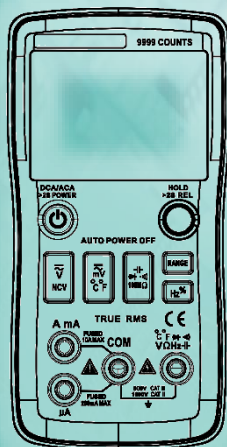


# User Manual



## 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 9999 counts true RMS auto-ranging digital multimeter. It is operated all by buttons with a triple display.

## Safety Information

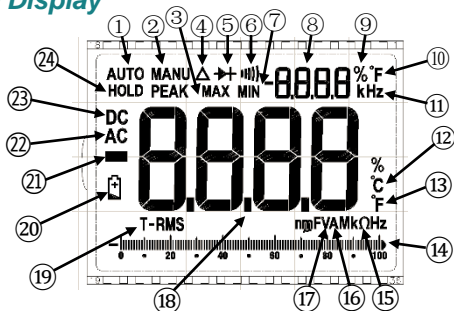
To avoid possible electrical shock, fire, or personal injury, please read all safety information before you use the product. Please use the product only as specified, or the protection supplied by the product can be compromised.

- 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

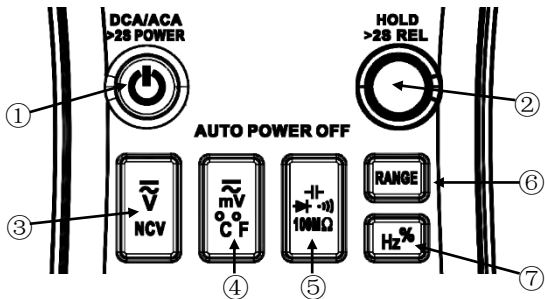


|   |              |   |
|---|--------------|---|
| ① | <b>AUTO</b>  | Auto range. The product selects the range with the best resolution. |
| ② | <b>MANU</b>  | Manual range. The user selects the range.                           |
| ③ | <b>MAX</b>   | Display shows maximum reading.                                      |
| ④ | <b>Δ</b>     | Relative mode.  |
| ⑤ | <b>→ </b>    | Diode test.   |
| ⑥ | <b>•))</b>   | Continuity test.  |
| ⑦ | <b>MIN</b>   | Display shows minimum reading.                                      |
| ⑧ | <b>-0000</b> | Secondary measurements display.                                     |
| ⑨ | <b>%</b>     | Duty cycle test.  |
| ⑩ | <b>F</b>     | Capacitance test. (Farad)   |

|                  |   |   |
|------------------|---|---|
| ⑪                | <b>Hz</b>   | Frequency test. (Hertz)   |
| ⑫                | <b>°C</b>   | Temperature test. (Celsius)   |
| ⑬                | <b>°F</b>   | Temperature test. (Fahrenheit)  |
| ⑭                |  | Analog bar graph.   |
| ⑮                | <b>Ω</b>  | Resistance test. (Ohm)  |
| ⑯                | <b>A</b>  | Current test. (Ampere)  |
| ⑰                | <b>V</b>  | Voltage test. (Volt)  |
| ⑱                | <b>-8888</b>  | Primary measurement display.  |
| ⑲                | <b>T-RMS</b>  | The product measures both sinusoidal and nonsinusoidal ac waveforms accurately. |
| ⑳                |  | Low battery. Replace batteries.   |
| ㉑                |  | Negative readings.  |
| ㉒                | <b>AC</b>   | Alternating current.  |
| ㉓                | <b>DC</b>   | Direct current.   |
| ㉔                | <b>HOLD</b>   | Display freezes present reading.  |
| <b>n k M μ m</b> |   | Measurement units.  |



## Function Buttons



Push for more than 2 seconds to turn on/off the product.

- The product automatically powers off after 5 minutes of inactivity.
- The built-in beeper beeps 5 times 1 minute before auto power off.

- ① • To disable the Auto Power Off function, hold down **RANGE** while turning on the product, you will hear five beeps if you have successfully disabled the function.

Push to toggle between DCA/ACA when the red test lead is plugging in the terminals to test current.

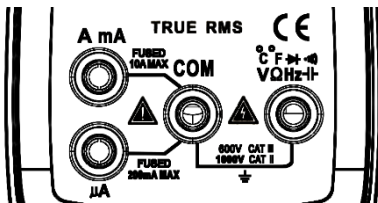
|   |   |
|---|---|
| ② | <p>Push once to hold the current reading on the display; push again to continue normal operation.</p> <p>Push for more than 2 seconds to enter the relative mode. The product will store the present reading as a reference for subsequent readings. The display is zeroed, and the stored reading is subtracted from all subsequent readings. Long-push again to exit the relative mode.</p> |
| ③ | <p>Push this button to toggle between testing modes of DCV, ACV, and NCV.</p>   |
| ④ | <p>Push this button to toggle between testing modes of DCmV (<math>&lt; 99.99\text{mV}</math>), ACmV(<math>&lt; 99.99\text{mV}</math>), and Temperature.</p>  |
| ⑤ | <p>Push this button to toggle between testing modes of Resistance, Diode/Continuity, and Capacitance.</p>   |
| ⑥ | <p>Push this button once to enter the manual range mode. In manual range mode, each push increases the range; when the highest range is reached, the next push will lead to the lowest range. To exit the manual range mode, push the button for more than 2 seconds.</p>   |

⑦

Push this button when the product is at the setting of ACV, the primary measurement display will show the current frequency (1~100kHz) while the secondary measurement display will show the current duty cycle.

Push this button when the product is at the setting of ACmV, the primary measurement display will show the current frequency (1~5MHz) while the secondary measurement display will show the current duty cycle.



## Input Terminals



|         |  |
|---------|--|
| A mA    | Input terminal for AC/DC current measurements to 9.999A.   |
| $\mu$ A | Input terminal for AC/DC current measurements to 999.9 $\mu$ A.  |
| COM     | Common (return) terminal for all measurements.   |
| VΩHz    | Input terminal for the measurements of:<br>1. AC/DC voltage<br>2. Resistance<br>3. Capacitance<br>4. Frequency<br>5. Temperature<br>6. Continuity<br>7. Diode<br>8. Duty cycle |

# 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. To measure voltage under 99.99mV, push  , push once to measure DCmV, push twice to measure ACmV. To measure voltage higher than 99.99mV, push  , push once to measure DCV, push twice to measure ACV.
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 Terminal or the  $\mu$ A Terminal (choose based on the value of the current to be measured); if the previous setting was continuity/diode, push any of the three rectangle buttons on the left once.


2. Push  to toggle between DCA and ACA.
3. Break the circuit path to be measured, connect the test leads across the break and apply power.
4. Read the measured current on the display.

**\*Do not measure current that exceeds the extremes as indicated in the Specifications.**

**\*Use the AmA Terminal when you are measuring an unknown current. Then switch to the  $\mu$ A Terminal 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 V $\Omega$ Hz Terminal.
2. Push  once to enter the Resistance Mode.
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 Diodes and Continuity


1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.
2. Push  twice to enter the Diode/Continuity Mode.
3. To test continuity, touch the probes to the desired test points of the circuit. The built-in beeper will beep when there is a short circuit.
4. To test diodes, connect the red probe to the anode side and the black probe to the cathode side of the diode being tested. Then read the forward bias voltage value on the display. 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. Push  three times to enter the Capacitance Mode.
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 stabilized.

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


### *Measure Frequency and Duty Cycle*

1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.
2. When the frequency to be measured is  $\leq 100\text{kHz}$ , push  until the product is at the setting of ACV; touch the probes to the desired test points, and the secondary measurement display will show the frequency; then push , the primary measurement display will show frequency while the secondary measurement display will show the duty cycle.




3. When the frequency to be measured is between 100kHz and 500MHz, push  twice to enter the ACmV Mode; touch the probes to the desired test points, and the secondary measurement display will show the frequency; then push , the primary measurement display will show frequency while the secondary measurement display will show the duty cycle.

### ***Measure Temperature***

1. Connect the black test lead to the COM Terminal and the red lead to the VΩHz Terminal.
2. Push  three times to enter the Temperature Mode. Both displays will show room temperature; the primary measurement display will show Celsius while the secondary measurement display will show Fahrenheit.

2. Touch the probes to the desired test points.
3. Read the measured temperature on the display.

### **Test NCV**

1. Push  twice to enter the NCV Mode.
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

| <b>General Specifications</b> |                |
|-------------------------------|----------------|
| Display (LCD)                 | 9999 Counts    |
| Ranging                       | Auto/Manual    |
| Material                      | ABS+TPE        |
| Update Rate                   | 3 Times/Second |
| Ture RMS                      | √              |
| Data Hold                     | √              |
| Backlight                     | √              |
| Low Battery Indication        | √              |
| Auto Power Off                | √              |

| <b>Mechanical Specifications</b> |                     |
|----------------------------------|---------------------|
| Dimension                        | 146*74*34mm         |
| Weight                           | 125g                |
| Battery Type                     | 1.5V AA Battery * 2 |
| Warranty                         | One year            |

| <b>Environmental Specifications</b> |             |          |
|-------------------------------------|-------------|----------|
| Operating                           | Temperature | 0~40°C   |
|                                     | Humidity    | <75%     |
| Storage                             | Temperature | -20~60°C |
|                                     | Humidity    | <80%     |

## Electrical Specifications

| <i>Function</i>                       | <i>Range</i> | <i>Resolution</i> | <i>Accuracy</i> |
|---------------------------------------|--------------|-------------------|-----------------|
| DC Voltage<br>(V)                     | 999.9mV      | 0.1mV             | $\pm(0.5\%+3)$  |
|                                       | 9.999V       | 0.001V            |                 |
|                                       | 99.99V       | 0.01V             |                 |
|                                       | 999.9V       | 0.1V              |                 |
| DC Voltage<br>(mV)                    | 9.999mV      | 0.001mV           |                 |
|                                       | 99.99mV      | 0.01mV            |                 |
| AC Voltage<br>(V)                     | 999.9mV      | 0.1mV             | $\pm(1.0\%+3)$  |
|                                       | 9.999V       | 0.001V            |                 |
|                                       | 99.99V       | 0.01V             |                 |
|                                       | 750.0V       | 0.1V              |                 |
| AC Voltage<br>(mV)                    | 9.999mV      | 0.001mV           |                 |
|                                       | 99.99mV      | 0.01mV            |                 |
| *Frequency response of ACV: 40Hz-1kHz |              |                   |                 |

| <i>Function</i>                             | <i>Range</i>    | <i>Resolution</i> | <i>Accuracy</i> |
|---|-----------------|-------------------|-----------------|
| DC Current<br>(mA&A)                        | 999.9mA         | 0.1mA             | $\pm(1.0\%+3)$  |
|   | 9.999A          | 0.001A            |                 |
| DC Current<br>( $\mu$ A)                    | 99.99 $\mu$ A   | 0.01 $\mu$ A      | $\pm(0.8\%+3)$  |
|   | 999.9 $\mu$ A   | 0.1 $\mu$ A       |                 |
| AC Current<br>(mA&A)                        | 999.9mA         | 0.1mA             | $\pm(1.2\%+3)$  |
|   | 9.999A          | 0.001A            |                 |
| AC Current<br>( $\mu$ A)                    | 99.99 $\mu$ A   | 0.01 $\mu$ A      | $\pm(1.0\%+3)$  |
|   | 999.9 $\mu$ A   | 0.1 $\mu$ A       |                 |
| Frequency response of AC Current: 40Hz-1kHz |                 |                   |                 |
| Resistance                                  | 99.99 $\Omega$  | 0.01 $\Omega$     | $\pm(1.0\%+3)$  |
|   | 999.9 $\Omega$  | 0.1 $\Omega$      | $\pm(0.5\%+3)$  |
|   | 9.999k $\Omega$ | 0.001k $\Omega$   |                 |
|   | 99.99k $\Omega$ | 0.01k $\Omega$    |                 |
|   | 999.9k $\Omega$ | 0.1k $\Omega$     |                 |
|   | 9.999M $\Omega$ | 0.001M $\Omega$   | $\pm(1.5\%+3)$  |
|   | 99.99M $\Omega$ | 0.01M $\Omega$    | $\pm(3.0\%+5)$  |

| <i>Function</i>  | <i>Range</i>  | <i>Resolution</i> | <i>Accuracy</i> |
|--|---------------|-------------------|-----------------|
| Capacitance  | 9.999nF       | 0.001nF           | $\pm(5.0\%+20)$ |
|  | 99.99nF       | 0.01nF            | $\pm(2.0\%+5)$  |
|  | 999.9nF       | 0.1nF             |                 |
|  | 9.999 $\mu$ F | 0.001 $\mu$ F     |                 |
|  | 99.99 $\mu$ F | 0.01 $\mu$ F      |                 |
|  | 999.9 $\mu$ F | 0.1 $\mu$ F       |                 |
|  | 9.999mF       | 0.001mF           | $\pm(5.0\%+5)$  |
| Frequency<br>(Measures only to 100kHz under the ACV setting) | 99.99Hz       | 0.01Hz            | $\pm(0.1\%+2)$  |
|  | 999.9Hz       | 0.1Hz             |                 |
|  | 9.999kHz      | 0.001kHz          |                 |
|  | 99.99kHz      | 0.01kHz           |                 |
|  | 999.9kHz      | 0.1kHz            |                 |
|  | 5.000MHz      | 0.001MHz          |                 |
| Duty Cycle   | 1%~99%        | 0.1%              | $\pm(0.1\%+2)$  |



| <i>Function</i> | <i>Range</i> | <i>Resolution</i> | <i>Accuracy</i> |
|-----------------|--------------|-------------------|-----------------|
| Temperature     | (-20~1000)°C | 1°C               | ±(2.5%+5)       |
|                 | (-4~1832)°F  | 1°F               |                 |
| Diode           | √            |                   |                 |
| Continuity      | √            |                   |                 |
| NCV             | √            |                   |                 |

