USERS MANUAL

**Made in China**

CE RoHS ♻ M101040058

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

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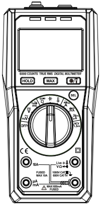
# USERS MANUAL

## Digital multimeter


6000 COUNTS TRUE RMS DIGITAL MULTIMETER
HOLD
MAX
SEL
OFF
NCV Live
10A
FUSED MAX 10A
µA mA
1000V CAT III 600V CAT IV
COM
MAX 600mA FUSED

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120*90mm

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### 1.Overview

- This product is a 6000-count automatic range digital multimeter. It has the functions of MAX maximum value hold, HOLD data hold, temperature measurement, automatic shutdown, backlight, flashlight, full range overload protection and battery undervoltage indication, etc. Whether used by professionals, factories, schools, meter lovers or families, it is an ideal multifunctional product.
- The meter can be used to measure AC/DC voltage, AC/DC current, resistance, capacitance, diode, on/off, temperature, live wire identification, NCV detection.

### 2.Safety/security information

| | |
|---|---|
| ⚠ | **Attention should be paid to the use of the meter. Wrong operation may cause electric shock or damage. Before using, please read the instructions carefully and use it according to the operating instructions.** |

- When using, please observe the standard safety rules.
- Upon receipt, please check whether it is damaged in transit and whether the probe is in good condition.
- When using, please make sure that the meter shell is damaged, the probe insulation layer is complete, and the functional range is correct.
- It is forbidden to measure beyond the indicated value of the range protection range, and it is forbidden to switch positions during the measurement.
- When the meter is connected to the measuring circuit, the finger must be in the safe area of the probe sheath protection device, and it is forbidden to touch the tip of the probe (metal part).
- If the measured voltage is higher than 60V DC or 30V AC (effective value), it should be handled with caution, and the highest voltage measured at COM end and V input end should not exceed AC 750V/DC 1000V.

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- Before changing the measurement function, please remove the probe from the circuit under test.

### 2.1 Marks

| | |
|---|---|
| ⚠ | Warning ! Important safety information, see the instruction manual. |
| ϟ | Safety use to avoid danger! |
| ⧈ | Double insulation protection ( class II). |
| ⏚ | Earth wire. |
| ⊟ | Fuse. |
| CE | Complies with the directives of the European Union. |
| CAT III | Refers to the level of pulse withstand voltage protection provided by over-voltage (installation) level III and pollution degree 2 according to IEC-61010 standard. |

### 2.2 Maintenance

- Non-professional maintenance personnel are forbidden to open the bottom case to adjust or repair the meter.
- The meter should be far away from high temperature, humidity, corrosive gas or objects.
- If the meter is stained with dirt or dust, please clean it with a soft cloth.
- To avoid electric shock caused by wrong reading, the battery should be replaced immediately when the meter shows "🪫"symbol.
- The meter should be turned off after use.
- When the meter is stored for a long time, the battery should be taken out to prevent leakage and corrosion.

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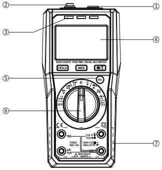
### 3. Introduction

### 3.1 Schematic diagram of appearance



| | |
|---|---|
| 1.Flashlight | 2. NCV non-contact AC voltageprobe |
| 3. NCV indicator light | 4. LCD |
| 5. Function keys | 6. Range knob |
| 7. Input end | |

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### 3.2 Description of input end

| Input end | Description |
|---|---|
| **COM** | Common input end (connected with black probe). |
| **V/Ω/⊣⊢/▶\|/🌡<br>Live/·))/Hz** | Voltage,resistance,capacitance,temperature,diode, on/off test, live wire identification (connected with red probe). |
| **uA/mA** | Current uA 、mA input end (connected with red probe). |
| **10A** | Current 10A input end (connected with red probe). |

### 3.3 Description of display symbols

| Symbol | Description |
|---|---|
| 🪫 | Battery under-voltage |
| ⏻ | Automatic shutdown function |
| - | Negative electrode |
| AC ~ | AC voltage |
| DC ⎓ | DC voltage |
| ·))) | On-off |
| ▶\| | Diode |
| **°C/°F** | Degree Celsius/Fahrenheit degree |
| **HOLD** | Reading hold |
| **MAX** | Maximum value |
| **NCV** | Non-contact AC voltage detection |
| **Live** | Live wire identification |
| **Auto** | Automatic range |
| **Hz** | Frequency |
| **mV/V** | Voltage |
| **Ω/K/M** | Resistance |
| **nF/uF/mF** | Capacitance |
| **uA/mA/A** | Current |

## 3.4 Key description

| Key | Description |
|---|---|
| **HOLD** | Data hold |
| **MAX** | Maximum value hold |
| ☀/🔦 | Flashlight/backlight |
| **SEL** | Function selection |

## 4.Operation guide

**4.1 Data hold**

HOLD key, short press the HOLD key to lock the measured data, and press the HOLD key again to unlock it.

**4.2 MAX maximum value hold**

MAX maximum value: it can be used in AC/DC voltage, AC/DC current and resistance. Lock the maximum value of measured data, and short press it to turn this function on or off.

**4.3 Backlight/flashlight**

Short press the ( ☀/🔦 ) key to turn on or off the backlight,
and long press the ( ☀/🔦 ) key to turn on or off the flashlight.

**4.4 SEL function selection key**

The meter can switch positions in AC/DC mV position, resistance position, on-off position, diode position, temperature position, current position and NCV/Live position.

**4.5 Automatic shutdown function**

If there is no operation after about 20 minutes of startup, the meter will automatically shut down and enter a dormant state. Press (SEL) key in automatic shutdown mode to restart it.

**4.6 Cancel the automatic shutdown function**

Press the HOLD key, turn the range knob to power on, the symbol ( ⏻ ) on the upper left corner of the display disappears, the meter sounds five alarms, the automatic shutdown function is cancelled, and the function is resumed after it's shut down and restarted again.

## 5.How to use

### 5.1 AC voltage measurement

(1) Turn the range knob to ( $\tilde{V}$ ) AC voltage.
(2) Insert the black probe into the COM end and the red probe into the V input end.
(3) The red and black probes contact the tested line, and the meter screen displays the measured value.

**Notes**

① Select the appropriate position mV or V according to the corresponding voltage when using.
② During measurement of AC voltage, the screen displays the frequency of the measured voltage at the same time.
③ The maximum input voltage of AC voltage is AC 750V/40HZ-1KHZ.
④ At the mV range of AC voltage, due to the interference of electromagnetic field in the use environment, the meter will have a numerical display even if the probe is not input or inserted. If the probe is used to short-circuit the “V” input end and the “COM” end, the meter display will return to zero, which is regarded as a normal phenomenon.

### 5.2 DC voltage measurement

(1) Turn the range knob to ( V⎓ ) DC voltage.
(2) Insert the black probe into the COM end and the red probe into the V input end.
(3) The red and black probes contact the tested line, and the meter screen displays the measured value.

**Notes**

①Select the suitable position mV or V according to the corresponding voltage when using.
② The highest input voltage of DC voltage range is DC 1000V .
③ At the mV range of DC voltage, due to the interference of electromagnetic field in the use environment, the meter will have a numerical display even if the probe is not input or inserted. If the probe is used to short-circuit the “V” input end and the “COM” end, the meter display will return to zero, which is regarded as a normal phenomenon.

### 5.3 Resistance measurement

(1) Turn the range knob to ( 🔊▶|Ω ) on and off.
(2) Short press SEL key to switch to ( Ω ) resistance position.
(3) Insert the black probe into the COM end, and the red probe into the ( Ω ) input end.
(4) The red and black probes are connected to the measured resistance, and the meter screen displays the measured value.

**Notes**

① To avoid damage to the instrument or equipment under test, cut off the resistance of the circuit under test and discharge all high voltage capacitors.
② The measured resistance on the circuit will be different from the actual resistance, because there will be some error between the measured resistance of other components connected in series or in parallel and the actual resistance.
③ When the meter is open or the measured resistance value is too large, “OL” will be displayed to indicate that the measured value is out of range.

### 5.4 On-off measurement

(1) Turn the range knob to ( 🔊▶|Ω ) on and off.
(2) Short press SEL key to switch to ( 🔊 ) on and off position.
(3) Insert the black probe into the COM end, and the red probe into the ( 🔊 ) input end.
(4) The red and black probes are connected to the tested line.

**Notes**

During on-off measurement, when the resistance is less than about 50Ω, the indicator light (green light) is on, and the meter beeps.

### 5.5 Diode measurement

(1) Turn the range knob to ( 🔊▶|Ω ) diode position.
(2) Short press SEL key to switch to the ( ▶| ) diode position.
(3) Insert the black probe into the COM end, and the red probe into the ( ▶| ) input end.
(4) The red and black probes are connected to the diode under test, and the meter displays the measured voltage value.

**Notes**

During the normal diode measurement, the meter shows that the forward voltage drop of the diode under test is about 0.5V —0.8V, and the reverse voltage is non-conductive.

### 5.6 Capacitance measurement

(1) Turn the range knob to ( ⊣⊢ ) capacitance.
(2) Insert the black probe into the COM end, and the red probe into the ( ⊣⊢ ) input end.
(3) The red and black probes are connected to the measured capacitance, and the meter displays the measured capacitance value.

**Notes**

When measuring the capacitance, it is necessary to discharge the capacitance first. During measurement the meter charges the capacitance, and it takes a certain time to stabilize the measured data.

## 5.7 Temperature measurement

(1) Turn the range knob to ( 🌡 ) temperature, and the meter will automatically measure the current ambient temperature.
(2) Short press SEL key to switch switch to (°C/°F).
(3) Measurement of K-type thermocouple: Connect the red plug of K-type thermocouple to the ( 🌡 ) input end, and the black plug into the "COM" end. The thermocouple probe contacts the object to be measured for measurement.

**Notes**

If the temperature of the measured environment changes suddenly, it is necessary to place the meter in the current measuring environment at a constant temperature for about 15 minutes to make accurate measurement.

## 5.8 AC current measurement

| ⚠ | **If the voltage of the open circuit is over 250V，it' forbidden to measure the current on the circuit.** |
|---|---|

(1) Turn the range knob to uA/mA/A to measure the current.
(2) Press SEL key to switch to AC current mode.
(3) The frequency of the measured current can be displayed synchronously at the AC current position.
(4) Insert the black probe into the COM input.
(5) When the measured current is less than 6000uA, turn the range knob to uA position for measurement, and insert the red probe into the uA/mA input end.
(6) When the measured current is between 6000 uA and 600 mA, turn the range knob to the mA position for measurement, and insert the red probe into the uA/mA input.
(7) When the measured current is 600 mA-10A, turn the range knob to position A for measurement, and insert the red probe into the input end of 10A.

**Notes**

① If the current is unknown, rotate the position to the maximum range, and adjust the corresponding current range according to the measured value.
② Series load and correct range position should be used when measuring current position, and over-range measurement is prohibited.
③ During current measurement, if the measured value is not displayed on the screen, please check whether the fuse is fused. If the fuse is damaged, the fuse of corresponding specification needs to be replaced before it can be used again.

## 5.9 DC current measurement

| ⚠ | **If the voltage of the open circuit is over 250V，it' forbidden to measure the current on the circuit.** |
|---|---|

(1) Turn the range knob to uA/mA/A to measure the current.
(2) Press SEL key to switch to DC current mode.
(3) Insert the black probe into the COM input.
(4) When the measured current is less than 6000uA, turn the range knob to uA position for measurement, and insert the red probe into the uA/mA input.
(5) When the measured current is between 6000 uA and 600 mA, turn the range knob to the mA position for measurement, and insert the red probe into the uA/mA input.
(6) When the measured current is 600mA –10A, turn the range knob to position A for measurement, and insert the red probe into the input end of 10A.

**Notes**

① If the current is unknown, turn the position to the maximum range, and adjust the corresponding current range according to the measured value.
② Series load and correct range position should be used when measuring current position, and over-range measurement is prohibited.
③ During current measurement, if the measured value is not displayed on the screen, please check whether the fuse is fused. If the fuse is damaged, the fuse of corresponding specification needs to be replaced before it can be used again.

## 5.10 NCV non-contact AC voltage detection

(1) Turn the range knob to NCV position.
(2) Press SEL key to switch to NCV function.
(3) When the display shows the NCV symbol, close the NCV probe of the meter to the conductor, and the corresponding signal indicator lights up according to the intensity of the detection signal. When the induced voltage is low, the screen displays- L, the green indicator lights up, and when the induced voltage is high, the screen displays- H, the red indicator lights up. At the same time, the buzzer sounds different frequencies.

**Notes**

① Even if there is no indication, the voltage may still exist. Don't rely on NCV detection to judge whether there is voltage on the wire.
② The detection process may be affected by factors such as socket design, different insulation thickness and type.
③ Interference sources of external environment (such as flashlights, motors, electromagnetic interference, etc.) may mistakenly trigger NCV detection.

## 5.11 Live wire identification

(1) Turn the range knob to the Live position.
(2) Press SEL key to switch to the Live function.
(3) A single red probe of the meter is inserted into the (Live) input end, the black probe is pulled out, and the tip of the red probe is inserted into the power jack. If the screen shows —H, red indicator lights up, and the buzzer sounds an alarm, then it's the live wire, otherwise the zero line or the ground line.

**Notes**

① Before use, please test on the known live conductor to ensure that the meter is in good working condition.
② For the Live wire identification function, a single red probe is inserted into the input end, and the black probe is pulled out to prevent electric shock!

## 6. Technical parameters

| | |
|---|---|
| Working height | Max 2000m |
| Auto range | Yes |
| Display | LCD |
| Full range overload protection voltage | 1000V |
| Max | 5999 |
| Over-range display | 0L or - 0L |
| Sampling time | About 3times/sec |
| Automatic shutdown | About 20 minutes |
| Backlight | Automatic shutdown in about 2minutes |
| Flashlight | Automatic shutdown in about 5minutes |
| Power | 2x1.5V AA batteries |
| Low battery | LCD displays "🔋" |
| Working temperature | 0°C～50°C |
| Working humidity | 0～85%RH |
| Working temperature | -20～60°C |
| Working humidity | 0～80%RH |
| Size | 184x88x50mm |
| Weight | About 300g（excluding batteries） |

## 7. Technical indicators

### 7.1 DC voltage

| Measuring range | Resolution | Accuracy |
|---|---|---|
| 600mV | 0.1mV | ±(0.5% reading +5 digits) |
| 6V | 0.001V | |
| 60V | 0.01V | ±(0.8% reading +5 digits) |
| 600V | 0.1V | |
| 1000V | 1V | |

Input impedance: 10MΩ / maximum input voltage: 1000V.

### 7.2 AC voltage

| Range | Resolution | Accuracy |
|---|---|---|
| 600mV | 0.1mV | ±(1.0% reading +5 digits) |
| 6V | 0.001V | |
| 60V | 0.01V | ±(1.2% reading +3 digits) |
| 600V | 0.1V | |
| 750V | 1V | |

Input impedance: 10MΩ

maximum input voltage: 750V

frequency response: 40Hz -1kHz.

### 7.3 Resistance

| Range | Resolution ratio | Accuracy |
|---|---|---|
| 600Ω | 0.1Ω | ±(0.8% reading +3 digits) |
| 6kΩ | 0.001KΩ | |
| 60kΩ | 0.01KΩ | |
| 600kΩ | 0.1KΩ | |
| 6MΩ | 0.001MΩ | ±(1.2% reading +8 digits) |
| 60MΩ | 0.01MΩ | |

Overload protection: 1000V / open circuit voltage: 0.5V~1V

### 7.4 Diode

| Function | Range | Resolution ratio | Test condition |
|---|---|---|---|
| Diode test | 0.1V-3V | 0.001V | Forward DC current: about 2mA;<br>Open circuit voltage: about 3V. |

Overload protection: 1000V

### 7.5 On-off test

| Function | Range | Resolution | Description | Test condition |
|---|---|---|---|---|
| 🔊 | 600Ω | 0.1Ω | When the resistance value is less than 50W, it beeps; Green indicator light | Open circuit voltage: about 1V;The current is about 0.5 mA |

Overload protection: 1000V

### 7.6 Capacitance

| Range | Resolution | Accuracy |
|---|---|---|
| 60nF | 0.01nF | ±(3.5% reading +15 digits) |
| 600nF | 0.1nF | |
| 6uF | 0.001uF | |
| 60uF | 0.01uF | |
| 600uF | 0.1uF | |
| 6mF | 0.001mF | ±(4.0% reading +20 digits) |
| 60mF | 0.01mF | |

Overload protection: 1000V

### 7.7 Temperature

| Range | Resolution | Accuracy |
|---|---|---|
| -20~1000°C | 1°C | ±(2.0% reading +2 digits) |
| -4~1832°F | 1°F | ±(2.0% reading +4 digits) |

Overload protection: 1000V

### 7.8 DC current

| Range | Resolution | Accuracy |
|---|---|---|
| 6000uA | 1uA | ±(0.8% reading +3 digits) |
| 600mA | 0.1mA | ±(1.0% reading +3 digits) |
| 10.00A | 0.01A | |

Overload protection:

mA range fuse (FF600mA/1000V )

10A range fuse (FF10A/1000V ).

### 7.9 AC current

| Range | Resolution | Accuracy |
|---|---|---|
| 6000uA | 1uA | ±(1% reading +3 digits) |
| 600mA | 0.1mA | ±(1.2% reading +5 digits) |
| 10.00A | 0.01A | |

Overload protection:

mA range fuse (FF600mA/1000V )

10A range fuse (FF10A/1000V ).

Frequency response: 40Hz~1KHz.

## 8. Battery replacement

> ⚠ In order to avoid electric shock or personal injury caused by wrong reading, the battery should be replaced immediately when the " 🪫 " symbol appears on the instrument display. Before opening the battery cover to replace the battery, turn it off and check that the test probe has been disconnected from the measuring circuit.

①. Turn off the power supply.
②. Remove the test probe from the measuring circuit.
③. Use a screwdriver to remove the battery cover screw on the back of the instrument.
④. Remove the battery cover.
⑤. Remove the old battery.
⑥. Replace with a new 1.5X2AA battery.
⑦. Install the battery cover and tighten the fixing screws.

## 9.Accessories

| | |
|---|---|
| 1. Multimeter | One |
| 2. Manual instruction | One |
| 3. Probe | A pair |
| 4. K-type temperature probe | A pair |
| 5. 1.5x2 AA battery | A pair |