

MULTI-FUNCTION GROUND RESISTANCE SOIL RESISTIVITY TESTER Model 6470-B

Now measure ground
resistance, soil resistivity
and bonding resistance
with one instrument!



- ▶ 2- and 4-Wire Bond Resistance/Continuity Measurement (DC Resistance) with automatic polarity reversal
- ▶ 3-Pole (3-Point) Fall-of-Potential measurement with manual or automatic frequency selection
- ▶ 4-Pole (4-Point) Fall-of-Potential measurement for very low resistance measurements with manual or automatic frequency selection and automatic lead compensation
- ▶ 4-Pole (4-Point) Soil Resistivity measurement with automatic calculation of Rho (ρ) and user selection of the Wenner or Schlumberger test method
- ▶ 3-Pole (3-Point) Earth Coupling measurement
- ▶ Manual and automatic frequency scan from 40 to 513Hz for optimum test accuracy in electrically noisy environments
- ▶ Selectable test voltage of 16 or 32V up to 250mA of test current
- ▶ Auto-off power management
- ▶ Automatic recognition of all electrode connections and their resistance value
- ▶ Stores up to 512 complete test results in internal memory
- ▶ Optically isolated USB communication
- ▶ Remote set up and operation of all measurements using DataView[®] software supplied
- ▶ Automatic report generation
- ▶ Rechargeable NiMH batteries from wall charger or vehicle power
- ▶ Rugged dustproof and rainproof field case – IP54 rated in closed position
- ▶ Grounding standards IEC 61557 parts 4 and 5 compliant
- ▶ Includes DataView[®] software for data storage, real-time display, analysis, report generation and system configuration



Model 6470-B quickly checks ground rod resistance with its Connect - Press - Read approach

The Digital Ground Resistance Tester Model 6470-B is a portable measurement instrument designed to measure Ground Resistance, Soil Resistivity (two methods – Wenner and Schlumberger), Bonding Resistance (DC Resistance 2-Wire and 4-Wire Kelvin sensing) and Earth Coupling resistance. This direct reading tester measures from 0.01 to 99.99k Ω and is auto-ranging, automatically seeking out the optimum measurement range and test current.

Easy-to-use – simply connect the leads, select the test mode, press Start and read the results. Up to 512 test results can be stored in internal memory for later recall to the display or downloaded to a PC via DataView® software.

The large LCD is easy-to-read and indicates ground electrode resistance, test voltage, current and frequency as well as individual electrode resistance, battery status and more.

The Model 6470-B is Cat IV rated to 50V and is over voltage protected to more than 250VAC against accidental connection to live circuits. The voltage is also displayed on screen. In the event of a system fault, the Model 6470-B can withstand 250VAC.

Additional features of the Model 6470-B include a heavy-duty field case sealed against dust and water when closed (the test button is also sealed against the elements); manual and automatic test frequency selection from 40 to 513Hz; user selectable 3-Pole (3-Point) Fall of Potential or 4-Pole (4-Point) Soil Resistivity test methods and user selectable 2-Wire or 4-Wire Bond Resistance test method.

The Model 6470-B is powered by 9.6V, 3.5 Ah NiMH rechargeable batteries. An external recharger powered from 120/230V 50/60Hz is included and provides for testing while recharging. The Model 6470-B can also be vehicle powered from an optional 12V battery adapter.

The Ground Resistance Tester Model 6470-B is rugged, easy-to-use and ideal for maintenance crews performing numerous tests. It exceeds mechanical and safety specifications for shock, vibration and drop tests per IEC standards. The adjustable test frequency provides for rejection of high levels of interference, allowing it to be used under difficult conditions such as high stray currents that normally affect accuracy.

FEATURES

- ▶ 2- and 4-Wire Bond Resistance/Continuity Measurement (DC Resistance) with automatic polarity reversal
- ▶ 3-Pole (3-Point) Fall-of-Potential measurement with manual or automatic frequency selection
- ▶ 4-Pole (4-Point) Fall-of-Potential measurement for very low resistance measurements with manual and automatic frequency selection and automatic lead compensation
- ▶ 4-Pole (4-Point) Soil Resistivity measurement with automatic calculation of Rho (ρ) and user selection of the Wenner or Schlumberger test method
- ▶ 3-Pole (3-Point) Earth Coupling measurement
- ▶ Manual and automatic frequency scan from 40 to 513Hz for optimum test accuracy in electrically noisy environments
- ▶ Selectable test voltage of 16 or 32V up to 250mA of test current
- ▶ Auto-off power management
- ▶ Automatic recognition of all electrode connections and their resistance value
- ▶ Stores up to 512 complete test results in internal memory
- ▶ Optically isolated USB communication
- ▶ Remote set up and operation of all measurements using DataView® software supplied
- ▶ Automatic report generation
- ▶ Rechargeable NiMH batteries from wall charger or vehicle power
- ▶ Rugged dustproof and rainproof field case – IP54 rated in closed position
- ▶ Grounding standards IEC 61557 parts 4 and 5 compliant
- ▶ Includes DataView® software for data storage, real-time display, analysis, report generation and system configuration

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.
- ▶ **4-Point tests or soil resistivity measurements.** Locating areas of lowest soil resistivity is essential for achieving an economical grounding installation.
- ▶ **Touch and step potential testing measurements.** These tests are 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 earth) is comparable to the size of the ground to be tested.
- ▶ **2- or 4-Wire tests for continuity tests on bonding or on grounding systems.** This test is a DC resistive test using 250mA or more and is used to check bonding of all connection points on the ground system.
- ▶ **Earth coupling measurement and display.** Used to estimate the influence of two earth resistance systems that are not connected to each other.

SPECIFICATIONS

MODEL	6470-B
ELECTRICAL	
3-Point Measurement	
Range (Auto-Ranging)	0.01 Ω to 99.99k Ω
Resolution	0.01 Ω to 100 Ω
Test Voltage	Nominal 16 or 32VRMS user selectable
Resistance Measurement Frequency	41 to 513Hz user selectable or automatic selection
Test Current	Up to 250mA
Accuracy	$\pm 2\%$ of Reading + 1ct
Earth Coupling Measurement	Yes
Soil Resistivity 4-Point Measurement	
Test Method	Wenner or Schlumberger selectable with automatic calculation of test results in Ω -meters, Ω -cm or Ω -feet
Range (Auto-Ranging)	0.01 to 99.99k Ω
Resolution	0.01 to 100 Ω
Test Voltage	16 or 32V user selectable
Frequency	From 41 to 128Hz selectable
External Voltage Measurement	
Range (Auto-Ranging)	0.1 to 65.0V — DC to 450Hz
Accuracy	2% of Reading + 3cts
Resistance Measurement (Bond Testing)	
Measurement Type	2-Point (with lead resistance compensation) or 4-Point (Kelvin sensing) user selectable
Range (Auto-Ranging)	2-Point 0.01 Ω to 99.9k Ω ; 4-Point 0.001 Ω to 99.99k Ω
Accuracy	$\pm 2\%$ of Reading + 2cts
Test Voltage	16Vdc (+, — or auto polarity)
Test Current	Up to 250mA max
Data Storage	
Memory Capacity	512 test results
Communication	Optically isolated USB
Automatic Report Generation	Yes — tabular listings and Fall-of-Potential plots
Power Source	9.6V rechargeable battery pack
Recharging Source	110/220 50/60Hz external charger with 18Vdc, 1.9A output or 12 Vdc vehicle power
MECHANICAL	
Test Lead Connection	4mm recessed banana jacks
Mechanical Shock	Per EN 61557
Vibration Test	Per EN 61557
Drop Test	Per EN 61557
Dielectric Test	3kV 50/60Hz
Dimensions	10.7 x 9.76 x 5.12" (272 x 248 x 130mm)
Weight	7.5 lbs (3.5kg)
Case	Polypropylene
Index of Protection	IP53 with cover closed
DISPLAY	
Display Type	Custom 256 segment multi-line LCD
Backlight	Blue electroluminescent
COMMUNICATION	
Software	DataView® graphing, analysis and reporting software
ENVIRONMENTAL	
Operating Temperature	14° to 122 °F (-10° to 55°C)
Storage Temperature	-40° to 158°F (-40° to 70°C)
SAFETY	
Safety Rating	EN 61010-1 50V Cat IV, Pollution Degree 2
Double Insulation	Yes
CE Mark	Yes

FUNCTIONAL DISPLAYS

4-Point Bond Test



The 4-Point (Kelvin sensing) Bond test shows lead connections, bond resistance test results, test voltage and current.

3-Point Fall-of-Potential Test



The 3-Point Fall-of-Potential test displays test lead connection, grounding rod resistance and test electrode resistances. Test voltage, current or frequency can also be displayed with a button press.

Frequency Selection



The Frequency selection screen displays selected frequency and voltage for the test as well as lead connection.

Data Storage



Displays test results stored at a specific memory location as well as the test function.

Schlumberger Test



The Schlumberger test displays test lead connection, soil resistivity test results (ρ) and electrode spacing.

Wenner Test



The Wenner test displays test lead connection, soil resistivity test results (ρ), electrode spacing and resistance.

4-Point Fall-of-Potential Test



The 4-Point Fall-of-Potential test provides a 10 times more accurate test result for very low resistance measurements

SOFTWARE

DataView® Data Analysis and Reporting Software

Configure all functions of the Model 6470-B

- ▶ Run tests and analyze real-time data from your PC
- ▶ Configure all test functions and parameters from your PC
- ▶ Customize views, templates and reports to your exact needs
- ▶ Create and store a complete library of configurations that can be used with the Model 6470-B as needed
- ▶ Display Fall-of-Potential plots, tabular listings of test results, resistance vs. frequency plots, soil resistivity and bonding tests
- ▶ Print reports using standard or custom templates you design
- ▶ Free updates are available through our website www.aemc.com



DataView is included with the Model 6470-B.



DataView® software provides a convenient way to configure and control ground resistance tests from your computer. Through the use of clear and easy-to-use tabbed dialog boxes, all of Model 6470-B functions can be configured and tests can be initiated. Results can be displayed in real time and stored in your PC. Reports may be printed along with the operator's comments and analysis.



DataView®

Minimum System Requirements:

- ▶ Windows 2000/XP/Vista® operating system
- ▶ 128MB of RAM for Windows 2000 (256MB recommended)
- ▶ 256MB of RAM for Windows XP
- ▶ 512MB of RAM for Windows Vista®
- ▶ 80MB of hard disk space (200MB recommended)
- ▶ CD-ROM drive

Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Fall-of-Potential Plot

Model _____ Name of Operator _____
 Location _____ Date _____
 Serial # _____ Ground System Type: Single Rod Rod Depth _____ ft
 Multiple Rods (Grid) Longest Diagonal Dimension _____ ft
 Z Electrode Distance _____ ft

	Voltage Electrode (Y) distance from Ground Rod under Test (X)	Measured Resistance
%	FEET	OHMS
90	180	49.3
80	160	34.2
72	144	22.1
70	140	22.1
62	124	21.8
60	120	21.8
52	104	21.6
50	100	21.6
40	80	20.4
30	60	16.2
20	40	12.8
10	20	9.1
0		

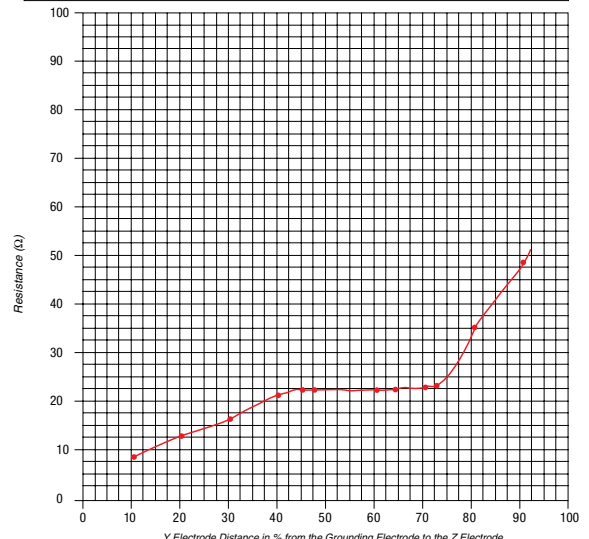
Test Conditions

Temp: _____ Soil: Moist Dry

Soil Type

Loam Sand & Gravel Shale Clay Limestone

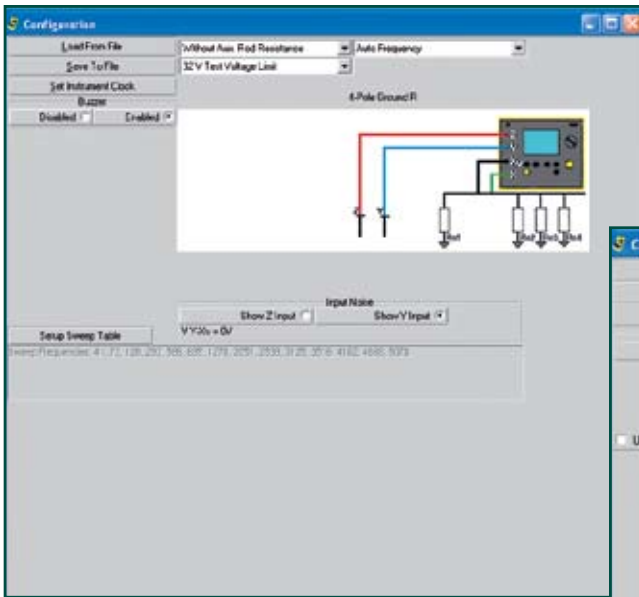
Sandstone Granite Slate Other _____



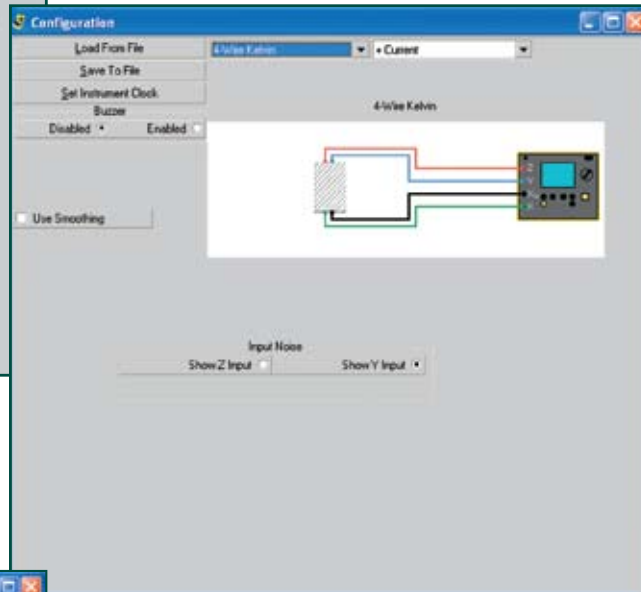
Typical report showing Fall-of-Potential plot using DataView® software.



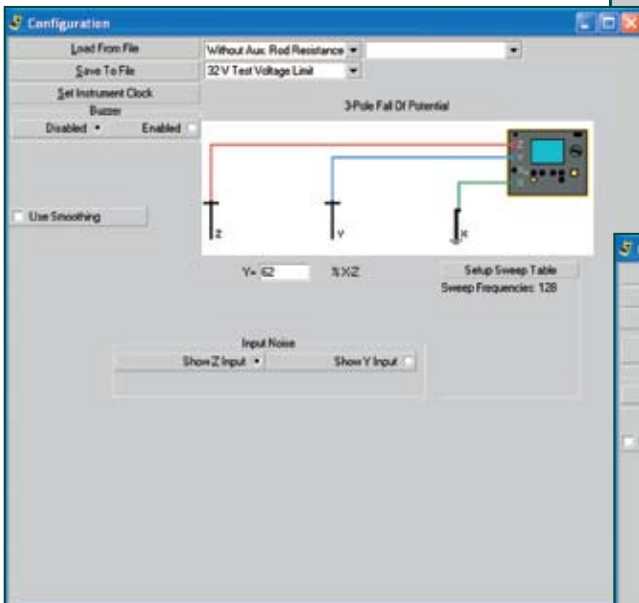
DATAVIEW[®] FUNCTIONAL DISPLAYS



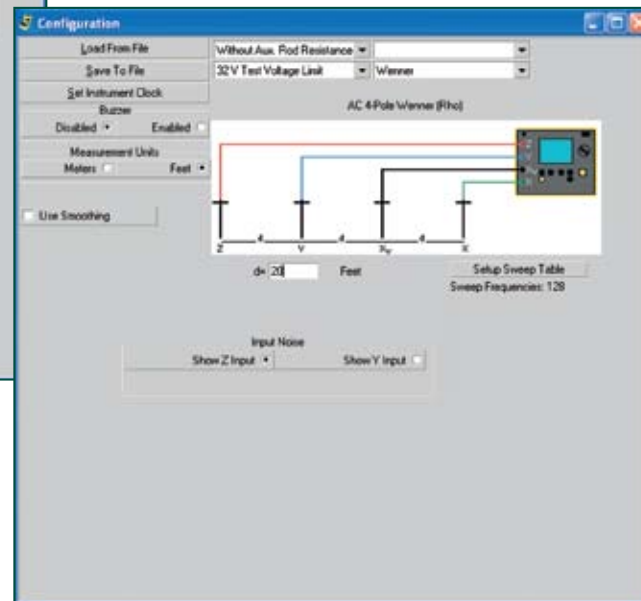
4-Point Fall-of-Potential test setup screen — operator can select test voltage, manually select the test frequency or have the instrument automatically select the best test frequency. Distance for Y electrode can also be entered manually and a Fall-of-Potential plot generated. Lead Compensation is automatically provided in this test mode.



Bond test setup screen — operator can choose two or four wire test method.

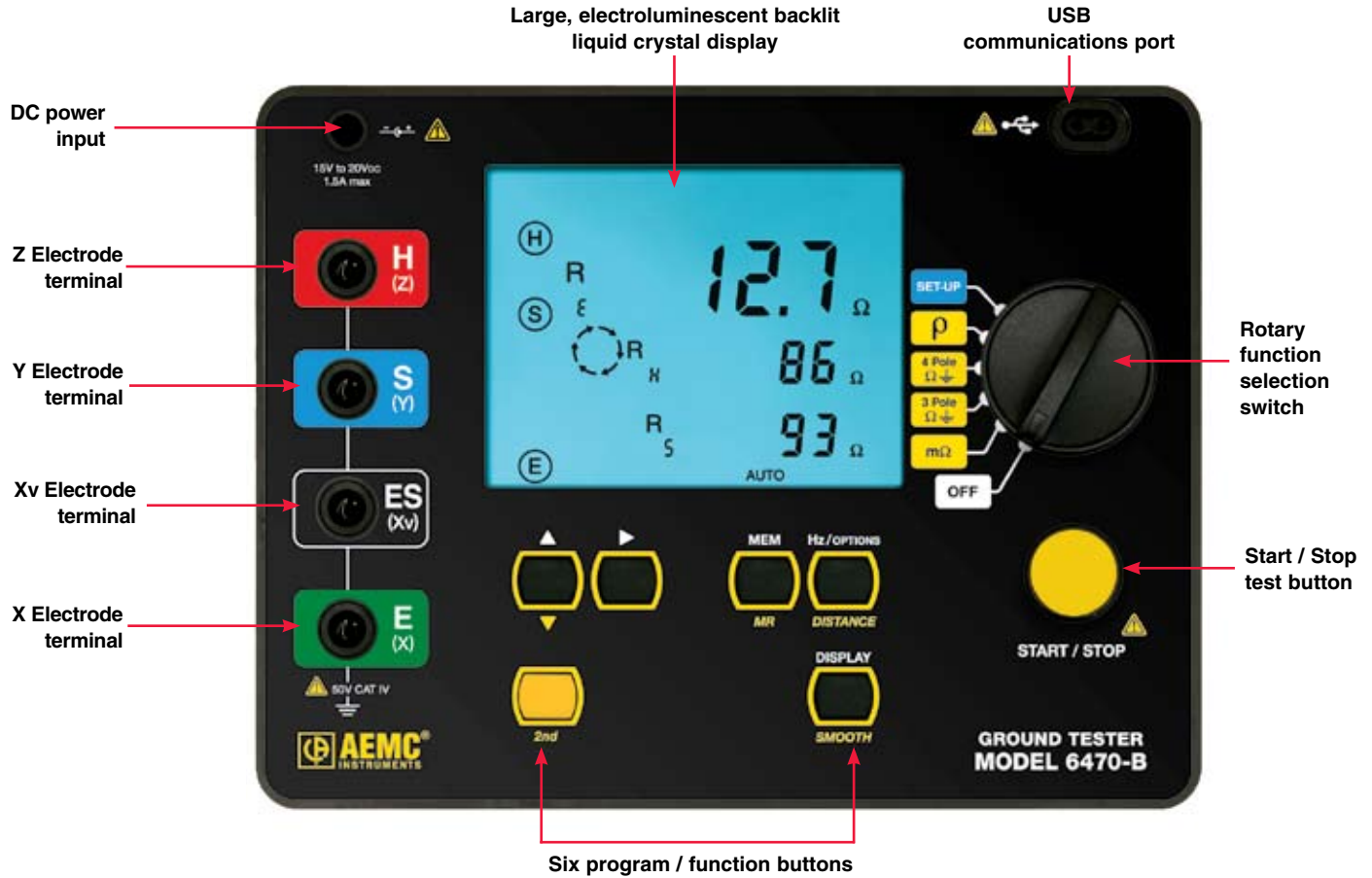


3-Point Fall-of-Potential test setup screen — operator can select test voltage, manually select the test frequency or have the instrument automatically select the best test frequency. Distance for Y electrode can also be entered manually and a Fall-of-Potential plot generated.



Soil resistivity test setup screen — operator can select either the Wenner or Schlumberger test method, select test voltage and frequency and program the spacing between electrodes in either feet or meters.

CONSTRUCTION



Model 6470-B includes meter, NiMH battery pack, optically isolated USB cable, DataView® software, external battery charger, AC power cord and user manual.
Catalog #2135.01



Multi-Function Ground Resistance Tester Model 6470-B Kit (500 ft kit shown) includes meter, NiMH batteries, optically isolated USB cable, DataView® software, external battery charger, AC power cord, one 30 ft green wire, one each 500 ft red and blue wire, one each 100 ft black and green wire, set of five spade lugs, four 14.5" auxiliary electrodes, tape measure (100 ft), carrying case and user manual.
Catalog #2135.04

ACCESSORIES



Test Kit for 3-Point testing includes two 150 ft color-coded leads on spools (red and blue), one 30 ft lead (green), two 14.5" T-shaped auxiliary ground electrodes, one set of five spade lugs, 100 ft tape measurer and carrying bag.
Catalog #2135.35



Test Kit for 4-Point testing includes two 300 ft color-coded leads on spools (red and blue), two 100 ft color-coded leads (green and black), four 14.5" T-shaped auxiliary ground electrodes, one set of five spade lugs, 100 ft tape measurer and carrying bag.
Catalog #2135.36



Test Kit for 4-Point testing includes two 500 ft color-coded leads on spools (red and blue), two 100 ft color-coded leads (green and black), one 30 ft lead (green), four 14.5" T-shaped auxiliary ground electrodes, one set of five spade lugs, 100 ft tape measurer and carrying bag.
Catalog #2135.37



Test Kit for 3-Point testing (supplemental for 4-Point testing) includes two 100 ft color-coded leads, one 30 ft lead (green), two 14.5" auxiliary electrodes and soft carrying bag for use with kit number 2135.35 when 4-Point soil resistance testing is necessary.
Catalog #2135.38

ORDERING INFORMATION	CATALOG NO.
Ground Resistance Tester Model 6470-B (3-Point, 4-Point, Bond Test, Digital, DataView® software)	Cat. #2135.01
Includes meter, rechargeable NiMH batteries, optical USB cable, power adapter 110/240V with power cord 115V US, DataView® software, ground tester workbook CD, carrying bag for meter and user manual	
Ground Resistance Tester Model 6470-B Kit (150 ft)	Cat. #2135.02
Includes meter, rechargeable NiMH batteries, optical USB cable, power adapter 110/240V with power cord 115V US, two 150 ft color-coded leads on spools (red/blue), one 30 ft lead (green), two T-shaped auxiliary ground electrodes, set of five spaded lugs, one 100 ft AEMC® tape measure, DataView® software, ground tester workbook CD, carrying bag for meter, carrying bag for kit and user manual	
Ground Resistance Tester Model 6470-B Kit (300 ft)	Cat. #2135.03
Includes meter, rechargeable NiMH batteries optical USB cable, power adapter 110/240V with power cord 115V US, two 300 ft color-coded leads on spools (red/blue), two 100 ft color-coded leads (hand-tied, green/black), four T-shaped auxiliary ground electrodes, set of five spaded lugs, one 100 ft AEMC® tape measure, DataView® software, ground tester workbook CD, carrying bag for meter, carrying bag for kit and user manual	
Ground Resistance Tester Model 6470-B Kit (500 ft)	Cat. #2135.04
Includes meter, rechargeable NiMH batteries, optical USB cable, power adapter 110/240V with power cord 115V US, two 500 ft color-coded leads on spools (red/blue), two 100 ft color-coded leads (hand-tied, green/black), one 30 ft lead (green), four T-shaped auxiliary ground electrodes, set of five spaded lugs, one 100 ft AEMC® tape measure, DataView® software, ground tester workbook CD, carrying bag for meter, carrying bag for kit and user manual	
Accessories (Optional)	
25Ω Calibration Checker	Cat. #2130.59
Tape Measure (100 ft)	Cat. #2130.60
Test Kit for 3-Point testing (includes two 150 ft color-coded leads on spools (red/blue), one 30 ft lead (green), two 14.5" T-shaped auxiliary ground electrodes, set of five spade lugs, 100 ft tape measure and soft carrying bag)	Cat. #2135.35
Test Kit for 4-Point testing (includes two 300 ft color-coded leads on spools (red/blue), two 100 ft color-coded leads (hand tied green/black), four 14.5" T-shaped auxiliary ground electrodes, set of five spade lugs, 100 ft tape measure and soft carrying bag)	Cat. #2135.36
Test Kit for 4-Point testing (includes two 500 ft color-coded leads on spools (red/blue), two 100 ft color-coded leads (hand tied green/black), one 30 ft lead (green), four 14.5" T-shaped auxiliary ground electrodes, set of five spade lugs, 100 ft tape measure and soft carrying bag)	Cat. #2135.37
Ground Test Kit for 3-Point testing (Supplemental for 4-Point testing — includes two 100 ft color-coded leads, one 30 ft lead (green), two 14.5" T-shaped auxiliary ground electrodes and soft carrying bag)	Cat. #2135.38



Call the AEMC® Instruments Technical Assistance Hotline for immediate consultation with an applications engineer: **(800) 343-1391**

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