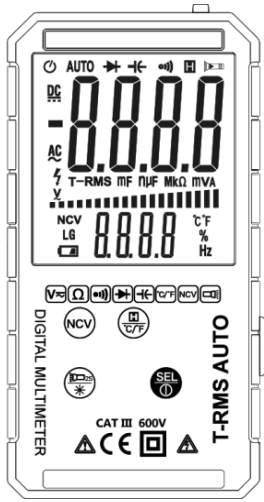


Digital smart multimeter



Please read this instruction manual carefully before using this product, and keep it in a safe place for future use.

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Overview

This is a stable, safe and reliable intelligent digital multimeter. It can automatically identify and measure AC and DC voltage, resistance, buzzer, etc., and can selectively measure diode capacitor. It is an instrument very suitable for electricians, maintenance personnel and households. Any update or change in future version of this manual will have no prior notice.

Safety Statement

Caution

The label indicates situation or operation which may damage instrument or equipment.

Warning

The “Warning” label indicates situation or operation which may cause danger to users.

Safety Information

The instrument complies with IEC61010-1 International Electrician Safety Standards. The

design and manufacture of the instrument shall strictly follow IEC61010-1 CAT.II600V over-voltage safety standards and pollution level 2.

Safe Working Habits

In order to avoid possible electric shock or personal injury, as well as to avoid damage to the instrument or the object under test, please observe the following methods to use the instrument:

- Before using the instrument, please check the casing. Do not use the instrument if the casing is damaged. Check whether there're any cracks or missing plastic parts. Please pay special attention to the insulation layer of the connector.
- Check the test lead insulation for damages or exposed metals. Check the connectivity of the test lead. If the lead is damaged, please replace it before using the instrument.
- Measure a known voltage with the instrument,

to confirm normal operation of it. If the instrument works abnormally, do not use it. The protective facilities may have been damaged. If there's any doubt, send the instrument for repair.

- Do not apply a voltage exceeding the rated voltage indicated on the instrument between any terminal and ground wire.
- When using the instrument exceeding the effective value of 30V AC voltage, 42V AC peak or 60V DC, be careful to prevent electric shock.
- During measurement, it is required to use correct jack, function and range.
- Do not use the instrument near explosive gas, steam or dust.
- When using the pen, please keep the fingers at the back of the guard of the pen.

- When connecting, first connect the common test lead, and then connect the live test lead; when disconnecting, first disconnect the live test lead, and then disconnect the common test lead.
- Before testing resistance, connectivity and diode, it is required to cut off the power supply first, and discharge all high-voltage capacitors.
- If the instrument is not used as indicated in the manual, the safety protection function provided by the instrument may be invalid.
- For all DC measurements, in order to avoid the risk of electric shock due to possible incorrect readings, please use the AC function first to confirm the existence of any AC voltage. Then, select a DC voltage range equal to or greater than AC range.
- Before measuring current, first check the fuse


of the instrument and power off before connecting the instrument to the circuit.

- When the casing (or part of it) is opened, do not use the instrument.
- When the battery undervoltage indicator "" lights up, replace the battery immediately. When the battery is low, the instrument may produce error readings, which may cause electric shock and personal injury.
- Before opening the casing or battery cover, it is required to remove the test lead from the instrument.
- During maintenance of instrument, be sure to use the replacement parts specified by the plant.
- All standard requirements. If the pen is damaged, it is required to replace with a pen of

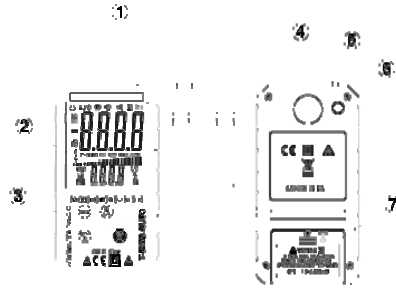
the same model and the same electrical specification.

Safety symbols


	High voltage warning
	Alternating current (AC)
	Direct current (DC)
	AC or DC
	Warning message
	Earthing
	Protected by dual insulation or enhanced insulation.
	Low battery
	It complies with European Union (EU) directives.

	The additional product label indicates it is not allowed to discard such electrical/electronic products into household waste.
CAT. II	Category II measurement is applicable for measuring circuits directly connected to electricity points of low-voltage power devices (sockets or similar points).
CAT. III	Category III measurement is applicable for testing and measuring circuits connected to power distribution part of low-voltage power devices of buildings.
CAT. IV	Category IV measurement is applicable for testing and measuring circuits connected to low-voltage power devices of buildings.

Instrument panel



- ① Test pen
- ② Display
- ③ Press key

: Power button, long press to turn on/off. It is Atuo by default at startup, and short press to switch function.

NCV button: Short press this button to enter NCV

intelligent measurement function.

- 2) Contact the pen probe to both ends of the circuit or resistance (parallel connected) being measured, and the instrument will automatically recognize the signal being measured currently.
- 3) When measuring AC voltage, it will display the frequency at the same time.
- 4) When measuring resistance, when the resistance is less than about 50Ω, the buzzer will sound and the indicator will light up.
- 5) Read measurement result from the display.



Warning

- Never measure a voltage higher than 600V, otherwise the instrument may be damaged.
- When measuring a high voltage, pay special attention to safety to avoid electric shock or personal injury.
- Before use, use the instrument to test a

known voltage to confirm that the instrument functions well.

Note 1: Under this function, the minimum measurable voltage: 0.8V.

DC voltage measurement


- 1) Long press the "" button to power on the instrument, and then short press the "" button to switch to the DCV function.
- 2) Contact the pen probe to the circuit being measured (parallel connected to the measured power supply or circuit), to measure.
- 3) Read measurement result from the display.

Warning

- Never measure a voltage higher than 600V, otherwise the instrument may be damaged.
- When measuring a high voltage, pay special attention to safety to avoid electric shock or personal injury.

measurement mode, and press again to exit NCV mode.

H: Hold button/temperature switch button. Short press this button to switch on/off data hold. Long press for about 2 seconds to switch the temperature between Celsius and Fahrenheit degrees.

: Backlight flashlight. Press this button to turn on or off the backlight; press this button for about 2 seconds to turn on or off the flashlight.


- ④ NCV induction zone
- ⑤ Alarm light
- ⑥ Flashlight
- ⑦ Battery cover

Automatic shutdown

- If there's no operation within 15 minutes after power-up, the instrument will shut down automatically to save battery power. After




- Before use, use the instrument to test a known voltage to confirm that the instrument functions well.

Note: When the pen is not connected to the measurement circuit, the instrument may display a non-zero reading, which is normal and will not affect the normal measurement.


 **Warning**

- Never measure a voltage higher than 600V, otherwise the instrument may be damaged.
- When measuring a high voltage, pay special attention to safety to avoid electric shock or personal injury.

Diode and connectivity measurement

- 1) Long press the "" button to power on the instrument, and then short press the "" button to switch to the  function.
- 2) Contact the measuring pen to both ends of


automatic shutdown, press the power button to start again.

- Press and hold the backlight button and then power on the instrument, the automatic shutdown function will be disabled. After shutdown, the automatic shutdown function will be restored after restart.
- When the "" symbol is displayed, it indicates that the automatic shutdown function is enabled.



Measurement operation


Intelligent measurement

Under this function, DC voltage, AC voltage, resistance, and connectivity can be measured, and the instrument will automatically recognize and measure without user selection. This measurement function is default at startup.

- 1) Press the "" button to power on the instrument, the instrument displays "", and enters the



the measured object, and the instrument will automatically judge whether the measured object is a diode or a buzzer.

- 3) For example, the diode will display , and display the diode voltage drop value, if it is a resistance and the resistance value is less than 50 Ω, it will display , displaying the resistance value, with sound and light prompting.

 **Warning**


Before measuring resistance or diode on the circuit, please disconnect the power supply first and discharge all high voltage capacitors, otherwise it may cause damage to the instrument and may cause electric shock.

Capacitance measurement

- 1) Long press the "" button to power on the instrument, and then short press the ""


button to switch to the Hf function.

- 1) Contact the pen with both ends of the measured capacitor.
- 2) When the reading is stable, read measurement result from the display.

 **Warning**

When measuring the capacitor, make sure that the capacitor has been discharged, otherwise the instrument may be damaged, and an electric shock may occur.

NCV test

- 1) Long press the  button to power on. Press the "NCV" button to switch to the NCV function and display the 'NCV' characters.
- 2) Then gradually close the NCV induction zone of the instrument to the point being tested.
- 3) The instrument will light up the NCV simulation

bars according to the AC signal strength.

Warning


When using the NCV function, please remove the test pen, otherwise it will affect the testing accuracy.

When using this function, even there's no display or sound alarm, voltage may still exist.

General technical indicators

- Use environmental conditions:
 - CAT. III 600V;
 - Pollution level: 2
 - Altitude < 2000m.
 - Working temperature and humidity: 0~40°C (<80% RH, <10°C non-condensation).
 - Storage temperature and humidity: -10~60°C (<70% RH, battery taken off).
- Temperature coefficient: $0.1 \times \text{accuracy} / ^\circ\text{C}$

(<18°C or >28°C).

- Measure the maximum allowable voltage between the measurement end and the ground: 600V
- Sampling rate: About 3 times/second.
- Display: 6000 count display.
- Over range indication: Displays "OL".
- Battery low voltage indication: When battery voltage is lower than normal operating voltage, the  will display.
- Input polarity indication: It will display "--" automatically.
- Power supply: 2 x 1.5V AAA battery.

Precision indicators

The accuracy is applicable within one year after calibration.

Basic conditions: Ambient temperature is 18°C to 28°C, and relative humidity is no greater than 80%.

Accuracy: $\pm(\% \text{reading} + \text{characters})$

DC voltage

Range	Resolution	Precision
6V	0.001V	$\pm(0.5\%+3)$
60V	0.01V	
600V	0.1V	

Input impedance: 10MΩ; Maximum measurement voltage: 600V



AC voltage

Range	Resolution	Precision
6V	0.001V	$\pm(1.0\%+3)$
60V	0.01V	
600V	0.1V	

Input impedance: 10MΩ; Maximum measurement voltage: 600V

Frequency range: 40Hz~1kHz; response: True RMS

Diode and/or on-off test

	Display approximate diode forward voltage drop Open circuit voltage is about 2.0V Overload protection: 250V
	The resistance is less than about 50Ω, the buzzer attached inside the instrument will sound, and the indicator will light up. The open circuit voltage is about 1.0V/overload protection: 250V

Resistor

Range	Resolution	Precision
600Ω	0.1Ω	$\pm(1.0\%+5)$
6kΩ	0.001 kΩ	
60kΩ	0.01 kΩ	
600kΩ	0.1 kΩ	$\pm(1.5\%+3)$
6MΩ	0.001MΩ	
60MΩ	0.01MΩ	

Overload protection: 250V;

Capacitor

Range	Resolution	Precision
6nF	0.001nF	$\pm(4.0\%+5)$
60nF	0.01nF	
600nF	0.1nF	
6μF	0.001μF	
60μF	0.01μF	$\pm(5.0\%+5)$
600μF	0.1μF	
6mF	0.001mF	
60mF	0.01mF	

Overload protection: 250V;

Note:

The parameters do not include the errors caused by the capacitor of the pen and the capacitor base.

Warning

Please keep the inside of the instrument clean and dry, to avoid electric shock or damaged instrument.

Replacement of battery

Power off the instrument, and remove the pen inserted on the instrument.

- 1) Unfasten the screws fixing the battery cover with a screwdriver, and remove the battery cover.
- 2) Remove the old battery, and replace with a new one of the same specification. Please pay attention to battery polarity.
- 3) Install the battery cover back to its original position, fix and lock the battery cover with screws.

Warning

- **In order to guarantee the reading accuracy and avoid possible electric shock or personal injury, please replace the battery**

immediately when battery is low. Please do not discharge the battery by means of battery short circuit or reversal of battery polarity.

- **In order to guarantee safety operation and maintenance of this instrument, when it is not used for a long term, please take out the battery, to avoid any damage to the product due to battery leakage.**