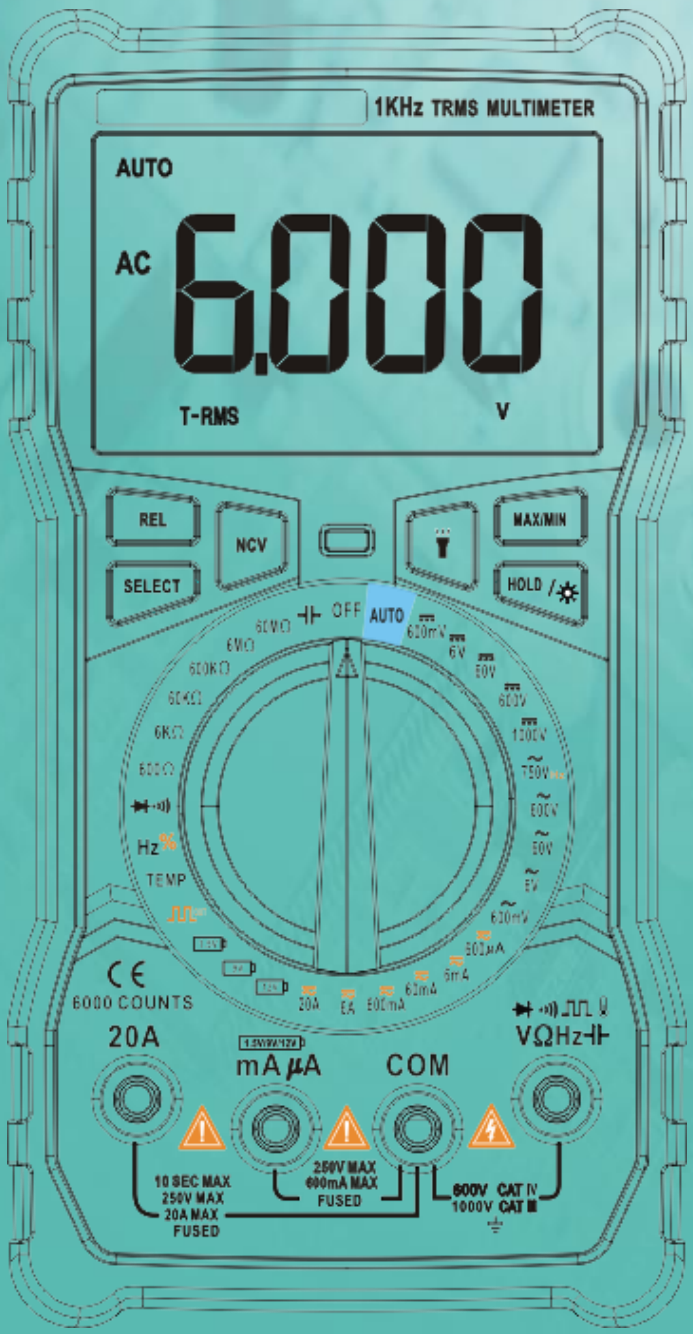
User Manual



LIMITED WARRANTY AND LIMITATION OF LIABILITY

Customers enjoy one-year warranty from the date of purchase.

This warranty does not cover fuses, disposable batteries, damage from misuse accident, neglect, alteration, contamination, or abnormal conditions of operation or handling, including failures caused by use outside of the product's specifications, or normal wear and tear of mechanical components.

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Introduction

This product is a battery-powered, true-rms, auto-ranging digital multimeter with a 6000 counts LCD display and a backlight.

Safety Information

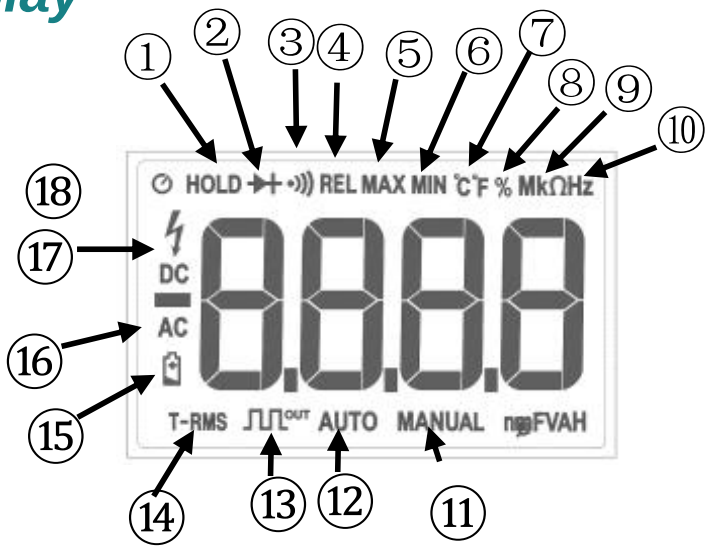
To avoid possible electrical shock, fire, or personal injury, please read all safety information before you use the product. Please use the product only as specified, or the protection supplied by the product can be compromised.

- Examine the case before you use the product. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.
- The measurement must be made with correct input terminals and functions and within the allowable measuring range.

- Do not use the product around explosive gas, vapor, or in damp or wet environments.
- Keep fingers behind the finger guards on the probes.
- When the product has already been connected to the line being measured, do NOT touch the input terminal that is not in service.
- Disconnect the test leads from the circuit before changing the mode.
- When the voltage to be measured exceeds 36V DC or 25V AC, the operator shall be careful enough to avoid electric shock.
- Misuse of mode or range can lead to hazards, be cautious. “ OL ” will be shown on the display when the input is out of range.
- Low level of a battery will result in incorrect readings. Change the batteries when battery level is low. Do not make measurements when the battery door is not properly placed.

Instrument Overview

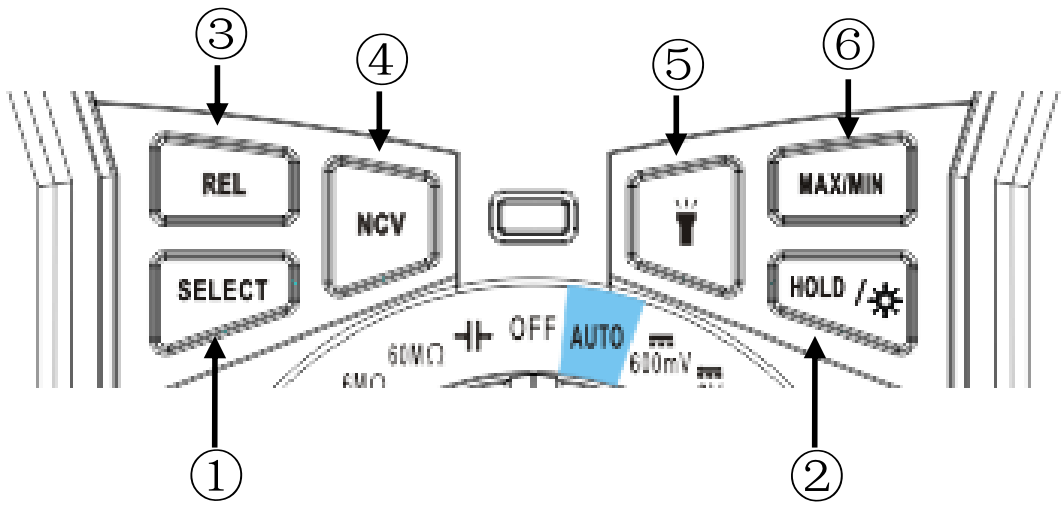
LCD Display



①	HOLD	Display freezes present reading.
②	▶|◀	Diode test.
③	)))))	Continuity test.
④	REL	The product measures both sinusoidal and nonsinusoidal ac waveforms accurately.
⑤	MAX	Display shows maximum reading.
⑥	MIN	Display shows minimum reading.
⑦	°F °C	Temperature test. (Fahrenheit or Celsius)
⑧	%	Duty cycle test.

⑨	Ω	Resistance test. (Ohm)
⑩	Hz	Frequency test. (Hertz)
⑪	MANUAL	Manual range. The user selects the range.
⑫	AUTO	Auto range. The product selects the range with the best resolution.
⑬		Suqare waves output
⑭	TRUE RMS	True RMS
⑮		Low battery. Replace batteries.
⑯	AC	Alternating current.
⑰	DC	Direct current.
⑱		Unsafe Voltage.
n k M m		Measurement units.

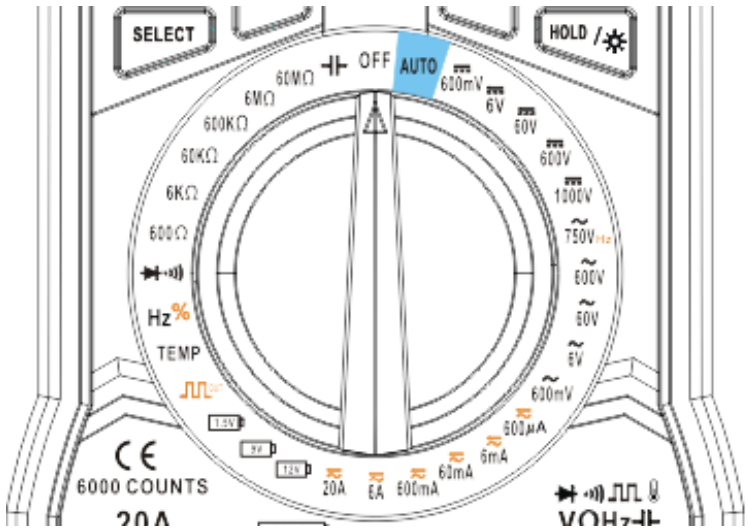
Function Buttons



①	Selects alternate measurement modes on a rotary switch setting, including: 1. Frequency/Duty Cycle 2. DC A/AC A 3. DC mA/AC mA 4. DC μA/AC μA 5. Celsius/Fahrenheit 6. Square waves output
②	Push once to hold the current reading on the display; push again to continue normal operation. Push for more than 2 seconds to turn on the backlight; long-push again to turn off or the backlight automatically turns off after 2 minutes.

③	Push this button to enter the relative mode. The product will store the present reading as a reference for subsequent readings. The display is zeroed, and the stored reading is subtracted from all subsequent readings. Push again to exit the relative mode.
④	Keep pushing this button to enter the NCV testing mode. In this mode, you have to push the button always.
⑤	Push once to turn on the flashlights,push once more to turn off the flashlight.
⑥	Push to toggle between the MAX and the MIN mode. To exit MAX/MIN mode, push the button for more than 2 seconds

Rotary Switch

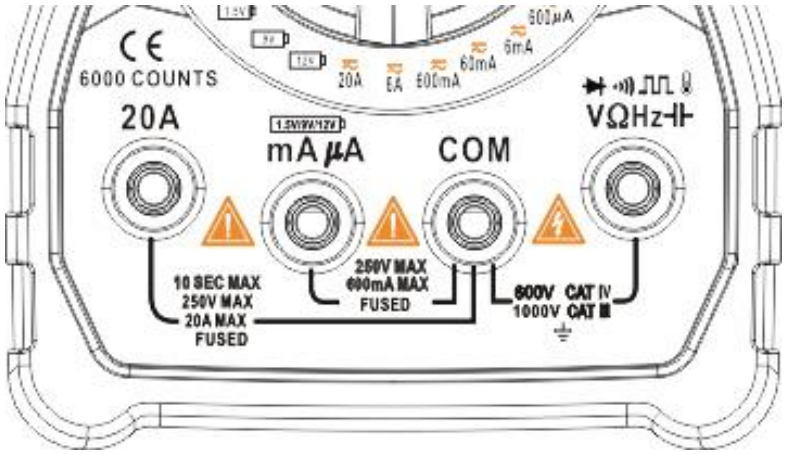


OFF	Turn off the product at this position. • The product automatically powers off after 15 minutes of inactivity. • The built-in beeper beeps 5 times 1 minute before auto power off. • To restart the product from auto power off, press the SELECT button or turn the rotary switch back to the OFF position and then to a needed position. • To disable the Auto Power Off function, hold down the SELECT button when turning on the product, you will hear four beeps if you have successfully disabled the function.

	DC Voltage: ≤500V AV Voltage: ≤500V Resistance: ≤ 60MΩ Continuity: √	Auto mode ONLY can test the voltage under 500V, resistance and continuity.
600mV	DC Voltage: ≤600mV。	
6V	DC Voltage: ≤6V	
60V	DC Voltage: ≤60V	
600V	DC Voltage: ≤600V	
1000V	DC Voltage: ≤1000V	
750V Hz	AC Voltage: ≤750V	
600V	AC Voltage: ≤600V	
60V	AC Voltage: ≤60V	
6V	AC Voltage: ≤6V	
600mV	AC Voltage: ≤600mV	
600μA	AC/DC Current: ≤600uA	
6mA	AC/DC Current: ≤6mA	
60mA	AC/DC Current: ≤60mA	
600mA	AC/DC Current: ≤600mA	

6A	AC/DC Current：≤6A
20A	AC/DC Current：≤20A
12V	12V Battery testing
9V	9V Battery testing
1.5V	1.5V Battery testing
OUT	Square waves output 50-5000Hz
TEMP	Celsius:-20~1000, Fahrenheit:-4~1832
Hz %	Frequency, Duty cycle1%~99%
	Continuity, Diode
600Ω	Resistance：≤600Ω
6KΩ	Resistance：≤6KΩ
60KΩ	Resistance：≤60KΩ
600KΩ	Resistance：≤600KΩ
6MΩ	Resistance：≤6MΩ
60MΩ	Resistance：≤60MΩ
	Capacitance：≤10mF

Input Terminals



20A	Input terminal for AC/DC current measurements to 20A.
1.5V/9V/12V mA μA	Input terminal for AC/DC current measurements to 600mA. Input terminal for battery testing.
COM	Common (return) terminal for all measurements.
VΩHz	Input terminal for the measurements of: 1. AC/DC voltage 2. Resistance 3. Capacitance 4. Frequency 5. Temperature 6. Continuity 7. Diode 8. Duty cycle 9. Square waves output

Measurements Instruction

Measure AC/DC Voltage

1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.
2. Turn the rotary switch to each range from 600mV~1000V according to the votage you want to test. Or you can choose the AUTO mode for testing the voltage under 500V.
3. Touch the probes to the correct test points of the circuit to measure the voltage.
4. Read the measured voltage on the display.

***Do not measure voltage that exceeds the extremes as indicated in the Specifications.**
***Do not touch high voltage circuit during measurements.**

Measure AC/DC Current

1. Connect the black test lead to the COM Terminal and the red lead to the mA μA Terminal or the 20A Terminal (choose based on the value of the current to be measured).

2. Turn the rotary switch to each range from 600uA~20A.
3. Press SELECT to toggle between AC/DC.
4. Break the circuit path to be measured, connect the test leads across the break and apply power.
5. Read the measured current on the display.

***Do not measure current that exceeds the extremes as indicated in the Specification.**
***Use the 20A Terminal and the Mode when you are measuring an unknown curre Then switch the mA µA Terminal and the Mode or the Mode if necessary.**
***Do not input voltage at this setting.**

Measure Resistance

1. Connect the black test lead to the COM Terminal and the test lead to the Terminal.
2. Turn the rotary switch to each range from 600Ω~60MΩ, Or you can choose the AUTO mode for testing the resistance.
3. Touch the probes to the desired test points of the circuit to measure the resistance.
4. Read the measured resistance on the display.

***Disconnect circuit power and discharge all capacitors before you test resistance.**
***Do not input voltage at this setting.**

Test for Continuity

1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.
2. Turn the rotary switch to
3. Touch the probes to the desired test points of the circuit.
4. The built-in beeper will beep when the resistance is lower than 50Ω, which indicates a short circuit.

***Do not input voltage at this setting.**

Test Diodes

1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.

2. Turn the rotary switch to ⊣◀·))
3. Connect the red probe to the anode side and the black probe to the cathode side of the diode being tested.
4. Read the forward bias voltage value on the display.
5. If the polarity of the test leads is reversed with diode polarity or the diode is broken, the display reading shows "OL".

***Do not input voltage at this setting.**
***Disconnect circuit power and discharge all capacitors before you test diode.**

Measure Capacitance

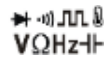
1. Connect the black test lead to the COM Terminal and the red lead to the ⊣◀·))⎍⎍ VΩHz⊣ Terminal.
2. Turn the rotary switch to ⊣⊢ .
3. Connect the red probe to the anode side and

the black probe to the cathode side of the capacitor being tested.

4. Read the measured capacitance value on the display once the reading is stablized.

***Disconnect circuit power and discharge all capacitors before you test capacitance.**

Measure Frequency

1. Connect the black test lead to the COM Terminal and the red lead to the  Terminal.
2. Turn the rotary switch to  (applies to high frequency with low voltage); or turn the rotary switch to  , press SELECT once to toggle to the Frequency Mode (applies to low frequency with high voltage).
3. Touch the probes to the desired test points.
4. Read the measured frequency value on the display.

Measure Duty Cycle

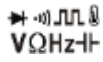
1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.
2. Turn the rotary switch to Hz% , press the Hz % button once to toggle to the Duty Cycle Mode .
3. Touch the probes to the desired test points.
4. Read the measured duty cycle value on the display.

Measure Temperature

1. Connect the black thermocouple probe to the COM Terminal and the red probe to the VΩHz Terminal.
2. Turn the rotary switch to TEMP, and the display will show the room temperature, to toggle between ℃/℉, press SELECT button.
3. Touch the probes to the desired test points.
4. Read the measured temperature on the display.

***Do not input voltage at this setting.**

Square Wave Output

1. Connect the black test lead to the COM Terminal and the red lead to the  Terminal.
2. Turn the rotary switch to  , and the default output frequency is 50Hz. To change the output frequency, press the SEL button.
3. Touch the probes to the desired test points.

***Do not input voltage at this setting.**

Battery Measurement

1. Put the red lead into the terminal, put the black lead into the COM terminal.
2. When you test the batteries, You can change the range between 1.5v, 9v, and 12v.

3. Connect the probes to the positive and negative poles of the battery, then you can read the voltage on the screen. Or you can judge the voltage according to the color of central lighting

Test NCV

1. Keep pushing the NCV button .
2. Hold the product and move it around, the built-in beeper will beep when the inner sensor detects AC voltage nearby. The stronger the voltage is, the quicker the beeper beeps.

Maintenance

Beyond replacing batteries and fuses, do not attempt to repair or service the product unless you are qualified to do so and have the relevant calibration, performance test, and service instructions.

Clean the Product

Wipe the product with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings.

*Remove the input signals before you clean the product.

Replace the Batteries

When “  ” is shown on the display, batteries shall be replaced as below:

1. Remove the test leads and turn off the product before replacing the batteries.

2. Loosen the screw on the battery door and remove the battery door.
3. Replace the used batteries with new batteries of the same type.
4. Place the battery door back and fasten the screw.

Replace the Fuses

When a fuse is blown or do not work properly, it shall be replaced as below:

1. Remove the test leads and turn off the product before replacing the fuse.
2. Loosen the four screws on the back cover and the screw on the battery door, then remove the battery door and the back cover.
3. Replace the fuse with a new fuse of the same type.
4. Place the back cover and the battery door back and fasten the screws.

Specifications

General Specifications		
Display (LCD)		6000 counts
Ranging		Auto/Manual
Material		ABS/PVC
Update Rate		3 times/second
Ture RMS		√
Data Hold		√
Backlight		√
Low Battery Indication		√
Auto Power Off		√
Mechanical Specifications		
Dimension		176*91*47mm
Weight		330g
Battery Type		1.5V AA Battery * 3
Warranty		One year
Environmental Specifications		
Operating	Temperature	0~40℃
	Humidity	＜75%
Storage	Temperature	-20~60℃
	Humidity	＜80%

Electrical Specifications

Function	*Range*	*Resolution*	*Accuracy*
DC Voltage (V) (mV)	600.0mV	0.1mV	±(0.5%+3)
	6.000V	0.001V	
	60.00V	0.01V	
	600.0V	0.1V	
	1000V	1V	
AC Voltage (V) (mV)	600.0mV	0.1mV	±(1.0%+3)
	6.000V	0.001V	
	60.00V	0.01V	
	600.0V	0.1V	
	750V	1V	
DC Current (A)	6.000A	0.001A	±(1.2%+3)
	20.00A	0.01A	

Function	*Range*	*Resolution*	*Accuracy*
DC Current (mA)	6.000mA	0.001mA	±(1.2%+3)
	60.00mA	0.01mA	
	600.0mA	0.1mA	
DC Current (μA)	600.0μA	0.1μA	
AC Current (A)	6.000A	0.001A	±(1.5%+3)
	20.00A	0.01A	
AC Current (mA)	6.000mA	0.001mA	
	60.00mA	0.01mA	
	600.0mA	0.1mA	
AC Current (μA)	600.0μA	0.1μA	
Resistance	600.0Ω	0.1Ω	±(0.5%+3)
	6.000kΩ	0.001kΩ	
	60.00kΩ	0.01kΩ	
	600.0kΩ	0.1kΩ	
	6.000MΩ	0.001MΩ	
	60.00MΩ	0.01MΩ	±(1.5%+3)

Function	*Range*	*Resolution*	*Accuracy*
Capacitance	9.999nF	0.001nF	±(5.0%+20)
	99.99nF	0.01nF	±(2.0%+5)
	999.9nF	0.1nF	
	9.999μF	0.001μF	
	99.99μF	0.01μF	
	999.9μF	0.1μF	
	9.999mF	0.001mF	±(5.0%+5)
Frequency	9.999Hz	0.001Hz	±(0.1%+2)
	99.99Hz	0.01Hz	
	999.9Hz	0.1Hz	
	9.999kHz	0.001kHz	
	99.99kHz	0.01kHz	
	999.9kHz	0.1kHz	
	9.999MHz	0.001MHz	
Duty Cycle	1%~99%	0.1%	±(0.1%+2)

Function	*Range*	*Resolution*	*Accuracy*
Temperature	(-20~1000)℃	1℃	±(2.5%+5)
	(-4~1832)℉	1℉	
Diode	√		
Continuity	√		
Square wave output	50Hz~5000Hz		

Battery test		1.5V	9V	12V
load Current		10mA	10mA	120mA
Dump Energy	Green	≧1.30V	≧7.83V	≧10.44V
	Yellow	0.94V-1.29V	5.64V-7.82V	7.52V-10.43V
	Red	0.15V-0.93V	0.90V-5.63V	1.2V-7.51V
	No light	≦0.14V	≦0.89V	≦1.19V