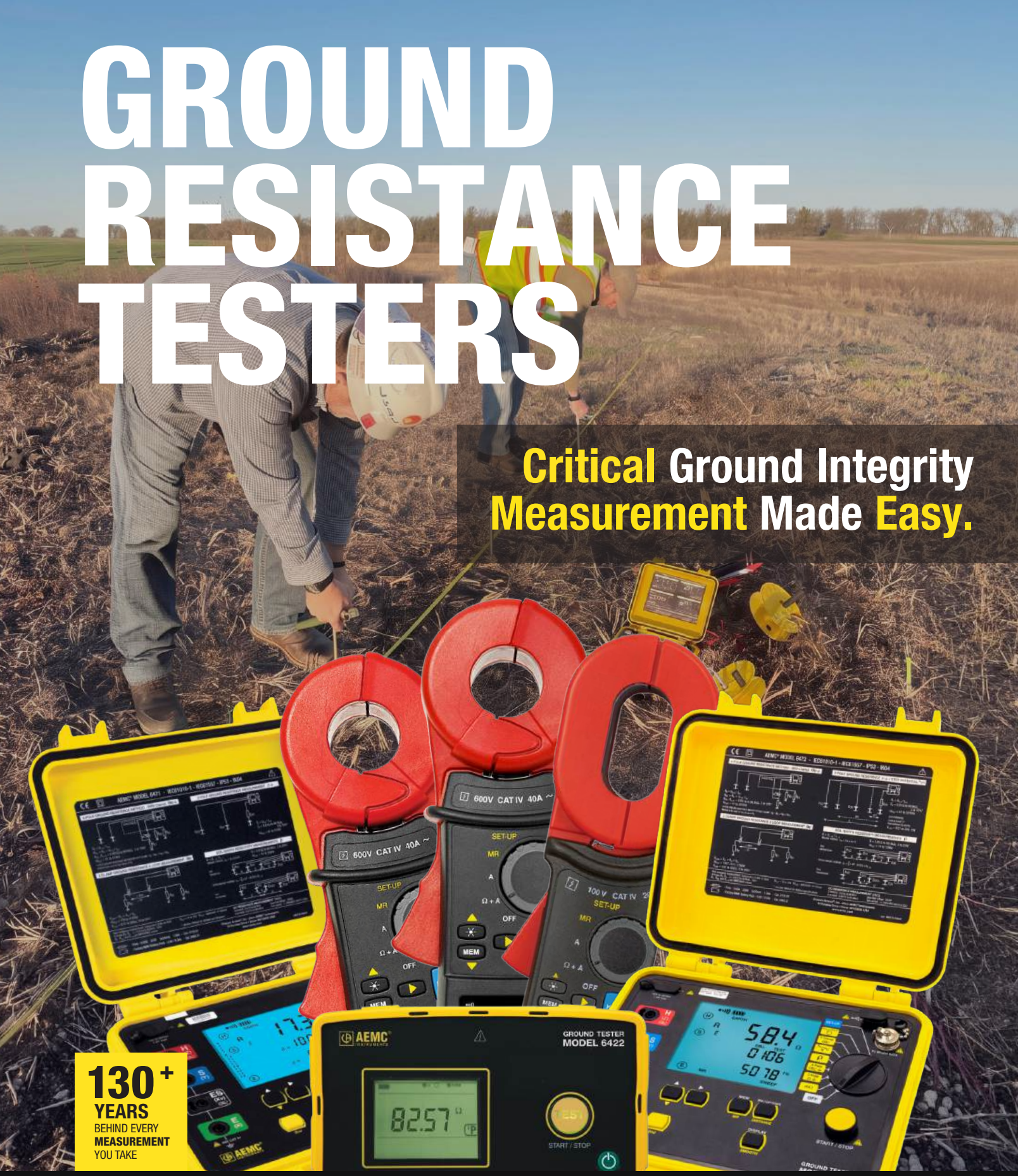
GROUND RESISTANCE TESTERS

Critical Ground Integrity Measurement Made Easy.



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AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP



Understanding Ground Resistance Testing

The term ***ground*** is defined as a conducting connection by which a circuit or equipment is connected to the earth. The connection is used to establish and maintain, as closely as possible, the potential of the earth on the circuit or equipment connected to it. A ***ground*** consists of a grounding electrode, a bonding connector, its grounding electrode(s) and the soil in contact with the electrode.

Grounding Electrode Systems Have Several Protection Applications:

For natural phenomena, such as lightning, grounds are used to discharge current from the system to protect people from possible injury or system components from possible damage.

For faults in electric power systems with ground returns, grounds help ensure rapid operation of the protection relays by providing low resistance fault current paths. This provides for the removal of the potential as quickly as possible. The ground should drain the foreign potential before people are injured and the power or communications system is damaged.

For maintaining a reference potential for instrument safety, protect against static electricity, and limit the system to frame voltage for operator safety, a ground resistance should be zero ohms. In reality, this value is difficult to obtain.

For low ground resistance, it is essential to meet NEC®, OSHA and other electrical safety standards.

APPLICATIONS

- Measure ground rod and grid resistance
- Use in multi-grounded systems without disconnecting the ground under test
- Measure resistance and continuity of ground loops around transformer pads and buildings
- Measure leakage current flowing to ground or circulating in ground loops
- Conduct quick field checks
- Conduct field surveys and retrieve and analyze readings from stored data
- Measure ground resistance of the type of single rod or small ground grids often found in remote telecommunication switching stations
- Measure ground electrode resistance on lightning protection equipment
- Measure the ground electrode resistance of equipment in recreational areas, especially public swimming pools
- Test electrode resistance of installed ground rods and grids at new construction sites before utility power is supplied
- Test the ground electrode resistance of grounded towers and counterpoises at cellular phone remote installations and power transmission towers
- Three- and Four-Point measurement of large grounding grids, counterpoises, ground mats, and grounded equipment
- Locate areas of lowest soil resistivity which is essential for achieving an economical grounding installation

Ground Tester Selection Guide

Ground resistance testers play a vital role in maintaining electrical safety, protecting equipment, and ensuring reliable operation in a wide range of applications and industries. It's important to understand the differences and choose the right test instrument for your application.

TO MEASURE	INSTRUMENT TO USE
Soil Resistivity	4-Point tester
Step and Touch Potential	4-Point tester
Individual Ground Rods	3-Point tester
Ground Resistance testing without the need for auxiliary electrodes or isolating the system under test	Clamp-on tester or instrument using clamp-on features
Bonding Resistance	Micro-Ohmmeter
Point-to-point verification of a conductive path	2-, 3-, 4-Point tester with lead compensation



Micro-Ohmmeter Model 6240 is a low resistance tester designed for both plant maintenance and field use. It's designed to conduct tests on both resistive and inductive material.



Maintenance and inspection activities for infrastructure systems are simplified with ground, bond, and insulation testers.

Clamp-On Ground Resistance Testers



Clamp-On Ground Resistance Testers measure ground rod and grid resistance without the use of auxiliary ground rods. They offer accurate readings from (0.01 to 1500) Ω, as well as ground leakage current from 0.2 mA to 40 A, ***without disconnecting the ground system under test.***

3-Point Ground Resistance Testers

Our new 3-Point Ground Resistance Testers, Models 6422 and 6424, are affordable and feature-rich. Their innovative design simplifies the process and provides reliable results. A single button operation allows users to easily connect, press, and read measurements. The Model 6424 stores and calculates measurements using the simplified 62% test method, displaying average and % deviation for accurate auxiliary electrode spacing determination.



Complete kits available!

4-Point Multifunction Ground Resistance Testers



Our 4-Point Ground Resistance Testers are ideal for both soil resistivity and Fall-of-Potential testing. Models are available as battery powered or with an AC power cord. All models are available in complete kit form which includes leads, auxiliary electrodes, 100 ft tape measure, carrying bag and cable.

Bond Testers



Micro-Ohmmeter Models 6240 and 6255 perform reliable low resistance measurements with test current to 10 A and resolution to 1 µΩ *(Model 6240)*. Both models also use a four-wire Kelvin Bridge method, which eliminates test lead resistance for best measurement accuracy.

Ground Resistance Testers
Models 6416 & 6417

Measure ground resistance without disconnecting or de-energizing the system!

The Ground Resistance Tester **Models 6416 and 6417** measure ground rod and grid resistance without the use of auxiliary rods. Clamp-on ground resistance testers can be used in multi-grounded systems without disconnecting or de-energizing the ground system under test.

The meters simply clamp around the ground conductor or rod and measure the resistance to ground. By performing measurements on intact ground systems, the user also verifies the quality of the grounding connections and bonds. Resistance and continuity of grounding loops around pads and buildings may also be measured.

The Models 6416 and 6417 are equipped with a cutting-edge safety features unique to AEMC® Instruments: test frequency selection and ground voltage indication. The ability to select the test frequency provides more accurate results in inductive environments. The inductance can also be measured and displayed. Displaying voltage derived from current and resistance measurements provides an extra level of safety for the user, indicating a potential dangerous touch condition.

Both models include a current measurement function. The probe's high sensitivity enables measurement of leakage current flowing to ground or circulating in ground loops from 0.2 mA to 40 A and resistances from 0.01 to 1500 Ω.

The Models 6416 and 6417 offer battery life information at power-up and Auto-Off for power management. Additional features are also displayed on the large OLED display to ensure precise measurements. The Buzzer and Auto Power Off features may be disabled from the push-buttons at any time.

Both models also offer an alarm function and a data storage function. In the Alarm mode, the probe will audibly and visually indicate if the reading is beyond the user programmed set point. The user may have the alarm activate above or below the set point. This alarm feature permits quick field checks where only 'pass' or 'fail' readings are required.

Model 6417 is equipped with DataView® that allows you to download, display, and analyze real-time data on your PC. In addition, Model 6417 is available with Android™ application.



MODEL 6417

DataView®

AUTOMATIC REPORT GENERATION

SCAN TO LEARN MORE



Model 6417 is available with an Android™ application for easy configuration, downloading, displaying of real-time data, printing and emailing test results from your mobile device. With its mobile GPS capability, users are able to easily locate the site associated with the measurements.

DOWNLOAD THE APP!

- ***A simple solution to read your measurements***
- ***Results, on the go!***

FEATURES

- Ground voltage is displayed to alert user to potential unsafe conditions
- Large multi-function, bright white organic display (OLED) usable in all lighting conditions
- Display in Standard mode (1 screen) or Advanced mode (3 screens)
- Selectable test frequency improves accuracy in inductive environments
- Differentiates between loop and ground resistance measurements
- Data storage Ω and/or A, with time-stamping – **Model 6416** stores up to 300 measurements and **Model 6417** stores up to 2000 measurements
- Displays stored measurements on the OLED display or by Bluetooth to a PC or the Android™ based mobile application ***(Model 6417)***
- Easy clamp opening by a force compensation trigger system
- Rugged Lexan® head and body construction resists breakage
- Alarm function with adjustable set point and buzzer for quick field checks
- Alarm settings and stored memory information saved during shutdown
- NOISE icon and buzzer alert user to presence of dangerous voltage and current levels
- Large jaw design, 1.38 in (35 mm) accommodating up to 1000 kcmil cables
- Automatic HOLD of measurement when jaw is opened

FUNCTIONAL DISPLAYS *MODELS 6416, 6417 & 6418*



* *Models 6416 & 6417 only*



Measurement Results – Once the measurement has stabilized, the display shows the first screen, which indicates the leakage current and the loop impedance.



Press ▶ to display the second screen, which indicates the contact voltage.



Press ▶ to display the third screen, which indicates the values of R and L. The loop inductance and loop resistance are displayed.

IP 40 | 600 V CAT IV | CE

* Model 6417 only







MODELS 6416 & 6417			
ELECTRICAL			
	Measurement Range	**Resolution**	**Accuracy (% of Reading)**
Ground Resistance Auto-Ranging (0.01 to 1500) Ω	(0.010 to 0.099) Ω	0.001 Ω	±1.5 % ±0.01 Ω
	(0.10 to 0.99) Ω	0.01 Ω	±1.5 % ±0.01 Ω
	(1.0 to 49.9) Ω	0.1 Ω	±1.5 % ±0.1 Ω
	(50.0 to 99.5) Ω	0.5 Ω	±2 % ±0.5 Ω
	(100 to 199) Ω	1 Ω	±3 % ±1 Ω
	(200 to 395) Ω	5 Ω	±5 % ±5 Ω
	(400 to 590) Ω	10 Ω	±10 % ±10 Ω
	(600 to 1150) Ω	50 Ω	20 % approx
	(1200 to 1500) Ω	50 Ω	25 % approx
Current Measurement Auto-Ranging 0.2 mA to 40 A	(0.200 to 0.999) mA	1 µA	±2 % ±50 µA
	(1.000 to 2.990) mA (3.00 to 9.99) mA	10 µA	±2 % ±50 µA
	(10.00 to 29.90) mA (30.0 to 99.9) mA	100 µA	±2 % ±100 µA
	(100.0 to 299.0) mA (0.300 to 0.990) A	1 mA	±2 % ±1 mA
	(1.000 to 2.990) A (3.00 to 39.99) A	10 mA	±2 % ±10 mA
Selectable Measurement Frequency	(50, 60, 128 or 2083) Hz		
Current Measurement Frequency	(47 to 800) Hz		
Ground Voltage Display	(0.1 to 75.0) VAC		
Inductance Measurement	(10 to 500) µH		
Power Source	(4) 1.5 V LR6 (AA) alkaline batteries or (4) NiMH batteries; Battery life: 12 h, or 1440, 30 - s measurements (approx.)		
Data Storage	**Model 6416:** 300 measurements **Model 6417:** 2000 measurements		
Communication	Bluetooth Class 2 - communicates up to 30 ft ***(Model 6417)***		
MECHANICAL			
Dimensions	(2.16 x 3.74 x 10.31) in (55 x 95 x 262) mm		
Weight	2.06 lbs (935 g) approx. with batteries		
Jaw Opening	1.38 in (35 mm) max		
Display	Multi-function, bright white organic display (OLED)		
ENVIRONMENTAL			
Operating Temperature	(-4 to 131) °F (-20 to 55) °C		
Operating Humidity	(10 to 90) % RH		
SAFETY			
Safety Rating	EN 61010-1, 600 V CAT IV		

Consult factory for NIST Calibration prices.

PRODUCT INCLUDES

Model 6416 and 6417: Hard carrying case, calibration loop, (4) 1.5 V AA batteries and a user manual.

Model 6417 also includes: Quick start guide and a USB drive with DataView® software and user manual.

CAT. #	DESCRIPTION
2141.01	Ground Resistance Tester Model 6416 (Clamp-On, Alarm, Memory)
2141.02	Ground Resistance Tester Model 6417 (Clamp-On, Alarm, Memory, DataView® Software)

Ground Resistance Testers
Model 6418

IP 40 | 150 V CAT III | 100 V CAT IV | CE | ⧈

Measure ground impedance on ground rods and bus bars

The Ground Resistance Tester **Model 6418** measures ground rod, busbar, and grid resistance and impedance without the use of auxiliary rods. Clamp-on ground resistance testers can be used in multi-grounded systems without disconnecting or de-energizing the ground system under test. The Model 6418 simply clamps around the grounding electrode or conductor and measures the resistance to ground. By performing measurements on intact ground systems, the user also verifies the quality of the grounding connections and bonds. Resistance and continuity of grounding loops around pads and buildings may also be measured.

FEATURES

- Ground Integrity Measurement
- Large multi-function bright white OLED *(organic LED display)* (1.89 x 1.55) in (48 x 39) mm
- Clamping diameter accommodates both cable and bus bar
- Storage of measurements *(Ω and/or A, with time-stamping)*
- Up to 300 measurements stored
- View stored measurements on the OLED display
- Auto Power OFF function and Auto HOLD function
- Alarm function with adjustable set point and buzzer for quick field checks for amps and ohms
- Rugged Lexan® head and body construction resists breakage
- Alarm settings and stored memory information saved during shutdown
- Noise icon and buzzer alert user to presence of dangerous current levels
- Automatic calibration of the jaw gap at power-up



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MODELS 6418			
ELECTRICAL			
	Measurement Range	**Resolution**	**Accuracy (% of Reading)**
Ground Resistance **Auto Ranging**	(0.010 to 0.099) Ω	0.001 Ω	± 1.5 % ± 0.01 Ω
	(0.10 to 0.99) Ω	0.01 Ω	± 1.5 % ± 0.02 Ω
	(1.0 to 49.9) Ω	0.1 Ω	± 1.5 % ± 0.2 Ω
	(50.0 to 149) Ω	1 Ω	± 2.5 % ± 2 Ω
	(150 to 245) Ω	5 Ω	± 5 % ± 10 Ω
	(250 to 440) Ω	10 Ω	± 10 % ± 20 Ω
	(450 to 640) Ω	10 Ω	± 15 % ± 20 Ω
	(650 to 1200) Ω	50 Ω	± 20 % Reading + 100 Ω
Measurement Frequency	2083 Hz		
Current Measurement **Auto Ranging 1 mA to 20 A**	(0.50 to 9.950) mA	50 µA	± 2 % + 200 µA
	(10.00 to 99.90) mA	100 µA	± 2 % + 100 µA
	(100.0 to 299.0) mA	1 mA	± 2 % ± 1 mA
	(0.300 to 2.990) A	10 mA	± 2 % ± 10 mA
	(3.000 to 20.00) A	100 mA	± 2 % ± 100 mA
Current Measurement Frequency	(47 to 800) Hz		
Current Overload	OL displayed above 19.99 Arms		
Power Supply	(4) 1.5 V LR6 (AA) alkaline batteries or (4) NiMH batteries; Battery life: 12 h, or 1440 30 - s measurements *(approx.)*		

Consult factory for NIST Calibration prices.



PRODUCT INCLUDES

Model 6418: Hard carrying case, 5 Ω calibration loop, (4) 1.5 V AA batteries, wrist strap and a user manual.

CAT. #	DESCRIPTION
2141.03	Ground Resistance Tester Model 6418 (Clamp-On, Alarm, Memory, Oblong Jaws)

Ground Resistance Testers
Models 6422 & 6424

IP 65 | 600 V CAT IV | CE | ▣

To keep your installation safe, measure the resistance of its connection to ground

The Digital Ground Resistance Tester **Models 6422 and 6424** perform 2-pole resistance and 3-pole ground resistance measurements. This direct reading tester is auto-ranging, so it automatically seeks out the optimum measurement range. The large LCD also indicates low battery status and overrange.

Models 6422 and 6424 are ideal for testing commercial, residential and light industrial grounding systems. Their innovative design simplifies the process and provides reliable results eliminating confusion in setting it up correctly. The Model 6424 is capable of storing and calculating the measurements from the simplified test method *(62% test method)* and displaying the average and % deviation which is important in determining correct pole spacing for the test.



Simple to use – as easy as 123!
1. *Connect the leads*
2. *Press to measure*
3. *Read results*

SCAN TO LEARN MORE

FEATURES

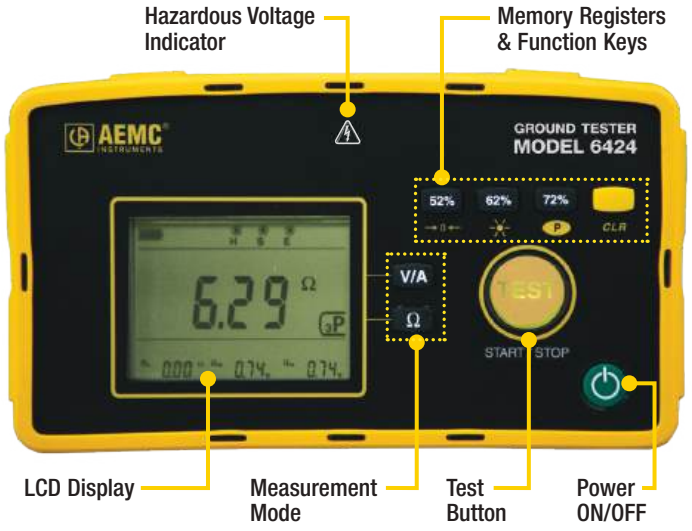
- Simple, one button operation – eliminates errors in testing
- Test button turns green when measurement is stable
- 2P resistance measurement up to 50 kΩ
- 3P ground resistance measurement
  Model 6422: up to 2 kΩ
  Model 6424: up to 50 kΩ for highly resistive terrain
- Large back lit digital display – easier to read in all lighting conditions
- Automatic HOLD function – retains last measurement after the reading stabilizes ensuring the measurement is valid
- Automatic test frequency selection between (128 to 256) Hz, providing stable results in adverse environments
- Powers up in 2 pole mode – automatically checks the injector lead connection when connected to the H auxiliary rod
- Convenient storage of the three measurements along with the average and % deviation – easily determines proper test results
- Built in test lead compensation capability – improves the accuracy of low resistance measurements
- CAT IV 600 V rated for a high level of operator safety
- Checks AC/DC voltage *(Model 6424)*
- Stores (52, 62 and 72) % measurements – eliminates errors in determining the ground resistance *(Model 6424)*
- Leakage current measurement from 0.5 mA to 60 A *(Model 6424)*
- Battery recharging via AC adapter, USB or vehicle DC port *(Model 6424)*
- Color coded leads and terminals provide fast, error-free connection
- Detects the presence of hazardous voltage and prohibits measurement
- Direct access to all functions, even when wearing work gloves
- Rugged water resistance case, for all terrain use
- Built-in display stand to prop up instrument for seeing the display better when placed on the ground

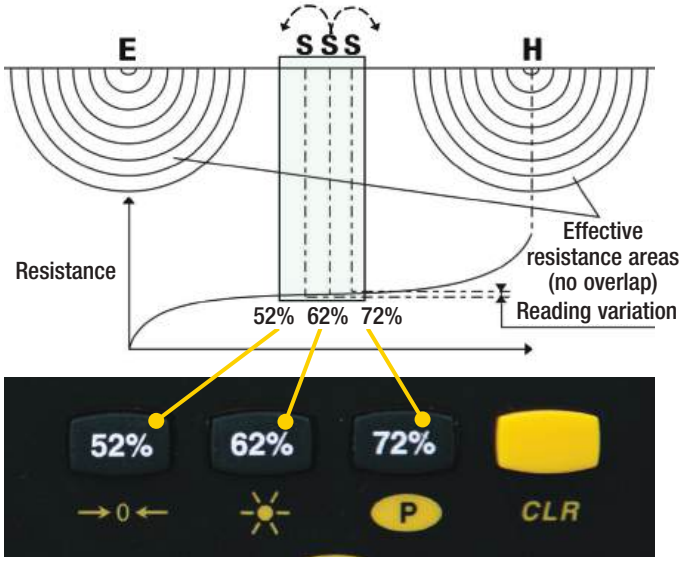


MODELS	6422			6424			
ELECTRICAL							
Voltage							
Range	-			(0.1 to 600) VAC/DC			
Resolution	-			0.1 V			
Accuracy	-			±(1 % R + 1 ct)			
Current							
Range	-			(0.5 to 60.00) AAC *(requires optional MN72 probe)*			
Resistance (2P Mode)							
Measurement Range	(0.05 to 99.99) Ω, (80.0 to 999.9) Ω , (0.800 to 9.999) kΩ, (8.00 to 50.00) kΩ						
Resolution	(0.01, 0.1, 1, and 10) Ω						
Intrinsic Uncertainty	± (2 % R + 10 ct), ± (2 % R + 2 ct), ±(2 % R + 1 ct), ±(2 % R + 1 ct)						
Ground Resistance (3P Mode)							
Measurement Range	(0.50 to 99.99) Ω	(80.0 to 999.9) Ω	(0.800 to 2.000) kΩ	(0.50 to 99.99) Ω	(80.0 to 999.9) Ω	(0.800 to 9.999) kΩ	(8.00 to 50.000) kΩ
Resolution	0.01 Ω	0.1 Ω	1 Ω	0.01 Ω	0.1 Ω	1 Ω	10 Ω
Intrinsic Uncertainty	± (1 % R + 10 ct)	± (1 % R + 2 ct)	± (1 % R + 1 ct)	± (1 % R + 10 ct)	± (1 % R + 2 ct)	± (1 % R + 1 ct)	
Measurement Frequency	(128 or 256) Hz *(automatically selected)*						
No-load Voltage	±10 V peak						
Maximum Test Current	20 mA						
Measurement Mode	One shot or continuous						
Data Storage	-			Stores the (52, 62 and 72) % 3P resistance measurements			
Calculation	-			Calculates average and % deviation of the three saved readings			
MECHANICAL							
Display	Backlit LCD						
Measurement Mode	2P Ω, 3P Ω			V, I, 2P Ω, 3P Ω			
Power Supply	(6) AA Alkaline batteries			(6) NiMH rechargeable batteries, charging time approx. 6 h			
Battery Life	> 2000 x 3P ground measurements at 100 Ω			>1500 x 3P ground measurements at 100 Ω			
Dimensions	(8.78 x 4.96 x 2.75) in (223 x 126 x 70) mm						
SAFETY							
Safety Ratings	EMC: IEC 61326-1; IEC 61010-2-030 / 600 V CAT IV						

Consult factory for NIST Calibration prices.

USER INTERFACE

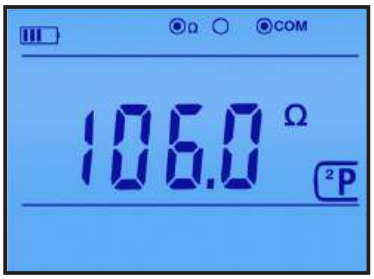




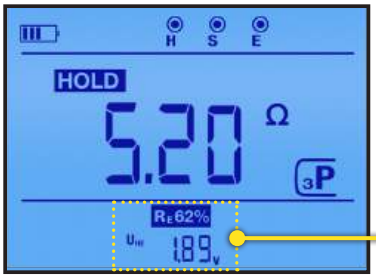
Memory Registers

Complete kits available!
(See page 20)

FUNCTIONAL DISPLAYS



2P mode used for continuity and bonding checks – is active when the instrument is turned on.



3P mode used for measuring the grounding system. The resistance of the injector electrode and the test voltage are also displayed.

Model 6424



Live voltage is displayed when the V/A function is selected and test leads are connected to AC or DC voltage. *(Model 6424)*



Leakage current is displayed when the optional MN72 probe is connected and the V/A function is selected. *(Model 6424)*

PRODUCT INCLUDES

Models 6422 and 6424: (2) 150 ft color-coded leads on spools (red/blue), (1) 30 ft lead (green), (2) T-shaped auxiliary ground electrodes, set of (2) 5 ft colorcoded (red/blue) leads, (1) 100 ft tape measure, (6) AA rechargeable NiMH batteries, carrying bag and user manual.

Model 6424 also includes: USB to wall charger, 5 V, 2 A, USB charger cable.

CAT. #	ORDERING INFORMATION
2135.55	Ground Resistance Tester Model 6422 (Digital, 3-Point)
2135.56	Ground Resistance Tester Model 6422 Kit - 150 ft (Digital, 3-Point)
2135.57	Ground Resistance Tester Model 6424 (Digital, 3-Point)
2135.58	Ground Resistance Tester Model 6424 Kit - 150 ft (Digital, 3-Point)
2135.59	Ground Resistance Tester Model 6424 Kit - 300 ft (Digital, 3-Point)

Ground Resistance Testers
Models 4620 & 4630

Easy-to-use ground resistance and soil resistivity testers that automatically select the optimum resistance range

The Digital Ground Resistance Tester **Models 4620 and 4630** perform both ground resistance and soil resistivity tests. These testers measure from 0 to 2000 Ω, and are auto-ranging, so they automatically seek out the optimum measurement range.

The large LCDs are easy-to-read, and also indicate low battery status, overrange, test lead shorts and lead reversals. The display is backlit for easy readings in all lighting conditions. Three LED indicators on the front panel continuously warn the user of measurement problems to ensure accurate and reliable tests.

The Models 4620 and 4630 are fuse protected up to >250 VAC against accidental connection to live circuits. In the event of a system fault, they can withstand 250 VAC or 100 VDC.

The heavy-duty field case is sealed against dust and water when closed. The meter itself is self-contained within an inner case providing additional environmental and insulation protection *(double wall construction)*. The test button is also sealed against the elements.

The Model 4620 is powered by (8) Alkaline C cell batteries. The Model 4630 is powered by a 9.6 V, 3.5 A·h NiMH rechargeable battery pack. A built-in recharge circuit, powered from (120 to 230) V (50 to 60) Hz line, also provides for testing while recharging.

Both models exceed mechanical and safety specifications for shock, vibration and drop tests called out in IEC standards. They are designed to reject high levels of interference, so they can be used under difficult conditions, such as high stray currents that normally affect accuracy.





Simple to use – as easy as 123!
1. *Connect the leads*
2. *Press to measure*
3. *Read results*

SCAN TO LEARN MORE

APPLICATIONS

- 3-Point measurements of resistance to ground of ground rods and grids. 3-Point measurements are generally used when the electrode or grid can be easily disconnected, if corrosion is suspected, or in circumstances where ground faults are unlikely to occur.
- 4-Point soil resistivity measurements. Locating areas of lowest soil resistivity is essential for achieving an economical grounding installation.
- Touch potential measurements, an alternative to 3-Point tests in evaluating electrical safety. This test is recommended when the ground cannot be disconnected, where ground faults are highly likely to occur, or when the 'footprint' of grounded equipment *(the outline of the part of equipment in contact with the ground)* is comparable to the size of the ground to be tested.

IP 65 cover closed | IP 53 cover open | 30 V CAT III | CE | ⧈

FEATURES

- Ground integrity measurement
- Measures soil resistivity (4-Point)
- Measures ground resistance 2- and 3-Point Fall-of-Potential method
- Step voltage tests and touch potential measurements
- Auto-Ranging: automatically selects the optimum resistance range and test current
- Designed to reject high levels of noise and interference
- Extremely simple to operate: connect / press / read
- LED on faceplate informs operator of high input noise, high auxiliary rod resistance and faulty connections
- Large easy-to-read backlit display
- Battery powered *(Model 4620)*
- AC powered with rechargeable NiMH battery pack *(Model 4630)*
- Rugged dustproof and watertight field case
- Color-coded terminals



MODELS	4620		4630
ELECTRICAL			
Range	20 Ω	200 Ω	2000 Ω
Measurement Range	(0.00 to 19.99) Ω	(20.0 to 199.9) Ω	(200 to 1999) Ω
Resolution	10 mΩ	100 mΩ	1 Ω
Open Voltage	≤ 42 V peak		
Measurement Frequency	128 Hz square wave		
Test Current	10 mA	1 mA	0.1 mA
Accuracy	± 2 % of Reading ± 1 ct		± 5 % of Reading ± 3 cts
Aux Electrode Influence	3 kΩ	30 kΩ	50 kΩ
Max Res. - Current Circuit	50 kΩ		
Max Res. - Voltage Circuit			
Response Time	Approximately four to eight seconds for a stabilized measurement		
Withstanding Voltage	250 VAC or 100 VDC		
Power Supply	(8) C cell batteries *(included)* Alkaline recommended		(120/230) V, (50/60) Hz Rechargeable 9.6 V, 3.5 A·h NiMH battery pack *(included)*
Battery Life	> 2000 15 - s measurements; LO BAT indication on LCD		
Fuse Protection	0.1 A > 250 V , (0.25 x 1.25) in; 30 kA Interrupt Capacity		
MECHANICAL			
Connection	Color-coded terminals accept spade lugs with minimum gap of 6 mm or standard 4 mm banana jacks		
Dimensions	(10.8 x 9.7 x 5.0) in (273 x 247 x 127) mm		
Weight	6.28 lbs (2.85 kg)		7.38 lbs (3.35 kg)
Case	Heavy duty o-ring sealed field case		
Index of Protection	O-ring sealed against dust and water to IP50 when case is closed		
Display Type	3½ digit, 0.71 in (18 mm) high; 2000-counts; electroluminescent blue backlight LCD also indicates overrange, test lead shorts and lead reversals		
LED Indication	Three LEDs indicate high input noise, high auxiliary rod resistance, open leads, blown fuse		
SAFETY			
Safety Rating	EN 61010-1, 30 V CAT III, Pollution Degree 2		

Consult factory for NIST Calibration prices.

PRODUCT INCLUDES

Model 4620: (8) C cell batteries and user manual.

Model 4630: Rechargeable 9.6 V NiMH battery pack, AC power cord, and user manual.

Complete kits available!
(See page 20)

CAT. #	DESCRIPTION
2130.40	Ground Resistance Tester Model 4620 (Digital, 4-Point, Battery Powered)
2130.44	Ground Resistance Tester Model 4630 (Digital, 4-Point, Rechargeable Battery)
2135.19	Ground Resistance Tester Model 4620 Kit – 150 ft
2135.20	Ground Resistance Tester Model 4620 Kit – 300 ft
2135.21	Ground Resistance Tester Model 4620 Kit – 500 ft
2135.22	Ground Resistance Tester Model 4630 Kit – 150 ft
2135.23	Ground Resistance Tester Model 4630 Kit – 300 ft
2135.24	Ground Resistance Tester Model 4630 Kit – 500 ft

Ground Resistance Testers
Models 6471 & 6472



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Test ground resistance without the need of auxiliary rods or test with the 3- and 4-Point methods

The Digital Ground Resistance Tester **Models 6471 and 6472** are portable measurement instruments designed to measure Ground Resistance with 2 clamps *(sold separately),* no auxiliary rods needed, Bond/Connection Resistance (2-Pole and 4-Pole Kelvin sensing), Ground Resistance (3-Pole or 4-Pole), Earth Coupling Resistance, Selective Ground Resistance, and Soil Resistivity (Wenner or Schlumberger method).

Both models measure from 0.01 to 99.99 kΩ and are auto-ranging, automatically seeking out the optimum measurement range, test frequency and test current.

Additional features include a heavy-duty field case sealed against dust and water when closed *(the test button is also sealed against the elements).* Models 6471 and 6472 are rugged, easy-to-use, and ideal for maintenance crews performing numerous tests. It exceeds the IEC standards in mechanical and safety tests for shock, vibration, and drops.



APPLICATIONS

- **Ground Resistance with 2 clamps**
  For systems with parallel ground connections, both models are capable of accurately measuring ground resistance using probes only. This method involves placing 2 probes around the ground conductor to be tested and connecting them each to the instrument. One probe injects a known signal (32 V and 1367 Hz) while the other probe measures the current circulating in the loop. This method saves considerable time because it is no longer necessary to set up auxiliary rods or disconnect the ground connector.
- **Ground Resistance with 3-Point method**
  The 3-Point method is the traditional method using rods to measure the resistance of an existing ground connection.
- **Ground Resistance with 4-Point method**
  The 4-Point measurement method is particularly suitable for measuring very low ground resistance. If there are several resistances connected in parallel, it is possible to use the instrument with a clamp-on ammeter to carry out selective measurements in order to avoid the effect of the parallel ground connections.
- **Earth Coupling Resistance**
  To estimate the reciprocal influence of two normally unrelated ground resistances, calculate the coupling coefficient, which should be as low as possible. The operator takes three successive measurements: two classic ground measurements using the classic 3P – R1 & R2 method, and one ground measurement using the 2P – R1-2 method.
- **Soil Resistivity**
  When it is possible to choose the position of the ground connection, resistivity measurements help evaluate the soil to locate the area with the lowest ground resistance, thus optimizing building costs.

IP 53 cover closed | 50 V CAT IV | CE | ⧈

FEATURES

- Ground Resistance testing using the 2-clamp method *(no auxiliary rods needed)*
- 2- and 4-Point Resistance/Continuity measurement (DC Resistance) with automatic polarity reversal
- 3-Point Fall-of-Potential measurement with manual or automatic frequency selection
- 4-Point Soil Resistivity measurement with automatic calculation of Rho and user selection of the Wenner or Schlumberger test method
- 3-Point Earth Coupling measurement
- Manual and Automatic frequency scan from (41 to 5078) Hz for optimum test accuracy in electrically noisy environments
- Auto Power OFF feature
- Automatic recognition of all electrode connections and their resistance value
- Stores up to 512 complete test results in internal memory
- Display with automatic backlight when entering a function
- Optically isolated USB communication cable included
- Rechargeable NiMH batteries from wall charger or vehicle power *(CAT. #2135.43 needed for vehicle power)*
- Rugged dustproof and water-resistant field case *(IP53 rated in closed position)*
- Compliant with IEC 61557 parts 4 and 5 grounding standards
- Includes DataView® software for set up, data retrieval, real-time display, analysis, report generation and system configuration
- Can also be used for continuity tests on bonding

MODELS	6471	6472
ELECTRICAL		
2-Clamp Measurement		
Range	(0.10 to 500) Ω	
Resolution	(0.01 to 1) Ω	
Measurement Frequency	Auto: 1611 Hz Manual: (128, 1367, 1611, or 1758) Hz	
3-Point Measurement		
Range (Auto-Ranging)	0.09 Ω to 99.9 kΩ	
Resolution	(0.01 to 100) Ω	
Test Voltage	Nominal (16 or 32) Vrms user selectable	Nominal (10, 16, 32 or 60) Vrms user selectable
Resistance Measurement Frequency	(41 to 513) Hz automatic or user selectable	(41 to 5078) Hz automatic or user selectable
Test Current	Up to 250 mA	
Accuracy	± 2 % of Reading + 1 ct @ 128 Hz	
Soil Resistivity 4-Point Measurement		
Test Method	Wenner or Schlumberger selectable with automatic calculation in Ω-meters	
Range (Auto-Ranging)	(0.01 to 99.9) kΩ; ρ max: 999 kΩm	
Resolution	(0.01 to 100) Ω	
Test Voltage	(16 or 32) V user selectable	(10, 16, 32 or 60) V user selectable
Frequency	From (41 to 128) Hz selectable	
External Voltage Measurement		
Range (Auto-Ranging)	(0.1 to 65.0) VAC/DC DC to 440 Hz	
Accuracy	± 2 % of Reading + 1 ct	
Resistance Measurement (Bond Testing)		
Measurement Type	2-Pole *(with lead resistance compensation)* or 4-Pole *(Kelvin sensing)* user selectable	
Range (Auto-Ranging)	2-Pole (0.12 to 99.99) kΩ 4-Pole (0.02 to 99.99) kΩ	
Accuracy	± 2 % of Reading + 2 cts	
Test Voltage	16 VDC (+, - or auto polarity)	
Test Current	Up to 250 mA max	
MECHANICAL		
Memory Capacity	512 test results (64 kB)	
Communication	Optically Isolated USB	
Power Supply	9.6 V rechargeable battery pack *(included)*	
Recharging Source	(110 and 220) V, (50 and 60) Hz external charger with 18 VDC, 1.9 A output	

Consult factory for NIST Calibration prices.





Models 6471 & 6472 are equipped with DataView® software. *Reports can be displayed on a PC and printed. Each report includes all test results in a tabular and graphic format, as well as operator and test site information. Comments typed by the operator will also be included.*



Complete kits available!
(See page 20)

PRODUCT INCLUDES

Model 6471 ***(without probes)***: Meter, carrying bag, (110/240) V power adapter with US power cord, optical USB cable, rechargeable NiMH battery, and a USB drive with DataView® software, ground tester workbook and user manual.

Model 6471 ***(with probes)***: Meter, carrying bag, set of (2) SR182 current probes, (110/240) V power adapter with US power cord, optical USB cable, rechargeable NiMH battery, and a USB drive with DataView® software, ground tester workbook and user manual.

Model 6472: Carrying bag, (110/240) V power adapter with US power cord, optical USB cable, rechargeable NiMH battery, and a USB stick with DataView® software, ground tester workbook and user manual.

Optional current probes for Models 6471 & 6472:



SR182 Current Probe



MN82 Current Probe

CAT. #	DESCRIPTION
2135.48	Ground Resistance Tester Model 6471 (Digital, 3-Point, 4-Point, Clamp-on (SR182 probes not included), DataView® Software)
2135.49	Ground Resistance Tester Model 6471 (Digital, 3-Point, 4-Point, Clamp-on, (includes (2) SR182 probes), DataView® Software)
2135.50	Ground Resistance Tester Model 6471 Kit – 300 ft (with probes)
2135.60	Ground Resistance Tester Model 6471 Kit – 300 ft (without probes)
2135.61	Ground Resistance Tester Model 6471 Kit – 500 ft (without probes)
2135.51	Ground Resistance Tester Model 6472
2135.53	Ground Resistance Tester Model 6472 Kit – 300 ft
2135.54	Ground Resistance Tester Model 6472 Kit – 500 ft

Ground Resistance Testers
GroundFlex® Field Kit Model 6474

Transform the way you assess ground resistance for power transmission, cellular, windmills, and other towers

The Digital Ground Resistance Tester **Model 6472, coupled with the advanced Model 6474 GroundFlex® Adapter**, forms an exceptionally robust and advanced ground resistance testing system. Test towers with one to four legs effortlessly, measuring current flow for precise resistance calculations — *all WITHOUT disconnecting the overhead ground wire!* Choose the GroundFlex® Field Kit Tower Ground Resistance Testing System for unparalleled accuracy, efficiency, and cost savings in assessing the grounding resistance of vital towers. Elevate your testing capabilities with a system designed for the challenges of the modern electrical landscape.



SCAN TO LEARN MORE

FEATURES

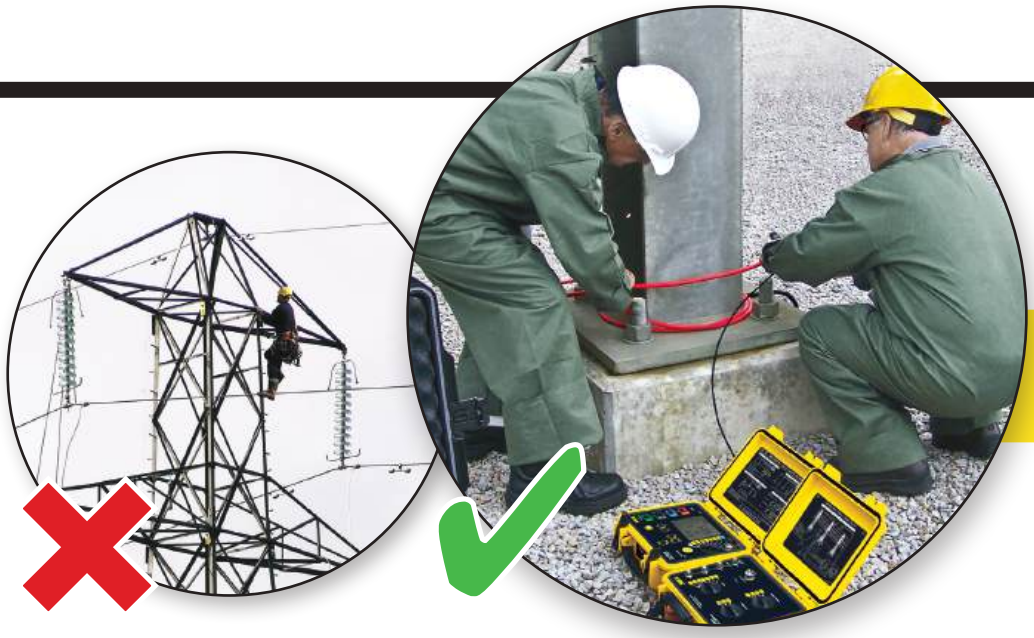
- **Flexible Sensors:** Any tower with one to four legs can be tested. Measuring the present live current and voltage allows for the passive resistance of the tower to be calculated for both individual legs and the total resistance of the structure. An active test can be performed to apply a known current into the tower for accurate resistance measurements. Flexible sensors wrapped around each leg of the tower provide an accurate high sensitivity measurement capable of determining values that other measuring techniques cannot.
- **Comprehensive Testing:** This system can also measure all traditional ground testing measurements including 3- or 4-pole Fall-Of-Potential, 4-pole soil resistivity, continuity and earth coupling. Tests can be conducted at selected frequencies from (41 to 5078) Hz or swept across the full frequency range, ideal for profiling impedance needed to analyze the effects of a potential lightning strike. The system includes all necessary sensors, wires and reels, auxiliary electrodes and cables.
- **Data Management:** Store up to 512 complete measurements in internal memory, downloadable for analysis and report generation using our FREE included DataView® software.
- **Portability and Durability:** Each instrument is built into a rugged water resistant polycarbonate case. Additionally, the full kit is packaged in a field travel case which also serves as a field work station. The instrument can perform measurements even while charging.

Flexible sensors measure leakage current down tower legs





IP 53 cover closed | 50 V CAT IV | CE | ⧈



Test active towers safely WITHOUT disconnecting the overhead ground conductor!

MODELS 6472 & 6474

ELECTRICAL

	3-Point Method	4-Point Selective Method	Ground Measurement with 2 clamps	Soil Resistivity	Earth Potential Measurement	DC Resistance Measurement	Measurements with Model 6474
Range (Auto-Ranging)	0.09 Ω to 99.9 kΩ	0.011 Ω to 99.99 kΩ	(0.1 to 500) Ω	0.01 Ω to 99.9 kΩ	0.01 mV to 65.00 V	0.02 Ω to 99.99 kΩ	0.067 Ω to 99.99 kΩ
Resolution	(0.01 to 100) Ω	(0.001 to 10) Ω	(0.01 to 1) Ω	(0.01 to 100) Ω	(0.01 to 10) mV	**2 wires**: (0.01 to 100) Ω **4 wires**: (0.001 to 10) Ω	(0.001 to 10) Ω
Accuracy	± (2 % + 1 ct)		± (10 % + 1 ct)	± (2 % + 1 ct)	± (5 % + 1 ct)	± (2 % + 2 cts)	± (5 % + 1 ct)
No-Load Voltage	(10, 16, 32 or 60) Vrms *(Not applicable with 2-clamp method)*					± 16 VDC	(10, 16, 32 or 60) Vrms
Measurement Frequency	(41 to 5078) Hz		**Auto**: 1611 Hz **Manual**: (128, 1367, 1611, or 1758) Hz	(41 to 128) Hz	(41 to 5078) Hz	DC	(41 to 5078) Hz
Coupling Measurement	Yes	–					
Auxiliary Rod Resistance Measurement	0.14 Ω to 99,9 kΩ		–				0.14 Ω to 99,9 kΩ
Voltage Interference	Maximum 60 V peak						
Soil Resistivity	–			Wenner and Schlumberger	–		
Type of Measurement	3 wires	4 wires	2 clamps	4 wires	3 wires	2 or 4 wires	GroundFlex®
Measurement Current	> 200 mAAC		< 26 ARMS (w/ SR182) < 5 ARMS (w/ MN82)	> 200 mAAC		> 200 mADC	> 200 mAAC

MECHANICAL

Memory/ Communication	512 record memory / Optically isolated USB
Dimensions/ Weight	(10.7 x 9.84 x 5.04) in (272 x 250 x 128) mm / **Model 6472**: 7.1 lb (3.2 kg) / **Model 6474**: 5.1 lb (2.3 kg)

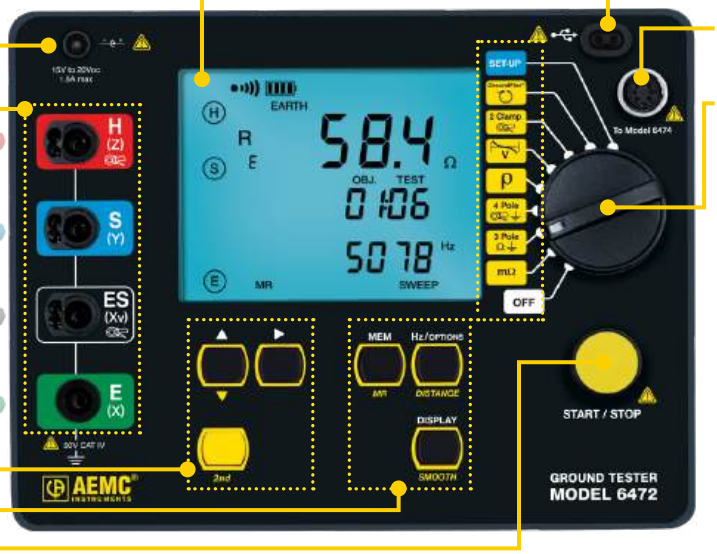
SAFETY

Safety Rating	50 V CAT IV, complies with IEC 61326-1 / IEC 61010 / IEC 61557-1-4-5

Consult factory for NIST Calibration prices.

USER INTERFACES

Model 6472



Large, electroluminescent backlit liquid crystal display

DC power input

Input terminals

To ground measurement point

To potential electrode

To ground measurement point or clamp

To injector electrode

Navigation buttons

Function buttons

Start/Stop test button

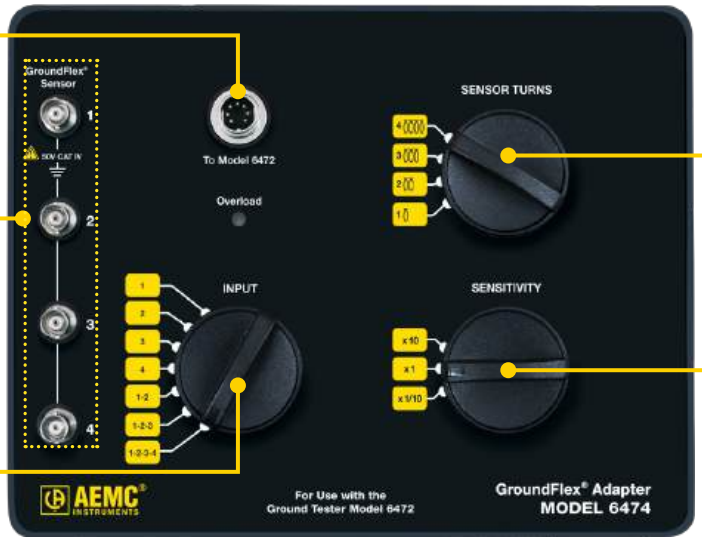
USB communications port

Cable input for connecting to the GroundFlex® Adapter Model 6474

Test Function Rotary Switch

- SET UP — SET UP Position
- GroundFlex® Measurement Position
- 2 Clamp — Two Clamp Position
- V Potential Measurement Position
- ρ — Soil Resistivity Measurement Position
- 4 Pole — 4-Pole Ground Resistance Measurement Position
- 3 Pole Ω — 3-Pole Ground Resistance Measurement Position
- mΩ — DC Resistance Measurement Position

Model 6474



Cable input for connecting to Model 6472

BNC Connections
Used for connecting the GroundFlex® sensors to the Model 6474 amplifier

Input Rotary Switch
Used for selecting a specific tower leg to test or the sum of all legs

Sensor Turns Rotary Switch
Used to match the amplifier module to the number of turns a GroundFlex® sensor is wrapped around a tower leg *(more turns provides a stronger measurement signal)*

Sensitivity Rotary Switch
Provides the ability to adjust the gain based on signal output from GroundFlex® sensors to improve the accuracy and quality of the measurement

PRODUCT INCLUDES

GroundFlex® Field Kit Model 6474: Ground Resistance Tester Model 6472 Kit 500 ft, GroundFlex® Adapter Model 6474, (4) GroundFlex® sensors (5 m), (12) color-coded rings, (1) connection lead, (2) extension leads on H reel (green/black) with color-coded alligator clips, (1) extra green and black alligator clip, (2) BNC extension leads, (1) calibration loop, (3) C-clamps, set of (2) reel caddy, (1) inverter 12 VDC to 120 VAC 200 watt *(vehicle use)*, carrying case with wheels and handle for meters, and user manual.

CAT. #	DESCRIPTION
2136.03	GroundFlex® Field Kit Model 6474 (Tower Tester)

History Highlight

Since its creation in 1893, Chauvin Arnoux® has continued to innovate and develop new products in response to customer needs and applications.

Over the years, Chauvin Arnoux® has developed extensive expertise and knowledge in many product lines, including:

- *Current probes*
- *Multimeters (they invented the first multimeter in 1937!)*
- *Ground testers*
- *Insulation testers*
- *Environmental testers*
- *Many other portable test instruments*

One product line that stands out is Earth/Ground Testers, which finds its roots in the early 1930s:

- *Early ground testers used a null balance galvanometer, a decade resistance box, and a DC power source.*
- *Later models featured hand-cranked technology with a generator to provide test voltage.*
- *In the 1950s and 60s, electronic amplifiers led to the development of electronic ground testers.*
- *Digital displays eventually emerged, though analog meters remained popular due to customer preferences.*

Over 20 years ago, AEMC® Instruments revolutionized the ground testing market with clamp-on ground testers, setting the industry standard with Models 6416 and 6417. After several generations, they remain the industry standard.

Modern ground testers are digital and incorporate many intelligent features, such as:

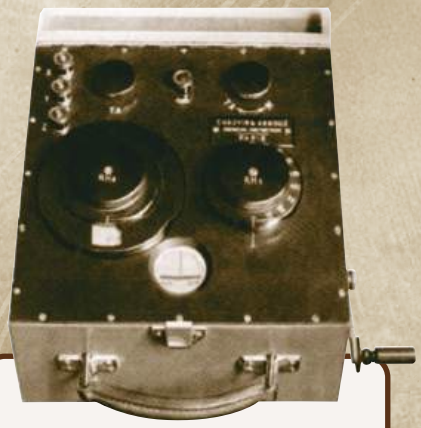
- *Timers*
- *Alarms*
- *Variable test voltages*

AEMC® Instruments recently introduced a unique line of professional ground testers built into field cases, including the latest Model 6472:

- *These units automatically select the right test voltage, range, and frequency.*
- *They indicate circuit noise and connection faults to ensure reliable measurements.*
- *Capable of performing earth coupling along with 2- and 4-wire bond tests.*
- *Data storage and download capabilities for automatic report generation.*

All AEMC® Instruments manufactured ground testers are designed to the latest international safety and testing standards and are CE marked.

Visit our website at ***aemc.com*** *to learn more about our history.*



First Ground Tester introduced in 1935



Setting the industry standard with Models 6416 & 6417



Our latest Multi-function Ground Tester Model 6472

Ground Resistance Testers
Complete Kits



Ground Resistance Tester Kit 150 ft
CAT. #2135.35

Test Kit for 3-Point testing includes:

- (2) 150 ft color-coded leads on spools (red and blue)
- (1) 30 ft lead (green)
- (2) 5 ft color-coded leads (red and blue)
- (2) 14.5 in T-shaped auxiliary ground electrodes
- (1) set of five spaded lugs
- (1) 100 ft AEMC® Instruments tape measure
- Carrying bag

Model 4620 Kit:	Catalog #2135.19
Model 4630 Kit:	Catalog #2135.22
Model 6422 Kit:	Catalog #2135.56
Model 6424 Kit:	Catalog #2135.58





Ground Resistance Tester Kit 300 ft
CAT. #2135.36

Test Kit for 4-Point testing includes:

- (2) 300 ft color-coded leads on spools (red and blue)
- (2) 100 ft color-coded leads (green and black)
- (2) 5 ft color-coded leads (red and blue)
- (4) 14.5 in T-shaped auxiliary ground electrodes
- (1) set of five spaded lugs
- (1) 100 ft AEMC® Instruments tape measure
- Carrying bag

Model 4620 Kit:	Catalog #2135.20
Model 4630 Kit:	Catalog #2135.23
Model 6424 Kit:	Catalog #2135.59
Model 6471 Kit:	Catalog #2135.50 *(with probes)*
Model 6471 Kit:	Catalog #2135.60 *(no probes)*
Model 6472 Kit:	Catalog #2135.53





Ground Resistance Tester Kit 500 ft

CAT. #2135.37

Test Kit for 4-Point testing includes:

- (2) 500 ft color-coded leads on spools (red and blue)
- (2) 100 ft color-coded leads (green and black)
- (1) 30 ft lead (green)
- (2) 5 ft color-coded leads (red and blue)
- (4) 14.5 in T-shaped auxiliary ground electrodes
- (1) set of five spaded lugs
- (1) 100 ft AEMC® Instruments tape measure
- Carrying bag

Model 4620 Kit:	Catalog #2135.21
Model 4630 Kit:	Catalog #2135.24
Model 6471 Kit:	Catalog #2135.61
Model 6472 Kit:	Catalog #2135.54









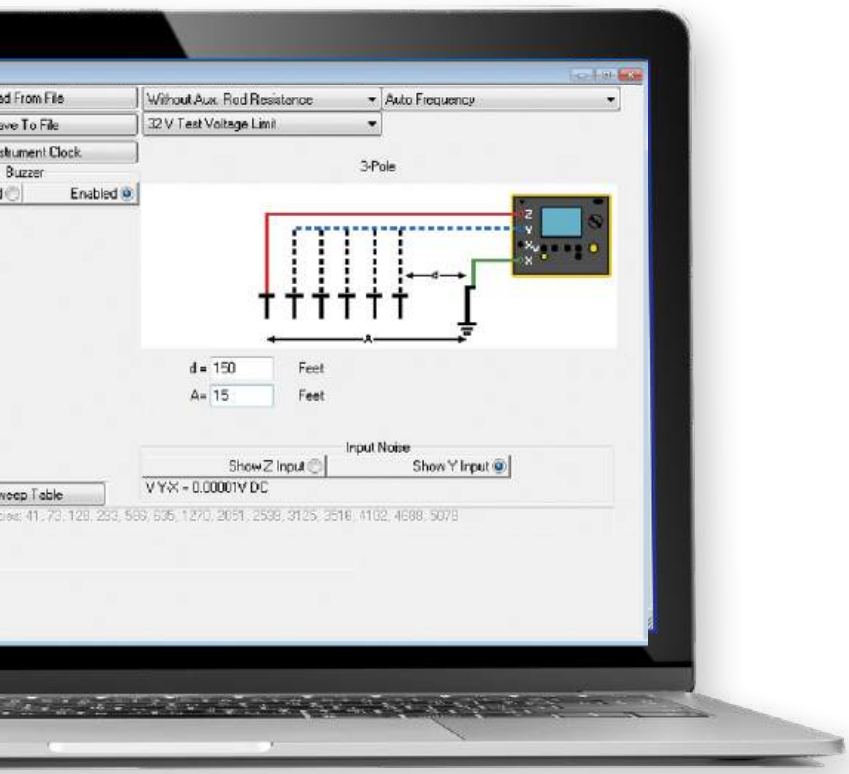
DataView®

Data Analysis and Reporting Software

AEMC® Instruments developed our DataView® software interface for recording and displaying measurement data recorded on AEMC® Instruments devices and generates views for analysis and both custom and standard reports.

DataView® on a PC opens their respective menus for direct data access to recorded data, and offers users quick access to preset reports with full safety compliance to current standards. You can also create and save custom reports and views.

Additionally any future software upgrades are always free. This approach ensures users can easily learn and utilize the software, regardless of the AEMC® instrument being used.



Functions for all applicable AEMC® Instruments devices

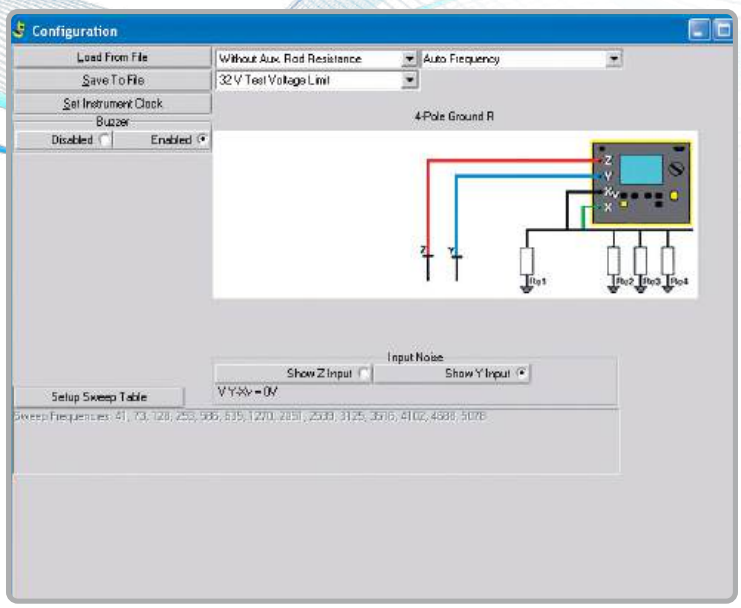
- Capture, download, display and analyze real-time data on your PC
- Upload stored test results to your PC
- Easily configure all functions and parameters specific to each instrument from your PC
- Create and store a complete library of configurations that can be uploaded to a device as needed
- Create custom views, templates, and reports to your exact needs
- Zoom in and out and pan through sections of graphs to analyze the data
- View measurements in real-time *(model dependent)*, download, display and analyze recorded and stored data
- Display Fall-of-Potential plots, tabular listings of test results, resistance vs. frequency plots, soil resistivity and bonding tests *(Models 6417, 6471, and 6472)*
- Print all test result reports using our standard report templates or your custom templates
- Free updates available on our website: ***www.aemc.com***

TIP

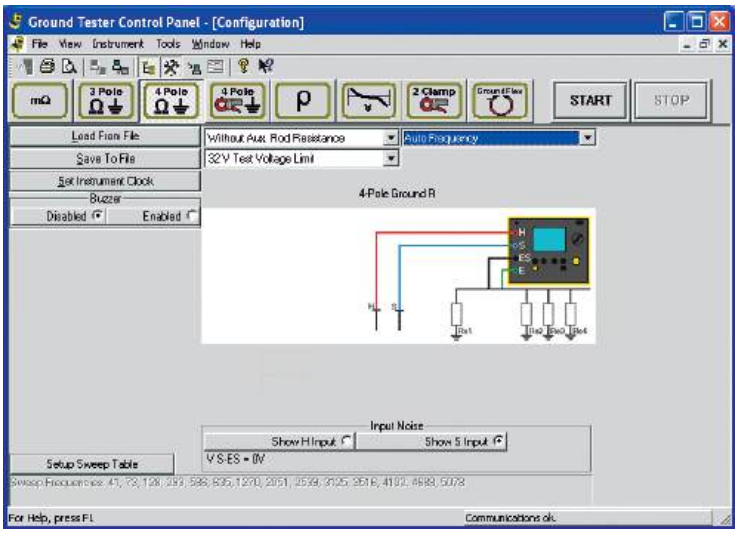
Already own an instrument with DataView® installed? It is quicker and easier to update the DataView® software from within the program itself. Simply click on the ***Help*** tab at the top of the main menu and then click on ***Update***. DataView® will automatically check to see if you have the latest version and direct you to the download process if necessary.



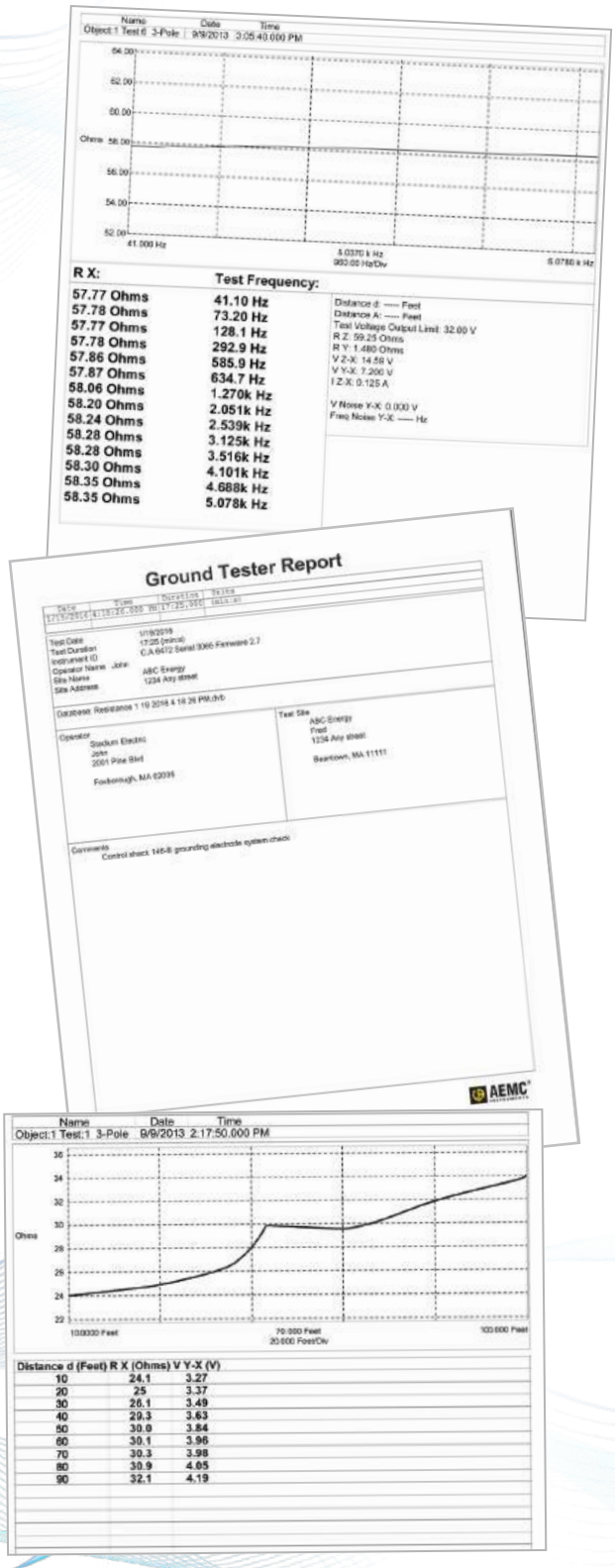
Ground Resistance Testers equipped with DataView® Software: ***Models 6417, 6471, & 6472.***



Configure and control ground resistance tests from your computer through the use of clear and easy-to-use tabbed dialog boxes.



All Ground Tester functions can be configured and tests can be initiated with graphical illustration of proper connections



Typical reports showing test measurements data

AEMC® INSTRUMENTS
CHAUVIN ARNOUX GROUP

CHAUVIN ARNOUX GROUP



CATALOG



FAMILY OF PRODUCT BROCHURES

UNITED STATES & CANADA

Chauvin Arnoux®, Inc.
d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
(603) 749-6434

Customer Support
Place orders, obtain prices and delivery options
(800) 343-1391
customerservice@aemc.com

Sales & Marketing Department
sales@aemc.com
marketing@aemc.com

Repair & Calibration Service
repair@aemc.com

Technical & Product Application Support
(800) 343-1391
techsupport@aemc.com

INTERNATIONAL SUPPORT

South America, Central America, Mexico & the Caribbean, Australia & New Zealand

Chauvin Arnoux®, Inc.
d.b.a. AEMC® Instruments
15 Faraday Drive
Dover, NH 03820 USA
export@aemc.com

All other countries

Chauvin Arnoux®
12-16 Rue Sarah Bernhardt
92600 Asnières-Sur-Seine, FR
+1 33 1 44 85 45 85
info@chauvin-arnoux.com
www.chauvin-arnoux.com

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RELIABILITY WHEN IT MATTERS™

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Export Department: +1 (603) 749-6434 x520 • E-mail: export@aemc.com

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