

Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

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AMES

I N S T R U M E N T S

64013

AC 600V CAT III DIGITAL CLAMP METER



Visit our website at: <http://www.harborfreight.com>
Email our technical support at: productsupport@harborfreight.com

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-888-866-5797 as soon as possible.

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⚠WARNING


**Read this material before using this product.
Failure to do so can result in serious injury.
SAVE THIS MANUAL.**

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WARNING SYMBOLS AND DEFINITIONS

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE CAUTION	Addresses practices not related to personal injury.

SAFETY

SETUP

OPERATION

MAINTENANCE

IMPORTANT SAFETY INFORMATION

Safety Warnings and Precautions

⚠ WARNING

Read all safety warnings and all instructions.

Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

1. Electrical shock can cause death or injury! NEVER TOUCH exposed conductors of electricity.
2. **Test cable voltages with care.** One use one hand when securing the clamp around cable.
3. Inspect the Meter before use. In addition to a general inspection, look specifically for:
 - a. Pay special attention to the insulation protecting the connectors.
 - b. Check the leads for exposed metal, damaged insulation, and continuity.
 - c. Replace damaged test lead immediately, before use.
4. Do not use the Meter if:
 - a. Either of the test leads are damaged in any way.
 - b. Test leads are dirty or have residue on them.
 - c. The battery is low.
 - d. Near any explosive gasses or fumes.
 - e. Any abnormal operation is detected.
(If in doubt about the condition of the Meter, have it serviced before use.)
 - f. The battery cover is open.
5. Power this Meter using only the battery(ies) referenced in the Specifications Chart.
6. Use caution when working near voltages above 30 VAC rms, 42 VAC peak, or 60 VDC. Voltages this high present a risk of electric shock.
7. Disconnect the circuit's power before connecting the Meter in series, when measuring current.
8. Connect the common (COM) test lead first and disconnect it last.
9. Hold the probes with fingers behind guards.
10. Avoid electrical shock. Use extreme caution when working near uninsulated conductors or bus bars. Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and cabinet enclosures when testing voltages.
11. Observe work area conditions. Do not test voltages in damp or wet locations. Don't expose to rain. Keep work area clean and well lit.
12. Keep children away. Children must never be allowed in the work area.
13. Stay alert. Watch what you are doing, use common sense. Do not operate any Meter when you are tired.

14. Do not operate Meter if under the influence of alcohol or drugs. Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the Meter.
15. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure.
16. Do not test voltage on circuits higher than 600 volts.
17. Do not test current on circuits higher than 600A.
18. Dress properly. Protective, electrically nonconductive clothes and nonskid footwear are recommended when working.
19. Wear ANSI-approved safety goggles during use.
20. Only use accessories intended for use with this Meter.
21. Avoid damaging Meter. Use only as specified in this manual.
22. Prior to testing resistance, diodes, or continuity; disconnect all power to the circuit and discharge all high-voltage capacitors.
23. Performance of this Meter may vary depending on battery condition.
24. Use the proper settings, terminals, techniques, and range for the tests performed. Start with the range stated in the instructions.
25. Do not apply voltage to the Test Leads when the Meter is in the Ohms testing setting. Damage can occur to the Meter.
26. Do not switch between testing modes with the Meter connected to a circuit.
27. Do not use the Meter at a setting marked as blank on the scale.
28. Have the Meter calibrated by a qualified technician every year to maintain accurate results.
29. Do not disassemble Meter; take it to a qualified technician when service or repair is required.
30. The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.



SAVE THESE INSTRUCTIONS.

Specifications

DC Voltage	Ranges: 400mV / 4V / 40V / 400V / 600V
DC Voltage Accuracy	± 0.8% of rdg + 3D
AC Voltage	Ranges: 400mV / 4V / 40V / 400V / 600V Frequency Range: 40-400Hz
AC Voltage Accuracy	± 1.0% of rdg + 5D
AC Current	Ranges: 4A / 40A / 400A / 600A Frequency Range: 50~60Hz
AC Current Accuracy	± 2.5% of rdg + 5D
Resistance	Ranges: 400Ω / 4KΩ / 40KΩ / 400KΩ / 4MΩ / 40MΩ
Resistance Accuracy	(@400Ω-4MΩ) ± 1.0% of rdg + 5D (@40MΩ) ± 2.0% of rdg + 5D
Continuity	Meter beeps at < 50Ω ± 20Ω
Capacitance	Ranges: 5nF / 50nF / 500nF / 5μF / 50μF / 100μF
Capacitance Accuracy	(@5.0nF) ± 4.0% of rdg + 5D (@50nF-100 μF) ± 3.0% of rdg + 3D
Diode Test	Forward DC Current: ~ 1mA Reverse DC Voltage: ~ 1.5V
Frequency	Range: 50Hz / 500Hz / 5kHz / 10kHz
Frequency Accuracy	± 1.0% of rdg + 5D
Duty Cycle	0.1%~99.9%
Duty Cycle Accuracy	± 2.0%
Temperature	Range: -4°F to 1832°F (-20°C to 1000°C)
Temperature Accuracy	± 3.0% of rdg + 3D
Sampling Rate	~3 times/second
Operating Temperature	Range: 32° - 104° F
Max Jaw Opening	28mm
Display	3-¾ digit LCD (max. display: 3999)
Battery	3x AAA batteries (included)

SAFETY

SETUP

OPERATION

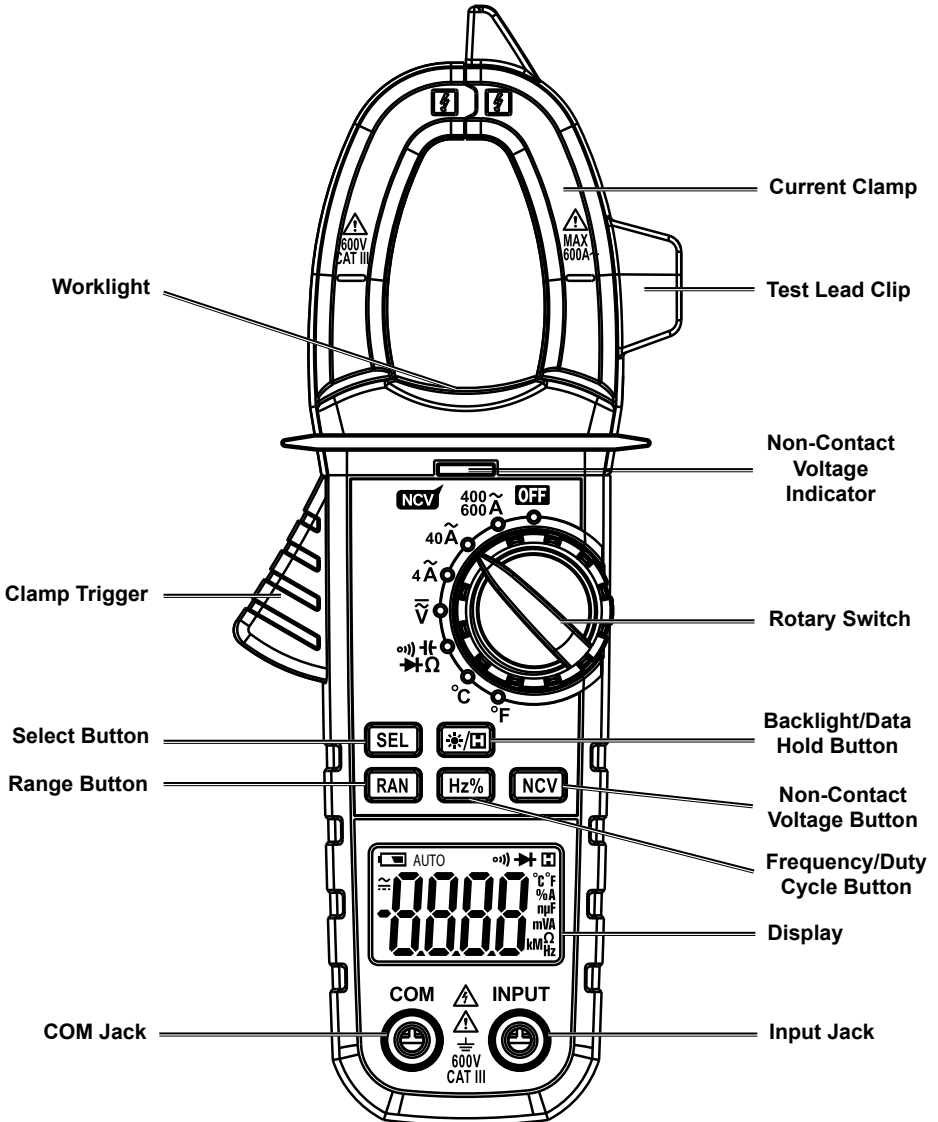
MAINTENANCE

Setup - Before Use:

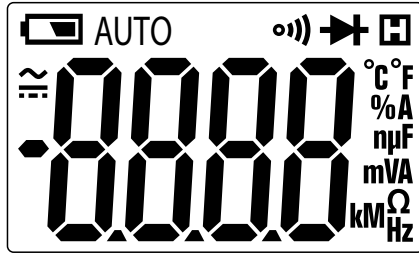


Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Functions



Display



Symbol	Description
AUTO	Auto-Range
— — —	Direct Current
~	Alternating Current
🔋	Low Battery
°C/°F	Celsius/Fahrenheit
%	Percentage (duty cycle)
Hz, kHz	Hertz (frequency)
MV, V	Volts (Voltage)
μA, mA, A	Amps (Current)
nF, uF, mF	Farads (Capacitance) ±f
Ω, kΩ, MΩ	Ohms (Resistance)
•••)	Continuity
▶	Diode
🔒	Display Hold

Operating Instructions



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Electrical shock can cause death or injury! NEVER TOUCH exposed conductors of electricity.

General Operating Instructions

Data Hold

The data hold function will keep the current reading on the Display. To activate data hold:

1. Press the ***/□** button and the reading will be held on the Display. The **□** symbol appears.
2. Press ***/□** again to release the hold.

Manual Range

The Meter's default range is **AUTO**. To select manual range, press **RAN**. Each press of the button increases the range. Hold the **RAN** button to return to auto-range.

Note: Manual range cannot be used in **40A~** and **4A~** current modes, frequency, duty cycle, diode, continuity, or temperature modes.

Backlight and Worklight

1. Press the ***/□** button for two or more seconds to turn on the backlight.
 2. Press the ***/□** button for two or more seconds again to turn the backlight off.
 3. While in current range modes, turning the backlight on also turns the Clamp Worklight on.
- Note:** Frequent use of the backlight will shorten the life of the batteries. Only use the backlight when necessary.

NCV (Non-Contact Voltage)

1. Turn Rotary Switch to any position.
2. Hold the **NCV** button and move the tip of the clamp close to the unshielded conductor. If detected voltage is $>110V$ AC, Meter will beep and the Non-Contact Voltage Indicator will flash.

WARNING! Even if no indication is given, voltage may still be present.
Do not rely solely on NCV detection to determine the presence of voltage.

Auto Power Off

If Meter is not used for approximately 30 minutes, it will automatically turn itself off to conserve battery power. To turn Meter back on after auto-off, press the **SEL** button.

Measurement Operation

Note: Remove plugs from ends of Test Leads (included) before connecting to Meter.

Note: Test Lead probes have removable covers for overvoltage protection. With covers in place, Test Leads are rated for use with CAT III circuits. Exposed probes are rated for use with CAT II circuits.

Note: Insert Test Lead into Test Lead Clip to allow for easier two hand operation.

Current Measurement

Measure AC conductors carrying up to 600 amperes.

WARNING! To avoid electric shock, use only one hand to hold Meter when measuring current.

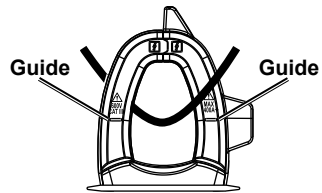
WARNING! Remove Test Leads before taking measurements with the Current Clamp.

Note: Amperage is always tested in series with circuit under test.

Note: To measure 2- and 3-wire power cords, use an AC Line Splitter (not included) and follow its instructions.

1. Turn Rotary Switch to **400-600A~**, **40A~** or **4A~** position. Start with highest range if amperage is unknown.

2. Using one hand, press Trigger to open Clamp jaws. Position Clamp jaws around conductor to be tested.



3. Center conductor between guides in Clamp Jaws, as shown.
4. Read measured current on the Display. Switch to lower ranges, as necessary, to get the most accurate reading.
5. When testing is complete, turn Rotary Switch to **OFF**, and store Meter.

AC/DC Voltage Measurement

Measure AC conductors carrying up to 600 VAC, 40-400 Hz.

Measure DC conductors carrying up to 600 VDC.

WARNING! Use caution when working near voltages above 30 VAC rms, 42 VAC peak, or 60 VDC. Voltages this high present a risk of electric shock.

1. Plug black test lead into **COM** Jack. Plug red test lead into **INPUT** Jack.
2. Turn Rotary Switch to the \bar{v} position.
3. Press **SEL** button to choose between AC and DC voltage.
4. Carefully touch exposed conductors with tips of probes.
5. Read measured voltage on the Display.
6. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Note: If voltage is too high, Display will read **OL**.

Continuity Measurement

Test continuity between two points of a circuit.

WARNING! To prevent electric shock, turn off all power and fully discharge capacitors on the circuit under test before measuring.

1. Plug black test lead into COM Jack.
Plug red test lead into INPUT Jack.
2. Turn Rotary Switch to the $\text{⌚} \text{ } \Omega$ position.
3. Press SEL until ⌚ is displayed.
4. Connect the test leads across the circuit to be measured.
5. Read measured resistance on the Display. If measured resistance is less than $50\Omega \pm 20\Omega$, Meter will beep.
6. When testing is complete, turn Rotary Switch to OFF, remove Test Leads and store with Meter.

Capacitance Measurements

Measure capacitance up to $100\mu\text{F}$.

WARNING! Turn off all power and fully discharge capacitors on the circuit under test before measuring.



1. Plug black test lead into **COM** Jack.
Plug red test lead into **INPUT** Jack.
2. Turn Rotary Switch to the $\text{⌚} \text{ } \mu\text{F}$ position.
3. Press **SEL** button until **nF** is displayed.
4. Carefully touch capacitor leads with tips of probes.
5. Read measured capacitance on the Display.
6. When testing is complete, turn Rotary Switch to **OFF**, remove and store capacitor and Meter.

Note: If capacitor is short circuited or capacitance is too high, Display will read **OL**.

Diode Measurement

Test voltage drop in diodes.

WARNING! To prevent electric shock, turn off all power and fully discharge capacitors on the circuit under test before measuring.

1. Plug black test lead into **COM** Jack.
Plug red test lead into **INPUT** Jack.
2. Turn Rotary Switch to the  Ω position.
3. Press **SEL** until  is displayed.

4. Connect red probe to diode's anode and black probe to its cathode.
5. Read measured forward biased voltage drop on the Display.

Note: If the leads are reversed, **1** is displayed.


6. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Resistance Measurements

Measure circuit resistance up to 40M Ω .

WARNING! To prevent electric shock, turn off all power and fully discharge capacitors on the circuit under test before measuring.

Note: When measuring Ohms, start with the lowest range if the resistance is unknown.

1. Plug black test lead into **COM** Jack.
Plug red test lead into **INPUT** Jack.
2. Turn Rotary Switch to the  Ω position.
3. Press **SEL** button until **M Ω** is displayed.
4. Carefully touch exposed conductors with tips of probes.
5. Read measured resistance on the Display.

6. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Note: Sometimes resistor value and measured resistance differ. This is due to the Meter's output test current going through all possible paths between leads.

Note: For low resistance measurements, short the test leads and record the resistance displayed. Then connect to the circuit and subtract the recorded resistance from the measurement for the most accurate results.

Note: When leads are disconnected or measurement is out of range, **OL** is displayed.

Frequency/Duty Cycle Measurements

Measure frequency up to 10kHz.

1. Plug black test lead into **COM** Jack. Plug red test lead into **INPUT** Jack.
2. Turn Rotary Switch to the \bar{v} position.
3. Press **Hz%** to switch to frequency mode.
4. Connect the test leads across the circuit to be measured.
5. Read measured frequency on the Display.
6. Press **Hz%** again to switch to duty cycle mode. Connect the test leads across the circuit to be measured.
7. Read measured duty cycle on the Display.
8. Press **Hz%** again to return to voltage mode.
9. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Temperature Measurement

1. Turn Rotary Switch to the **°C** or **°F** position. The Display will show the current ambient temperature.
 2. Connect red end of Thermocouple (included) to the **INPUT** Jack and the black end to the **COM** Jack.
 3. Touch the tip of the Thermocouple to the object to be tested.
 4. Read measured temperature on the Display.
- WARNING!** To prevent electric shock, remove Thermocouple before switching between testing modes.

Maintenance and Servicing




Procedures not specifically explained in this manual must be performed only by a qualified technician.

Cleaning, Maintenance, and Lubrication

1. Wipe unit with a dry, lint-free cloth. Do not use solvents or abrasives.
2. Remove batteries if not in use for long periods.
3. Store unit in a dry location.
4. Other than the batteries, there are no replaceable parts on this unit. **Repairs should be done by a qualified technician.**

Battery Replacement

If the  symbol appears on the LCD display, the battery should be replaced.

1. Remove Test Leads from the Meter.
2. Turn the unit over.
3. Remove screw on battery cover.
4. Remove battery cover carefully.
5. Pull batteries out of unit and replace with the same.
6. Replace cover and retighten screw.

Calibration

Have the Meter calibrated by a qualified technician every year to maintain accuracy.

Limited 90 Day Warranty

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Record Serial Number Here:

Note: If product has no serial number, record month and year of purchase instead.

