Greenlee CM-660

Greenlee CM-660 General Purpose AC Clamp Meter Instruction Manual

Model: CM-660

1. Introduction

The Greenlee CM-660 is a general-purpose AC True RMS clamp meter designed for accurate electrical measurements. This instrument is capable of measuring AC currents, DC voltages, resistance, and frequency. It incorporates a digital low-pass filter for precise readings on variable frequency drives (VFDs) and features AmpTip™ technology for enhanced accuracy on small wires carrying low currents (60 amps or less).

Key features include non-contact AC voltage detection, continuity testing, and diode testing. The meter can record average, maximum, and minimum readings, and offers two voltage detection modes: non-contact or single test lead. It is powered by two 1.5V AAA batteries and comes with test leads and a carrying case for convenience. The CM-660 has a 6000-count LCD display and a 1.18-inch jaw opening. It is UL listed, ensuring compliance with safety standards.

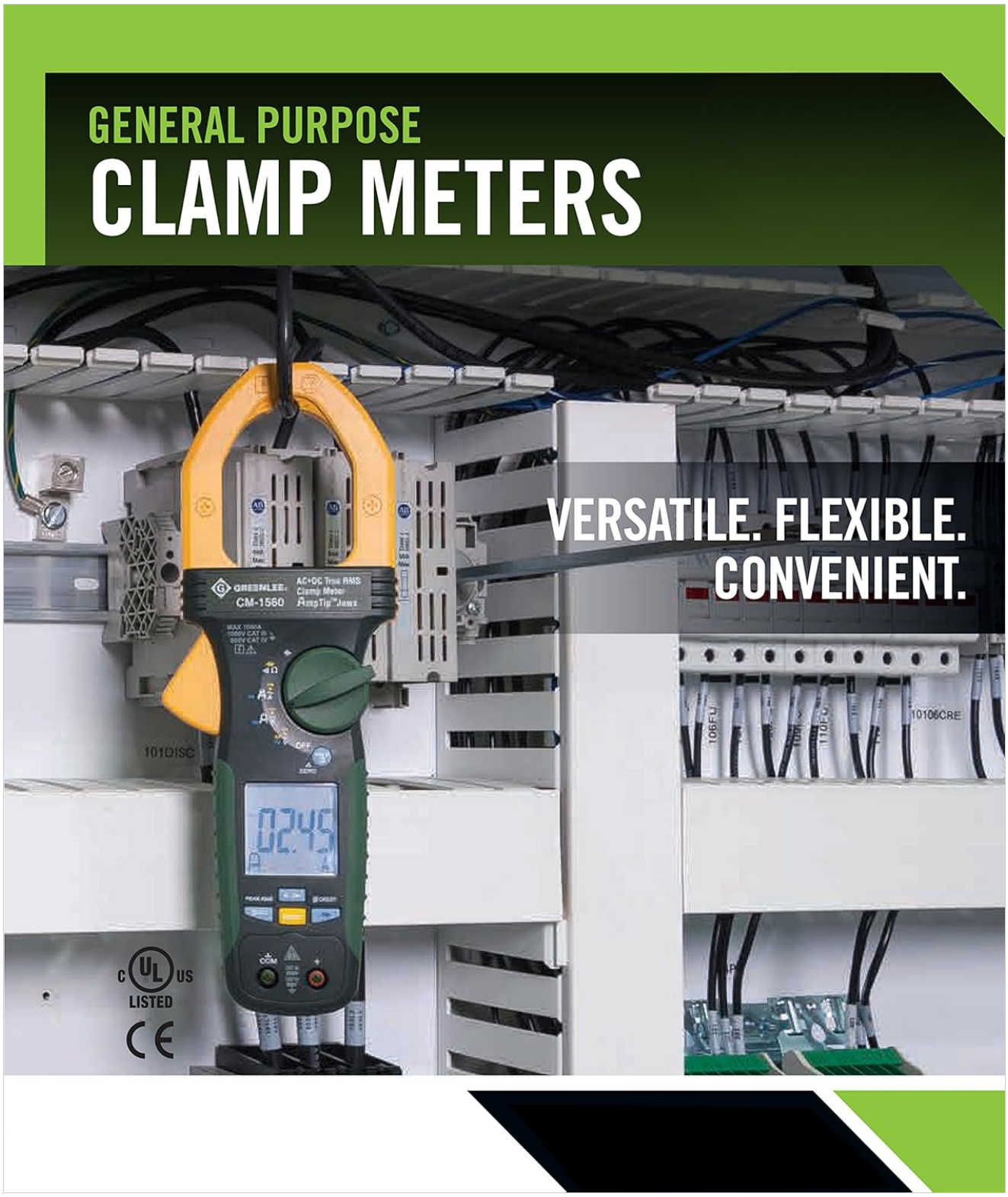

Figure 1.1: Greenlee CM-660 General Purpose AC Clamp Meter.

2. Safety Information

Always adhere to safety precautions when using electrical test equipment. Failure to do so may result in injury or damage to the meter.

- **Read Instructions:** Read and understand all instructions and safety information before operating the meter.
- **Qualified Personnel:** This meter should only be used by qualified personnel who are familiar with electrical hazards.
- **Personal Protective Equipment (PPE):** Always wear appropriate PPE, including safety glasses and insulated gloves, when working with electrical circuits.

- **Voltage Limits:** Do not exceed the maximum voltage ratings specified for the meter (600 VAC/DC).
- **Current Limits:** Do not exceed the maximum current ratings (600 Amps).
- **Inspect Test Leads:** Before each use, inspect test leads for damage. Do not use if insulation is cracked or if the conductor is exposed.
- **Non-Contact Voltage Detection:** Use non-contact voltage detection as a preliminary check only. Always verify with direct contact measurements.
- **Battery Replacement:** Ensure the meter is disconnected from all circuits before opening the battery compartment.
- **Environmental Conditions:** Do not use the meter in wet conditions or in the presence of explosive gases or dust.
- **Proper Function:** If the meter appears to be damaged or is not operating correctly, discontinue use immediately.

3. Setup

3.1 Battery Installation

The Greenlee CM-660 requires two 1.5V AAA batteries for operation. These are typically included with the meter.

1. Ensure the meter is turned OFF and disconnected from any electrical circuits.
2. Locate the battery compartment cover on the rear of the meter.
3. Use a screwdriver to loosen the screw securing the battery cover.
4. Remove the cover and insert two AAA batteries, observing the correct polarity (+/-) as indicated inside the compartment.
5. Replace the battery cover and tighten the screw securely.

3.2 Initial Inspection

Before first use, and periodically thereafter, perform a visual inspection of the meter and its accessories.

- Check the meter casing for any cracks, damage, or signs of wear.
- Inspect the test leads for frayed insulation, exposed wires, or damaged connectors.
- Ensure the jaw mechanism opens and closes smoothly and securely.
- Verify the display is clear and free from defects when the meter is powered on.

Figure 3.1: Included test leads and carrying case.

4. Operating Instructions

The Greenlee CM-660 offers various measurement functions. Always select the appropriate function before making a measurement.

4.1 Meter Overview

Figure 4.1: Diagram illustrating key features of the Greenlee CM-660 clamp meter, including the clamp jaw, AmpTip, non-contact AC voltage detection, AC voltage with digital filter, over-molded grip, and display.

- **Clamp Jaw:** Used for non-contact AC current measurements.
- **AmpTip™:** Provides increased accuracy for low AC currents (60 amps or less) on small wires.
- **Function Dial:** Selects the desired measurement mode (AC Current, DC Voltage, Resistance, Frequency, Continuity, Diode).
- **Display:** 6000-count LCD for clear reading of measurements.
- **Test Lead Inputs:** Ports for connecting test leads for voltage, resistance, continuity, and diode measurements.
- **Non-Contact AC Voltage Detection:** Integrated sensor for detecting live AC voltage without direct contact.
- **Digital Low Pass Filter:** Improves accuracy when measuring AC voltage on variable frequency drives.

4.2 Measuring AC Current (Clamp)

1. Turn the function dial to the AC current (A~) position.
2. Open the clamp jaw by pressing the lever.
3. Enclose a single conductor with the clamp jaw. Ensure the jaw is fully closed around the conductor.
4. Read the AC current value on the display.

5. For small wires carrying 60 amps or less, the AmpTip™ feature automatically provides increased accuracy.

Figure 4.2: The CM-660 clamp meter in use, measuring current by clamping around a single conductor.

4.3 Measuring DC Voltage

1. Insert the red test lead into the VΩHz input and the black test lead into the COM input.
2. Turn the function dial to the DC voltage (V⎓) position.
3. Connect the red test lead to the positive side of the circuit and the black test lead to the negative side.
4. Read the DC voltage value on the display.

4.4 Measuring Resistance

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

4.5 Continuity Test

1. Ensure the circuit is de-energized before performing a continuity test.
2. Insert the red test lead into the VΩHz input and the black test lead into the COM input.
3. Turn the function dial to the Continuity (Buzzer symbol) position.
4. Connect the test leads across the circuit or component.
5. The meter will emit an audible tone if continuity is detected (low resistance).

4.6 Diode Test

1. Ensure the circuit is de-energized before performing a diode test.

2. Insert the red test lead into the VΩHz input and the black test lead into the COM input.
3. Turn the function dial to the Diode (Diode symbol) position.
4. Connect the red test lead to the anode and the black test lead to the cathode of the diode.
5. The display will show the forward voltage drop. Reverse the leads; the display should show "OL" (Open Line) for a good diode.

4.7 Non-Contact AC Voltage Detection

1. Turn the function dial to the NCV (Non-Contact Voltage) position.
2. Hold the meter with the NCV sensor near the conductor or outlet.
3. If AC voltage is present, the meter will indicate with an audible beep and/or visual indicator.
4. **WARNING:** This feature is for preliminary detection only. Always verify voltage presence and magnitude with direct contact measurements using test leads.

5. Maintenance

Proper maintenance ensures the longevity and accuracy of your Greenlee CM-660 clamp meter.

5.1 Cleaning

- Wipe the meter casing with a damp cloth and mild detergent. Do not use abrasive cleaners or solvents.
- Ensure no moisture enters the meter's openings.
- Clean the test leads regularly, especially the probe tips, to ensure good electrical contact.

5.2 Battery Replacement

Refer to Section 3.1 for battery installation instructions. Replace batteries promptly when the low battery indicator appears on the display to ensure accurate readings.

5.3 Storage

- Store the meter in its carrying case when not in use to protect it from dust and physical damage.
- If storing for extended periods, remove the batteries to prevent leakage.
- Store in a cool, dry environment, away from direct sunlight and extreme temperatures.

6. Troubleshooting

Problem	Possible Cause	Solution
Meter does not power on.	Dead or incorrectly installed batteries.	Check battery polarity; replace batteries.
"OL" (Overload) displayed.	Measurement exceeds meter's range.	Ensure the measurement is within the meter's specified range.
Inaccurate readings.	• Dirty test leads/probes. • Incorrect function selected. • External electromagnetic interference. • Low battery.	• Clean test leads and probes. • Select the correct measurement function. • Move away from strong magnetic fields. • Replace batteries.

Problem	Possible Cause	Solution
No continuity beep.	• Circuit is open. • Test leads are faulty.	• Verify the circuit path. • Test leads on a known good conductor.

7. Specifications

The following table outlines the key specifications for the Greenlee CM-660 General Purpose AC Clamp Meter.

Feature	Specification
Model	CM-660
Measurement Type	AC Current, DC Voltage, Resistance, Frequency, Continuity, Diode
AC Current Range	Up to 600 Amps
DC Voltage Range	Up to 600 VDC
AC Voltage Range	Up to 600 VAC
Resistance Range	Up to 60 kΩ
Frequency Range	50/60 Hz (voltage/AmpTip currents), 50-400 Hz (higher currents)
Display	6000 Count LCD
Jaw Opening	1.18 inches (30 mm)
Power Source	2 x 1.5V AAA Batteries
Safety Rating	UL Listed, CAT IV 300V, CAT III 600V
Dimensions (L x W x H)	5.5 x 11.4 x 2.2 inches (approximate)
Item Weight	16 ounces (1 pound)
Special Features	AmpTip™, Digital Low Pass Filter, Non-Contact AC Voltage Detection, Max/Min/Avg Recording, Data Hold, Auto Power Off

Figure 7.1: Approximate dimensions of the CM-660 clamp meter shown in hand for scale.

8. Warranty & Support

8.1 Warranty Information

Greenlee products are manufactured to high standards and are backed by a limited warranty against defects in materials and workmanship. For specific warranty terms and conditions applicable to your CM-660 clamp meter, please refer to the warranty card included with your product or visit the official Greenlee website. Keep your proof of purchase for warranty claims.

8.2 Customer Support

For technical assistance, troubleshooting, or service inquiries, please contact Greenlee customer support. Contact information can typically be found on the Greenlee website or in the product packaging.
Online Resources: For additional product information, FAQs, and support, visit the official Greenlee website: www.greenlee.com
Product Videos and Demonstrations: For product videos and demonstrations, you may visit the link provided in some product documentation: http://tagr.com/t/V3v6VF