **Note** identifies the information that user should pay attention on.

International electrical symbols used on the Meter and in this Operating Manual are explained on page 9.

Rules For Safe Operation

⚠ Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

- **Check for the lever is in good condition when measuring AC current.**
- **Must center the wire (conductor) within the transformer jaw.**
- **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 connectors.**
- **Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads with identical model number or electrical specifications before using the Meter.**
- **Do not apply more than the rated voltage 600V, between the terminals or between any terminal and grounding.**
- **When the Meter working at an effective voltage over 60V in DC or 30V in AC, special care should be taken for there is danger of electric shock.**
- **When using the test leads, keep your fingers behind the finger guards.**

- **Disconnect circuit power and discharge all high-voltage capacitors before testing resistance.**
- **Replace the battery as soon as the battery indicator appears or no display when turning on the Meter. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.**
- **Before carrying out any measurement, make sure the Meter is in good condition after turning it on.**
- **When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.**
- **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.**
- **Turn the Meter off when it is not in use and take out the battery when not using for a long time.**
- **Constantly check the battery as it may leak when it has been using for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.**

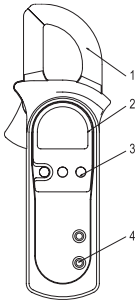
- **Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after dampened.**

International Electrical Symbols

	Deficiency of Built-In Battery
	AC or DC
	Grounding
	The allowed removable dangerous voltages existed between the leads.
	Conforms to Standards of European Union
	Warning. Refer to the Operating Manual
	Double Insulated

The Meter Structure (see figure 1)

1. Transformer Jaws designed to pick up the AC current flowing through the conductor.
2. LCD Display.
3. Function Buttons
4. Input Terminals



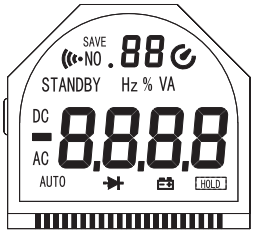
(figure 1)

Functional Buttons

Below table indicated for information about the functional button operations.

Button	Operation Performed
SAVE	Press to store the data.
READ	Press to recall the stored data.
◯ **(POWER)**	Press to turn the Meter on and off.

Display Symbols (see figure 2)



(figure 2)

Number	Symbol	Meaning
1		Auto power off is on
2	STANDBY ---	Standby indicator
3	No. XX	The number of records are saved
4	SAVE	Indicator for saving record.
5	"−"	Indicator for negative reading

Number	Symbol	Meaning
6	AC	Indicator for AC Voltage.
7	DC	Indicator for DC Voltage
8	OL	Indicator for overloading
9	Ω,kΩ,MΩ	Ohm. The unit of resistance. kilohm. 1 x 10^3 or 1000 ohms. Megaohm. 1 x 10^6 or 1,000,000 ohms.
	V	Volts. The unit of voltage.
	A	Indicator for AC current
10	Auto	The Meter is in the auto range mode in which the Meter automatically selects the range with the best resolution.
11		The battery is low. ⚠Warning: To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.

Measurement Operation

The LCD displays full icon while turning on the Meter, then the Meter will carry out self-check process, it will take around 2 seconds, after that, the Meter will enter stand by mode and display “STANDBY-----“.

A. DC and AC Voltage Measurement (See figure 3)

⚠Warning

To avoid harms to you or damages to the Meter from electric shock, please do not attempt to measure voltages higher than 600V although readings may be obtained.

When measure high voltages, take extra care to avoid electric shock

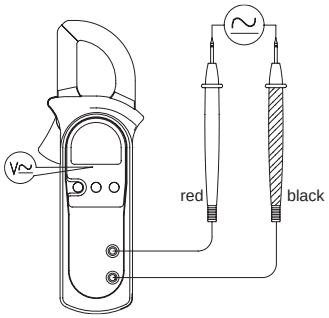


figure 3

Full auto measurement mode

To measure DC and AC voltage, connect the Meter as follows:

1. Insert the red test lead into the V terminal and the black test lead into the COM terminal
2. Connect the test leads across with the object being measured. When the AC voltage is higher than AC1.5V or DC voltage is higher than ±1V, the Meter will automatically enter the voltages measurement mode.
   The measured value shows on the display.
3. When the input voltage is less than 5V, the input impedance is around 10MΩ. When the voltage is higher than 5V, the input impedance will instantly transit from 1kΩ to 10MΩ.

Semi auto measurement mode

Press **SAVE** button to turn the Meter on, the Meter will then enter into voltage measurement mode, the input impedance is 10MΩ at this moment. The Meter is default as DC voltage measurement mode. The Meter will auto identify the voltage type and switch to the appropriate measurement mode.

Note:

- When DC and AC voltage measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

B. AC Current Measurement (See figure 4)

To measure current, do the following:
1. Check the lever is in good condition.
2. Press the lever to open the transformer jaws.
3. Center the conductor within the transformer jaw like figure 5.
4. When the tested current is greater than AC0.4A, the Meter will automatically enter current testing mode.

The measured value shows on the display, it is a effective value of sine wave (mean value response).

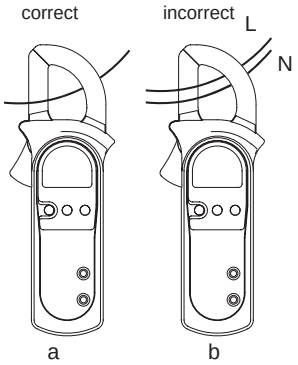


figure 4

Note

- When current measurement has been completed, disconnect the connection between the conductor under test and the jaw, and remove the conductor away from the transformer jaw of the Meter.

C. Measuring Resistance (see figure 5)

⚠Warning

To avoid damages to the Meter or to the devices under test, disconnect circuit power and discharge all the high-voltage capacitors before measuring resistance.

When the Meter working at an effective voltage over 60V in DC or 30V in AC, special care should be taken for there is danger of electric shock.

To measure resistance, connect the Meter as follows:

1. Insert the red test lead into the Ω terminal and the black test lead into the **COM** terminal.
2. Connect the test leads across with the object being measured.

The measured value shows on the display.

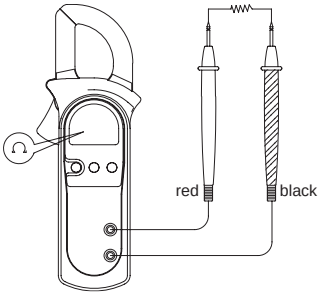


figure 5

Note

- The test leads can add 0.1Ω to 0.2Ω of error to resistance measurement. To obtain precision readings in low-resistance measurement, it is necessary to subtract the value measured when the testing leads are short circuited from the reading.

- If reading with shorted test leads is not less than 0.5Ω, check for loose test leads, incorrect function selection, or any other reasons.

- The LCD displays OL indicating open-circuit or the tested resistor or the resistor value is higher than the maximum range of the Meter.

- For high-resistance measurement (>1MΩ), it is normal to take several seconds to obtain a stable reading.. In order to obtain stable reading, try to use as short as test lead possible.

- When resistance measurement has been completed, disconnect the connection between the testing leads and the circuit under test, and remove the testing leads away from the input terminals of the Meter.

D. Using Save, Read and Clear Features

1. Under any measurement mode, press **SAVE** button to enter save mode. The LCD displays “SAVE No.” to indicate saving record is in process and the index number (number of records saved).
2. During measurement or standby mode, press **READ** button to exit the current measurement mode or standby mode and to display the last number of saved reading. Each presses to view the next saved reading, it is in first save last out bases. When the first saved reading is displayed, press **READ** button again to return to measurement or standby mode.
3. During measurement or standby mode, press and hold **READ** button to clear the saved readings. The LCD displays CLR to confirm the operation, SAVE No.xx will disappear.
4. The maximum number of reading saved is 10.

E. Sleep Mode

1. Under the standby mode, to preserve battery life, the Meter automatically enters into sleep mode you do not press any button or carrying out measurement for around 10 minutes. The Meter display .

2. The Meter can be activated by pressing any button except the **YELLOW** button, the Meter displays standby mode symbol.

3. The Sleep Mode feature will be invalid under measurement mode.

General Specifications

- Maximum Voltage between any Terminals and Grounding: Refer to different range input protection voltage.
- Maximum Current Measurement of Transformer Jaw: 400A.
- Auto Function: Auto detect
- Maximum Display: Digital: 3999, 3 3/4 digits
- Overload Display: OL

- Range: Auto
- Polarity Display: Auto
- Measurement Speed: Updates 2-3 times/second.
- Below 1V/m electrostatic discharge: Accuracy = specified accuracy + 5% of the range.
- Over 1V/m electrostatic discharge: Without specified accuracy.
- Temperature: Operating: 0°C to +40°C (32°Fto +104°F).
  Storage: -10°C to +50°C (14 °F to +122°F).
- Relative Humidity: ≤ 75% @ 0°C to 30°C; ≤ 50% @ 30 to 40°C.
- Altitude: Operating: 2000 m.
  Storage: 10000 m.
- Battery Type: One piece of 9V (NEDA1604 or 6F22 or 006P).
- Battery Deficiency: Display
- Dimensions (HxWxL): 210mm x 75.6mm x 30mm
- Weight: Approximate 300g (battery included).
- Safety/Compliances: IEC61010 CAT. II 600V / CAT III 300V overvoltage and double insulation standard.
- Certifications: CE

Accuracy Specifications

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

A. DC Voltage

Range	Resolution	Accuracy	Overload Protection	Remarks
4V	1mV	±(0.8%+1)	600V	● Input impedance: ▶Full auto measurement mode: When Vx⩽5V, it is around 10MΩ. When Vx>5V, it instantly transits from 1kΩ to 10MΩ. ▶At high impedance mode: around 10MΩ ● Testing sensitivity: ⩾ DC ± 1V
40V	10mV			
400V	100mV			
60V	1V	±(1%+3)		

B. AC Voltage

Range	Resolution	Accuracy	Overload Protection	Remarks
4V	1mV	±(1.2%+5)	600V	● Input impedance: ▶Full auto measurement mode: When Vx ⩽ 5V, it is around 10MΩ. When Vx > 5V, it instantly transits from 1kΩ to 10MΩ. ▶At high impedance mode: around 10MΩ High impedance is mode is 10MΩ. ● Displays effective value of sine wave (mean value response). ● Frequency response: 50Hz~400Hz. Testing sensitivity: ⩾ AC ± 1.5V
40V	10mV			
400V	100mV			
60V	1V	±(1.5%+5)		

C. AC Current

Range	Resolution	Accuracy	Remarks
40A	10mA	0.4A ⩽ input current ⩽ 20A: ± (3.0%+8)	● Frequency response 50Hz~60Hz. ● Display effective value of sine wave (mean value response). ● Testing sensitivity: ⩾AC0.4A
		>20A: ± (2.0%+8)	
400A	100mA	⩽200A: ± (1.5%+5)	
		>200A: ± (1.5%+50)	

D. Resistance

Range	Resolution	Accuracy	Overload Protection
400Ω	0.1Ω	± (1.2%+2) + test lead short circuit resistance value	600Vp
4kΩ	1Ω	± (1.0%+2)	
40kΩ	10Ω		
400kΩ	100Ω		
4MΩ	1kΩ	± (1.2%+2)	
20MΩ	10kΩ	± (1.5%+2)	

Maintenance

This section provides basic maintenance information including battery replacement instruction.

⚠Warning

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information.

To avoid electrical shock or damage to the Meter, do not get water inside the case.

A. General Service

- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.
- To clean the terminals with cotton bar with detergent, as dirt or moisture in the terminals can affect readings.
- Turn the Meter off when it is not in use.
- Take out the battery when it is not using for a long time.
- Do not use or store the Meter in a place of humidity, high temperature, explosive, inflammable and strong magnetic field.

B. Replacing the Battery (See t)

⚠Warning

To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator "🔋" appears or no display when turning on the Meter.

Make sure the transformer jaw and the test leads are disconnected from the circuit being tested before opening the case bottom.

Make sure the test leads are removed from the input terminals.

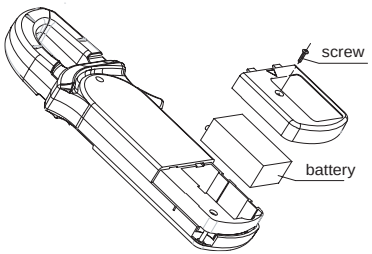


figure 6

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To replace the battery:

1. Turn the meter power off and remove all the connections from the terminals.
2. Remove the screw from the battery compartment, and separate the battery compartment from the case bottom.
3. Remove the battery from the battery compartment.
4. Replace the battery with a new 9V battery (NEDA1604, 6F22 or 006P).
5. Rejoin the case bottom and battery compartment, and reinstall the screw.

** END **
This operating manual is subject to change without notice.

Manufacturer:
Uni-Trend Technology (Dongguan) Limited
Dong Fang Da Dao
Bei Shan Dong Fang Industrial Development District
Hu Men Town, Dongguan City
Guang Dong Province
China
Postal Code: 523 925

Headquarters:
Uni-Trend Group Limited
Rm901, 9/F, Nanyang Plaza
57 Hung To Road
Kwun Tong
Kowloon, Hong Kong
Tel: (852) 2950 9168
Fax: (852) 2950 9303
Email: info@uni-trend.com
http://www.uni-trend.com