

AMRU-200



Also measures leakage current with a clamp, continuity of protective conductors and auxiliary electrode resistance

AMRU-200

Earth impedance, resistance and soil resistivity meter

amperis

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Implements every earth resistance measurement method, including the impulse method for lightning protection earths.

Measurement methods



Double-clamp method: earth resistance without disconnecting the installation

What it measures

- Earth resistance using auxiliary electrodes (2-, 3- and 4-wire method).
- Earth resistance using auxiliary electrodes and a clamp, for multiple earth electrodes.
- Earth resistance using two clamps, when auxiliary electrodes cannot be driven into the ground.
- Dynamic earth resistance (impedance) by the impulse-wave method, with a 4/10 μ s or 10/350 μ s test impulse.
- Soil resistivity by the Wenner method, and leakage current with a current clamp or a flexible clamp.
- Continuity of equipotential bonding and protective conductors, with auto-zero and a test current of 200 mA, meeting IEC 60364-6-61:2000 section 6.12.2.

Additional functions

- Resistance of the auxiliary electrodes RS and RH.
- Interference voltage and its frequency, with automatic or manual selection against 16 2/3 Hz, 50 Hz, 60 Hz or 400 Hz mains interference.
- Selectable maximum measuring voltage, 25 V or 50 V, and electrode spacing entry in metres or feet for the resistivity calculation.



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Battery-powered operation with onboard memory, USB data transfer and optional documentation software.

Power, memory and data transfer



Reading the result on the graphic display during a measurement

Power and autonomy

The meter runs from a rechargeable 4.8 V 4.2 Ah Ni-MH battery pack, charged through the supplied Z7 mains adaptor and charging cable, or from a car cigarette-lighter cable, and gives over 300 measurements per charge. Battery status is shown on the display.

Memory and data transfer

Results are stored in memory for 990 measurements, organised in 10 banks of 99 cells, each with the real-time clock's time stamp. Readings are transferred to a computer over the supplied USB cable; the meter's data-transmission function is designed for this wired link to a computer.

Software

An optional PC application for creating measurement documentation completes the set: installed on a computer, it is used to organise and print the readings downloaded from the meter.



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Earth resistance (3- and 4-wire method)

Range	Resolution	Accuracy
0.000...3.999Ω	0.001Ω	±(2% m.v. + 4 digits)
4.0...39.99Ω	0.01Ω	±(2% m.v. + 4 digits)
40.0...399.9Ω	0.1Ω	±(2% m.v. + 2 digits)
400...3999Ω	1Ω	±(2% m.v. + 2 digits)
4.00k...19.99kΩ	10Ω	±(5% m.v. + 2 digits)

Auxiliary electrode resistance (RH, RS)

Range	Resolution	Accuracy
0...999Ω	1Ω	±(5% (RS+RE+RH) + 8 digits)
1.00kΩ...9.99kΩ	10Ω	±(5% (RS+RE+RH) + 8 digits)
10.0kΩ...19.9kΩ	100Ω	±(5% (RS+RE+RH) + 8 digits)

Measurement range to IEC 61557-5: 0.10 Ω...19.9 kΩ.

3- and 4-wire method; test current under short-circuit >200 mA; voltage on open terminals selectable <25 V AC or <50 V AC.

Test current frequency: 125 Hz (50 Hz networks) or 150 Hz (60 Hz networks), selectable in the menu.

The third range is printed as "400...3999 kΩ" in the source datasheet; kept here as 400...3999 Ω, consistent with the neighbouring ranges and the 1 Ω resolution of this row (see AUDIT).



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Continuity of protective and equipotential bonding conductors

Range	Resolution	Accuracy
0.00...3.99Ω	0.001Ω	±(2% m.v. + 4 digits)
4.0...39.9Ω	0.01Ω	±(2% m.v. + 4 digits)
40.0...399.9Ω	0.1Ω	±(2% m.v. + 2 digits)
400...3999Ω	1Ω	±(2% m.v. + 2 digits)
4.0k...19.9kΩ	10Ω	±(5% m.v. + 2 digits)

Interference voltage UN (r.m.s.)

Range	Resolution	Accuracy
0...100V	1V	±(2% m.v. + 3 digits)

Measurement range to IEC 61557-5: 0.045 Ω...19.9 kΩ, meeting IEC 60364-6-61:2000 section 6.12.2.
Test current under short-circuit >200 mA, with auto-zero of the test leads.



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Multiple earth resistance with clamp and auxiliary electrodes (3-wire + clamp)

Range	Resolution	Accuracy
0.00...3.99Ω	0.001Ω	±(8% m.v. + 4 digits)
4.00...39.99Ω	0.01Ω	±(8% m.v. + 4 digits)
40.0...399.9Ω	0.1Ω	±(8% m.v. + 3 digits)
400...1999Ω	1Ω	±(8% m.v. + 3 digits)

Interference frequency

Range	Resolution	Accuracy
15...450Hz	1Hz	±(1% m.v. + 2 digits)

Measurement range to IEC 61557-5: 0.12 Ω...1999 Ω.

3- and 4-wire method; test current under short-circuit >200 mA; test current frequency 125 Hz (50 Hz networks) or 150 Hz (60 Hz networks).



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Multiple earth resistance with the double-clamp method

Range	Resolution	Accuracy
0.00...19.99 Ω	0.01 Ω	$\pm(10\% \text{ m.v.} + 3 \text{ digits})$
20.0...149.9 Ω	0.1 Ω	$\pm(20\% \text{ m.v.} + 3 \text{ digits})$

Dynamic earth resistance (impedance) - impulse-wave method (4-wire)

Range	Resolution	Accuracy
0.0...99.9 Ω	0.1 Ω	$\pm(2.5\% \text{ m.v.} + 3 \text{ digits})$
100...200 Ω	1 Ω	$\pm(2.5\% \text{ m.v.} + 3 \text{ digits})$

Two-clamp method.



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Soil resistivity (Wenner method)

0.00...199.9Ωm	0.1Ωm
200...1999Ωm	1Ωm
2.00k...19.99kΩm	10Ωm
20.0k...99.9kΩm	100Ωm
100k...999kΩm	1kΩm

AC current (leakage), with clamp

Range	Resolution	Accuracy
0.1...99.9mA1	0.1mA	±(8% m.v. + 5 digits)
100...999mA1	1mA	±(8% m.v. + 3 digits)
1.00...4.99A1	0.001A	±(5% m.v. + 5 digits)
5.00...9.99A1.2	0.01A	±(5% m.v. + 5 digits)
10.0...99.9A1.2	0.1A	±(5% m.v. + 5 digits)
100...300A1.2	1A	±(5% m.v. + 5 digits)

$\rho = 2\pi LRE$. Accuracy depends on the RE accuracy in the 4-wire method, and is never less than ± 1 digit.
L: distance between the test probes, entered in metres or feet.



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Safety, environmental and general specifications

Type of insulation	Double insulation, to EN 61010-1 and IEC 61557, with EMC
Measurement category	CAT III 600 V, to EN 61010-1
Protection rating (EN 60529)	IP54
Display	Backlit graphic LCD
Data interface	USB cable
Autonomy	More than 300 measurements per battery set
Memory	990 measurements, in 10 banks of 99 cells, with real-time clock time stamp
Warranty	36 months
Operating temperature	-10...+50°C
Storage temperature	-20...+70°C
Humidity	20...80 %



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Standard and optional accessories

Standard accessories

50 m reel test lead, yellow; 25 m reel test lead, red; 25 m reel test lead, blue; 1.2 m banana-plug test lead, yellow; 2.2 m banana-plug test lead, black; USB transmission cable; car cigarette-lighter charging cable (12 V); 0.30 m earth contact test probes (4 pcs); L2 carrying case; K01 crocodile clip, black; K02 crocodile clip, black; 4.8 V 4.2 Ah Ni-MH battery pack; cramp; battery charger cable; Z7 power supply adaptor; carrying strap; calibration certificate; operating manual.

Optional accessories

Documentation-creation PC software; 0.80 m earth contact test probe; N-1 current clamps (Ø 52 mm); 2 m two-wire banana-plug test lead; C-3 current clamps (Ø 52 mm); LR14 (size C) battery case; L3 carrying case; hard carrying case; F-1 flexible current clamp (Rogowski coil), Ø 400 mm.



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