

OWON CM210E

OWON CM210E Mini Digital Clamp Meter User Manual

Model: CM210E | Brand: OWON

INTRODUCTION

This manual provides detailed instructions for the safe and effective operation of the OWON CM210E Mini Digital Clamp Meter. This device is a versatile tool combining the functions of a clamp meter and a multimeter, capable of measuring AC/DC current, voltage, resistance, capacitance, and performing diode and Non-Contact Voltage (NCV) tests. Its compact design and comprehensive features make it suitable for various electrical measurement tasks.

SAFETY INFORMATION

Always adhere to safety precautions when using electrical testing equipment to prevent personal injury or damage to the meter. Read all safety warnings and operating instructions before use.

- Do not exceed the maximum input values for any function as specified in the specifications.
- Ensure test leads are properly connected and in good condition before each use. Replace damaged leads immediately.
- Do not use the meter if it appears damaged, if the case is open, or if any part of the insulation is compromised.
- Exercise extreme caution when working with live circuits. Always assume circuits are live until proven otherwise.
- Refer to the CAT ratings (CAT III 300V, CAT II 600V) for safe operating voltage levels and ensure the meter is suitable for the intended application.
- Keep fingers behind the finger guards on the test leads during measurements.

PRODUCT FEATURES

The OWON CM210E offers a range of functionalities for various electrical measurements:

- **Multimeter Functionality:** It functions as both a clamp meter and a multimeter, capable of testing AC/DC current/voltage, resistance, capacitance, and diode.
- **High Resolution:** Features 100A 1mA high resolution, enabling precise measurement of small currents.
- **Non-Contact Voltage (NCV) Test:** Allows for the detection of AC voltage or electromagnetic fields without direct contact, enhancing safety.
- **Compact Design:** Small and exquisite, designed for easy portability and handling in tight spaces.

- VFC Function:** Includes a Variable Frequency Control (VFC) function to reduce interference from high-frequency signals, providing more accurate measurements in complex environments.



Image: The OWON CM210E Mini Digital Clamp Meter shown with its dimensions: 182mm height and 57mm width. This image highlights the compact size of the device.

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Mini Clamp Meter CM210E



Image: A detailed view of the OWON CM210E Mini Digital Clamp Meter with key components labeled, including the NCV sensor, pincher head trigger, function selection knob, numerical lock/backlight switch, LCD, function selector, NCV light, and input jacks for capacitance/resistance/voltage/frequency/diode/ON-OFF and common-end.

SETUP

1. **Unpacking:** Carefully remove the CM210E clamp meter, test leads, and user manual from the packaging. Inspect all items for any signs of damage during transit.
2. **Battery Installation:** The meter requires 2 AAA batteries, which are included. Locate the battery compartment on the back of the device. Open the compartment cover and insert the batteries, ensuring correct polarity (+ and -). Close the cover securely.
3. **Initial Inspection:** Before first use, perform a thorough visual inspection of the meter and test leads. Check for any cracks in the casing, frayed wires, or damaged insulation on the test leads. Do not use the meter if any damage is observed.

OPERATING INSTRUCTIONS

General Operation

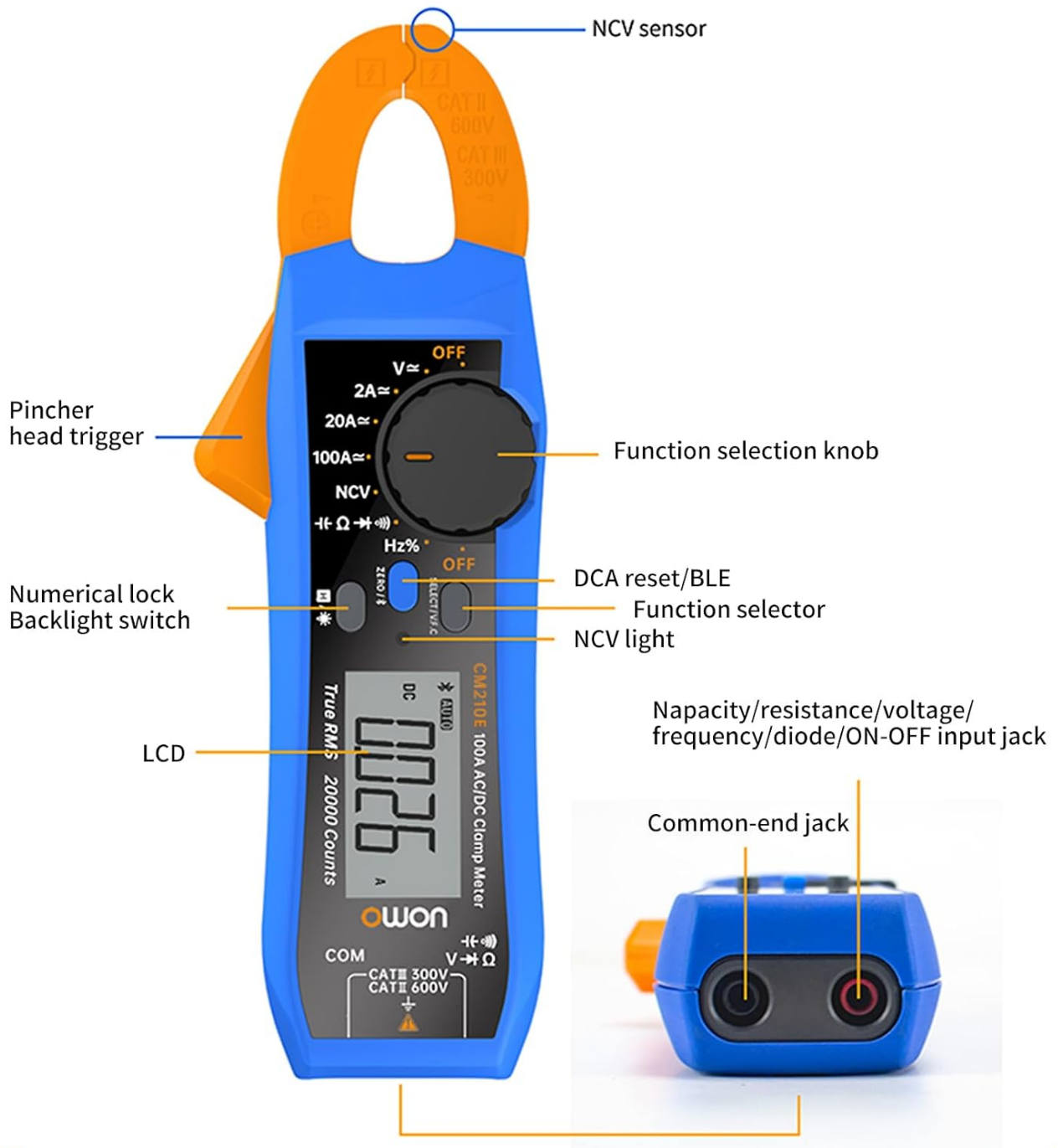


Image: The OWON CM210E Mini Digital Clamp Meter being held, demonstrating its compact size and highlighting its high precision and auto-ranging capabilities for AC/DC voltage and current measurements. The display shows a reading of 0.022.

1. **Power On/Off:** Rotate the function selection knob from the "OFF" position to the desired measurement mode to turn the meter on. To power off, rotate the knob back to the "OFF" position.
2. **Function Selection:** Use the main rotary knob to select the primary measurement function (e.g., V~ for AC Voltage, A~ for AC Current, Ω for Resistance).
3. **Sub-Function Selection:** For modes with multiple sub-functions (e.g., AC/DC for current/voltage, or Diode/Capacitance/Continuity), press the "SELECT/F.C" button to cycle through the available options.
4. **Backlight:** Press the backlight button (often combined with numerical lock) to illuminate the display in low-light conditions. Press again to turn off.
5. **Data Hold:** Press the "HOLD" button to freeze the current reading on the display. This is useful for recording measurements in difficult-to-view locations. Press the button again to release the hold function.

Specific Measurement Modes

AC/DC Current Measurement (Clamp Function)



It can accurately measure the effective value of various waveforms in real time.

Image: The OWON CM210E clamp meter measuring current on multiple wires, illustrating its use for frequency measurement in an industrial setting.

1. Rotate the knob to the 100A~ or 20A~ position for AC current, or 100A= or 20A= for DC current.
2. Press the trigger to open the clamp jaws.
3. Enclose only one conductor within the jaws. Ensure the conductor is centered for accurate readings.
4. Read the current value on the LCD.
5. For DC current, use the "ZERO" button to zero out any offset before measurement to ensure accuracy.

AC/DC Voltage Measurement

1. Insert the red test lead into the V- Ω input jack and the black test lead into the COM jack.
2. Rotate the knob to the V~ (AC Voltage) or V= (DC Voltage) position.
3. Connect the test leads in parallel to the circuit or component to be measured.
4. Read the voltage value on the LCD.

Resistance Measurement



Frequency measurement

Image: The OWON CM210E clamp meter with test leads connected, performing a resistance measurement on a circuit board, showing the meter's versatility beyond current clamping.

1. Insert the red test lead into the V- Ω input jack and the black test lead into the COM jack.
2. Rotate the knob to the Ω 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.

Capacitance Measurement



Image: The OWON CM210E clamp meter with test leads connected to a capacitor, demonstrating its capability for capacitance measurement.

1. Insert the red test lead into the V- Ω input jack and the black test lead into the COM jack.
2. Rotate the knob to the capacitance symbol (often shared with diode/continuity). Press "SELECT/F.C" until the capacitance mode is active.
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.

Diode Test



Image: The OWON CM210E clamp meter with test leads connected to a diode, illustrating the process of performing a diode measurement.

1. Insert the red test lead into the V- Ω input jack and the black test lead into the COM jack.
2. Rotate the knob to the diode symbol (often shared with capacitance/continuity). Press "SELECT/F.C" until the diode test mode is active.
3. Connect the red test lead to the anode and the black test lead to the cathode of the diode.
4. Read the forward voltage drop on the LCD. A good diode will show a specific voltage drop (e.g., 0.5V to 0.8V for silicon diodes). Reverse the leads to check for an open circuit (OL) for a good diode.

Non-Contact Voltage (NCV) Test



Image: The OWON CM210E clamp meter's NCV sensor being used near an electrical outlet, demonstrating its non-contact voltage detection capability.

1. Rotate the knob to the NCV position.
2. Place the NCV sensor (located at the top of the clamp jaw) near the conductor, outlet, or electrical field to be tested.
3. The meter will indicate the presence of AC voltage through audible beeps and/or visual indicators (NCV light), with the frequency of beeps increasing with stronger signals.

VFC Function

The VFC (Variable Frequency Control) function is designed to accurately measure voltage and current in circuits with variable frequency drives or other non-sinusoidal waveforms, by filtering out high-frequency interference.

1. Select the desired AC Voltage (V~) or AC Current (A~) mode using the rotary knob.
2. Press the "VFC" button (or cycle through "SELECT/F.C" if combined) to activate the VFC mode. An indicator on the display may show that VFC is active.
3. Proceed with the measurement as usual. The meter will automatically apply the necessary filtering for accurate readings.

MAINTENANCE

Proper maintenance ensures the longevity and accuracy of your OWON CM210E clamp meter.

- **Cleaning:** Wipe the meter's casing with a damp cloth and a mild detergent. Do not use abrasive cleaners, solvents, or chemicals that could damage the plastic.
- **Battery Replacement:** Replace batteries promptly when the low battery indicator appears on the display. Always ensure the meter is powered off before opening the battery compartment. Dispose of old batteries responsibly.
- **Storage:** Store the meter in a cool, dry place away from direct sunlight, high humidity, and extreme temperatures. If storing for extended periods, remove the batteries to prevent leakage.
- **Test Lead Inspection:** Regularly inspect the test leads for any signs of damage, such as cuts, cracks, or compromised insulation. Damaged leads can pose a safety hazard and affect measurement accuracy. Replace damaged leads immediately with appropriate replacements.

TROUBLESHOOTING

If you encounter issues with your OWON CM210E, refer to the table below for common problems and their solutions.

Problem	Possible Cause	Solution
Meter does not power on	Dead or incorrectly installed batteries	Check battery polarity; replace batteries with fresh ones.
"OL" displayed (Overload)	Measurement exceeds selected range; open circuit (resistance/continuity)	Select a higher range (if applicable); ensure proper connection for continuity/resistance measurement.
Inaccurate readings	Poor test lead connection; external electromagnetic interference; incorrect mode selection	Ensure secure connections of test leads; move away from strong electromagnetic fields; verify correct function mode is selected.
No NCV detection	No AC voltage present; NCV sensor not close enough to the source	Confirm power is present in the circuit; place the NCV sensor directly over the live wire or near the outlet.

SPECIFICATIONS

Feature	Detail
Model Number	CM210E
Brand	OWON
Measurement Type	Ammeter, Multimeter
Power Source	Battery Powered (2 AAA batteries included)
Color	Blue
Package Dimensions	8.62 x 4.06 x 1.85 inches
Item Weight	13.44 ounces
Safety Rating	CAT III 300V, CAT II 600V
Display Counts	20000 Counts
AC/DC Current Resolution	1mA
True RMS	Yes

WHAT'S IN THE BOX

The OWON CM210E Mini Digital Clamp Meter package typically includes the following items:

- OWON CM210E Mini Digital Clamp Meter
- Test Leads (one red, one black)
- User Manual (Quick Guide)
- 2 x AAA Batteries



Image: The complete package of the OWON CM210E Mini Digital Clamp Meter, including the meter itself, a carrying case, test leads, a quick guide, and a small screwdriver, illustrating all items included in the box.

WARRANTY AND SUPPORT

For detailed warranty information, technical support, and service inquiries regarding your OWON CM210E Mini Digital Clamp Meter, please refer to the official OWON website or contact their customer service directly. Specific contact details and warranty terms may also be found in the included Quick Guide or product documentation.

Extended protection plans may be available for purchase separately to provide additional coverage beyond the standard manufacturer's warranty.

ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page's manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question