

## Technical Specifications for Digital Earth Resistance Tester

### A: SCOPE:

This specification covers Design/Engineering, manufacture, testing & calibration as well as supply & delivery of Digital earth resistance meter suitable for measuring earth resistance of electrical installations, impedance of transmission tower & soil resistivity in a single kit as per applicable standard & testing procedure. The offer for supply should include all accessories even though not specifically mentioned but which are essential for complete & satisfactory operation. The instrument shall be portable, light weight with internal chargeable battery.

### B: SPECIFICATION:

- 1) Digital earth resistance tester shall be suitable for accurate measurement of earth resistance of electrical installations, transmission tower and soil resistivity. The tester should be free from the effect of AC earth stray & electrolytic fields as the same is to be used in the live switchyard up to 765 kV.
- 2) The tester should be powered by re-chargeable battery. Low battery indication be provided enabling the user to charge it by connecting it to 230Volt, 50 Hz main supply. (The supply is subject to + 10% fluctuation in voltage and + 3% fluctuation in frequency).
- 3) The instrument shall have range of 0-19.99 K ohms with a resolution of 0.01 ohm. The accuracy of the instrument shall not be more than  $\pm 2\%$  of selected range for earth pit measurement.
- 4) The instrument shall have range of 300 Ohms with a resolution of 1ohm for the impulse method. The accuracy of the instruments shall not be more than  $\pm 2.5\%$  for Impulse earth measurement.
- 5) Instruments should have the feature of
  - a. 2-pole measurement
  - b. 3-pole measurement
  - c. 4-pole measurement
  - d. 3-Pole Clamp method
  - e. Two clamp measurement/Stake less measurement
  - f. Soil resistivity measurement.
  - g. Impulse method for Tower Footing Resistance measurement (4/10 $\mu$ s, 8/20 $\mu$ s, 10/350 $\mu$ s)
- 6) The output voltage should be 25V or 50 V (selectable) with 125 HZ frequency for 50HZ network & 150HZ for 60Hz network (at a test frequency different from 50Hz to avoid electromagnetic interference)
- 7) The indication of high noise and high resistance of spikes (current & potential) provided in test instrument.
- 8) Comply with testing requirements set by international standards.
- 9) Measurement should not be influenced by electrostatic/electromagnetic interference present in EHV switchyards.
- 10) Measurement of disturbance voltage be provided up to 100V
- 11) The instrument should indicate the battery status.
- 12) USB data transfer & free software should be available.
- 13) Bluetooth function for data transfer to mobile application.

- 14) Should be able to perform fall of potential and clamp on technique in same kit for earth resistance measurement along with soil resistivity.
- 15) Printer port for external printer connection/PC interface and having inbuilt memory for at least 900 measurements.
- 16) Safety compliance as per IEC61010-1 CAT III 600V and CAT IV 300V
- 17) Test Certificates are mandatory conforming to the following standards
  - EMC requirements (immunity for industrial environment) according to the following standards 61326-1:2006 and EN 61326-2-2:2006
  - type of insulation double, EN 61010-1 and IEC 61557 compliant
  - quality standard: design, construction and manufacturing are ISO 9001, ISO 14001, PN-N-18001 compliant
- 18) The instrument should be supplied along with its measurement leads (Red-25m, Yellow-50m, Blue -25m), earth spikes (4 Nos.), Connecting clips, charging leads, battery charger, Clamps, USB and a carrying case for safe transportation.

**C: SERVICE AFTER SALE:**

Bidder will have to submit the documentary evidence of having established mechanism for prompt services as & when required.

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