

1. Introduction

UT523A Earth Resistance Soil Resistivity Tester is specially designed and manufactured for field measurement of earth resistance, soil resistivity, earth voltage and AC voltage. Digital processing technology, precise 4-wire method, 3-wire method and simple 2-wire method are applied to measuring earth resistance; FFT (fast Fourier transform) technology and AFC (automatic frequency control) technology are adopted for automatic identification of interference and selection of measurement frequency, to minimize the impact of interference and provide more accurate earth resistance value. The unique anti-interference capability, environmental adaptability and retest consistency ensure high precision, high stability and high reliability for long-term measurement. The tester is widely used in power, telecommunications, meteorology, oil fields, construction, lightning protection and industrial electrical equipment, such as earth resistance, soil resistivity, earth voltage and AC voltage measurement.

UT523A Earth Resistance Soil Resistivity Tester is composed of host machine, monitoring software, test wires, auxiliary ground rods, communication wires, etc. The large LCD display, with white backlight and bar graph indication, makes readings absolutely clear. The tester can store 300 sets of data, fulfilling historical inquiry and online real-time monitoring through monitoring software. It also comes with dynamic display, alarm indication, and the functions like historical data access, reading, preservation, statement, and printing.

UT523A Earth Resistance Soil Resistivity Tester also named: Precision Earth Resistance Tester, 4-pole Earth Resistance Tester, 2/3/4-pole Earth Resistance Tester, Soil Resistivity Tester.

2. Technical Specifications

2.1. Base Conditions and Working Conditions


Influence Constant	Base Conditions	Working Conditions	Remark
Ambient Temp	23°C±1°C	-10°C~40°C	----
Ambient Humidity	40%~60%	<80%	----
Working Voltage	9V±0.1V	9V±1.5V	----
Auxiliary Earth Resistance Value	<100Ω	<30kΩ	rC、rP
Interference Voltage	----	<20V	----
Interference Current	----	<2A	----
Electrode Distance of measuring R	a>5d	a>5d	----
Electrode Distance of measuring ρ	a>20h	a>20h	----

2.2. General Specifications

Function	2/3/4-pole measurement for earth resistance and soil resistivity; earth voltage and AC voltage measurement
Power Supply	DC 9V (6×1.5V LR14 alkaline batteries, continuous standby for 300 hours)
Measurement Range	Earth Resistance: 0.00Ω-30.00kΩ
	Soil Resistivity: 0.00Ωm-9000kΩm
	Earth Voltage: 0V-600V
Measurement Mode	Precise 4-pole measurement, 3-pole measurement, simple 2-pole measurement of earth resistance

Measurement Method	Earth Resistance: rated current change-pole method, test current 20mA Max Soil Resistivity: 4-pole method (Wenner method) Earth Voltage: average rectification (between P(S)-ES)
Test Frequency	128Hz/111Hz/105Hz/94Hz (AFC)
Short-circuit Test Current	AC 20mA max
Open-circuit Test Voltage	AC 40V max
Test Voltage Wave	Sine wave
Electrode Distance Range	Can be set at 1m-100m
Shift	Earth resistance: 0.00Ω-30.00kΩ automatic shift
	Soil Resistivity: 0.00Ωm-9000kΩm automatic shift
Backlight	Controllable white screen backlight, suitable for dim environments
Display Mode	4-digit super-large LCD display, white screen backlight
Measurement Indicator	During measurement, LED flash indicator, LCD count down display, progress bar indicator
LCD Frame Dimension	128mm×75mm
LCD Window Dimension	124mm×67mm
Tester Dimension	212mm(L)×175mm(W)×76mm(H)
Standard Test Wire	4 pcs: 20m red, 20m black, 10m yellow, 10m green (1 each)

Simple Test Wire	2 pcs: 1.6m red, 1.6m black (1 each)
Auxiliary Ground Rod	4 pcs: Φ10mm×150mm
Measurement Rate	Earth Voltage: about 3 times/second
	Earth resistance, soil resistivity: about 5 seconds/time
Measuring Times	Over 5000 times (for short-circuit test, interval time should be at least 30 seconds)
Circuit Voltage	below AC 600V
Communication Interface	With USB interface and software monitoring, storage data can be uploaded to computer to save or print.
Communication Wire	1 pc: 1.5m USB communication wire
Data Storage	300 sets, "MEM" storage indicator, "FULL" symbol to indicate full storage
Data Hold	"HOLD" indicator display
Data Read	"READ" indicator display
Over Range Display	"OL" symbol display
Interference Test	Recognize interference signal automatically; "NOISE" symbol display when interference voltage exceeds 5V
Auxiliary Earth Test	With auxiliary earth resistance test function, 0.00KΩ-30kΩ (100R+rC<50kΩ, 100R+rP<50kΩ)
Alarm Function	When measurement value exceeds alarm setting value, there will be "Toot-toot-toot" alarm hint

Battery Voltage	When battery voltage decreases to around 7.5V, the low battery symbol “  ” will be displayed, reminding to replace the batteries
Working current	Standby: about 20mA (Backlight off)
	Boot up and with backlight: about 45mA (25mA without backlight)
	Measurement: about 100mA (Backlight off)
Weight	Tester: 950g
	Test wires: 1560g
	Auxiliary ground rods: 935g (4pcs)
Working Temperature & Humidity	-10°C-40°C, below 80%rh
Storage temperature & humidity	-20°C-60°C, below 70%rh
Overload Protection	Measuring earth resistance: between each interfaces of C(H)-E and P(S)-ES, AC 280V/3 seconds
Insulation Resistance	Over 20MΩ (between circuit and enclosure it is 500V)
Withstand Voltage	AC 3700V/rms (Between circuit and enclosure)
Electromagnetic Property	IEC61326(EMC)
Protection Type	IEC61010-1 (CAT III 300V, CAT IV 150V, Pollution Degree 2), IEC61010-031, IEC61557-1 (earth resistance), IEC61557-5 (soil resistivity)

2. 3. Intrinsic Error and Performance Indicators under Base Conditions

Measurement Function	Measurement Range	Accuracy	Resolution
Earth Resistance (R)	0.00Ω~30.00Ω	±2%rdg±3dgt	0.01Ω
	30.0Ω~300.0Ω	±2%rdg±3dgt	0.1Ω
	300Ω~3000Ω	±2%rdg±3dgt	1Ω
	3.00kΩ~30.00kΩ	±4%rdg±3dgt	10Ω
Soil Resistivity (ρ)	0.00Ωm~99.99Ωm	(ρ=2πaRa: 1m~100m; π=3.14)	0.01Ωm
	100.0Ωm~999.9Ωm		0.1Ωm
	1000Ωm~9999Ωm		1Ωm
	10.00kΩm~99.99kΩm	(ρ=2πaRa: 1m~100m; π=3.14)	10Ωm
	100.0kΩm~999.9kΩm		100Ωm
	1000kΩm~9000kΩm		1kΩm
Earth Voltage	AC 0.0~600V	±2%rdg±3dgt	0.1V

⚠ Note: 1. rC max or rP max, additional error $\leq \pm 3\%rdg \pm 5dgt$
(rC max: 4kΩ+100R<50kΩ, rP max: 4kΩ+100R <50kΩ)

2. Interference voltage with 5V, additional error $\leq \pm 5\%rdg \pm 5dgt$

⚠ Warning: Voltage measurement is strictly prohibited when the tester is charged, connected to a computer, or supplied with external power.