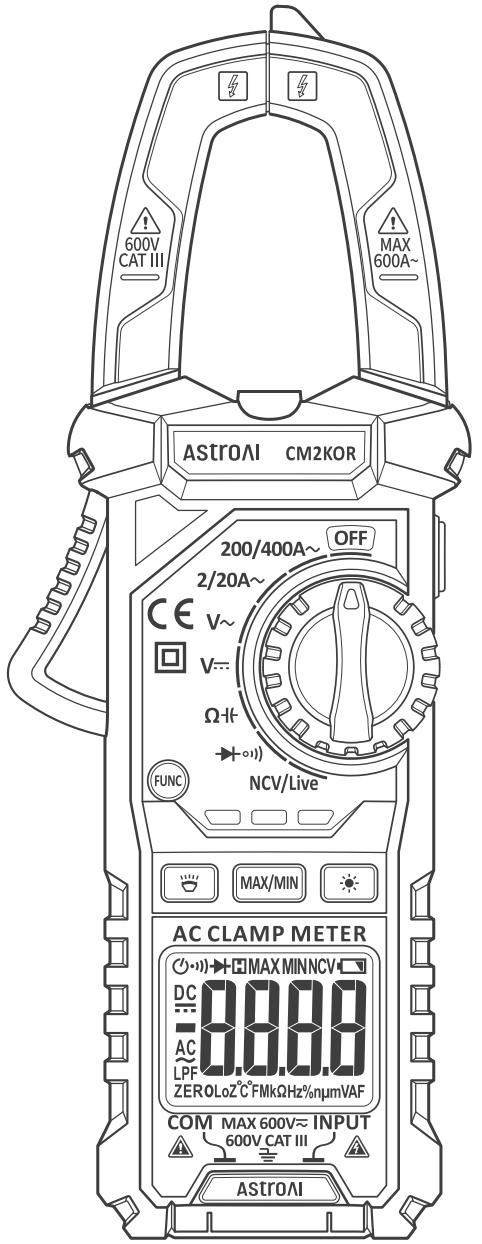



# DIGITAL CLAMP METER

# USER MANUAL

# CATALOG

# INTRODUCTION

Thank you for purchasing the True RMS 2000 Counts Clamp Meter from AstroAI.

This meter is designed to be safely and accurately used by professionals and DIYer’ s alike. This manual provides all safety information, operation instruction, specifications, and maintenance information for the meter. The instrument performs AC Current AC/DC Voltage, Resistance, Audible Continuity Testing, Diode Testing, NCV Detection, and Capacitance Testing.

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

Fully read and understand this manual before use and keep it for future reference.

## WARNING

To avoid electric shocks or personal injury, and possible damage to the meter or to the equipment being tested, please adhere to the following rules:

- Use the Meter strictly in accordance with this manual, otherwise the protection function provided by the Meter may be damaged or weakened.
- Please be especially careful when measuring over 60 V DC, 30 V AC RMS or 42 V peak value as there is an increased danger of electric shock.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- 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.
- Before using the Meter, please check whether there are cracks or damage to the plastic parts of the Meter casing. Do not use the Meter if any part of the exterior casing is damaged.
- Before using the Meter, please check whether the test leads are cracked or damaged. Please replace the test leads with the same model and electrical specifications if the leads are damaged.
- Use the Meter according to the measurement category, voltage or current rating specified on the Meter or manual.
- 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.

- Replace the battery as soon as the low-battery indicator appears to avoid measurement errors.
- Do not use the Meter around explosive gas or steam; or humid environments.
- When using the test leads, keep your fingers behind the finger guards.
- Do not measure the current when a test lead is inserted into the INPUT Terminal.
- Do not let the Meter work without someone present to monitor it.
- 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.
- Before opening the case or battery cover, remove the test leads from the Meter first. Do not use the Meter when it is disassembled or the battery cover is opened.
- To ensure your safety, the Meter can only be used with the equipped test leads. If the test leads are damaged and need to be replaced, only replace them with the same model and the electrical specifications.

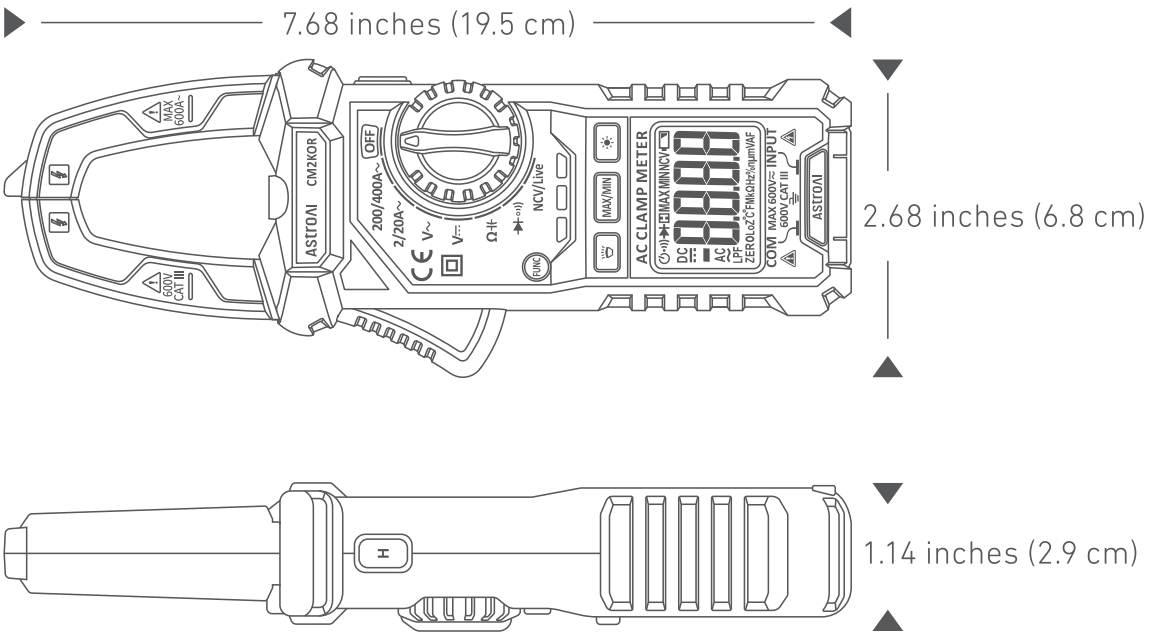
## INCLUDED IN BOX

| | |
|---|---|
| Owner's Manual | ×1 |
| Pair of Test Leads | ×1 |
| Storage Bag | ×1 |
| AstroAI 2000 Counts CLAMP METER | ×1 |

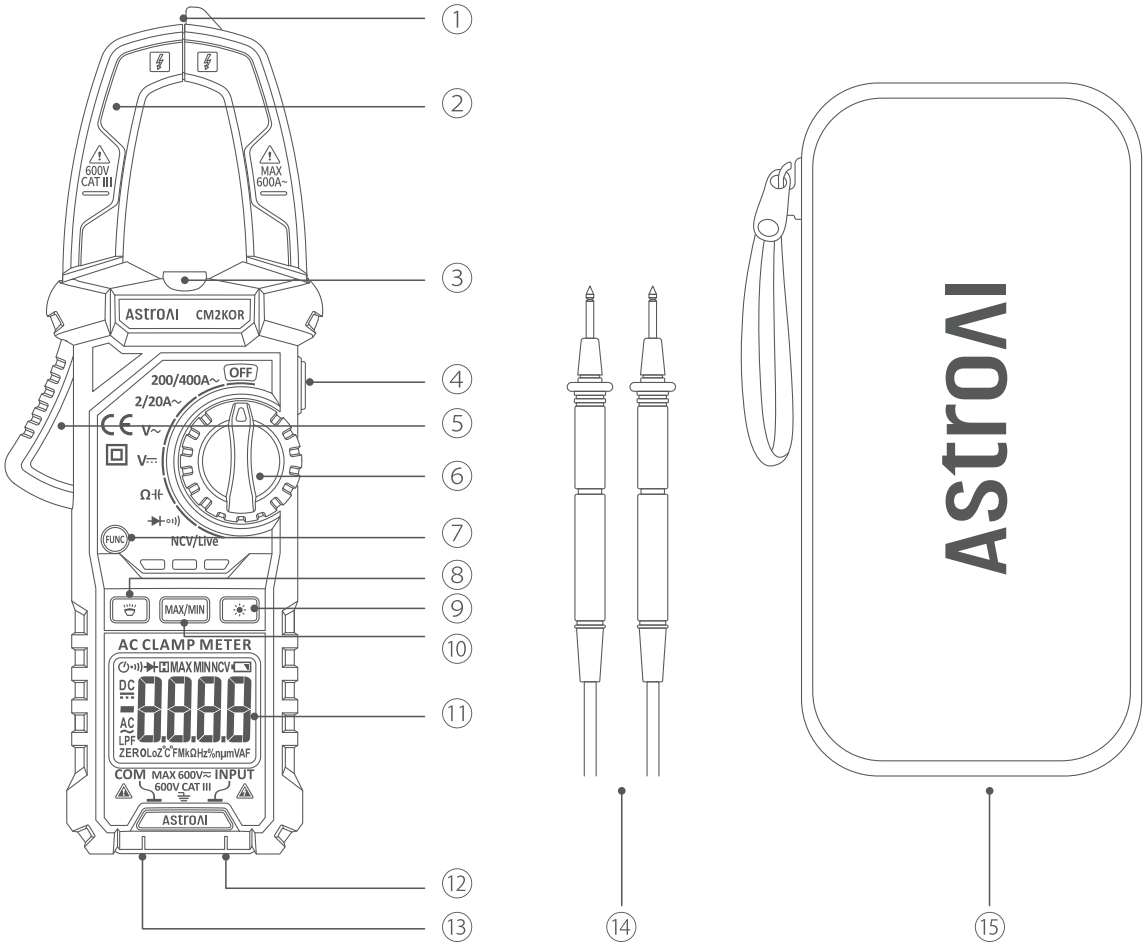
## ELECTRICAL SYMBOLS

| | |
|---|---|
| ~ AC (Alternating Current) | Ω Resistance |
| ⎓ DC (Direct Current) | Continuity Test |
| ≂ AC and DC | Diode Test |
| Capacitance | Low Battery |
| A Current | V Voltage |
| Warning | Dangerous Voltage may be present |
| Earth Ground | **NCV** Non-Contact Voltage Setting |

## DIMENSIONS



# METER DIAGRAM




① NCV Detector

② Transformer Jaws

③ Flashlight

④ DATA HOLD Button

⑤ Trigger

⑥ Rotary Switch

⑦ FUNC Button

⑧ Flashlight Button

⑨ Backlight Button

⑩ MAX/MIN Button

⑪ Display

⑫ INPUT Terminal

⑬ COM Terminal

⑭ Test Leads

⑮ Storage Bag

# BUTTON FUNCTIONS

## FUNC

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; choosing between diode, resistance, and continuity tests.

**NOTE: Pay special attention to the selected setting before performing any tests.**


Press this button while performing a test to hold (freeze) the reading for easy recording. The screen will display when the hold function is activated. Press the button again to cancel the data hold.

Press this button to turn the flashlight on/off.

## MAX/MIN

Press this button to turn on the MAX/MIN hold function, and press it again to view the recorded maximum value and minimum value, respectively. Press and hold the button for more than two seconds to exit this function.

Press this button to turn the screen’s backlight on/off.

### Input Terminal

Plug in the red test lead for all measurements.

### COM Terminal

Plug the black test lead into this terminal.

## AUTO POWER OFF

If the Meter is not in operation for 15 minutes, it will turn off automatically. To turn it on again, simply rotate the range switch or press any button.

## HOW TO USE THIS METER

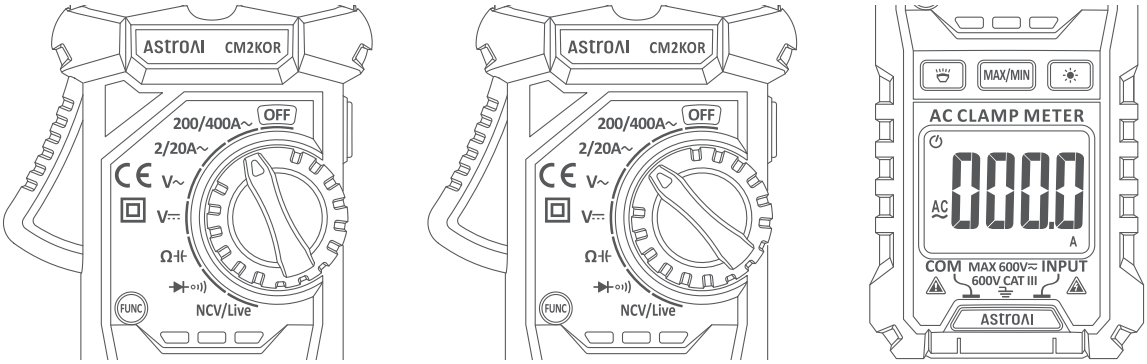
The Meter is very sensitive. It will be affected by nearby magnetic fields. Without touching any objects, there may be a reading jumping on the screen when it is turned on. This is a normal occurrence for a digital meter and it does not affect the measurement results.

**NOTE:**

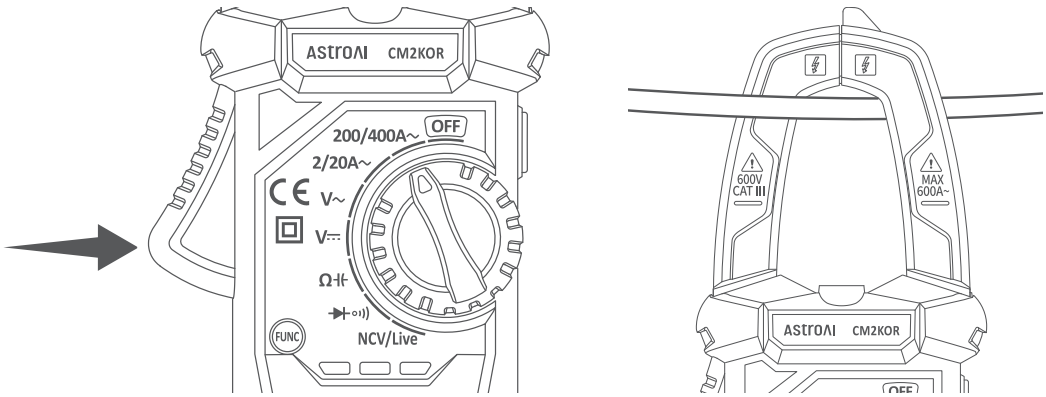
- To avoid damaging the Meter, do not measure voltage exceeding 600 V.
- Pay special attention to safety when measuring high voltages to avoid electric shock or other personal injury.
- Before using the Meter, test a known voltage or current with it to confirm that the Meter works properly.

## I. Measuring AC Current

1. Turn the rotary dial to the “200/400 A~” or “2/20 A~” setting. The screen will display “AC” indicating that the measurement function is AC current.



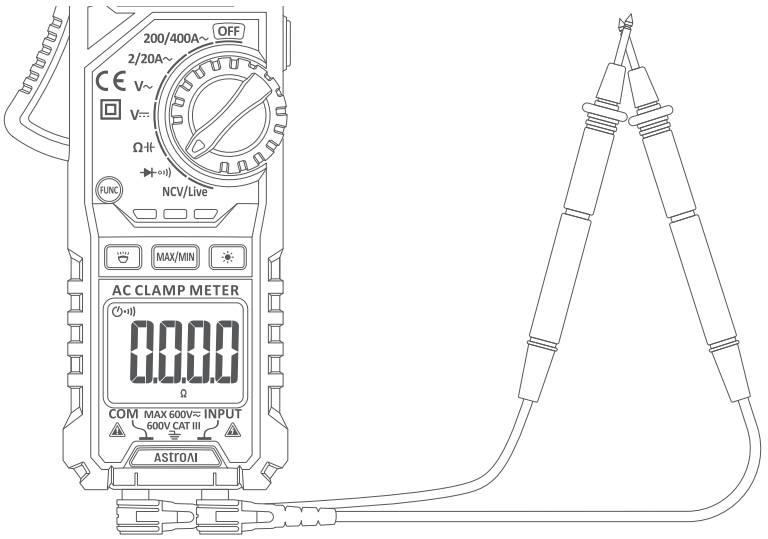

2. Press the trigger to open the transformer jaws, clamp the conductor to be tested, slowly releasing the trigger until the clamp head is completely closed. Ensure the conductor to be tested is in the center of the clamp head. Errors will occur if the conductor is not placed in the center of the clamp head.



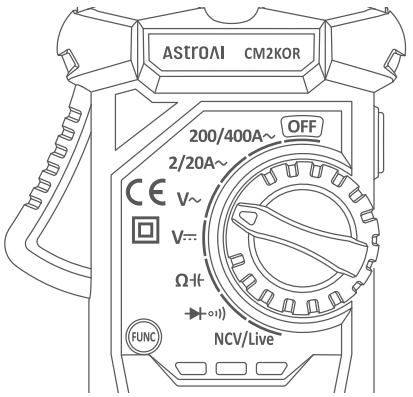

3. After the reading stabilizes, record it from the LCD screen.
4. Turn the rotary switch to the OFF position to turn off the Meter.

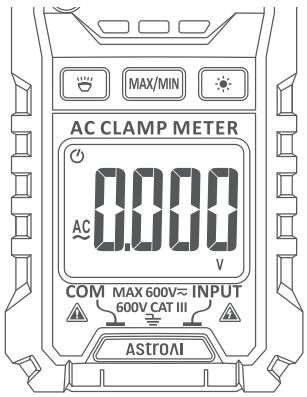
## II. Measuring AC/DC Voltage

1. Insert the red test lead into the Input terminal and the black test lead into the COM terminal.
2. Turn the rotary dial to the continuity test. Then, touch the red and black test leads together to ensure they function. The buzzer will beep and the indicator light will come on if the test leads are normal.

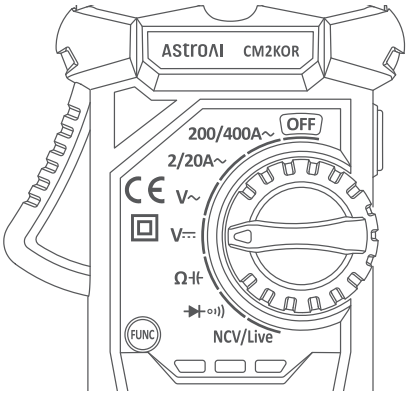


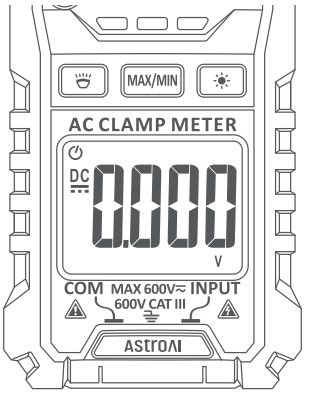

3. Turn the rotary dial to the "V~" setting. The screen will display "AC" indicating that the measurement function is AC voltage.



4. Turn the rotary dial to the "DC" setting. The screen will display "V⎓" indicating that the measurement function is DC voltage.




5. Connect the meter in parallel to the circuit being tested.

   NOTE: If the reading is negative when measuring DC voltage, it means that the positive and negative poles of the test leads are reversed, please change the test leads.

6. After the reading stabilizes, record the reading from the LCD screen.

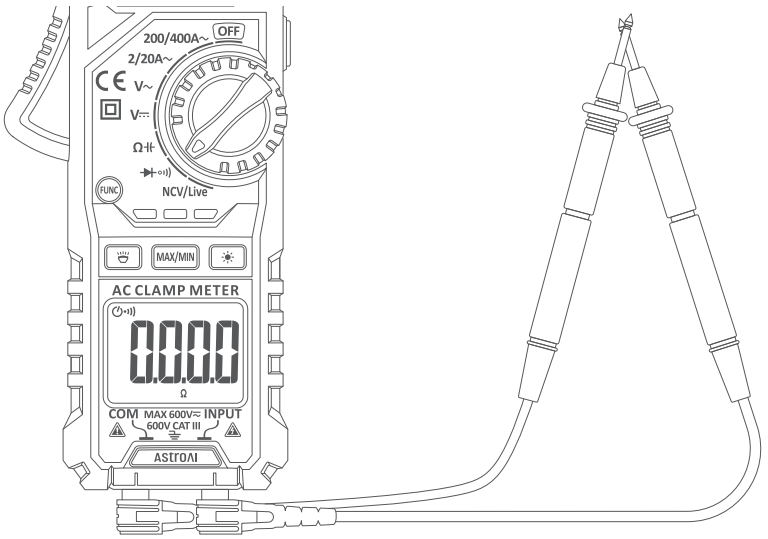
7. Turn the rotary switch to the OFF position to turn off the Meter.

## Voltage Notes

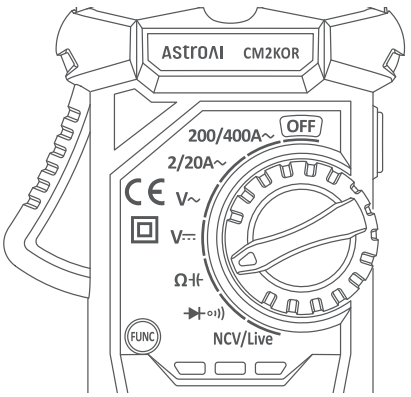
- To avoid damaging the Meter, do not measure voltage exceeding 600 V DC or 600 V AC CATIII.
- If the AC setting is used to measure DC and vice versa, an overflow symbol will be displayed. Doing this has the potential to damage the Meter and any components you are attempting to test.
- When measuring voltage, the result will fluctuate depending on the power supply. Generally speaking, the result will fluctuate ± 10 V, which is NOT an inaccurate result.

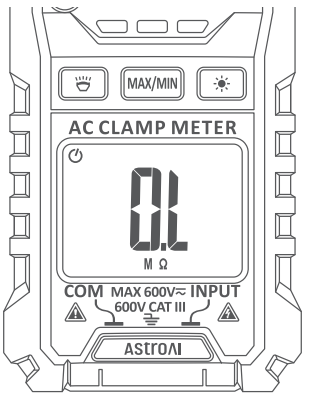
## III. Measuring Resistance

1. Insert the red test lead into the Input terminal and the black test lead into the COM terminal.
2. Turn the rotary dial to the continuity test. Then, touch the red and black test leads together to ensure they function. The buzzer will beep and the indicator light will come on if the test leads are normal.




3. Turn the rotary dial to the "**Ω⊣⊢**" setting. The screen will display "Ω" indicating that the measurement function is resistance.



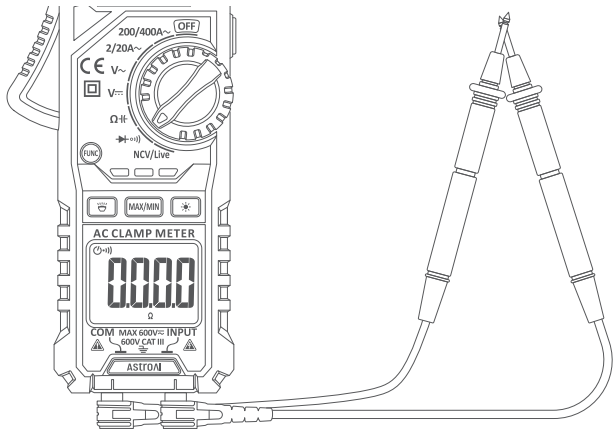
4. Connect the test leads to both ends of the circuit or resistor being tested (connect the leads to the resistance under test in parallel).
5. After the reading stabilizes, record the reading from the LCD screen.
6. Turn the rotary switch to the OFF position to turn off the Meter.

Resistance Notes

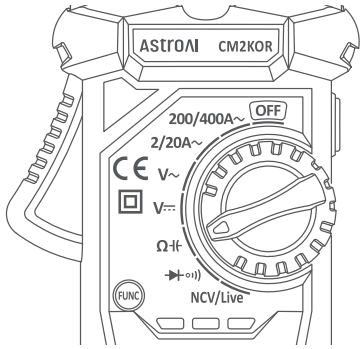
- Do not change the resistance while taking a measurement. Doing so may damage the Meter and affect the test results.
- Do not test parallel circuits. The accuracy of the measurement will be affected, and the results may not be accurate.
- Do not directly measure the internal resistance of micrometers,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

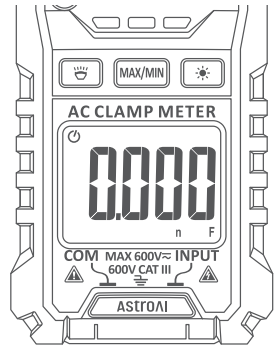
## IV. Measuring Capacitance

1. Insert the red test lead into the Input terminal and the black test lead into the COM terminal.
2. Turn the rotary dial to the continuity test. Then, touch the red and black test leads together to ensure they function. The buzzer will beep and the indicator light will turn on if the test leads are normal.



3. Turn the rotary dial to the "Ω⊣⊢" setting. Press the "FUNC" button to switch to capacitance test. The screen will display "n F" indicating that the measurement function is capacitance.




4. Connect the test leads to both ends of the circuit or resistor being tested (connect the leads to the resistance under test in parallel).
5. After the reading stabilizes, record the reading from the LCD screen.
6. Turn the rotary switch to the OFF position to turn off the Meter.

## Capacitance Tips

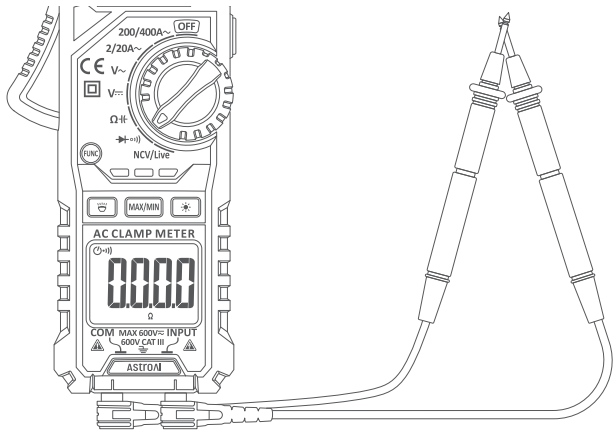
If the measured value is significantly different from the value marked on the capacitor, the capacitor is damaged.

## Capacitance Notes

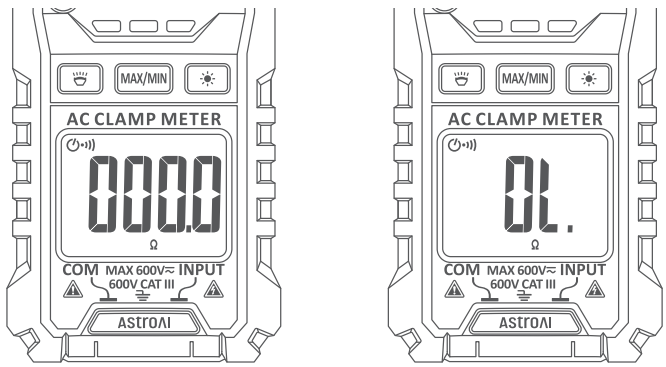
- Before measuring the capacitor, discharge it to avoid damaging the Meter. Do so by connecting the capacitor to a high-powered resistor.
- Discharge the capacitor after measurement to avoid any potential safety hazards.
- If the capacitance is large, it may take a long time for the reading to stabilize.

## V. Continuity Test

1. Insert the red test lead into the Input terminal and the black test lead into the COM terminal.
2. Turn the rotary dial to the "⊣◦)))" setting. The screen will display "◦))" indicating that the measurement function is continuity. Then, touch the red and black test leads together to ensure they function. The buzzer will beep if the test leads are normal.



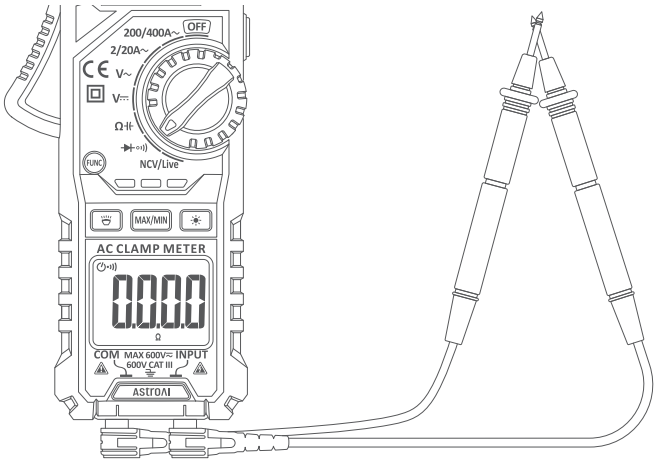

3. Connect the test leads to both ends of the circuit or resistor being tested (parallel). If the resistance of the circuit or resistor being tested is less than 50 Ω, the buzzer will emit a beep and the measured resistance value will be displayed on the LCD display.
4. If the circuit or resistor being tested is disconnected, or the resistance value is greater than 50 Ω, the LCD screen will display "OL".



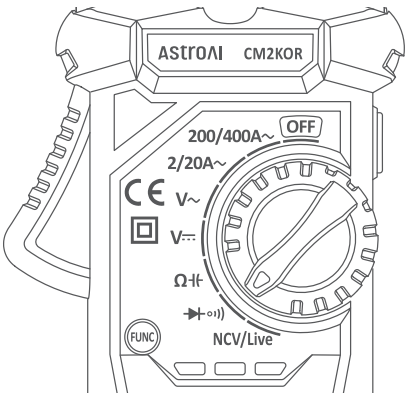
5. Turn the rotary switch to the OFF position to turn off the Meter.

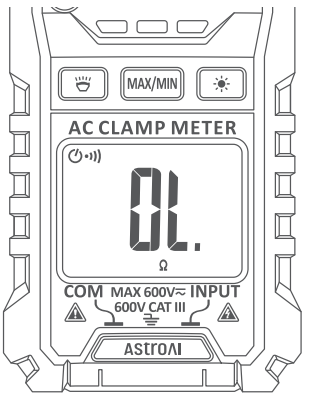
## VI. Diode Test

1. Insert the red test lead into the Input terminal and the black test lead into the COM terminal.
2. Turn the rotary dial to the continuity test. Then, touch the red and black test leads together to ensure they function. The buzzer will beep and the indicator light will turn on if the test leads are normal.




3. Turn the rotary dial to the "⊣◦)))" setting. Press the "FUNC" button to switch to the diode test. The screen will display "⊣" indicating that the measurement function is diode.



4. Connect the red test lead to the anode of the diode being tested and the black test lead to the cathode of the diode.

   NOTE: Usually the anode of the diode is the longer end.

5. The LCD screen will display the approximate voltage drop reading of the diode. If the test leads are connected reversely, “OL” will be displayed on the LCD screen. Please replace the test leads to measure again.

6. Turn the rotary switch to the OFF position to turn off the Meter.

### Diode Test Tips

- 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, and the displayed value is the forward voltage drop.
- Normal diode forward pressure drops: the general silicon tube is 0.5- 0.7 V, germanium tube is 0.15-0.3 V.
- If "0000" is displayed, the diode is broken.
- You can also verify that the red test lead is connected to the negative pole of the tested diode and the black test rod is connected to the positive pole. The meter should display “OL”.

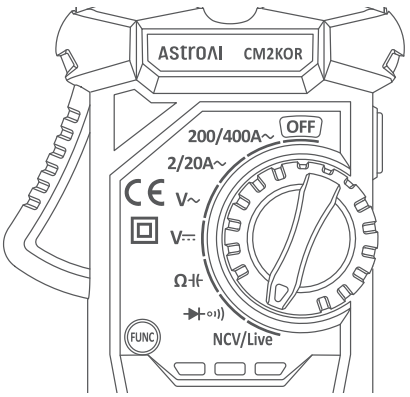
### Polarity Judgment Method

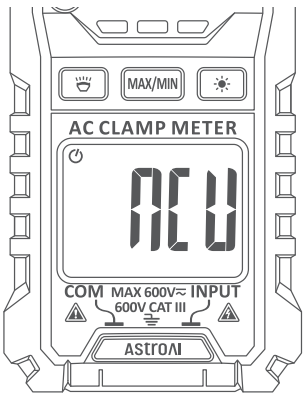
- Switch the Meter to the Resistance setting.
- Connect the two test leads to the two electrodes of the diode.
- Measure one result, then swap the positions of the test leads, then measure the second result.

- 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.

## VII. Non-Contact Voltage

1. Turn the rotary dial to the “NCV/Live” setting. The screen will display “NCV” indicating that the measurement function is non-contact voltage.

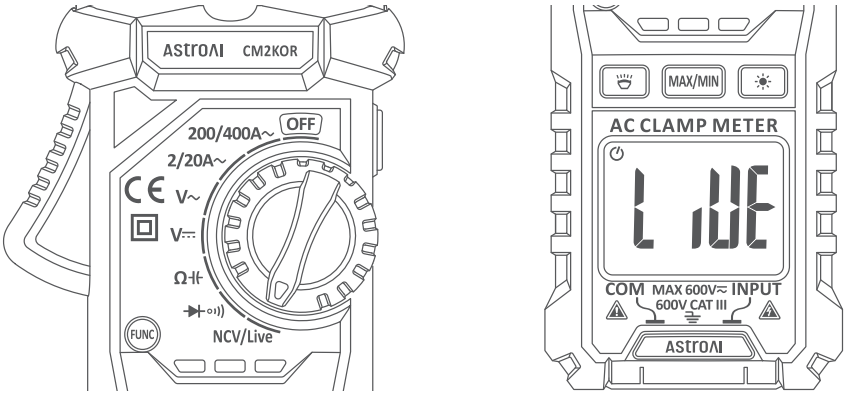



2. Move the NCV detector close to the point to be tested:
   When the Meter senses a weak AC signal, the green indicator light will be on, the buzzer will emit a slow, audible beep and the screen will display “---L”; When the Meter senses a strong AC signal, the red indicator light will be on, the buzzer will emit a quick beep and the screen will display “---H”.
   **NOTE: When the indicator light is on, it means there is voltage, please pay attention to your safety!**
3. Turn the rotary switch to the OFF position to turn off the Meter.

## VIII. Live Wire Detection

1. Insert the red test lead into the INPUT terminal.
2. Turn the rotary dial to the “NCV/Live” setting. Press the “FUNC” button to switch to live wire detection. The screen will show “Live” indicating that the measurement function is live wire detection.




3. Touch the point to be measured with the tip of the red test lead: When the indicator light is on, it means that the measured position is a live wire, please pay attention to your safety! A green light may mean that the test lead is not fully connected to the socket. Please test again after confirming that the test lead is fully connected.

   NOTE: When the meter senses a weak AC signal, the LCD screen will display “---L”, and the buzzer will emit a slow beep; When the meter senses a strong AC signal, the LCD screen will display “---H”, and the buzzer will emit a quick beep.
4. Turn the rotary switch to the OFF position to turn off the Meter.

# MAINTENANCE

## Cleaning the Meter

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

- Turn off the power to the Meter and remove the test leads.
- Turn the meter over and shake out the accumulated dust in the input terminal. Then, wipe the case with a damp cloth or mild detergent. Wipe the contacts in each terminal with a clean cotton swab dampened in alcohol.

# BATTERY REPLACEMENT

If the low battery sign appears on the LCD display, the battery should be replaced immediately. Remove the screws and open the back case, replace the expended battery with new batteries (Size AAA, 1.5 V x 2).

NOTE: Replace batteries immediately to prevent inaccurate readings due to low power. This also prevents potential safety hazards.

## SPECIFICATIONS

| | |
|---|---|
| Digital Display | 2000, 3½ |
| Sampling Speed | 3 Times/Second |
| LCD Dimensions | 35 x 25 mm |
| Range Selection | Auto |
| Polarity Indication | "-" Automatically Displayed |
| Overload Indication | "OL" Displayed |
| Low Battery Indication | "  "displayed when battery voltage is lower than normal |
| Work Environment | 32 ° F~104 ° F (0 ° C~40 ° C; <80% RH,<10 °C Non-Condensing) |
| Storage Temperature | 14 °F~140 °F (-10°C~60 °C; <70% RH, Remove the Battery) |
| Power | 2 x 1.5 V AAA Batteries |
| Weight | Approximately 203 g |
| Dimensions | 195 × 68 × 29 mm |
| Safety/Compliance | CAT.III 600 V; Pollution Level: 2; Altitude <2000 m |

# DETAILED SPECIFICATIONS

## I. Precision Index

Ambient Temperature :18 °C to 28 °C,

Relative Humidity: ≤ 80%;

Accuracy: ± (%rdg + dgts)

The accuracy is consistent within one year of calibration.

## II. DC Voltage

| Range | Resolution | Accuracy |
|---|---|---|
| 2 V | 0.001 V | ± (0.5% + 5 ) |
| 20 V | 0.01 V | |
| 200 V | 0.1 V | |
| 600 V | 1 V | |

Input Impedance: 10 MΩ

Overload Protection: 600 V

Maximum Measuring Voltage: 600 V

## III. AC Voltage

| Range | Resolution | Accuracy |
|---|---|---|
| 2 V | 0.001 V | ± (1.0% + 5 ) |
| 20 V | 0.01 V | |
| 200 V | 0.1 V | |
| 600 V | 1 V | |

Input Impedance: 10 MΩ

Frequency Range: 40 Hz ~ 1k Hz

Overload Protection: 600 V

Response: True RMS

Maximum Measuring Voltage: 600 V

## IV. AC Current

| Range | Resolution | Accuracy |
|---|---|---|
| 2 A | 0.001 A | 50~60 Hz: ± (2.5% + 5)<br>Other: ± (3.0% + 10) |
| 20 A | 0.01 A | |
| 200 A | 0.1 A | |
| 400 A | 1 A | |

Frequency Range: 40 Hz ~ 400 Hz Response: True RMS

## V. Resistance

| Range | Resolution | Accuracy |
|---|---|---|
| 200 Ω | 0.1 Ω | ± (1.0% + 5) |
| 2 kΩ | 0.001 kΩ | |
| 20 kΩ | 0.01 kΩ | |
| 200 kΩ | 0.1 kΩ | |
| 2 MΩ | 0.001 MΩ | |
| 20 MΩ | 0.01 MΩ | |

Overload Protection: 250 V

## VI. Capacitance

| Range | Resolution | Accuracy |
|---|---|---|
| 2 nF | 0.001 nF | ± (4.0% + 5) |
| 20 nF | 0.01 nF | |
| 200 nF | 0.1 nF | |
| 2 µF | 0.001 µF | |
| 20 µF | 0.01 µF | |
| 200 µF | 0.1 µF | |
| 2 mF | 0.001 mF | |

Overload Protection: 250 V

### VII .Continuity Test

| | |
|---|---|
|  | The buzzer inside the Meter will beep if the resistance is< 50 Ω.<br>Open Circuit Voltage: Approximately 1.0 V<br>Overload Protection: 250 V |

### VIII .Diode Test

| | |
|---|---|
|  | The approximate diode forward voltage value will be displayed<br>Reverse DC Voltage: Approximately 2.0 V<br>Overload Protection: 250 V |

## HOW TO DISPOSE OF THE METER

If, at some point, you intend to dispose of this product, please keep in mind that many of its components consist of valuable materials which can be recycled. Please do not discard it in the garbage bin, but check with your local authorities for recycling facilities in your area.

## WARRANTY PERIOD

3 Year Limited Warranty from AstroAI.

Each AstroAI Digital Clamp Meter 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
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