

## USER'S MANUAL

DIGITAL MULTIMETER

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MADE IN CHINA

CE RoHS

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#### 1. Overview

This instrument is an intelligent automatic integrated handheld digital multimeter (1000 counts) with RMS, 8-bit long-term peak measurement, alarm, overload protection and battery under-voltage indication and other functions. No matter for professional personnel, technicians, home or hobby use, it is an ideal multi-function instrument.

It is designed and produced according to safety requirements on international standards safety standard EN61010. It complies with CEV, CAT III or EN 61010 and safety categories. Before using this instrument, safety information must be carefully read and pay attention to related work.

#### 1.1 Safety symbols

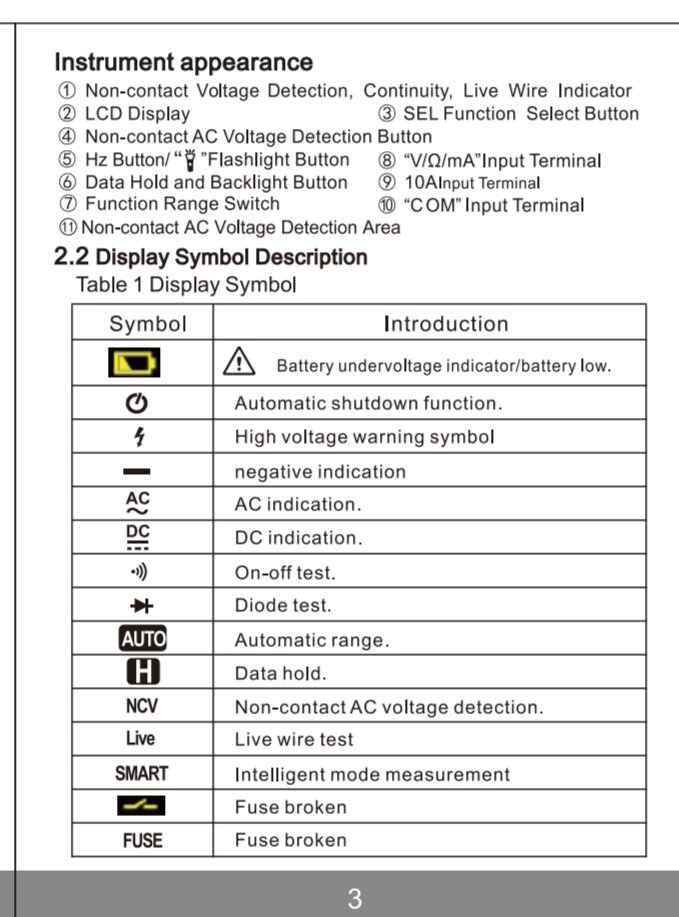
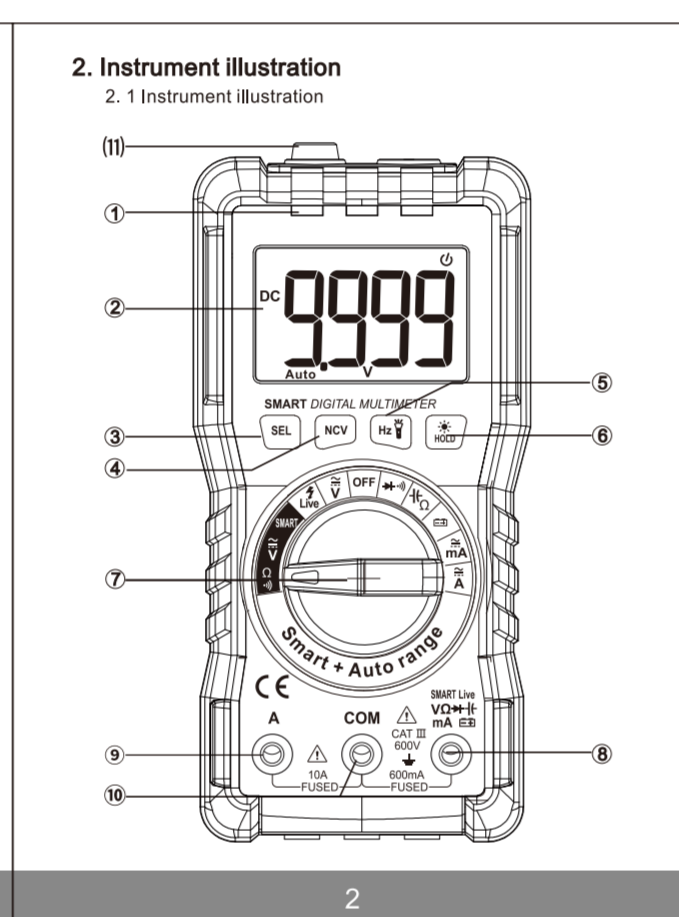
Instrument body and symbols used in the user manual:

- ⚠: For warnings and important safety signs, refer to this user manual before using. Misuse may cause damage to equipment or the user.
- ⚡: AC voltage
- ⚡: DC voltage
- ⚡: Ground
- ⚡: Double insulation protection
- ⚡: Fuse
- ⚡: Comply with European Union instructions
- ⚡: High voltage warning
- ⚡: Residual risk

#### 1.2 Input protection measures

During high measurement, the instrument has input voltage to AC/DC voltage under 250V could be withstood.

During measurement of current and resistance, product safety protective fuse is broken. In this case, it is required to replace with a fuse of corresponding specification to continue measurement. The same operation will also display when at 10A current gear.



#### 3. Operation Guide

#### 3.1 Register operation

#### 3.1.1 Reading hold and backlight

In reading hold mode, the current reading could be held on the display. Press the HOLD key again to turn off reading hold.

#### 3.1.2 Lighting function

1. Short Press the "H" key, to turn on the lamp.

2. Short Press the "H" key again, to turn off the lamp.

#### 3.1.3 Automatic shutdown function

If there is no operation within about 15 minutes after startup, the instrument will switch to DC stand-by to prevent automatic shutdown of power supply, and enter sleep state. In automatic shutdown mode, press SEL key to reset.

#### 3.2 Measuring guide

The instrument's 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 the input socket.

⚡: All measured public input terminals are connected to the black lead pen.

⚡: Measure AC or DC voltage.

⚡: Turn the rotary switch to "V~" (AC), press the SEL key to switch DC or AC voltage.

⚡: 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, DC off all power supplies of the circuit being measured and fully discharge all high-voltage capacitors. Use SEL key to confirm the capacitor is discharged.

#### 3.2.3 Measuring capacitance

1. Turn the rotary switch to "C" gear.

2. Connect the black test pen and the red test pen to COM input socket and F input socket.

#### 3.2.4 Measuring inductance

1. Turn the rotary switch to "L" gear.

2. Connect the black test pen and the red test pen to COM input socket and F input socket.

#### 3.2.5 Measuring current

1. Turn the rotary switch to "A" gear 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 10A input socket.

#### 3.2.6 Measuring resistance

1. Turn the rotary switch to "Ω" gear 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 10A input socket.

Note: Use the SEL switching key, the AC/DC current conversion can be completed.

#### 3.2.7 Long press NCV button

Indicator light on corresponding light intensity indicator, according to the signal intensity detected, when the induced voltage is low, — displays on the screen, and the green indicator is on normally, when the induced voltage is high, — displays on the screen, and red indicators are on normally, meanwhile, the buzzer makes short sounds of different frequency.

#### 3.2.8 Line wire test

1. Turn the rotary switch to "L" gear.

2. Connect the black test pen to the V input socket.

3. Insert the single pen into the power socket (jack or close it to the red indicator is on, and the buzzer makes an alarm sound).

#### 3.2.9 Battery measurement

1. Turn the rotary switch to "B" gear.

2. Connect the black test pen to the V input socket, and connect the black pen to COM.

#### 3.2.10 Automatic gear resistance

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 F input socket.

3. In this case, the instrument will automatically judge the value measured and the type of the signal measured.

Note: SMART gear automatically recognizes AC voltage, DC voltage, resistance, and buzzer.

#### 4 Technical indicators

#### 4.1 Comprehensive indicators

Working environment temperature and humidity: 0~40°C (32~104°F), 85%RH.

Storage environment temperature and humidity: -10~40°C (14~104°F), 85%RH.

Note: Use the SEL switching key, the AC/DC current conversion can be completed.

#### 4.2 Precision indicators

#### 4.2.1 Automatic gear DC voltage

Range	Resolution	Accuracy
150V	1mV	±(0.5% reading + 3 characters)
1000V	10mV	±(0.5% reading + 3 characters)
600V	100mV	±(0.5% reading + 3 characters)

#### 4.2.2 Automatic gear AC voltage

Range	Resolution	Accuracy
150V	1mV	±(0.8% reading + 3 characters)
1000V	10mV	±(0.8% reading + 3 characters)
600V	100mV	±(0.8% reading + 3 characters)

#### 4.2.3 SMART resistance

Range	Resolution	Accuracy
600Ω	0.1Ω	±(1.2% reading + 5 characters)
6kΩ	0.1kΩ	±(1.2% reading + 5 characters)

#### 4.2.4 Diode

Function	Range	Resolution	Test condition
Diode test	0.1V~1V	0.01V	Forward DC current About 1mA, open circuit voltage About 2.5V, the display value is approximate value of forward voltage drop of the diode.

#### 4.2.5 Diode Continuity

Function	Range	Resolution	Test condition
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#### 4.2.6 Capacitance

Range	Resolution	Accuracy
1000nF	0.01nF	±(0.8% reading + 3 characters)
100μF	0.1μF	±(0.8% reading + 3 characters)
10μF	1nF	±(0.8% reading + 3 characters)
1000pF	10pF	±(0.8% reading + 3 characters)

#### 4.2.7 DC current

Range	Resolution	Accuracy
100mA	0.1mA	±(0.8% reading + 3 characters)
10A	10mA	±(1.2% reading + 3 characters)

#### 4.2.8 AC current

Range	Resolution	Accuracy
100mA	0.1mA	±(1.1% reading + 3 characters)
10A	10mA	±(1.5% reading + 3 characters)

#### 4.2.9 Battery measurement

Range	Resolution
1.5V	0.01V
9V	0.01V

#### 4.2.10 SMART measurement

Range	Resolution	Accuracy
600Ω	0.1Ω	±(1.2% reading + 5 characters)

#### 4.3 Protection

• Fuse protection: mA gear: Fuse FF 600mA/250V; A gear: Fuse FF 15A/250V.

• Conversion rate: About 13 times/second.

• Display: 8000 counts.

• Over-range indicator: The LCD display "OL".

• Battery voltage indication: When battery voltage is lower than normal operating voltage, "BAT" will display.

• Input polarity indication: It will display "—" automatically.

#### 4.4 Precision indicators

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

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150V	1mV	±(0.5% reading + 3 characters)
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