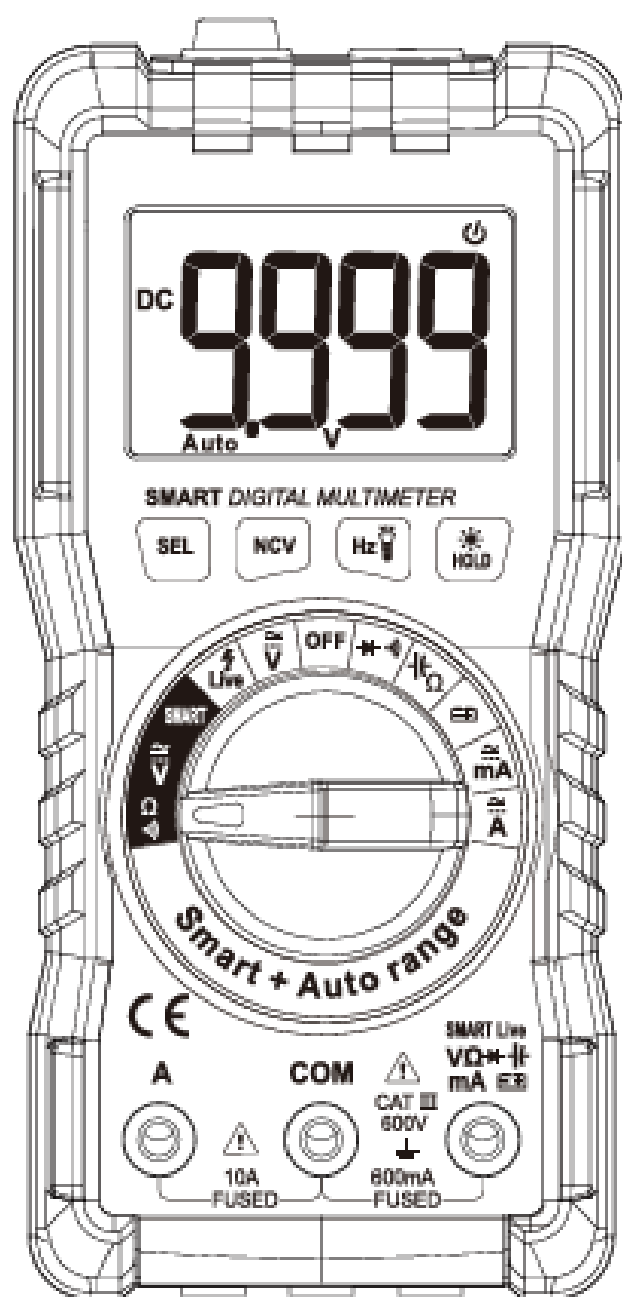


USER'S MANUAL



DIGITAL MULTIMETER



Before using the instrument, please read this manual carefully, and save it well for future using.

Contents

1. Overview	1
1.1 Safety information	1
1.1 Safety symbols	1
1.2 Input protection measures	1
2. Instrument illustration	2
2.1 Instrument appearance	2
2.2 Display symbol description	3-4
2.3 Function key description	4
2.4 Input socket description	4
2.5 Attachments	4
3. Operation Guide	5
3.1 Regular operation	5
3.1.1 Reading hold and backlight	5
3.1.2 Lighting function	5
3.1.3 Automatic shutdown function	5
3.2 Measuring guide	5
3.2.1 Measuring AC and DC voltage	5
3.2.2 Measuring resistance/capacitance	5-6
3.2.3 Measuring on-off diode	6
3.2.4 Measure capacitance	6
3.2.5 Measure current	6
3.2.6 NCV test	7
3.2.7 Neutral/live wire test	7
3.2.8 Battery measurement	7

Contents

3.2.9 SMART measurement	7
4. Technical indicators	7
4.1 Comprehensive indicators	7-8
4.2 Precision indicators	8
4.2.1 DC voltage	8
4.2.2 AC voltage	9
4.2.3 Resistance	9
4.2.4 Diode	10
4.2.5 Buzzer connection/disconnection	10
4.2.6 Capacitance	10
4.2.7 DC current	11
4.2.8 AC current	11
4.2.9 Battery measurement	11
5. Replacement of battery	12

1. Overview

The instrument is an intelligent/automatic integrated handheld digital multimeter (10000 counts) with true RMS. It has fusing alarm, pen mis-insertion alarm, overload protection and battery undervoltage indication and other functions. No matter for professional personnel, factories, schools, fans or family use, it is an ideal multi-function instrument.

It is designed and produced according to safety requirements on electronic measuring instrument and handheld digital multimeter of international electrician safety standard EN 61010. It complies with 600V CAT. III of EN 61010 and pollution degree. Before using this instrument, please read the user manual carefully and pay attention to related work safety standards.

1.1 Safety symbols:

Instrument body and symbols used in the user manual:

	For warnings and important safety signs, refer to the user manual before using. Misuse may cause damages to equipment or its parts.
	AC
	DC
	Ground
	Double insulation protection
	fuse
	Comply with European Union instructions
	High voltage warning
	Broken fuse

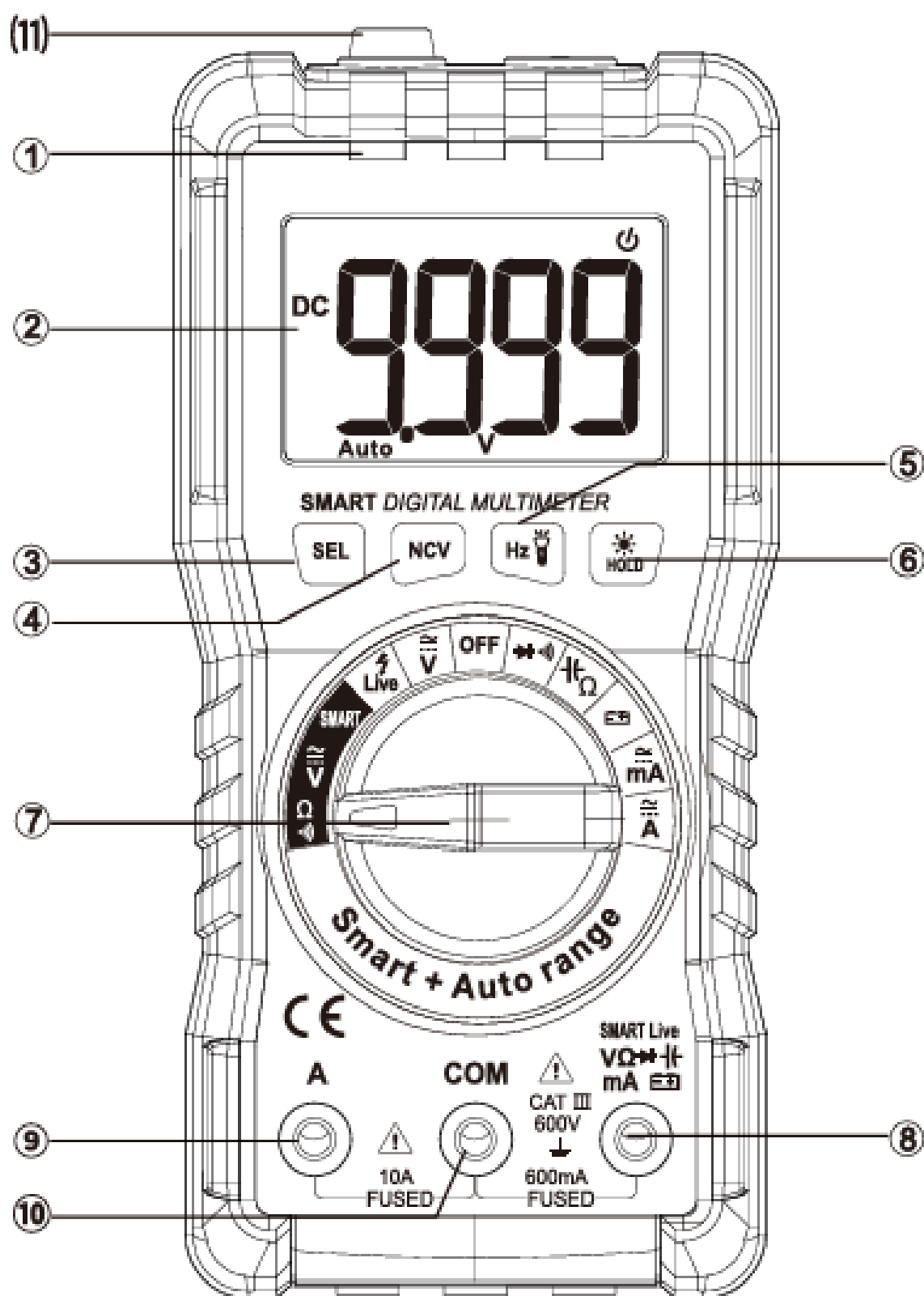
1.2 Input protection measures

- * During voltage measurement, the withstand max. input voltage is AC/DC 600V.
- * During frequency, resistance, on-off and diode measurement, AC/DC voltage under 250V could be withstood.
- * During measurement of A current and mA current, protect via protective tube (F600mA/250V).

At uA and mA gears, if the fuse is broken, after the pen is inserted into Ua/mA, FUSE and  symbol will display on the screen, indicating the fuse is broken, in this case, it is required to replace with a fuse of corresponding specification to continue measuring. The same indication will also display when at 10A current gear.

2. Instrument illustration

2. 1 Instrument illustration



Instrument appearance

- ① Non-contact Voltage Detection, Continuity, Live Wire Indicator
- ② LCD Display
- ③ SEL Function Select Button
- ④ Non-contact AC Voltage Detection Button
- ⑤ Hz Button/ “” Flashlight Button
- ⑥ Data Hold and Backlight Button
- ⑦ Function Range Switch
- ⑧ “V/Ω/mA” Input Terminal
- ⑨ 10A Input Terminal
- ⑩ “COM” Input Terminal
- ⑪ Non-contact AC Voltage Detection Area

2.2 Display Symbol Description

Table 1 Display Symbol

Symbol	Introduction
	 Battery undervoltage indicator/battery low.
	Automatic shutdown function.
	High voltage warning symbol
	negative indication
	AC indication.
	DC indication.
	On-off test.
	Diode test.
	Automatic range.
	Data hold.
	Non-contact AC voltage detection.
	Live wire test
	Intelligent mode measurement
	Fuse broken
	Fuse broken

Symbol	Introduction
V, mV	V :V, the unit of voltage. mV:mV, 1×10^{-3} or 0.001 V.
A, mA	A : A, the unit of current. mA: mA, 1×10^{-3} or 0.001 A. μ A: μ A, 1×10^{-6} or 0.001 A.
Ω , k Ω , M Ω	Ω :Ohm, the unit of resistance. k Ω :kilo-ohm, 1000 ohms. M Ω :Meg-ohm, 1000,000 ohms.
mF, μ F, nF	F :F, the unit of capacitance. mF:mF, 1×10^{-3} or 0.001 F μ F: μ F, 1×10^{-6} or 0.000001 F. nF : nF, 1×10^{-9} or 0.000000001 F.

2.3 Function key description

press key	Function description
SEL	Function selection key, at AC/DC voltage gear.
HOLD	Data hold key
Hz 	Short press to turn on/off the flashlight.

2.4 Input socket description

Input socket	descriptions
COM	All measured public input terminals are connected to the black test pen.
   V Ω SMART Live mA	Positive input terminal of capacitance, on-off, diode measurement, voltage, resistance, intelligent mode and live wire judgment (connected to red test pen).
10A	Positive input terminal of current 10A (connected to red test pen).

2.5 Attachments

① user manual	1 manual
② Test pen line	One pair
③ 1.5x2 AAA battery	Two batteries

3. Operation Guide

3.1 Regular operation

3.1.1 Reading hold and backlight

In reading hold mode, the current reading could be held on the display. Press the HOLD/BL key again to exit reading hold.

Long press "HOLD/BL" to turn on backlight, and long press "HOLD/BL" to turn off backlight.

3.1.2 Lighting function

1. Short Press the " Hz/  " key, to turn on the lamp.
2. Short Press the " Hz/  " key again, to turn off the lamp.

3.1.3 Automatic shutdown function

If there's no operation within about 15 minutes after startup, the instrument will make a Di-Di sound to prompt the automatic shutdown of power supply, and enter sleep state. In automatic shutdown mode, press SEL key to restart.

3.2 Measuring guide

The manual/automatic integrated design is adopted by the instrument, during measuring voltage or resistance, the automatic range or the manual range can be selected for measuring.

3.2.1 Measuring AC and DC voltage



It is not allowed to measure any voltage higher than 600V, to avoid electric shock and/or damaged instrument.

The AC/DC voltage ranges of the instrument are: 999.9mV, 9.999V, 99.99V and 600V.

Measure AC or DC voltage:

1. Turn the rotary switch to **V**  gear, (press the SEL key to switch DC and AC voltage).
2. Connect the black test pen and the red test pen to COM input socket and V input socket.

3.2.2 Measuring resistance



In order to avoid any damage to instrument or measured equipment, before measuring resistance, cut off all power supplies of the circuit being measured and fully discharge all high-voltage capacitors.

Measure resistance:

1. Turn the rotary switch to Ω gear to enter the resistance measurement mode;
2. Connect the black test pen and the red test pen to COM input socket and V/ input socket.

3.2.3 Measuring Diode/Continuity

The on-off/diode automatic recognition function is adopted by the instrument. Conduct on-off or diode measurement:

1. Turn the rotary switch to $\rightarrow$ gear.
2. Connect the black test pen and the red test pen to COM input socket and V/ input socket.

3.2. 4. Measuring capacitance



In order to avoid any damage to instrument, before measuring capacitance, cut off all power supplies of the circuit being measured and fully discharge all high-voltage capacitors. Use DC voltage to confirm the capacitor is discharged.

Measure capacitance:

1. Turn the rotary switch to Ω gear, and press the SEL key to switch to capacitance measurement mode.
2. Connect the black test pen and the red test pen to COM input socket and Ω input socket.

3.2. 5. Measuring current



When the open-circuit voltage exceeds 250V, do not measure the current on the circuit.

Measure current:

1. Turn the rotary switch to mA/A for current measurement.
2. Connect the black test pen to the COM input socket. If the measured current is less than 600mA, connect the red test pen to the μ A/mA input socket; if the measured current ranges from 600mA to 10A, connect the red test pen to the 10A input socket.

Note: Via the SEL switching key, the AC/DC current conversion can be conducted.

3.2. 6. Long press NCV button

inductor lights up corresponding signal intensity indicator, according to the signal intensity detected, when the induced voltage is low, ---L displays on the screen, and the green indicator is on normally; when the induced voltage is high, ---H displays on the screen, and two red indicators are on normally, meanwhile the buzzer makes alarm sounds of different frequency.

3.2. 7. Live wire test

1. Turn the rotary switch to live gear.
2. Connect the red test pen to the V input socket.
3. Insert the single pen into the power socket L jack or close it to live conductor, if judged as a live wire, LIVE displays on the screen, the red indicator is on, and the buzzer makes an alarm sound.

3.2. 8. Battery measurement

1. Turn the knob to the battery gear.
2. Connect the red test pen to the V input socket, and connect the black pen to COM.

3.2. 9. SMART measurement

1. Turn the rotary switch to SMART, in this case, the instrument enters the intelligent measurement mode.
2. Connect the black test pen and the red test pen to COM input socket and V/ input socket.
3. In this case, the instrument will automatically judge the value measured and the type of the signal measured.

Note: SMART can automatically recognize AC voltage, DC voltage, resistance, and buzzer.

4 Technical indicators

4.1 Comprehensive indicators

Working environment temperature and humidity: 0~40°C (<80% RH, <10°C not considered).

Storage environment temperature and humidity: -10~60°C (<70% RH, battery taken off).

- Fuse protection: mA gear: Fuse FF 600mA/250V; A gear fuse FF 10A/250V
- Conversion rate: About 3 times/second
- Display: 9999 counts.
- Over range indication: The LCD 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.

4.2 Precision indicators

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

4.2.1 Automatic gear DC voltage

Range	Resolution	Accuracy
10V	1mV	$\pm (0.5\% \text{ reading} + 3 \text{ characters})$
100V	10mV	
600V	100mV	

(SMART) DC voltage

Range	Resolution	Accuracy
600V	0.1V	$\pm (0.5\% \text{ reading} + 4 \text{ characters})$

Input impedance: 10M

Max. input voltage: 600V, min. measuring voltage 0.5VDC.

4.2. 2 Automatic gear AC voltage

Range	Resolution	Accuracy
10V	0.1mV	$\pm$ (0.8% reading + 3 characters)
100V	1mV	
600V	100mV	$\pm$ (1% reading + 5 characters)

(SMART) AC voltage

Range	Resolution	Accuracy
600V	0. 1V	$\pm$ (1% reading + 7 characters)

Input impedance: 10M

Max. input voltage: 600V.

Frequency response: 50Hz-400Hz true RMS

4.2. 3. Automatic gear resistance

Range	Resolution	Accuracy
1000 Ω	0.1 Ω	$\pm$ (0.8% reading + 3 characters)
10K Ω	1 Ω	
100k Ω	10 Ω	
1000k Ω	100 Ω	
10M Ω	1k Ω	
60M Ω	10k Ω	$\pm$ (1.5% reading + 10 characters)

(SMART) resistance

Range	Resolution	Accuracy
6k Ω	0. 1 Ω	$\pm$ (1.2% reading + 5 characters)

Overload protection: 250V

Open circuit voltage: 1.5V

4.2. 4. Diode

Function	Range	Resolution	Test conditions
Diode test 	0.15V-2.5V	0.01V	Forward DC current: About 1mA; open circuit voltage: About 2.5V. The display shows an approximate value of forward voltage drop of the diode.

Overload protection: 250V

4.2. 5 Buzzer connection/ Continuity

Function	Range	Resolution	Resolution	Test conditions
	100Ω	1Ω	The resistance is no greater than 30 Ω, and the built-in buzzer sounds continuously.	Open circuit voltage: About 1V

Overload protection: 250V

4.2. 6. Capacitance

Range	Resolution	Accuracy
100nF	0.01nF	± (3.5% reading + 15 characters)
1000nF	0.1nF	
10μF	1nF	
100μF	10nF	
1000μF	100nF	
10mF	1μF	

Overload protection: 250V

4.2. 7. DC current

Range	Resolution	Accuracy
600.0mA	0.1mA	$\pm (0.8\% \text{ reading} + 3 \text{ characters})$
10A	10mA	$\pm (1.2\% \text{ reading} + 3 \text{ characters})$

Overload protection: mA range fuse (FF630mA/250V); 10A range fuse(FF10A/250V).

When the measured current is greater than 5A, the continuous measuring time cannot exceed 15 seconds, and it is required to stop the current measurement for 1 minute after measuring.

4.2. 8. AC current

Range	Resolution	Accuracy
600.0mA	0.1mA	$\pm (1\% \text{ reading} + 3 \text{ characters})$
10A	10mA	$\pm (1.5\% \text{ reading} + 3 \text{ characters})$

Overload protection: mA range fuse (FF600mA/250V); 10A range fuse(FF10A/250V).

When the measured current is greater than 5A, the continuous measuring time cannot exceed 15 seconds, and it is required to stop the current measurement for 1 minute after measuring.

Frequency response: 50Hz-400Hz, true RMS

4.2. 9. Battery measurement

Range	Resolution
1.5V	0.001V
9V	0.001V

Overload protection: 250V DC/AC

5. Replacement of battery



In order to avoid electric shock or personal injury caused by error reading, replace the battery immediately when the "  " symbol appears on the instrument display.

Before opening the battery cover and replacing the battery, it is required to shut down and check whether the test pens have been disconnected from the measured circuit.

Please replace battery according to the following steps:

1. Disconnect the power supply of the instrument.
2. Pull out all test pens from the input socket.
3. Use a screwdriver to unfasten screws fixing battery cover.
4. Remove the battery cover.
5. Remove the old battery.
6. Replace with a new 2 x 1.5V AAA battery.
7. Place the battery cover and fasten the bolts.

USER'S MANUAL

MADE IN CHINA

CE RoHS



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