

Annexure: Earth Resistance Meter

Earth Tester Model MRU 200

- earth resistance using auxiliary electrodes,
- earth resistance using auxiliary electrodes and clamp (for measurements of multiple earthing),
- earth resistance using double clamps (for measurement of earthing when it is impossible to use auxiliary electrodes),
- impulse earth impedance (without disconnecting measured earthing),
- ground resistivity (Wenner method),
- current using the clamp (e.g. leakage) and flexible clamp (Rogowsky coil),
- measurement of continuity of equipotential bondings and protective conductors (meeting the requirements of IEC 60364 - 6 - 01:2000 section 6.12.2) with auto-zero function - with current 200 mA.

Additionally:

- measurement of resistance of auxiliary electrodes RS and RH,
 - measurement of interference voltage,
 - measurement of interference frequency,
 - measurement in the presence of interference voltage in the power network
- with frequency 16 2/3 Hz, 50 Hz, 60 Hz and 400 Hz (with automatic selection of proper frequency of measuring signal or with manual selection),
- selection of maximum measuring voltage (25 V and 50 V)
 - introducing the distance between the electrodes for the resistivity in meters (m) and feet (ft),
 - memory of 990 measurements (10 banks of 99 cells each),
 - calibration of clamp used,
 - real time clock (RTC),
 - data transmission to the computer (USB),
 - indication of battery state.

Electric security:

- type of insulation: double, according to EN 61010 - 1 and IEC 61557
- measurement category: CAT IV 300 V acc. to EN 61010 - 1
- protection class acc. to EN 60529, IP54

Rated operational conditions:

- operation temperature: -10...+50°C
- storage temperature: -20...+70°C
- humidity: 20...80%

Other technical data:

- LCD display: graphic, backlit
- interface: USB
- number of measurements carried out of set of batteries: > 1200
- warranty: 36 months

Measurement of interference voltage

0...100 V with Accuracy of $\pm(2\% \text{ m.v.} + 3 \text{ digits})$

Measurement of interference frequency

15...450 Hz with accuracy of $\pm(1\% \text{ m.v.} + 2 \text{ digits})$

Measurement of earthing resistance (method 3- and 4-pole)

measurement range to IEC61557 - 5: 0,100 Ω ...19,9k Ω

Measurement of continuity of equipotential bondings and protective conductors (Rcont)

measurement range to IEC61557 - 4: 0,045 Ω ...19,99k Ω

Measurement of resistance of auxiliary electrodes RH and RS

measurement range to IEC61557 - 4: 1 Ω ...19,99 k Ω

Measurement of multiple earthing resistance with using the clamp and auxiliary

electrodes (3p + clamp) measurement range to IEC61557 - 5: 0,120 Ω ...1,99k Ω

- in range 0,000...0,045 Ω the accuracy is not specified.

Measurement of multiple earthing resistance with using double clamps

0,1 Ω to 149,9 Ω

Measurement of ground resistivity Measurement method: Wenner, $\rho=2\pi L R_E$

0,1 Ω m to 999K Ω m

0,2 L - distance between probes: 1...50 m

Measurement of AC current (leakage)

0,1mA to 300A (Option)

1 - receiving clamp (diameter 52 mm) -

2 - flexible clamp (Rogowsky coil) with diameter 400 mm (Option)

Measurement of Impedance dynamic earthing resistance (RD) with Impulse wave method (4p)

0,1 Ω to 199 Ω

0,2 choice Impulse edges: 4/10 ms, 10/350 ms

All the traditional method and non-traditional method should be available in the same meter

Measurement of 2Pole, 3Pole, 4Pole, 3pole with Clamps, 2 Clamp method, Impulse method, Current measurement, Soil resistivity and memory of 990 results.

Connection diagram for each measurement should be available in meter itself.

GPS Functionality should also be available in the meter itself.

Make: Sonel / equivalent in Megger/FLIR

Handwritten signature and date: 15/02/18