

Contents

1. Safety Information	1
1.1 Preparation	2
1.2 Using	2
1.3 Symbols	3
1.4 Maintenance	4
2. Descriptions	4
2.1 Components	5
2.2 Switch And Button Instructions	7
2.3 LCD Display	7
3. Specifications	8
3.1 Summary	8
3.2 Technical Specifications	9
4. Operation Instructions	16
4.1 Data Hold	16
4.2 Function Keys	17
4.3 Backlight & Flashlight	17
4.4 Automatic Power Off	18
4.5 Buzzer	18
4.6 Measurement Preparation	19
4.7 AC & DC Voltage Measurement	19
4.8 AC & DC Current Measurement	21
4.9 Resistance Measurement	22
4.10 Diode Test	23
4.11 Buzzer On/Off Test	24

4.12 Transistor Measurement	.....25
4.13 Capacitance Measurement	.....25
4.14 Frequency/Duty Ratio Measurement	.....26
4.15 Temperature Measurement	.....28
4.16 Non-contact voltage Measurement	.....29
(NCV))	
5. Maintenance	.....29
5.1 Battery Replacement	.....29
5.2 Probes Replacement	.....30
6. Appendix	.....30
Warranty Instructions	.....31

This device is a 3 1/2 digit digital multimeter with stable performance and reliable quality. The meter adopts LCD display screen with clear reading, intuitive display and convenient operation. It can be used to measure DC voltage, AC voltage sine RMS, DC current, AC current sine RMS, resistance, capacitance, frequency, duty ratio, diode on/off test, symbol unit data hold and automatic power off functions etc. The meter is equipped with a high performance MCU processor. It is cost performance with full functions and accurate measurement. The multimeter is an ideal tool for laboratory, factory, radio enthusiasts and household.

1. Safety Information

Warning

Pay attention that wrong operations may cause electric shock or damage to the meter. Please follow the normal safety regulations and user manual when using this product.

In order to take full advantages of the functions and ensure safety, please read the instructions in this manual carefully.

The meter complies with the general technical conditions of GB / T 13978-92 digital multimeter and complies with the safety requirements of GB4793.1-1995 (IEC-61010-1, IEC-61010-2-032) electronic measuring requirements. It is a secondary pollution. The overvoltage standard is CAT IV 600V and CAT III 1000V.

Please follow the safety instructions to ensure safe use of the device.

With appropriate use and protection, the multimeter will give you a satisfactory service.

1.1 Preparations

1.1.1 When using the meter, the user must follow the standard safety rules:

- General anti-shock protection
- Avoid misuse of the meter.

1.1.2 After receive the meter, please check if it is damaged in transit.

1.1.3 Store under rough conditions or after shipment, please check to see if the product is damaged or not.

1.1.4 The probe pens must be in good condition. Before use, please check if the probe pens insulation is damaged, the wire is exposed or not.

1.1.5 Using the original probe pens will ensure safety. If not, the same type or same grade ones will be needed.

1.2 Using

1.2.1 When using the meter, please make sure the functions and measuring ranges are correct,

1.2.2 Don't exceed the protection measuring range.

1.2.3 Do not touch the top of the test leads (metal part) while the meter is connected to the measurement circuit.

1.2.4 During measurement, please take care to keep finger behind stylus guard if the measured voltage is above 60V DC or 30V AC (RMS).

1.2.5 Do not measure the voltage if the voltage between the measuring terminal and ground exceeds 750 V.

1.2.6 Before turning the switch to change the

measurement function, please remove the test leads from the circuit which is under test.

1.2.7 Do not measure resistors, capacitors, diodes and on/off when they are charged.

1.2.8 Be careful to avoid the instrument connected to the voltage power when measuring range under current, resistance, capacitance, diode and circuit on/off.

1.2.9 Do not measure the capacitance until the capacitor is fully discharged.


1.2.10 Do not use this meter near explosive gases, vapors or dust.


1.2.11 If there is any abnormal or faulty performance of the meter, stop to use it.


1.2.12 Do not use the device unless the instrument case and battery cover are fully fastened in place.

1.2.13 Do not store or use the meter in direct sunlight, hot or humid conditions.

1.3 Symbols

 Warning (an important safety symbol, please refer to Operation Manual before operating the meter.)

 It can be used on hazardous live conductors.

 Double insulation protection (class II)

CAT III Overvoltage (installation) class III in accordance with IEC-61010-1 Pollution degree 2 refers to the level of impulse withstand voltage protection provided.


 Complies with the European Union (EU) standard

 Ground.

1.4 Maintenance

1.4.1 Do not attempt to open the bottom case to adjust or repair the meter, this operation can only be performed by technicians who fully understand the dangers of the instrument and electric shock.

1.4.2 Before opening the instrument case or battery cover, please remove the test leads from the circuit under test.

1.4.3 To avoid possible electrical shock from erroneous readings, when the meter display “”, please replace batteries.

1.4.4 When clean the meter with a damp cloth and a mild detergent, please do not use abrasives or solvents.

1.4.5 Turn off the power when the meter is not in use and turn the range switch to the OFF position.

1.4.6 If the meter is not used for a long time, remove the battery to prevent damage to the meter.

2. Descriptions

- The meter is a portable, professional measuring instrument, with LCD digital display, and a backlight. Users can read the data easily. One-handed operation of the range switch facilitates measurement, with overload protection and low battery indication. Whether for professionals, factories, schools, hobbyists or families, it is an ideal multifunction instrument.

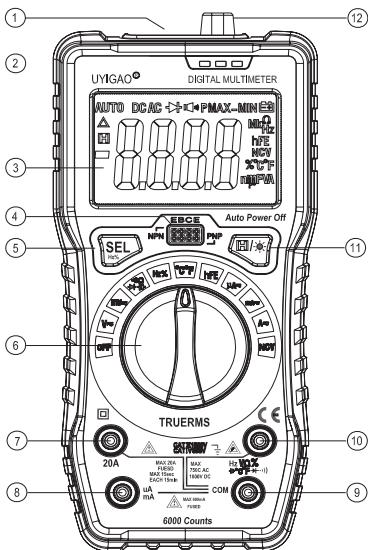
- The meter is for AC current, DC current, AC voltage sine wave True RMS, DC voltage, frequency, duty cycle, resistance, capacitance measurement and line continuity, diode test, temperature measurement.

- Meter is with automatic range function. (Capacitance, frequency)

- Meter has a reading hold function.
- Meter with automatic shutdown function.

2.1 Components

- (1) Flashlight
- (2) NCV and buzzer indicator
- (3) LCD Monitor
- (4) Transistor test socket
- (5) Function selection button (SEL)
- (6) Switch
- (7) 20A High current input jack
- (8) μA 、mA current input jack
- (9) Public side jack
- (10) Resistor, capacitor, voltage, frequency, temperature, diode and on / off input jacks
- (11) Reading Hold / Backlight button (H/☀)
- (12) Non-contact voltage sensing area



2.2 Switch and button and description

H/☀ :For reading hold or backlight control.

SEL For measuring functions switch. Switch between diode and buzzer for diode and buzzer gear; switch between temperature and Fahrenheit for temperature gear; switch for frequency and duty cycle measurement in HZ% gear. In the AC voltage gear can also switch to the measurement frequency state.

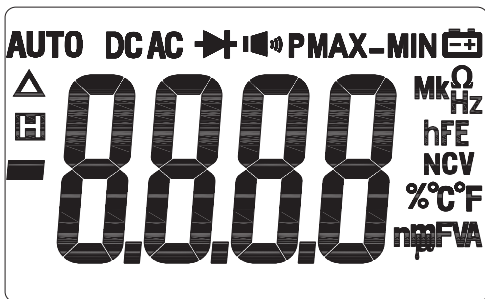
OFF position: Power off



VΩ% Jack: Voltage, resistance, frequency, duty ratio, capacitance, diode, circuit on/off, and temperature input terminals.

COM Jack: Voltage, resistance, frequency, duty ratio, capacitance, diode, circuit on/off and temperature and other public terminals.

Switch: Used for selection function and measuring range

2.3 LCD Display



AC、DC 	ALTERNATING CURRENT 、 Direct Current
►|、	Diode、 On/off
AUTO	Automatic Measuring Range Mode
NCV	Non-Contact AC Voltage Detect
hFE	Transistor test status
℃ ℉	Temperature measurement status
	BATTERY WEEK
H	Data hold
%	Percentage (duty ratio)
mV, V	Millivolt, volt (voltage)
A	Ampere (current)
nF, μF, mF	NaFala, micro-Farah, millifara
Ω, kΩ, MΩ	Ohm, kilo-ohm, megaohm (resistance)
Hz, kHz , MHz	Hertz, kilohertz, megahertz (frequency)

3. Specifications

The meter should be designated one year as a cycle and re-calibrated at 18 °C ~ 28 °C and relative humidity less than 75%.

3.1 Summary

Automatic range and manual range.

Full range overloaded protection.

The maximum voltage allowed between the measuring terminal and ground: 1000V DC or 750V AC

Fuse protection: μA 、mA Gear fuse:FF630mA/250V; A
Gear fuse: FF20A/250V

Working height: Max 2000m

Monitor: 6000 counts LCD monitor.

Maximum display value: 5999 digits

Polarity indication: automatic indication, '-' indicates
negative polarity.

Over-range display: 'OL' or '-OL'.


Sampling time: about 3 times / second

Unit display: a function, power unit display.

Automatic power off time: about 15 minutes when no
signal

Power: DC 9V

Battery type: 6F22 9V battery

Battery under-voltage indication: LCD display 

Temperature coefficient: less than $0.1 \times$ accuracy / $^{\circ}\text{C}$

Working temperature: $18^{\circ}\text{C} \sim 28^{\circ}\text{C}$

Storage temperature: $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$

Size: 190 (L) \times 90 (W) \times 50 (H) mm

Weight: about 380g (including battery)

3.2 Technical Specifications

Ambient temperature: $23 \pm 5^{\circ}\text{C}$ Relative humidity<75%

3.2.1 True RMS zero input characteristics

3.2.1.1 To test sine wave signal measurement, the True
RMS measurement method makes less error than
traditional way of average response.

3.2.1.2 The True RMS meter measures the sine wave

accurately, but it may display a reading between 1 and 50 if the measured signal is not being input (in the ac voltage range, at the input) on the AC function gear. These deviations from the readings are normal. They do not affect the multimeter's accuracy of measuring AC power within the specified measurement range.

3.2.1.3 True RMS values require the input signal to reach a certain level for measurement. Therefore, the AC voltage and current ranges are specified between 2% and 100% of full scale.

3.2.2 DC Voltage

Measuring Range	Resolution	Accuracy
600mV	0.1mV	\pm (0.5% readings + 3digits)
6V	0.001V	
60V	0.01V	
600V	0.1V	\pm (0.8% readings + 5digits)
1000V	1V	

- input resistance: 10M Ω

- Maximum input voltage: 750V AC (RMS) or 1000V DC

Note:

In the small voltage range, the test leads not connected measured circuit, the meter may be beating the readings,

This is normal because of the high sensitivity of the meter, which does not affect the actual measurement results.

3.2.3 AC Voltage

Measuring Range	Resolution	Accuracy
600mV	0.1mV	(1.2% readings + 5 digits)
6V	0.001V	\pm (0.8% readings + 3 digits)
60V	0.01V	
600V	0.1V	\pm (1.0% readings + 10 digits)
750V	1V	

- Input resistance: 10M Ω

- Maximum input voltage: 750V AC (RMS) or 1000V DC

- Frequency range: 40 ~ 1000Hz True RMS

Note:

In the small voltage range, the test leads not connected measured circuit, the meter may be beating the readings,

This is normal because of the high sensitivity of the meter, which does not affect the actual measurement results.

3.2.4 AC Current

Measuring Range	Resolution	Accuracy
60uA	0.01uA	\pm (1.0% readings + 3 digits)
600uA	0.1uA	
6000uA	1uA	
60mA	0.01mA	

600mA	0.1mA	\pm (1.0% readings + 3 digits)
20A	0.01A	\pm (2.5% readings +10 digits)

- Overload Protection: mA measuring range fuse (FF630mA/250V)

20A measuring range fuse (FF20A/250V)

-Maximum input current : mA gear: 600mA DC or AC RMS;

-20A gear: 20A DC or AC RMS;

When the measured current is greater than 5A, the continuous measurement time is not longer than 15 seconds, after measuring the current measurement to be stopped for more than 1 minute.

- Frequency response: 40Hz ~ 1000Hz true RMS.

3.2.5 DC Current

Measuring Range	Resolution	Accuracy
60uA	0.01uA	\pm (0.8% readings + 3 digits)
600uA	0.1uA	
6000uA	1uA	
60mA	0.01mA	
600mA	0.1mA	
20A	0.01A	\pm (2.0% readings +10 digits)

- Overload Protection: mA measuring range fuse

(FF630mA/250V),20A measuring range fuse
(FF20A/250V)

- Maximum input current : mA gear: 600mA DC or AC
RMS;

20A gear: 20A DC or AC RMS;

When the measured current is greater than 5A, the continuous measurement time is not longer than 15 seconds, after measuring the current measurement to be stopped for more than 1 minute.

3.2.6 Frequency

Measuring Range	Resolution	Accuracy
9.999Hz	0.001Hz	$\pm (1.0\% \text{ readings} + 3 \text{ digits})$
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99KHZ	0.01kHZ	
999.9KHZ	0.1KHZ	
9.999MHZ	0.001MHZ	

- Overload protection: 250V DC or AC (RMS)

- Input voltage range: 200mV~10V ac (As the measured frequency increases, the input voltage should also increase)

3.2.7 Duty Ratio

Measuring Range	Resolution	Accuracy
-----------------	------------	----------

0.1 – 99.9%	0.1%	$\pm 3.0\%$
-------------	------	-------------

- Frequency response: 10 ~ 10MHz
- Input voltage range: 200mV ~ 10V ac (with the measured frequency increases, the input voltage should also increase)
- Maximum input voltage: 250V AC (RMS)

3.2.8 Resistance

Measuring Range	Resolution	Accuracy
600 Ω	0.1 Ω	$\pm (0.8\% \text{ readings} + 3 \text{ digits})$
6k Ω	0.001k Ω	
60k Ω	0.01k Ω	
600k Ω	0.1k Ω	
6M Ω	0.001M Ω	$\pm (1.2\% \text{ readings} + 3 \text{ digits})$
60M Ω	0.01M Ω	

- Open circuit voltage: about 1.0V
- Overload protection: 250V DC or AC (RMS)


3.2.9 Circuit On/Off Test

Measuring Range	Resolution	Function

•||)	0. 1Ω	<p>1) If the resistance of the circuit to be tested is less than 50Ω, buzzer attached to the instrument may sound. If less than 10Ω, the buzzer must sound.</p> <p>2) When the built-in buzzer sounds and the indicator lights on, when the measured resistance is about 40Ω~60Ω, the rightmost two indicator lights; When the measured resistance is less than 30Ω, the rightmost four lights will be on. When the measured resistance is not over 5Ω, all six lights will be lit</p>
------	-------	--

- Open circuit voltage: about 1.0V
- Overload protection: 250V DC or AC (RMS)

3.2.10 Diode Test

Measuring Range	Resolution	Function
	0.001V	Display approximate diode forward voltage value

- Forward DC current is about 1mA
- Reverse DC voltage about 3.0V
- Overload protection: 250V DC or AC (RMS)

3.2.11 Transistor test

Measuring Range	Description	Test Conditions
-----------------	-------------	-----------------

hFE	The display reads the hFE approximation (0~1000)	Base current approx 10uA; Vce approx 2.8V
-----	--	--

3.2.12 Capacitance

Measuring Range	Resolution	Accuracy
9.999nF	0.001nF	$\pm (4.0\% \text{ readings} + 3 \text{ digits})$
99.99nF	0.01nF	
999.9nF	0.1nF	
9.999 μ F	0.001 μ F	
99.99 μ F	0.01 μ F	
999.9 μ F	0.1 μ F	
9.999mF	0.001mF	$\pm (5.0\% \text{ readings} + 3 \text{ digits})$
99.99mF	0.01mF	Not calibrated

- Overload protection: 250V DC or AC (RMS)


3.2.13 Temperature Test

Measuring Range	Accuracy	Resolution
-20°C — 300°C	$\pm(1.0\%+4d)$	1°C
301°C — 1000°C	$\pm(1.9\%+5d)$	1°C
-4°F — 600°F	$\pm(1.2\%+6d)$	1°F
601°F — 1832°F	$\pm(1.9\%+6d)$	1°F

- Overload protection: 250V DC or AC (RMS)

4. Operation Instructions

4.1 Data hold

In the process of measurement, if need to hold the reading, you can tap “ **H/**  key to display.

The displayed value of the device will be locked, and then to press the key again to release the reading hold.

4.2 Function Key

- 1) In diode, buzzer gear, press "SEL" key, the meter will switch between on-off detection and diode two-file.
- 2) In frequency and duty gear, press "SEL" key, the meter will switch between the frequency and duty.
- 3) In temperature gear, press "SEL" key, the meter will switch between degrees Celsius and Fahrenheit.
Press HZ% key to switch between HZ and DUTY.
- 4) Press "SEL" key in AC voltage gear to enter the frequency test status. This is the most convenient frequency test for high-voltage signals.





4.3 Backlight and flashlight

1) During the measurement, if the ambient light is too dark, which makes the reading difficult, press the “H/☀” key for more than 2 seconds, turn on the backlight and the flashlight, and turn off automatically after about 15 seconds.

2) If you press the “H/☀” key for more than 2 seconds during this period, the backlight and the light will be turned off manually.

Backlight and flashlight's illuminator is LED which works with large current. The meter has a timer circuit (about 15 seconds, but the battery life will be shorten if backlight and flashlight are used often. So don't use the backlight very often if not necessary.

Note:

When battery voltage $\leq 7.5\text{V}$, LCD display “” (Under-voltage) symbol. But under the condition of backlight and flashlight, when battery voltage $\geq 7.5\text{V}$, the high working current will decrease the battery voltage, “” symbol may appears (when “” appears, the measuring result may not be accurate), It is no necessary to replace batteries. Please turn off the backlights and flashlights and use the meter in normal condition until “” appears again.

4.4 Automatic Power Off



- 1) If there is no operation for any 15 minutes after power-on, the meter will go to sleep state to automatically shut down to save power. One minute before the shutdown, the buzzer has 5 prompts, and then goes to sleep after a long time before shutdown. (Note: there is still 3 ~ 5uA working current after automatic shutdown, it is better to go to OFF or unplug the battery for a long time)
- 2) After automatically shut down, press the SEL button, the meter resumes working status.
- 3) If the "SEL" key is pressed while powering on, the auto power off function will be canceled.

4.5 Buzzer

When any key is pressed or the function switch is turned on, if the function key is active, the buzzer beeps (about 0.25 seconds). If the measured voltage or current is greater than the set alarm value, for example, the AC

voltage is greater than 750V, the DC When the voltage is higher than 1000V and the AC / DC current is greater than 20A, the buzzer will continue to sound as over-range warning. The buzzer will continuously emit 5 sounds about 1 minute before the auto-off and the buzzer will give a long sound warning; When the auto power off function is canceled, the buzzer will be issued five consecutive warnings every 5 minutes.

4.6 Measurement Preparation

- 1) Turn the switch to turn on the power. If the battery voltage is low (about $\leq 7.5V$), the monitor Show “” symbol, then you should replace the battery.
- 2) “” symbol indicate that the input voltage or current should not exceed the indicated value, which is to protect the internal circuit from damage.
- 3) Set the switch to the desired measurement function and range.
- 4) When wiring, first to connect the public test line, then connect the live test line. Remove the wiring should first remove the power of the test line.

4.7 AC & DC voltage measurements

Warning

Risk of electric shock

Pay special attention to avoid electric shock when measuring high voltage.

Do not enter voltages above 1000V DC or 750V rms to prevent electric shock or damage to the

meter.

Do not apply voltages in excess of 1000VAC or 750VAC between the common terminal and earth ground in case of electric shock or damage to the meter.

The meter's DC voltage range is: 600.0mV、6.000V、60.00V、600.0V、1000V

AC voltage range is: 6.000V、60.00V、600.0V、750V

1) Set the switch to **V_{DC}** DC voltage position。 or **V_{AC}** AC voltage gear.

2) Connect the red and black test leads separately to COM and **VΩ_{Hz}mA_{10A}** input jack.

3) Measure the other two ends of the test pen and connect it to the voltage source or both ends of the load.

4) read by the LCD monitor the measured voltage value. When measuring DC voltage, the display will be simultaneous

Shows the polarity of the voltage connected to the red test lead.

Note:

1) In the small voltage range such as DC 600mV and AC 6V range, the test leads are not connected to the measured power

LCD, there will be beatings on the LCD. This is normal because of the high sensitivity of the meter. When the meter is connected to the circuit under test, a real measured value is obtained.

2) “**△**” Indicates the maximum input voltage is 750V AC

or 1000V DC.

3) If the meter measured readings over 1000V DC or 750V RMS AC, it will be issued a "beep" alarm sound.

4.8 AC & DC Current Measurement

⚠ Warning

Risk of electric shock

Do not attempt to make current measurements on the circuit when the voltage between the open circuit voltage and ground exceeds 250V. If the fuse is blown during measurement, it may damage the meter or yourself.

To avoid damage to the meter or the device under test, check the fuse of the meter before making current measurements. When measuring, use the correct input sockets, function gears and measuring range. When the test pen is inserted in the current input socket, do not connect the other end of the test pen to any circuit in parallel

The meter's AC & DC current range is: 60uA、600uA、6000uA、60mA、600mA、20A.

Measuring Current

- 1) Turn the rotary switch to the proper position.
- 2) Connect the black test lead to the COM input socket. If the measured current is less than 600mA, connect the red test pen to the mA input socket; if the measured current is

between 600mA and 20A, connect the red test lead to the 20A input socket.

3) Disconnect the circuit under test. Connect the black test lead to the disconnected (lower voltage) end of the circuit, and connect the red test lead to the other end of the disconnected circuit (which has a higher voltage).

4) Connect the circuit power, and then read the displayed readings. If the display only shows "OL", this means that the input exceeds the selected range and the rotary switch should be placed in a higher range.

4.9 Resistance Measurement

Warning


Risk of electric shock.

To avoid damage to the meter or the device under test, all power to the circuit under test should be cut off and all high voltage capacitors fully discharged before measuring the resistance.

Resistance is measured in ohms (Ω)

The meter's resistance range is :600.0 Ω 、 6.000k Ω 、 60.00k Ω 、 600.0k Ω 、 6.000M Ω 、 60.00M Ω 。

Resistance measurement:

- 1) Turn the rotary switch to the proper position.
- 2) Insert the black test lead into the **COM** jack, and the red test lead into the  jack.
- 3) Use the other end of the test pen to measure the resistance of the circuit under test.

4) Read the measured resistance value from the LCD.

Note:

- 1) The measured resistance on the circuit will usually differ from the resistance rating.
- 2) In the measurement of low resistance, in order to measure accurately, please short-circuit the two test leads, read out the resistance of the test leads short-circuit, after measuring the resistance to be measured to be subtracted from the resistance.
- 3) At $60\text{M}\Omega$, the meter may take a few seconds to stabilize the reading, which is normal for high resistance measurements.
- 4) When the meter is open, the display will show "OL", indicating that the measured value is out of range.




4.10 Diode Test

⚠ Warning

Risk of electric shock.

To avoid damage to the meter or the device under test, all power to the circuit under test should be cut off and all high voltage capacitors fully discharged before measuring the resistance.

Test a diode outside the circuit

- 1) Turn the rotary switch to the  gear, press "SEL" button to switch to  test status.
- 2) Insert the black test lead into the **COM** jack, and the red test lead into the  Jack.
- 3) Connect the other end of the red test lead to the diode anode and the other end of the black test lead to the diode cathode for testing.

4) The meter shows the approximate forward voltage drop of the diode under test. If the polarity of the test leads is reversed, the meter will display "OL."

In the circuit, the normal diode should produce a forward voltage drop of 0.5V to 0.8V; however, the reverse bias reading will depend on the change in resistance of the other channels between the two test leads




4.11 Buzzer On/Off Test

Warning

Risk of electric shock.

To avoid damage to the meter or the device under test, all power to the circuit under test should be cut off and all high voltage capacitors should be fully discharged before the beep on-off test.

On-off test:

- 1) Turn the rotary switch to the  gear, and press "SEL" button to switch to the  test status.
- 2) Insert the black test lead into the **COM** jack, and the red test lead into the  Jack.

Connect the other end of the red and black test leads to the resistance of the circuit under test. If the resistance of the circuit under test is less than 50Ω , the buzzer inside the meter may sound. When the built-in buzzer sounds and the indicator lights, when the measured resistance is about $40\Omega\sim 60\Omega$, only the rightmost two indicator lights; when the measured resistance is less than 30, the

rightmost four Only the light will be lit; when the measured resistance is less than 5Ω , all six lights will be lit.

Note:

If the test leads are open or the measured line resistance is greater than 600Ω , the display shows "OL".

4.12 Transistor Measurement

⚠ Risk of electric shock.

Do not apply voltages in excess of 36 VDC or RMS to the common and hFE terminals to prevent electric shock or damage to the meter.

- 1) Turn the rotary switch to hFE.
- 2) First determine the transistor is NPN or PNP type, and then the three e, b, c three feet into the hFE test hole corresponding hole.
- 3) The hFE approximation of the transistor being measured is read by the liquid crystal display.

4.13 Capacitance Measurement

⚠ Risk of electric shock.

To avoid damage to the meter or the device under test, disconnect all power to the circuit under test and fully discharge all high-voltage capacitors before measuring capacitance. DC voltage gesr to determine the capacitor has been discharged.

The meter's capacitance range is: 60.00nF、600.0nF、6.000uF、60.00 uF、600.0 uF、6mF、100mF。

- 1) Turn the rotary switch to 100mF.
- 2) Insert the black test lead into the **COM** jack, and the red test lead into the **HzVΩ%
*CF*** jack.
- 3) After the capacitor is fully discharged, connect the other end of the red and black test leads to the two ends of the capacitor under test. The measured capacitance value is read by the liquid crystal display.

Note:

- 1) To improve the accuracy of measurements below 10nF, subtract the distribution capacitance of the meter and leads.
- 2) When measuring large capacitance, stable reading takes a certain amount of time.
- 3) When measuring polar capacitor, pay attention to the corresponding polarity to avoid damaging the instrument.

4.14 Frequency / Duty Ratio Measurement

1) Through the AC voltage gear:

⚠ Warning

Risk of electric shock.

Pay special attention to avoid electric shock when measuring high voltage. Do not enter voltages above 750V RMS to prevent electric shock or damage to the meter.

Do not apply voltages in excess of 750 V RMS between the common terminal and earth ground in case of electric shock or damage to the meter.

- 1) Put the changeover switch in the proper AC voltage

range.

2) Connect the red and black test leads to the **COM** and **VΩ%** input jack.

3) Press "**SEL**" key to switch to frequency measurement status

4) Use the other two ends of the test pen and connect it to the voltage source or both ends of the load for measurement.

5) Read the measured frequency value from the LCD.

6) Press "**SEL**" again to enter the duty cycle measurement status.

Note:

(1) The measurement range of frequency is 10Hz ~ 10kHz. If the measured frequency is lower than 10Hz, the LCD will display "00.0". It is possible to measure the frequency below 10 kHz, but the measurement accuracy is not guaranteed.

(2) duty ratio measurement range of 10 to 95%.

(3) "△" Indicates the maximum input voltage is 750V AC (RMS).

2) Through the HZ / DUTY gear:

△ Warning

Risk of electric shock.

Do not measure the frequency of any voltage above 250V DC or ac RMS to prevent electric shock or damage to the meter.

1) Set the switch to Hz%.

- 2) Connect the red and black test leads to the **COM** and **VΩ** jack respectively.
- 3) Connect the other two ends of the red and black test leads to the signal source or both ends of the load.
- 4) Read the measured frequency value from the LCD.
- 5) Press "SEL" again to enter duty cycle measurement.

Note:

The measurement range of the frequency is 10Hz ~ 10MHz. If the measured frequency is lower than 10Hz, the LCD will display "000.0". It is possible to measure the frequency above 10 MHz, but the measurement accuracy is not guaranteed.

4.15 Temperature Measurement

Warning

Do not enter a temperature higher than 60V AC voltage 30V AC voltage to avoid damage or instrument damage

- 1) Turn the switch to the temperature measurement position and select (press "SEL") Celsius or Fahrenheit as required.
- 2) Connect the negative terminal (black) and the positive terminal (red) of the K type thermocouple to the **COM** input jack and **VΩ** input jack separately.
- 3) The other end of the thermocouple (test side) close to the surface of the measured object.
- 4) To be read by the liquid crystal display to read the measured temperature value.

Note:

K-type thermocouple distribution of the highest measurement temperature of 250

4.16 Non-Contact Voltage Measurement (NCV)



Set the function range switch to the NCV range position. At this time, the instrument displays "NCV" and "----" symbols, and the top of the instrument is close to the object to be detected such as the mains phase line, the power switch and the outlet. When the voltage is detected to be greater than 110V (AC RMS), the meter lights up the corresponding signal strength indicator (high, medium and low) according to the detected signal strength, and the buzzer will give out alarm at different frequencies.

Note:

- 1) Even if there is no indication, the voltage may still exist. Do not rely on non-contact voltage detectors to determine if there is voltage on the shield. Detection operations may be affected by socket design, insulation thickness and type of different factors.
- 2) When the input voltage of the instrument input terminal, due to the existence of induced voltage, the voltage sensing indicator may also be bright.
- 3) Sources of external environment interference (such as flash, motor, etc.) may falsely trigger non-contact voltage detection.

5 Maintenance

5.1 Battery Replacement

 To avoid false readings that could result in electric shock or personal injury, replace the battery immediately with the “” symbol on the

meter's display.

To avoid electric shock or personal injury, shut off the machine and check that the test pen has been disconnected from the measurement circuit before opening the battery cover to replace the new battery.

Please follow the steps below to replace the battery

- 1) Turn off the meter power.
- 2) Remove all test leads from the input socket.
- 3) Unscrew the cover battery cover screw and remove it.
- 4) Remove the battery cover.
- 5) Replace the new 6F22 9V battery
- 6) Install the battery cover as it is and tighten the screw.

Note:

The polarity of the battery can not be installed reversely.

5.2 Probes Replacement

Warning

When changing the test leads, the same or equivalent test lead must be replaced. The pen must be in good condition, the level of the pen: 1000V 10A.

If the pen insulation is damaged, such as wire exposed, you must replace the pen.

6. Appendix

1) Probes

Grade: 1000V 1 pair

2)	User Manual		1 pc
3)	Temperature probe		1 pair
4)	Battery	6F22 9V	1 pc

* The contents of this manual are subject to change without notice *

* The contents of this manual are considered correct. Please contact the manufacturer if the user finds errors, omissions, etc. *

* The company is not responsible for accidents and hazards caused by user's wrong operations *

* The functions described in this manual do not justify the use of the product for special purposes *

Warranty Instructions:

Product certification is required when your device in the use of the failure to seek maintenance services. And at the same time, please provide your purchase invoice.

(1) When your device fails to use, please contact our repair service department as soon as possible, to avoid delaying your use and warranty period.

(2) The manufacturer provides users one year warranty from the date of purchase. Within warranty period time, we will provide free warranty service after the company professional confirm that the defectives not caused by users' wrong operation.

(3) If the product is out of warranty valid time, we will charge your maintenance fees (repair fee + component fee).

(4) Within the warranty period time, we will charge maintenance cost according the following situations:

- *Users improper use of device or damage caused by accident leads to damaged components and burned board.
- *The device has been opened, inspected, or modified by those who are not the company professionals.
- * Failures caused by not following instruction manuals.
- * The device was not manufactured by the company.
- * Shipping cost and other related costs due to maintenance are to the users' account.
- * Batteries, testing leads and related functional accessories are out of warranty policy.

C E FCC **RoHS**
Made in China



20180120-19B