Digital Multimeter Operation Manual

I. Summarize

This instrument is an intelligent true RMS digital multimeter with intelligent and professional measurement functions. Full functions includes gear, analog bar display, it can measure AC/DC voltage, resistance, continuity test, diode, capacitance, frequency/duty cycle, temperature, AC/DC current, NCV (non-contact AC voltage sensing measurement), Live (live wire judgment)), dual display (ambient temperature/AC frequency). At the same time, it also has the function of low power indication, fuse blown indication and the test leads correctly inserted jack shining indication, which is more convenient for the user to operate.

II. Open the Package for Checking

Open the box, take out the meter, checking the items below if they are missing or damaging:

1.	Manual	1pc
2.	Test leads	1pair
3.	K-type probe（-20℃~250℃）	1pc
4.	1.5V AAA Battery LR03	4pcs
5.	Bag	1pc

Please contact with your supplier, if you find out any problems.

III. Safety Operation Guidelines

This instrument is designed and produced according to the safety requirements of GB4793 electronic measuring instrument and IEC61010-1 standard. It conforms to the safety standards of CAT III 600V and pollution II. Please read the instruction carefully before using.

1.When measuring each range, it is forbidden to input more than the limit value of the range.

2.The voltage below 36V is a safe voltage, when measuring higher than DC 36V or AC 25V, check

whether the test leads is reliable contact, whether it is correct connection, whether the insulation is good, so as to avoid electric shock; A high voltage warning symbol "⚡" is displayed when an AC/DC voltage bigger than 24V is input.

3.Do not measure voltage higher than the rated value between terminals or between terminals and ground.

4.When switching functions, the test lead should leave the test point.

5.Select the right function and range, beware of misoperation, although the series of instruments have full range protection function, but for the sake of safety, please pay more attention.

6.Comply with local and national safety regulations. Wear personal protective equipment (approved rubber gloves, masks, flame-retardant clothing, etc.) to protect against electric shock and electric arc injury if a dangerous live conductor is exposed.

7.Use only the correct measurement standard category (CAT), voltage and current rating probes, test leads and adapters.

8.Do not use the instrument in the presence of explosive gas or steam or in a humid environment.

9.When measuring, please connect the null or ground wire first, then the live wire; when disconnected, please disconnect the live wire first, and then the null or ground wire.

10.Description of safety symbols:

"⚠" Dangerous voltage， "⏚" Ground connection

" ▣ " Double insulation， "⚠" Refer to the manual

" " Operator must refer to the manual

IV. Electrical Symbol

⚠	Warning	⎓	DC
⚠	High voltage damage	~	AC
⏚	Ground	▭	Fuse
▣	Dual insulation	CE	Compliant with EU command

V. Comprehensive Characteristics

1-1.Display: Maximum display 5999(3 5/6 digits), update about 3 times per second;

1-2. Polarity Indicator: auto-display"-"sign;

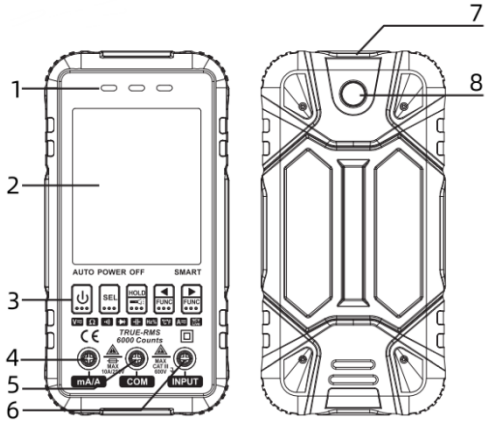
1-3. Over range display: display "OL";
1-4. Low voltage display: "  "symbol appears;
1-5. Fuse blown indicate:"  "symbol appears;
1-6.Test leads jack prompt: Correct jack flashing prompt、luminous instructions;
1-7.Working altitude：＜2000m;
1-8.Working environment:0℃~ 40℃（relative humidity <75%RH，<10°CNon-condensing）;
1-9.Storage environment :-20℃ ~ 60℃（relative humidity <85%RH，remove the battery）;
1-10.Temperature coefficient: 0.1x accuracy/℃ (<18℃ or>28℃）;
1-11.Battery type: 4*1.5V AAA Battery LR03;
1-12.Size:144x73x27mm(Length×width×height);
1-13.Weight: Approx 235g (including battery);

VI. Appearance and Structure

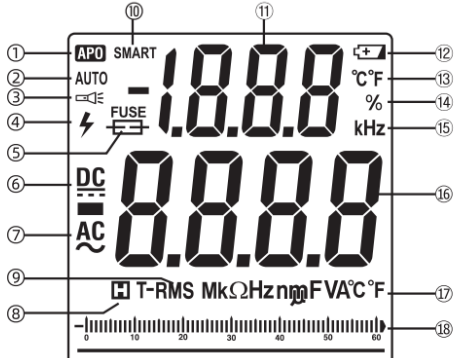
1. Alarm indicator
2. LCD display
3. Function key
4. Current input jack
5. Common ground terminal
6. Voltage / resistance / diode / continuity /

frequency / capacitance / live line judgment / temperature input jack

7. Non-contact AC voltage sensing terminal
8. Flashlight



VII. Display Screen



1. Auto power-off
2. Auto Range
3. Flashlight
4. High Voltage
5. Blown fuse
6. DC measurement
7. AC measurement
8. Data-hold
9. True RMS
10. Intelligent
11. Slave display
12. Low battery
13. Temperature unit
14. Duty cycle
15. Frequency
16. Main display
17. Voltage, current, capacitance, frequency, resistance, temperature
18. Functional range analog bar
19. Function display area

VIII. Key and indication function

1. Power on/off

Press and hold the "⏻"key for about 2 seconds to turn on or off the device.

2. Switch Function

Press the"REL" key to switch the same gear function. Valid in V≂、A≂、 and NCV Live gears for switching between AC/DC and NCV/Live.

3. Gear selection

Press the“FUNC” or “FUNC”key to enter manual mode; Press the“FUNC” or “FUNC”key again to select the gear to the left or right; press and hold the“FUNC” or “FUNC”key at any range for about 2 seconds to return to the intelligent (AUTO) measurement mode. Power on is in intelligent (AUTO) measurement mode by default.

4. Data-hold/Flashlight

During the measurement process, press the "HOLD" key to turn on or off data hold; Long press the "HOLD" key (>2 seconds) to turn on or off the flashlight, and the“ ” symbol is displayed when the flashlight is on.

⚠⚠**Warning: To prevent possible electric shock, fire, or personal injury, do not use the HOLD function to measure unknown potentials. When**

HOLD is turned on, the display does not change when different potentials are measured.

5. Warning of fuse-burning-out

If the fuse is burnt out, the symbol"  " will be displayed. When the current gear is selected, the symbol "FUSE" will be displayed at the same time. It is not allowed to measure the current. Please replace the fuse in time.

6. Input jack indication

When the gear is changed, the corresponding input light will flash for 8 times to prompt to insert the probe into the corresponding jack.

7. Current measurement auto identification

When the “mA/A” jack is inserted into the probe, the meter will automatically jump to the "A⏦" gear and enter the current measurement function. Now you cannot change the range.

8. Auto-power off

After power on, auto power off will be on by default and " APO " symbol will be displayed. Without any key operation in about 15 minutes, the meter will automatically shut down to save battery energy.

Press and hold “SEL” key to turn on meter, you can cancel the automatic shutdown function. The“ APO ” symbol will not be displayed after the function of automatic shutdown is canceled; the function of automatic shutdown will be resumed after reboot.

IX. Measurement instructions

First of all, please pay attention to check whether the battery power is sufficient，if the battery power is insufficient, the "▭" symbol will be displayed on the LCD. Note the symbol “⚠” next to the test lead socket, which warns you to be careful that the test voltage and current do not exceed the indicated value.

SMART measurement mode

This measurement mode is default when power on. In this mode, DC voltage, AC voltage, resistance, continuity test can be measured, and the meter can automatically identify the measurement signal.

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Insert the red probe into “INPUT”jack and the black probe into the “COM” jack.

3.Contact the probe of the probe with both ends of the measured power supply or resistance (parallel), and the meter will automatically recognize the measured signal.

4.When measuring the resistance, the resistance value is less than about 50Ω The buzzer sounds and the indicator light is on.

5.Read the measurement results from the display.

NOTE：The minimum measurable voltage of this mode: 0.8V

Professional measurement mode

（I）AC/DC voltage measurement

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press“ FUNC ” or “ FUNC ” key to select the AC/DC voltage “V≂”gear.

3.Press the " SEL " key to select AC voltage or DC voltage. Display"AC" symbol is AC voltage; Display " DC " symbol is the DC voltage.

4.Insert the red probe into“INPUT”jack and the black probe into the “COM” jack.

5.Contact the probe with both ends of the measured

power supply (parallel).

6.Read the measurement results from the display.

（II）Resistance measurement

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press “ ” or “ ” key to select "Ω" gear.

3.Insert the red probe into“INPUT”jack and the black probe into the “COM” jack.

4.Contact the probe with both ends of the measured resistance (parallel).

5.Read the measurement results from the display.

(III）Continuity test

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press “ ” or “ ” key to select "•))" gear.

3.Insert the red probe into“INPUT”jack and the black probe into the “COM” jack.

4.Contact the probe with both ends of the measured resistance or Circuit (parallel).

5.When the resistance value is less than about 50 Ω The buzzer sounds and the indication light is on.

6.Read the measurement results from the display.

(IV）Frequency/Duty measurement

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press “ ” or “ ”key to select "Hz%" gear.

3.Insert the red probe into “INPUT” jack and the black probe into the COM jack.

4.Contact the probe with both ends of the measured frequency signal source.

5.Read the measurement results from the display.

（V）Capacitance measurement

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press “ ” or “ ” key to select “⊣⊢” gear.

3.Insert the red probe into“INPUT”jack and the black probe into the COM jack.

4.Contact the probe with both ends of the measured capacitance.

5.Read the measurement results from the display.

（VI）Diode test

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press“ ”or“ ”key to select "→|" gear.

3.Insert the red probe into“INPUT”jack and the black probe into the COM jack.

4.The red probe contacts the anode of the diode and the black probe contacts the cathode of the diode.
5.If the probe polarity is opposite to the diode polarity, the display will display "OL".
6.Read the measurement results from the display.

（VII）Temperature measurement

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.
2.Press “ ” or “ ” key to select "℃/℉" gear.
3.Insert the positive pole of the K-type thermocouple into the“INPUT”jack and the negative pole into the COM jack.
4.The thermocouple probe contacts the measured object.
5.Read the measurement results from the display.

(VIII）Non contact AC voltage measurement

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.
2.Press “ ” or “ ” key to select “ NCV Live " gear.
3.Press “ ”key to select “NCV" function (default is NCV function)
4.The NCV sensor area is gradually close to the conductor.

5.When the weak electric field signal is detected, it will display "---L"; the buzzer will sound slowly and the green light on.

6.When the strong electric field signal is detected, it will display "---H"; the buzzer will sound quickly and the red light on.

(IX）Live-wire-detecting

1.Press ⏻ key to power on, the instrument shows “Auto” into intelligent measurement mode.

2.Press “◀ RANGE ” or “ ▶ RANGE ” key to select “ NCV Live " gear.

3.Press “ SEL ” key to select Live function.

4.Insert the red probe into“INPUT”jack and remove the black probe.

5.Use the red probe contact the conductor.

6.When the weak electric field signal is detected, it will display "---L"; the buzzer will sound slowly and the green light on.

7.When the strong electric field signal is detected, it will display "---H"; the buzzer will sound quickly and the red light on.

(X）AC/DC-current-measurement

1.Press ⏻ key to power on,the instrument shows“Auto” into intelligent measurement mode.

2.Press “ ” or “ ”key to select "A≂" gear. Or insert the red probe into the mA/A jack to automatically select the "A≂" gear.
3.Press "SEL" key to select AC or DC current, display "AC" symbol is AC current，display "DC" symbol is DC current(default is DC current)
4.Insert the red probe into mA/A jack and the black probe into the COM jack.
5.Disconnect the measured power supply, connect the meter in series with the power supply, and then turn on the measured power supply.
6.Read the measurement results from the display.

X. Technical Characteristic

Accuracy :±(a% reading +b words), calibration guarantee period is one year.
Operating ambient temperature:(23±5)℃, relative humidity<75%RH.

1. DC voltage（DCV）

Range	Accuracy	Resolution
600mV	±(0.5% +3)	0.1mV
6V		0.001V
60V		0.01V

600V		0.1V
Input impedance: about 10MΩ Maximum input voltage：±600V, ≥600V has alarm sound, input >610V, LCD display OL		

2. AC voltage（ACV）

Range	Accuracy	Resolution
6V	±(1.0%+3)	0.001V
60V		0.01V
600V		0.1V
Input impedance: about 10MΩ Maximum input voltage :600Vrms, ≥600V has alarm sound, input >610V, LCD display OL		

⚠Frequency response: 40Hz-1kHz true RMS value;
Secondary display area shows AC frequency, AC frequency identification sensitivity＞1V
Accuracy measurement range: 1%~100% of the range;
1kHz frequency response accuracy must increase 1%

3. Resistance

Range	Accuracy	Resolution
600Ω	±(1.0%+5)	0.1Ω
6KΩ		0.001KΩ

60KΩ		0.01KΩ
600KΩ		0.1KΩ
6MΩ		0.001MΩ
60MΩ	±(2.0%+10)	0.01MΩ
Overload protection：250V		

4. AC/DC current

Range	Accuracy	Resolution
600mA	±(1.2%+3)	0.1mA
6A		0.001A
10A		0.01A
Overload protection:F10A/250V fuse		

⚠Frequency response: 40Hz-1kHz true RMS value; Secondary display area shows AC frequency, AC frequency identification sensitivity＞100mA

Accuracy measurement range: 1%~100% of the range

5. Capacitance（F）

Range	Accuracy	Resolution
6nF	±(4.0%+5)	0.001nF
60nF		0.01nF
600nF		0.1nF
6μF		0.001μF

60μF		0.01μF
600μF		0.1μF
6mF	±(5.0%+5)	0.001mF
60mF	±(10%+10)	0.01mF
Overload protection：250V		

6. Frequency/Duty

Range	Accuracy	Resolution
6Hz	±(1.0%+3)	0.001Hz
60Hz		0.01Hz
600Hz		0.1Hz
6KHz		0.001KHz
60kHz		0.01kHz
600kHz		0.1kHz
6MHz		0.001MHz
10MHz		0.01MHz
1.0~99.0%		0.1%
Overload protection：250V		

7. Diode/Continuity

Range	Resolution	Show value
	0.001V	Display diode voltage drop; The open circuit voltage is about 3.5V

◦))	0.1Ω	Less than 50Ω，buzzer will sound and the indicator light will be on.

8. Temperature

Range	Resolution	Accuracy	
℃	1℃	-40~ 0℃	± 3℃
		0 ~ 1000℃	±2% or ± 2℃
℉	1℉	-40~ 32℉	± 6℉
		32~ 1832℉	±2% or ± 4℉

⚠Use K-type thermocouple probe

XI. Replace battery or fuse

Refer to follow these steps:

1. The test lead leaves the circuit under test, pull out the pen from the input jack, and turn off the power supply of the instrument.
2. Use a screwdriver to unscrew the battery door and remove it.
3. Remove the old battery or broken fuse and replace it with the new 1.5 V alkaline battery or new fuse.
4. Cover the battery door and use a screwdriver to unscrew the battery door.

5. Battery specifications:

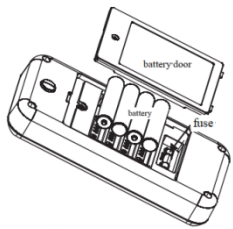
4x1.5V AAA alkaline battery

6. Fuse size:

Φ5×20mm 10A 250V ceramic fuse

Note: When the LCD shows the under voltage "🔋" symbol

The built-in battery should be replaced immediately, otherwise the measurement accuracy will be affected.



XII. Instrument Maintenance

This series of instrument is a precision instrument, the user should not arbitrarily change the circuit.

1. Please pay attention to waterproof, dustproof and anti-fall;
2. It is not suitable to store and use the instrument in high temperature and humidity, inflammable, explosive and strong magnetic field

3. Please use damp cloth and mild cleaning agent to clean the surface of the instrument, do not use abrasive and alcohol and other organic solvents;
4. If the instrument is not used for a long time, please take out the battery to prevent battery leakage corrosion of the instrument.

XIII. Trouble shooting

If your instrument is not working properly, the following methods can help you quickly resolve the general problem. If the fault still cannot be removed, please contact the maintenance center or the distributor.

Fault phenomenon	Location and method of examination
No display	■ The power supply is not connected; ■Need to change the battery
 appears	■Need to change the battery
No input current	■The test lead is not touch well
	■ Replace the fuse when the "FUSE" symbol appears
Large display	■The test lead is not touch well;

error	■Need to change the battery
Bad display	■Need to change the battery

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