

■ MICRO-OHMMETER

6240



NOTE: For instruments with serial numbers lower than 116339SEV, terminals C1 and P1 are red, and C2 and P2 are black

ENGLISH

User Manual



Catalog #: 2129.80

Model #: 6240

Please fill in the appropriate date as indicated:

Date Received: _____

Date Calibration Due: _____




**AEMC**[®]
INSTRUMENTS
CHAUVIN ARNOUX GROUP

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INTRODUCTION

WARNING

These safety warnings are provided to ensure the safety of personnel and proper operation of the instrument.

- This instrument is protected from accidental voltages of not more than 50V with respect to earth in measurement Category III.
- Do not attempt to perform any tests with this instrument until you have read the user manual.
- Tests are to be carried out on de-energized circuits only! **Never connect the unit to a live circuit.**
- Make sure that none of the input terminals are connected and that the switch is set to OFF before plugging in the AC power to recharge the battery of the instrument.
- Make sure the internal battery is fully charged prior to testing. If the instrument has been left unused for several months, recharge the battery.
- If the case needs cleaning, do not use any alcohol or oil based cleaners. Preferably use soapy water with a damp cloth or sponge. Do not immerse the 6240 micro-ohmmeter in water.
- Use connection accessories of which the overvoltage category and the service voltage are greater than or equal to those of the measuring instrument (50V CAT III). Use only accessories that comply with safety standards (IEC 61010).
- The test leads and measuring wires must be in good condition and should be replaced if there is any evidence of deterioration (insulation split, burnt, etc.).
- Troubleshooting and metrological verification procedures must only be performed by qualified, approved personnel, or the factory.

1.1 International Electrical Symbols

	Signifies that the instrument is protected by double or reinforced insulation.
	This symbol on the instrument indicates a WARNING and that the operator must refer to the user manual for instructions before operating the instrument. In this manual, the symbol preceding instructions indicates that if the instructions are not followed, bodily injury, installation/sample and/or product damage may result.
	Risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.
	When disposed of, this product must be sorted for the recycling of electrical and electronic equipment in accordance with WEEE directive 2002/96/EC.

1.2 Definition of Measurement Categories

CAT IV: For measurements performed at the primary electrical supply (<1000V) such as on primary overcurrent protection devices, ripple control units, or meters.

CAT III: For measurements performed in the building installation at the distribution level such as on hardwired equipment in fixed installation and circuit breakers.

CAT II: For measurements performed on circuits directly connected to the electrical distribution system. Examples are measurements on household appliances or portable tools.

1.3 Receiving Your Shipment

Upon receiving your shipment, make sure that the contents are consistent with the packing list. Notify your distributor of any missing items. If the equipment appears to be damaged, file a claim immediately with the carrier and notify your distributor at once, giving a detailed description of any damage. Save the damaged packing container to substantiate your claim.



NOTE: Charge the instrument fully before use.



1.4 Ordering Information

Micro-ohmmeter Model 6240 **Cat. #2129.80**
Includes extra large tool bag, set of two 10ft Kelvin clips (10A - Hippo), set of two 10ft Kelvin probes (1A - Spring Loaded), optical USB cable, US 115V power cord, two spare fuses (12.5A), NiMH rechargeable battery pack, and USB stick supplied with product user manual and DataView® software.

1.4.1 Accessories and Replacement Parts

Kelvin clips (10A - Hippo), 10 ft color-coded leads
with spade lug terminations **Cat. #1017.84**
Kelvin clips (10A - Hippo), 20 ft color-coded leads
with spade lug terminations **Cat. #2118.70**
Kelvin Probes (1A - Spring Loaded), 10 ft with 4mm banana
plug termination (includes set of 5 fork terminals) **Cat. #2118.73**
Kelvin Probes (1A - Spring Loaded), 20 ft with 4mm banana
plug termination (includes set of 5 fork terminals) **Cat. #2118.74**
Kelvin Probes Pistol Grip 10 ft (10A) Spring Loaded **Cat. #2118.75**
Kelvin Probes Pistol Grip 20 ft (10A) Spring Loaded **Cat. #2118.76**
Kelvin Probes 10 ft (10A) Spring Loaded **Cat. #2118.77**
Kelvin Probes 20 ft (10A) Spring Loaded **Cat. #2118.78**
Kelvin Clips 10 ft (1-10A) **Cat. #2118.79**
Kelvin Clips 20 ft (1-10A) **Cat. #2118.80**
Thermo-Hygrometer Model CA846 **Cat. #2121.24**
Optical USB Cable **Cat. #2135.41**
Battery – Replacement NiMH 6V 9000mAH
for Model 6240 **Cat. #2129.91**
Fuse, set of 5, 12.5A/500V, 6.3 x 32mm **Cat. #2129.92**
Extra Large Classic Tool Bag **Cat. #2133.73**
Inverter – 12VDC to 120VAC 200 Watt for vehicle use **Cat. #2135.43**
115V Power Cord US **Cat. #5000.14**

PRODUCT FEATURES

2.1 Description

The Micro-ohmmeter Model 6240 is used to perform low resistance measurements from $5\mu\Omega$ to 400Ω . There are six ranges with test currents from 10mA to 10A.

The front end of the micro-ohmmeter employs a four-wire Kelvin configuration, which eliminates test lead resistance for a measurement accuracy of 0.25%. A built-in circuit filters out AC signals.

The Micro-ohmmeter Model 6240 is packaged in a sealed field case well suited for shop and field use. Power is supplied by a long-life NiMH battery pack with a built-in recharger (110/220V).

The large, easy-to-read liquid crystal display is 2.25 x 4.00". It displays the value of resistance, current or voltage test, polarity and battery charge.

For operator safety and instrument protection, the micro-ohmmeter is fuse protected at the inputs. One fuse, accessible from the front panel, protects against stored energy in inductive loads.

Enhanced internal circuitry protects against possible inductive kickback when the current is shut off.

A built-in thermal switch protects the micro-ohmmeter against overheating on the 10A range when in continuous use.

2.2 Applications

Some of the more popular and most frequent uses of the micro-ohmmeter are in applications for:

- Checking metallic coating resistance, especially in aeronautics
- Ground connections and continuity measurement
- Resistance measurements on motors and small transformers
- Contact resistance measurements on breakers and switches
- Component measurement
- Electrical cable resistance measurement
- Mechanical bond tests
- Wire to terminal connections
- Aircraft and rail bonds

2.3 Key Features

- Measures from $5\mu\Omega$ to 400Ω
- Test current selection from 10mA to 10A
- Manual temperature compensation (with DataView® software)
- Front panel polarity reverse function
- Stores up to 99 test results
- Operator safety by automatic discharge of residual charge on the equipment under test
- Auto store of multiple test results
- Internal, rechargeable batteries conduct up to 850, 10A tests
- A built-in battery pack recharger recharges the batteries by connecting to the AC line (110V-230V, 50/60Hz) using a standard line cord
- 4-Wire measurement with automatic compensation of undesirable voltages and lead resistance
- Large multi-function backlit display
- Direct display of the measurement with units, range and test current
- Rugged, sealed case

2.4 Control Features

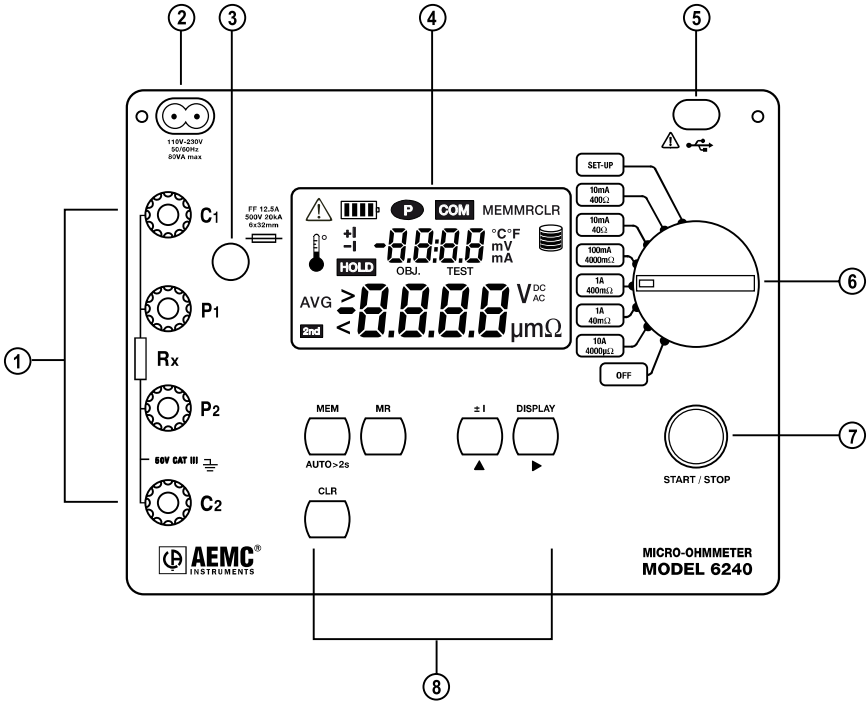


Figure 2-1

1. Kelvin input terminals
2. AC line recharging receptacle
3. Output fuse - 12.5A, 500V, 6x32mm
4. Large multi-line backlit liquid crystal display (see § 2.6)
5. Optical interface connector for connection to a computer
6. Range selection switch
7. Start/Stop button
8. Program/function buttons (see § 2.5)

2.5 Button Functions

MEM	Stores the measurement at an address identified by an object number (OBJ) and a test number (TEST). Two presses on this button are required, one to select the location (use the ▲ and ► buttons to change the location) and another to store the measurement.
MR	Retrieves stored data except for the OFF and SET-UP positions (this function is independent of the selector setting of the switch). Data is viewed using the ▲ and ► buttons.
± I	Reverses the direction of the current and displays the average.
DISPLAY	Displays the current or voltage on the terminals.
AUTO>2s	Activates automatic recordings.
▲	Used in the SET-UP and memory mode, selects a function or increments a flashing parameter.
►	Used in the SET-UP and memory mode, accesses the function to be modified.
CLR	Erases the memory

2.6 Display Symbols

The display incorporates two lines of characters to display test results, as well as a library of symbols to assist the operator in determining conditions at a glance. The symbols that can appear are shown in Figure 2-2.

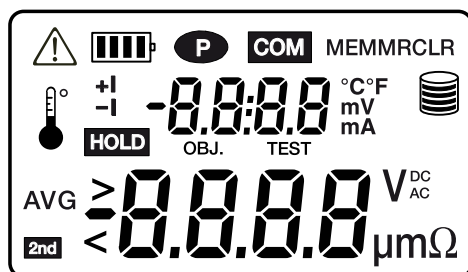


Figure 2-2

	Indicates the measurement is noisy; accuracy is not guaranteed
	Indicates the battery charge condition; the segments represent energy
	Indicates that power down is deactivated
	Not used
	Displayed measurement about to be stored in memory
	Memory recall
	Indicates the memory is being erased
	Indicates internal overheating
	Indicates the direction of current
	Indicates the direction of current
	Indicates that a measurement has been stopped
	First position locator for data stored in memory
	Second position locator for data stored in memory
	Not used
	Memory utilization indicator
	Displays average $\frac{R (+I) + R (-I)}{2}$
	Not used
> symbol"/>	Indicates an overrange

CHAPTER 3

SPECIFICATIONS

3.1 Electrical

Specifications are given for an ambient temperature of $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$, relative humidity of 45 to 55%, supply voltage of $6\text{V} \pm 0.2\text{V}$ and magnetic field of $<40\text{A/m}$.

RESISTANCE						
Measurement Range	5.0 to 3999 $\mu\Omega$	4.0 to 39.99m Ω	40.0 to 399.9m Ω	400 to 3999m Ω	4.0 to 39.99 Ω	40.0 to 399.9 Ω
Resolution	1 $\mu\Omega$	10 $\mu\Omega$	100 $\mu\Omega$	1m Ω	10m Ω	100m Ω
Accuracy	$\pm 0.25\% \pm 2\text{ct}$					
Measurement current	10.2A $\pm 2\%$ ⁽¹⁾	1.02A $\pm 2\%$		102mA $\pm 2\%$	10.2mA $\pm 2\%$ ⁽²⁾	
Open voltage	4 to 6V					
Inductance	0.5H Max					

(1) With nominal value of 10.2A, the measurement current is at least 10A whatever the charge condition of the battery.

(2) The current is 10mA only up to 300 Ω . If the battery is low, it can fall to as low as 8mA.

VOLTAGE MEASUREMENT INDICATION					
Measurement Range	0.01 to 3.999mV	4.0 to 39.99mV	40.0 to 399.9mV	0.40 to 3.999V	4.0 to 4.70V
Resolution	1 μV	10 μV	100 μV	1mV	10mV

CURRENT MEASUREMENT INDICATION				
Measurement Range	5.0 to 39.99mA	40.0 to 399.9mA	0.40 to 3.999A	4.0 to 11.00A
Resolution	10 μA	100 μA	1mA	10mA

Influences on the Resistance Measurement

Quantities of Influence	Range of use	Variation of the measurement	
		Typical	Maximum
Temperature	-10 to +55°C	0.1%/10°C	0.5%/10 °C + 2cts
Relative Humidity	10 to 85% RH @ 45°C	0.1 %	0.5% + 2cts
Supply Voltage	5 to 7V	2cts	0.2%/V + 2cts
Series Mode Rejection, 50/60Hz*	$U (AC) = (R \text{ measured} \times I \text{ measurement})$	< 0.2%	2% + 1ct
Common Mode Rejection, 50/60Hz AC	0 to 50 V AC	> 80 dB	> 60 dB

*Example: If the measured resistance is 1mΩ and the measurement current is 10A, an alternating voltage of 1mV RMS in series with the resistance to be measured will induce an error of not more than 2%.

Power Supply: 6V, 8.5Ah rechargeable NiMH battery pack

Battery Life: Range dependent

Range	Number of measurements*
10A	850
1A	3500
100mA	4500
10mA	5000
In Standby or Off	battery life 4 to 6 months

*Established for measurements lasting 5s, every 25s.

3.2 Mechanical

Dimensions:

10.70 x 9.76 x 7.17" (272 x 248 x 182mm)

Weight:

10 lbs (4.5kg approx)

Case Protection:

ABS plastic polycarbonate: watertight to IP64 (cover closed), water resistant to IP53 (cover open).

Color:

Safety yellow case with gray faceplate

3.3 Environmental

Operating Temperature:

14° to 132°F (-10° to 55°C), 10 to 85% RH

Storage Temperature:

-40° to 158°F (-40° to 70°C); 10 to 90% RH

Altitude: <2000m



NOTE: For long-term storage (>1 year) with the battery installed, the storage range is -4 to 86°F (-20 to 30°C); 85% RH, otherwise the battery will deteriorate. For short-term storage (1 month) the temperature can reach up to 122°F (50°C).

3.4 Safety

Electrical safety as per EN 61010, EN 61557.

Degree of pollution: 2

Protection: Measurement CAT III, 50V with respect to earth, 500V differential between terminals, and 300V CAT II on the charger input

Electromagnetic Compatibility:

The instrument satisfies the CEM and DBT directives required for the CE marking and product standard EN 61326-1

Emissions in residential environment

Immunity in industrial environment

**Specifications are subject to change without notice*

CHAPTER 4


OPERATION



NOTE: Charge the instrument fully before use.



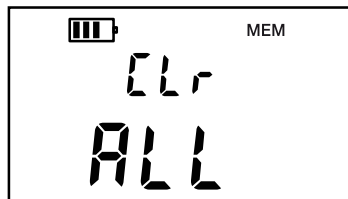
4.1 Precautions Before Use

- **Never** use test leads or measuring wires if there is any evidence of deterioration (insulation split, burnt, etc).
- **Never** exceed the safety values indicated in the specifications.
- **Never** connect the unit to a live circuit.
- **Never** disconnect the connection wires before the  icon disappears from the display.

4.2 Instrument Configuration (SET-UP mode)





The **SET-UP** mode is used to modify the instrument's configuration. This can also be performed by using the **DataView® software** that came with the instrument.

To configure the Model 6240 directly from the display, turn the rotary switch to the **SET-UP** position. The following screen will appear:



- **The display order of the parameters that can be modified is:**
 - Clear all memory (see § 4.9.2)
 - Time
 - Date
 - Automatic Power Off
 - Display of the Internal Parameters (e.g. serial number, software version, date of last calibration, lighting of all segments on display)

To display and modify parameters:

- To move through parameters, press the  button.
- To change the displayed parameters or view additional ones, press and hold the  button.
- To modify the parameters, use the  button.
- To accept the changes, press and hold the  button >2s until the display stops blinking.

4.3 Resistance Measurements

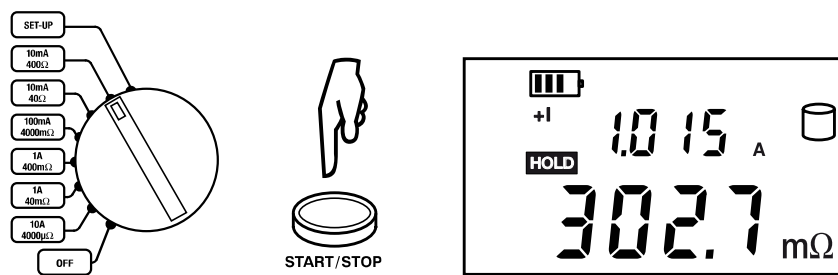


WARNING: Before performing the resistance test, verify that the sample under test is not energized.

1. Clean all surfaces before connecting test leads.
2. Connect the two leads to the four terminals, then the two Kelvin clips to the object to be tested.
3. Set the range selector switch to the desired range for the test. If the anticipated resistance is not known, begin with the highest range (400Ω) and successively lower the range selection until adequate resolution is achieved.
4. Press the **START/STOP** button to start the measurement.



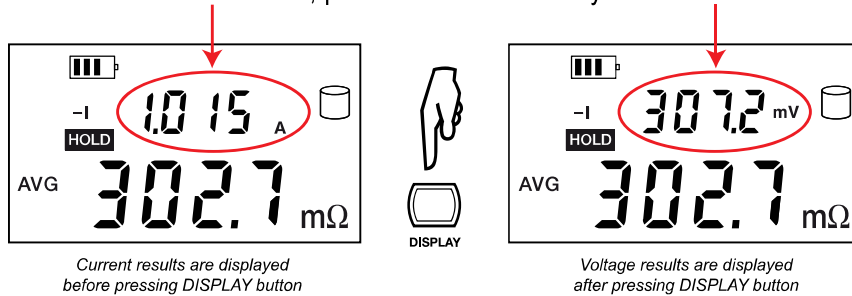
NOTE: The **START/STOP** needs to be pressed each time the range is changed. The range selection may be changed while the instrument is on.



5. Press the **START/STOP** button again to stop the measurement or disconnect one of the Kelvin clips. The last measurement made is displayed along with the **HOLD** symbol.

NOTE: If the measurement was stopped by disconnecting a Kelvin clip, simply connect it to another object to start the next measurement; It is not necessary to press the **START/STOP** button.

- To display the voltage on the terminals of the resistance instead of the measurement current, press the **DISPLAY** key.

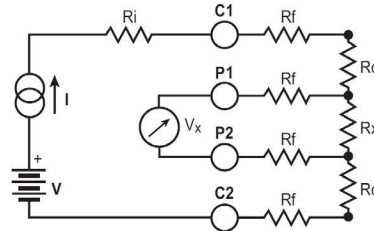


4.3.1 Measurement Readings

When testing resistive samples, the meter reading will stabilize within the first few hundred milliseconds. On inductive loads (e.g. small transformers), the measurement reading may take from several seconds to a few minutes to stabilize and depends greatly on the type of equipment and the impedance of the equipment under test.

4.3.2 Connections and Readings

The Model 6240 generates a current (I) from the internal voltage source (V). A voltmeter measures the voltage drop V_x at the Kelvin probe contact points to the resistance to be measured (R_x) and displays the resistance measurement (R_x) directly using the formula $R_x = V_x / I$.



The result is not affected by the other resistances encountered in the current loop (R_i , R_f , R_c), as long as the total voltage drop induced across R_x remains below the voltage supplied by the source which is between 5 to 6V. The maximum admissible lead resistance level is $R_f \approx (V - V_x) / I$. The use of Kelvin probes helps, as they eliminate the effect of the lead resistance (R_f).

R_i = Unit internal resistance
 R_f = Lead resistance
 R_c = Contact resistance
 R_x = Resistance to be measured

4.3.3 Test Lead Connection

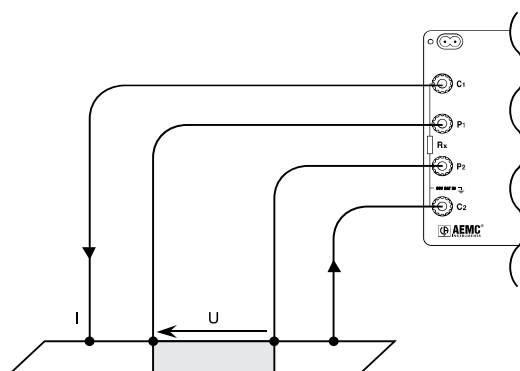
The measurement leads are connected using the four binding posts on the left side of the front panel as shown below.

Connect the two red leads to terminals P1 and P2. Connect the two black leads to terminals C1 and C2.



NOTE: For instruments with serial numbers lower than 116339SEDV, terminals C1 and P1 are red and C2 and P2 are black.

Any drop in the voltage on the load terminals is measured between the two “voltage” (V) leads, P1 and P2. The current leads (C1 and C2) can deliver current from 10mA to 10A.



4.4 Repetitive Measurements

1. Connect the Kelvin clips to the first object. Press **START/STOP**.
2. Disconnect the clips. The measurement stops and result is displayed.
3. Connect the clips to the second object. The measurement restarts automatically. Repeat as necessary.
4. After the last measurement, press **START/STOP** again.



NOTE: This operation is valid only if all of the objects to be measured have substantially the same value and all of the measurements are made in the same range.

4.5 Measuring Very Low Resistance

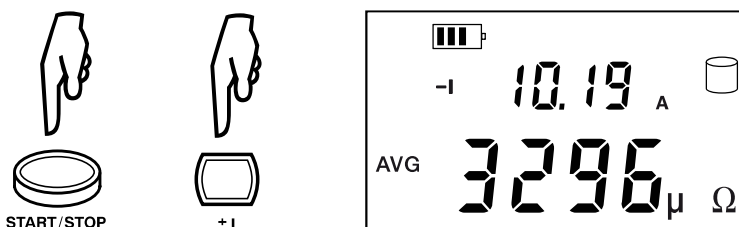
When measuring very low resistive values in the $\mu\Omega$ range, the presence of stray DC currents may affect the accuracy of the measurements. These currents can be present due to a variety of reasons including chemical or thermal EMF in samples made of dissimilar metals.

You can eliminate the effects of this by reversing the direction of current flow (see example below) and using the average of forward and reverse readings.

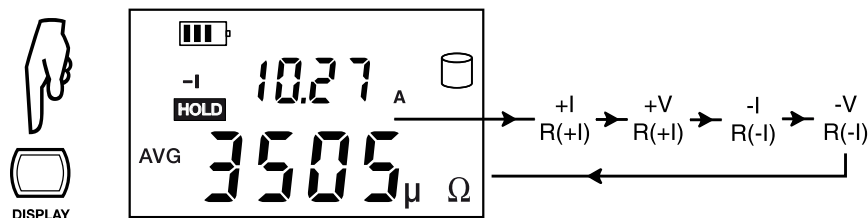
The presence of AC interference in the sample under test may cause the measured value on the display to fluctuate. This interference may become more noticeable in the presence of strong electric fields. The effects of this interference may be reduced by twisting the leads around each other.

1. Reverse the direction of the current by pressing the $\pm I$ button and the instrument displays the average:

$$R_{AVG} = \frac{R(+I) + R(-I)}{2}$$





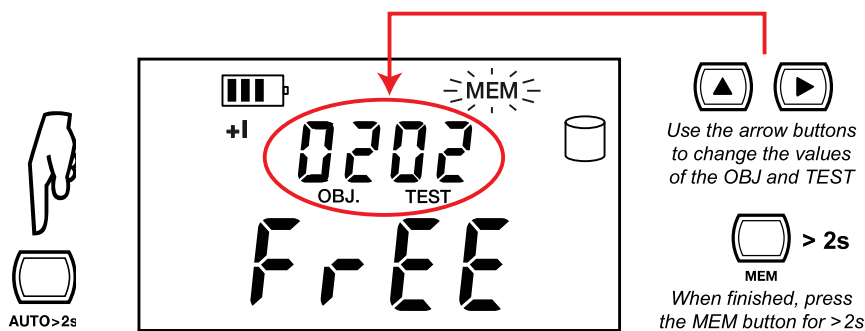
2. To display the values $R(+I)$ and $R(-I)$, press the **DISPLAY** button.



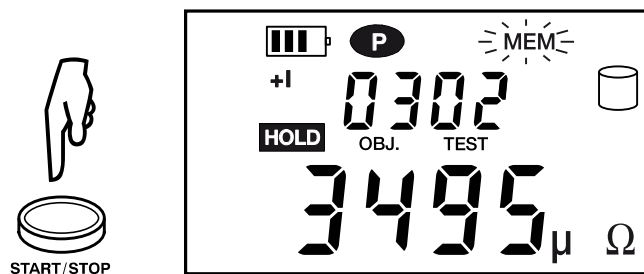
Press the DISPLAY button to cycle through the values

4.6 Automatic Recording

1. Before making measurements, press the **AUTO >2s** button.
2. When the button is pressed, the **MEM** symbol flashes and the small display indicates the first free **OBJ : TEST** number (e.g. 01 : 01). The main display indicates **FrEE**.
3. Use the  button to switch between the **OBJ** and **TEST** option, then use the  button to change the number of the test or object.
4. When finished, press the **MEM** button for >2s. Automatic recording is activated (the **MEM** symbol flashes).





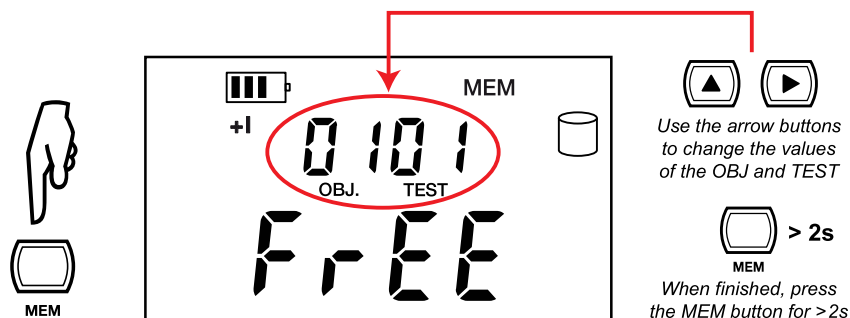
5. Press the **START/STOP** button to begin measuring.
At each new measurement, the test number is incremented and the measurement is recorded.
6. Press the **START/STOP** button again to stop automatic recording.




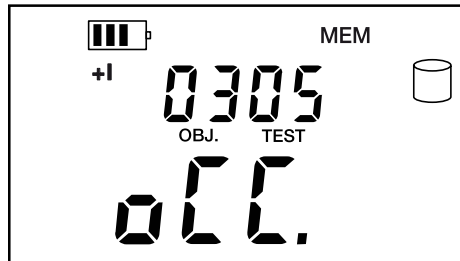
4.7 Storing Results into Memory

Data storage is organized into objects (**OBJ**), each of which can contain several tests (**TEST**). **OBJ** corresponds to the object tested and each test corresponds to a measurement made on the object. The instrument can store 99 measurements.

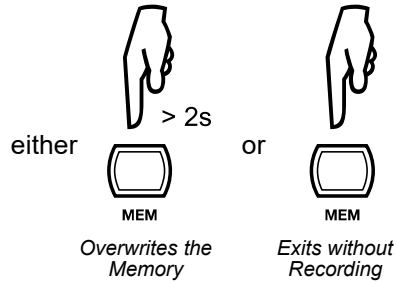
1. Start and Stop a measurement (see § 4.3).
2. Press the **MEM** button.
3. When the button is pressed, the **MEM** symbol flashes and the small display indicates the first free **OBJ : TEST** number (e.g. 01 : 01). The main display indicates *FrEE*.
4. Use the  button to switch between the **OBJ** and **TEST** option, then use the  button to change the number of the test or object.
5. When finished, press the **MEM** button for >2s. The measurement is stored.



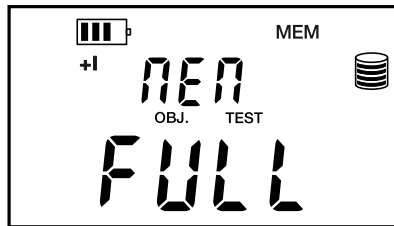
6. If the user selects a memory address that is already occupied,  appears on the main screen. To overwrite the location, press the **MEM** button for >2s.



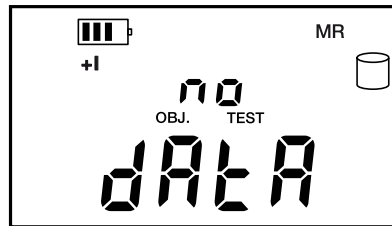
Indicates address is already occupied





Display shown if memory is **full**:

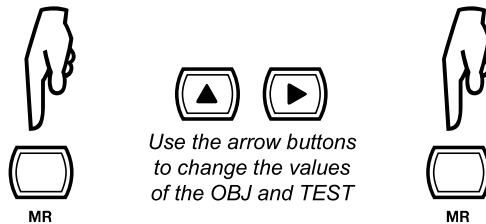


Display shown If memory is **empty**:





4.8 Recalling Results from Memory

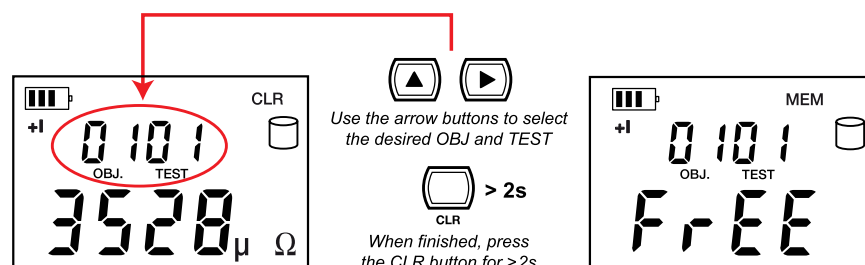
1. Make sure there is no measurement in progress.
2. Press the **MR** button.
3. Use the  and  buttons to select the desired OBJ and TEST.
4. Press the **MR** button again to exit the memory function.



4.9 Erasing Measurements from Memory

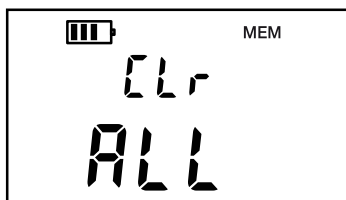
4.9.1 Erasing Selected Measurements




1. Press the **CLR** button.
2. Use the  and  buttons to select the desired OBJ and TEST.
3. Press the **CLR** button for >2s to delete the selected record.



4.9.2 Erasing All Measurements

1. Turn the rotary switch to **Set-up**. The default display appears:



2. Press  for >2s. **ALL** will blink.
3. Press  again. **FrEE** will display.
4. Press  again for >2s. All measurements are erased and the screen returns to the default display.

DATAVIEW® SOFTWARE

5.1 Installing DataView®



DO NOT CONNECT THE INSTRUMENT TO THE PC BEFORE INSTALLING THE SOFTWARE AND DRIVERS.

When you purchase an AEMC instrument supported by DataView, the software is included as part of the product package. DataView program files are stored on a USB stick.

NOTE: When installing, the user must have Administrative access rights during the installation. The users access rights can be changed after the installation is complete. DataView must be reinstalled for each user in a multi-user system.

1. Insert the DataView thumb drive into an available USB port on your computer. If Autorun is enabled, an AutoPlay window appears on your screen. Click "Open folder to view files" to display the DataView folder. If Autorun is not enabled or allowed, use Windows Explorer to locate and open the USB drive labeled "DataView."
2. When the DataView folder is open, find the file Setup.exe located in the root directory of the USB drive, and double-click it to run the installation program.
3. The DataView setup screen appears. In the upper left corner of the screen, choose the language version of the Setup interface. (All Setup screens and dialogs will immediately appear in the selected language.)

In the lower left corner are the available installation options. In addition to the DataView software, you can select "Adobe Reader." This links to the Adobe web site where you can download the latest version of Reader. This program is required to view DataView .pdf documents.

The option Firmware Upgrades links to the website where you can check for new firmware updates for the instrument. Finally, User Manuals displays a list of .pdf files contained in the USB drive that accompanies DataView. (DataView also comes with a Help system that is installed with the program files.)

To install DataView, select DataView in the Options list and click Install.

4. Select the language version of DataView you want to install (English, French, or Spanish) then click Next. (By default, the language selected in step 3 is highlighted.)
5. You are now prompted to select the software you want to install. Each AEMC product family has its own specially designed Control Panel. If you are performing a Complete install, by default all available Control Panels are selected (a check mark next to the Control Panel indicates it is selected). Control Panels take up disk space on the computer; so unless you have other types of AEMC instruments, we recommend that you select MicroOhmmeter and deselect the rest. You should also check the option DataView Core, which is a requirement if you plan to create DataView reports.


After you finish selecting and deselecting Control Panels and/or DataView Core, click Next.

6. The Setup program now informs you that it is ready to install DataView. If you want to review any of your previous selections, click the Previous button to return to earlier screens. Otherwise, click Install to begin installation.
7. The InstallShield program installs the selected software. If an earlier version of the software is already installed on your computer, for each selected program the InstallShield program will:
 - (a) Ask you to confirm the installation of the program. Click Next.
 - (b) Display a status bar indicating the progress of the installation.
 - (c) Inform you when the program is installed.

Click Finish to install the next selected program.

If the software is not installed (or if the installed software is the same version as the selected software), the software is installed without requesting confirmation.

When all programs are installed, a message appears informing you of this. Click Finish to return to the Setup screen.

8. You can now select additional Setup options to install (see step 3 above). When finished, click Exit.
9. The DataView folder now appears on your computer desktop, within which is the MicroOhmmeter  icon and the icon(s) for any other Control Panel(s) you have installed.

5.2 Micro-ohmmeter Control Panel

Clicking the DataView icon in the DataView folder on your desktop opens the core DataView program. Clicking the MicroOhmmeter Control Panel icon opens the MicroOhmmeter Control Panel.

In general, core DataView features are for creating, viewing, editing, and storing DataView reports; while the Control Panel is for connecting to, configuring, viewing measurements on, and downloading data from the instrument. You can access all DataView features through either the DataView icon or the Control Panel icon. For users who interact with micro-ohmmeter instruments, we recommend primarily using the Control Panel. However, there are situations where using the core DataView icon may be more convenient for some users, such as when viewing multiple archived reports from different AEMC product families.

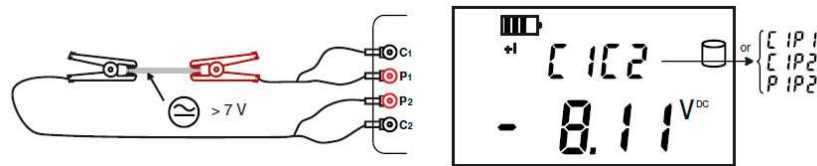
For further information about using the MicroOhmmeter Control Panel, consult the Help system that comes with the product. Access this Help by clicking the option Help in the Control Panel's menu bar at the top of the screen.

TROUBLESHOOTING

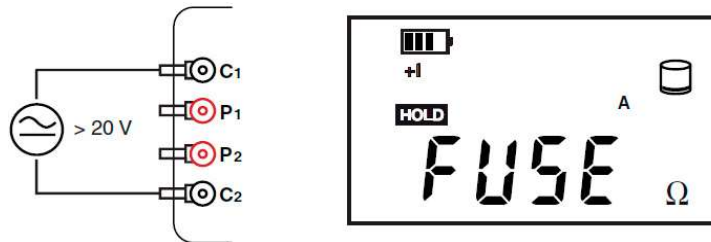
6.1 Error Messages

6.1.1 Voltage Present

An error message will appear when an external voltage is present on the device being measured. (e.g. C1C2 or C1P1). Before a measurement is possible the voltage must be removed from the test object.

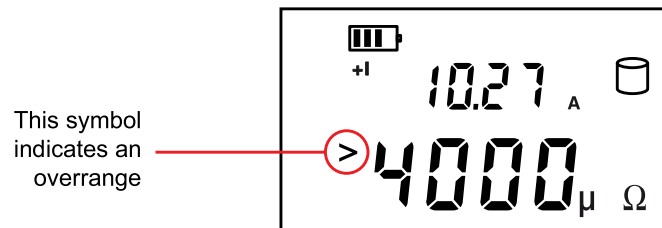


A voltage greater than 20V applied across the C1-C2 terminal will cause the Fuse on the front panel to blow. (See §7.4 for fuse replacement)



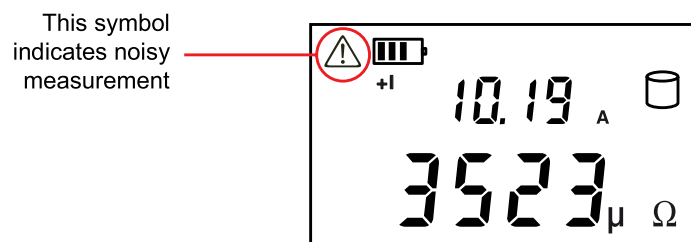
6.1.2 Overrange

The > symbol indicates an overrange condition. Switch to a higher measurement range and restart the measurement until the > symbol no longer appears.



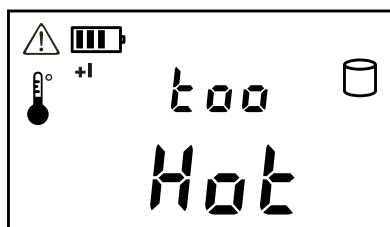
6.1.3 Noisy Measurement

The ⚠ symbol indicates noise in the measurement. The measurement accuracy is not guaranteed.



6.1.4 Overheating

Internal overheating can occur if a measurement in the 10A range last for several minutes. No measurement is possible until the temperature symbol and *too Hot* indication are no longer visible.



MAINTENANCE

Use only factory specified replacement parts. AEMC® will not be held responsible for any accident, incident, or malfunction following a repair done other than by its service center or by an approved repair center.

7.1 Warning

- To avoid electrical shock, do not attempt to perform any servicing unless you are qualified to do so.
- Do not perform any service while the micro-ohmmeter is on any circuit.
- To avoid electrical shock and/or damage to the instrument, do not get water or other foreign agents into the electronic module.
- Make sure the internal battery is fully charged prior to testing. If the instrument has been left unused for several months, recharge the battery.
- We recommend recharging the micro-ohmmeter every month to ensure a full battery charge when used.
- When replacing the fuse, install only the fuse which is a direct replacement.

7.2 Cleaning



WARNING: Disconnect the instrument from any source of electricity.

- If the case needs cleaning, do not use any alcohol or oil based cleaners. Preferably use soapy water with a damp cloth or sponge.
- Dry immediately after cleaning. Avoid water penetration into the electronic module.
- Make sure the micro-ohmmeter and all leads are dry before further use.

7.3 Charging/Recharging the Battery

AC POWER SELECTION

The Model 6240 may be recharged from 110 to 230VAC (50/60Hz). The instrument includes a 110V line cord, which provides the charging voltage for the rechargeable battery.

CHARGING THE BATTERY

- The Model 6240 should be charged to a full charge before using it for the first time.
- Charging to full capacity may take up to 6 hours for a completely discharged battery.
- If the battery symbol shows as an empty cell, the battery needs to be recharged.

The battery will only charge in the OFF mode.

- In the ON mode, the charging halts and the battery level indication is shown in the battery symbol to the top left of the display.
- In the OFF mode, indication is as described in the charging indicator section below.

Connect the Model 6240 to 110VAC using the power cord provided (charging starts automatically if the instrument is in the OFF mode).



NOTE: Measurement can be obtained while the power cord is connected but the charging process will be stopped until the instrument is turned OFF again.

CHARGING INDICATORS

OFF Mode:

- **bAtt** on the small display and **###** on the main display, signifies fast charging in progress. Where **###** is the percent of battery charge (only in the OFF position).
- **bAtt** on the small display and **FULL** on the main display, signifies that charging is complete. At this point a low charge current is applied to maintain the battery charge.

ON Mode:

- **bAtt** shown when instrument is turned on and battery is low. There will be a 5 second delay then 4 beeps before the instrument shuts down.
- **bAtt** shown during high current measurement indicates a low battery condition (measurement will be possible on lower current range only).

Battery Indicator Status	Battery Charge (C)
	$C > 87.5\%$
	$87.5\% > C > 62.5\%$
	$62.5\% > C > 37.5\%$
	$37.5\% > C > 12.5\%$
	$12.5\% > C$
Blink	$C = 0$ (battery Indicator not initialized)
Automatic shutdown	$C = 0$

If the instrument is turned on and the battery voltage is $>5V$, then the normal use of the device is permitted.

7.4 Battery and Fuse Replacement



NOTE: Make sure that no terminals are connected and that the switch is in the OFF position before removing the instrument from the case.

BATTERY



WARNING: Replacing the battery causes data loss from memory.

- The battery should be replaced by an authorized repair facility recognized by AEMC® Instruments. See the Repair and Calibration section for return instructions.
- The battery is accessible using a Phillips Head screwdriver to remove the four screws on the bottom side of the case and pulling the chassis out from the top.

FUSE

- The fuse is located on the front panel between the C1 and P1 input terminals.
- Fuse F1, is a 6.3x32 mm, fast acting, 12.5A/500V, low internal resistance, protecting the current source from outside voltages on energized specimens.

Repair and Calibration

To ensure that your instrument meets factory specifications, we recommend that it be scheduled back to our factory Service Center at one-year intervals for recalibration, or as required by other standards or internal procedures.

For instrument repair and calibration:

You must contact our Service Center for a Customer Service Authorization Number (CSA#). This will ensure that when your instrument arrives, it will be tracked and processed promptly. Please write the CSA# on the outside of the shipping container. If the instrument is returned for calibration, we need to know if you want a standard calibration, or a calibration traceable to N.I.S.T. (Includes calibration certificate plus recorded calibration data).

you are experiencing any technical problems, or require any assistance with the proper operation or application of your instrument, please call, mail, fax or e-mail our technical support

Limited Warranty

The Model 6240 is warranted to the owner for a period of two years from the date of original purchase against defects in manufacture. This limited warranty is given by AEMC® Instruments, not by the distributor from whom it was purchased. This warranty is void if the unit has been tampered with, abused or if the defect is related to service not performed by AEMC® Instruments.

Please print the online Warranty Coverage Information for your records.

What AEMC® Instruments will do:

If a malfunction occurs within the warranty period, you may return the instrument to us for repair, provided we have your warranty registration information on file or a proof of purchase. AEMC® Instruments will, at its option, repair or replace the faulty material.

Warranty Repairs

What you must do to return an Instrument for Warranty Repair:

First, request a Customer Service Authorization Number (CSA#) by phone or by fax from our Service Department (see address below), then return the

