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OWON CM210E

OWON CM210E Mini Clamp Meter User Manual

Model: CM210E

1. Safety Information

Please read and understand all safety information before operating this device. Failure to follow these instructions may result in electric shock, fire, or personal injury.

- Always use the correct function and range for measurements.
- Do not measure voltage on circuits exceeding 600V AC/DC.
- Ensure the test leads are in good condition and properly connected.
- Do not operate the meter if it appears damaged or if the case is open.
- Avoid working alone when measuring high voltages.
- Adhere to local and national safety codes.
- This device is rated for CAT II 600V and CAT III 300V.

2. Product Overview

The OWON CM210E is a compact, handheld digital clamp meter designed for measuring AC/DC current, AC/DC voltage, resistance, capacitance, and performing diode and continuity tests. It features a 20,000 count display, True RMS measurement, and Non-Contact Voltage (NCV) detection.

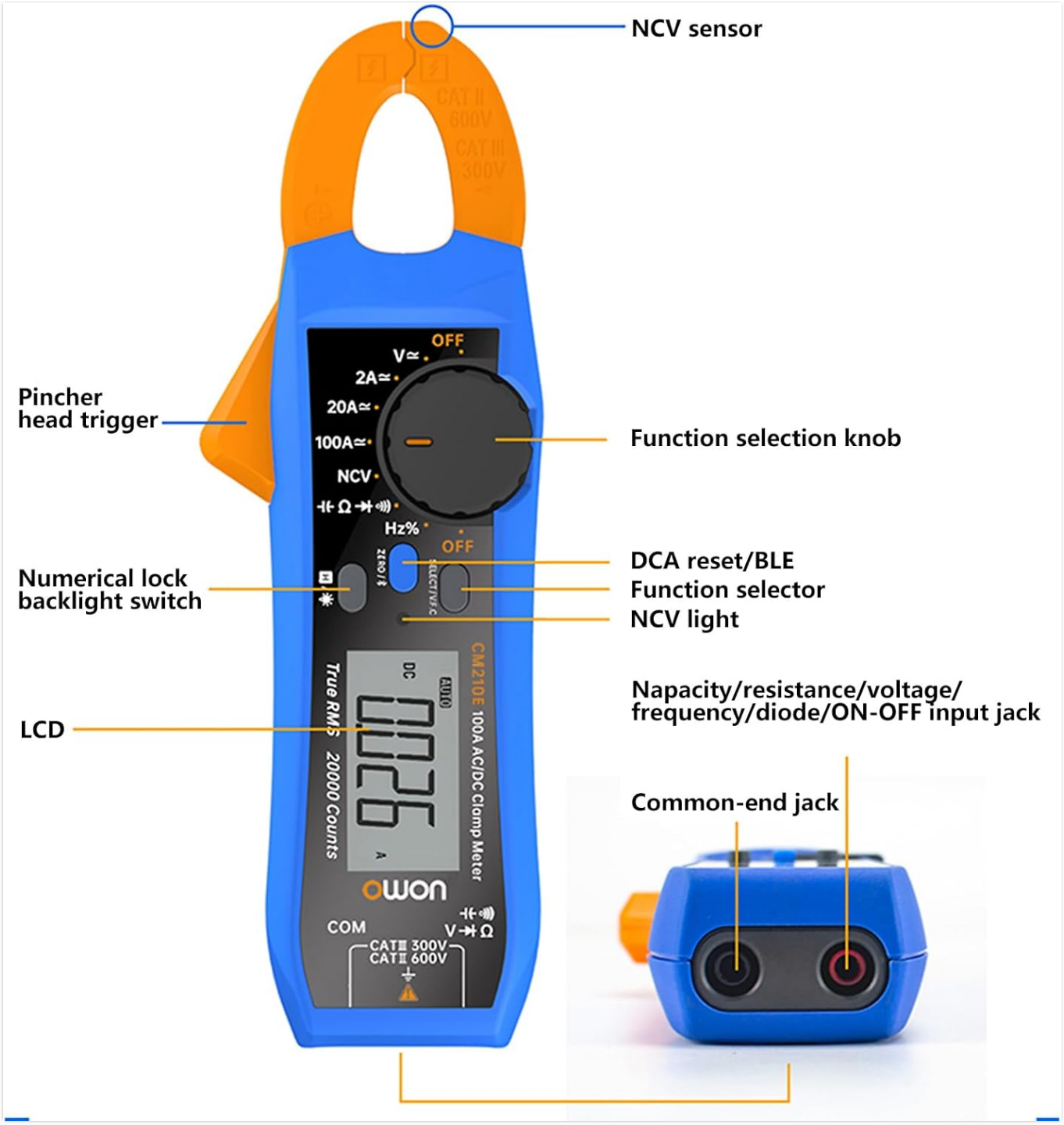


Figure 2.1: Labeled components of the OWON CM210E Mini Clamp Meter. This diagram highlights key parts such as the NCV sensor, pincher head trigger, function selection knob, numerical lock backlight switch, LCD, function selector, NCV light, input jacks for capacitance/resistance/voltage/frequency/diode/ON-OFF, and the common-end jack.

Key Features:

- **Integrated Clamp Ammeter:** Safely measures AC and DC currents up to 200A.
- **Multi-functionality:** Measures AC/DC voltage, resistance, and capacitance.
- **High Resolution Display:** 20,000 counts for precise readings.
- **True RMS:** Provides accurate measurements for non-sinusoidal waveforms.
- **Non-Contact Voltage (NCV):** Detects live voltage without direct contact.
- **DMM Functions:** Includes diode test and continuity buzzer.
- **Data Hold & Zero Function:** For convenience in reading and DC current measurement.
- **Compact and Portable:** Designed for easy carrying and use in various environments.

3. Package Contents

Upon unpacking, please verify that all items listed below are present and undamaged:

- 1 x OWON CM210E Mini Clamp Meter
- 1 x Set of Test Leads (Red and Black)
- 1 x Screwdriver
- 1 x Storage Bag
- 2 x AAA Batteries (pre-installed or included separately)
- 1 x Quick Guide (if applicable)



Figure 3.1: The OWON CM210E Mini Clamp Meter shown with its included accessories: test leads, screwdriver, and storage bag.

4. Setup

4.1 Battery Installation

The OWON CM210E requires two AAA batteries for operation. If the batteries are not pre-installed or need replacement, follow these steps:

1. Ensure the meter is turned OFF.
2. Locate the battery compartment cover on the back of the meter.
3. Use the included screwdriver to loosen the screw securing the battery cover.
4. Remove the cover.
5. Insert two new AAA batteries, observing the correct polarity (+ and -) as indicated inside the compartment.
6. Replace the battery cover and tighten the screw.

Note: *Remove batteries if the meter is not used for an extended period to prevent leakage.*

5. Operating Instructions

Before any measurement, ensure the meter is in the correct function and range. Connect test leads securely when required.

5.1 Measuring AC/DC Current (Clamp)

1. Turn the function selection knob to the desired AC Current (A~) or DC Current (A=) range (e.g., 2A, 20A, 100A).

2. Press the trigger to open the clamp jaws.
3. Enclose only one conductor (wire) within the clamp jaws. For accurate current measurement, ensure no other conductors are within the clamp.
4. Release the trigger to close the jaws securely around the conductor.
5. Read the current value on the LCD.
6. For DC current, use the ZERO button to nullify any offset before measurement.



Figure 5.1: The clamp jaws can open up to 17mm to accommodate various conductor sizes for current measurement.

5.2 Measuring AC/DC Voltage

1. Insert the red test lead into the VΩHz input jack and the black test lead into the COM jack.
2. Turn the function selection knob to the V~ (AC Voltage) or V= (DC Voltage) position.
3. Connect the test leads in parallel to the circuit or component you wish to measure.
4. Read the voltage value on the LCD.

5.3 Measuring Resistance

1. Insert the red test lead into the VΩHz input jack and the black test lead into the COM jack.
2. Turn the function selection knob to the Ω (Resistance) position.
3. Ensure the circuit or component is de-energized before measuring resistance.
4. Connect the test leads across the component.
5. Read the resistance value on the LCD.

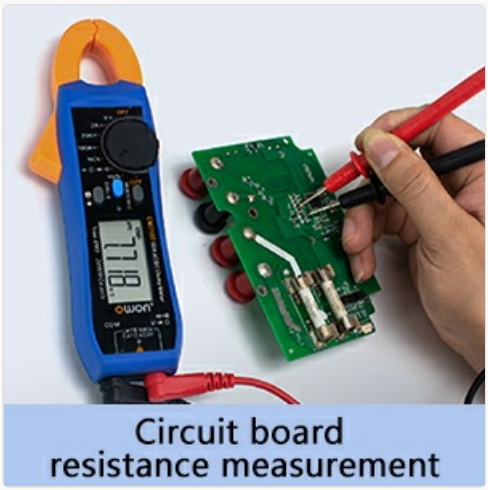


Figure 5.2: Measuring resistance on a circuit board using the test leads.

5.4 Measuring Capacitance

1. Insert the red test lead into the VΩHz input jack and the black test lead into the COM jack.
2. Turn the function selection knob to the capacitance (†) position.
3. Ensure the capacitor is fully discharged before measurement.
4. Connect the test leads across the capacitor terminals.
5. Read the capacitance value on the LCD.



Figure 5.3: Demonstrating capacitance measurement with the OWON CM210E.

5.5 Non-Contact Voltage (NCV) Detection

1. Turn the function selection knob to the NCV position.
2. Move the NCV sensor (located at the top of the clamp jaws) close to the conductor or outlet you want to test.
3. The meter will indicate the presence of AC voltage through audible beeps and visual indicators (dashes on the LCD, NCV light). The number of dashes and frequency of beeps may increase with stronger electric fields.



Figure 5.4: Using the NCV function to detect voltage near an electrical outlet without direct contact.

5.6 Diode Test

1. Insert the red test lead into the VΩHz input jack and the black test lead into the COM jack.
2. Turn the function selection knob to the diode (→|•)) position.
3. Connect the red test lead to the anode and the black test lead to the cathode of the diode.
4. The LCD will display the forward voltage drop. Reverse the leads; an open circuit (OL) reading indicates a good diode.



Figure 5.5: Performing a diode test with the OWON CM210E.

5.7 Continuity Test

1. Insert the red test lead into the VΩHz input jack and the black test lead into the COM jack.
2. Turn the function selection knob to the continuity (•)) position.
3. Connect the test leads across the circuit or component.
4. If the resistance is below a certain threshold (typically 50Ω), the buzzer will sound, indicating continuity.

5.8 Data Hold (HOLD)

Press the **HOLD** button to freeze the current reading on the display. Press it again to release the hold and resume live measurements.

5.9 Backlight

Press the backlight button (often indicated by a light bulb icon) to turn on the display backlight for better visibility in low-light conditions. Press it again to turn off the backlight.

6. Maintenance

6.1 Cleaning

Wipe the meter's case with a damp cloth and mild detergent. Do not use abrasives or solvents. Ensure the meter is completely dry before use.

6.2 Battery Replacement

Refer to Section 4.1 for detailed instructions on replacing the AAA batteries. Replace batteries when the low battery indicator appears on the display.

6.3 Test Lead Inspection

Regularly inspect test leads for any signs of damage, such as cracked insulation or exposed metal. Replace damaged leads immediately to prevent electric shock.

7. Troubleshooting

- **Meter does not turn on:** Check battery installation and ensure batteries are not depleted. Replace if necessary.
- **Inaccurate readings:** Ensure the correct function and range are selected. Check test lead connections. For current measurements, ensure only one conductor is within the clamp.

- **"OL" (Overload) displayed:** The measured value exceeds the selected range. Switch to a higher range or ensure the circuit is within the meter's capabilities.
- **No NCV detection:** Ensure the NCV function is selected and the sensor is close enough to a live AC voltage source.

8. Specifications

Feature	Specification
Manufacturer	OWON
Model Number	CM210E (210E)
Display Counts	20,000
AC/DC Current Range	Up to 200A
AC/DC Voltage Range	Up to 600V
Safety Rating	CAT II 600V, CAT III 300V
Clamp Opening	Approx. 17mm
Power Source	2 x AAA Batteries
Material	Plastic
Package Dimensions	22 x 21 x 6 cm
Weight	800 grams

9. Warranty and Support

Information regarding specific warranty terms and customer support for the OWON CM210E is not available in the provided product details. Please refer to the product packaging or contact the manufacturer directly for warranty claims and technical assistance.
For general inquiries or support, you may visit the official OWON website or contact their customer service department.

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