

# Micro-Ohmmeter Model 6240



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



## MICRO-OHMMETERS

*Measure Up*  
WITH AEMC INSTRUMENTS



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We guarantee that at the time of shipping your instrument has met the instrument's published specifications.

**An NIST traceable certificate may be requested at the time of purchase, or obtained by returning the instrument to our repair and calibration facility, for a nominal charge.**

The recommended calibration interval for this instrument is 12 months and begins on the date of receipt by the customer. For recalibration, please use our calibration services. Refer to our repair and calibration section at [www.aemc.com/calibration](http://www.aemc.com/calibration).

**Serial #:** \_\_\_\_\_

**Catalog #:** 2129.80

**Model #:** 6240

Please fill in the appropriate date as indicated:

Date Received: \_\_\_\_\_

Date Calibration Due: \_\_\_\_\_



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# TABLE OF CONTENTS

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|                                                                                                                   |           |
|-------------------------------------------------------------------------------------------------------------------|-----------|
| <b>1. INTRODUCTION.....</b>                                                                                       | <b>6</b>  |
| 1.1 INTERNATIONAL ELECTRICAL SYMBOLS.....                                                                         | 6         |
| 1.2 DEFINITION OF MEASUREMENT CATEGORIES (CAT) .....                                                              | 6         |
| 1.3 PRECAUTIONS FOR USE  .....   | 7         |
| 1.4 BATTERY HANDLING.....                                                                                         | 7         |
| 1.5 RECEIVING YOUR SHIPMENT .....                                                                                 | 8         |
| 1.6 ORDERING INFORMATION.....                                                                                     | 9         |
| 1.6.1 Accessories.....                                                                                            | 9         |
| 1.6.2 Replacement Parts .....                                                                                     | 9         |
| <b>2. FEATURES .....</b>                                                                                          | <b>10</b> |
| 2.1 DESCRIPTION.....                                                                                              | 10        |
| 2.2 APPLICATIONS.....                                                                                             | 10        |
| 2.3 KEY FEATURES.....                                                                                             | 11        |
| 2.4 CONTROL FEATURES.....                                                                                         | 12        |
| 2.5 BUTTON FUNCTIONS.....                                                                                         | 13        |
| 2.6 DISPLAY SYMBOLS .....                                                                                         | 14        |
| <b>3. SPECIFICATIONS.....</b>                                                                                     | <b>15</b> |
| 3.1 ELECTRICAL .....                                                                                              | 15        |
| 3.2 MECHANICAL .....                                                                                              | 16        |
| 3.3 ENVIRONMENTAL.....                                                                                            | 16        |
| 3.4 SAFETY.....                                                                                                   | 16        |
| <b>4. OPERATION .....</b>                                                                                         | <b>17</b> |
| 4.1 PRECAUTIONS FOR USE  ..... | 17        |
| 4.2 INSTRUMENT CONFIGURATION (SET-UP MODE).....                                                                   | 17        |
| 4.3 RESISTANCE MEASUREMENTS .....                                                                                 | 18        |
| 4.3.1 Measurement Readings.....                                                                                   | 19        |
| 4.3.2 Connections and Readings .....                                                                              | 19        |
| 4.3.3 Test Lead Connection.....                                                                                   | 19        |
| 4.4 REPETITIVE MEASUREMENTS .....                                                                                 | 20        |
| 4.5 MEASURING VERY LOW RESISTANCE .....                                                                           | 20        |
| 4.6 AUTOMATIC RECORDING .....                                                                                     | 21        |
| 4.7 STORING RESULTS INTO MEMORY .....                                                                             | 21        |
| 4.8 RECALLING RESULTS FROM MEMORY.....                                                                            | 23        |

|                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------|-----------|
| 4.9 ERASING MEASUREMENTS FROM MEMORY .....                                                          | 23        |
| 4.9.1 Erasing Selected Measurements .....                                                           | 23        |
| 4.9.2 Erasing Selected Measurements .....                                                           | 23        |
| <b>5. DATAVIEW® SOFTWARE.....</b>                                                                   | <b>24</b> |
| 5.1 INSTALLING DATAVIEW® .....                                                                      | 24        |
| 5.2 MICRO-OHMMETER CONTROL PANEL .....                                                              | 25        |
| 5.3 CONNECTING THE INSTRUMENT .....                                                                 | 25        |
| <b>6. TROUBLESHOOTING .....</b>                                                                     | <b>26</b> |
| 6.1 ERROR MESSAGES .....                                                                            | 26        |
| 6.1.1 Voltage Present .....                                                                         | 26        |
| 6.1.2 Overrange .....                                                                               | 26        |
| 6.1.3 Noisy Measurement .....                                                                       | 27        |
| 6.1.4 Overheating .....                                                                             | 27        |
| <b>7. MAINTENANCE.....</b>                                                                          | <b>28</b> |
| 7.1 WARNING  ..... | 28        |
| 7.2 CLEANING .....                                                                                  | 28        |
| 7.3 CHARGING THE BATTERY .....                                                                      | 28        |
| 7.4 BATTERY AND FUSE REPLACEMENT .....                                                              | 30        |
| 7.5 REPAIR AND CALIBRATION .....                                                                    | 30        |
| 7.6 TECHNICAL ASSISTANCE .....                                                                      | 31        |
| 7.7 LIMITED WARRANTY .....                                                                          | 31        |
| 7.7.1 Warranty Repairs .....                                                                        | 31        |

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# 1. INTRODUCTION

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Thank you for purchasing an AEMC® Instruments **Micro-Ohmmeter Model 6240**.

For best results from your instrument and for your safety, read the enclosed operating instructions carefully and comply with the precautions for use. Only qualified and trained operators should use this product.

## 1.1 INTERNATIONAL ELECTRICAL SYMBOLS

|                                                                                   |                                                                                                                                                             |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Signifies that the instrument is protected by double or reinforced insulation.                                                                              |
|  | Indicates a risk of electric shock. The voltage at the parts marked with this symbol may be dangerous.                                                      |
|  | <b>CAUTION - Risk of Danger!</b> Indicates a <b>WARNING</b> . Whenever this symbol is present, the operator must refer to the user manual before operation. |
|  | Battery                                                                                                                                                     |
|  | Indicates Important information to acknowledge                                                                                                              |
|  | This product complies with the Low Voltage & Electromagnetic Compatibility European directives.                                                             |

## 1.2 DEFINITION OF MEASUREMENT CATEGORIES (CAT)

- CAT IV:** Corresponds to measurements performed at primary electrical supply (< 1000 V).  
*Example: primary overcurrent protection devices, ripple control units, and meters.*
- CAT III:** Corresponds to measurements performed in the building installation at the distribution level.  
*Example: hardwired equipment in fixed installation and circuit breakers.*
- CAT II:** Corresponds to measurements performed on circuits directly connected to the electrical distribution system.  
*Example: measurements on household appliances and portable tools.*

## 1.3 PRECAUTIONS FOR USE

Refer to the following warnings to ensure personnel safety and proper instrument operation.

Failure to observe the safety instructions may result in electric shock, fire, explosion, and destruction of the instrument and of the installations.

- This instrument is protected from accidental voltages of not more than 50 V with respect to earth in measurement CAT 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 (50 V 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.

## 1.4 BATTERY HANDLING

Your instrument is equipped with a NiMH battery. This technology offers several advantages:

- Long battery charge life for a limited volume and weight.
- Possibility of quickly charging your battery.
- Significantly reduced memory effect: you can charge your battery even if it is not fully discharged.
- Respect for the environment: no pollutant materials such as lead or cadmium, in compliance with the applicable regulations.

After prolonged storage, the battery may be completely discharged. If so, it must be completely charged. Full charging of a completely discharged battery may take several hours.



**NOTE:** The instrument cannot be used while the battery is charging.

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**NOTE:** At least 5 charge/discharge cycles will be necessary for your battery to recover 95 % of its capacity.

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To maximize battery life:

- Only charge your instrument at temperatures between (32 and 104) °F (0 and 40) °C.
- Comply with the conditions of use defined in this user manual.
- Comply with the storage conditions specified in this user manual.

NiMH technology allows a limited number of charge/discharge cycles depending significantly on:

- The conditions of use.
- The charging conditions.

See § 7.4 for battery replacement instructions.

## 1.5 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.



**WARNING:** Charge the instrument fully before use.

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1.6 ORDERING INFORMATION

Micro-Ohmmeter Model 6240 ..... Cat. #2129.80

*Includes extra-large tool bag, set of two 10 ft Kelvin clips (10 A - Hippo), set of two 10 ft Kelvin Probes (1 A - Spring Loaded), optical USB cable, US 115 V power cord, two spare fuses (12.5 A), NiMH rechargeable battery pack, and USB thumb drive supplied with user manual and DataView® software.*

1.6.1 Accessories

|                                                               |               |
|---------------------------------------------------------------|---------------|
| Kelvin Clips 20 ft (6 m) 10 A-Hippo.....                      | Cat. #2118.70 |
| Kelvin Probes 20 ft (6 m) 1 A Spring Loaded.....              | Cat. #2118.74 |
| Kelvin Probes 10 ft (3 m) 10 A Spring Loaded.....             | Cat. #2118.77 |
| Kelvin Probes 20 ft (6 m) 10 A Spring Loaded.....             | Cat. #2118.78 |
| Kelvin Clips 10 ft (3 m) 1-10 A.....                          | Cat. #2118.79 |
| Kelvin Clips 20 ft (6 m) 1-10 A.....                          | Cat. #2118.80 |
| Kelvin Probes Pistol Grip 10 ft (3 m) 25 A Spring Loaded..... | Cat. #2118.84 |
| Kelvin Probes Pistol Grip 20 ft (6 m) 25 A Spring Loaded..... | Cat. #2118.85 |
| Thermo-Hygrometer Model CA846 .....                           | Cat. #2121.24 |
| Inverter – 12 VDC to 120 VAC 200 W for Vehicle Use .....      | Cat. #2135.43 |

1.6.2 Replacement Parts

|                                                                                      |               |
|--------------------------------------------------------------------------------------|---------------|
| Kelvin Clips 10 ft (3 m) 10 A-Hippo.....                                             | Cat. #1017.84 |
| Kelvin Probes 10 ft (3 m) 1 A Spring Loaded.....                                     | Cat. #2118.73 |
| Battery Pack - Replacement NiMH 6 V 9000 mAh for<br>Models 6240, 6250 and 6255 ..... | Cat. #2129.91 |
| Extra-large Classic Tool Bag .....                                                   | Cat. #2133.73 |
| Fuse, set of 5, 12.5 A/500 V (Fast Blow), 6.3 x 32 mm .....                          | Cat. #2129.92 |
| Cable - Optical USB Cable .....                                                      | Cat. #2135.41 |
| 115 V Power Cord .....                                                               | Cat. #5000.14 |

**Order Accessories and Replacement Parts Directly Online**  
Check our Storefront at [www.aemc.com/store](http://www.aemc.com/store) for availability

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## 2. FEATURES

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### 2.1 DESCRIPTION

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

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 charger (110/220 V).

The large, easy-to-read liquid crystal display is 2.25 x 4.00 in. 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 10 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 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 400  $\Omega$
- Test current selection from 10 mA to 10 A
- 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 charges the batteries by connecting to the AC line (110 to 230 V, 50/60 Hz) 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

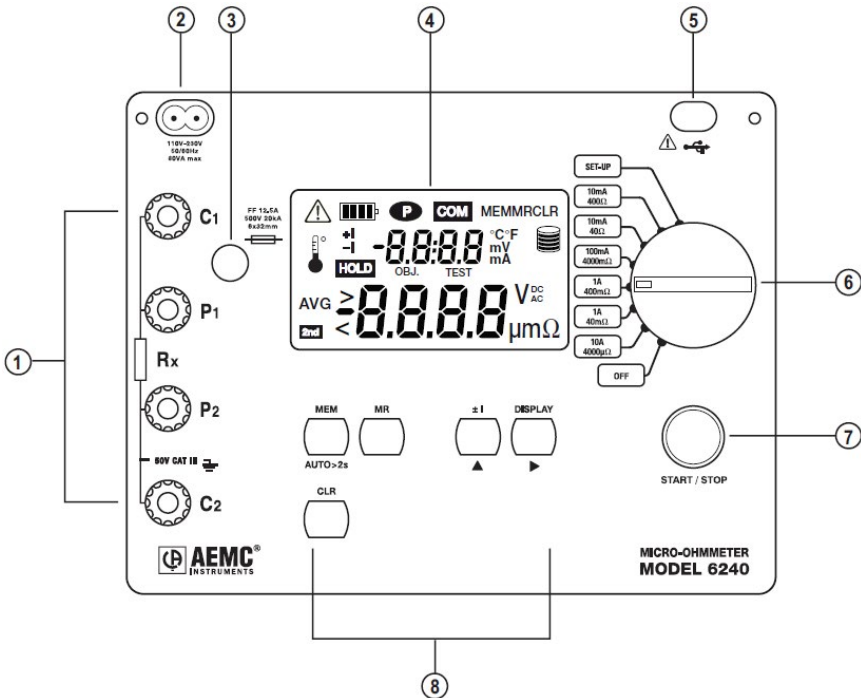


Figure 2-1

|   |                                                             |
|---|-------------------------------------------------------------|
| 1 | Kelvin input terminals                                      |
| 2 | AC line recharging receptacle                               |
| 3 | Output fuse - 12.5 A, 500 V, 6 x 32 mm                      |
| 4 | Large multi-line backlit liquid crystal display (see § 2.6) |
| 5 | Optical interface connector for connection to a PC          |
| 6 | Range selection switch                                      |
| 7 | Start/Stop button                                           |
| 8 | Program/Function buttons (see § 2.5)                        |

## 2.5 BUTTON FUNCTIONS

|                   |                                                                                                                                                                                                                                                                   |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>MEM</b>        | Stores the measurement at an address identified by an object number (OBJ) and a test number (TEST).<br>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. |
| <b>MR</b>         | 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.                                                                                     |
| <b>± I</b>        | Reverses the direction of the current and displays the average.                                                                                                                                                                                                   |
| <b>DISPLAY</b>    | Displays the current or voltage on the terminals.                                                                                                                                                                                                                 |
| <b>AUTO&gt;2s</b> | Activates automatic recordings.                                                                                                                                                                                                                                   |
| <b>▲</b>          | Used in the SET-UP and memory mode, selects a function or increments a flashing parameter.                                                                                                                                                                        |
| <b>►</b>          | Used in the SET-UP and memory mode, accesses the function to be modified.                                                                                                                                                                                         |
| <b>CLR</b>        | 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 and are described below.

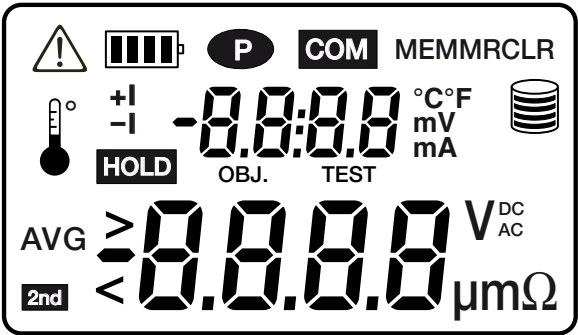


Figure 2-2

|  |                                                                       |
|--|-----------------------------------------------------------------------|
|  | 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                                                              |
|  | Indicates an overrange                                                |

## 3. SPECIFICATIONS

### 3.1 ELECTRICAL

Specifications are given for an ambient temperature of  $23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ , 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 39.99) $\text{m}\Omega$ | (40.0 to 399.9) $\text{m}\Omega$ | (400 to 3999) $\text{m}\Omega$ | (4.0 to 39.99) $\Omega$      | (40.0 to 399.9) $\Omega$ |
| Resolution          | 1 $\mu\Omega$                    | 10 $\mu\Omega$                  | 100 $\mu\Omega$                  | 1 $\text{m}\Omega$             | 10 $\text{m}\Omega$          | 100 $\text{m}\Omega$     |
| Accuracy            | $\pm 0.25\ \% \pm 2\ \text{cts}$ |                                 |                                  |                                |                              |                          |
| Measurement Current | 10.2 A<br>$\pm 2\ \%^{(1)}$      | 1.02 A<br>$\pm 2\ \%$           |                                  | 102 mA<br>$\pm 2\ \%$          | 10.2 mA<br>$\pm 2\ \%^{(2)}$ |                          |
| Open Voltage        | (4 to 6) V                       |                                 |                                  |                                |                              |                          |
| Inductance          | 0.5H Max                         |                                 |                                  |                                |                              |                          |

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

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

| VOLTAGE MEASUREMENT INDICATION |                             |                            |                             |                   |                 |
|--------------------------------|-----------------------------|----------------------------|-----------------------------|-------------------|-----------------|
| Measurement Range              | (0.01 to 3.999) $\text{mV}$ | (4.0 to 39.99) $\text{mV}$ | (40.0 to 399.9) $\text{mV}$ | (0.40 to 3.999) V | (4.0 to 4.70) V |
| Resolution                     | 1 $\mu\text{V}$             | 10 $\mu\text{V}$           | 100 $\mu\text{V}$           | 1 $\text{mV}$     | 10 $\text{mV}$  |

| CURRENT MEASUREMENT INDICATION |                            |                             |                   |                  |
|--------------------------------|----------------------------|-----------------------------|-------------------|------------------|
| Measurement Range              | (5.0 to 39.99) $\text{mA}$ | (40.0 to 399.9) $\text{mA}$ | (0.40 to 3.999) A | (4.0 to 11.00) A |
| Resolution                     | 10 $\mu\text{A}$           | 100 $\mu\text{A}$           | 1 $\text{mA}$     | 10 $\text{mA}$   |

#### Influences on the Resistance Measurement

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

\*Example: If the measured resistance is 1  $\text{m}\Omega$  and the measurement current is 10 A, an alternating voltage of 1  $\text{mV}_{\text{RMS}}$  in series with the resistance to be measured will induce an error of not more than 2 %

**Power Source:**

Rechargeable 6 V, 8.5 A·h NiMH battery pack, built-in (90 to 256) V  
(45 to 420) Hz charger

**Battery Life:** Range dependent

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

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

**3.2 MECHANICAL**

**Dimensions:** (10.70 x 9.76 x 7.17) in (272 x 248 x 182) mm

**Weight:** 10 lbs (approximately 4.5 kg)

**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:** <2000 m



**WARNING:** For long-term storage (>1 y) 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 mo) 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, 50 V with respect to earth, 500 V differential between terminals, and 300 V 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

*NOTE: Specifications are subject to change without notice*

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## 4. OPERATION

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**WARNING:** Charge the instrument fully before use.

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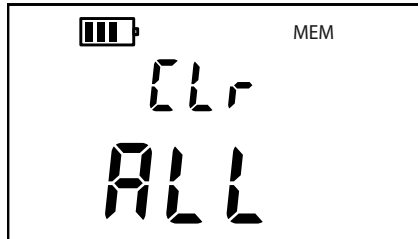
### 4.1 PRECAUTIONS FOR USE

- 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
  - Automatic Power Off
  - Display of the Internal Parameters (e.g. serial number, software version, date of last calibration, lighting of all segments on display)



**NOTE:** The **Date** can only be adjusted from the Control Panel software.

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- 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

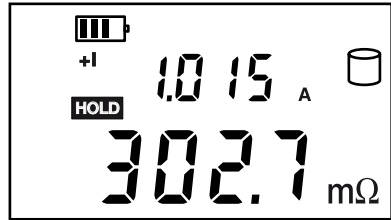
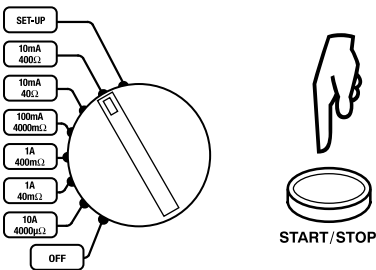


**WARNING:** Before performing the resistance test, verify that the sample under test is not energized.

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 (400  $\Omega$ ) 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.

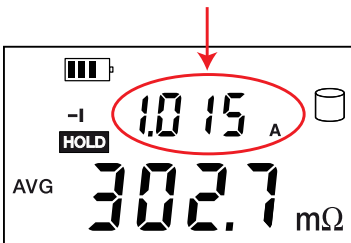


5. Press the **START/STOP** button again to stop the measurement or disconnect one of the Kelvin clips. The last measurement made is displayed along with the **HOLD** symbol.

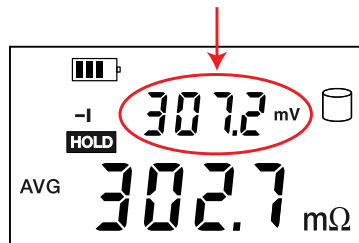
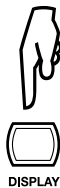


**NOTE:** If the measurement was stopped by disconnecting a Kelvin clip, simply connect it to another object to start the next measurement; it is not necessary to press the **START/STOP** button.

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



Current results are displayed  
before pressing DISPLAY button



Voltage results are displayed  
after pressing DISPLAY button

### 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.

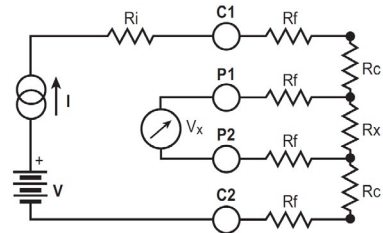
### 4.3.2 Connections and Readings

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 6) V.

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

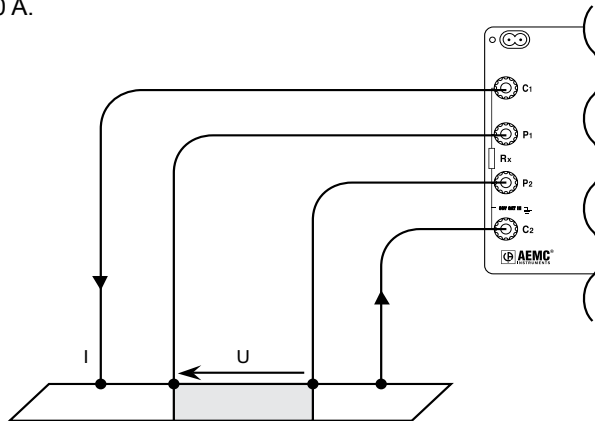
$R_c$  = Contact resistance

$R_x$  = 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.

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 10 mA to 10 A.



## 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

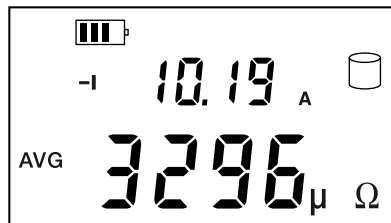
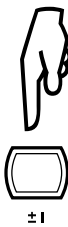
When measuring very low resistive values in the  $\mu\Omega$  range, the presence of stray DC currents may affect the accuracy of the measurements. These currents can be present due to a variety of reasons including chemical or thermal EMF in samples made of dissimilar metals.

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.

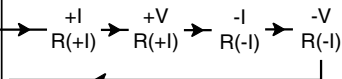
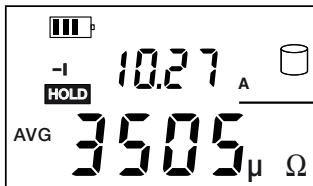
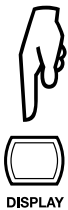
The presence of AC interference in the sample under test may cause the measured value on the display to fluctuate. This interference may become more noticeable in the presence of strong electric fields. The effects of this interference may be reduced by twisting the leads around each other.

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

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



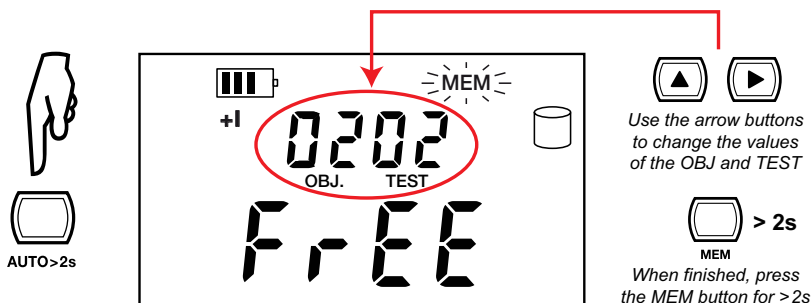
2. To display the values  $R(+I)$  and  $R(-I)$ , press the **DISPLAY** button.



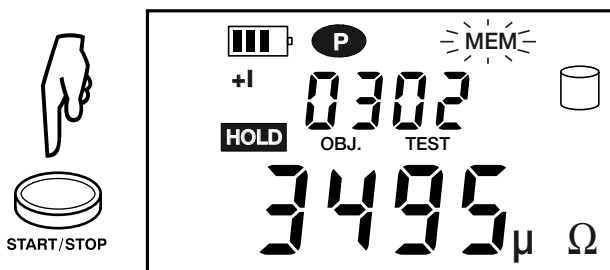
Press the **DISPLAY** button to cycle through the values

## 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.

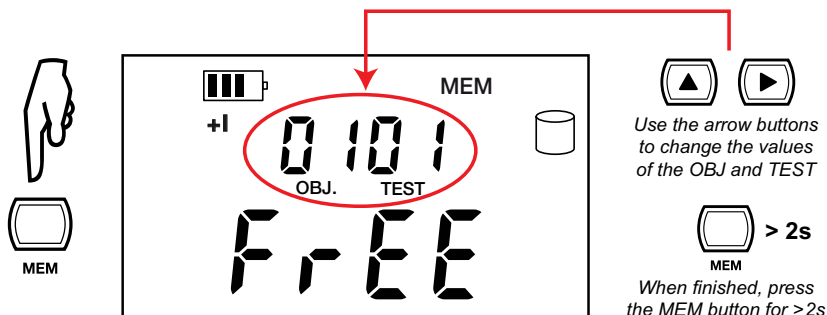


## 4.7 STORING RESULTS INTO MEMORY

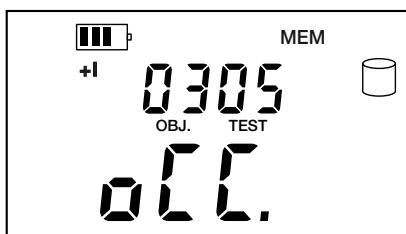
Data storage is organized into objects (**OBJ**), each of which can contain several tests (**TEST**). **OBJ** corresponds to the object tested and each test corresponds to a measurement made on the object. The instrument can store 99 measurements.

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**.

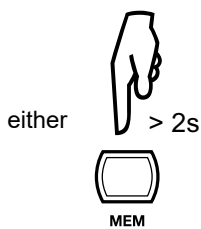
- Use the  button to switch between the **OBJ** and **TEST** option, then use the  button to change the number of the test or object.
- When finished, press the **MEM** button for >2s. The measurement is stored.



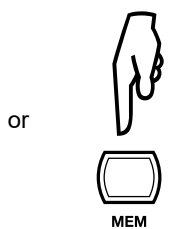
- If the user selects a memory address that is already occupied, **oLL** appears on the main screen. To overwrite the location, press the **MEM** button for >2s.



*Indicates address is already occupied*

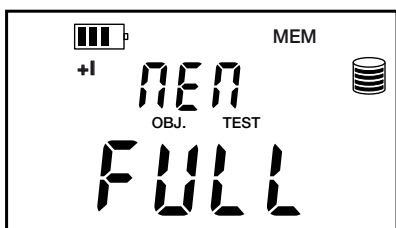


*Over-  
writes the  
Memory*

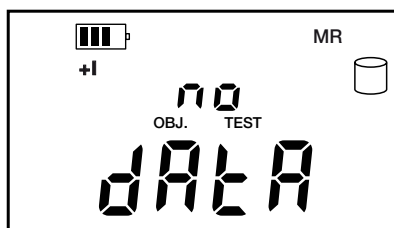


*Exits  
without  
Recording*

Display shown if memory is **full**:

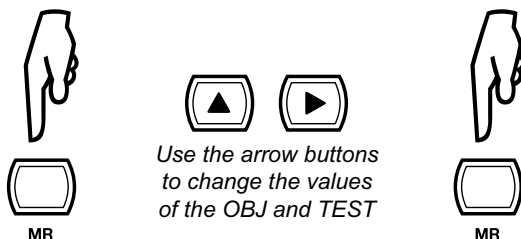


Display shown if memory is **empty**:



## 4.8 RECALLING RESULTS FROM MEMORY

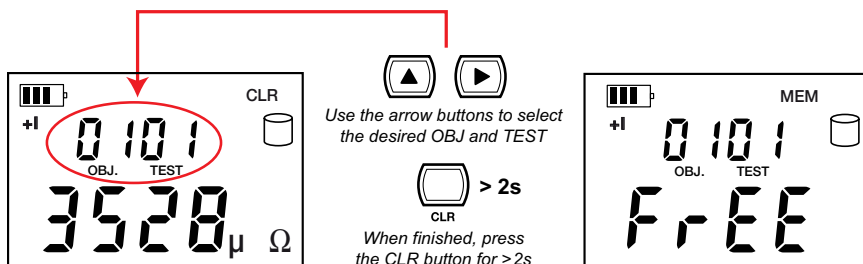
1. Make sure there is no measurement in progress.
2. Press the **MR** button.
3. Use the  and  buttons to select the desired **OBJ** and **TEST**.
4. Press the **MR** button again to exit the memory function.



## 4.9 ERASING MEASUREMENTS FROM MEMORY

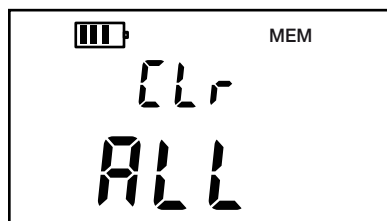
### 4.9.1 Erasing Selected Measurements

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 Selected 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.

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## 5. DATAVIEW® SOFTWARE

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### 5.1 INSTALLING DATAVIEW®



**WARNING:** Do not connect the instrument to the computer before installing the software and drivers.

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



**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.

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DataView® software with the Micro-Ohmmeter Control Panel allows you to:

- Connect the instrument to a computer
- Configure and schedule a recording session on the instrument
- Download recorded data from the instrument to the computer
- Generate reports from downloaded data
- View instrument measurements in real time on the computer

To install DataView on a computer:

1. Insert the USB drive that comes with the instrument into a USB port on your computer.
2. 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**.
3. When the DataView folder is open, double-click the file **Setup.exe** in the root directory.
4. The Setup screen appears. This enables you to select the language version of the setup program. You can also select additional install options (each option is explained in the Description field). Make your selections and click **Install**.
5. Click **OK** to confirm setup. The InstallShield Wizard screen appears. This program leads you through the DataView install process. As you complete these screens, be sure to check **Micro-Ohmmeters** when prompted to select features to install.
6. When the InstallShield Wizard finishes installing DataView, the Setup screen appears. Click **Exit** to close. The DataView folder appears on your computer desktop.
7. Open the DataView folder on your desktop. This displays a list of icons for the Control Panel(s) installed with DataView.

## 5.2 MICRO-OHMMETER CONTROL PANEL

Clicking the **DataView** icon in the DataView folder on your desktop opens the core DataView program. Clicking the **Micro-Ohmmeter Control Panel** icon  opens the Micro-Ohmmeter Control Panel.

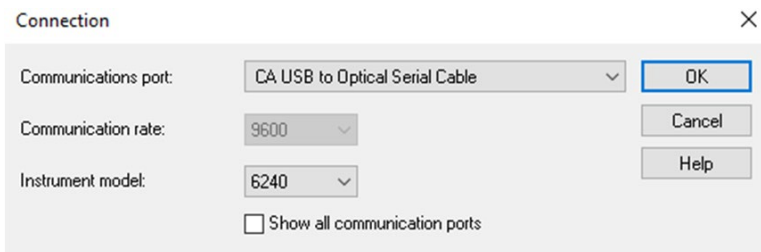
In general, core DataView features are for creating, viewing, editing, and storing DataView reports; while the Control Panel is for connecting to, configuring, viewing measurements on, and downloading data from the instrument.

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, such as when viewing multiple archived reports from different AEMC® Instruments product families.

## 5.3 CONNECTING THE INSTRUMENT

To connect the instrument to the PC, select **Connect** from the Instrument menu. Alternatively, you can connect the instrument by clicking the **Connect icon**  in the toolbar. Either action displays the Connection Dialog Box. This dialog box allows you to specify the serial port and communication rate to be used to access the instrument.

- **Communication Port:** The USB port through which the PC will communicate with the instrument. Select the desired serial port by selecting it from the Communications port drop-down list. If your computer's Device Manager indicates the instrument is connected but it is not listed in the Communications port field, make note of the communications port through which the instrument is connected. Then select the **Show all communication ports** check box in the Connection Dialog Box. This displays a drop-down list of all available communications ports in the Communications port field. Select the port through which the instrument is connected.
- **Communication Rate:** The serial transfer rate for communicating with the instrument. The **Model 6240** defaults to communication rate **9600**.
- **Instrument Model:** The type of micro-ohmmeter instrument with which your PC is communicating. After you make your selections, click **OK** to make the connection or **Cancel** to exit the dialog without establishing communication.



Connection

Communications port: CA USB to Optical Serial Cable

Communication rate: 9600

Instrument model: 6240

☐ Show all communication ports

OK Cancel Help

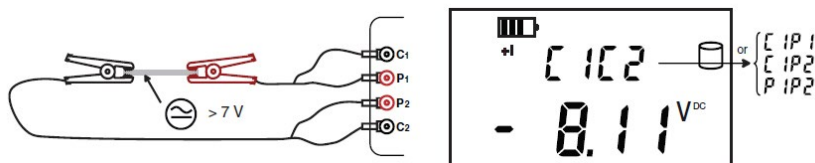
For further information about using the Micro-Ohmmeter Control Panel, consult the Help system that comes with the product. Access Help by clicking the option **Help** in the Control Panel's menu bar at the top of the screen.

## 6. TROUBLESHOOTING

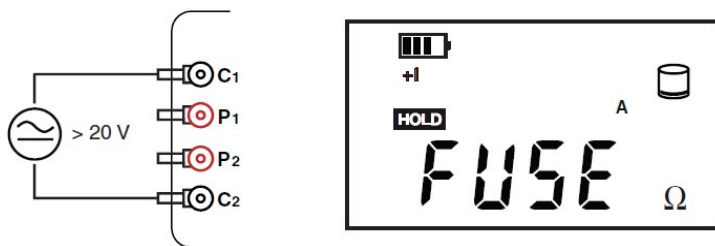
### 6.1 ERROR MESSAGES

#### 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.

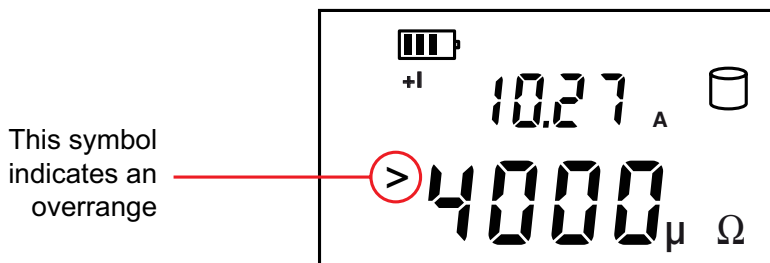


A voltage greater than 20 V applied across the C1-C2 terminal will cause the Fuse on the front panel to blow. (See § 7.4 for fuse replacement).



#### 6.1.2 Overrange

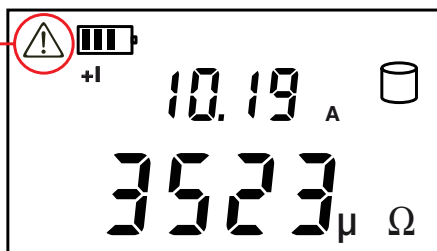
The > symbol indicates an overrange condition. Switch to a higher measurement range and restart the measurement until the > symbol no longer appears.



### 6.1.3 Noisy Measurement

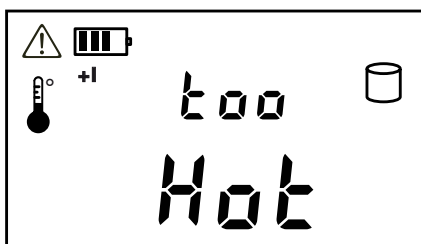
The  symbol indicates noise in the measurement. The measurement accuracy is not guaranteed.

This symbol indicates noisy measurement



### 6.1.4 Overheating

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



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## 7. MAINTENANCE

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Use only factory specified replacement parts. AEMC® Instruments 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 allow 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, charge the battery.
- We recommend charging the micro-ohmmeter every month to ensure a full battery charge when used.
- When replacing the fuse, install only a direct replacement fuse.

### 7.2 CLEANING



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**WARNING: Disconnect the instrument from any source of electricity.**

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- 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 THE BATTERY

#### AC POWER SELECTION

The Model 6240 may be recharged from (110 to 230) V<sub>AC</sub> (50/60 Hz). The instrument includes a 110 V 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 h for a completely discharged battery.
- If the battery symbol shows as an empty cell, the battery needs to be charged.



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**NOTE:** For models built before January 2021, the battery will only charge in **OFF** mode.

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- 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 110 V<sub>AC</sub> using the power cord provided (charging starts automatically if the instrument is in the OFF mode).



**WARNING: Measurement can be obtained while the power cord is connected, however 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)                             |
|--------------------------|------------------------------------------------|
|                          | $C > 87.5 \%$                                  |
|                          | $87.5 \% > C > 62.5 \%$                        |
|                          | $62.5 \% > C > 37.5 \%$                        |
|                          | $37.5 \% > C > 12.5 \%$                        |
|                          | $12.5 \% > C$                                  |
| Blinking                 | $C = 0$<br>(battery Indicator not initialized) |
| Automatic Shutdown       | $C = 0$                                        |

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

## 7.4 BATTERY AND FUSE REPLACEMENT



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



**WARNING:** Replacing the battery causes data loss from memory.

### BATTERY

- The battery should only be replaced by a qualified technician or sent back to AEMC® Instruments for replacement and standard calibration. See the Repair and Calibration section (§ 7.5) for return instructions.
- The battery is accessible using a Phillips Head screwdriver to remove the four screws located on the bottom 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 6.3 x 32 mm, fast acting, 12.5 A/500 V, low internal resistance, protecting the current source from outside voltages on energized specimens.

## 7.5 REPAIR AND CALIBRATION

To ensure that your instrument meets factory specifications, we recommend that it be sent 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#). Send an email to [repair@aemc.com](mailto:repair@aemc.com) requesting a CSA#, you will be provided a CSA Form and other required paperwork along with the next steps to complete the request. Then return the instrument along with the signed CSA Form. 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).

**Ship To:** Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments

15 Faraday Drive • Dover, NH 03820 USA

Phone: (800) 945-2362 (Ext. 360) / (603) 749-6434 (Ext. 360)

Fax: (603) 742-2346

E-mail: [repair@aemc.com](mailto:repair@aemc.com)

### (Or contact your authorized distributor.)

Contact us for the costs for repair, standard calibration, and calibration traceable to N.I.S.T.



**NOTE:** You must obtain a CSA# before returning any instrument.

## 7.6 TECHNICAL ASSISTANCE

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

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments

Phone: (800) 343-1391 (Ext. 351)

Fax: (603) 742-2346

E-mail: [techsupport@aemc.com](mailto:techsupport@aemc.com) • [www.aemc.com](http://www.aemc.com)

## 7.7 LIMITED WARRANTY

The instrument 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.

**Full warranty coverage and product registration is available on our website at [www.aemc.com/warranty.html](http://www.aemc.com/warranty.html).**

**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 repair or replace the faulty material at our discretion.

**REGISTER ONLINE AT: [www.aemc.com/warranty.html](http://www.aemc.com/warranty.html)**

### 7.7.1 Warranty Repairs

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

First, send an email to [repair@aemc.com](mailto:repair@aemc.com) requesting a Customer Service Authorization Number (CSA#) from our Service Department. You will be provided a CSA Form and other required paperwork along with the next steps to complete the request. Then return the instrument along with the signed CSA Form. Please write the CSA# on the outside of the shipping container. Return the instrument, postage or shipment prepaid to:

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments

15 Faraday Drive, Dover, NH 03820 USA

Phone: (800) 945-2362 (Ext. 360) • (603) 749-6434 (Ext. 360)

Fax: (603) 742-2346

E-mail: [repair@aemc.com](mailto:repair@aemc.com)

**Caution: To protect yourself against in-transit loss, we recommend that you insure your returned material.**



**NOTE:** You must obtain a CSA# before returning any instrument.



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**AEMC® Instruments**  
15 Faraday Drive • Dover, NH 03820 USA  
Phone: +1 (603) 749-6434 • +1 (800) 343-1391 • Fax: +1 (603) 742-2346  
**www.aemc.com**

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