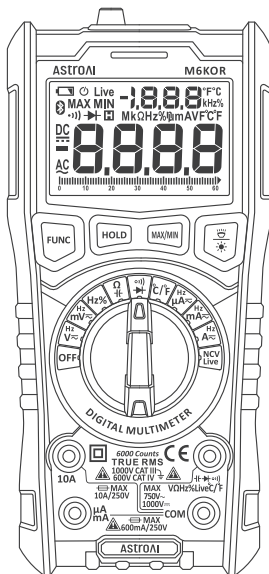


AstroAI



M6KOR

DIGITAL MULTIMETER

USER MANUAL

CATALOG

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INTRODUCTION

Thank you for purchasing the AstroAI True RMS 6000 Counts Digital Multimeter.

This multimeter is designed to be safely and accurately used by professionals or DIYers who need a little more utility from their standard digital multimeter.

This manual provides all safety information, operation instructions, specifications, and maintenance procedures for the meter. This instrument performs AC/DC Voltage, AC/DC Current, Resistance, Audible Continuity, Diode, Frequency, Duty Cycle, Capacitance, NCV Detection, Live Wire Detection, and Temperature Testing.

Thank you again for choosing AstroAI, if you have any questions or concerns regarding your product, please contact us via support@astroai.com.



If you have any questions or concerns when using this product, please feel free to contact our customer support or refer to the detailed user manual on the product page.

WARNING

To avoid possible electric shock, personal injury, meter damage, and damage to the equipment being tested, always adhere to the following rules:

- Before using the meter, inspect its exterior casing. Do not use the meter if it is damaged or if any part of its exterior casing is removed. Look for cracks or missing plastic. Pay special attention to the insulation around the connectors.
- Always comply with local and national safety regulations. Wear personal protective equipment (such as approved rubber gloves, masks, flame-retardant clothing, etc.) to prevent injury from electric shocks and arcs when hazardous live conductors are exposed.
- Check whether the meter is working normally by measuring a known voltage. Do not use it if the readings are incorrect or the meter is damaged.
- When servicing the meter, only use replacement parts with the same model number or identical electrical specifications as the original.
- When using the test leads, always keep your fingers behind the finger guards.
- Do not apply more than the rated voltage, as marked on the meter, between the terminals or between any terminal and grounding.
- Do not use or store the meter in a high-temperature environment, near strong magnetic fields, or in high levels of humidity. The meter's performance may deteriorate after exposure to moisture.
- Before opening the meter's case, remove the connection between the testing leads and the circuit being tested. Then, turn the meter off.

- When the meter is working at an effective voltage over 60 V in DC or 30 V RMS in AC, exercise extra caution; there is an increased risk of electric shock.
- When taking measurements, connect the neutral wire or ground wire first. Then, connect the live wire. When disconnecting, disconnect the live wire first. Then, disconnect the neutral wire and the ground wire.
- Replace the battery as soon as the low battery symbol appears. With a low battery, the meter may produce false readings that can lead to electric shock and personal injury.
- The manual rotary switch should be placed in the correct position before taking any measurements and should NOT be moved during measurements, doing so may damage the meter.
- Turn the meter off when not in use and remove the battery when it is not going to be used for an extended period. Regularly check the battery as it may leak when it has not been used for some time. Replace the battery as soon as leaking appears. A leaking battery will damage the meter.

INCLUDED IN BOX

User Manual	x 1
Pair of Test Leads	x 1
K-Type Thermocouple	x 1
AstroAI 6000 Counts Multimeter	x 1

ELECTRICAL SYMBOLS

Category III test equipment is suitable for testing and measuring **CAT III** circuits connected to the power distribution portion of a low-voltage power supply unit in a building.

Category IV test equipment is suitable for testing and measuring **CAT IV** circuits connected to the power supply of a low-voltage power supply unit in a building.

 Dangerous Voltage (Shock Risk)

 Earth Ground

 Fuse

 Double Insulation

 Compliance with EU Standards

 Warning

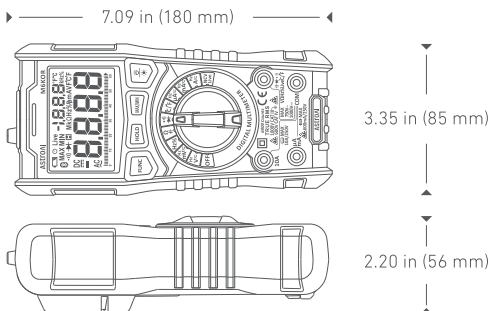
 AC (Alternating Current)

 DC (Direct Current)

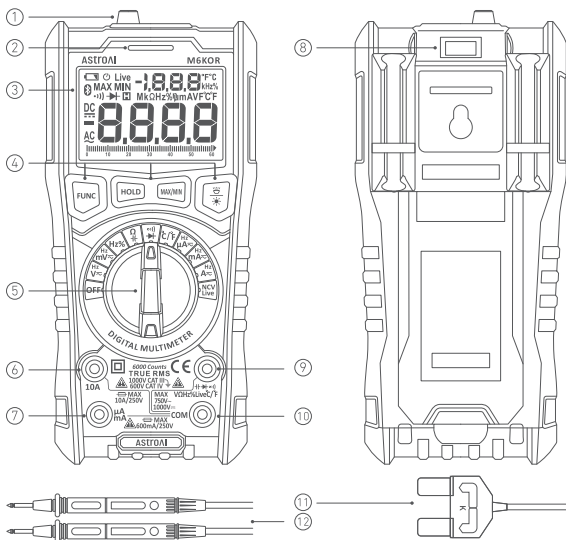
 AC and DC

 Low Battery Symbol

DIMENSIONS



DIAGRAM



① NCV Detector

② Indicator Light

③ LCD Screen

④ Function Buttons

⑤ Rotary Switch

⑥ 10 A Terminal

⑦ μ A/mA Terminal

⑧ Flashlight Button

⑨ $\star \star \star \star \star$ V Ω Hz/mV μ A/°C/°F Terminal

⑩ COM Terminal

⑪ K-Type Thermocouple

⑫ Test Leads

FUNCTION BUTTONS



Use the rotary switch to select a function. Use the "FUNC" Button to select a specific function if there are multiple functions in one rotary setting.

For example: Switching between AC and DC voltage tests.

Note: Ensure the appropriate setting is selected before performing any tests.



Press this button while performing a test to hold (freeze) the reading for easy recording.

The screen will display "[H]" while the hold function is activated.

Press the button again to cancel the data hold.



When taking a measurement, press this button once to enter "Max Mode". In this mode, the multimeter will capture the highest reading it records. Press this button again to enter "Min Mode" which will capture the lowest reading it records.

Press and hold this button to exit the Max/Min modes.



Backlight: Press this button to turn the screen's backlight on/off.

Flashlight: Press and hold this button to turn the flashlight on/off.

SETTING FUNCTIONS

Note: Use the "FUNC" Button to select a specific function if there are multiple functions in one rotary setting.

 Diode Test

 Audible Continuity Test

Hz Frequency

A  AC/DC Current Test: 0~10 A

% Duty Cycle

Ω Resistance Test: 0.1 Ω~60 MΩ

NCV NCV Detection

 Capacitance Test: 0.001 nF~100 mF

Live Live Wire Detection

mV  AC/DC Voltage Test: 0~600 mV

°C Celsius Temperature

μA  AC/DC Current Test: 0~6000 μA

°F Fahrenheit Temperature

mA  AC/DC Current Test: 0~600 mA

V  DC Voltage Test: 0~1000 V; AC Voltage Test: 0~750 V

OTHER FUNCTIONS

Auto Shutoff

After 15 minutes of inactivity, the meter will automatically turn off. To turn it on again, turn the rotary switch or press a button.


Input Indication

When turning on the multimeter or switching functions, the corresponding input terminal will flash to remind the user which terminal should be used.

High Voltage/High Current Indication

When the measured voltage is higher than 80 V or the measured current is higher than 1 A, the orange backlight will illuminate, reminding the user to be careful.

Low Battery Indication


If the " " symbol appears on the display, the battery should be replaced immediately.

AC Frequency Display

When measuring AC voltage/current, the frequency of the voltage/current will display.

OPERATING INSTRUCTIONS

Measuring Voltage

1. Insert the red test lead into the "  " terminal and the black test lead into the "COM" terminal.
2. Turn the rotary switch to the " **V** " setting. When the voltage is below 600 mV, turn the switch to the " **mV** " setting. Press the "FUNC" Button to switch between AC/DC voltage. The screen will indicate the multimeter's current setting. "DC" will display for DC measurements and "AC" will display when the meter is set to measure AC.
3. Connect one end of the test leads to the circuit that needs to be measured, in parallel with the circuit.
4. After the reading stabilizes, record the reading from the LCD screen. Turn the rotary switch to the OFF position to turn off the Meter.

Voltage Notes


- To avoid damaging the meter, do not measure voltages exceeding 600 V DC or 600 V AC.
- Ensure the correct voltage setting is selected before performing measurements. The LCD screen will indicate whether the setting is in the AC or DC setting. Use the "FUNC" Button to choose the appropriate setting.
- As a warning, the orange backlight will illuminate when the measured voltage is higher than 80 V.

Measuring Current


1. Turn the rotary switch to the " μA_{AC} ", " mA_{AC} ", or " A_{AC} " setting according to the current level to be measured.
2. When the screen displays "DC" the meter is in the DC setting, when "AC" is displayed, the meter is in the AC setting.
3. Under the " μA_{AC} " and " mA_{AC} " settings, connect the red test lead to the " $\text{V}\Omega\text{Hz}\% \text{Live}/\text{C}/\text{F}$ " terminal and the black test lead to the "COM" terminal.
4. Under the " A_{AC} " setting, connect the red test lead to the "10 A" terminal and the black test lead to the "COM" terminal.
5. Disconnect the power supply of the circuit being tested. Connect the meter in series to the circuit being tested. Then, turn on the circuit's power supply.
6. The reading will be displayed on the LCD screen.

Measuring Frequency/Duty Cycle

1. Turn the rotary switch to the " $\text{Hz}\%$ " setting.

2. Insert the red test lead into the "  " terminal and the black test lead into the "COM" terminal.
3. Connect the test leads to the source or load to be measured.
4. The reading will be displayed on the LCD screen.

Measuring Resistance

1. Turn the rotary switch to the " Ω " setting.
2. Insert the red test lead into the "  " terminal and the black test lead into the "COM" terminal.
3. Place the test leads at both ends of the resistor being measured and maintain strong contact.
4. The results will appear on the LCD display.

Resistance Notes

- Do not change the resistance while taking a measurement. Doing so may damage the meter and affect the test results.
- Do not directly measure the internal resistance of micrometers, galvanometers, batteries, and other instruments.
- Do not test parallel circuits. The accuracy of the measurement will be affected, and the results may not be accurate.
- If the measured value is equal to the nominal resistance of the resistor or within the range of error, the resistor is functioning correctly.
- If there is a large deviation between the nominal resistance and the measured resistance, the resistor is bad.
- If the measured resistance is infinite (open circuit), zero (short circuit), or unstable, it means the resistor is damaged and can no longer be used.

Measuring Capacitance

1. Turn the rotary switch to the " Ω " setting. Press the "FUNC" Button to switch to the capacitance test.
2. Insert the red test lead into the " $\text{V}\Omega\text{Hz}\% \text{Live}^{\circ}\text{C}/^{\circ}\text{F}$ " terminal and the black test lead into the "COM" terminal.
3. Make a secure connection between the test leads and both ends of the capacitor.
4. Measurement results will be displayed on the LCD screen.



Note:

It can take several seconds to measure some capacitors, be patient if accurate readings do not instantly appear. Charged capacitors can cause electrical shocks, please measure with extreme caution.

Continuity Test

1. Turn the rotary switch to the " \rightarrow " setting.
2. Insert the red test lead into the " $\text{V}\Omega\text{Hz}\% \text{Live}^{\circ}\text{C}/^{\circ}\text{F}$ " terminal and the black test lead into the "COM" terminal.
3. Place the test leads on both sides of the object being measured.
4. If the value of the measured resistance or circuit is less than 30 Ω , the buzzer will emit a beep and the green indicator light will illuminate. When the value is between 30 Ω ~60 Ω , the red indicator light will illuminate and the screen will display the measured value. If there is no continuity, the buzzer will not sound, and "OL" will appear on the screen, indicating an open line.



Diode Test

1. Set the rotary switch to the " " setting, press the "FUNC" Button to switch to the diode test.
2. Connect the black test lead to the "COM" terminal and the red test lead to the " " terminal.
3. Connect the red test lead to the positive end of the diode and the black test lead to the negative end.
4. The LCD will show the reading of the voltage decreased by the diode. If the leads are incorrectly connected to the diode electrodes, the LCD will show "OL".

Note:

Generally, the positive end of the diode is the longer end.


Temperature Measurement

1. Set the function switch to the " " setting.
2. Insert the negative (-) plug of the K-type thermocouple into the "COM" terminal and the positive (+) plug into the " " terminal.
3. Carefully touch the end of the thermocouple to the object being measured.
4. Celsius and Fahrenheit levels are both displayed onscreen.

Note:

Results take time to stabilize as thermal equilibrium is reached with the measuring environment. When the thermocouple is not in contact with an object being measured, it will read the ambient temperature of the surrounding environment.



Non-Contact Voltage (NCV)

1. The NCV function detects AC voltage without the use of test leads.
2. Set the rotary switch to the NCV function "  ".
3. When the meter senses a weak AC signal, the green indicator light will illuminate and the buzzer will emit a slow beep. When the meter senses a strong AC signal, the red indicator light will illuminate and the buzzer will beep rapidly.

Note:

This function does not affect the meter's measurements in other modes. If the rotary switch is not in the NCV position, the meter will operate normally.

Live Wire Detection

1. Turn the rotary switch to the "  " setting. Press the "FUNC" Button to switch to Live Wire Detection. The screen will display "Live".
2. Insert the red test lead into the "  " terminal. Do not insert the black test lead into any terminal.
3. Touch the point to be measured with the tip of the red test lead.
4. When the meter senses a weak AC signal, the green indicator light will illuminate and the buzzer will emit a slow beep. When the meter senses a strong AC signal, the red indicator light will illuminate and the buzzer will beep rapidly.

MAINTENANCE

Cleaning the Meter

If there is dust or humidity in the terminals, it may produce erroneous measurements. Please clean the meter as follows:

1. Turn off the meter and remove the test leads.
2. Wipe the case with a damp cloth or mild detergent. Do not use abrasives or solvents. Wipe the contacts in each terminal with a clean cotton swab dampened in alcohol.

Replacing the Battery and Fuse

Battery Replacement:

1. Turn off the meter and remove the test leads.
2. Remove the screws on the battery cover with a screwdriver. Then, remove the cover.
3. Remove the old battery and replace it with a new battery of the same specification. Ensure the new batteries are placed with their poles in the correct position; as indicated on the batteries and in the multimeter.
4. Put the battery cover back in its original position and secure the battery cover with its screws.

Fuse Replacement:

Fuses will rarely need replacement and are normally only blown due to operator error.

1. Turn off the power and remove the test leads plugged into the meter.

2. Remove the insulating sleeve and the four screws on the meter's back cover. Then, remove the cover.
3. Remove the blown fuses and replace them with new fuses of the same specification.
4. Put the cover back in its original position and secure the cover with the removed screws.

Note:

Always replace a damaged fuse with a new one of the same rating. This meter uses two fuses:

Fuse 1: F600 mA/250 V, Ø 6 X 32 mm.

Fuse 2: F10 A/250 V, Ø 6 X 32 mm.

TROUBLESHOOTING

How to Find a Live Wire in a Socket:

1. Switch to the Live Wire Test setting.
2. Connect the red test lead to the jack being measured.
3. Check both jacks. One should have a reading and the other should remain at or near zero. The live wire will have the reading.

Is the Diode Functioning Correctly?

If the red test lead is connected to the positive pole of the diode and the black lead is connected to the negative, then the diode should be in a forward conduction state. The displayed value is the forward voltage drop. To ensure correct current flow, reverse the connection; if "OL" appears, current is flowing correctly.


Normal Diode Forward Pressure Drop

The general silicon tube is 0.5-0.7 V while the germanium tube is 0.15-0.3 V.

Polarity Judgment Method

1. Switch the multimeter to the Resistance setting.
2. Connect the two test leads to the diode's two electrodes.
3. Measure one result, then swap the positions of the test leads. Then, measure the second result.
4. The larger result is the reverse resistance and the smaller result is the forward resistance. The smaller resistance is when the black test lead is connected to the positive end of the diode and the red lead is connected to the negative end.

SPECIFICATIONS

Digital Display	5999
Sampling Speed	3 Times Per Second
Range Selection	Automatic
Polarity Indication	"-" Automatically displayed
Overload Indication	"OL" Displayed
Low Battery Indication	"  " Displayed
Operating Environment	CAT IV 600 V; CAT III 1000 V
Pollution Degree	2
Altitude	<2000 m (6562 ft)

Operating Environment	32~104 °F (0~40 °C); (<80% RH)
Storage Environment	14~140 °F (-10~60 °C); (<70% RH, take out battery)
Temperature Coefficient	0.1 x accuracy/°C (<18°C or >28°C)
Maximum Voltage	DC 1000 V/AC 750 V
Fuse Protection	mA: F600 mA/250 V fuse; 10A: F10 A/250 V fuse
Power	2 x 1.5 V AA Batteries

DETAILED SPECIFICATIONS

DC Voltage

Range	Resolution	Accuracy
600 mV	0.1 mV	± (0.5% + 3)
6 V	0.001 V	
60 V	0.01 V	
600 V	0.1 V	
1000 V	1 V	

- Input Impedance: 10 MΩ.
- Overload Protection: 1000 V DC/750 V AC.

AC Voltage

Range	Resolution	Accuracy
600 mV	0.1 mV	± (0.8% + 5)
6 V	0.001 V	
60 V	0.01 V	
600 V	0.1 V	
750 V	1 V	

- Input Impedance: 10 MΩ.
- Overload Protection: 1000 V DC/750 V AC.
- Frequency Range: 40 Hz~1 kHz.
- Response: True RMS.

DC Current

Range	Resolution	Accuracy
600 μA	0.1 μA	± (1.2% + 3)
6000 μA	1 μA	
60 mA	0.01 mA	
600 mA	0.1 mA	
10 A	0.01 A	

- Overload Protection: "μA/mA": F600 mA/250 V fuse;
"10 A": F10 A/250 V fuse.
- Max Input Current: "μA/mA" jack: 600 mA; "10 A" Jack: 10 A.
(For measurements > 5 A: duration < 10 seconds, interval > 15 minutes between tests)

AC Current

Range	Resolution	Accuracy
600 μA	0.1 μA	± (1.5% + 3)
6000 μA	1 μA	
60 mA	0.01 mA	
600 mA	0.1 mA	
10 A	0.01 A	

- Overload Protection: "μA/mA": F600 mA/250 V fuse; "10 A": F10 A/250 V fuse.

- Max Input Current: "μA/mA" Jack: 600 mA ; "10 A" Jack: 10 A.
- Frequency Range: 40 Hz~1K Hz.
- Response: True RMS.

(For measurements >5 A: Duration <10 seconds, interval >15 minutes)

Resistance

Range	Resolution	Accuracy
600 Ω	0.1 Ω	± (1.0% + 3)
6 kΩ	0.001 kΩ	
60 kΩ	0.01 kΩ	
600 kΩ	0.1 kΩ	
6 MΩ	0.001 MΩ	
60 MΩ	0.01 MΩ	± (1.5% + 3)

Overload Protection: 250 V.

Temperature

Range	Resolution	Accuracy	
°C	1 °C	-20 °C~0 °C	± 5.0% or ± 3 °C
		0 °C~400 °C	±1.0% or ± 2 °C
		400 °C~1000 °C	± 2.0%
°F	1 °F	-4 °F~32 °F	± 5.0% or ± 6 °F
		32 °F~752 °F	± 1.0% or ± 4 °F
		752 °F~1832 °F	± 2.0%

The accuracy does not include the error of the thermocouple probe.

Capacitance

Range	Resolution	Accuracy
10 nF	0.001 nF	$\pm (4.0\% + 5)$
100 nF	0.01 nF	
1000 nF	0.1 nF	
10 μ F	0.001 μ F	
100 μ F	0.01 μ F	
1000 μ F	0.1 μ F	
10 mF	0.001 mF	$\pm (5.0\% + 5)$
100 mF	0.01 mF	

Overload Protection: 250 V.

Frequency/Duty Cycle

Range	Resolution	Accuracy
10 Hz	0.001 Hz	$\pm (1.0\% + 3)$
100 Hz	0.01 Hz	
1000 Hz	0.1 Hz	
10 kHz	0.001 kHz	
100 kHz	0.01 kHz	
1000 kHz	0.1 kHz	
10 MHz	0.001 MHz	$\pm (3.0\% + 3)$
1~99%	0.1%	

- Measuring Range: 0~10 MHz.
- Voltage Range: 0.2~10 V AC (The higher the measured frequency, the higher the voltage should be).
- Overload Protection: 250 V.

Note:



" $\frac{\text{Hz}}{\text{mV}_{\text{AC}}}$ " and " $\frac{\text{Hz}}{\text{V}_{\text{AC}}}$ ", Frequency measurement:

- Measuring Range: 0~10 kHz.
- Voltage Range: 0.5~600 V AC (The higher the measured frequency, the higher the voltage should be).
- Overload Protection: 250 V.

" $\frac{\text{Hz}}{\text{mV}}$ ", " $\frac{\text{Hz}}{\text{mA}}$ ", and " $\frac{\text{Hz}}{\text{A}}$ " Frequency measurement:

- Measuring Range: 0~10 kHz.
- Signal Range; $\geq 1/4$ range (The higher the measured frequency, the higher the current should be).
- Overload Protection: "A/mA": F600 mA/250 V fuse.
- "10 A": F10 A/250 V fuse.

Diode and Continuity

Range	Description	Note
	The approximate forward voltage drop will be displayed.	Test Voltage: 3.0 V Overload Protection: 250 V
	<p>If the value of the measured resistance or circuit is less than 30 Ω, the buzzer will emit a beep and the green indicator light will illuminate.</p> <p>When the value is between 30 Ω~60 Ω, the red indicator light will illuminate and the screen will display the measured value.</p> <p>If there is no continuity, the buzzer will not sound, and "OL" will appear on the screen, indicating an open line.</p>	Test Voltage: 1 V Overload Protection: 250 V

RECYCLING

You may dispose of the product when its service life has ended, please recycle the recyclable parts according to local guidelines.

WARRANTY PERIOD

3-Year Limited Warranty from AstroAI.

Each AstroAI True RMS 6000 Counts Digital Multimeter will be free from defects in material and workmanship.

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

This warranty covers the original purchaser only and is not transferable.

If this product is defective, please contact AstroAI Customer Support at support@astroai.com.

AstroAI

Web: www.astroai.com

E-Mail: support@astroai.com