# **GROUND RESISTANCE TESTERS** MULTIFUNCTION

# **MODEL 6471**

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









#### GROUND RESISTANCE MEASUREMENT USING 2 PROBES

For systems with parallel ground connections, Models 6471 and 6472 are capable of accurately measuring a 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/1611 Hz) while the other probe measures the current circulating in the loop. This method saves considerable time when ground testing because it is no longer necessary to set up auxiliary rods or to disconnect the ground connector.

## **PRODUCT INCLUDES**

#### CAT. #2135.48 MODEL 6471 (without probes)

Carrying bag, (110/240) V power adapter with US power cord, optical USB cable, rechargeable NiMH battery, and a USB drive with DataView<sup>®</sup> software, ground tester workbook and user manual.

#### CAT. #2135.49 MODEL 6471 (with probes)

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<sup>®</sup> software, ground tester workbook and user manual.

#### KIT SHOWN 300 FT KIT: CAT. #2135.50

Carrying bag for kit, (2) 300 ft color-coded (red/blue) leads on spools,

(2) 5 ft color-coded (*red/blue*) leads, (2) 100 ft hand-tied color-coded (*green/black*) leads, set of (2) SR182 current probes, (110/240) V power adapter with US power cord, optical USB cable, (4) T-shaped auxiliary ground electrodes, set of (5) spaded lugs, 100 ft tape measure, rechargeable NiMH battery, and a USB drive with DataView<sup>®</sup> software, ground tester workbook and user manual.



2 probes required to perform stakeless testing

| MODEL         6471           ELECTRICAL         2-Clamp Measurement           Range $(0.10 to 500) \Omega$ Resolution $(0.01 to 1) \Omega$ Measurement         Auto: 1611 Hz           Frequency         Manual: (128, 1367, 1611, or 1758) Hz           3-Point Measurement         Range (Auto-Ranging)           Resolution $(0.01 to 100) \Omega$ Rest Voltage         Nominal (16 or 32) Vrms user selectable           Resistance         (41 to 513) Hz automatic or user selectable           Measurement $(41 to 513)$ Hz automatic or user selectable           Frequency         ± 2 % of Reading + 1 ct @ 128 Hz           Soil Resistivity 4-Point Measurement         Venner or Schlumberger selectable with automatic calculation in Ω-meters.           Range (Auto-Ranging) $(0.01 to 99.9)$ kΩ; ρ max: 999 kΩm           Resolution $(0.01 to 99.9)$ kΩ; ρ max: 999 kΩm           Resolution $(0.01 to 100) \Omega$ Test Voltage $(16 \text{ or 32})$ V user selectable           Frequency         From (41 to 128) Hz selectable           Frequency $\pm 2 \%$ of Reading + 1 ct           Range (Auto-Ranging) $(2.1 to 65)$ Vac/oc - D to 440 Hz           Accuracy $\pm 2 \%$ of Reading + 1 ct           Ra  |                                      | closed   |  |
|---|--------------------------------------|--|--|
| 2-Clamp MeasurementRange $(0.10 \text{ to } 500) \Omega$ Resolution $(0.01 \text{ to } 1) \Omega$ MeasurementAuto: 1611 HzFrequency $2$ -Point MeasurementRange (Auto-Ranging) $0.09 \Omega$ to $99.9 \text{ k}\Omega$ Resolution $(0.01 \text{ to } 100) \Omega$ Test VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement $(41 \text{ to } 513) \text{ Hz automatic}$<br>or user selectableFrequencyUp to 250 mAAccuracy $\pm 2 \%$ of Reading $\pm 1$ ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectableRange (Auto-Ranging) $(0.01 \text{ to } 99.9) \text{ k}\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 99.9) \text{ k}\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 99.9) \text{ k}\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 99.9) \text{ k}\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 90.9) \text{ k}\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 99.9) \text{ k}\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution $(0.1 \text{ to } 128) \text{ Hz selectable}$ FrequencyFrom (41 to 128) Hz selectableRange (Auto-Ranging) $(0.1 \text{ to } 65) \text{ Vac/bc} - DC to 440 \text{ Hz}$ Accuracy $\pm 2 \%$ of Reading $+ 1$ ctRange (Auto-Ranging) $2$ -Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging) $2$ -Pole ( $0.12 \text{ to } 99.99 \text{ k}\Omega$ Accuracy $\pm 2 \%$ of Reading $+ 2 \text{ cts}$ Range (Auto-Ranging) $2$ -Pole ( $0.12 \text{ to } 99.99 \text{ k}\Omega$ Ac   | MODEL                                | 6471   |  |
| Range(0.10 to 500) ΩResolution(0.01 to 1) ΩMeasurementAuto: 1611 HzFrequencyManual: (128, 1367, 1611, or 1758) Hz3-Point MeasurementRange (Auto-Ranging)0.09 Ω to 99.9 kΩResolution(0.01 to 100) ΩTest VoltageNominal (16 or 32) Vrms user selectableResistance(41 to 513) Hz automatic<br>or user selectableResistance(41 to 513) Hz automatic<br>or user selectableResistance(0.01 to 100) ΩTest CurrentUp to 250 mAAccuracy± 2 % of Reading + 1 ct @ 128 HzSoil Resit/y 4-Point MeasurementTest Method(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistanceCompensation) or 4-Pole (Kelvin sensing)<br>user selectableRange (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩ;<br>4-Pole (0   |                                      | ELECTRICAL   |  |
| Resolution $(0.01 to 1) \Omega$ Measurement<br>FrequencyAuto: 1611 Hz<br>Manual: (128, 1367, 1611, or 1758) Hz <b>3-Point Measurement</b> Range (Auto-Ranging) $0.09 \Omega$ to 99.9 kΩResolution $(0.01 to 100) \Omega$ Test VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement<br>Frequency(41 to 513) Hz automatic<br>or user selectableTest CurrentUp to 250 mAAccuracy $\pm 2$ % of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in $\Omega$ -meters.Range (Auto-Ranging) $(0.01 to 99.9) k\Omega; \rho$ max: 999 kΩmResolution $(0.01 to 99.9) k\Omega; p$ max: 999 kΩmResolution $(0.01 to 99.9) k\Omega; p$ max: 999 kΩmResolution $(0.01 to 99.9) k\Omega; p$ max: 999 kΩmResolution $(0.1 to 50) Vac/bc - DC to 440$ HzAccuracy $\pm 2$ % of Reading + 1 ctRange (Auto-Ranging) $(0.1 to 65) Vac/bc - DC to 440$ HzAccuracy $\pm 2$ % of Reading + 1 ctResistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectableRange (Auto-Ranging) $2-Pole (with lead resistancecompensation) or 4-Pole (Kelvin sensing)user selectableRange (Auto-Ranging)2-Pole (0.12 to 99.99) k\Omega;4-Pole (0.02 to 99.99) k\Omega;4-Pole $   | 2                                    | -Clamp Measurement                                   |  |
| Measurement<br>FrequencyAuto: 1611 Hz<br>Manual: (128, 1367, 1611, or 1758) HzRange (Auto-Ranging)0.09 Ω to 99.9 kΩResolution(0.01 to 100) ΩTest VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement<br>Frequency(41 to 513) Hz automatic<br>or user selectableResistance<br>Measurement<br>Frequency(41 to 513) Hz automatic<br>or user selectableResistance<br>Measurement(0.01 to 100) ΩTest CurrentUp to 250 mAAccuracy± 2 % of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in Ω-meters.Range (Auto-Ranging)<br>Resolution(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyExternal Voltage MeasurementRange (Auto-Ranging)<br>Accuracy(0.1 to 65) Vac/bc - DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectableRange (Auto-Ranging)<br>Accuracy2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectableRange (Auto-Ranging)<br>Accuracy2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99   | Range                                | (0.10 to 500) Ω                                      |  |
| FrequencyManual: (128, 1367, 1611, or 1758) Hz3-Point MeasurementRange (Auto-Ranging)0.09 Ω to 99.9 kΩResolution(0.01 to 100) ΩTest VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement<br>Frequency(41 to 513) Hz automatic<br>or user selectableTest CurrentUp to 250 mAAccuracy $\pm 2 \%$ of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectableRange (Auto-Ranging)(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/bc – DC to 440 HzAccuracy $\pm 2 \%$ of Reading + 1 ctRange (Auto-Ranging) $2$ -Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Measurement Type $2$ -Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging) $2$ -Pole (0.12 to 99.99) kΩ;<br>$4$ -Pole (0.02 to 99.99) kΩ;<br>$4$ -Pole  | Resolution                           | (0.01 to 1) Ω  |  |
| 3-Point MeasurementRange (Auto-Ranging) $0.09 \Omega$ to $99.9 k\Omega$ Resolution $(0.01 \text{ to } 100) \Omega$ Test VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement<br>Frequency $(41 \text{ to } 513) \text{ Hz}$ automatic<br>or user selectableTest CurrentUp to 250 mAAccuracy $\pm 2 \%$ of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementWenner or Schlumberger selectable with<br>automatic calculation in $\Omega$ -meters.Range (Auto-Ranging) $(0.01 \text{ to } 99.9) k\Omega; \rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 99.9) k\Omega; \rho$ max: 999 k $\Omega$ mResolution $(0.01 \text{ to } 100) \Omega$ Test Voltage $(16 \text{ or } 32) \text{ V}$ user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyExternal Voltage MeasurementRange (Auto-Ranging)<br>Accuracy $(0.1 \text{ to } 65) \text{ Vac/bc} - DC \text{ to } 440 \text{ Hz}$ Accuracy $\pm 2 \%$ of Reading + 1 ctResistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging) $2$ -Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging) $2$ -Pole (0.12 to 99.99) k $\Omega$ ;<br>$4$ -Pole (0.02 to 99.99) k $\Omega$ ;<br>$4$ |                                      |  |  |
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| Resolution $(0.01 \text{ to } 100) \Omega$ Test VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement $(41 \text{ to } 513)$ Hz automatic<br>or user selectableFrequencyUp to 250 mAAccuracy $\pm 2 \%$ of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in $\Omega$ -meters.Range (Auto-Ranging) $(0.01 \text{ to } 99.9) \text{ k}\Omega; \rho \text{ max}: 999 \text{ k}\Omega m$ Resolution $(0.01 \text{ to } 72) \text{ V}$ user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyFrom (41 to 128) Hz selectableRange (Auto-Ranging) $(0.1 \text{ to } 65) \text{ Vac/bc} - DC \text{ to } 440 \text{ Hz}$ Accuracy $\pm 2 \%$ of Reading + 1 ctRange (Auto-Ranging) $(0.1 \text{ to } 65) \text{ Vac/bc} - DC \text{ to } 440 \text{ Hz}$ Accuracy $\pm 2 \%$ of Reading + 1 ctResistance<br>measurement Type $2-Pole (with lead resistancecompensation) or 4-Pole (Kelvin sensing)user selectable.Range (Auto-Ranging)2-Pole (0.12 \text{ to } 99.99) \text{ k}\OmegaAccuracy\pm 2 \% of Reading + 2 ctsTest Voltage16 \voc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityStorage512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz externalcharger with 18 \voc, 1.9 A output$   |                                      |  |  |
| Test VoltageNominal (16 or 32) Vrms user selectableResistance<br>Measurement(41 to 513) Hz automatic<br>or user selectableTest CurrentUp to 250 mAAccuracy± 2 % of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementWenner or Schlumberger selectable with<br>automatic calculation in Ω-meters.Range (Auto-Ranging)(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyFrom (41 to 128) Hz selectableFrequencyExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctRange (Auto-Ranging)2Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩ;<br>4-Pole (0.0  | • • • • •                            |  |  |
| Resistance<br>Measurement<br>Frequency(41 to 513) Hz automatic<br>or user selectableTest CurrentUp to 250 mAAccuracy± 2 % of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in Ω-meters.Range (Auto-Ranging)(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc - DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistanceMeasurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vcc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output  |                                      | · · · · · · · · · · · · · · · · · · ·                |  |
| Measurement<br>Frequency(41 to 513) Hz automatic<br>or user selectableTest CurrentUp to 250 mAAccuracy± 2 % of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in Ω-meters.Range (Auto-Ranging)(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableRange (Auto-Ranging)(0.1 to 65) Vac/oc - DC to 440 HzAccuracy± 2 % of Reading + 1 ctRange (Auto-Ranging)(0.1 to 65) Vac/oc - DC to 440 HzAccuracy± 2 % of Reading + 1 ctRange (Auto-Ranging)2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Measurement Type2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vpc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)OnmunicationOptically Isolated USB9.6 V rechargeable battery pack (included)Power Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vpc, 1.9 A output  | ···· J.                              |  |  |
| Accuracy $\pm 2 \%$ of Reading + 1 ct @ 128 HzSoil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in Ω-meters.Range (Auto-Ranging)(0.01 to 99.9) kΩ; ρ max: 999 kΩmResolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy $\pm 2 \%$ of Reading + 1 ctResistance Measurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy $\pm 2 \%$ of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Voc, 1.9 A output  | Measurement                          |  |  |
| Soil Resistivity 4-Point MeasurementTest MethodWenner or Schlumberger selectable with<br>automatic calculation in $\Omega$ -meters.Range (Auto-Ranging)(0.01 to 99.9) k $\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution(0.01 to 100) $\Omega$ Test Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy $\pm 2 \%$ of Reading + 1 ctResistance Measurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) k $\Omega$ ;<br>4-Pole (0.02 to 99.99) k $\Omega$ Accuracy $\pm 2 \%$ of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)Optically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Voc, 1.9 A output  | Test Current                         | Up to 250 mA   |  |
| Test MethodWenner or Schlumberger selectable with<br>automatic calculation in $\Omega$ -meters.Range (Auto-Ranging)(0.01 to 99.9) k $\Omega$ ; $\rho$ max: 999 k $\Omega$ mResolution(0.01 to 100) $\Omega$ Test Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy $\pm 2$ % of Reading + 1 ctResistanceMeasurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) k $\Omega$ ;<br>4-Pole (0.02 to 99.99) k $\Omega$ Accuracy $\pm 2$ % of Reading + 2 ctsTest Voltage16 Vbc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output  | Accuracy                             | $\pm$ 2 % of Reading + 1 ct @ 128 Hz                 |  |
| Test Methodautomatic calculation in Ω-meters.Range (Auto-Ranging) $(0.01 \text{ to } 99.9) \text{ k}\Omega; \text{ ρ max: } 999 \text{ k}\Omegam$ Resolution $(0.01 \text{ to } 100) \Omega$ Test Voltage $(16 \text{ or } 32) \text{ V}$ user selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging) $(0.1 \text{ to } 65) \text{ Vac/oc} - DC \text{ to } 440 \text{ Hz}$ Accuracy $\pm 2 \%$ of Reading + 1 ctPole (with lead resistancecompensation) or 4-Pole (Kelvin sensing)user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;Accuracy $\pm 2 \%$ of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source $(110 / 220) V, (50 / 60)  Hz external charger with 18 Voc, 1.9 A output$   | Soil Resistivity 4-Point Measurement |  |  |
| Resolution(0.01 to 100) ΩTest Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistance Measurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Voc, 1.9 A output  | Test Method                          | 5  |  |
| Test Voltage(16 or 32) V user selectableFrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistanceMeasurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)Communication0ptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Voc, 1.9 A output  | Range (Auto-Ranging)                 | (0.01 to 99.9) k $\Omega;\rho$ max: 999 k $\Omega m$ |  |
| FrequencyFrom (41 to 128) Hz selectableExternal Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/oc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistanceMeasurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vpc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vpc, 1.9 A output   | Resolution                           | (0.01 to 100) Ω                                      |  |
| External Voltage MeasurementRange (Auto-Ranging)(0.1 to 65) Vac/bc – DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistance Measurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vbc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityS12 test results (64 kB)Optically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output   | Test Voltage                         | (16 or 32) V user selectable                         |  |
| Range (Auto-Ranging)(0.1 to 65) VAc/oc - DC to 440 HzAccuracy± 2 % of Reading + 1 ctResistance Measurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Voc, 1.9 A output  | Frequency                            | From (41 to 128) Hz selectable                       |  |
| Accuracy± 2 % of Reading + 1 ctResistanceMeasurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Voc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Voc, 1.9 A output  | External Voltage Measurement         |  |  |
| Resistance Measurement (Bond Testing)Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vpc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vpc, 1.9 A output  | Range (Auto-Ranging)                 | (0.1  to  65)  Vac/dc - DC to  440  Hz               |  |
| Measurement Type2-Pole (with lead resistance<br>compensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vpc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vpc, 1.9 A output   | Accuracy                             | $\pm$ 2 % of Reading + 1 ct                          |  |
| Measurement Typecompensation) or 4-Pole (Kelvin sensing)<br>user selectable.Range (Auto-Ranging)2-Pole (0.12 to 99.99) kΩ;<br>4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vpc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory CapacityMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vpc, 1.9 A output  |                                      |  |  |
| Range (Auto-Hanging)4-Pole (0.02 to 99.99) kΩAccuracy± 2 % of Reading + 2 ctsTest Voltage16 Vpc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vpc, 1.9 A output   | Measurement Type                     | compensation) or 4-Pole (Kelvin sensing)             |  |
| Test Voltage16 Vbc (+, - or auto polarity)Test CurrentUp to 250 mA maxData StorageMemory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output  | Range (Auto-Ranging)                 |  |  |
| Test Current       Up to 250 mA max         Data Storage         Memory Capacity       512 test results (64 kB)         Communication       Optically Isolated USB         Power Supply       9.6 V rechargeable battery pack (included)         Recharging Source       (110 / 220) V, (50 / 60) Hz external charger with 18 Vbc, 1.9 A output   | Accuracy                             | $\pm$ 2 % of Reading + 2 cts                         |  |
| Data Storage         Memory Capacity       512 test results (64 kB)         Communication       Optically Isolated USB         Power Supply       9.6 V rechargeable battery pack (included)         Recharging Source       (110 / 220) V, (50 / 60) Hz external charger with 18 Vbc, 1.9 A output   | Test Voltage                         | 16 Vpc (+, - or auto polarity)                       |  |
| Memory Capacity512 test results (64 kB)CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output  | Test Current                         | Up to 250 mA max                                     |  |
| CommunicationOptically Isolated USBPower Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output   |                                      | -  |  |
| Power Supply9.6 V rechargeable battery pack (included)Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 Vbc, 1.9 A output  |                                      | 512 test results (64 kB)                             |  |
| Recharging Source(110 / 220) V, (50 / 60) Hz external<br>charger with 18 VDc, 1.9 A output  | Communication                        | Optically Isolated USB                               |  |
| charger with 18 Vpc, 1.9 A output   | Power Supply                         | с ўі ( <i>,</i> ,                                    |  |
|   |                                      | charger with 18 VDc, 1.9 A output                    |  |

50 V

CAT IV

cover

CE

Consult factory for NIST Calibration prices

## ACCESSORIES

#### REEL CADDY

CAT. #2135.85 Set of (2), for use with ground kit spools



**MN82 CURRENT PROBE** (2 mA to 10 Arms) CAT. #2135.71





SR182 CURRENT PROBE (0.5 mA to 40 Arms) CAT. #2135.72



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# **GROUND RESISTANCE TESTERS** MULTIFUNCTION



closed

6472

(0.1 to 500) Ω

(0.01 to 1) Ω Auto: 1611 Hz

Manual: (128, 1367, 1611, or 1758) Hz

0.09 Ω to 99.9 kΩ

(0.01 to 100) Ω

ELECTRICAL 2-Clamp Measurement

**3-Point Measurement** 

## **MODEL 6472**

Use under difficult conditions such as the presence of high stray currents that normally affect accuracy





The Model 6472 provides an automated way to measure the value of the earth/ground using the Fall-of-Potential method and storing measurements.

## **PRODUCT INCLUDES**

Carrying bag, (110/240) V power adapter with US power cord, optical USB cable, rechargeable NiMH battery, and a USB drive with DataView<sup>®</sup> software, ground tester workbook and user manual.

## **TEST KITS**

6472 METER

300 ft Kit: CAT. #2135.53 500 ft Kit: CAT. #2135.54 *(shown)* 

Refer to page 85 for Model 6472 Kit descriptions CAT. #2135.35, #2135.36 and #2135.37



2 probes required to perform stakeless testing



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Nominal (10, 16, 32 or 60) Vrms user selectable **Test Voltage Resistance Measurement** (41 to 5078) Hz automatic or user selectable Frequency **Test Current** Up to 250 mA Accuracy ± 2 % of Reading + 1 ct @ 128 Hz Soil Resistivity 4-Point Measurement Wenner or Schlumberger selectable with Test Method automatic calculation of test results in  $\Omega$ -meters Range (Auto-Ranging) (0.01 to 99.9) kΩ; ρ max: 999 kΩm Resolution (0.01 to 100) Ω **Test Voltage** (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) VAC/DC - DC to 440 Hz Accuracy  $\pm 2$  % of Reading + 1 ct Resistance Measurement (Bond Testing) 2-Pole (with lead resistance compensation) or **Measurement Type** 4-Pole (Kelvin sensing) user selectable. 2-Pole 0.12  $\Omega$  to 99.99 k $\Omega$ ; Range (Auto-Ranging) 4-Pole 0.02 Ω to 99.99 kΩ Accuracy ± 2 % of Reading + 2 cts **Test Voltage** 16 VDC (+, - or auto polarity) **Test Current** Up to 250 mA max Data Storage **Memory Capacity** 512 test results (64 kB) **Optically Isolated USB** Communication **Power Supply** 9.6 V rechargeable battery pack (included) (110 / 220) V. (50 / 60) Hz external charger **Recharging Source** with 18 VDC, 1.9 A output Consult factory for NIST Calibration prices.

ACCESSORIES



MODEL

**Measurement Frequency** 

Range (Auto-Ranging)

Range

Resolution

Resolution

**MN82 CURRENT PROBE** (2 mA to 10 Arms) CAT. #2135.71 **SR182 CURRENT PROBE** (0.5 mA to 40 Arms) CAT. #2135.72 55

REEL CADDY CAT. #2135.85 Set of (2), for use with ground kit spools

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# **GROUND RESISTANCE TESTERS** MULTIFUNCTION

## **FEATURES**

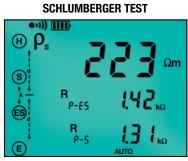
- Ground Resistance testing using the 2-clamp method (no auxiliary rods needed)
- 2- and 4-Point Resistance/Continuity measurement (DC Resistance) with automatic polarity reversal
- 3-Point Fall-of-Potential measurement with manual or automatic frequency selection
- 4-Point Soil Resistivity measurement with automatic calculation of Rho (o) 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
- Selectable test voltage of (10, 16, 32 or 60) V up to 250 mA of test current (model dependent)
- 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)
- · Grounding standards IEC 61557 parts 4 and 5 compliant
- Includes DataView<sup>®</sup>software for set up, data retrieval, real-time display, analysis, report generation and system configuration
- · Can also be used for Continuity tests on bonding
- 2 probes required to perform stakeless testing.

## LARGE FUNCTIONAL DISPLAYS





The 4-Point test shows lead connections, Continuity test results, test voltage and current.



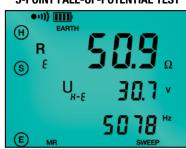
The Schlumberger test displays test lead connection, soil resistivity (p) test results and electrode spacing.

#### **DATA STORAGE**



Memory Recall displays test results stored at a specific memory location.

#### **3-POINT FALL-OF-POTENTIAL TEST**



The 3-Point Fall-of-Potential test displays test lead connection, grounding rod resistance and test electrode resistances.





The 2-Clamp method displays clamp connection resistance, test current and frequency.

#### WENNER TEST



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

| CAT. # | DESCRIPTION |
|--------|-------------|
|        |             |
|        |             |

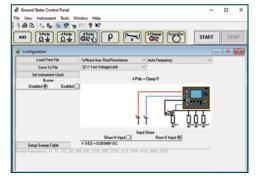
| 2135.48 | Ground Resistance Tester Model 6471 (Digital, 3-Point, 4-Point, Clamp-on (SR182 probes not included), DataView® Software) |
|---------|---|
| 2135.49 | Ground Resistance Tester Model 6471 (Digital, 3-Point, 4-Point, Clamp-on, (includes 2-SR182 probes), DataView® Software)  |
| 2135.50 | Ground Resistance Tester Model 6471 Kit – 300 ft (CAT. #2135.49 and CAT. #2135.36)  |
| 2135.51 | Ground Resistance Tester Model 6472 (Digital, 2-Point, 3-Point, 4-Point, Bond Test, DataView® software)                   |
| 2135.53 | Ground Resistance Tester Model 6472 Kit – 300 ft (CAT. #2135.51 and CAT. #2135.36)  |
| 2135.54 | Ground Resistance Tester Model 6472 Kit – 500 ft (CAT. #2135.51 and CAT. #2135.37)  |
| 2135.60 | Ground Resistance Tester Model 6471 Kit – 300 ft w/o Probes (CAT. #2135.48 and CAT. #2135.36)                             |
| 2135.61 | Ground Resistance Tester Model 6471 Kit – 500 ft w/o Probes (CAT. #2135.48 and CAT. #2135.37)                             |



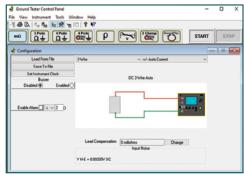
## GROUND TESTERS MODELS 6471 & 6472 - TYPICAL DATAVIEW® FUNCTIONAL DISPLAYS

# Provid Nature Control Paral Provide Nature Provide Nature

#### **SELECTIVE 3-POINT TESTING OF MULTIPLE RODS**



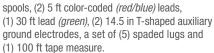
#### 2-POINT-RESISTANCE



## **OPTIONAL KITS**

#### 150 FT KIT

CAT. #2135.35 Test Kit for 3-Point testing includes carrying bag, (2) 150 ft color-coded *(red/blue)* leads on



**300 FT KIT** CAT. #2135.36 Test Kit for 4-Point testing includes carrying bag, (2) 300 ft color-coded

(red/blue) leads on spools,(2) 5 ft color-coded (red/blue) leads,

(2) 100 ft band-tied color-coded leads,
(2) 100 ft band-tied color-coded leads (green/black),
(4) 14.5 in T-shaped auxiliary ground electrodes, a set of (5) spaded lugs and (1) 100 ft tape measure.



#### **500 FT KIT** CAT. #2135.37 Test Kit for 4-Point testing includes carrying bag, (2) 500 ft color-coded *(red/blue)* leads on

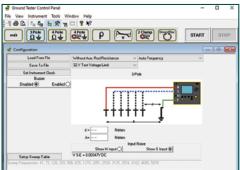


spools, (2) 5 ft color-coded *(red/blue)* leads, (2) 100 ft hand-tied color-coded *(green/black)* leads, (1) 30 ft lead *(green)*, (4) 14.5 in T-shaped auxiliary ground electrodes, a set of (5) spaded lugs and (1) 100 ft tape measure.

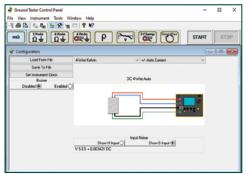


#### 2-CLAMP METHOD SETUP

#### FALL-OF-POTENTIAL, STEP-TOUCH POTENTIAL



#### 4-POINT-RESISTANCE



#### SOIL RESISTIVITY

