User Manual
ENGLISH

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

# Megohmmeter
# Model 6505


## MEGOHMMETERS

Measure Up
WITH AEMC® INSTRUMENTS

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# Statement of Compliance

Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments certifies that this instrument has been calibrated using standards and instruments traceable to international standards.

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.

**Serial #:** _____

**Catalog #:** **2130.18**

**Model #:** **6505**

Please fill in the appropriate date as indicated:

Date Received: _____

Date Calibration Due: _____

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

Chauvin Arnoux®, Inc.
d.b.a AEMC® Instruments
**www.aemc.com**

# TABLE OF CONTENTS

# 1. INTRODUCTION

Thank you for purchasing an AEMC® Instruments **Megohmmeter Model 6505**.

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. |
|  | **CAUTION - Risk of Danger!** Indicates a **WARNING**. Whenever this symbol is present, the operator must refer to the user manual before operation. |
|  | Indicates a risk of electric shock. The voltage at the parts marked with this symbol may be dangerous. |
|  | Battery |
|  | Fuse |
|  | USB socket |
|  | Indicates Important information to acknowledge |
|  | This product complies with the Low Voltage & Electromagnetic Compatibility European directives (73/23/CEE & 89/336/CEE). |
|  | In the European Union, this product is subject to a separate collection system for recycling electrical and electronic components in accordance with directive WEEE 2012/19/EU. |

## 1.2 DEFINITION OF MEASUREMENT CATEGORIES (CAT)

**CAT IV:** Corresponds to measurements performed at the 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 ⚠

This instrument is protected against accidental voltages of not more than 1000 V with respect to earth in measurement CAT III. The protection provided by the instrument may be compromised if used in unapproved, unspecified by the manufacturer, or improper ways.

- Make no measurements on conductors likely to be connected to a live source.
- Comply with the rated voltage, maximum current, and measurement category.
- Never exceed the protection limits indicated in the specifications.
- Comply with the conditions for use: temperature, humidity, altitude, degree of pollution, and place of use.
- Do not use the instrument or its accessories if they seem damaged.
- Use only the accessories delivered with the unit compliant with safety standards (IEC/EN 61010-2-031 or BS EN 61010-2-031).
- Respect the value and type of the fuse (see § 5.2) to avoid damaging the instrument and voiding the warranty.
- Set the switch to OFF when the instrument is not in use.
- Repairs and calibration checks must be carried out by approved and qualified personnel.
- Wear the appropriate protective gear (insulated boots & gloves).

## 1.4 RECEIVING YOUR SHIPMENT

Upon receiving your shipment, make sure that the contents are consistent with the ordering information. 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 with a detailed description of any damage. Save the damaged packing container to substantiate your claim.

## 1.5 ORDERING INFORMATION

**Megohmmeter Model 6505..... Cat. #2130.18**

*Includes extra-large tool bag, set of three color-coded 10 ft leads with clips [5000 V] (red, blue, black), one blue guard terminal jumper lead, fuse 0.1 A 380 V, rechargeable battery pack (installed), US 115 V power cord, and user manual.*

### 1.5.1 Accessories

Lead – Set of three, 25 ft (5 kV) Safety with Clips..... **Cat. #2151.32**

Megohmmeter Calibration Checker..... **Cat. #5000.66**

### 1.5.2 Replacement Parts

Fuse – Set of three, 0.1 A, 380 V, 5 x 20, 10 kA.....**Cat. #2119.84**

Extra Large Tool Bag..... **Cat. #2133.73**

Lead – Replacement set of three, 10 ft (5 kV) Color-coded Safety with Clips (JUMPER LEAD NOT INCLUDED)..... **Cat. #2151.30**

Lead – Replacement 1 ft Jumper Lead ..... **Cat. #2151.31**

Lead – Set of three, 45 ft, Color-coded 5 kV Safety with Clips..... **Cat. #2151.33**

9.6 V rechargeable NiMH battery pack..... **Cat. #2960.21**

Power Cord 115 V US Plug ..... **Cat. #5000.14**

**Order Accessories and Replacement Parts Directly Online**

Check our Storefront at www.aemc.com/store for availability

# 2. PRODUCT FEATURES

## 2.1 DESCRIPTION

The **Megohmmeter Model 6505** is a portable instrument housed in a rugged field case and operates on battery or line power. It performs voltage, insulation, and capacitance measurements. This instrument contributes to the safety of electrical installations and equipment.

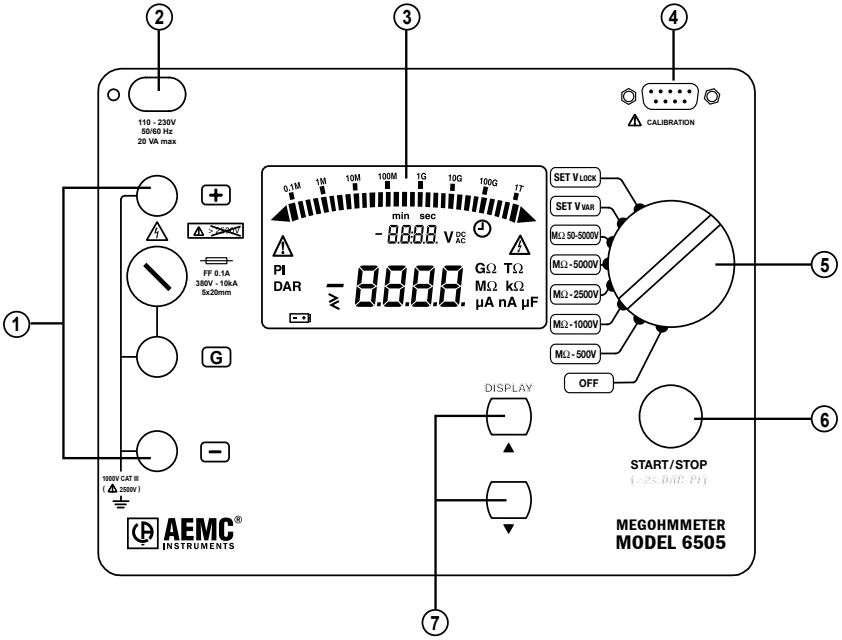
Features include automatic calculation and presentation of the Dielectric Absorption Ratio (DAR) and Polarization Index (PI). The Model 6505 displays the test voltage, insulation resistance, and leakage current during the test. Capacitance of the sample and discharge voltage present at the test leads is displayed at the test's conclusion.

The Model 6505 is designed with the highest level of built-in safety features. This meter incorporates test inhibit capabilities that will not allow test voltages to be generated if a live sample is detected. The test terminals are recessed to ensure operating safety.

### Features:

- Test voltage combination of 500 V, 1000 V, 2500 V, and 5000 V.
- Insulation measurements from 30 kΩ to 10 TΩ.
- Adjustable and programmable test voltage (40 to 5100) V.
- Automatic calculation of DAR and PI values.
- Direct measurement and display of capacitance and leakage current.
- Display of resistance, test voltage, and run time.
- Programmable test run times and PI ratio times.
- Automatic test inhibition if live sample > 40 % of test voltage.
- Automatic discharge and display of discharge voltage.
- Large dual-display with time, voltage, and measurements.
- Rugged, dual-wall weatherproof field case.
- Designed and built to IEC safety standards.
- EN 61010-1, 1000 V CAT III.

## 2.2 CONTROL FEATURES




| Item | Description |
|---|---|
| 1 | Access to the protective fuse and connection terminals **+**, **G**, and **-**. |
| 2 | AC power plug (direct operation on AC and battery recharge). |
| 3 | Back-lit crystal display (see § 2.5). |
| 4 | Serial interface male plug (9-pin) for calibration only. |
| 5 | Rotary selector switch with 8 positions (see § 2.3). |
| 6 | START/STOP button. |
| 7 | Two function buttons (see § 2.4). |

## 2.3 SWITCH FUNCTIONS

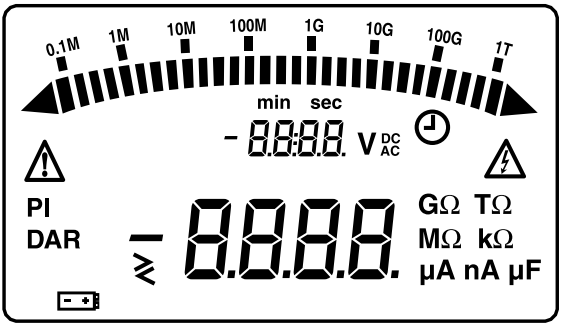
| Range | Function |
|---|---|
| OFF | Instrument powered down. |
| MΩ - 500 V | Insulation measurement at 500 V, up to 2 TΩ. |
| MΩ - 1000 V | Insulation measurement at 1000 V, up to 4 TΩ. |
| MΩ - 2500 V | Insulation measurement at 2500 V, up to 10 TΩ. |
| MΩ - 5000 V | Insulation measurement at 5000 V, up to 10 TΩ. |
| MΩ - 50-5000 V | Insulation measurement with variable test voltage. |
| SETV$_{VAR}$ | Sets the user definable test voltage for the variable (50 to 5000) V position |
| SETV$_{LOCK}$ | Sets the user definable maximum test voltage output regardless of the insulation measurement positions |

## 2.4 BUTTON FUNCTIONS

| Range | Function |
|---|---|
| ON/OFF | This button is pressed to start and then stop the measurement. A long press starts the measurement of the DAR and PI. |
| DISPLAY | Before, during, or after the measurement, pressing this key displays the various measurement parameters. |
| ▲ | This function is available only in the **SET** position of the switch. Increases the flashing parameter being displayed. Used to navigate the list of interval insulation measurements in the R(t) function. |
| ▼ | This function is available only in the **SET** position of the switch. Decreases the flashing parameter being displayed. Used to navigate the list of interval insulation measurements in the R(t) function. |

**NOTE:** If you hold down the ▲ or ▼ buttons, the movement speed between parameters will increase.

## 2.5 DISPLAY




### 2.5.1 Digital Display

#### Main Display

Indicates:

- Value of insulation measurement (resistance, DAR and PI, or capacitance).

#### Small Display

Indicates:

- Voltage measured or applied by the instrument.
- Elapsed time or the output voltage during insulation measurement.

### 2.5.2 Bargraph Display

Indicates:

- Active during insulation measurement (0.1 MΩ to 1 TΩ).
- Battery charge at start-up.

### 2.5.3 Display Symbols

| | |
|---|---|
|  | Dangerous voltage generated; V > 120 V. |
|  | External voltage present, symbol is activated after pressing **START** if V > 25 $V_{AC}$ ± 3 V or > 35 $V_{DC}$. |
|  | Indicates the duration of the measurement or the time remaining in the case of PI measurement. |
|  | Indicates the battery is low and must be recharged (§ 5.1). |

# 3. OPERATION

**NOTE:** Charge the instrument fully before use (see § 5.1).

## 3.1 SERIAL NUMBER

To view the serial number of the instrument, keep the **DISPLAY** button pressed and turn the switch to the **MΩ-500 V** position.

## 3.2 SOFTWARE VERSION

To view the internal software version of the instrument, keep the **DISPLAY** button pressed and turn the switch to the **MΩ-1000 V** position.

**NOTE:** Technical documentation on Understanding Insulation Resistance Testing is available at www.aemc.com/understanding-irt.

## 3.3 VOLTAGE MEASUREMENT

As soon as the switch is set to an insulation measurement position, the instrument automatically measures the presence of any AC/DC voltage. This voltage is measured at all times and indicated on the small display unit.

The instrument automatically determines AC or DC. The AC measurement is an RMS value.

If an excessively high external voltage is present on the terminals (> 0.4 Vn), pressing the **START/STOP** button will have no effect, and no measurements will be made. Similarly, if an excessively high erroneous voltage (> 0.4 Vn) is detected during the measurement, the measurement will automatically stop.

## 3.4 INSULATION MEASUREMENT

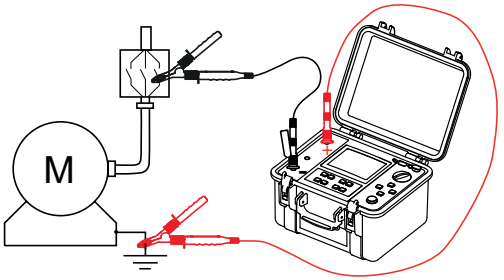
Depending on the type of measurement, there are three ways to connect the instrument.

In all cases, disconnect the device to be tested from the source.

**Weak Insulation**

Connect the red high-voltage lead between earth and the **+** terminal of the instrument.

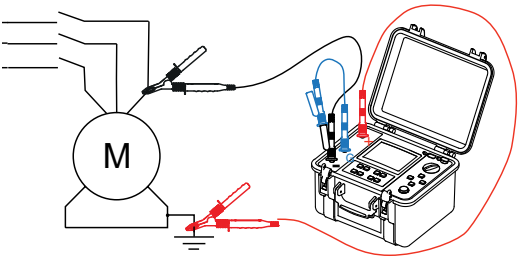
Connect the black high-voltage lead between one phase of the motor and the **-** terminal of the instrument.




**Strong Insulation**

For a very high insulation value, connect the small blue high-voltage lead between the rear earth pick-up jack of the black lead and the **G** terminal of the instrument.

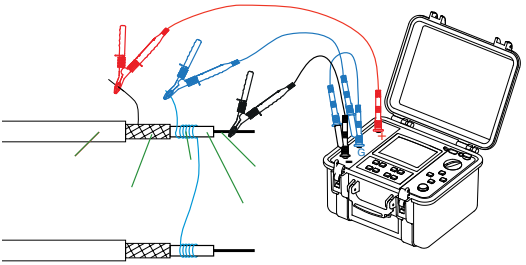
This serves to reduce any external influence and obtain a more stable measurement.




**Cable**

Connect the red high-voltage lead between the braid and the **+** terminal of the instrument.

Connect the black high-voltage lead between the core and the **-** terminal of the instrument.



Connect the blue high-voltage lead between the insulation and the **G** terminal of the instrument.

The guard serves to eliminate the effect of surface leakage currents.

Once the connections have been made, choose the desired test voltage on the rotary switch.

When powered up, the instrument displays the following:

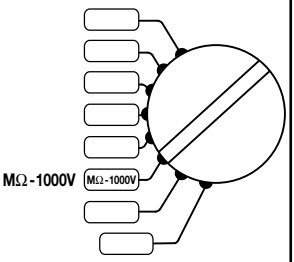
- Condition of the battery.
- Test voltage.
- Voltage present on the object to be tested.

- Press the **START/STOP** button to start the measurement.
- During measurements, the instrument will beep every 10 seconds to alert the user that a high voltage is present.
- Press the **START/STOP** button again to stop the measurement. The instrument will continue to measure external voltages, but the test result will remain displayed on the main display unit.

**WARNING:** To ensure your safety, the instrument will automatically discharge the circuit under test, allow for the voltage displayed to fall back below 25 V before disconnecting the leads.

| **Press the DISPLAY button to display:** | |
|---|---|
| **Before the measurement (2 Presses)** | ■ Voltage present on the device to be tested.<br>■ Test voltage.<br>■ Surface leakage current. |
| **During the measurement (2 Presses)** | ■ Test voltage.<br>■ Instantaneous insulation resistance value.<br>■ Duration of the measurement.<br>■ Current flowing in the resistance being measured. |
| **After the measurement (5 Presses)** | ■ Voltage present on the device tested.<br>■ Insulation resistance value just before the measurement was stopped.<br>■ Duration of the measurement.<br>■ Test voltage generated during the measurement.<br>■ Current that flowed in the resistance measured.<br>■ Surface leakage current.<br>■ Capacitance. |

## 3.5 PI MEASUREMENT




- Set the switch to one of the insulation measurement positions.
- Start the measurement with a long press (> 2 s) on the **START/STOP** button. The long press will be acknowledged by an audible beep.
- The measurement starts the default duration of 10 min. A countdown will display the time remaining. The measurement will stop automatically.

| Press the DISPLAY button to display: | |
|---|---|
| **Before the measurement (2 Presses)** | ■ Voltage present on the device to be tested.<br>■ Test voltage.<br>■ Leakage current present. |
| **During the measurement (4 Presses)** | ■ Measurement time remaining.<br>■ Instantaneous insulation resistance value.<br>■ Test voltage.<br>■ Current flowing through the resistance being measured.<br>■ Value of PI (available at the end of 10 min).<br>■ Value of DAR (available at the end of one min). |
| **After the measurement (6 Presses)** | ■ Test voltage generated during the measurement.<br>■ PI and DAR.<br>■ Duration of the measurement.<br>■ Insulation resistance value just before the measurement was stopped.<br>■ Current that flowed in the resistance measured.<br>■ Voltage present on the device being tested.<br>■ Capacitance.<br>■ Surface leakage current. |

**The values of PI and DAR are calculated as follows:**

PI = R 10 min / R 1 min (2 values to be recorded during a measurement lasting 10 min).*

DAR = R 1 min / R 30 s (2 values to be recorded during a measurement lasting 1 min).

**For the calculation of the PI, the times of 1 and 10 min can be modified by the user, if required, for a particular application. See § 3.5.1.*

They are especially useful for monitoring insulation deterioration of revolving machines or very long cables.

On items of this type, the measurement is initially disturbed by spurious currents (capacitive charging current, dielectric absorption current) that gradually cancel out. To measure the leakage current representative of the insulation accurately, measurements with long durations are necessary.

The quality of the insulation is a function of the results found.

| DAR | PI | Condition of the Insulation |
|---|---|---|
| < 1.25 | < 1 | Inadequate, even dangerous. |
| | < 2 | |
| > 1.6 | < 4 | Good. |
| > 1.6 | > 4 | Excellent. |

### 3.5.1 Adjustments of the PI

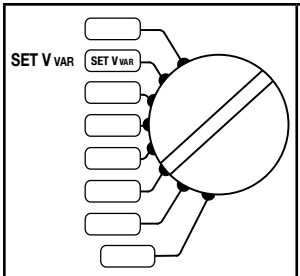
It is possible to modify the PI times to meet specific needs.

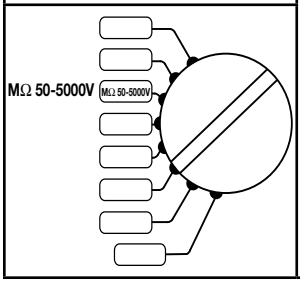
Reminder: PI = R 10 min / R 1 min

The first PI time is 1 min. It can be set to values from 30 s to 30 min in 30 s steps.

- Press and hold the **DISPLAY** button. Turn the rotary switch to the **SET VVAR** position. Hold the **DISPLAY** button until **PI_1** appears in the display.
- You can change the first PI time (PI_1) using the ▲ and ▼ buttons.
- To save changes, simply turn the switch.
- The second PI time (PI_2) is 10 min. It can be set to values from PI_1 up to 59 min in 1 min steps.
- Press and hold the **DISPLAY** button. Then, turn the rotary switch to the **SET VLOCK** position.
- You can modify the second PI time using the ▲ and ▼ buttons.
- To save changes, simply turn the switch.

## 3.6 ADJUSTMENT OF THE VARIABLE TEST VOLTAGE



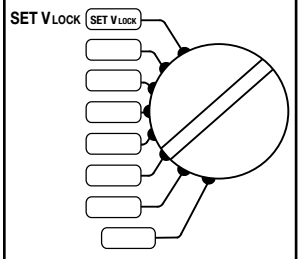




This function makes it possible to use test voltages other than the 4 preset values of (500, 1000, 2500 and 5000) V.

- Set the switch to **SET VVAR**.
- The test voltage will flash.
- Change the test voltage using the ▲ and ▼ buttons.
- Set the switch to **MΩ 50-5000 V** to make the measurement.
- This value will be retained in a non-volatile memory.

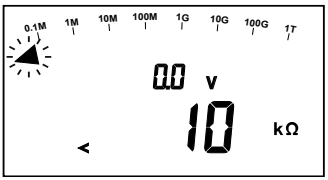
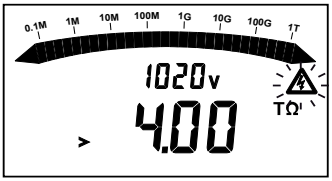
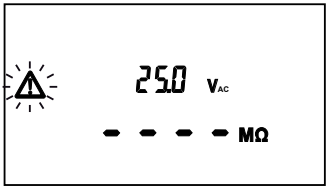
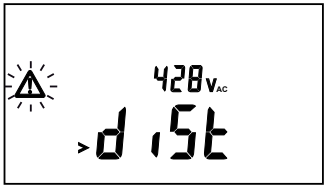
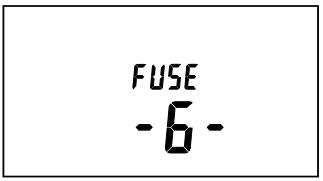
## 3.7 ADJUSTMENT OF THE MAXIMUM TEST VOLTAGE

The user can set a maximum generated voltage to prevent any accidental over-voltage tests from being conducted in error.




- Set the switch to **SET VLOCK**.
- The maximum test voltage will flash and can be adjusted using the ▲ and ▼ buttons.
- Turn the switch to an insulation measurement setting to make measurements.
- The maximum test voltage value will be retained in a non-volatile memory. It will be displayed for a few seconds when an affected range is selected (e.g. if the maximum voltage is 750 V, it will be applied and displayed on all switch settings from 1000 V up).

## 3.8 ERROR MESSAGES

| | |
|---|---|
|  | ■ The insulation resistance is too low.<br>■ Check your connections. The **+** and **-** terminal of the instrument may be short-circuited. |
|  | ■ The insulation resistance is outside the measurement range.<br>■ Check your connections. One of the terminals of the instrument may be disconnected, or the value measured is > 4 TΩ. |
|  | ■ The voltage present on the terminals is greater than 25 VAC or 35 Vpeak.<br>■ The instrument will alert you but does not prevent making the measurement. |
|  | ■ The voltage present on the terminals is too high for a measurement to be made:<br>peak V > 0.4 Vn.<br>The test voltage, Vn, is indicated by the setting of the switch.<br>■ Eliminate the voltage and restart the measurement. |
|  | ■ Indicates that the protective fuse of the **G** terminal is defective.<br>■ Replace the fuse as indicated in § 5.2. |

# 4. SPECIFICATIONS

## 4.1 REFERENCE CONDITIONS

| Influence Quantity | Reference Values |
|---|---|
| Temperature | 23 °C ± 3 °C |
| Relative humidity | (45 to 55) % RH |
| Supply voltage | (9 to 12) V |
| Frequency range | DC and (15.3 to 65) Hz |
| Capacity in parallel on resistor | 0 µF |
| Electrical field | nil |
| Magnetic field | < 40 A/m |

## 4.2 VOLTAGE

| Measurement Range | (1.0 to 99.9) V | (100 to 999) V | (1000 to 2500) V | (2501 to 5100) V |
|---|---|---|---|---|
| Frequency Range* | DC and (15 to 65) Hz | | (15 to 65) Hz | **DC** |
| Resolution | 0.1 V | 1 V | 1 V | 1 V |
| Accuracy | 1 % of Reading ± 5 cts | 1 % of Reading ± 1 ct | | |
| Input Impedance | 750 kΩ at 3 MΩ depending on measurement voltage | | | |

**Over 500 Hz, the small display will indicate* `----`*, and the main display will give an assessment of the measured voltage's peak value only.*

## 4.3 INSULATION RESISTANCE

**Method:** Voltage-current method according to EN 61557-2 (ed. 02/97)

**Nominal Output Voltage:**
500, 1000, 2500, 5000 VDC (or adjustable from 40 V to 5100 V)

**Adjustments Available in Variable Mode:**
10 V from (40 to 1000) V
100 V from (1000 to 5100) V

**Nominal Current:** > 1 mADC

**Short-circuit Current:** < 1.6 mA ± 5 %

**Load Current:** 3 mAD C approx when starting measurement

**Max. Acceptable Voltage:** Upeak = 0.4 Vn

| Test Voltage | 500 V - 1000 V - 2500 V - 5000 V | | | |
|---|---|---|---|---|
| Range | (10 to 999) kΩ<br>(1.000 to 3.999) MΩ | (4.00 to 39.99) MΩ | (40.0 to 399.9) MΩ | (0.400 to 3.999) GΩ |
| Resolution | 1 kΩ | 10 kΩ | 100 kΩ | 1 MΩ |
| Accuracy | ± 5 % of Reading + 3 cts | | | |

| Test Voltage | 500 V - 1000 V - 2500 V - 5000 V | | | 1000 V<br>2500 V<br>5000 V | 2500 V<br>5000 V |
|---|---|---|---|---|---|
| Range | (4.00 to 39.99) GΩ | (40.0 to 399.9) GΩ | (0.400 to 1.999) TΩ | (2.000 to 3.999) TΩ | (4.00 to 9.99) TΩ |
| Resolution | 10 MΩ | 100 MΩ | 1 GΩ | | 10 GΩ |
| Accuracy | ± 5 % of Reading + 3 cts | | ± 15 % of Reading + 10 cts | | |

### 4.3.1 Accuracy in Variable Mode

R measured = Vn / 250 pA

| Test Voltage | (40 to 160) V | (170 to 510) V | (520 to 1500) V | (1600 to 5100) V |
|---|---|---|---|---|
| R measured min | 10 kΩ | 10 kΩ | 10 kΩ | 10 kΩ |
| R measured max | (160.0 to 640.0) GΩ | 640.0 GΩ to 2.040 TΩ | (2.080 to 6.000) TΩ | (6.400 to 10.00) TΩ |

To obtain the accuracy in variable voltage mode, calculate using the fixed voltages above.

### 4.3.2 Measurement of the Test Voltage after a Capacitive Insulation Measurement

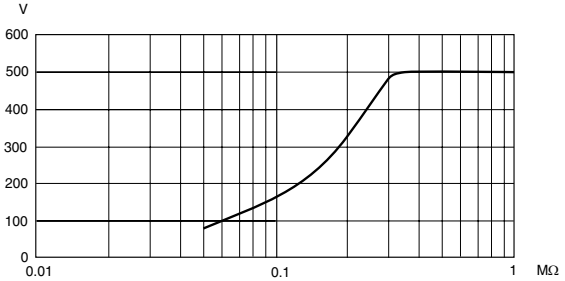
| Measurement Range | 25 to 5000 V |
|---|---|
| Resolution | 0.2 % Vn or 1 ct |
| Accuracy | 5 % of Reading ± 3 cts |

### 4.3.3 Calculation of Terms DAR and PI

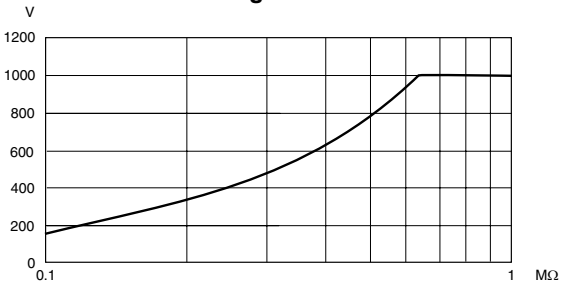
| Specified Range | 0.02 to 50.00 |
|---|---|
| Resolution | 0.01 |
| Accuracy | 5 % of Reading ± 1 ct |

## 4.3.4 Typical Change Curve for Test Voltages according to Load

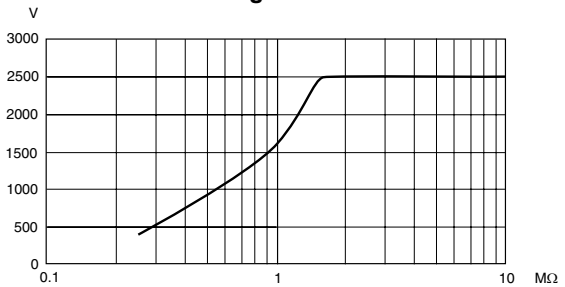
**Range 500 V**



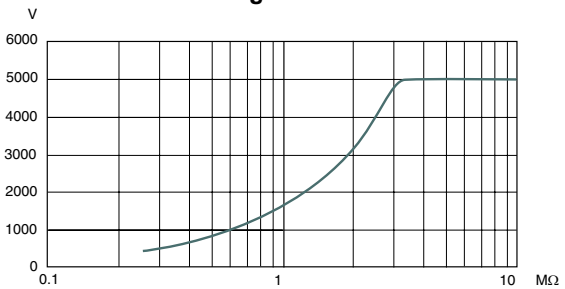

**Range 1000 V**




**Range 2500 V**




**Range 5000 V**



## 4.4 CAPACITANCE

This measurement is made at the end of each insulation measurement while the circuit is being discharged.

| Measurement Range | (0.001 to 9.999) µF | (10.00 to 49.99) µF |
|---|---|---|
| Resolution | 1 nF | 10 nF |
| Accuracy | 10 % of Reading ± 1 ct | 10 % |

## 4.5 POWER SUPPLY

- 9.6 V rechargeable NiMH battery pack.
- Line Voltage: (85 to 256) V / 50-60 Hz.

**Minimum Battery Charge Life** (per NF EN 61557-2)

| Test Voltage | Nominal Charge | Number of Measurements 5 s on nominal charge (with 25 s pause between each measurement) |
|---|---|---|
| 500 V | 500 kΩ | 6500 |
| 1000 V | 1 MΩ | 5500 |
| 2500 V | 2.5 MΩ | 4000 |
| 5000 V | 5 MΩ | 1500 |

**Average Battery Life:** The operating time will be 15 days or 3 weeks based on a 10 min PI measurement.

**Recharge Time:**
Charging must be completed between (68 and 86) °F (20 and 30) °C
6 h for 100 % capacity (10 h if the battery is completely drained)
0.5 h for 10 % capacity (charge life: approximately 2 days)

**NOTE:** It is possible to recharge the batteries while performing insulation measurements provided that the values measured are higher than 20 MΩ. In this case, the recharging time is higher than 6 h and depends on the frequency of the measurements.

## 4.6 ENVIRONMENTAL SPECIFICATIONS

**Operating Range:**
(14 to 104) °F (-10 to 40) °C during recharging of batteries
(14 to 131) °F (-10 to 55) °C during measurement
(10 to 80) % RH

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

**Altitude:** < 2000 m

Use indoors or outdoors

## 4.7 MECHANICAL SPECIFICATIONS

**Case Dimensions:**
(10.63 x 9.84 x 7.09) in (270 x 250 x 180) mm

**Weight:** 9.5 lbs (4.3 kg) approx.

**Mechanical Protection**
IP 53 per NF EN 60529 (Ed. 92)
IK 04 per NF EN 50102 (Ed. 95)

## 4.8 SAFETY SPECIFICATIONS

Electrical safety as per: IEC/EN 61010-2-030 or BS EN 61010-2-030, IEC 61557

1000 V CAT III, Pollution Degree 2

**Electromagnetic Compatibility:**
NF EN 61326-1 (Ed. 97) + A1, industrial environment category

## 4.9 VARIATIONS IN OPERATING RANGE

| Influential Quantity | Range of Influence | Quantity Influenced* | Influence | |
|---|---|---|---|---|
| | | | Typical | Max. |
| Battery Voltage | (9 to 12) V | V<br>MΩ | <1 ct<br><1 ct | 2 cts<br>3 cts |
| Temperature | (-10 to +55) °C | V<br>MΩ | 0.15 % R/10 °C<br>0.20 % R | 0.3 % R ± 1 ct<br>1 % R ± 1 ct |
| Humidity | (10 to 80) % RH | V<br>MΩ (10 kΩ to 40 GΩ)<br>MΩ (40 GΩ to 10 TΩ) | 0.2 % R<br>0.2 % R<br>0.3 % R | 1 % R ± 2 cts<br>1 % R ± 5 cts<br>15 % R ± 5 cts |
| Frequency | (15 to 100) Hz | V | | 0.3 % R ± 1 ct |
| | (100 to 500) Hz | V | | 6 % R ± 15 cts |
| AC voltage superimposed on test voltage | (0 to 20) % Vn | MΩ | 0.1 % R / % Vn | 0.1 % R / % Vn ± 5 cts |

**The terms DAR, PI, DD and the capacity and current leak measurements are included in the quantity **MΩ**.*

# 5. MAINTENANCE

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

## 5.1 RECHARGING THE BATTERY

If the  symbol is displayed, the battery needs to be recharged.

Connect the instrument to the 115 VAC power cord via the connector (charging will start automatically).

- **bAt** on the small display and **chrG** on the main display signifies fast charging in progress.
- **bAt** on the small display and **chrG** flashing on the main display signifies slow charging.
- **bAt** on the small display and **FULL** on the main display signifies that charging is complete.

If the instrument is started up and the battery voltage is >8 V, then the normal use of the device is permitted.

**NOTE:** The battery should only be changed by an authorized repair facility recognized by AEMC® Instruments.

## 5.2 FUSE REPLACEMENT

If **FUSE -G-** flashes on the display, the fuse must be replaced. Take all necessary precautions when opening up the instrument.

**WARNING:** Make sure that none of the terminals are connected and that the selector switch is set to OFF.

- The fuse is located on the left side of the faceplate as indicated by the  symbol.
- Using a coin or a flathead screwdriver, unscrew the fuse holder and remove the fuse.
- Only replace with the type of fuse specified on the label inside the unit's cover: 0.1 A - Fast Acting - 380 V, 5 x 20 mm, 10 kA.

**NOTE:** This fuse is in series with a 0.5 A / 3 kV internal fuse active only in case of major fault in the unit. If the display still indicates **FUSE - G -** after changing the fuse, the unit must be returned for servicing.

## 5.3 CLEANING

**WARNING:** Risk of electric shock. Before cleaning, disconnect all inputs.

Use a soft cloth lightly dampened with soapy water. Rinse with a damp cloth and then dry with a dry cloth. Do not use alcohol, solvents, or hydrocarbons.

## 5.4 STORAGE

If the instrument is not used for an extended period, it is recommended to charge the instrument every two or three months.

## 5.5 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 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

**(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.

## 5.6 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:

**Contact:** Chauvin Arnoux®, Inc. d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
Phone: (800) 343-1391 (Ext. 351)
Fax: (603) 742-2346
E-mail: techsupport@aemc.com
www.aemc.com

## 5.7 LIMITED WARRANTY

The instrument is warrantied 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.**

**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**

### 5.7.1 Warranty Repairs

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

First, send an email to 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 pre-paid 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

**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.

CHAUVIN ARNOUX GROUP

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**AEMC® Instruments**
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**www.aemc.com**