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**SMART DIGITAL MULTIMETER
OPERATION MANUAL**



Statement

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Safety Statement

◆ Caution

Caution mark refers to the condition and operation which may cause damage to the instrument or equipment.

It requires that you must be careful during the execution of the operation. If incorrectly perform the operation or do not follow the procedure, it may damage the instrument or equipment. In the circumstances that such conditions are not met or not fully understood, please do not continue to perform any operation indicated by the caution mark.

◆ Warning

Warning mark indicates the condition and operation which may cause danger to users.

It requires that you must pay attention during the execution of this operation.

If incorrectly perform the operation or do not follow the procedure, it may result in personal injury or casualties. In the circumstances that such conditions are not met or not fully understood, please do not continue to perform any operation indicated by the warning mark.

Safety Instructions

The instrument is designed according to the requirements of the international electrical safety standard IEC61010-1 for the safety requirements of the electronic testing instruments. The design and manufacture of instruments strictly comply with the requirements of IEC61010-1 CAT.III 600V over voltage safety standards and pollution level 2.

Safety Operation Specifications

◆ Warning

In order to avoid possible electric shock or personal injury and other safety accidents, please abide by the following specifications:

1. Please read this manual carefully before using the instrument, and pay special attention to safety warning information.
2. Strictly observe the operation of this manual and use this instrument. Otherwise, the protection function of the instrument may be damaged or weakened.
3. Please be careful if the measurement exceeds 30V AC true RMS, 42V AC peak or 60V DC. There may be danger of electric shock at this kind of voltage.
4. Do not measure voltage higher than the rated value between terminals or between terminals or ground.
5. Check whether the meter works normally by measuring the known voltage. Do not use it again if it is abnormal or damaged.
6. Before using the instrument, please check whether there is any crack or plastic damage in the instrument case. If you do, do not use it again.
7. Before using the instrument, please check whether the probe is cracked or damaged. If so, please replace the same type and the same electrical specifications.
8. Please use the meter according to the measurement category, voltage or current rating specified on the instrument or manual.
9. Please observe local and national safety regulations. Wear personal protection equipment (such as approved rubber gloves, masks and flame retardant clothes, etc.) to prevent being damaged by electric shock and electric arc due to exposed hazardous live conductor.
10. When it shows low battery indicator, please replace the battery in time in case of any measurement error.
11. Do not use the instrument around explosive gas, steam or in wet environment.
12. When using the probe, please put your fingers behind the finger protector of the probe.

13. When measuring, please connect the zero line or the ground line firstly, then connect the live wire; but when disconnecting, please disconnect the live wire firstly, then disconnect the zero line and ground line.
14. Before opening the outer cabinet or battery cover, please remove the probe on the instrument. Do not use the instrument in the circumstances that the instrument is taken apart or battery cover is opened.
15. It only meets the safety standards when the instrument is used together with the supplied probe. If the probe is damaged and needs to replace, the probe with same model number and same electrical specifications must be used for replacement.

Safety Symbols

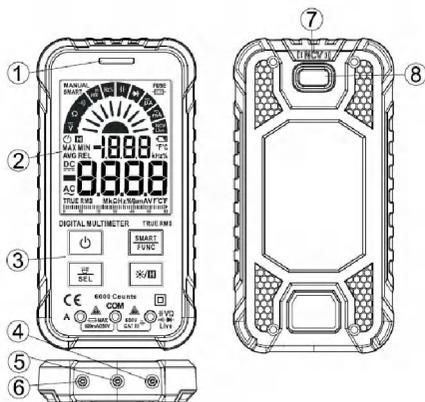
	High voltage warning
	AC (Alternating current)
	DC (Direct current)
	AC or DC
	Warning, important safety signs
	Ground
	Fuse

	Equipment with double insulation/reinforced insulation protection
	Battery undervoltage
	Product complies with all relevant European laws
	The additional product label shows that do not discard this electrical/electronic product into household garbage.
CAT. II	Class II measurements are suitable for testing and measuring circuits directly connected to power points (sockets and similarities) of low voltage power installations.
CAT. III	Class III measurement is suitable for testing and measuring circuits connected to the distribution part of low voltage power supply devices in buildings.
CAT. IV	Class IV measurements are suitable for testing and measuring circuits connected to the power supply of low voltage power installations in buildings.

Overview

This meter is an intelligent true effective value multimeter. Intelligent identification and manual function are integrated, which can measure AC and DC voltage, AC and DC current, resistance, capacitance, continuity, diode, NCV, etc. It is the best choice for professional electrician, engineer, electronic enthusiast or family use.

◆ Meter panel



- | | |
|--|---------------------------|
| ① indicator light | ⑤ COM input terminals |
| ② Display | ⑥ Current input terminals |
| ③ Keys | ⑦ NCV sensor |
| ④ Measuring input terminals except current | ⑧ Flashlight |

: Power key

: Function select key. After the meter is powered on, it defaults to smart function. Press this key once to switch to manual function. Press this key again to switch to other functions. Press this key for more than 2 seconds to restore smart function.

: Function selection/flashlight key. When a position has multiple functions, press this key to switch; press this key for more than 2 seconds to turn on or off the flashlight.

: Backlight/data hold key. Press this key to turn on or off the data holding function; press this key for more than 2 seconds to turn on or off the backlight.

◆ Auto power off

1. No operation within 15 minutes, the meter will auto power off.
2. Press and hold the " " key and turn on the power, the auto power off function will be cancelled.
3. When the symbol " " is displayed, it means that the auto power off function is on.

◆ Fuse burn out prompt

When the " " symbol is displayed, it indicates that the fuse is burnt out. Please replace the fuse.

◆ The probe Wrong prompt

When the current measurement function is used, if the probe is not inserted into the current input terminal, " " will be displayed.

Measurement operation

WARNING

1. The voltage above 600V can't be measured; otherwise the instrument may be damaged.
2. Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.
3. Test the known voltage with the meter before use, confirm the instrument function is intact.

◆ SMART measurement

It can measure DC voltage, AC voltage, resistance, continuity. The meter can measure automatically without user selection function. This measurement function is default when power on.

1. Press “” key to turn on the power, and the meter displays “” to enter the smart measurement function.
2. Insert the red probe into the “” input terminal and the black probe into the “COM” input terminal.
3. Connect the probe with voltage source or resistor in parallel for measurement, and the meter will automatically recognize the currently measured signal.
4. When measuring AC voltage, the frequency will be displayed at the same time.
5. When measuring the resistance, when the resistance is less than about 50Ω, the buzzer will sound and the indicator light will be on.
6. Read the results on the display.

Note: Minimum measurable voltage: 0.5V

◆ DC/AC mV measurement

1. Press “” key to turn on the power, press “” key to switch to “” function.
2. Insert the red probe into the “” input terminal and the black probe into the “COM” input terminal.
3. Connect the probe with voltage source or both ends of load in parallel for measurement.
4. When measuring AC voltage, the frequency will be displayed at the same time.
5. Read the results on the display.

Note: When the probe is not connected with the measuring circuit, the meter display reading may not be zero, which is normal and will not affect the normal measurement.

◆ Frequency/Duty measurement

1. Press “” key to turn on the power, press “” key to switch to “Hz%” function.
2. Insert the red probe into the “” input terminal and the black probe into the “COM” input terminal.
3. Connect the probe with voltage source or both ends of load in parallel for measurement.
4. Read the results on the display.

◆ Capacitance measurement

1. Press “” key to turn on the power, press “” key to switch to “” function.
2. Insert the red probe into the “” input terminal and the black probe into the “COM” input terminal.
3. Connect the probe with both ends of capacitor in parallel for measurement.
4. Read the results on the display.

WARNING

When measuring capacitance, please disconnect the power supply and discharge capacitors, otherwise the instrument may be damaged and may suffer electric shock.

◆ Diode test

1. Press “” key to turn on the power, press “” key to switch to “” function.
2. Insert the red probe into the “” input terminal and the black probe into the “COM” input terminal.
3. Connect the red probe to diode anode and connect the black probe to diode cathode.
4. Read the results on the display.

Note 1: The meter shows is approximation of diode forward voltage drop. The forward voltage drop of the diode is generally in the range of 0.3V to 0.8V.

Note 2: If the probe has reverse connection or the probe is open, the meter will show “ OL ”.

◆ **DC/AC current measurement**

1. Press “  ” key to turn on the power.
2. Press “  ” key to switch to “  ” or “  ” function; or directly insert the red probe into “ A ” Current input terminal and automatically switch to the “  ” or “  ” function.
3. The black probe into the “ COM ” input terminal.
4. Press “  ” key to switch to AC or DC current.
5. Disconnect the power supply, connect the meter in series to the circuit under test, and then turn on the power supply.
6. When measuring AC current, the frequency is displayed at the same time.
7. Read the results on the display.

WARNING

1. Pay special attention to safety when measuring high voltage to avoid electric shock or personal injury.
2. Before use, use the meter to test the known voltage or current and confirm that the meter is in good condition.

Caution

To avoid damaging meter or equipment, and ensure that the measured current does not exceed the rated maximum current of 600 mA And . use the correct input terminal.

◆ **NCV Detection**

1. Press “  ” key to turn on the power, press “  ” key to switch to “  ” function. The meter shows “ NCV ” .
2. Detection with the meter of NCV sensing area.
3. When the meter senses weak AC signal, the green indicator light will be on, and the buzzer will beep slowly, displaying “ -L ” .
4. When the meter senses strong AC signal, the red indicator light will be on, and the buzzer will beep fast, displaying“-H”.

WARNING

When using the NCV function, please remove the probe, otherwise the detection accuracy will be affected.

NCV function is affected by many factors, even if there is no alarm prompt, there may still be high voltage.

◆ **Live test**

1. Press “  ” key to turn on the power, press “  ” key to switch to “  ” function. Then press “  ” key to switch to live function, the meter shows “ Live ” .
2. Insert the red probe into the “  ” input terminal and remove the black probe from the “ COM ” input terminal.
3. When the meter detected weak AC signal, the green indicator light will be on, and the buzzer will beep slowly, displaying “ -L ” .
4. When the meter detected strong AC signal, the red indicator light will be on, and the buzzer will beep fast, displaying “ -H ” . In general, what is detected is the live at this time.

WARNING

Please remove the black probe, otherwise the detection accuracy will be affected.

General Technical Specifications

- ◆ Environment condition of using:
 - CAT. III 600V; Pollution level2, Altitude < 2000m
 - Working environment temperature and humidity: 0~40°C (<80% RH <10°C non condensing) ,
 - Storage environment temperature and humidity: -10~60°C (<70% RH, remove the battery)
- ◆ Temperature coefficient 0.1 accuracy /°C (<18°C or >28°C)
- ◆ MAX. Voltage allowed between input terminals 600V
- ◆ Fuse protection: F600mA/250V fuse
- ◆ Sampling rate: about 3 times/second.
- ◆ Display: maximum 6000 count.
- ◆ Over range indication: it displays "OL".
- ◆ Low battery indication: when the battery voltage is lower than the normal
- ◆ working voltage, "  " will be displayed.
- ◆ Input polarity indication: automatically display " ____ ".

Accuracy Specifications

Function	Range	Resolution	Accuracy
DC Voltage	60mV/600mV/6V/60V/600V	0.01mV/0.1mV/0.001V/0.01V/0.1V	±(0.5%+3)
AC Voltage	60mV/600mV/6V/60V/600V	0.01mV/0.1mV/0.001V/0.01V/0.1V	±(1.0%+3)
DC Current	6000µA/60mA/600mA	1µA/0.01mA/0.1mA	±(1.2%+5)
AC Current	6000µA/60mA/600mA	1µA/0.01mA/0.1mA	±(1.5%+5)
Resistance	600Ω/6kΩ/60kΩ/600kΩ	0.1Ω/0.001kΩ/0.01kΩ/0.1kΩ	±(1.0%+5)
	6MΩ/60MΩ	0.001MΩ/0.01MΩ	±(1.5%+3)
Capacitance	6nF/60nF/600nF/6µF/60µF/600µF	0.001nF/0.01nF/0.1nF/0.001µF/0.01µF/0.1µF	±(4.0%+5)
	6mF/60mF	0.001mF/0.01mF	±(5.0%+5)
Frequency	10Hz/100Hz/1000Hz/10kHz/100kHz/1000kHz	0.001Hz/0.01Hz/0.1Hz/0.001kHz/0.01kHz/0.1kHz	±(1.0%+5)
	10MHz	0.001MHz	±(3.0%+5)
Duty	1~99%	0.1%	±(3.0%+5)
Diode measurement	open circuit voltage 2.0V		
Continuity measurement	<50Ω		
Power	2×3V CR2032 batteries		
Dimension (LxWxH)	133×68×18mm		
Weight	178g		

The accuracy applies within one year after the calibration.
 Reference condition: the environment temperature 18°C to 28°C, the relative humidity is no more than 80.
 accuracy: (reading + word)

- ◆ **DC voltage**
 - Input impedance: 10MΩ
 - Maximum input voltage: 600V
- ◆ **AC voltage**
 - Input impedance: 10MΩ
 - Maximum input voltage: 600V
 - Frequency Response: 40Hz ~ 1kHz
 - True-RMS
- ◆ **DC current**
 - Overload protection: F600mA/250V fuse
 - Maximum input current: 600mA
- ◆ **AC current**
 - Overload protection: F600mA/250V fuse
 - Maximum input current: 600mA
 - Frequency Response: 40Hz ~ 1kHz
 - True-RMS
- ◆ **Resistance**
 - Overload protection: 250V
- ◆ **Capacitance**
 - Overload protection: 250V

◆ **Frequency/Duty**

Hz/duty: 1. Range: 10 ~ 10MHz
 2. Voltage sensitivity: 0.5~10V AC
 3. Overload protection: 250V

ACV: 1. Range: 10 ~ 2 kHz
 2. Voltage sensitivity: 0.5~600V AC
 3. Overload protection: 250V

μ A or mA: 1. Range: 10 ~ 2 kHz
 2. Current response: ≥ 2mA
 3. Overload protection: F600mA/250V fuse

Maintenance

◆ **Clean**

If there's dust on the terminal or the terminal is wet, it may cause measurement error. Please clean the instrument according to the steps below:

1. Switch off the power supply of the instrument, and remove the test probe.
2. Turn over the instrument and shake out the dust accumulated in the input socket. Wipe the outer cabinet with a damp cloth and mild detergent, do not use abrasive or solvent. Wipe contacts in each input socket with a clean cotton swab soaked in alcohol.

◆ **WARNING**

Please always keep the inside of the instrument clean and dry to avoid electric shock or instrument damage.

Replace Battery and Fuse

Replace Battery:

1. Turn off the power supply of the instrument, and remove the probe on the instrument.
2. Use screwdriver to unscrew screws fixing the battery cover, remove the battery cover.
3. Remove old batteries, replace with new batteries of the same specifications. Please note the polarity of the battery according to the positive and negative polarity marks inside of the battery cover.
4. Install the battery cover to its original position, fix and lock the battery cover with screws.

◆ **WARNING**

1. To prevent electric shock or personal injury caused by error reading, please replace the battery promptly when the battery power is low. Please do not make battery short circuit or reverse battery polarity to discharge the batteries.
2. To ensure safety operation and product maintenance, when the instrument will not be used for an extended period of time, please remove the batteries to avoid any product damage caused by battery leakage.

◆ **Replace Fuse**

1. Turn off the power supply of the instrument, and remove the probe on the instrument.
2. Use screwdriver to unscrew screws fixing the back cover, and remove the back cover.
3. Remove the burnt fuse, replace with new fuse of the same specifications, and ensure that the fuse is clamped in the safety clip.
4. Install the back cover, fix and lock it with screws.

WARNING

To avoid possible electric shock, personal injury or instrument damage, please use the fuse with same specifications or specified specifications.