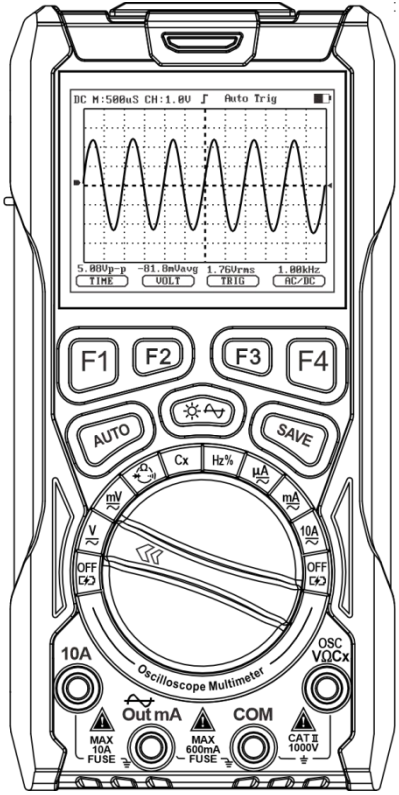


Oscilloscope Multimeter

User's Manual

Preface

Dear users,

Thank you for choosing this digital storage wave multimeter, and believe that the product's innovative combination of functions and user-friendly design will bring you great convenience in field testing. Before use, please read this manual carefully, especially the "Safety Instructions" section. After reading, please keep this manual in a safe place so that you can refer to it whenever you need it.

Contents

Safety Instructions

The technical design of this digital storage visual wave multimeter complies with IEC1010-1 safety specification, overvoltage measurement category II CAT II - 1000V, pollution protection level: 1.

1. Check the case before use, don't use the meter with damaged case, check if there are cracks or missing plastic parts, please pay special attention to the meter pen and the connecting wire insulation layer. Usage Test Keep fingers away from the metal part of the meter pen probe when the meter pen is in use;
2. Do not operate in hot, humid, rainy and flammable environments or when the instrument is wet;
3. Never apply more voltage/current to the instrument than the maximum limit that the instrument can withstand;

Measurement Functions	Using the input	Maximum limit
mV AC/DC	V/Ω/Cx，COM	250V DC+AC peak, within 10 seconds
V DC	V/Ω/Cx，COM	1000V DC+AC peak, within 10 seconds
V AC	V/Ω/Cx，COM	750V DC+AC RMS, within 10 seconds
Hz%	V/Ω/Cx，COM	250V DC/AC RMS, within 10 seconds
μA, mA AC/ DC	uA/mA，COM	600mA DC/AC RMS, 250V/750mA fusible Fuse
A AC/ DC	10A，COM	10A DC/AC RMS, within 30 seconds, 15 minutes of cooling interval 250V/10A fusible Fuse
Ω →+ ·)) ⊣⊢	V/Ω/Cx，COM	250V DC/AC RMS, within 10 seconds

4. Be sure to disengage the pen probe from the test point before changing the measuring gear, unplugging the pen and switching on the machine;
5. Attention to safety sound and light warning: measurement voltage exceeds "safety voltage" (24V), red warning message " ⚡ " is displayed, 3 times beeping and flashing red light to indicate attention to safety;
6. Do not perform voltage measurements when the voltage to ground on the reference input "**COM**" of the instrument reaches 500 V;
7. Do not perform current measurements on circuits with voltages above 250V;
8. Never connect the meter pen across both ends of the voltage source when the measurement function selects the current, resistance, on/off test, diode, capacitance and other gears;
9. Before conducting resistance and diode/on/off tests, the power to the equipment under test must be turned off and the discharge of the capacitors in the power circuit must be confirmed to be exhausted;
10. Before opening the back cover of the instrument to replace the fuse and battery, the instrument must be powered off and the meter pen must be removed from the circuit under test; the same specifications must be used to replace the fuse;
11. Do not modify, disassemble or use the product and accessories for purposes other than the functional design of the product, and all accessories and attachments are not to be substituted at will;
12. Do not allow children to use this equipment or as a toy.

Safety signs

	Caution, danger! This symbol, when located near other symbols or socket terminals, indicates that the user must follow the instructions in this manual in order to prevent instrumentation/personal injury.
	Caution, electric shock danger! This symbol is located near one or more terminals to indicate that these terminals may carry dangerous voltages in use. For maximum safety, avoid touching the test end of the meter pen with your hand when these terminals carry voltage.
Tips!	A reminder statement states that special care should be taken when operating, as incorrect operation can result in incorrect measurement results or damage to accessories.
Attention!	The cautionary statement states that extreme care must be taken when handling the product and that errors or irregularities may result in damage to this product and other property.
Warning!	The warning statement states that the operation should be very concentrated and that wrong or illegal operation may cause personal injury or even endanger life safety.

Introduction of Instrument

Main features

◆50Msps high-speed sampling chip 12MHz analog bandwidth 6000 code digital multimeter.

◆One key to see the wave of voltage gear, there are three waveform scanning modes such as automatic / conventional / single.

◆Signal source outputs three types of waveforms, such as sine, triangle and square waveforms.

◆Signal source output range, frequency, duty cycle, fixed point, adjustable.

◆Configured with replaceable 18650 lithium batteries, more environmentally friendly.

◆Data waveform hold function during measurement, 100 sets of data and 10 waveforms can be stored

◆Waveform range up to 200V/grid, The highestup to 1600Vpp measurement.

◆Relative value measurement, effectively eliminating lead resistance, distributed capacitance or interference signals.

◆Multimeter functions include voltage/current, resistance, capacitance, frequency, duty cycle, diode/on/off testing.

◆Automatic/manual range switching, displaying real-time data and stored data on the same screen.

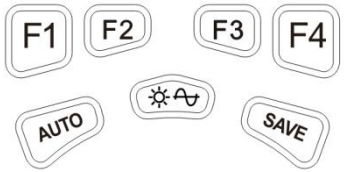
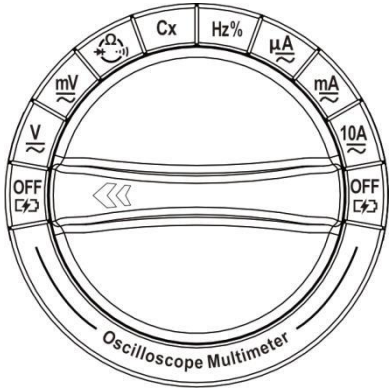
◆Overload protection 750mA;10A double fuse,double protection instrument.

◆15 minutes no operation auto-sleep function.

◆2.4 inch color screen display, clear display.

◆Panel calibration, memory calibration factor without potentiometer adjustment, higher reliability.

Key Function

KEY	Name	Function	
	**F1 ~ F4**	The multi-functional keys change with the range and operating mode, and the menu display on the LCD serves as a prompt for operation.	
	AUTO	Multimeter Status	Manual/automatic switching
		Oscilloscope status	Automatic capture
	SAVE	Data locking and storage	
	☼∿	Backlight and signal source settings	
	**OFF**	Instrument Switches	
	V≂	DC/AC voltage and oscillator	
	mV≂	DC/AC millivolt voltage and millivolt oscillator	
	Hz%	Frequency/Duty cycle gear	
	Ω	Resistance / Diode / On-Off Test	
	Cx	Capacitor gear	
	μA≂	AC/DC micro-amp gear	
	mA≂	AC/DC milliamp gear	
	10A≂	AC/DC ten-amp gear	

c

Basic operation

Power on and off

Turning the knob to select the measuring position will power on the meter, and turning the knob to select the OFF position will turn off the power.

Attention!	• Be sure to keep the test meter pen away from the test point before turning off the power. • When the instrument is finished using, the power must be turned off in time.

Automaticsleep

If there is no key+knob operation within the set time, the meter will automatically sleep. To turn off the auto-sleep function, you can press and hold the "F1" key and then turn the knob to turn on the computer can be automatically set to continuous work.

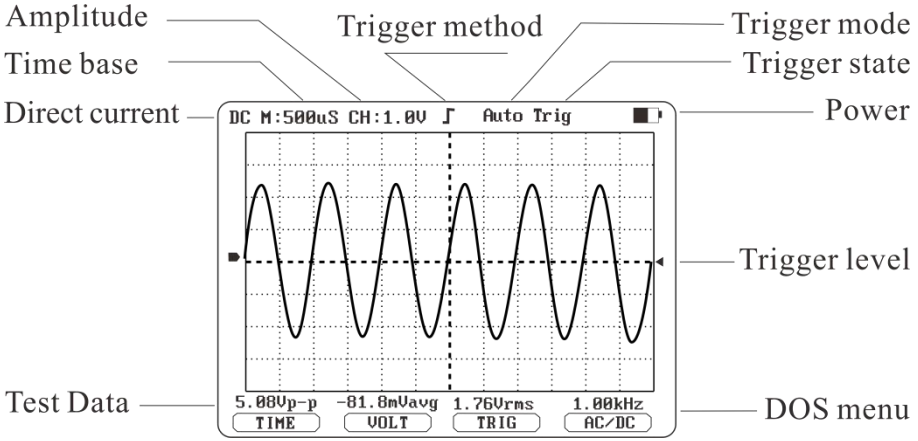
Oscilloscope operation

Enter oscilloscope mode

Press "AUTO" for 2 seconds to enter the oscilloscope (OSC) mode in the voltage section of the multimeter mode (DMM). In the oscilloscope (OSC) mode, press the "AUTO" key for 2 seconds to enter the multimeter mode (DMM) mode.

1. OSC mode of mV filegear, the amplitude range is 50mV/div~ 200mV/div, and the measurable amplitude is 0 ~ 1.6Vpp.
2. V-range OSC mode, the amplitude range is 500mV/div~ 200V/div, and the measurable amplitude is 0 ~ 1600Vpp.

Basic displayinoscilloscope mode



Function Keys & Main Menu

Function keys F1~F4 are located at the bottom of the LCD screen, these keys with the on-screen menu prompts can complete the operation of a variety of functions. The operation of certain functions will also generate sub-menus for further manipulation. Refer to the relevant sections later on for the use of these menus and a la carte menus.

The main menu is a prompt for the basic operation of the machine, the details of which are as follows:

Time base adjustment	Range adjustment	Trigger control	Coupling method
TIME	VOLT	TRIG	AC/DC
F1	F2	F3	F4

1. Press the F1 key (TIME) to enter the time base adjustment sub-menu to adjust the scan time base and trigger position.
2. Press the F2 key (VOLT) to enter the range adjustment sub-menu to adjust the vertical range and waveform position.
3. Press the F3 key (TRIG) to enter the trigger control sub-menu and adjust the trigger edge, trigger mode and trigger level.
4. Press F4 key (AC/DC) to switch DC/AC coupling mode.

Time baseadjustment

Under the main menu of the oscilloscope, press the F1 key (TIME) and the instrument enters the time base adjustment sub-menu:

Return	Time base adjustment		
EXIT	◄	►	
F1	F2	F3	

1. Press the F1 key (EXIT) to exit the Time Base Adjustment submenu and return to the main menu.
2. Press the F2 key (◄), F3 key (►) to adjust the time base (t/div).

Tips!	·When measuring a signal of unknown frequency, you should try waveform acquisition from the fastest time base (see related content in this manual), and then gradually select a slower time base until the signal can be displayed correctly. Otherwise, the waveform may not reflect the actual signal correctly due to the "aliasing effect". ·There are several ways to avoid the overlapping effect: adjust the time base or press the "AUTO" key.

Range adjustment

In the main menu of the oscilloscope mode, press the F2 key (VOLT) to enter the range adjustment sub-menu:

Return	Range adjustment		
EXIT	▲	▼	
F1	F2	F3	

1. Press the F1 key (EXIT) to exit the range Adjustment sub-menu and return to the main menu.
2. Press the F2 key (▲) and the F3 key (▼) to adjust the vertical range (V/div).

Trigger control

In the main menu of the oscilloscope mode, press the F3 key (TRIG) to enter the trigger control sub-menu:

Return	Trigger edge	Trigger Mode	Trigger Level
EXIT	⎍ ⎏	MODE	LEVEL
F1	F2	F3	F4

1. Press the F1 key (EXIT) to exit the Trigger Control submenu and return to the main menu.
2. Press the F2 key (“⎍” or “⎏”) to select rising edge or falling edge trigger.
3. Pressing the F3 key (MODE) is used to select the trigger mode.

4. Press the F4 key (LEVEL) to enter the Trigger Level Adjustment sub-menu.

Trigger level adjustment

Under the trigger setting sub-menu, press the F4 key (LEVEL) to enter the trigger level adjustment sub-menu:

Return	Trigger level adjustment		Trigger level reset
EXIT	▲	▼	RESET
F1	F2	F3	F4

1. Press the F1 key (EXIT) to exit the Trigger Level Adjustment submenu and return to the Trigger Control submenu.
2. Press the F2 key (▲) and F3 key (▼) to decrease or increase the trigger level, and the display will mark the position corresponding to the current trigger level.
3. Press the F4 key (RESET) to reset the trigger level to zero.

About Trigger Mode

Auto: The oscilloscope can acquire waveforms even if no trigger condition is detected. If there is no trigger condition, when the oscilloscope waits for a certain period of time, it will trigger itself and start collecting data. Without the correct trigger, the waveform displayed by the oscilloscope scrolls on the screen because it cannot be synchronized. When a legitimate trigger signal is detected, the waveform is stabilized. Users can use this mode to monitor irregular signals at low frequencies or to observe the range of signals, such as DC power waveforms, etc.

Normal: Start collecting waveform data only after the trigger signal is detected. If no trigger occurs, the oscilloscope will not acquire a new waveform. The display content will not be refreshed.

Single: In single mode, the oscilloscope starts waveform data acquisition once the trigger condition is detected. When new data is acquired, the latest waveform is automatically held.

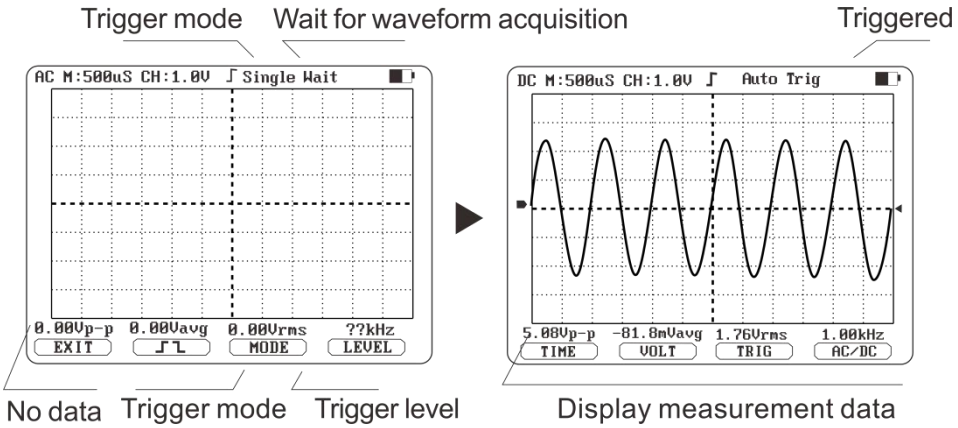
Prompt message for scan status

Auto	In auto mode, waveforms can be acquired without trigger conditions.
wait	Wait for the trigger condition.
Trig	The trigger condition has been detected.
Stop	Keep Locked

Trigger operation for single scan

Perform a single-trigger data acquisition in the following steps:

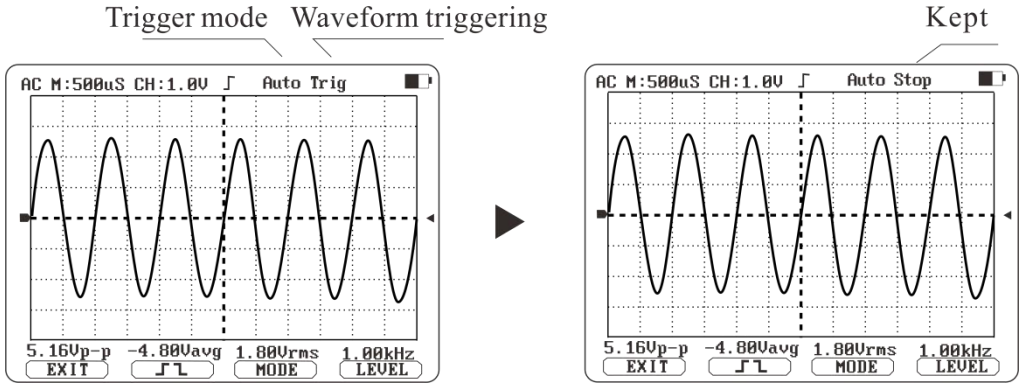
1. Adjust the vertical range V/div and the horizontal range s/div to fit the waveform to be acquired.
2. Select the appropriate trigger level, trigger edge and choose the single trigger mode Single.
3. Once the signal is present, the oscilloscope will be triggered and will capture it.



Holding of signal waveforms

As data acquisition continues, the waveform of the signal is constantly refreshed. Stopping data collection will keep the display content. The main purpose of the hold waveform is to hold the current data or waveform for closer inspection. There are two ways to maintain the waveform: pressing the "SAVE" key or using the single-trigger scan mode.

Press the "SAVE" key to start and stop waveform data acquisition, and the last waveform on the screen can be kept immediately after pressing the "SAVE" key. Once the oscilloscope has stopped collecting waveform data, the display is held.



Storage and readout of signal waveforms

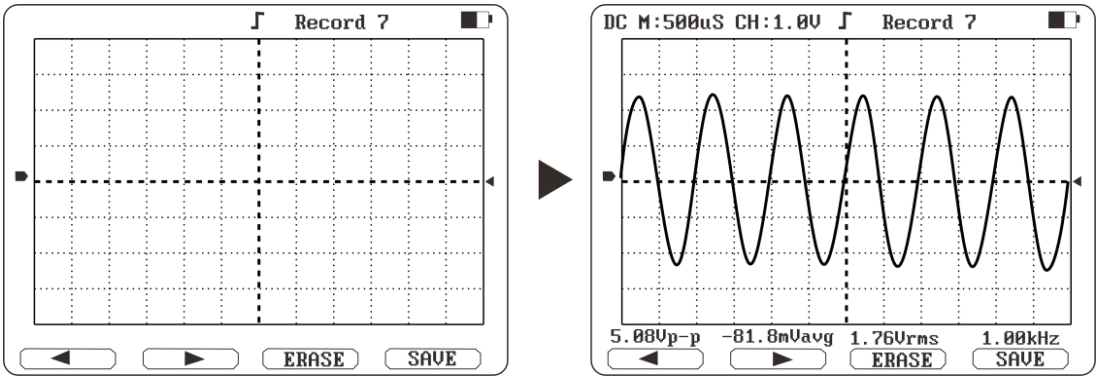
The instrument OSC database has memory space for 10 OSC waveform data. The storage operation method is as follows:

1. Press the "SAVE" key to hold the current waveform.
2. Press "SAVE" again and hold for 2 seconds to enter the database, press F1 (◄) / F2 (►) to select the save location, press F4 (SAVE) to save the current waveform.
3. Press the "SAVE" key again and hold it for 2 seconds to exit the database.

The selection list for the database (DATABASE) is as follows:

Page up	Page down	Delete	Save
◄	►	ERASE	SAVE
F1	F2	F3	F4

a. Press the F1 key (◄) to sequentially select the waveform in the previous page position.
b. Press the F2 key (►) to sequentially select the waveform at the next page position.
c. Press the F3 key (ERASE) to delete the waveform at the current page position.
d. Press the F4 key (SAVE) to save the currently held waveform to the current page location.



Tips!	·Save the new waveform to an existing waveform memory location and the existing waveform will be replaced. Be careful when handling to avoid losing useful data.

After entering the memory waveform reading function, the stored waveforms and related parameters will be displayed on the screen. The results of the automatic waveform measurement are also displayed simultaneously. The range measurement results can be the peak-to-peak, average, and rms values of the waveform.

Multimeter operation

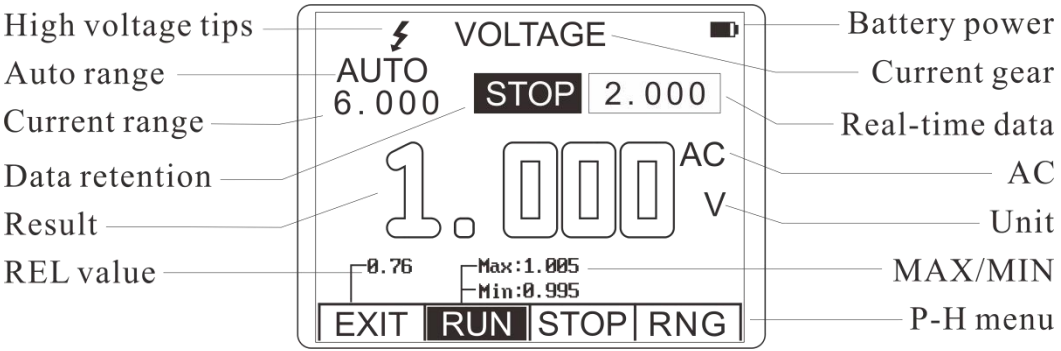
Enter multimeter mode

Power on the default multimeter mode (DMM) mode, or long press the "AUTO" key to switch the mode.

Warning!	·Please read, understand and follow the safety rules and practices indicated in the following contents. ·When changing the measurement function, be sure to detach the probe of the meter pen from the test point first.

Basic display contents in multimeter mode

The following figure shows the basic condition of the screen display in the DMM state. Note that the symbols in the figure do not include the full set of characters for the meter, and they may not all appear at the same time.



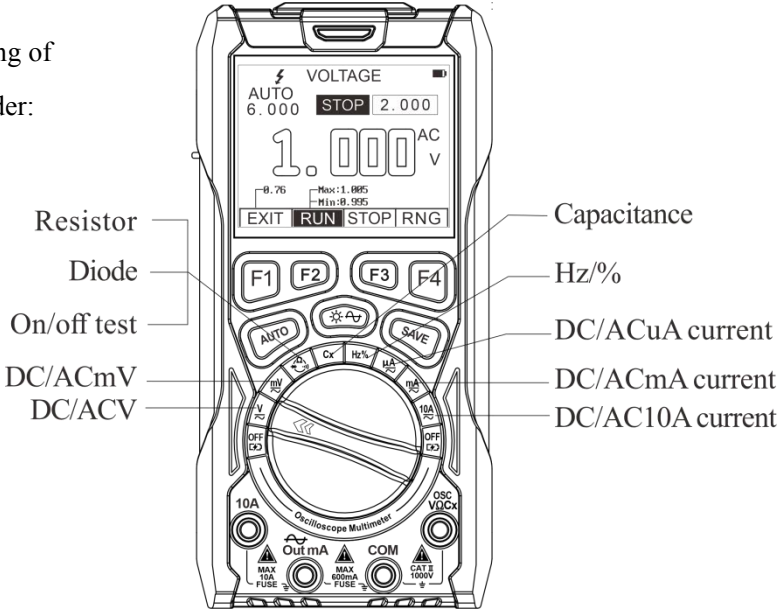
Switching of measurement functions

Turn the knob to select the test function. Switching of measurement functionsCycle in the following order:

DC/ACV→DC/ACmV→resistor/Diode / On/Off /→ /Capacitance→ Hz/%→ DC/ACuA→DC/ACmA current→ DC/AC10A current.

Multifunctional gear can be Pressed

Press the F3 key (SEL) to switch the function.



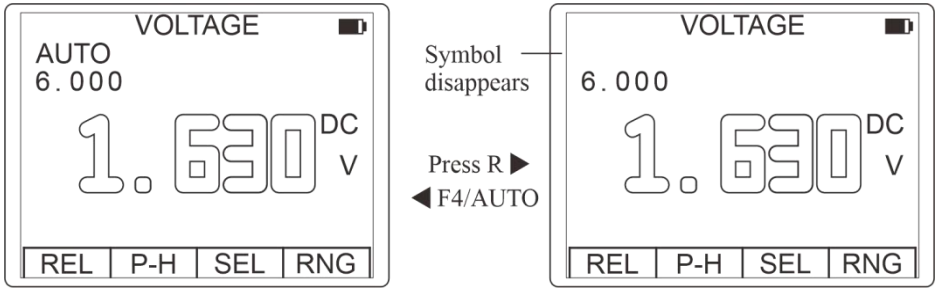
Manual/automatic range selection

The initial state after powering on or switching the measurement function is auto range. For most applications, this is the most convenient method of measurement. When a range needs to be fixed, the following operations can be performed:

1. Press the "F4" (RNG) key, the automatic range mark "AUTO" will disappear and the meter will enter the manual range.

2. Each press of the "F4" (RNG) key switches the meter to the next range.

3. Press the AUTO key to return to the auto range state.



Relative Measurement Mode

The relative value mode is a measurement mode that displays the difference between the actual measured value and the reference value.

Most of the functions of this instrument can be used in relative value mode.

1. When the F1 key (REL) is pressed, the currently displayed measured value is stored as a reference value and then the relative value mode is activated.

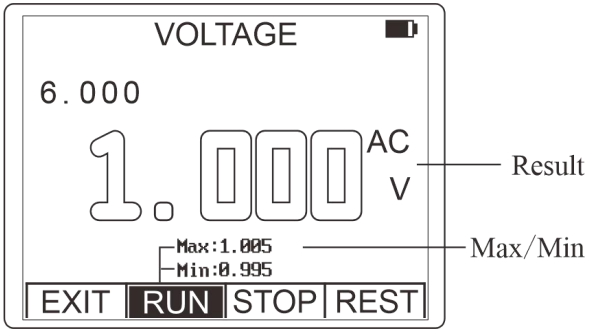
2. The value displayed on the screen is the difference between the current measured value and the pre-stored reference value.
3. Press the F1 key (REL) again to exit the relative value mode.
4. The meter will automatically switch the range control mode to manual mode after entering the relative value mode.
5. When the measurement function is changed, the relative value mode is automatically disengaged.

Peak Hold (P-H) mode

The peak hold mode displays the measured maximum and minimum values. These values are updated with each new measurement. Peak hold mode is available for most functions of this meter. This function can be activated by pressing the F2 button (P-H). The LCD will display the maximum and minimum peak values of the measured data.

The menu functions of the peak hold mode are as follows:

Exit peak hold	Perform measurement	Stop measurement	Reset the peak
EXIT	RUN	STOP	REST
F1	F2	F3	F4



1. Press the F1 key (EXIT) to exit peak hold mode.
2. Press the F2 key (RUN) for peak hold measurement.

3. Press the F3 key (STOP) to stop refreshing the peak measurement
and the current max/min value will no longer change.
4. Press the F4 key (REST) to reset the measured peak in order to start a new measurement.

Tips!	·The meter will automatically switch the range control mode to manual mode after entering peak hold mode. ·The peak hold mode is automatically released when the measurement function, gear, or range is changed or when the relative value mode is selected midway.

AC and DC voltage measurement

Tips!	·If the measured voltage exceeds the "safety voltage" (24V), a warning message " ⚡ " will be displayed. 3 beeps with flashing red light to remind users to pay attention to safety.
Warning!	·To avoid damage to the meter, do not apply 700V AC or 1000V DC for more than 10 seconds to the measurement terminal.

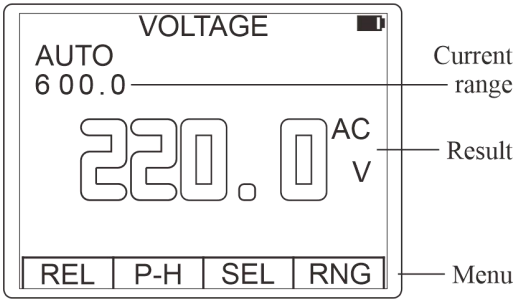
1. Insert the banana plug of the black test lead into the negative polarity "**COM**" socket and the banana plug of the red test lead into the positive polarity "**VΩCx**" socket.
2. Turn the knob to select the " $\underline{\underline{\tilde{V}}}$ " or " $\underline{\underline{\tilde{mV}}}$ " function and the word "VOLTAGE" will appear at the top of the screen to indicate that you are currently in the voltage measurement function.
3. Press the F3 key (SEL) to switch the DC/AC/Hz/% measurement method (no **Hz/%** in mV filegear).

Tips!	Please use the "Hz%" filegear to measure the frequency above 20kHz.

4. Touch the test point with a meter pen.
5. Read the voltage value displayed by the meter. The display includes the value, decimal point, and polarity.

The selection list for voltage measurement is:

Relative value mode	Peak hold mode	Extended measurement functions	Manual measuring range
REL	P-H	SEL	RNG
F1	F2	F3	F4



a. Press the F1 key (REL) to enter the relative value mode.

b. Press the F2 key (P-H) to enter peak hold mode.

c. Press F3 key (SEL) to switch DC/AC/HZ/%(no Hz/% in mV filegear).

d. Press the F4 key (RNG) to switch to the manual measurement range.

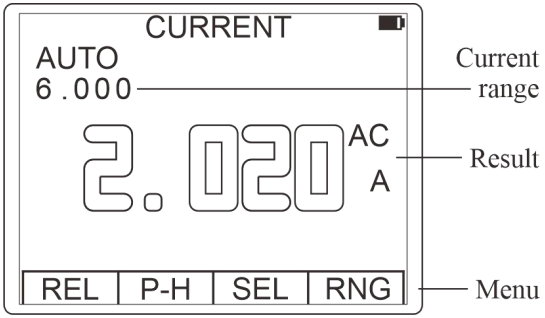
AC and DC current (uA, mA, 10A) measurement

Warning!	·To avoid electric shock, do not perform current measurements on circuits with voltages above 250V. ·When using 10A gear to measure high current, the measurement time should not exceed 30 seconds in every 15 minutes, otherwise the meter and the test meter pen connecting wire may be damaged.

1. Plug the banana plug of the black test lead into the negative polarity "**COM**" socket, and plug the banana plug of the red test lead into the positive polarity "mA" or "10A" socket.
2. Turn the knob to select the "$\mu A\tilde{}$" or "$mA\tilde{}$" or "$10A\tilde{}$" measurement function and the word "CURRENT" will appear at the top of the screen to indicate that you are in the current measurement function.
3. Press the F3 key (SEL) to switch between DC and AC measurement methods.
4. Insert the meter pen in series with the circuit under test. Reads the current value displayed by the meter as well as the decimal point, polarity, etc.

The selection list for current measurement is:

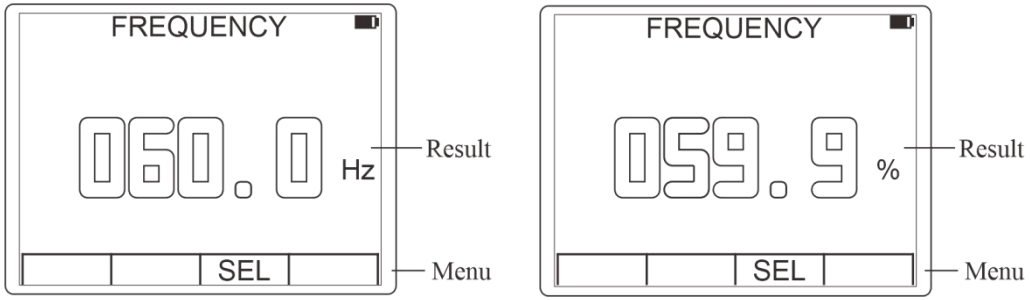
Relative value mode	Peak hold mode	Extended measurement functions	Manual measuring range
REL	P-H	SEL	RNG
F1	F2	F3	F4



a. Press the F1 key (REL) to enter the relative value mode.
b. Press the F2 key (P-H) to enter peak hold mode.
c. Press the F3 key (SEL) to select the extended function: DC/AC.
d. Press the F4 key (RNG) to switch to the manual measurement range.

Frequency measurement and duty cycle measurement

1. Insert the banana plug of the black test lead into the negative polarity "**COM**" socket and the red plug into the positive polarity "**VΩCx**" socket according to the measurement needs.
2. Turn the knob to select " **Hz%**" gear.
3. Press the F3 key (SEL) to select the extended functions: frequency and duty cycle.



Attention!	The signal frequency measurement range is proportional to the signal range, refer to the following table		
	1Hz-5MHz, requires >500mVpp	5MHZ-10MHz, requires >1Vpp	10MHZ-20MHz, requires >3Vpp
	Above 20MHz for reference only		

Resistance measurement

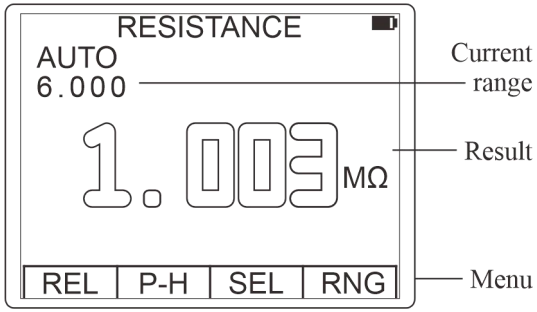
Warning !	To avoid electric shock, when performing resistance measurements, first disconnect the power to the device under test (remove the battery/unplug the power cord) and discharge the capacitor in the power supply.

1. Plug the banana plug on the black test lead into the negative polarity "**COM**" socket; plug the banana plug on the red test lead into the positive polarity "**VΩCx**" socket.
2. Turn the knob to select the " " "measurement function, the word "RESISTANCE" will appear at the top of the screen, indicating that it is in the resistance measurement function.
3. Connect a meter pen across the circuit or component under test. It is best to disconnect the part under test from the line to ensure that the rest of the circuit does not affect the correctness of the readings.
4. Reads the resistance value displayed by the meter as well as the unit and decimal point.

The operation list for the resistance measurement function is:

Relative value mode	Peak hold mode	Extended measurement functions	Manual measuring range
REL	P-H	SEL	RNG
F1	F2	F3	F4

a. Press the F1 key (REL) to enter the relative value mode.



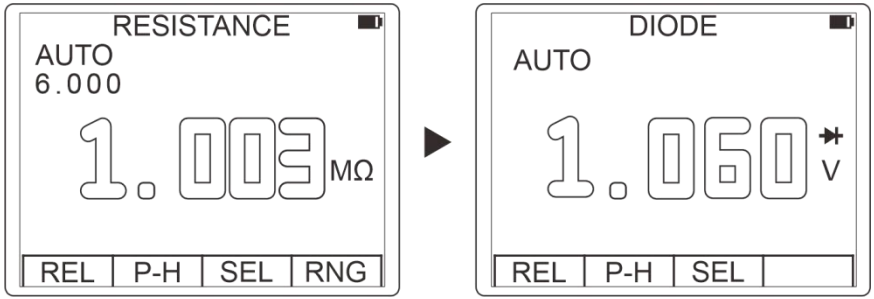
b. Press the F2 key (P-H) to enter peak hold mode.

c. Press the F3 key (SEL) to enter the extended function: Diode Detection.

d. Press the F4 key (RNG) to switch to the manual measurement range.

Diode detection

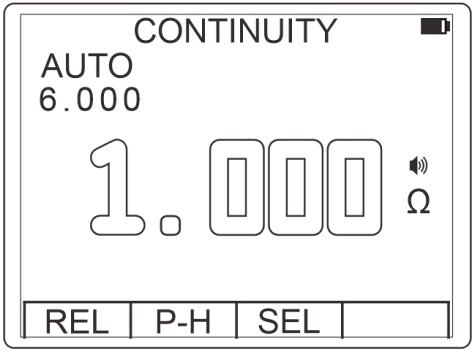
1. Plug the banana plug on the black test lead into the negative polarity "**COM**" socket; plug the banana plug on the red test lead into the positive polarity "**VΩCx**" socket.
2. Turn the knob to select the " " "measurement function, the word "RESISTANCE" will appear at the top of the screen, indicating that it is in the resistance measurement function.
3. Press the F3 key (SEL) to select the diode detection function. The word "DIODE" will appear at the top of the screen to indicate that the diode measurement function is in place.
4. Use the meter pen across the ends of the diode or semiconductor PN junction under test. (silicon tube is about 0.5-0.7V, germanium tube is about 0.15-0.25V).



On/off test

1. Plug the banana plug on the black test lead into the negative polarity "**COM**" socket; plug the banana plug on the red test lead into the positive polarity "**VΩCx**" socket.
2. Turn the knob to select the "  " measurement function, the word “CONTINUITY" will appear at the top of the screen to indicate that it is in the resistance measurement function.
3. Press the F3 key (SEL) to select the on-off test function.
4. Contact the circuit under test with a meter pen, if the resistance is less than 50Ω, the buzzer will sound.

Warning!	To avoid electric shock, diodes containing voltage should not be tested. Do not carry out on-off tests on lines containing voltage



Capacitance measurement

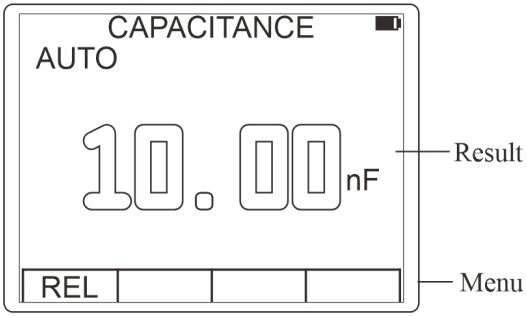
Warning!	To avoid electric shock, capacitors containing voltage should not be tested. The capacitance measurement function cannot be used with manual ranges!

1. Plug the banana plug on the black test lead into the negative polarity "**COM**" socket; plug the banana plug on the red test lead into the positive polarity "**VΩCx**" socket.
2. Turn the knob to select the " **Cx** " measurement function, the word "CAPACITANCE" will appear at the top of the screen, indicating that the capacitance measurement function is in place.
3. Touch the meter pen to the capacitor under test and read out the capacity, decimal point, and units, etc.

The operation list for the capacitance measurement function is:

Relative value mode	Peak hold mode	Extended measurement functions	Manual measuring range
REL	/	/	/
F1	/	/	/

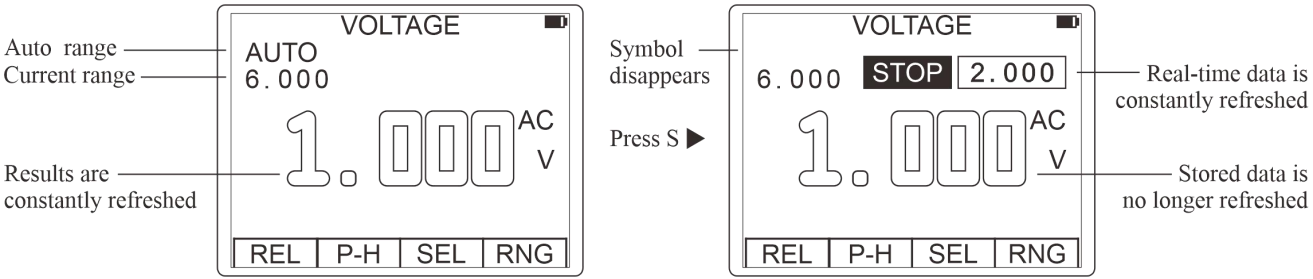
a. Press the F1 key (REL) to enter the relative value mode.



Measurement data hold

By pressing the data hold key "SAVE", the reading being displayed will be held, and the data hold icon "STOP" will appear on the LCD screen. Press the "SAVE" key again to resume normal operation.

1. In the data hold state, a small window (dynamic data window) appears at the top right of the meter's display. Data in this window remains refreshed.
2. Once the meter enters the data hold state, the range control mode is switched to the manual mode.
3. The meter will automatically exit the hold state when switching ranges or changing measurement functions.



Storage and readout of measurement data

The database of this instrument can save up to 100 DMM measurement data.

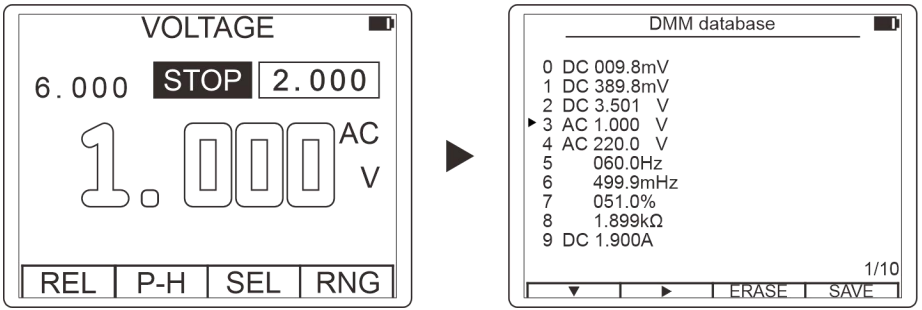
1. Press "SAVE" to keep the current data, then press "SAVE" again and stay for 2 seconds to enter the database, and press F (SAVE) to save the current data.

2. In the database, the LCD will list the 10 save locations on the first page and indicate whether the current save location of the data is available at those locations.
3. If there is data in a location, the value and unit of this data will be listed. Press the "SAVE" key again and hold it for 2 seconds to exit the database function.

The list of database operations is as follows:

Select the recording location	Select adjacent page	Record Delete	Save the data already held
▼	►	ERASE	SAVE
F1	F2	F3	F4

a. Press the F1 key (▼) to select the marker to point to the next save location.
b. Press the F2 key (►) to select the marker to point to the next page.
c. Press the F3 key (ERASE) deletes the current record.
d. Press the F4 key (SAVE) to save the held data in the currently selected save location.



Night mode switch

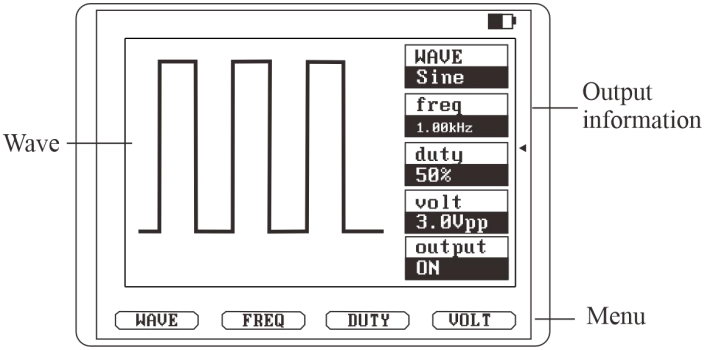
Night mode can be switched by short press " ☼∿ " key, night mode will turn off the LED light effect at the same time.

Signal Source Operation

1. Plug the banana plug on the black test lead into the negative polarity "**COM**" socket; plug the banana plug on the red test lead into the positive polarity "mA" socket.
2. Turn the knob to select the " V≂ "measurement function and set the output signal by pressing and holding the " ☼∿ "key for 2 seconds.
3. Signal source output function, there are sine wave, triangle wave, square wave three waveform output
4. Long press " ☼∿ " key to enter/exit the signal setting interface

The list of signal source operations is as follows:

Select waveform	Select frequency	Select duty cycle	Select range
WAVE	FREQ	DUTY	VOLT
F1	F2	F3	F4



a. Press the F1 key (WAVE) to select the types of sine wave, triangle wave and square wave.

b. Press F2 key (FREQ) to select the frequency.

c. Press the F3 key (DUTY) to select the duty ratio, and only the square waveform is available.

d. Press F4 key (VOLT)F4 to select the amplitude.

e. Press AUTO key to select signal to turn on and off on/off.

Charging parameters description

1. When the screen shows red "▭"prompt, you should charge in time, otherwise it may affect the accuracy of the oscillometric measurement, the output range of the signal source.
2. Select the off gear charging, charger specifications: Type-C interface, output DC5V, current ≧ 1A
3. The red light is on when charging, and the blue light is on when fully charged

Technical parameters and instrument sets

Instrument features and technical parameters

General Features

Display	240 × 320 Color Screen	Observation area	49.0mm × 36.7mm
Back Light	Ever Bright	Input resistance	500mV/div~200V/div, about 5M Ω 50mV/div~200mV/div, about 1M Ω
Battery	One 18650 lithium battery (capacity to be determined)	Automaticsleep	15 minutes or disabled
Static operating current	Multimeter about 80mA Oscilloscope about 300mA	Shutdown	Less than 10μA
Duration of continuous use	More than 8 hours	Save Capability	100 records of DMM data, 10 records of OSC waveforms
Usage environment	0°C~+40°C;<75%RH	Storage conditions	-10°C~+60°C;<90%RH
Outline dimensions	83 mm × 160 mm × 32mm	Weight	About 200g
Charging standard	5V/1A	Charging port	Type-C

Oscilloscope Features

Simulation bandwidth	DC ~ 8MHz（50mV/div ~ 200mV/div） DC ~ 12MHz（500mV/div ~ 20V/div） 20V/divThe above is for reference only	Maximum Equivalent Sampling Rate	50Msps
Number of channels	1	Input Resistance	About 5MΩ
Vertical sensitivity range	500mV~ 200V/div	Time base range	200ns ~ 10s/div
Vertical range Accuracy	±(5%+ 0.2/div)	Time Base Accuracy	±(0.01%+ 0.1/div)
Scan Mode	Auto/normal/single	Trigger edge selection	Rising/falling edge
Automatic settings	Automatic setting of time base and vertical range	Automatic measurement function	Vp-p, Vavg, Vrms, Hz

Signal Source Features

Output frequency	Sine wave: 100Hz~100kHz (fixed-point output in 1-2-5 steps)
	Square wave: 100Hz~20kHz (fixed-point output in 1-2-5 steps)
	Triangular wave: 100 Hz ~ 50 Hz (fixed-point output in 1-2-5 step mode)
Output amplitude	3Vpp、2.5Vpp、2Vpp、1.5Vpp、1Vpp、0.5Vpp、0.4Vpp、0.3Vpp、0.2Vpp、0.1Vpp、0Vpp

Multimeter Features

All range uncertainties are expressed as ± (a% reading + word count). Correction period of one year. The guaranteed uncertainty environmental conditions are: 23°C±5°C, <75%RH.

Function	Measurement range	Resolution	Uncertainty
DC Voltage	600mV/6V/60V/600V/1000V	0.1mV/1mV/10mV/100mV/1V	± 1.5%rdg + 10dgt
	60.00mV/600.0mV	0.01mV/0.1mV	± 0.8%rdg + 10dgt
AC Voltage	600mV/6V/60V/600V/750V	0.1mV/1mV/10mV/100mV/1V	± 1.5%rdg + 10dgt(50Hz ~1kHz)
	60.00mV/600.0mV	0.01mV/0.1mV	± 1%rdg + 10dgt(50Hz ~1kHz)
DC Current	600.0uA/6000uA	0.1μA /1μA	± 1%rdg + 10dgt
	60mA /600mA	10μA /100μA	± 1.5%rdg + 10dgt
	6A /10A	1mA /10mA	± 2%rdg + 10dgt
AC Current	600uA/6000uA	0.1μA /1μA	± 1%rdg + 10dgt(50Hz~1kHz)
	60mA /600mA	10μA /100μA	
	6A /10A	1mA /10mA	± 2%rdg +10dgt(50Hz~1kHz)
Resistance	600Ω/6kΩ/60kΩ/600kΩ/6MΩ/60 MΩ	0.1Ω/1Ω/10Ω/100Ω/1kΩ/10kΩ	± (1.0%rdg + 5dgt) ± (3.0%rdg + 5dgt) /60MΩ
Capacitance	99.99nF/999.9nF/9.99μF/99.99μF/ 999.9μF	10pF/100pF/1nF/10nF/100nF	± (3.0%rdg + 10dgt)
	9.999mF/99.99mF	1μF/10uF	± (5.0%rdg + 15dgt)

Frequency	1.000Hz~20.00MHz	range > 2Vp-p	± (1.0%rdg + 5dgt) (20M or more for reference only)
Diode/on/off test	Open circuit voltage about 2.8V; judgment resistance: about 50Ω		
Fuse specification	750mA/250V ,10A/250V		

Display symbols and icons

DC	Direct Current	AC	Alternating Current
A	Ampere	uA	Microampere
mA	Milliampere	☼	Back Light
V	Volt	mV	Millivolt
F	Farad	mF	Millifarad
nF	Nanofarad	μF	Microfarad
ms	Millisecond	μs	Microsecond
Hz	Hertz	Ω	Ohm
∿	Signal Source	WAVE	Signal Type
AUTO	Auto Range / Auto Scan / Auto Set	P-H	Peak hold
REL	Relative Value	REST	Peak reset
MAX	Maximum value	MIN	Minimum value
STOP	Pause/hold function	EXIT	Exit the current state or menu

COM	Measurement reference (near the input reference socket)	avg	Average value
ERASE	Record Delete	LEVEL	Trigger Level
SAVE	Save current data	RESET	Trigger level zeroing
Normal	Normal trigger method	Single	Single trigger method
Auto	Auto trigger method	Trig	Trigger in progress
Wait	Ready and waiting for trigger	Stop	Hold waveform
TIME	Time base	RANGE	Select range
◄►	Option Adjustment	▲▼	Option Adjustment
	Battery level		Diode
	Trigger edge		Safety Warning

Instrument sets and options

Standard accessories of the instrument: one main unit,one two-color meter pen, one cloth bag, and one product manual.

Daily maintenance and troubleshooting

Keep dry

If the meter is wet, dry it as soon as possible and do not use it until you can be sure it is dry.

Use and storage of meters at room temperature

Extreme ambient temperatures can shorten the life of the electronics, deform the plastic parts of the meter, and even render the meter unusable.

Carefully and gently hold and place the instrument

Drops may damage the LCD, electronic components or the case.

Keep clean

Wipe the instrument's housing frequently with a damp cloth dampened with a tiny amount of detergent. Do not use rough objects, chemical solvents or alcohol, etc.

Replacement of fuse

1. Remove the probe from the test point and turn off the power. Loosen the set screw, remove the back cover, and the fuse is on the back of the test socket.
2. Remove the burnt fuse and replace it with a new fuse of the same specification: 750mA /250V fused fuse for 600mA, 10A /250V fused fuse for 10A. Install the back cover and secure it with screws.

Repair of instruments

1. This product is a precision instrument, and unauthorized modification of wiring, replacement of components, and product calibration and repair work are not allowed without authorization from our Product Service Center.

2. Randomly with all test pens, accessories or options, do not replace, repair or replace with other.

Warning!	Be sure to disconnect the probe from any voltage source before opening the battery back cover, and do not use the meter until the back cover is covered and secured.

Troubleshooting

If your instrument is malfunctioning, you may wish to check it yourself as follows before you determine that the instrument must be repaired.

No screen display, no key response

1. There is no power supply, please charge the machine in time to confirm that it has no power.
2. Turn the knob to the off position and then turn it to the measurement position.

Unable to measure

Please check the goodness of the meter pen (Short connect the meter pen in the on/off gear).

Current cannot be measured

Fuse melted. Replace fuse.

Note:The content of the manual is subject to change without notice.

Disclaimer

All man-made damage, the customer's own dismantling, revision and upgrade, improper use of burn, our company does not assume any responsibility for this.