

## Ground resistance and soil resistivity meter, ES3001



### Main Features

The Fuzrr ES3001 portable digital soil resistance meter measures the resistance of the earthing system of electrical equipment and cables with high accuracy and resolution. The devices can be used to measure grounding or ground specific resistance in 2-, 3- and 4-wire measurement mode. The ground resistance measurement range is 0.01Ω ~ 30.00kΩ, the soil resistivity measurement range is 0.00Ωm ~ 9999kΩm, so it is perfect for those who are looking for a reliable and easy-to-use device. The high noise level and the USB interface increase the ease of use, which allows you to download up to 500 groups of measured values. Whether it's a larger project or a smaller repair job, the ES3001 is the perfect tool for the job.

### Specifications

#### Measuring Ranges and Accuracy

Function	Measuring ranges (Automatic selection)	Accuracy	Resolution
Ground resistance (R)	0.00Ω ~ 30.00Ω	±2% rdg ±5dgt <sup>1</sup>	0.01Ω
	30.0Ω ~ 300.0Ω	±2% rdg ±3dgt	0.1Ω
	300Ω ~ 3000Ω	±2% rdg ±3dgt	1Ω
	3.00kΩ ~ 30.00kΩ	±2% rdg ±3dgt	10Ω
Soil resistivity (ρ)	0.00Ωm ~ 99.99Ωm	$\rho=2\pi aR^2$	0.01Ωm
	100.0Ωm ~ 999.9Ωm		0.1Ωm
	1000Ωm ~ 9999Ωm		1Ωm
	10.00kΩm ~ 99.99kΩm		10Ωm
	100.0kΩm ~ 999.9kΩm		100Ωm
	1000kΩm ~ 9999kΩm		1kΩm
Ground voltage	0.00 ~ 100.0V AC	±2% rdg ±3dgt	0.01V

Notes:

1. Reference condition: Accuracy when  $R_h R_s < 100\Omega$ . Working conditions:  $R_h \max = 3k\Omega + 100R < 50k\Omega$ ;  $R_s \max = 3k\Omega + 100R < 50k\Omega$
2. It depends on the measurement accuracy of R,  $\pi=3.14$ , a: 1 m ~ 100m;

## General Data

- Ambient temperature, humidity: 23°C±5°C, <75% RH
- Power supply: 8.4V lithium battery (built-in)
- Interference voltage: < 20V
- Interference current: < 2A
- Electrodes spacing: can be set from 1m to 100m, when measuring R: a > 5d, when measuring ρ: a > 20h
- Auxiliary electrode resistance value: reference condition <100Ω, working condition <5kΩ
- Measurement methods:
  - Ground resistance: 3-wire measurement, simple 2-wire measurement, rated current pole changing method
  - Soil resistivity: 4-wire method
  - Ground voltage: average value rectification (between S-ES rods)
- Test frequency: 128Hz
- Short circuit test current: >20mA (sine wave)
- Open circuit test voltage: AC 28V max.
- Back-light: Variable
- Display: back-lit 4-digit large LCD, 111×68 mm, display field: 108×65mm
- Measurement signal: LED blinks during measurement
- Measuring time: voltage to ground: about 3/s, ground resistance, soil resistivity: about 7 s
- Ground voltage: ≤AC 100V, (the function must not be used to measure mains voltage)
- USB interface +software
- Data storage: 500 groups of data
- Automatically identifying interference, "NOISE" message if its voltage >5V
- Auxiliary ground test: With auxiliary grounding resistance value test function, 0.00kΩ~30kΩ (Rh max=3kΩ+100R < 50kΩ; Rs max=3kΩ+100R < 50kΩ)
- Alarm function: alarm prompt when the measured value exceeds the alarm set value
- Battery voltage: real-time display of battery charge
- Automatic power off: after about 15 minutes of idle
- Power consumption:
  - Standby: max. 40mA (back-light OFF)
  - Back-light ON: max. 43mA
  - Measurement: max. 75 mA (back-light OFF)
- Dimensions (L, W, H): 277×227.5×153 mm
- Weight:
  - Instrument: 2,4 kg (including battery)
  - Test cables: 1,3 kg:
  - Auxiliary ground electrodes: 0,9 kg (4 pieces)
- Working temperature: -10 ~ 40°C, <80% RH
- Storage temperature: -20 ~ 60°C, <70% RH
- Overload protection: ground resistance measurement: AC 280V, 3 s between each rod of H-E and S-ES
- Insulation resistance: > 20MΩ (500V between circuit and casing)
- Voltage test: 3700VACrms (between circuit and casing)
- EMC: IEC61326:
- Safety regulations:
  - IEC61010-1 (CAT III 300V, CAT IV 150V, pollution degree 2)
  - EC61010-031
  - IEC61557-1 (ground resistance)
  - IEC61557-5 (soil resistivity)
  - JJG 366-2004

## Packng List

- Instrument: 1
- Carrying case: 1
- Auxiliary ground rod: 4 pcs Ø10×200 mm
- Standard test lead: 4 strips (15 m red; 10 m yellow; 10 m green; 15 m black)
- Simple test lead 2 strips: (yellow, green: 1.6 meters each)
- 6V lead-acid battery (built-in): 1
- Battery charger: 1
- Monitoring software: CD 1
- USB communication cable: 1
- Manual, warranty: 1 set