



Advanced Test Equipment Rentals

www.atecorp.com 800-404-ATEC (2832)



Models 6472 & 6474

Reliable, accurate and quick for comprehensive earth testing

MULTI-FUNCTION

- All types of earth resistance measurements: and earth measurement on pylons (C.A. 6474 option)
- Resistivity (Wenner and Schlumberger methods)
- Earth coupling
- Ground potential measurement
- Continuity / resistance

HIGH PERFORMANCE

- Possibility of analysing the frequency behaviour of earthing systems (41 Hz to 5 kHz)
- Wide measurement range for optimum resolution
- Rejection of interference voltages up to 60 Vpeak
- Automatic calculation of the earth coupling coefficient and ground resistivity
- Measurement and analysis of pylon earthing
- Recording of results

Earth and resistivity tester

Adapter for pylon earth measurements



A versatile instrument

The Model 6472 earth and resistivity tester can be used for quick, comprehensive testing of all earthing systems by gathering all the earth measurement functions in a single instrument. When used with the Model 6474, it also offers pylon earth measurements, making it an essential tool for diagnosing and maintaining the earthing systems of all types of pylons.

2 operating modes for easy learning

Automatic mode:

A single key for simple handling:



- function selection by rotary switch
- press on START / STOP button
- reading of the result

In this mode, the instrument carries out a default measurement at 128 Hz and chooses the most appropriate frequency in the event of interference voltages.

New measurement concept

Unlike traditional earth testers, the Model 6472 offers the possibility of analysing the frequency behaviour of earthing systems thanks to its particularly extensive measurement frequency range (from 41 to 5,078 Hz).

The use of a high-frequency measurement signal makes it possible to assess the behaviour of an earthing system in the event of lightning.

Expert mode:

Users can choose the required measurement parameters (specific measurement frequency, frequency scan, measurement voltage between H and S, etc.) and can access additional measurement results for more accurate interpretation.

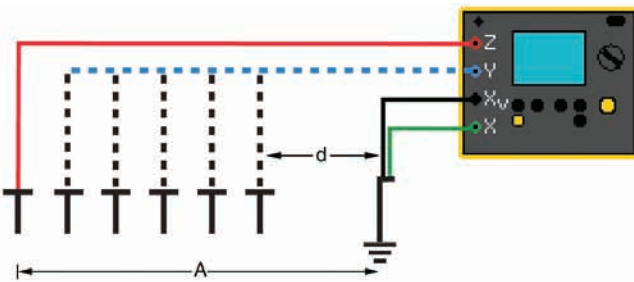
Automatic recognition of input connections:

the connections are displayed and flash if incorrect or absent.



4P MEASUREMENT METHOD

Do not connect the black cable if using the 3P method



3P EARTH MEASUREMENT METHOD

The 3P method is the traditional method using rods to measure the resistance of an existing earth connection. The Model 6472 can also be used to measure the resistances of the auxiliary rods RS and RH, as well as any interference voltages, thus allowing more accurate interpretation of the measurement.

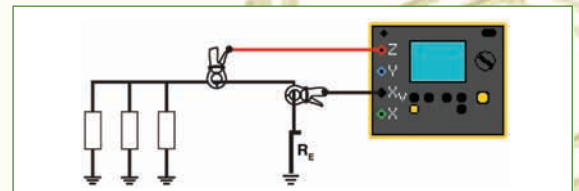
Suitable for all types of measurement environments, even the most difficult, it guarantees measurement of auxiliary rod resistances up to 100 kΩ and interference voltages up to 60 Vpeak.

4P AND 4P SELECTIVE MEASUREMENT

The 4P measurement method is particularly well-suited to measuring very low earth resistance values. In the event of several resistances set up in parallel, it is possible to combine this method with a clamp-on ammeter in order to carry out selective measurements. This "4P selective" method saves considerable time as it is no longer necessary to disconnect the earth resistance to be measured. Indeed, the clamp enables measurement of the current through the earth connection to be tested, thus avoiding the influence of the parallel earth connections.

EARTH LOOP MEASUREMENT WITH 2 CLAMPS

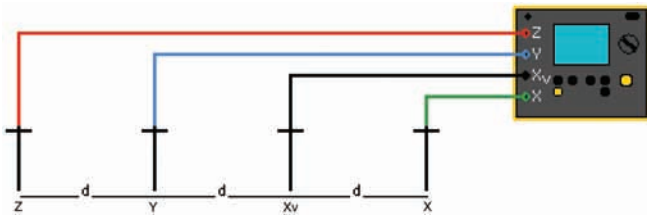
In the event of a system with parallel earth connections, the Model 6472 is capable of accurately measuring an earth resistance using clamps only. The principle of this method involves placing 2 clamps around the earth conductor to be tested and connecting them each to the instrument. One clamp injects a known signal (32 V / 1367 Hz) while the other clamp measures the current circulating in the loop. This method saves considerable time when earth testing because it is no longer necessary to set up auxiliary rods or to disconnect the earth connections.



EARTH COUPLING MEASUREMENT

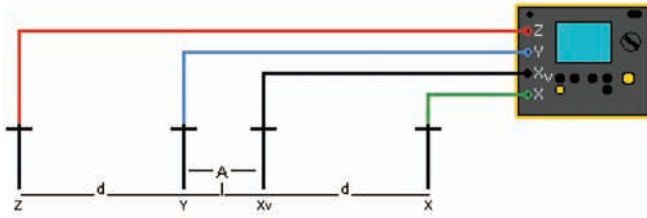
The operator performs 3 successive measurements (2 traditional earth measurements using the 3P method – R_1 & R_2 – and 1 earth measurement using the 2P method – R_{1-2}). The Model 6472 then automatically calculates the coupling resistance: $R_c = (R_1 + R_2 - R_{1-2}) / 2$.

WENNER METHOD



Wenner method:
 the distances between
 the 4 rods are identical:
 $d \rho W = 2 \cdot \pi \cdot d \cdot R_{S-SE}$

SCHLUMBERGER METHOD



Schlumberger method:
 the distance between
 the 2 central rods S & ES
 is A
 the distance between
 the 2 outside rods E & H
 is 2d
 $\rho S = (\pi \cdot (d^2 - A^2/4) \cdot R_{S-SE}) / 4$

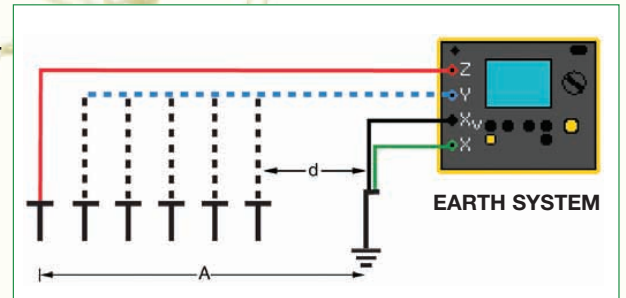
GROUND RESISTIVITY MEASUREMENT

When it is possible to choose the position of the earth connection, resistivity measurement helps to assess the ground and thus determine the place where the earth resistance will be lowest (optimization of construction costs).

The Model 6472 automatically calculates the resistivity of the ground (ρ) using the Wenner or Schlumberger method, as soon as the distances used between the rods have been entered. The resistances of the rods R_E , R_{ES} , R_S and R_H can also be measured.

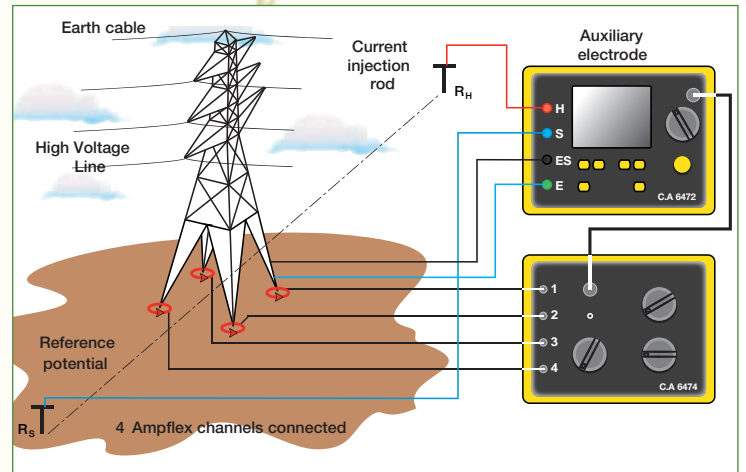
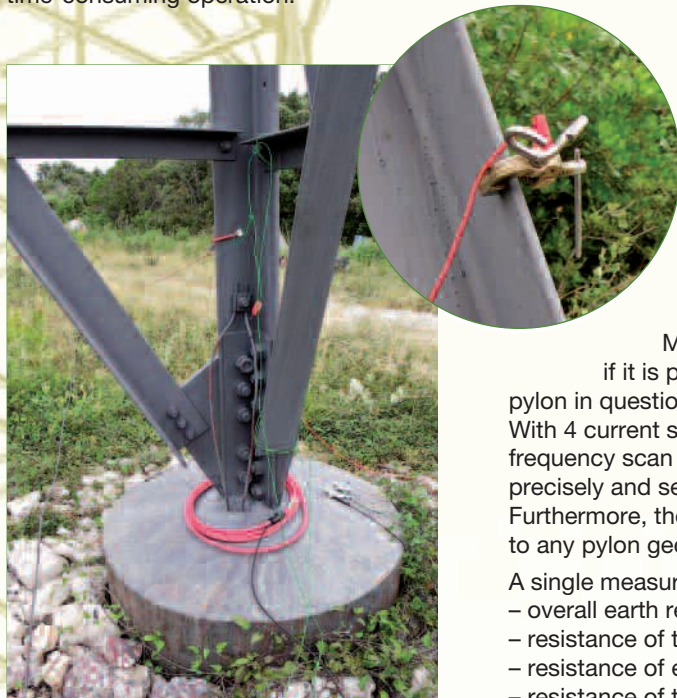
GROUND POTENTIAL MEASUREMENT

This measurement can be used to determine the value of the potential as a function of distance. By performing several measurements with different distances (d), it is thus possible to track the change in potential around an earthing system.



EARTH MEASUREMENT ON PYLONS WITH EARTH CABLE

High-voltage lines are usually equipped with an earth cable to allow lightning to discharge to earth via the pylons. As all the pylons are connected to this conductor, all the pylons' earth resistances are in parallel. This means that it is impossible to measure pylon resistance using traditional 3P methods unless the earth cable is disconnected, which is a dangerous and time-consuming operation.



Used in conjunction with the Model 6474 vectorial processing unit, the Model 6472 offers the possibility of measuring a pylon's earth resistance even if it is part of a parallel earth network, by selective measurement of the pylon in question.

With 4 current sensors (Ampflex) positioned around the footings of the pylon and a frequency scan up to 5 kHz, it is possible to measure the earth impedance of the pylon precisely and selectively.

Furthermore, the use of flexible sensors means that this concept can be adapted to any pylon geometry.

A single measurement is sufficient to acquire all the essential quantities:

- overall earth resistance of the line
- resistance of the pylon under consideration
- resistance of each pylon footing
- resistance of the earth cable between pylons

ELECTRICAL SPECIFICATIONS

	3P Method	4P / 4P Selective Method	Earth Measurement with 2 Clamps	Resistivity	Earth Potential Measurement	DC Resistance Measurement	Measurements with C.A 6474
Range	0.01 Ω to 99.9 kΩ	0.001 Ω to 99.99 Ω	0.01 Ω to 500 Ω	0.01 kΩ to 99.9 kΩ	0.01 mV to 65.00 V	0.001 Ω to 99.9 kΩ	0.001 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 mV to 10 mV	2 wires: 0.01 Ω to 100 Ω/ 4 wires: 0.001 Ω to 10 Ω	0.001 to 10 Ω
Accuracy	± (2% + 1 count)	± (2% + 1 count)	± (10% + 1 count)	± (2% + 1 count)	± (5% + 1 count)	± (2% + 2 counts)	± (5% + 1 count)
No-Load Voltage	16 or 32Vrms	16 or 32 Vrms	16 or 32 Vrms	16 or 32Vrms	16 or 32 Vrms	±16 VDC	16 or 32 Vrms
Measurement Frequency	41 to 5,078 Hz	41 to 5,078 Hz	Auto: 1,367 Hz Manual: 1,367 Hz, 1,611 Hz, 1,758 Hz	41 to 128 Hz	41 to 128 Hz	DC	41 to 5078 Hz
Coupling Measurement	yes	–	–	–	–	–	–
Auxiliary Rod Resistance Measurement	0.1 Ω to 100 kΩ	0.01 Ω to 100 kΩ	–	–	–	–	0.01 Ω to 100 kΩ
Voltage Interference	maximum 60 Vpeak					–	maximum 60 Vpeak
Test Method	–	–	–	Wenner and Schlumberger with automatic calculation	–	–	–
Type of Measurement	3 wires	4 wires	–	4 wires	3 wires	2 wires or 4 wires	–
Measurement Current	–	–	–	–	–	> 200 mA DC	–

MECHANICAL SPECIFICATIONS

Memory/Communication	512-record memory / optical link/USB
Dimensions / Weight	272x250x128 mm / C.A 6472: 3.2 kg / C.A 6474: 2.3 kg
Protection Rating	IP 53
Electrical Safety	CAT IV 50 V, complies with IEC 61326-1 / IEC 61010 / IEC 61557-1-4-5

ORDERING INFORMATION

- Ground Resistance Tester Model 6472** **Cat. #2135.51**
Includes 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, product warranty and registration card and a user manual.
- Ground Resistance Tester Model 6472 Kit (150 ft)** **Cat. #2135.52**
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, product warranty and registration card and a user manual.
- Ground Resistance Tester Model 6472 Kit (300 ft)** **Cat. #2135.53**
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, product warranty and registration card and a user manual.
- Ground Resistance Tester Model 6472 Kit (500 ft)** **Cat. #2135.54**
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, product warranty and registration card and a user manual.
- GroundFlex™ Adapter Model 6474** **Cat. #2136.01**
Includes GroundFlex™ Adapter Model 6474, four GroundFlex™ sensors (5m) with twelve color-coded rings, rechargeable NiMH batteries, connection lead, two extension leads on H reel (black/green) with color-coded alligator clips, six BNC extension leads, calibration loop, three C-clamps, carrying case for meter and a user manual.
- GroundFlex™ Field Kit (Models 6472 and 6474)** **Cat. #2136.03**
Includes Cat. #2136.01 and Cat. #2135.54.



NOTE: The GroundFlex™ Adapter Model 6474 is a factory supplied product only (not available through distribution)



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

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