CHAUVIN® ARNOUX
CHAUVIN ARNOUX GROUP

C.A 6472
C.A 6474

Reliable, accurate and quick for comprehensive earth testing

Earth and resistivity tester

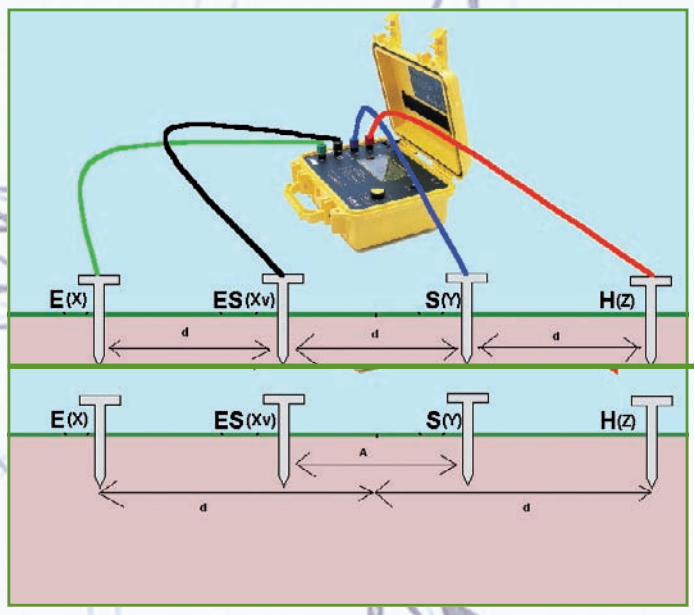
Adapter for pylon earth measurements

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



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

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

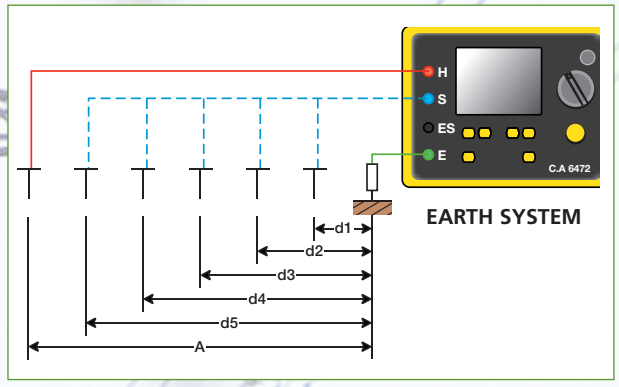
GROUND RESISTIVITY MEASUREMENT

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 C.A 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.

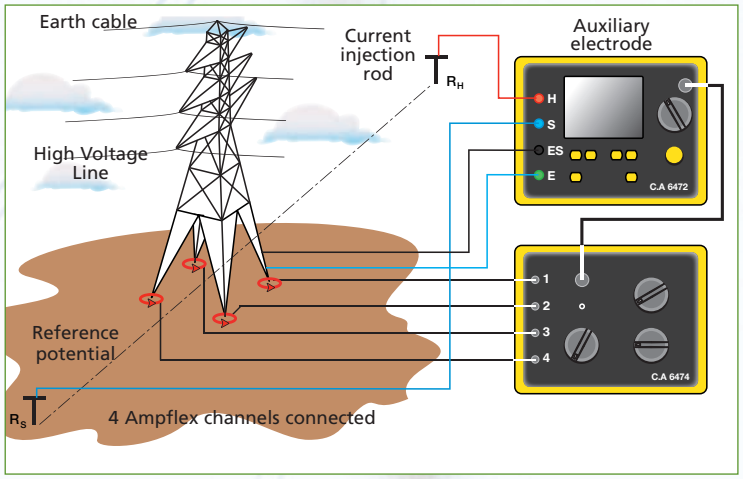
GROUND POTENTIAL MEASUREMENT

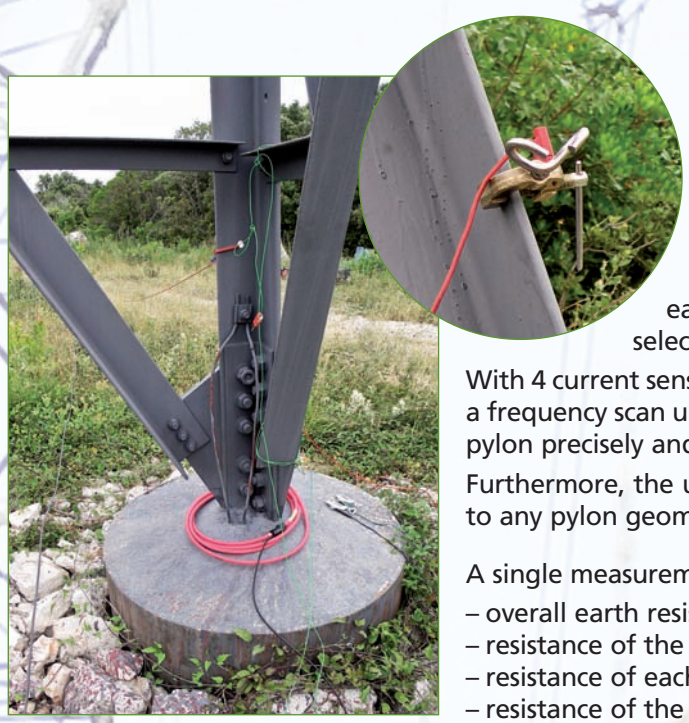
This measurement can be used to determine the value of the potential as a function of distance. By performing several measurements with different distances (d), it is thus possible to track the change in potential around an earthing system.



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 C.A 6474 vectorial processing unit, the C.A 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% + 1count)
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
$U_{interference}$	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

STATE OF DELIVERY

- **C.A 6472 earth and resistivity tester P01.1265.04**

Delivered with: mains adapter + 2-pole mains cable for recharging the battery from the mains supply, one operating manual in 5 languages on CD-ROM, 5 simplified operating manuals and 5 specific labels, each in a different language.
Data export software + USB/optical communication cable and two C182 clamps

ACCESSORIES

- **100 m earth and resistivity kit P01.1020.24**
- **150 m earth and resistivity kit P01.1020.25**
- **C.A 647X continuity kit** (mΩ position) **..... P01.1020.37**
- **MN82 CLAMP** (Ø 20 mm) for C.A 6474 **..... P01.1204.52**
- **Adapter for battery charging on cigarette lighter P01.1020.36**
- **DataView® PC software..... P01.1020.06**
- **Optical / RS232 communication cable..... P01.2952.52**

- **C.A 6474 adapter for pylon earth measurement** (PYLON BOX) **..... P01.1265.10**

Delivered with a carrying bag for accessories containing: One C.A 6472 – C.A 6474 connection lead, 6 BNC / BNC cables 15 m long, 4 AmpFLEX flexible current sensors 5 m long, 1 set of 12 AmpFLEX identification rings, 2 cables (5 m green, 5 m black) with safety connectors on winder, 5 spade lug/banana plug converters Ø 4 mm, 3 clamps, 1 calibration loop, 5 operating manuals and 5 specific labels, each in a different language.

For assistance and ordering

AthanA • 906211158 - Ed.1 - 09/2007 - Non contractual document. Confirm specifications before ordering.

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