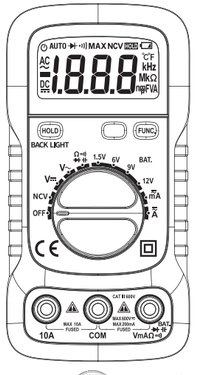
USERS MANUAL

DIGITAL MULTIMETER



EMC&LVD

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

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Overview and Safety Information

1.Overview

This instrument is a small handheld 3 1/2 digit digital multimeter with high reliability, stable and drop-proof performance. The instrument adopts a LCD display with a word height of 15mm, clear readings and backlight source, making it convenient for users to read measurement display values in dark places. The whole circuit takes an integrated circuit as the core and is equipped with overload protection circuit. It can be used to measure AC/DC voltage, AC/DC current, resistance, capacitance, frequency, diode, circuit on-off test and non-contact voltage detection, and can be widely used in social fields such as schools, research institutes, factories and enterprises.

2.Safety Information

This instrument is a digital multimeter designed in accordance with IEC61010-1 CAT III 600V and pollution class 2. In order to ensure the correct and safe use of the instrument, please read the instruction carefully.

⚠ **WARNING: To avoid possible safety accidents such as electric shock or personal injury, please abide by the following specifications:**

●Before using the meter, please read this manual

Safety Information

carefully and pay special attention to the warning information.

●Before using the meter, please check the meter housing for cracks or damaged plastic parts. If so, please do not use it again.

●Before using the meter, please check if the meter is working properly. If it is not normal or has been damaged, please do not use it again.

●Before using the meter, please check the insulator around the input terminals of the meter carefully and do not use it again if it is damaged.

●Before using the meter, please check the probes for cracks or damages. If so, please replace the probes with the ones with the same specification before use.

●Before use, please check whether the insulation layer of the probes is damaged, whether there is exposed metal or signs of wear, and check the connectivity of the probes. If there it is, please do not use it again.

●Before using the meter, verify that the meter is working properly by measuring a known voltage with the meter first.

●Use the meter in strict compliance with the operation of this manual, otherwise the protection provided by the meter may be damaged or weakened.

Safety Information

●Use the meter according to the measurement category, voltage or rate current value specified in the meter or manual.

●Do not measure any voltage beyond the measurement range specified by this instrument.

●Although there are internal protection circuits in resistance, capacitance, frequency, diode and circuit on-off gears, do not apply a voltage above 30V to the input terminal when measuring in the above gears.

●Observe local and national safety specifications. Wear personal protective equipment (such as approved rubber gloves, masks and flame-retardant clothing) to prevent injury from electric shock and arcing when dangerous live conductors are exposed.

●Before connecting the meter to the circuit under test, be sure to select the correct input terminal and switch position.

●The voltage applied between the input terminals or between any of the terminals and the ground point must not exceed the rated value indicated on the meter.

●Special care should be taken when measuring beyond AC true RMS at 30V, AC peak value at 42V or DC at 60V. There is a risk of electric shock with these types of voltage

Safety Information

same specification.

●When the instrument is not in use, turn off the power supply and turn the function range switch to the "OFF" position.

●If the instrument is not used for a long time, the battery should be taken out to prevent the instrument from being damaged.

●In case of any abnormality, stop using it immediately and send it for repair in time.

●Calibration or maintenance can only be carried out by professionals.

Security Signs:

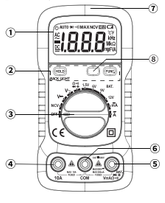
ϟ	High-voltage warning
~	AC (alternating current)
⎓	DC (direct current)
≂	AC/DC
⏚	Grounding
⧈	Equipment protected by double insulation or reinforced insulation
	This electrical/electronic product must not be disposed of in household
CE	Compliance with all relevant European legal requirements
CAT III 600V	Class III 600 V overvoltage protection
⚠	Warning, important safety signs

Product Profile

3.Product Profile

3.1 Product Appearance and Specifications

①LCD ②Function key ③Rotary switch
④10A current measurement positive input terminal
⑤ **VmAΩ⋯)))⊣⊢** measurement positive input terminal
⑥Measurement input common terminal **COM**
⑦Non-contact AC voltage detection area
⑧Indicator light



3.2 Function Keys

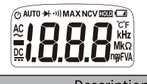
HOLD data hold key： Short press the "**HOLD**" key, the last measured reading will be maintained on the instrument display and the "HOLD" symbol will be displayed on the LCD; press the "**HOLD**" key again and the instrument will return to normal measurement status.Press and hold the "**HOLD**" key for more than 2s, and the backlight of the LCD screen will light up. Press and hold again to turn off the backlight or the backlight will automatically turn off after about 30s.

FUNC function selection key： In AC voltage

Product Profile

gear: Short press the "**FUNC**" key to switch to frequency measurement.In continuity, capacitance, resistance, and diode gear: Short press the "**FUNC**" key to cycle through continuity test, capacitance measurement, resistance measurement, and diode test.In current gear: Short press the "**FUNC**" key to switch between AC current and DC current measurement.During auto power-off: Short press the "**FUNC**" key to wake up the meter.

3.3 LCD



No	Symbol	Description
1	HOLD	Data hold symbol
2	AC	AC indicator symbol
3	DC	DC indicator symbol
4	kHz	Frequency unit: Hz, kHz
5	MkΩ	Resistance unit: Ω, kΩ, MΩ
6	nμF	Capacitance unit：nF, uF,mF
7	VA	Voltage unit: mV, V; Current unit: uA, mA, A
8		Battery undervoltage prompt symbol

Technical Indicators

9	NCV	Non-contact AC voltage detection indicator symbol
10	·))	Buzz measurement indicator symbol
11	⊣⊢	Diode measurement indicator symbol
12	AUTO	Automatic range indicator symbol
13	▬	Negative value symbol

4.Technical Indicators

4.1 General Characteristics

●Maximum voltage between voltage input and ground: 600V AC/DC.

●Automatic range

●Display: 3 1/2-bit segment code LCD display, with maximum display of 1999.

●Automatic shutdown: about 15min. Press "FUNC" key to wake it up.

●Data hold display function.

●Over-range display: "OL".

●Polarity display: Negative polarity displays "-".

●Working environment: 0 ~ 40°C; < 80% RH.

●Storage conditions: -10 ~ 50°C; <70%RH.

●Power supply: AAA 1.5Vbattery x2.

●Battery undervoltage prompt: When it is below about 2.5V, the LCD screen displays "▭".

Technical Indicators

●Fuse: F 250mA/600V，F 10A/600V。

●Safety level: IEC61010-1, CAT III 600V.

●Dimension: 129*66*33mm (no leather case included).

●Weight: about 126g (no leather case and battery included).

4.2 Accuracy Index

Accuracy: ±% reading ± dgt; Warranty period: one year from the date of manufacture.

Environment temperature: 18 ℃ ~28 ℃ .

Environment humidity:＜80%.

4.2.1 DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	±(0.5%reading+2dgt)
2V	0.001V	±(0.5%reading+2dgt)
20V	0.01V	
200V	0.1V	
600V	1V	±(0.8%reading+2dgt)

Input impedance: about 10MΩ.

Maximum input voltage: 600V DC or AC RMS.

4.2.2 AC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	±(1.0% reading + 3dgt)
2V	0.001V	
20V	0.01V	
200V	0.1V	

Technical Indicators

600V	1V	±(1.2% reading + 3dgt)

Input impedance: about 10MΩ.

Frequency range: 45~400Hz.

Maximum input voltage: 600V DC or AC RMS.

4.2.3 DC Current

Range	Resolution	Accuracy
2000μA	1μA	±(1.5% reading + 3dgt)
20mA	0.01mA	
200mA	0.1mA	
10A	0.01A	

Fuse: mARange：F 250mA/600V.
A range：F 10A/600V.
Maximum input current: mA jack：250mA.
10A jack: 10A.

4.2.4 AC Current

Range	Resolution	Accuracy
2000μA	1μA	±(1.5% reading + 4dgt)
20mA	0.01mA	
200mA	0.1mA	
10A	0.01A	

Fuse: mARange：F 250mA/600V.
A range：F 10A/600V.
Maximum input current: mA jack：250mA.
10A jack: 10A.
Frequency range: 45~400Hz.

4.2.5 Resistance

折页后尺寸73*105mm展开尺寸 438 *210mm　　黑线不要印　　Y01-04-0258

Range	Resolution	Accuracy
200Ω	0.1Ω	±(0.8% reading+2dgt)
2kΩ	0.001kΩ	
20kΩ	0.01kΩ	
200kΩ	0.1kΩ	
2MΩ	0.001MΩ	
20MΩ	0.01MΩ	±(1.0% reading+2dgt)

Overload protection:600V DC or AC RMS.

4.2.6 Capacitance

Range	Resolution	Accuracy
20nF	0.01nF	±(4.0% reading+5dgt)
200nF	0.1nF	
2μF	0.001μF	
20μF	0.01μF	
200μF	0.1μF	
2mF	0.001mF	

Overload protection:600V DC or AC RMS.

4.2.7 Diode & Continuity

Range	Function
⊣◀	Display the approximate forward voltage of the diode. The open circuit voltage is about 2V.
)))	The buzzer sounds when the on-resistance is less than about 30Ω. The open circuit voltage is about 1V.

Overload protection:600V DC or AC RMS.

4.2.8 Measuring Battery

Gear	Voltage Range	Indication
1.5V	＜1.300V	Red LED on
	1.300V~1.400V	Yellow LED on
	1.400V~2.000V	Green LED on, >2V displays OL
6V	＜5.00V	Red LED on
	5.00V~5.80V	Yellow LED on
	5.80V~8.00V	Green LED on, >8V displays OL
9V	＜8.00V	Red LED on
	8.00V~8.80V	Yellow LED on
	8.80V~11.00V	Green LED on, >11V displays OL
12V	＜11.00V	Red LED on
	11.00V~11.80V	Yellow LED on
	11.80V~15.00V	Green LED on, >15V displays OL

4.2.9 Non-contact AC voltage detection

Function	Description
NCV	0~3 class,AC 36~600V 50Hz/60Hz

5.Measurement Operation

Precautions before operation:

1. Connect the power and check the 3V battery first. In case of insufficient battery voltage, "▭" will be displayed on the display, and the battery needs to be replaced. If "▭" is not displayed on the display, follow the steps below.
2. The " ⚠ " symbol next to the test pen jack indicates that the input voltage should not exceed the indicated value, which is to protect the internal circuit from damage.
3. Before testing, turn the switch into the gear you need.

5.1 Measure AC or DC Voltage

1. Insert the red probe into the "VmAΩ⁾))⊣◀⊢" jack, and the black probe into the "COM" jack.
2. Place the rotary switch in V⎓ or V~ gear.
3. Connect the test pen to the power supply or load to be tested and read the value from the LCD screen. When measuring DC voltage, the polarity of the terminal connected to the red probe will also be displayed on the display.

Note

1. At the range of 200mV, even if there is no measurement, there will be a display on the instrument. In this case, the instrument reading can return to zero only by

short-circuiting the probe.

2. If the display only shows "OL", it means that the range has been exceeded, and the function range switch should be set to a higher range.

3. Do not input voltages higher than 600V. It is possible to display higher voltages, but there is a risk of damaging the internal wiring of the instrument.。

4. In AC voltage measurement mode, press the "FUNC." button to measure the frequency of the AC voltage.

5. In measuring voltage > 30V, special attention should be paid to avoid electric shock.

5.2 Measure AC or DC Current

⚠ WARNING

Do not attempt to measure current on the circuit when the voltage between the open circuit voltage and ground exceeds 30V. If internal components are damaged during measurement, you may damage the instrument or hurt yourself. When measuring, please use the correct input socket, function gear and range. When the test pen is plugged into the current input socket, do not connect the other terminal of the test pen in parallel to any circuit.

1. Cut off the power supply of the circuit under test. Discharge all high-voltage capacitors on the circuit under test.
2. Place the rotary switch in the proper current gear.
3. Insert the black probe into the "COM" jack. When the measured current does not exceed 200mA, insert the red probe into the "VmAΩ⁾))⊣◀⊢" jack. If the current being measured is between 200mA and 10A or the current is unknown, insert the red probe into the 10A jack.
4. Disconnect the circuit to be tested. Connect the black test pen to the low potential end of the disconnected circuit, and connect the red test pen to the high potential end of the disconnected circuit.
5. Turn on the power supply of the circuit under test, and then read the displayed reading. If the display only shows "OL", this means that the input exceeds the selected range and the rotary switch should be placed at a higher range.

WARNING

1. If the measured current range is not known in advance, please put the function range switch at the maximum range, and then gradually decrease until satisfactory

resolution is achieved.

2. The "⚠" symbol next to the test pen jack indicates that the maximum input current is 200mA or 10A depending on the jack used. Excessive current will burn out internal components.

3. When measuring a large current of 5-10A, the power-on time should not exceed 10s to avoid unstable test data due to heat or damage to the instrument due to overheating.

4. When making multiple measurements, the time interval between each measurement must be 3-5min.

5.3 Measure Resistance

1. Insert the black probe into the "COM" jack, and the red probe into the "VmAΩ⁾))⊣◀⊢" jack.
2. Place the rotary switch in the "⁂Ω⁾))" gear, press the "FUNC" key to switch to resistance measurement mode, and the "Ω" symbol will be displayed on the screen。
3. Connect the red and black test leads in parallel to the resistor under test, then read the measurement result from the display.

Note

If the measured resistance exceeds the maximum value of the selected range, the over-range "OL" will be displayed, and a

higher range should be selected at this time. When measuring the resistance above 1MΩ, it may take several seconds for the reading to be stable, which is normal for high resistance measurement. If the display only shows "OL", this means that the range has been exceeded and the function range switch should be placed at a higher range.

When there is no input, such as an open circuit, the instrument displays "OL".

5.4 Measure Diode

1. Insert the black probe into the "COM" jack, and the red probe into the "VmAΩ⁾))⊣◀⊢" jack, with the polarity of the red probe being positive.
2. Place the rotary switch in the "⁂Ω⁾))" gear, press the "FUNC" key to switch to the diode measurement mode, and the "⊣◀" symbol will be displayed on the screen.
3. Connect the red probe to the anode of the diode under test, and the black probe to the cathode of the diode, and read the approximate forward voltage drop value of the diode value under test on the display.

5.5 Measure Continuity

1. Insert the black probe into the "COM" jack, and the red probe into the "VmAΩ⁾))⊣◀⊢" jack.
2. Place the rotary switch in the "⁂Ω⁾))" gear, press

the "FUNC" key to switch to the on-off measurement mode, and the "⁾))" symbol will be displayed on the screen.
3. Connect the other ends of the test leads to measure the resistance of the circuit under test.If the measured resistance is ⩽ 30Ω, the green indicator LED will light up, and the buzzer will sound continuously.If the measured resistance is >30Ω, the red indicator LED will illuminate.

5.6 Measure Capacitance

Note

1. To avoid damage to the instrument or the equipment under test, before measuring the capacitance, all power supplies in the line under test should be turned off and all capacitors should be fully discharged.

2. The measured capacitance should be independent and cannot be connected in parallel or series with other lines, otherwise an incorrect value will be obtained.

3. When measuring capacitance values greater than 1mF, it is necessary to wait a few seconds or more, which is normal for capacitance measurements with large capacitance values.When there is no input, such as an open circuit, the instrument displays "OL".

1. Insert the black probe into the "COM" jack, and

the red probe into the "VmAΩ⁾))⊣◀⊢" jack.
2. Place the rotary switch in the "⁂Ω⁾))" gear，press the "FUNC" key to switch to the capacitance measurement mode.
3. When measuring a polarized capacitor, connect the red test lead to the positive terminal of the capacitor.
4. Connect the tip of the test pen to the capacitance to be measured, and read the measured capacitance value from the LCD screen.

5.7 Measuring Battery

1. Set the rotary switch to the corresponding battery range.。
2. Insert the black test lead into the "COM" jack and the red test lead into the "VmAΩ⁾))⊣◀⊢" jack.
3. Connect the red test lead to the positive terminal of the battery and the black test lead to the negative terminal. Read the measured voltage value on the display, and the corresponding battery health indicator (green, yellow, or red) will light up.

5.8 Detect Non-contact AC Voltage

1. Place the rotary switch in the "NCV" gear.
2. Place the non-contact AC voltage detection area at the top of the instrument close to the object being measured. If the meter detects AC voltage, the LCD display displays the detected signal

intensity. The more "—" displays, the stronger the induction signal, and the buzzer will sound with different frequencies.

Note：

1. Even if there is no indication, the voltage may still exist. Do not rely on non-contact voltage detector to determine whether there is voltage in the wire. Detection operation may be affected by factors such as socket design, insulation thickness and type.

2. When voltage is input to the instrument input terminal, the NCV test may also detect AC voltage due to the existence of induced voltage.

3.Interference sources in the external environment (such as flash lights and motors) may mistakenly trigger non-contact voltage detection.

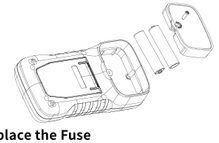
6.Repair

6.1 Replace the Battery

If the "▭" symbol appears on the LCD screen when the instrument is in use, the battery must be replaced to prevent the instrument from working abnormally.

1. Unplug the test line, and set the function range switch to the OFF gear.
2. Open the battery cover screw with a screwdriver and take out the battery cover and battery.

3. The battery used in this instrument is: AAA 1.5V, and insert batteries of the same specifications.
4. After replacing the battery, cover the battery cover and tighten the screws before using the instrument.



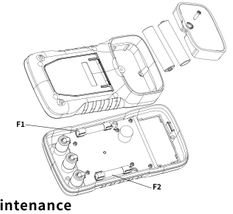
6.2 Replace the Fuse

Fuse specifications: diameter 6mm, length 20mm.

Fuse parameters:F1： F 250mA/ 600V；F2： F 10A/600V.

1. Unplug the test line, and set the function range switch to the OFF gear.
2. Open the battery cover with a screwdriver and take out the battery.
3. Remove the top and bottom screws and open the rear shell of the instrument.
4. Remove the damaged fuse, replace it with one of the same specification, cover the rear shell again, tighten the screws, install the battery, and

cover the battery cover.



6.3 Maintenance

Clean the instrument surface with a soft cloth when necessary. Do not use organic solvents or abrasives that corrode and dissolve the casing.

Accessories

- Instruction manual 1
- Test probe 1
- 1.5V AAA battery 2