EM4050

Digital Earth Tester

Ground resistivity (Wenner's method) and
Earth resistance measurement

Features

- Earth resistance measurement
- Ground resistivity (Wenner's method)
- High spurious voltage rejection
- Spurious voltage measurement
- Up to 20 kΩ resistance range
- 0.01 Ω resolution
- Auto-range
- Alphanumerical LCD display
- Direct reading (up to 3½ digits)
- Automatic interference detection
- Rechargeable battery
- Built-in printer
- Up to 50 m selectable distance
- Built-in memory
- USB data output
- IP54 protection (with closed lid)

Description

The **EM4050** earth tester is a digital, microprocessor controlled instrument that allows to measure the earth resistance and ground resistivity (using Wenner´s method), as well as to detect parasitic voltages present in the ground. This instrument is suitable to measure earth systems in power substations, industries, distribution networks, etc., according to IEC 61557-5.

It is also suitable for soil resistivity measurements, in order to optimize the earth systems project. It is a fully automatic and easy-to-operate equipment. Before starting each measurement, the equipment will check that conditions are within appropriate limits and will notify the operator in case any abnormality turns up (too high interference voltage, too much resistance in test spikes, very low test current, etc). Then, it will look for the most suitable range and show measurement results in an alphanumeric display.

The instrument has four ranges that are automatically selected, covering measurements from 0.01 Ω up to 20 kΩ, which allows to obtain very accurate measurements for any kind of soils. During ground resistivity measurement, the operator may indicate the distance between spikes in order for the equipment to apply Wenner's formula and to show the resistivity value directly.

The **EM4050** has a built-in memory to store measurements and a built-in printer, besides the USB interface that allows to communicate measured values to a computer or data logger for their later analysis. It is a portable, strong and lightweight equipment, suitable to be used out in the field and under severe weather conditions. It is powered by a rechargeable battery and it is supplied with all the necessary accessories for measurements (test spikes, leads, etc) within an auxiliary case that makes it simple to carry.

Rechargeable battery (LiFePO4)

Expected lifetime: 2000 charge / discharge cycles (average).

Low self-discharge: when the equipment is not in use, battery charge decreases with time at a much lower rate than other battery technologies.

Safety: in contrast to other lithium battery technologies commonly used, LFP batteries are thermally and chemically stable, significantly improving battery safety.

Technical Specifications

EM4050

OPERATION FREQUENCY
1470 Hz.
Max. variation: ± 1 Hz.

VOLTMETER
In the voltmeter function, the equipment operates as a conventional voltmeter, making it possible to measure voltages generated by parasitic currents.

MEASUREMENT RANGES
Resistance: 0 - 20 Ω; 0 - 200 Ω; 0 - 2000 Ω y 0 - 20 kΩ (auto ranging).
Resistivity: 0 - 50 kΩm (auto ranging).
Voltage: 0 - 60 V~.

ACCURACY
Resistance and Resistivity measurements:
± 2%.

Voltage measurement:
± (3% of the measured value ± 2 digits).

READING RESOLUTION
0.01 Ω in the resistance measurement;
0.01 Ωm in the resistivity measurement;
0.1 V in the voltage measurement.

OUTPUT CURRENT
The short-circuit current is limited to 10.0 mA (according the IEC 61557-5-4.5).

IMMUNITY TO SPURIOUS VOLTAGE INTERFERENCE
During the R measurement, it allows for the presence of spurious voltage up to 7 V~, with a error < 10%.

EARTH RESISTANCE OF AUXILIARY RODS
In the R measurement it allows Raux up to 50 kΩ with error < 30%.

AUDIBLE ALARM
It warns the operator in case that there are abnormalities in the current circuit, which make it difficult to obtain a reliable result.

SOIL RESISTIVITY COMPUTING
When performing soil resistivity measurements, the operator informs to the EM4050 the distance between spikes and the equipment automatically computes soil resistivity using the Wenner full equation.

INTERFACE
USB.

BUILT-IN PRINTER
For a printed register document of measured values.

AUTO POWER-OFF
Auto-turns off after 3 minutes of inactivity.

POWER SUPPLY
Internal rechargeable LFP battery (LiFePO4 12 V - 3000 mAh).

BATTERY STATUS CHECKING
It makes it possible to verify the battery charge status under normal use conditions.

BATTERY CHARGER
A smart, microprocessor controlled, circuit adjusts the battery charge to the optimised parameters in order to ensure the maximum service life. It is supplied by means of an external AC adapter (provided with the equipment) or from a 12 V car battery.

SAFETY CLASS
In accordance with IEC 61010-1.

E.M.C.
In accordance with IEC 61326-1.

ELECTROSTATIC IMMUNITY
In accordance with IEC 61000-4-2.

ELECTROMAGNETIC IRRADIATION IMMUNITY
In accordance with IEC 61000-4-3.

ENVIRONMENTAL PROTECTION
IP65 with closed lid.

OPERATION TEMPERATURE
-10°C to 55°C.

STORAGE TEMPERATURE
-25°C to 65°C.

HUMIDITY
95% RH (without condensation).

EQUIPMENT WEIGHT
Approx. 3 kg.

DIMENSION
274 x 250 x 124 mm.

Included accessories

- 4 steel rods (spikes), 400 mm long, easy removal
- Blue test lead, 50 meters cable (on reel)
- Red test lead, 30 meters cable (on reel)
- Green test lead, 15 meters cable (on reel)
- Black test lead, 3 meters cable (on reel)
- 1 kg hammer
- AC adapter (output: 12 V - 2 A, input 100 - 240 V)
- Connection wire to supply the charger with a 12 V external battery (the car battery)
- USB cable
- Standard resistance box, with 1 Ω and 1 kΩ values, to check the accuracy of measured values in the field
- User guide
- Canvas bag to accommodate reels, spikes, etc

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