# ES3002 Double clamp multi-function grounding resistance tester

## Ⅰ. Product Introduction

ES3002 Double clamp multi-function grounding resistance tester is also called double clamp grounding resistance tester, The advanced grounding resistance tester integrates a variety of measurement methods. In addition to the traditional function of ancillary grounding resistance, it also has the unique function of measuring without auxiliary ground. It uses a large LCD gray screen backlight display and microprocessor technology, through the microprocessor-controlled 2-wire, 3-wire, 4-wire, selection method, double clamp method to test ground resistance. Large-diameter current clamp design, using double jaw measurement technology, without the need to hit the auxiliary ground, without the need to isolate the grounding body and equipment to achieve on-line measurement. Widely used in telecommunications, electricity, meteorology, computer rooms, oil fields, power distribution lines, iron tower transmission lines, gas stations, factory grounding networks, lightning rods and so on.The instrument has the characteristics of precise, fast, simple, stable and reliable.

ES3002 Double clamp multi-function grounding resistance tester is controlled by a microprocessor and can accurately detect ground resistance, soil resistivity, ground voltage, DC voltage and AC current. It uses a fast filtering technique to minimize interference. Displaying the resistance value of the auxiliary electrode in the same screen, which is convenient for judging the measurement error caused by environmental factors, facilitating more accurate measurement of the grounding true resistance value, and storing 500 sets of data at the same time.The online monitoring data can be monitored by the monitoring software. USB data can be uploaded to the PC and has unique functions such as numerical maintenance and intelligent alarm prompting.

ES3002 Double clamp multi-function grounding resistance tester consists of host computer, monitoring software, test line, USB cable, and grounding pin. It has the functions of reading, checking, saving, reporting and printing of historical data.

## II. Technical Specification

### 1.Rang and Accuracy

| Test Function | Range | Accuracy | Resolution |
|---|---|---|---|
| **2、3、4 wire method for measuring ground resistance** | 0.00Ω～29.99Ω | ±2%rdg±5dgt(remark 1) | 0.01Ω |
| | 30.0Ω～299.9Ω | ±2%rdg±3dgt | 0.1Ω |
| | 300Ω～2999Ω | ±2%rdg±3dgt | 1Ω |
| | 3.00kΩ～30.00kΩ | ±2%rdg±3dgt | 10Ω |
| **DC resistance(Re)** | 0.0Ω～299.9Ω | ±2%rdg±3dgt | 0.1Ω |
| | 300Ω～2999Ω | ±2%rdg±3dgt | 1Ω |
| | 3.00kΩ～30.00kΩ | ±2%rdg±3dgt | 10Ω |
| **Selection method for measuring ground** | 0.00Ω～29.99Ω | ±2%rdg±5dgt(remark 1) | 0.01Ω |
| | 30.0Ω～299.9Ω | ±2%rdg±3dgt | 0.1Ω |
| | 300Ω～3000Ω | ±2%rdg±3dgt | 1Ω |
| **Double clamp method for measuring** | 0.01Ω～0.99Ω | ±10%rdg±10dgt | 0.01Ω |
| | 1.0Ω～9.9Ω | | 0.1Ω |
| | 10Ω～100Ω | | 1Ω |
| **Soil resistivity(ρ)** | 0.00Ωm～99.99Ωm | ρ=2πaR (remark 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** | AC 0.00～100.0V | ±2%rdg±3dgt | 0.01V |
| **AC current** | AC 0.0mA～1000A | ±2%rdg±3dgt | 0.1mA |

Remark：

1. Reference conditions: accuracy with Rh Rs < 100Ω。

Working conditions:Rh max＝3kΩ+100R＜50kΩ； Rs max＝3kΩ+100R＜50kΩ

2.Depends on the measurement accuracy of R, π=3.14, a:1 m～100m；

## 2．General specification

| Function | Ground resistance、Soil resistivity、DC resistance、Ground voltage、AC current |
|---|---|
| **Ambient temperature and humidity** | 23℃±5℃， below 75%rh |
| **Interference voltage** | <20V (should be avoided) |
| **Interference current** | <2A (should be avoided) |
| **Measure R electrode spacing** | a＞5d |
| **Measured ρ electrode spacing** | a＞20h |

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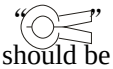
| **Power** | DC 6V 4.5Ah lead-acid battery lasts more than 100 hours standby |
| **Backlight** | Controllable backlight, suitable for use in dim places |
| **measurement mode** | Precise four-wire、 three-wire measurement, simple two-wire measurement、Selection method, double clamp method for measuring grounding resistance |
| **Measurement methods** | 2.3.4-wire method measurement: Polarization method, measuring current 20mA Max<br>Soil resistivity: four-pole method<br>Selectivity Measurement: Polarization Method, Measuring Current 20mA Max<br>Double clamp method: non-contact mutual inductance measurement method, test current 1mA Max<br>DC resistance: polarization method<br>AC current: average rectification (clamp)<br>Ground Voltage: Average Rectification(between S-ES interface) |
| **Test voltage waveform** | Sine wave |
| **Test frequency** | 128Hz |
| **Short circuit test current** | AC 20mA max |
| **Open circuit test voltage** | AC 28V max |
| **Electrode spacing range** | 1m～100m |
| **Display mode** | 4-bit large LCD display, with backlight |
| **Measurement instructions** | LED flashing indicator during measurement |
| **LCD size** | 111mm×68mm |
| **LCD display field** | 108mm×65mm |
| **Instrument size** | L/W/H：277.2mm×227.5mm×153mm |
| **Clamp size** | L/T/H：101mm×27mm×214mm |
| **Test line** | 4 strips：red 15m，black 15m, yellow 10m，green 10m each one |
| **Simple test line** | 2strips：yellow 1.5m，green 1.5m each one |
| **Auxiliary Grounding rod** | 4PCS： ϕ10mm×200mm |
| **Current clamp** | 2PCS： ϕ4 mm Banana plug |
| **Current clamp diameter** | ϕ50mm |
| **Current clamp lead** | Length 2m |
| **Measure time** | AC current：about 2 times/sec;<br>Ground voltage：about 2 times/sec;<br>grounding resistance、soil resistivity: about 7 seconds/time |
| **Line voltage** | Measurement below AC100V (ground voltage measurement function cannot be used to measure commercial power) |
| **USB interface** | With USB interface, storage data can be uploaded to the computer, save and print |
| **Communication Line** | One USB communication line, 1.5m long |
| **Data storage** | 500 groups, "MEM" storage indicates, flashing "FULL" symbol indicates that the memory is full |
| **Data review** | Data review function: "MR" symbol display |
| **Overflow display** | Over-range overflow function: "OL" symbol display |
| **Current clamp low current indication** | When measuring by the selection method or the double-clamp method, when the current signal received by the current clamp A is lower than 0.5 mA, the symbol  is displayed, and at this time, the clamping direction of the current clamp A should be checked. |

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| **Interference test** | Automatic identification of interference signals, "NOISE" symbol indication when the interference voltage is higher than 5V |
| **Auxiliary grounding test** | With auxiliary ground resistance test function, 0.00KΩ ~ 30kΩ (Rh max = 3kΩ +100R <50kΩ; Rs max = 3kΩ +100R <50kΩ) |
| **Alarm function** | Alarm when the measured value exceeds the alarm setting value |
| **Battery voltage** | Real-time display of battery power, reminding timely charging when battery voltage is low |
| **Automatic Shutdown** | “APO” Indicates, automatic Shutdown After 15 Minutes |
| **Power consumption** | Standby: 40mA Max(Backlight off) |
| | Turn on backlight: 43mA Max |
| | measuring：120mA Max(Backlight off) |
| **Weight** | Instrument： 2450g(including battery) |
| | Current clamp：940g(2PCS) |
| | Test lines：1300g(including simple test line) |
| | Auxiliary grounding rod： 850g(4PCS) |
| **Working temperature and humidity** | -10℃～40℃； below 80%rh |
| **Storage temperature and humidity** | -20℃～60℃； below 70%rh |
| **Overload protection** | Grounding resistance：AC 280V/3 seconds between H-E and S-ES ports |
| **Insulation resistance** | 20MΩ以上(500V between circuit and housing) |
| **Pressure resistance** | AC 3700V/rms(between circuit and housing) |
| **Electromagnetic properties** | IEC61326(EMC) |
| **Suitable for safety regulations** | IEC61010-1(CAT Ⅲ 300V、CAT IV 150V、pollution level 2)；<br>IEC61010-031；<br>IEC61557-1(grounding resistance)；<br>IEC61557-5(soil resistivity)；<br>JJG 366-2004.<br>JJG 366-2004(ground resistance meter)；<br>JJG 1054-2009(Clamp grounding resistance meter). |

## III. Accessories

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| **Instrument** | 1PC |
| **Instrument bag** | 1PC |
| **Auxiliary grounding rod** | 4PCS |
| **Current clamp** | 2PCS |
| **Monitoring software CD** | 1PC |
| **USB communication line** | 1PC |
| **Test line** | 4PCS |
| **Simple test line** | 2PCS |
| **6V Battery (built-in)** | 1PC |

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| **charger** | 1PC |
| **Manual, certificate** | 1SET |

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