

## **Technical Specifications for Digital Insulation Tester – 15KV**

### **A: SCOPE:**

This specification covers Design/Engineering, manufacture, testing & calibration as well as supply & delivery of Digital Insulation Tester (15 kV) suitable for measuring insulation resistance, DAR, PI in live /running Switch-yard up to 765 kV level 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. Performance from 765KV should be produced by bidder. Type test from NABL/ILAC should be submitted by the bidder (inhouse or factory test report shall not be considered)

### **B: SPECIFICATION**

1. Insulation Tester should be suitable for applications including:
  - a. Insulation testing of EHV power transformers at charged switchyards.
  - b. Insulation testing of EHV underground power cables.
  - c. Insulation testing of EHV switchgears within charged switchyards.
  - d. Insulation testing of capacitors.
  - e. 400/220 kV charged/running substations.
2. The instrument should have an in-built battery and battery charger. The battery should be rugged, have a long life, and support extended working hours. Input voltage for charging the battery should be 230 V  $\pm$ 15%, 50 Hz  $\pm$ 5%, AC.
3. The instrument should be capable of displaying IR values at programmable time intervals set as Rt1, Rt2, Rt3, PI, DAR, voltage applied, leakage current, time, step voltage, dielectric discharge, Ramp test, etc., without requiring any additional searching process.
4. The instrument should allow programmable time settings for resistance measurements as T1, T2, and T3, up to 99 minutes.
5. The instrument should have a direct digital display ranging in Kilo/Mega/Tera Ohms, with a maximum range of 40 T $\Omega$ . The display should be large and backlit for easy readability.
6. The instrument should have selectable test voltage ranges of 500V, 1000V, 2500V, 5000V, 10kV, and 15kV.
  - 6a. The instrument should be operable on both mains and rechargeable battery.
7. The instrument should offer selectable voltage steps: up to 1000V in 10V increments and up to 15,000V in 25V increments.
8. The instrument should have memory storage for 990 cells and support wireless data transmission via Bluetooth and USB.
9. The instrument should be operable via mobile phone and capable of displaying data and graphs in Bluetooth mode.
10. The instrument should include innovative memory features with the ability to enter descriptions, measurement location names, etc.
11. The instrument should automatically calculate DAR, PI, and capacitance based on user-programmed timing.
12. The instrument should have a rated short-circuit rejection current of 7 mA with high accuracy at 15 kV injection.
13. The instrument should support various types of short-circuit currents including 1.2 mA, 3 mA, 5 mA, 7 mA, and 10 mA (for burn mode).

14. The instrument should provide graphical representation of resistance, current, and voltage with respect to time.
15. The instrument should support measurement of polarization and depolarization currents (PDC).
16. The instrument should include a Partial Discharge Indicator (PDI).
17. The instrument should have an efficient converter with ~150W power, enabling insulation burnout to pinpoint short circuits in cables and wires, using one or more of the following methods:
  - Visual (if cables are visible along their length)
  - Reflectometric methods
  - Seismic-acoustic wave detector
  - A-frame to indicate fault direction (for conductors buried in the ground with direct earth contact)
18. The instrument should support induction suppression up to 1550V or more, with automatic discharge of the applied voltage. Manual discharge rods should not be required, ensuring user safety.
19. The instrument should be supplied with double-shielded connecting cables with locking facilities, suitable for use in high-induction environments and ensuring safe connections.
20. The instrument should comply with safety standards IEC 61010-1 CAT IV or equivalent.
21. The instrument should conform to the following standards:
  - a. EMC requirements (industrial immunity): EN 61326-1:2006 and EN 61326-2-2:2006
  - b. Type of insulation: Double insulation as per EN 61010-1 and IEC 61557
  - c. Quality standards: Design, construction, and manufacturing should comply with ISO 9001, ISO 14001, and PN-N-18001
22. The instrument should support real-time data download to Microsoft Windows-based PC software.
23. The instrument should be supplied with a suitable carrying case for the instrument and all its accessories.
24. The instrument should be capable of displaying cable length and capacitance, with temperature correction, on the instrument display.
25. The instrument should have a case protection rating as per EN 60529: IP67.

**C: SERVICE AFTER SALE:**

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