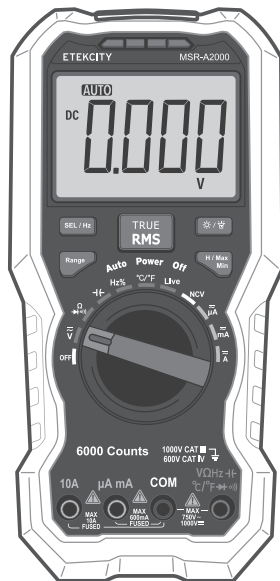




# Digital Multimeter

**Model:** MSR-A2000

**User Manual**



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*For full details on using your Digital Multimeter, scan the QR code to see the extended digital manual.*

*You can also type the following link into a web browser:*

**[www.etekcity.com/support/manual/model/msr-a2000](http://www.etekcity.com/support/manual/model/msr-a2000)**



## Package Contents

- 1 × Digital Multimeter
- 1 × User Manual
- 1 × 9V 6F22 Battery (Pre-Installed)
- 2 × Test Leads
- 1 × K-Type Thermocouple

## Specifications

<b>Max Voltage</b>	1000V
<b>Max Display Value</b>	5999
<b>Battery</b>	1 × 9V 6F22 Battery

## Features

- Auto-Off
- Backlit LCD Display
- Overload Protection
- True RMS
- Auto & Manual Range Options
- Overcurrent & Overvoltage Protection
- Test Lead Insertion Detection Function

# READ AND SAVE THESE INSTRUCTIONS

## Safety Information

**Before using, read all instructions. Only use the multimeter as directed, or the multimeter may be damaged, and you may be seriously injured.**

- Limit operation to the specified measurement category, voltage, or amperage ratings.
- **Do not** use the multimeter if it is damaged. Before you use the multimeter, inspect the case. Look for cracks or missing plastic. Pay particular attention to the insulation surrounding the connectors.
- **Do not** use the test leads provided for other products. Use **only** the certified test leads specified for this multimeter.
- Inspect the test leads for damaged insulation or exposed metal.
- Before use, verify the multimeter's operation by measuring a known voltage.
- **Only** qualified technicians can perform maintenance on this multimeter.
- **Always** use the specified battery type. This multimeter is supplied with a battery for power. Observe the correct polarity markings before you insert the batteries to ensure proper insertion of the batteries in the multimeter.
- **Check all Terminal Ratings.** To avoid fire or shock hazard, check all ratings and markers for this multimeter. Refer to this manual for more information about ratings before connecting anything to the multimeter.

## Safety Information (cont.)

- **Do not** operate the multimeter with the cover, or portions of the cover, removed or loosened.
- **Use Proper Fuses.** Use only the specified type and rating fuse for the multimeter.
- **Do not** operate if in any doubt about whether the multimeter is safe to use. If you suspect damage has occurred to the multimeter, have it inspected by qualified service personnel before further operation.
- To avoid electric shock, **do not** operate this multimeter in wet or damp conditions.
- **Do not** operate in an area with explosive substances or gasses.
- **Always** keep the multimeter's surfaces clean and dry.
- **Do not** apply more than the rated voltage (as marked on the multimeter) between terminals, or between terminal and earth ground.
- When measuring current, turn off the circuit power before connecting the multimeter in the circuit. Remember to place the multimeter in series with the circuit.
- When servicing the multimeter, use **only** the specified replacement parts.
- Use caution when working above 60V DC, 30V AC RMS, or 42.4V peak. Such voltages pose a shock hazard.
- When using the test leads, keep your fingers behind the finger guards on the test leads. **Never** touch any exposed metal while measuring.
- Remove the test leads from the multimeter before you open the battery cover.
- To avoid false readings, which may lead to possible electric shock or personal injury, replace the battery as soon as the low battery indicator appears and flashes.

# Safety Information (cont.)

- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
- **Always** use the proper terminals, function, and range for your measurements. When the range of the value to be measured is unknown, set the rotary switch position as the highest range, or choose the auto-ranging mode. To avoid damages to the multimeter, **do not** exceed the maximum limits of the input values shown in the technical specification tables (see pages 31–34).
- Connect the common test lead before you connect the live test lead. When you disconnect the leads, disconnect the live test lead first.
- Before changing functions, disconnect the test leads from the circuit undergoing testing.
- **Do not** alter the internal circuitry of the multimeter. This may result in serious injury.
- **Do not** use or store the multimeter in wet or humid environments, in very high temperatures, around explosive or flammable substances, or in areas with strong magnetic fields. The multimeter will not perform correctly, which may create a safety hazard.
- **Do not** allow children to operate or play with this multimeter.

# Safety Information (cont.)

## Measurement Category Safety Rating

The multimeter has a safety rating of 1000V, CAT III and 600V, CAT IV.

## Measurement Category (CAT) Definitions:

**Measurement CAT I** applies to measurements performed on circuits not directly connected to the AC mains. Examples are measurements on circuits not derived from the AC mains and specially protected (internal) mains-derived circuits, such as signal levels, electronics, and limited-energy parts of equipment, which usually have little chance of danger or overloading.

**Measurement CAT II** applies to measurements performed on circuits directly connected to the low-voltage installation. Examples are measurements on energy-consuming equipment such as TVs, PCs, portable tools, and other household circuits.

**Measurement CAT III** applies to measurements performed on equipment in fixed equipment installations, such as wiring, distribution panels, feeders and short branch circuits, and lighting systems in large buildings.

**Measurement CAT IV** applies to measurements performed at the source of the low-voltage installation. Examples are electricity meters and measurements on primary overcurrent protection devices and ripple control units.

# Safety Terms and Symbols

## Safety Terms

**Terms in this Manual.** The following terms may appear in this manual:

**⚠ Warning:** Warning indicates the conditions or practices that could result in personal injury or death.

**⚠ Caution:** Caution indicates the conditions or practices that could result in damage to this product or other property.

**Terms on the Product.** The following terms may appear on this product:








**Danger:** Indicates an injury or hazard may immediately occur.

**Warning:** Indicates an injury or hazard may potentially occur.

**Caution:** Indicates a potential damage to the instrument or other property might occur.

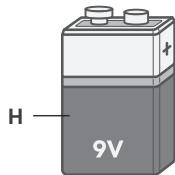
## Safety Symbols

**Symbols on the Product.** The following symbol may appear on the product:

	Direct current (DC)		Fuse
	Alternating current (AC)	<b>CAT II</b>	Category II overvoltage protection
	Both direct and alternating current	<b>CAT III</b>	Category III overvoltage protection
	Ground terminal	<b>CAT IV</b>	Category IV overvoltage protection
	Equipment protected throughout by double insulation or reinforced insulation		Caution, risk of danger (refer to this manual for specific Warning or Caution information)

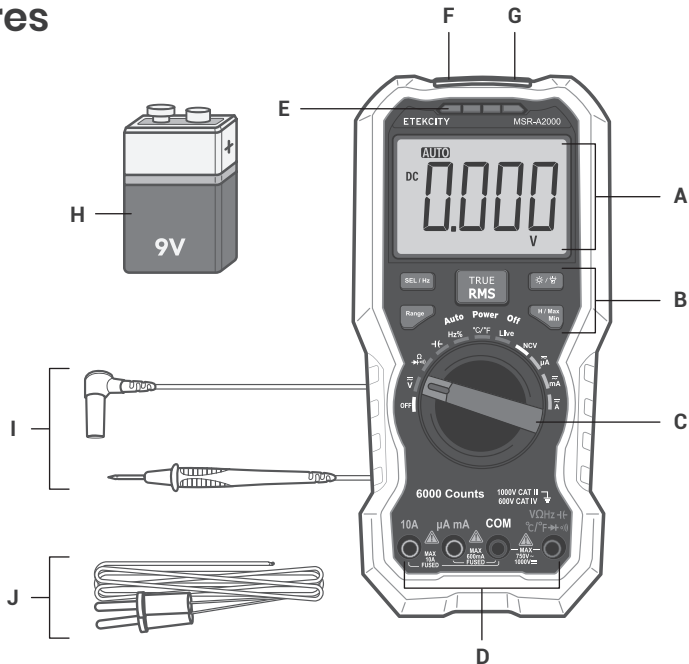
# Multimeter Features

- A. Display Screen (see page 12)
- B. Keypad (see page 11)
- C. Rotary Switch (see page 10)
- D. Input Terminals (see page 15)
- E. LED Indicator
- F. Non-Contact Voltage Detector (NCV) (see page 24)
- G. Flashlight (see page 19)



## Accessories

- H. 9V 6F22 Battery (Pre-Installed)
- I. Test Leads
- J. K-Type Thermocouple







# Rotary Switch

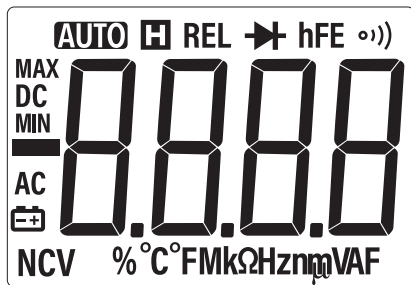
Position	Description	Details
<b>OFF</b>	Power off	Page 18
$\approx \bar{V}$	DC or AC voltage measurement	Page 20
$\rightarrow \Omega \rightarrow \rightarrow \rightarrow$	Resistance measurement	Page 21
	Continuity test	Page 21
	Diode test	Page 22
$\text{—} \leftarrow \leftarrow$	Capacitance measurement	Page 22
<b>Hz%</b>	Frequency / duty cycle measurement	Page 23
<b>°C/°F</b>	Temperature measurement	Page 23

Position	Description	Details
<b>Live</b>	Single test lead living wire detection	Page 24
<b>NCV</b>	Non-contact voltage detection	Page 24
$\approx \mu\text{A}$	DC or AC current measurement, Up to 6000 microamperes	Page 26
$\approx \text{mA}$	DC or AC current measurement, Up to 600 milliamperes	Page 26
$\approx \text{A}$	DC or AC current measurement	Page 26

# Keypad


Key	Description	Details
	Select DC or AC. In ACV or ACA function, long press to display Hz	--
	Switch frequency / duty cycle when measuring frequency	--
	Switch °C/°F when measuring temperature	--
	Select Resistance/Continuity/Diode	--
	Auto/Manual range	Page 19
	Select Backlight or Flashlight	Page 19
	Short press to hold the reading	Page 28
	Long press to switch Max./Min. value	Page 28




# Display Screen



Symbol	Description	Details
<b>AUTO</b>	Auto range	Page 33
<b>H</b>	Data hold enabled	Page 28
<b>REL</b>	Relative enabled	---
<b>→</b>	Diode test selected	Page 22
<b>hFE</b>	Transistor measurement	---

## Display Screen (cont.)

Position	Description	Details
	Continuity test selected	Page 21
<b>MAX</b>	Maximum reading	Page 28
<b>DC</b>	DC	Page 31
<b>MIN</b>	Minimum reading	Page 28
<b>AC</b>	AC	Page 32

Position	Description	Details
	Battery is low	Page 34
	Measurement display ("OL" is short for overload. Indicates the reading exceeds the display range)	--
<b>NCV</b>	Non-contact voltage detected	Page 24
	Measuring units	Page 31

# Measurement Units

Sign	Description
<b>M</b>	Mega 1E+06 (1000000)
<b>k</b>	kilo 1E+03 (1000)
<b>m</b>	milli 1E-03 (0.001)
<b>μ</b>	micro 1E-06 (0.000001)
<b>n</b>	nano 1E-09 (0.000000001)

Sign	Description	Measurement Type
<b>°C</b>	Degree Celsius	Temperature
<b>°F</b>	Degree Fahrenheit	
<b>V</b>	Voltage	Voltage
<b>A</b>	Ampere	Current
<b>Ω</b>	Ohm	Resistance
<b>Hz</b>	Hertz	Frequency
<b>%</b>	Percent	Duty cycle
<b>F</b>	Farad	Capacitance

# Input Terminals

The terminal connections for the different measurement functions of the multimeter are described in the table below.

**⚠ Warning:** Before starting any measurement, check the rotary switch position of the multimeter, and then connect the test leads to the correct terminals.

**⚠ Caution:** To avoid damaging the multimeter, do not exceed the rated input limit. See “Overload protection” values below, and the ranges listed in **Technical Specifications** (see page 31).

Rotary switch position	Input terminals	Overload protection
$\tilde{V}$ (mV)	V $\Omega$ Hz $\leftarrow$ °C/°F $\rightarrow$ $\ominus$ ) <b>COM</b>	750V AC/1000V DC
$\rightarrow$ $\Omega$ $\rightarrow$ $\ominus$ )	V $\Omega$ Hz $\leftarrow$ °C/°F $\rightarrow$ $\ominus$ ) <b>COM</b>	250V AC/300V DC
$\leftarrow$		
Hz%		
°C/°F		
$\tilde{\mu A}$ $\tilde{mA}$	$\mu A$ mA <b>COM</b>	1A/1000V, fast-acting fuse
$\tilde{A}$	<b>10A</b> <b>COM</b>	10A/1000V, fast-acting fuse

# Operation

## Getting Started

Before first using your multimeter, follow these steps to check the instrument:

**1. Check for any damage caused by transportation.**

If the packaging carton or the foamed plastic protection cushion have suffered serious damage, do not throw them away until you finish testing the multimeter and its accessories to make sure they are working correctly.

**2. Check the Accessories**

Check the Package Contents (see page 3) and the Diagram (see page 9) to make sure all accessories are correctly included. If any accessory is lost or damaged, please contact Customer Support (see page 38).


**3. Check the Multimeter**

If you find damage to the appearance of the multimeter, the multimeter does not work normally, or the multimeter fails in the performance test, please contact Customer Support (see page 38).

## Operation (cont.)


### Install the Batteries

The multimeter is powered by a 9V (6F22) battery.

**⚠ Warning:** To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the low battery indicator  appears.

**Before replacing the battery, turn off the meter, disconnect test leads and any connectors from any circuit undergoing testing, and remove test leads from the input terminals. Use only the specified battery type.**

Follow the steps below to install the battery.

1. Ensure that the rotary switch is at the  position. Remove test leads and any connectors from the input terminals.

2. Lift the tilt stand and loosen the screws with a suitable Phillips-head screwdriver and remove the battery cover.
3. Observe the battery polarity markings indicated inside the battery compartment. Insert the battery according to the polarity markings.
4. Place the battery cover back in its original position and tighten the screws.

**⚠ Caution:** To avoid damage from battery leakage, **always** remove the battery and store it separately if the multimeter is not going to be used for a long period of time.

## Operation (cont.)

### Adjust the Tilt Stand

Pull the tilt stand outward to its maximum reach (about 85° to the meter body).

[Figure 1.1]

Figure 1.1



### Power On

1. To power ON the multimeter, turn the rotary switch to any other position except **OFF**.
2. To power OFF the multimeter, turn the rotary switch to the **OFF** position.

### Sleep Mode

The multimeter automatically enters sleep mode if the rotary switch is not moved or a key is not pressed for 30 minutes.



Pressing **SEL / Hz** or turn the rotary switch will turn the multimeter back to operation mode from the sleep mode.



One minute before Auto Power-Off, the buzzer will beep five times to warn the user that the multimeter is about to shut off. Before shutoff, the buzzer will emit a long beep, and then the multimeter will shut off.

**Note:** In sleep mode, the multimeter will still use a little power. If the multimeter is not going to be used for a long period of time, the rotary switch should be turned to the **OFF** position.

## Operation (cont.)




### LCD Backlight and Flashlight

When the  key is pressed briefly, the LCD backlight will be turned on. This is useful for testing at night or in low-light conditions. After the backlight is turned on, it will automatically turn off after about one minute. To turn the backlight off manually, press the  key.

When the  key is pressed and held for about 2 seconds, the flashlight will turn on. This is also useful for testing at night or in low light conditions. To manually turn the flashlight off, press and hold the  key for 2 seconds.

### Selecting the Range

- Auto-ranging mode is set as the default mode when the meter is powered on. **AUTO** will be displayed.

- When auto-ranging mode is enabled, press  to enter the manual-range mode.
- In manual range mode, each additional press of  sets the multimeter to the next higher range, unless it is already in the highest range, at which point the range switches to the lowest range.
- When manual range mode is enabled, press  for more than 2 seconds to enter the auto-ranging mode.

**Note:** Manual range mode is not available when measuring capacitance.

# Taking Measurements

## Measuring AC or DC Voltage

**⚠ Warning: Do not measure any voltage of over 1000V DC or 750V AC RMS to avoid instrument damage or electric shock.**

**Do not apply more than 1000V DC or 750V AC RMS between the common terminal and the earth ground to avoid instrument damage or electric shock.**

This multimeter displays DC voltage values as well as their polarity. Negative DC voltages will display a negative sign on the left of the display.

1. Rotate the rotary switch to  $\overline{V}$ . Default is DC measurement mode, and **DC** will be displayed. Press **SEL / Hz** to switch into AC measurement mode, and **AC** will be displayed.
2. Connect the black test lead to the **COM** terminal and the red test lead to the  $\begin{matrix} V & \Omega & Hz & \text{+f} \\ \text{C} & / \text{F} & \rightarrow & \rightarrow \end{matrix}$  terminal.




3. Probe the test points and read the display. Press **Range** to enable and cycle through the manual ranges.

**Note:** During AC voltage measurement, long press the **SEL / Hz** key once to enter the frequency measurement mode, and long press it again to return to the original measurement mode.

## Taking Measurements (cont.)





### Measuring Resistance

**⚠ Caution:** To avoid possible damage to your multimeter or to the equipment undergoing testing, disconnect the circuit power and discharge all high-voltage capacitors before measuring resistance.

1. Rotate the rotary switch to   $\Omega$ .
2. Connect the black test lead to the **COM** terminal and the red test lead to the  terminal.
3. Probe the test points and read the display. Press  to enable and cycle through the manual ranges.

### Testing for Continuity




**⚠ Caution:** To avoid possible damage to your multimeter or to the equipment undergoing testing, disconnect the circuit power and discharge all high-voltage capacitors before testing for continuity.

1. Rotate the rotary switch to   $\Omega$ . Press  once to enter continuity testing mode, and  will be displayed.
2. Connect the black test lead to the **COM** terminal and the red test lead to the  terminal.
3. Probe the test points to measure the resistance in the circuit and read the display. If the reading is below 50 , the multimeter will beep continuously, and the green indicator light will stay on.

## Taking Measurements (cont.)

### Testing Diodes

**⚠ Caution:** To avoid possible damage to your multimeter or to the equipment undergoing testing, disconnect the circuit power and discharge all high-voltage capacitors before testing diodes.

1. Rotate the rotary switch to  $\Omega$  . Press  twice to enter diode testing mode, and  will be displayed.
2. Connect the black test lead to the **COM** terminal and the red test lead to the  $\frac{V}{\text{C}} \frac{\Omega}{\text{F}} \text{Hz} \text{ } \leftarrow \rightarrow$  terminal.
3. Connect the red test lead to the positive terminal (anode) of the diode and the black test lead to the negative terminal (cathode). The cathode of a diode is indicated with a band.
4. Read the diode forward bias. If the test lead connection is reversed, the multimeter will display "OL".

### Measuring Capacitance

**⚠ Caution:** To avoid possible damage to the multimeter or to the equipment undergoing testing, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is fully discharged.

1. Rotate the rotary switch to  $\leftarrow \rightarrow$ .
2. Connect the black test lead to the **COM** terminal and the red test lead to the  $\frac{V}{\text{C}} \frac{\Omega}{\text{F}} \text{Hz} \text{ } \leftarrow \rightarrow$  terminal.
3. Probe the test points and read the display.

## Taking Measurements (cont.)

### Measuring Frequency

1. Rotate the rotary switch to **Hz%**.
2. Connect the black test lead to the **COM** terminal and the red test lead to the  $\frac{V}{\text{°C/°F}}$   $\frac{\Omega}{\text{Hz}}$   $\frac{\text{Hz}}{\text{Hz}}$   $\frac{\text{Hz}}{\text{Hz}}$  terminal.
3. Probe the test points and read the display.
4. Press **SEL / Hz** to switch between the frequency and duty cycle measurement modes.

**Note:** During AC voltage or AC current measurement, long press the **SEL / Hz** key once to enter the frequency measurement mode, and long press it again to return to the original measurement mode.

To measure the frequency of a signal with a large amplitude, press **SEL / Hz** to measure the frequency in AC voltage measurement mode.

### Measuring Temperature

1. Rotate the rotary switch to **°C/°F**.
2. Connect the **red connection** of the K-type thermocouple to the  $\frac{V}{\text{°C/°F}}$   $\frac{\Omega}{\text{Hz}}$   $\frac{\text{Hz}}{\text{Hz}}$   $\frac{\text{Hz}}{\text{Hz}}$  terminal and the **black connection** to the **COM** terminal.
3. Probe the test points and read the display.

**Note:** When measuring temperature, press **SEL / Hz** to switch between °C and °F.

## Taking Measurements (cont.)

### Live Wire Detection

1. Rotate the rotary switch to **Live**.
2. Connect the red test lead to the  $\frac{V}{\Omega} \frac{Hz}{\text{Hz}} \frac{+}{-}$  terminal.
3. Measure the object undergoing testing with a test lead.
4. If a voltage is detected, the indicator light on the top of the display will flash, and the multimeter will emit a “beep beep beep” sound. The sound will change with the level of the detected voltage. When a high voltage is measured, the screen will display “---H”, and when a low voltage is measured, the screen will display “---L”.

### Non-Contact Voltage Detection (NCV)

To detect the presence of AC voltage, place the top of the multimeter close to a voltage source. When voltage is detected, the LED above the display will glow, and the multimeter will beep.

#### **Warning:**

- **Always** test the NCV function on a known live circuit before use.
- **Do not** attempt to use the multimeter as an AC Voltage Detector if the battery is weak or bad.
- Even without indication, voltage may still be present. **Do not** rely on NCV detection to check a shielded wire. Detection could be impaired by socket design, insulation thickness, or other factors.
- External interference such as static electricity sources could mistakenly trigger NCV indication.

## Taking Measurements (cont.)

### Non-Contact Voltage Detection (NCV) (cont.)

1. Rotate the rotary switch to **NCV**.
2. Test the NCV function on a known live circuit before use.
3. Place the top of the multimeter very close to the voltage source as shown in *Figure 2.1*.
4. If voltage is detected, the LED above the display will flash, and the multimeter will beep.
5. The sound will change with the level of the detected voltage. When a high voltage is measured, the screen will display "---H", and when a low voltage is measured, the screen will display "---L".



Figure 2.1

## Taking Measurements (cont.)

### Measuring DC or AC Current



**⚠ Warning:** **Never** attempt an in-circuit current measurement where the open-circuit potential to earth is greater than 250V. Doing so will cause damage to the multimeter and possible electric shock or personal injury.


**⚠ Caution:** To avoid possible damage to the multimeter or to the equipment undergoing testing, check the multimeter's fuse before measuring current. Use the proper terminals, function, and range for your measurement. **Never** place the test leads in parallel with any circuit or component when the leads are plugged into the current terminals.

1. Turn off the power of the measured circuit. Discharge all high-voltage capacitors.

2. Connect the black test lead to the **COM** terminal. For currents below 600mA, connect the red test lead to the **μA mA** terminal. For currents within 600mA – 10A, connect the red test lead to the **10A** terminal.
3. Rotate the rotary switch to the appropriate position according to the measurement range:  $\overline{\mu A}$ ,  $\overline{mA}$ , or  $\overline{A}$ .
4. Disconnect the circuit path to be tested. Connect the black test lead to one side of the circuit (with a lower voltage), and connect the red test lead to the other side (with a higher voltage). Reversing the leads will produce a negative reading, but will not damage the multimeter.



## Taking Measurements (cont.)

5. Select DC or AC measurement mode. Default is DC measurement mode, and **DC** will be displayed. Press  to switch into AC measurement mode, and **AC** will be displayed.
6. Turn on the power of the measured circuit, and read the display. Press  to enable and cycle through the manual ranges. If "OL" is displayed, it indicates the input exceeds the selected range and the rotary switch should be set to the position with higher range.
7. Turn off the power of the measured circuit and discharge all high-voltage capacitors. Remove the test leads and restore the circuit to the original condition.




**Note:** During AC current measurement, long press the  key once to enter the frequency measurement mode, and long press it again to return to the original measurement mode.

# Multimeter Features

## Data Hold Mode

1. Press  to freeze the display during measurement, and **H** will be shown on the display.
2. Press  again to exit this mode.

## Capturing Max. and Min. Values

1. Long press the  key to enter the maximum measurement mode, and **MAX** will appear on the display. Long press the  key again to enter the minimum measurement mode, and **MIN** will display on the display.
2. Long press the  key again to exit the mode. In this mode, the manual range mode will be activated automatically.

**Note:** This function is only available when measuring voltage, current, resistance, and temperature.

## Buzzer Feature

- Press the function key, and the buzzer will emit a short beep.
- One minute before Auto Power-off, the buzzer will beep five times to warn the user that the multimeter is about to shut off. Before shutoff, the buzzer will emit a long beep, and then the multimeter will shut off.
- The buzzer beeps continuously to warn the user once the measured DC voltage exceeds 1000V, or the measured AC voltage exceeds 750V.
- The buzzer emits a long beep when the short circuit resistance is less than about 50 during the continuity test.

## Multimeter Features (cont.)

### Test Lead Insertion Detection Function

- In the non-current function, when a test lead is inserted into **10A** or  **$\mu\text{A}$  mA** input terminal, the multimeter will sound an alarm and display "**LEAD**" on the display.
- In the  $\overline{\text{A}}$  current function, when the test lead is inserted into the  **$\mu\text{A}$  mA** input terminal, the multimeter will sound an alarm and display "**LEAD**" on the display.
- In the  $\overline{\mu\text{A}}$  or  $\overline{\text{mA}}$  current function, when the test lead is inserted into the **10A** input terminal, the multimeter will sound an alarm and display "**LEAD**" on the display.

# Care & Maintenance

**⚠ Warning: To avoid electrical shock or damage to the multimeter, ensure that the insides of the casing stay dry at all times.**

## Cleaning

To clean the multimeter exterior, follow these steps:

Wipe the dust from the multimeter surface with a soft cloth. Avoid scuffing the screen when cleaning the LCD. Clean the multimeter with a wet soft cloth that is not dripping water. Scrub with soft detergent or fresh water. To avoid damage to the multimeter, **do not** use any corrosive chemical cleaning agent.

Dirt or moisture in the terminals can distort readings. Follow the steps below to clean the multimeter terminals.

1. Turn the multimeter off and remove the test leads.
2. Turn the multimeter over and shake out the dirt in the terminals.
3. Wipe the contacts in each terminal with a clean swab dipped in alcohol.

# Technical Specifications

All these specifications apply to the multimeter unless otherwise explained.

Standard conditions: The environment temperature is 18°C to 28°C, and the relative humidity is less than 80%.

**Note:** When measuring AC voltage/current or capacitance, accuracy guarantee range is 5% to 100% of the range.

Function		Measurement Range	Resolution	Function
DC Voltage (V)	V	600.0mV/6.000V/60.00V/600.0V	0.1mV	±(0.5%+2dig)
		1000V	1V	±(0.8%+2dig)
AC Voltage (V)	V	600.0mV	0.1mV	±(2%+5dig)
		6.000V/60.00V/600.0V	0.001V	±(0.8%+2dig)
		750V	1V	±(1%+3dig)
DC Current (A)	μA	600.0μA/6000μA	0.1μA	±(0.8%+2dig)
	mA	60.00mA/600.0mA	0.01mA	±(0.8%+2dig)
	A	6.000A	0.001A	±(1.2%+3dig)
	A	10.00A <sup>[1]</sup>	0.01A	±(1.2%+3dig)

## Technical Specifications (cont.)

Function		Measurement Range	Resolution	Function
AC Current (A)	<b>μA</b>	600.0μA/6000μA	0.1μA	±(1%+3dig)
	<b>mA</b>	60.00mA/600.0mA	0.01mA	±(1%+3dig)
	<b>A</b>	6.000A	0.001A	±(1.5%+3dig)
	<b>A</b>	10.00A <sup>[1]</sup>	0.01A	±(1.5%+3dig)
Resistance (Ω)		600.0Ω/6.000kΩ/60.00kΩ/600.0kΩ/6.000MΩ	0.1Ω	±(0.8%+2dig)
		60.00MΩ	0.01 MΩ	±(2%+3dig)
Capacitance (F)		60.00nF/600.0nF/6.000μF/60.00μF	0.01nF	±(3%+3dig)
		600.0μF/6.000mF/60.00mF <sup>[2]</sup>	0.1μF	±(3%+5dig)
Frequency <sup>[3]</sup> (Hz)		9.999Hz/99.99Hz/999.9Hz/9.999kHz/99.99kHz/ 999.9kHz/9.999MHz	0.001Hz	±(0.8%+2dig)
Duty Cycle <sup>[4]</sup> (%)		0.1% - 99.9% (Typical: Vrms=1V, f=1kHz)	0.1%	±(1.2%+3dig)
		0.1% - 99.9%(≥1kHz)		±(2.5%+3dig)
Temperature (°C/°F)		-50°C to 1000°C	1	±(2.5%+3dig)
		-58°F to 1000°F	1	±(4.5%+5dig)

## Technical Specifications (cont.)

**[1]** When measuring current, for 8A to 10A, the measuring duration should not be over 2 minutes within a 10-minute time period, and in this 10-minute time period, no other current should flow through except within the measuring duration.

**[2]** When measuring capacitance, for the 60.00mF range, the measuring duration should be over 30 seconds.

**[3]** When measuring frequency, the typical waveform is Square or Sine. The signal meets the following conditions.


Frequency	Amplitude (rms)
1Hz – 5mHz	≥ 700mV

**[4]** When measuring duty cycle, the typical waveform is Square.

**Note: When measuring resistance and capacitance, the influence of the resistance reactance of the pen itself on the measured value should be considered.**

Characteristics	Information
Display	5999
Frequency Response (Hz)	(40 - 1000) Hz
Sample Rate for Digital Data	3 times/second
Auto Ranging	√
True RMS	√
Diodes Test	√
Sleep Mode	√
Continuity Test	√
NCV Function	√

## Technical Specifications (cont.)

Characteristics	Information
Flashlight	√
Low Battery Indication	√ (The  is displayed when the battery is under the proper operation range.)
Data Hold	√
MAX/MIN	√
LCD Backlight	√
Input Protection	√
Live Wire Detection	√
Test Lead Insertion Detection	√
Input Impedance	≥ 10MΩ

Characteristics	Information
Battery	9V battery (6F22)
LCD Size	58.5 mm * 41 mm
Weight (without package)	0.32 kg
Dimension	190 mm * 90 mm * 56 mm
Working Temperature	0°C to 40°C
Storage Temperature	-10°C to 60°C
Relative Humidity	≤ 80%
Altitude	Operating: 3,000 meters / Non-operating: 15,000 meters

### Interval Period of Adjustment:

One year is recommended for the calibration interval period.

# Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

**[1]** This device may not cause harmful interference, and

**[2]** This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**FCC Caution:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

# Warranty Information

<b>Product Name</b>	Digital Multimeter
<b>Model</b>	MSR-A2000
<i>For your own reference, we strongly recommend that you record your order ID and date of purchase.</i>	
<b>Order ID</b>	
<b>Date of Purchase</b>	

## Terms & Policy

Etekcitey Corporation ("Etekcitey") warrants this product to the original purchaser to be free from defects in material and workmanship, under normal use and conditions, for a period of 2 years from the date of original purchase.

Etekcitey agrees, at our option during the warranty period, to repair any defect in material or workmanship or furnish an equal product in exchange without charge, subject to verification of the defect or malfunction and proof of the date of purchase.

There is no other express warranty. This warranty does not apply:

- If the product has been modified from its original condition;
- If the product has not been used in accordance with directions and instructions in the user manual;
- To damages or defects caused by accident, abuse, misuse or improper or inadequate maintenance;
- To damages or defects caused by service or repair of the product performed by an unauthorized service provider or by anyone other than Etekcitey;
- To damages or defects occurring during commercial use, rental use, or any use for which the product is not intended;
- To damages or defects exceeding the cost of the product.

Etekcitey will not be liable for indirect, incidental, or consequential damages in connection with the use of the product covered by this warranty.

This warranty extends only to the original consumer purchaser of the product and is not transferable to any subsequent owner of the product regardless of whether the product is transferred during the specified term of the warranty.

## Warranty Information (cont.)

This warranty does not extend to products purchased from unauthorized sellers. Etekcitec's warranty extends only to products purchased from authorized sellers that are subject to Etekcitec's quality controls and have agreed to follow its quality controls.

All implied warranties are limited to the period of this limited warranty.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

If you discover that your product is defective within the specified warranty period, please contact Customer Support via [support@etekcity.com](mailto:support@etekcity.com). DO NOT dispose of your product before contacting us. Once our Customer Support Team has approved your request, please return the product with a copy of the invoice and order ID.

Every Etekcitec product automatically includes a 2-year warranty. To make the customer support process quick and easy, register your product online at [www.etekcity.com/warranty](http://www.etekcity.com/warranty).

This warranty is made by:

Etekcitec Corporation  
1202 N. Miller St. Suite A  
Anaheim, CA 92806

# Customer Support

If you encounter any issues or have any questions about your new product, please contact our helpful Customer Support Team.

## **Etekcity Corporation**

1202 N. Miller St., Suite A  
Anaheim, CA 92806

**Email:** [support@etekcity.com](mailto:support@etekcity.com)

**Toll-Free:** (855) 686-3835

## **Support Hours**

Monday—Friday  
9:00 am—5:00 pm PST/PDT

*\*Please have your invoice and order ID ready before contacting Customer Support.*





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