

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.

171

AMESTM

I N S T R U M E N T S

64016

200A AC FORK 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

	<p>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.</p>
 DANGER	<p>Indicates a hazardous situation which, if not avoided, will result in death or serious injury.</p>
 WARNING	<p>Indicates a hazardous situation which, if not avoided, could result in death or serious injury.</p>
 CAUTION	<p>Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</p>
<p>NOTICE CAUTION</p>	<p>Addresses practices not related to personal injury.</p>

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.** Only use one hand when securing the clamp around cable.
3. Inspect the Meter before use. In addition to a general inspection:
 - 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.)
 - 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 200A.

18. Prior to testing, resistance, diodes, or continuity; disconnect all power to the circuit and discharge all high-voltage capacitors.
19. Dress properly. Protective, electrically nonconductive clothes and nonskid footwear are recommended when working.

20. Wear ANSI-approved safety goggles during use.
21. Only use accessories intended for use with this Meter.
22. Performance of this Meter may vary depending on battery condition.
23. Use the proper settings, terminals, techniques, and range for the tests performed. Start with the range stated in the instructions.

24. Do not apply voltage to the Test Leads when the Meter is in the ohms testing setting. Damage can occur to the Meter.
25. Do not switch between testing modes with the Meter connected to a circuit.
26. Do not use the Meter at a setting marked as blank on the scale.
27. Prior to testing capacitors, resistance, diodes, or continuity; disconnect all power to the circuit and discharge all high-voltage capacitors.
28. Have the Meter calibrated by a qualified technician every year.
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: 600mV / 6V / 60V / 600V
DC Voltage Accuracy	± 0.7% of rdg + 3D
AC Voltage	Ranges: 6V / 60V / 600V Frequency Range: 40Hz - 400Hz
AC Voltage Accuracy	± 0.8% of rdg + 3D
AC Current	200A Frequency Range: 40Hz - 400Hz
AC Current Accuracy	± 3% of rdg + 3D
LoZ	(@1 - 600V AC/DC) ± 2.0% of rdg + 3D;
DC Current	Ranges: 600µA / 1000µA
DC Current Accuracy	± 1% of rdg + 4D
Resistance	Ranges: 600Ω / 6kΩ / 60kΩ / 600kΩ / 6MΩ / 60MΩ
Resistance Accuracy	(@ 600Ω, 6kΩ, 60kΩ, 600kΩ) ± 0.8% of rdg + 3D (@ 6MΩ, 60MΩ) ± 1.2% of rdg + 3D
Continuity	Meter beeps at < 50Ω
Capacitance	Ranges: 60nF / 600nF / 6µF / 60µF / 600µF / 6000µF / 60mF
Capacitance Accuracy	± 4.0% of rdg + 5D
Diode	Forward DC Current: 1mA Reverse DC Voltage: 3.2V
Frequency	Current Mode: 100Hz - 1000Hz Voltage Mode: 100Hz / 1000Hz / 10kHz Hz% Mode: 60Hz / 600Hz / 6kHz / 60kHz / 600kHz / 6MHz / 60MHz
Frequency Accuracy	Current Mode: ± 1.5% of rdg + 5D Voltage Mode: ± 1.5% of rdg + 5D Hz% Mode: ± 0.3% of rdg + 5D
Temperature	Range: -4°F to 752°F (-20°C to 400°C)
Temperature Accuracy	(@ -4°F to 32°F) ± 3% of rdg + 2D (@ 33°F to 752°F) ± 2% of rdg + 2D
Sampling Rate	~3 times/second
Operating Temperature	Range: 32° - 104°F
Operating Humidity	≤ 75% RH
Jaw Opening	12mm
Display	LCD
Battery	9V (included)

SAFETY

SETUP

OPERATION

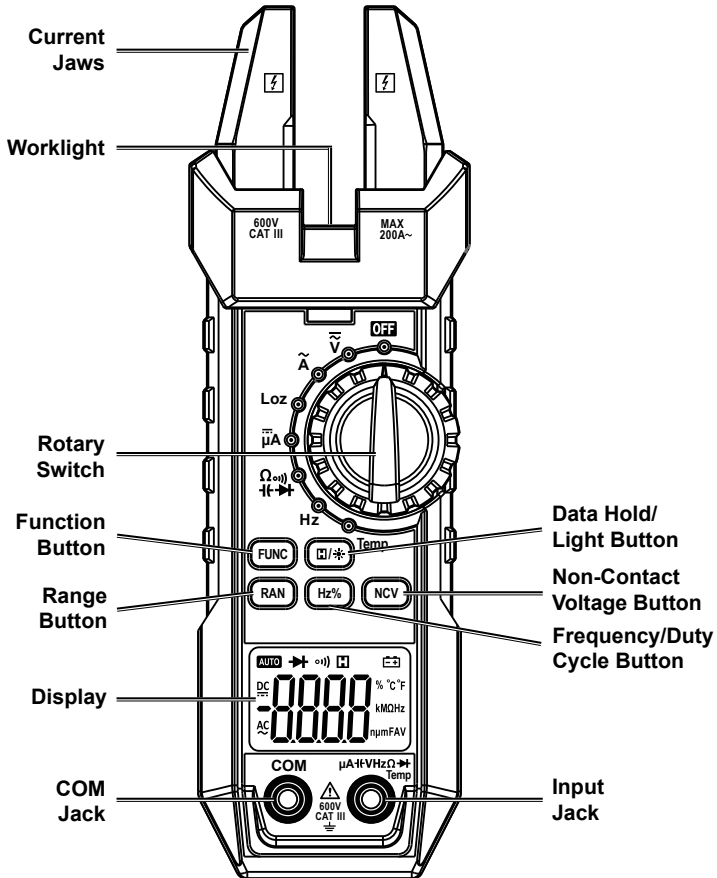
MAINTENANCE

Setup - Before Use:

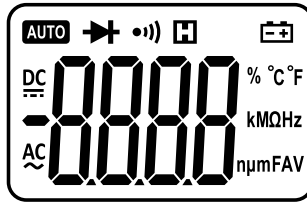


Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Functions



Display



Symbol	Description
AUTO	Auto-Range
→	Diode
•))	Continuity
□	Data Hold
⊖	Low Battery
DC	Direct Current
AC	Alternating Current
%	Duty Cycle
°C/°F	Celsius/Fahrenheit
nF, uF, mF	Farads (Capacitance) ⇄
μA, mA, A	Amps (Current)
V, mV	Volts (Voltage)
Hz, kHz	Hertz (Frequency)
Ω, kΩ, MΩ	ohms (Resistance)

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 Operation

Data Hold Button

Keep current reading on display.

2. Press button to release hold.

1. Press button to keep current reading. will appear on Display.

Backlight and Worklight

1. Press and hold button until Backlight turns on.

3. While in Current mode (\tilde{A}), turning Backlight on also turns Worklight on.

2. When finished, press and hold button until Backlight turns off.

Note: Frequent use of Backlight/Worklight will shorten battery life.

RAN Button

Meter's default range is **AUTO**.

2. Press and hold **RAN** button to return to **AUTO**.

1. To select manual range, press **RAN** button. Each press of button increases range.

Note: Manual range does not work in all modes.



Hz% Button

Switch between frequency and duty cycle measurements. **See page 13.**

NCV Button - Non-Contact AC Voltage Sensing

Detect AC voltage above 90V AC.

1. Turn Rotary Switch to any position.
2. Place tip of Meter within 10mm of unshielded conductor.

3. NCV light will come on and Meter will beep to indicate presence of voltage.

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

Auto Power Off

Meter will automatically turn off after 15 minutes of non-use. To conserve battery power, turn Meter off after use.

1. To turn Meter back on, press **FUNC** button.
2. To disable Auto Power Off, hold **FUNC** button down while turning Meter on.



Measurement Operation

SAFETY

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.

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 black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to \tilde{V} position.
3. Press **FUNC** button to choose between **AC** and **DC**.
4. Carefully touch exposed conductors with tips of probes.

5. Read measurement.
 - For **AC Voltage**, press the **H_z%** button once to measure frequency; press **H_z%** button again to measure duty cycle.
 - Use the **Loz** switch position on Meter when readings are suspect (ghost or stray voltages may be present), or when testing for the presence of voltage. Follow instructions for **Low Impedance Measurement on page 11**.

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

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

SETUP

AC Current Measurement

Measure AC conductors carrying up to 200 amperes.

WARNING! To prevent electric shock, test conductor voltages with care. Only use one hand when securing clamp around conductor.

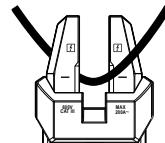
WARNING! Remove Test Leads before taking measurements with Current Fork.

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

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

1. Turn Rotary Switch to \tilde{A} position.

2. Using one hand, position Current Jaws around conductor to be tested.
3. Center conductor between lines in Current Jaws, as shown.



4. Read measurement.
 - Press **H_z%** button once to measure frequency; press **H_z%** button again to measure duty cycle.
5. When testing is complete, turn Rotary Switch to **OFF**, and store Meter.

OPERATION

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Low Impedance Measurement

Eliminate ghost voltages.

1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to **Loz** position.
3. Carefully touch exposed conductors with tips of probes.
4. Read measurement.
5. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

DC Microamp Current Measurement

Test thermocouple-based flame sensors.

1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to $\bar{\mu}\text{A}$ position.
3. Press **FUNC** button until μA is displayed.
4. **Perform test according to appliance's owner's manual.**

Resistance Measurement

Measure circuit resistance up to 60M Ω .

WARNING! To prevent electric shock, disconnect all power to circuit and discharge all high-voltage capacitors before measuring.

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

Note: When measuring above 1M Ω , it may take a few seconds for reading to stabilize.

1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to $\frac{\Omega}{\text{M}}$ position.
3. Carefully touch exposed conductors with tips of probes.
4. Read measurement.
5. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Note: If resistance value is too high, display will read **OL**.



Continuity Measurement

Test continuity between two points of a circuit.

WARNING! To prevent electric shock, disconnect all power to circuit and discharge all high-voltage capacitors before measuring.

1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to Ω position.
3. Press **FUNC** button until \bullet is displayed.
4. Short Test Leads together, meter should beep continuously.
5. Connect Test Leads to two points of circuit. If resistance value is less than 50 Ω , Meter will beep continuously.
6. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Capacitance Measurement

Measure capacitance up to 60mF.

WARNING! To prevent electric shock, disconnect all power to circuit and discharge all high-voltage capacitors before measuring.

Note: It may take up to 30 seconds for reading to stabilize.

1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to Ω position.
3. Press **FUNC** button until **n F** appears.
4. Carefully touch capacitor leads with tips of probes.
5. Read measurement.
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, disconnect all power to circuit and discharge all high-voltage capacitors before measuring.

1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
2. Turn Rotary Switch to Ω position.
3. Press **FUNC** Button until \rightarrow is displayed.
4. Connect red probe to diode's anode and black probe to its cathode.
5. Approximate forward voltage drop of diode will be displayed in mV.
6. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Note: If circuit is open or diode polarity is reversed, display will read **OL**.

Frequency/Duty Cycle Measurement

- Measure frequency between 60Hz - 60MHz.
1. Plug black Test Lead into black **COM** Jack.
Plug red Test Lead into red Input Jack.
 2. Turn Rotary Switch to **Hz%** position.
 3. Connect Test Leads across circuit to be measured.
 4. Read measurement.
 5. Press **Hz%** button to switch to Duty Cycle.
 6. Read measurement.
 7. When testing is complete, turn Rotary Switch to **OFF**, remove Test Leads and store with Meter.

Temperature Measurement

- Measure temperature from -4°F to 752°F (-20°C to 400°C)
1. Insert Thermocouple Plug (included).
Push black side into black **COM** Jack.
Push red side into red Input Jack.
 2. Turn Rotary Switch to **Temp** position.
 3. Press **FUNC** Button To choose between °F and °C.
 4. Touch tip of Thermocouple to object to be tested.
 5. Read measurement.
 6. When testing is complete, turn Rotary Switch to **OFF**, remove Thermocouple and store with Meter.
- 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 battery(ies), there are no replaceable parts on this Meter. **Repairs should be done by a qualified technician.**

Battery Replacement

When  symbol appears on display, replace battery(ies).

1. Remove Test Leads from Meter.
2. Turn Meter over.
3. Remove screw and battery cover.
4. Remove battery(ies) and replace with same.
5. Replace cover and screw.

Calibration

Have Meter calibrated by a qualified technician every year.

Record Serial Number Here: _____

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

SAFETY

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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.

