




AstroAI True RMS 6000 Count Digital Multimeter User Manual

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True RMS 6000 Count Digital Multimeter



V1.0

Thank you for purchasing the True RMS 6000 Count Digital Multimeter from AstroAI. The AstroAI True RMS Digital Multimeter is designed to be safely and accurately used by professionals or DIYer's that need a little more

utility from their standard digital multimeter. This manual provides all safety information, operation instruction, specifications, and maintenance for the meter. The instrument performs AC/DC Voltage, AC/DC Current, Resistance, Audible Continuity, Diode, Frequency, Duty Ratio, 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 at support@astroai.com.

NOTE: Fully read and understand this manual before using this Digital Multimeter.

WARNING











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

- Before using the Meter, inspect the exterior casing. Do not use the Meter if it is damaged or if all or part of the exterior casing is removed. Look for cracks or missing plastic. Pay special attention to the insulation around the connectors.
- Comply with local and national safety regulations. Wear personal protective equipment (such as approved rubber gloves, masks, and 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 the known voltage, do not use if the readings are incorrect or the Meter is damaged.
- When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.
- When using the test leads, 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, do not expose to high levels of humidity, or near strong magnetic fields. The performance of the Meter may deteriorate after dampening.
- When the Meter is working at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken because there is a danger of electric shock.
- When measuring, connect the neutral wire or ground wire first, and then connect the live wire; when disconnecting, disconnect the live wire first, and then disconnect the neutral wire and the ground wire.
- Replace the battery as soon as the battery indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Remove the connection between the testing leads and the circuit being tested and turn the Meter power off before opening the Meter case.
- The manual rotary switch should be placed in the correct position before measurement and should NOT be moved during measurement to prevent damage to the Meter.
- Turn the Meter off when not in use and take out 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.

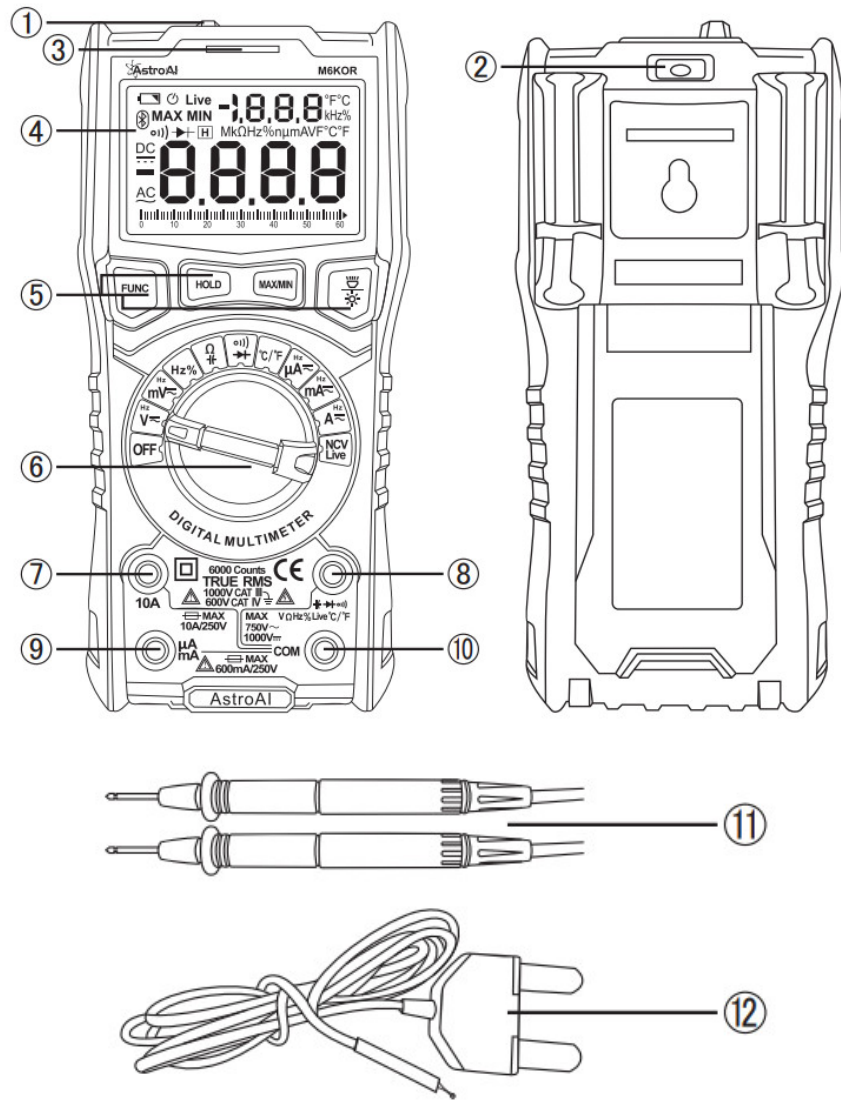
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ELECTRICAL SYMBOLS

	Warning		Dangerous Voltage
	AC (Alternating Current)		Earth Ground
	DC (Direct Current)		Fuse
	AC and DC		Double Insulation
	Low Battery Symbol		Compliance with EU Standards
CAT III	Category III test equipment is suitable for testing and measurements of circuits connected to the power distribution portion of a low-voltage power supply unit in a building.		
CAT IV	Category IV test equipment is suitable for testing and measurements of circuits connected to the power supply of a low-voltage power supply unit in a building.		

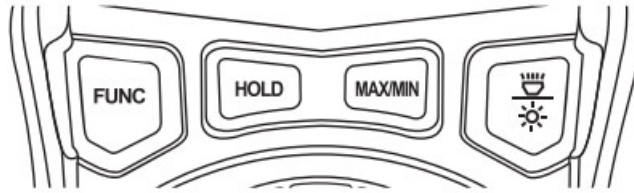
MULTIMETER DIAGRAM







1. NCV Detector
2. Flashlight Button
3. Indicator Light
4. LCD Screen
5. Function buttons
6. Rotary Function Switch
7. 10A Terminal
8. INPUT Terminal
9. COM Terminal
10. $\mu\text{A}/\text{mA}$ Terminal
11. Test Leads
12. K-Type Thermocouple

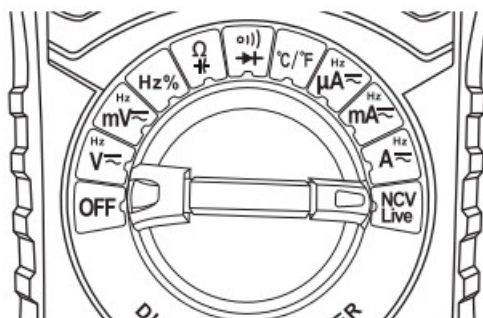
GETTING TO KNOW YOUR DEVICE







- BUTTONS FUNCTIONS



Button	Function
	<ul style="list-style-type: none"> Use the rotary switch to select a function. Use the FUNC Button to further select the function if there are multiple functions in one rotary setting. For example: Switching between AC and DC voltage tests. <p>NOTE: Pay special attention to the selected setting before performing any tests.</p>
	<ul style="list-style-type: none"> Press this button while performing a test to hold (freeze) the reading for easy recording. The screen will display HI when the hold function is activated. <p>Press the button again to cancel the data hold.</p>
	<ul style="list-style-type: none"> 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.
	<ul style="list-style-type: none"> Backlight: Press this button to turn on/off the screen’s backlight. Flashlight: Long Press this button to turn on/off the flashlight.

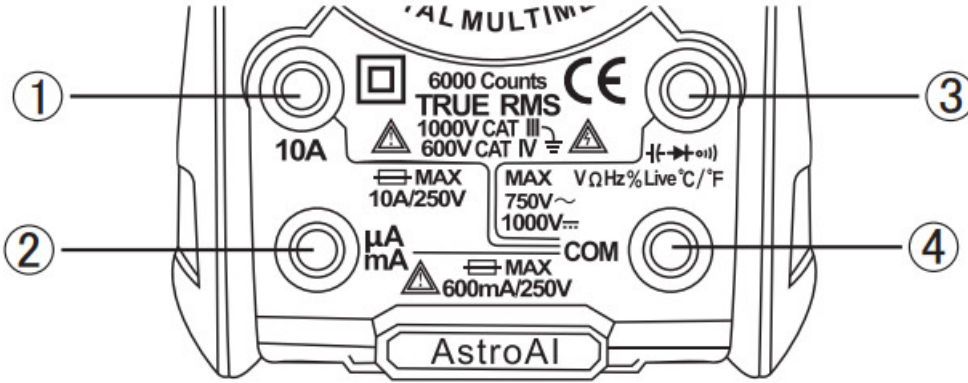
• SETTING FUNCTION



Setting	Function
NOTE: Use the FUNC Button to further select the function if there are multiple functions in one rotary setting.	
V 	DC Voltage Test : 0-1000v AC Voltage Test : 0-750v
mV 	AC/DC Voltage Test: 0-600mv
Ω	Resistance Test: 0.10-60M Ω
	Capacitance Test : 0.001nF-100mF
	Audible Continuity Test
	Diode Test
Hz	Frequency
%	Duty Cycle
A 	AC/DC Current Test : 0~10A
mA 	AC/DC Current Test : 0~600mA
μ A 	AC/DC Current Test : 0~6000uA
$^{\circ}$ F	Fahrenheit Temperature
$^{\circ}$ C	Celsius Temperature
NCV	NCV Detection

Live	Live Wire Detection
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• TERMINALS

	
1	Plug the red test lead into this terminal for currents between 600mA and 10A.
2	Plug the red test lead into this terminal for currents less than 600mA.
3	Plug the red test lead into this terminal for all measurements except the current.
4	Plug the black test lead into this terminal.

• OTHER FUNCTIONS

Auto Shut Off:

- After 15 of standby, the Meter will automatically turn off. To turn it on again, just rotate the range switch or press a button.


Input Indication:

- When turning on or function switching, the corresponding input indicator light will flash to remind the user which terminal is inserted.

High Voltage/High Current Indication:

- When the measured voltage is higher than 80V or the measured current is higher than 1A, the orange backlight will light up, prompting the user to be careful.

Low Battery Indication:

- If the“ ” symbol appears on the display, the battery should be replaced immediately.

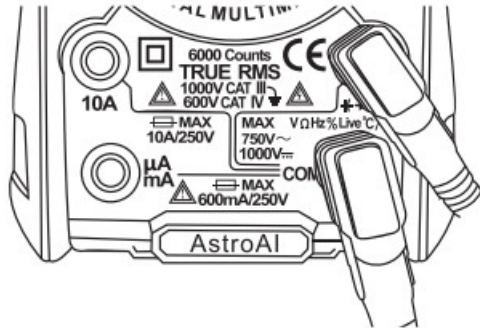
AC Frequency Display:

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

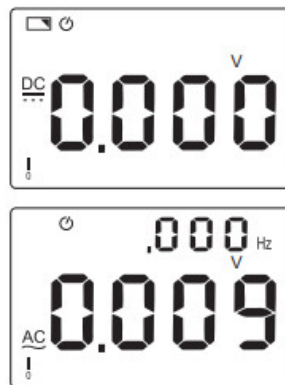
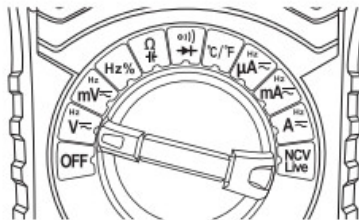
HOW TO USE THIS MULTIMETER

I. MEASURING VOLTAGE

- Insert the red test lead into the “Input” jack and the black test lead into the “COM” jack.



- Turn the rotary dial to the $v \sim$ set. When the voltage is below 600mV, turn the dial to the mv \sim setting. Press the “FUNC” button to switch between AC/DC voltage. The screen will indicate the setting that the DMM is currently in. “DC” will display for DC measurements and “AC” will display when the Meter is set to measure AC.



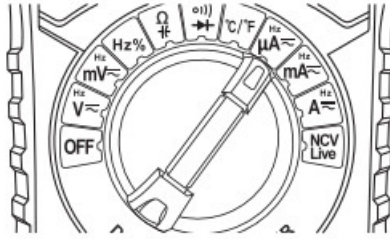
- Connect the test leads to the source of load to be measured.
Neutral wire first, then live wire.
- After the reading stabilizes, record the reading from the LCD screen.
- Turn the rotary switch to the OFF position to turn off the Meter.

VOLTAGE NOTES:

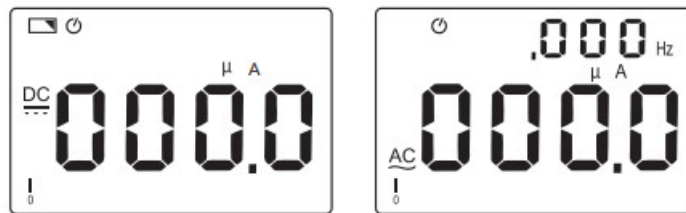
- To avoid damage to the meter, do not measure voltage exceeding 600V DC or 600V AC
- Pay special attention to the voltage setting of the Multimeter.
The LCD screen will indicate whether the setting is in AC.
Use the “FUNC” button to choose the appropriate setting.
- SPECIAL NOTE: The orange backlight will illuminate when the measured voltage is higher than 80V.

MEASURING CURRENT

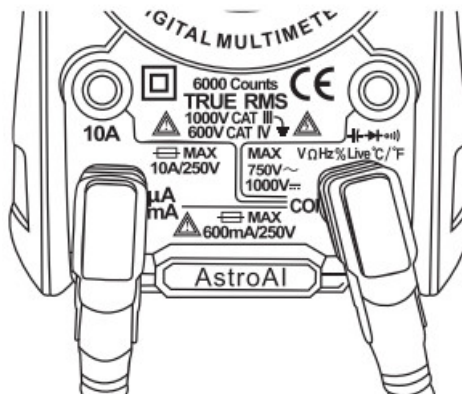
- Turn the rotary dial to the, μA , mA , A , or set it according to the current level to be measured.



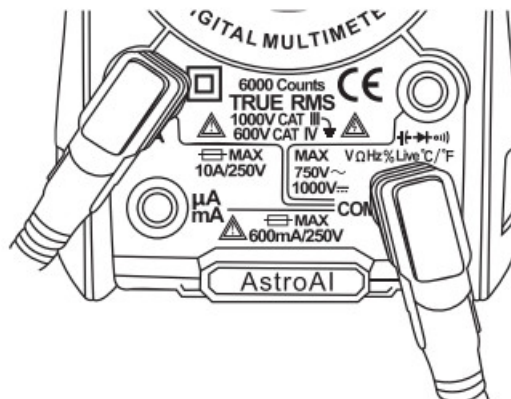
- When the screen displays “DC” the Meter is in the DC function, when “AC” is displayed, the Meter is in the AC function.



- Under the μA and mA settings, connect the red test lead to the input terminal and the black test lead to the COM terminal.



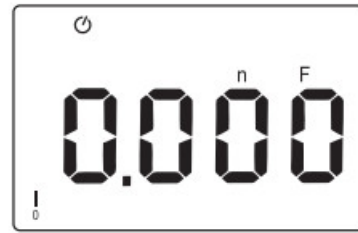
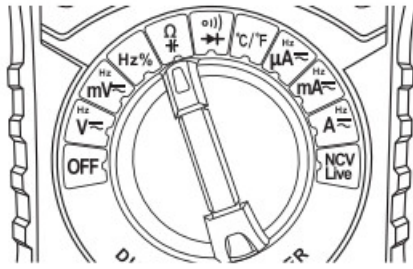
- Under the A setting, connect the red test lead to the 10A terminal and the black test lead to the COM terminal.



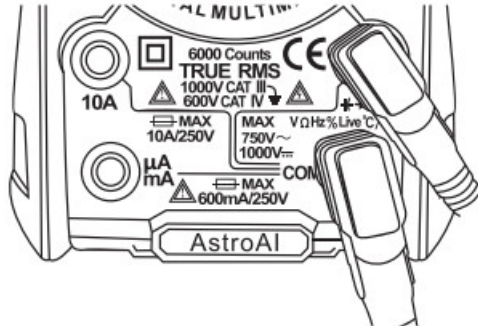
- Disconnect the power supply of the circuit under test.
Connect the meter to the circuit under test in series, and then turn on the power supply of the circuit.
- The reading will be displayed on the LCD screen.

MEASURING FREQUENCY/DUTY CYCLE

- Turn the rotary dial to the Hz% setting.



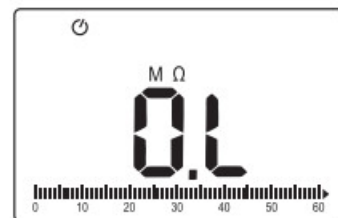
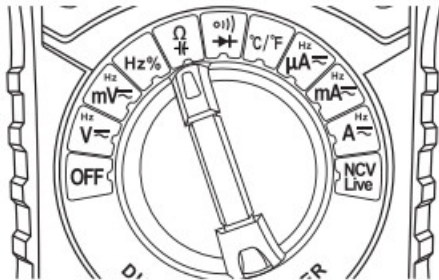
- Insert the red test lead into the “Input” jack and the black test lead into the “COM” jack.



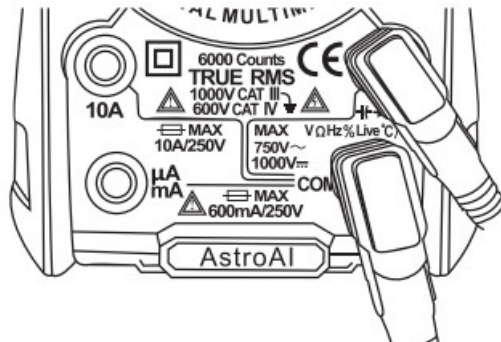
- Connect the test leads to the source or load to be measured.
- The reading will be displayed on the LCD screen.

MEASURING RESISTANCE

- Turn the rotary dial to the Ω setting.



- Insert the red test lead into the “Input” jack and the black test lead into the “COM” jack.



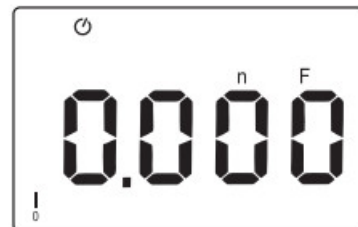
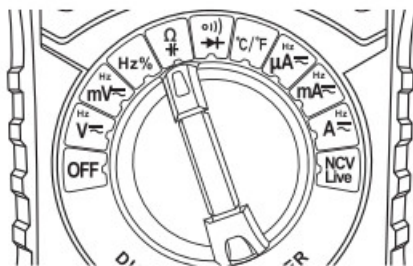
- Place the test leads at both ends of the resistance to be measured and maintain strong contact.
- The results will appear on the LCD display.

RESISTANCE NOTES:

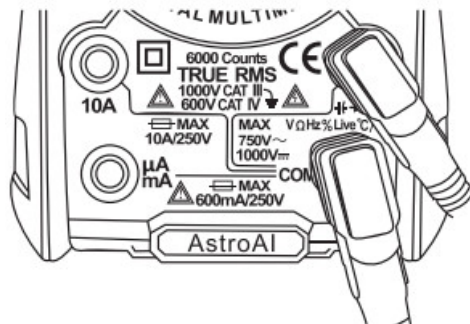
- Do not change the resistance while taking measurements.
Doing so may damage the Meter and affect the test results.
- Do not directly measure the internal resistance of micrometers, galvanometers, batteries, and other instruments.
- Do not test parallel circuits. The accuracy of the measurement will 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

- Turn the rotary dial to the Ω $\frac{1}{f}$ setting. Press the “FUNC” button to switch to Capacity Test.



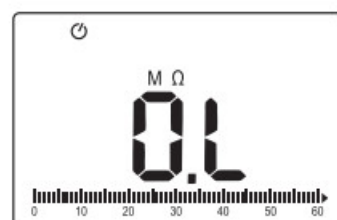
- Insert the red test lead into the “Input” jack and the black test lead into the “COM” jack.



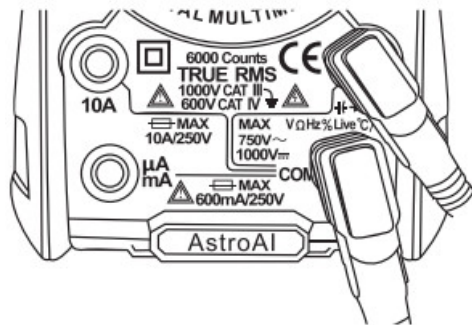
- Make a secure connection between the test leads and both ends of the capacitor.
- Measurement results will be displayed on the LCD display.

CONTINUITY TEST

- Turn the rotary dial to the \rightarrow setting.



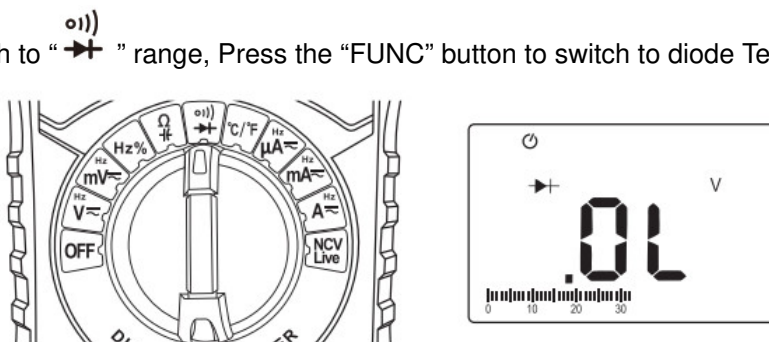
- Insert the red test lead into the “Input” jack and the black test lead into the “COM” jack.



- Place the test leads on both sides of the object to be measured.
 - If the value of the measured resistance or circuit is less than 300, the buzzer will emit a beep and the green indicator light will illuminate. When the value is between 300-600, the red indicator light will illuminate and the screen will display the measured value.
- If there is no continuity, the buzzer will not sound, “OL” will appear on the screen, indicating infinite resistance.

DIODE TEST

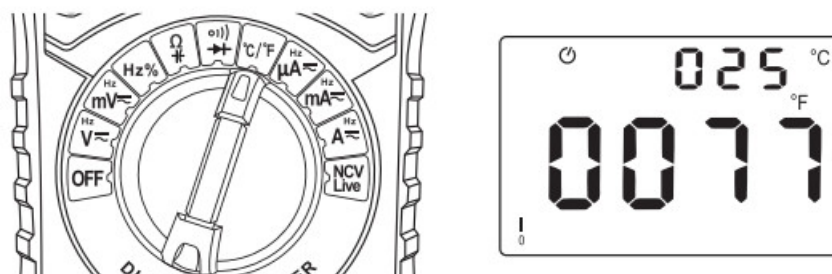
- Set the function switch to “ $\rightarrow|$ ” range, Press the “FUNC” button to switch to diode Test.



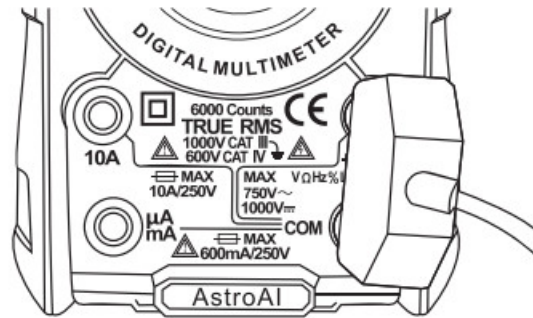
- Connect the black test lead to the “COM” jack and the red test lead to the “INPUT” jack.
 - Connecting the red test lead to the positive end of the diode and the black test leads to the negative end.
- NOTE:** Generally, the positive end of the diode is the longer end.
- The LCD will show the reading of the voltage decreased by the diode. If the leads are incorrectly connected to the diode electrodes, the LCD will show “OL”.

TEMPERATURE MEASUREMENT

Set the function switch to the “ °C/°F” range.



- Insert the negative (-) plug of the K-type thermocouple to the COM jack and the positive (+) plug to the INPUT jack.

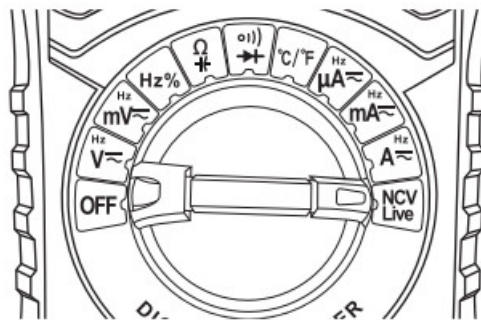


- Carefully touch the end of the thermocouple to the object being measured.
- Celsius and Fahrenheit are both displayed.

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)

- The NCV function detects AC voltage without the use of test leads.



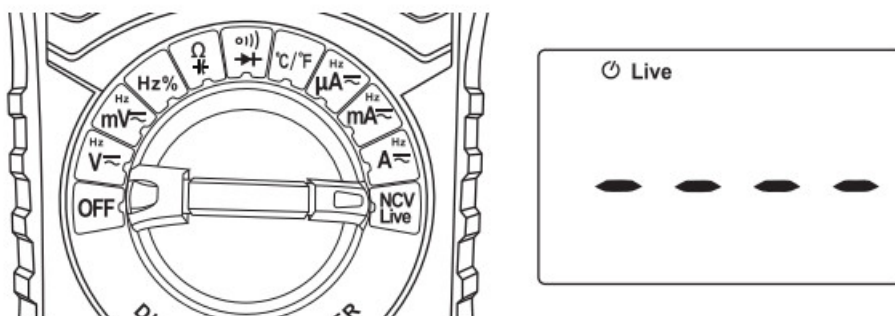
- Set the Rotary Dial to the NCV function **NCV/Live**
- When the meter senses a weak AC signal, the green indicator light will turn on and the buzzer emits a slow beep; When the meter senses a strong AC signal, the red indicator light will turn on, and the buzzer will emit a quick beep.

NOTE: This function does not affect the Meter's measurement after exiting the setting. If the range switch is not in the NCV position, the Meter will operate normally.

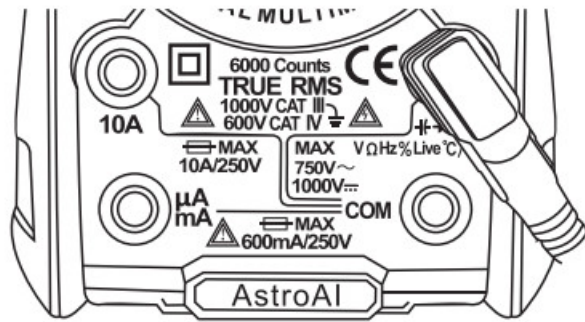
LIVE WIRE DETECTION

- Turn the rotary dial to the **NCV/Live** setting.

Press the "FUNC" button to switch to Live Wire Detection and the screen will show "Live".




- Insert the red test lead into the "Input" jack. Do not insert the black test lead into any terminal.



- Touch the point to be measured with the tip of the red test lead.
- When the meter senses a weak AC signal, the green indicator light will turn on, and the buzzer emits a slow beep; When the meter senses a strong AC signal, the red indicator light will turn on, and the buzzer will emit a quick beep.

GENERAL TECHNICAL INDICATORS

Operating Environment	<ul style="list-style-type: none"> • CAT. IV 600V; CAT. III 1000V • Pollution Degree: 2 • Altitude: <2000m (6562ft) • Operating Temp: 32~104°F (0~40°C) • Operating Humidity: (<80% RH) • emperature Coefficient: 0.1 x accuracy/°C (<18°C or >28°C)
Storage Environment	<ul style="list-style-type: none"> • Storage Temperature: 14~140°F (-10~60°C) • Storage Humidity: (<70% RH, take out the battery)
Maximum Voltage	<ul style="list-style-type: none"> • DC1000V/AC750V
Fuse Protection	<ul style="list-style-type: none"> • mA : F600mA/250V fuse,6mmX32mm • 10A: F10A/250V fuse,6mmX32mm
Sampling Speed	<ul style="list-style-type: none"> • 3x per second
Display	<ul style="list-style-type: none"> • 6000 counts display. Automatically displays unit according to rotary dial.
Overload Indication	<ul style="list-style-type: none"> • “OL” Displayed
Low Battery Indication	<ul style="list-style-type: none"> •  displayed when battery voltage is lower than normal.
Polarity Indication	<ul style="list-style-type: none"> • “-” Automatically displayed
Power	<ul style="list-style-type: none"> • 2 x 1.5V AA Batteries

TROUBLESHOOTING

The reading does not stabilize	<ul style="list-style-type: none"> • Check the test leads for damage. • Check the contact between test leads and the object being measured. • Check the connection between the test leads and the Meter.
Reading is not accurate	<ul style="list-style-type: none"> • Check the test leads for damage. • Check if the battery needs to be replaced.
A certain range is not available	<ul style="list-style-type: none"> • Adjust the contact point of the transfer switch.
Range error is large	<ul style="list-style-type: none"> • The variable value of shunt resistance needs to be adjusted or replaced.
No reading	<ul style="list-style-type: none"> • Check whether the fuse is intact. • Check the test leads for damage.

DC VOLTAGE

Range	Resolution	Accuracy
600mV	0.1mV	$\pm(0.5\% \text{ rdg} + 3 \text{ dgts})$
6V	0.001V	
60V	0.01V	
600V	0.1V	
1000V	1V	

- Input Impedance: 10M Ω
- Overload Protection : 1000V DC/750V AC

AC VOLTAGE

Range	Resolution	Accuracy
600mV	0.1mV	$\pm(0.8\% \text{ rdg} + 5 \text{ dgts})$
6V	0.001V	
60V	0.01V	
600V	0.1V	
750V	1V	

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

DC CURRENT

Range	Resolution	Accuracy
600pA	0.1 pA	$\pm (1 .2\% \text{ rdg} + 3 \text{ dgts})$
6000pA	1 pA	
60mA	0.01 mA	
600mA	0.1mA	
10A	0.01A	

- Overload Protection: “A/mA”: F600mA/250V fuse “10A”: F10A/250V fuse
- Max.Input Current: “A/mA” jack: 600mA “10A” jack: 10A (For measurements>5A: duration <10 seconds, interval >15 minutes)

AC CURRENT

Range	Resolution	Accuracy
600pA	0.1 pA	± (1 .5% rdg +3 dgts)
6000pA	1 pA	
60mA	0.01 mA	
600mA	0.1mA	
10A	0.01A	

- Overload Protection: “A/mA”: F600mA/250V fuse “10A”: F10A/250V fuse
- Max.Input Current: “A/mA” jack: 600mA “10A” jack: 10A
- Frequency Range: 40Hz ~ 1KHZ
- Response: True RMS (For measurements>5A: duration <10 seconds, interval >15 minutes)

RESISTANCE

Range	Resolution	Accuracy
6000	0.10	±(1.0% rdg +3 dgts)
6k0	0.001k0	
60k0	0.01k0	
600k0	0.1k0	
6M0	0.001M0	±(1.5% rdg +3 dgts)
60M0	0.01M0	

- Overload Protection: 250V

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

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

CAPACITANCE

Range	Resolution	Accuracy
10nF	0.001nF	±(4.0% rdg +5 dgts)
100nF	0.01nF	
1000nF	0.1 nF	
10pF	0.001 pF	
100pF	0.01 pF	
1000pF	0.1 pF	
10mF	0.001mF	±(5.0% rdg +5 dgts)
100mF	0.01mF	

- Overload Protection: 250V

FREQUENCY/DUTY CYCLE

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

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

NOTE:



$\overset{\text{Hz}}{\text{mA}}$ and, V  Frequency measurement:

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

$\overset{\text{Hz}}{\mu\text{A}}$, $\overset{\text{Hz}}{\text{mA}}$ and $\overset{\text{Hz}}{\text{A}}$  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" F600mA/250V fuse "10A" F10A/250V fuse

DIODE AND CONTINUITY

Range	Introduction	Remark
	The approximate forward voltage Drop will be displayed.	Test voltage: 3.0V Overload Protection 250V
	If the value of the measured resistance or circuit is less than 30Ω , the buzzer will emit a beep and the green indicator light will illuminate. When the value is between $30\Omega \sim 60\Omega$, the red indicator light will illuminate, and the screen will display the measured value. If there is no continuity, the buzzer will not sound, "OL" will appear on the screen, indicating infinite resistance.	Test voltage: 1V Overload Protection: 250V

MAINTENANCE

CLEANING THE METER:

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

- Turn off the power to the Meter and remove the test leads.
- 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:

- Turn off the Meter and remove the test leads.
- Remove the screws on the battery cover with a screwdriver, and remove the cover.
- Remove the old battery and replace it with a new battery of the same specification. Please pay attention to the polarity of the battery. The positive and negative polarity of each battery is marked in the battery box.
- Put the battery cover back to its original position and fix the battery cover with the removed screws.

REPLACING FUSES:

Fuses rarely need to be replaced and are usually blown due to operator error. To replace the fuses:

- Disconnect the test leads.
- Remove the rubber sleeve and screws on the back cover of the Meter.
- Open the back of the Meter and replace it with fuses of the same rating.

It is crucial that the replacement fuses have the same rating:

Fuse 1: F600mA/250V fuse, 6mmX32mm

Fuse 2: F10A/250V fuse, 6mmX32mm

INCLUDED INBOX

- 1 x Owner's Manual
- 1 x Pair of Test Leads
- 1 x K-Type Thermocouple
- 1 x AstroAI 6000 Counts Multimeter

3 YEAR WARRANTY LIMITED WARRANTY FROM ASTORIA

Each AstroAI 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.



Web:WWW.astroai.com
 E-mail:support@astroai.com

Documents / Resources

	AstroAI True RMS 6000 Count Digital Multimeter [pdf] User Manual AstroAI, True, RMS, 6000 Count, Digital, Multimeter
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References

- [A AstroAI: Focus on automotive and household tools by innovation](#)