OPERATING MANUAL

EarthLite

Digital Earth Resistance Tester

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CHAPTER 1
SAFETY INFORMATION

This section provides essential guidelines to ensure safe handling and operation of the EarthLite Digital Earth Resistance Tester. Read all instructions carefully before using the instrument. Failure to follow these precautions may result in electric shock, damage to equipment, inaccurate measurements, or personal injury.

The safety information in this manual is intended to complement, not replace, local site safety regulations and engineering practices.

Note: The term *earth* used in this manual refers to *ground* in international terminology.

1.1 General Safety Warnings

- The EarthLite instrument must only be operated by qualified and trained personnel familiar with grounding systems and electrical measurement procedures.
- Use the instrument only for its intended functions—earth resistance and earth voltage testing. Any unauthorized use may compromise internal protection systems.
- Inspect the instrument and test leads before use. Do not use if any damage, cracks, exposed conductors, or insulation wear is present.
- Always verify test leads and terminal connections are secure before applying power or starting measurements.
- Avoid touching test leads, electrodes, clamps, or the installation under test while a measurement is in progress.
- Do not operate the tester if wet or in explosive or flammable environments.
- Ensure the correct mode of selection before performing a test.
- Never leave the instrument connected to a live system unattended.
- Disconnect the tester after completing each measurement and before adjusting any test probes or stakes.
- Do not apply more than the rated maximum voltage between any terminals of the instrument.
- Do not attempt to open, modify, or repair the instrument yourself. Servicing must be performed by authorized personnel only.

1.2 Electrical Shock & Live Earth Precautions

- Always assume that any earth electrode may become energized due to electrical faults or soil potential rise.
- When testing in energized sites (industrial, substations), use appropriate PPE, including insulated gloves, insulated footwear, and rubber safety mats.
- Isolate the grounding system under test whenever possible before measurement.

- Never touch electrode or lead during testing, especially when measuring earth voltage.
- Stop the test immediately if abnormal noise, vibration, heat, or odor are detected.

1.3 Environmental Safety Conditions

To ensure accurate operation and safe performance:

Environmental Condition	Requirement
Operating Temperature	0°C to 45°C
Storage Temperature	–5°C to 60°C
Relative Humidity	≤ 85% non-condensing
Pollution Degree	Pollution Degree 2 environments only

- Avoid operating in direct sunlight for prolonged periods.
- If the unit becomes moist or wet, turn off immediately and allow it to dry completely before reuse.
- Keep the unit free from dust, chemicals, corrosive vapors, or mechanical shock

1.4 Safety Symbols Used on the Instrument

Symbol	Meaning
	Caution: Warns the user of potential hazards and the need to follow instructions to avoid damage or injury.
	The equipment is protected by double insulation.
	Do not dispose of the instrument with normal household waste.
	Indicates conformity with applicable EU Directives.
	Indicates the common reference point of the device and the return path for electrical current.

1.5 Battery Safety – EarthLite (AAA Alkaline)

- Use only **Standard AAA Alkaline** batteries of high quality.
- Insert batteries following correct polarity markings.
- Do not mix new and old batteries, or different brands/types.
- Remove batteries if storing the unit for long periods.
- Do not heat, crush, short circuit, puncture, or dispose of fire.

1.6 Protection Ratings & Safety Standards

The EarthLite tester is manufactured and tested according to:

- IEC 61010-1 (Safety requirements for electrical equipment)
- IEC 61557-1 & 61557-5 (Earth resistance measurement equipment)
- IEC 61326-1 (EMC compliance)
- Measurement Category: CAT III 600V / CAT IV 300V

Warning: Never operate the instrument beyond its rated measurement categories or voltage limits.

CHAPTER 2

INTRODUCTION & APPLICATIONS

The **EarthLite Digital Earth Resistance Tester** is a portable instrument designed for accurate earth voltage and earth resistance measurement using two-pole and three-pole test methods. The EarthLite provides reliable testing of grounding systems in residential, commercial, industrial, and utility installations, ensuring electrical safety and performance of earth electrodes and grounding networks.

The instrument is compact, rugged, and battery-powered, making it ideal for field measurements. With its intuitive user interface, large LCD display, and high measurement accuracy, EarthLite is suitable for daily professional use by electricians, maintenance engineers, contractors, and inspection agencies.

For best operation, all safety instructions must be read and understood before using the tester.

2.1 About EarthLite – Overview

EarthLite is a high-performance digital earth tester developed for verifying the integrity of grounding and earthing systems. It measures the resistance of buried electrodes by injecting test current into the soil and calculating the resulting voltage drop using Ohm's Law.

Key capabilities include:

- **Earth Resistance Measurement** (2P & 3P methods)
- **Earth Voltage Measurement** (up to 450V AC)
- **Selectable measurement ranges** of 20Ω / 200Ω / 2000Ω
- **Noise and interference rejection** for stable readings in challenging field conditions
- **High-contrast LCD display** with HOLD and Backlight features
- **Battery-powered operation** using AAA Alkaline cells

EarthLite is designed to comply with IEC safety and EMC standards, offering dependable performance for ground verification and certification tasks.

2.2 Typical Applications

The EarthLite tester is suitable for a broad set of grounding and earthing evaluations, including:

- Testing **residential, commercial, and industrial** earthing installations
- Inspection and validation of **earth pits and electrode systems**
- Maintenance of **transformer and generator grounding networks**

- Testing grounding of **communication shelters, data centers, and towers**
- Assessing **neutral–earth voltage problems** and identifying unsafe earth potentials
- Routine testing during **electrical installation audits and safety inspections**

2.3 Features & Benefits

- **Two-Pole Earth Resistance Measurement**
  Enables quick and convenient measurement of earth resistance using only two terminals, suitable for checking earth pits without disconnecting existing wiring.
- **Three-Pole Earth Resistance Measurement**
  Provides accurate earth resistance measurement using auxiliary electrodes (P & C stakes) for precise site testing as per standard testing methodology.
- **High Interference & Noise Rejection (up to 50 Vpp)**
  Advanced filtering and signal processing ensure reliable and stable measurements even in high electrical noise environments, such as live industrial sites.
- **Earth Voltage Measurement (Up to 450 V AC)**
  Measures ground-to-neutral voltage to verify installation safety, detect leakage, and assess system health before conducting earth resistance testing.
- **Backlight LCD Display**
  Bright backlit display ensures clear visibility of readings in low-light conditions, including basements and outdoor night testing.
- **Display HOLD Function**
  Allows users to freeze and review stable readings without maintaining probe contact, improving convenience and operational safety.
- **Built-in Volatile Memory (Storage of 50 Readings)**
  Stores up to 50 test results, enabling easy review, analysis, and documentation without the need for repeated testing.
- **Overload Protection (OL Indication)**
  Provides automatic protection up to 1.2 times the measuring range for 10 seconds, safeguarding the instrument against accidental over-range voltage or current exposure.
- **Battery Level Indicator**
  Real-time battery status display helps prevent unexpected shutdowns and supports effective planning during field operations.
- **Rugged Handheld Design**
  Compact, portable, and ergonomically designed enclosure with a firm grip, suitable for demanding field environments.
- **Runs on Standard AAA Alkaline Batteries**
  Powered by **6 × 1.5 V AAA Alkaline Batteries**, ensuring easy availability and extended operating time in the field.

- **Auto Power-Off Function**
  Automatically switches the instrument OFF after **2 minutes of inactivity** to conserve battery life.

2.4 Supplied Accessories

Sr. No.	Item Description	Specification / Details	Quantity
1	**EarthLite Instrument**	Digital Earth Resistance Tester	1 Nos.
2	**Earth Spikes / Ground Stakes**	10 mm diameter × 250 mm length	2 Nos.
3	**Test Leads – Red**	20 m length	1 Nos.
4	**Test Leads – Yellow**	10 m length	1 Nos.
5	**Test Leads – Green**	10 m length	1 Nos.
6	**Simple Test Lead with Alligator Clips**	Double plug × 1, Single plug × 1	1 Nos.
7	**Alkaline Batteries**	1.5 V AAA	6 Nos.
8	**Carrying Bag**	Protective carry case	1 Nos.
9	**User Manual**	Instruction manual	1 Nos.

2.5 Optional Accessories

Sr. No.	Item	Specification / Description	Quantity
1	**Earth Spikes**	10 mm diameter × 450 mm length	2 Nos.
2	**Hammer**	Suitable for driving earth spikes	1 Nos.

CHAPTER 3
INSTRUMENT OVERVIEW

The **EarthLite** Digital Earth Tester is designed with a rugged and ergonomic structure suitable for field environments. The instrument provides intuitive operation through a clearly labeled keypad and a high-visibility digital LCD display with status indicators. All electrical measurement terminals are positioned on the top side of the enclosure to ensure safe and convenient test lead connections.

3.1 Mechanical Design & Enclosure

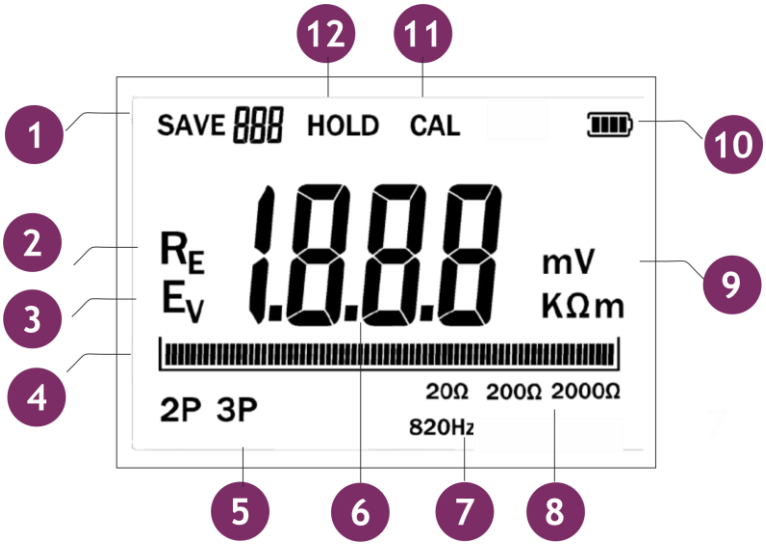
- The EarthLite features durable ABS housing designed to withstand rough handling and outdoor testing conditions.
- The enclosure is lightweight and compact, enhancing portability for field engineers.
- A rubber-protected outer frame absorbs mechanical shock during transport.
- The instrument includes a tilt stand at the rear side to enable angled viewing during testing.
- Designed for IP-rated dust and splash resistance* (based on environmental conditions and proper use).
- Battery compartment located at the rear side with secure screw-lock cover for safe access to AAA cells.

Note: Do not immerse the device in water or operate in heavy rainfall without shelter.

3.2 Front Panel & Keypad Description

Sr. No.	Button / Terminal Name	Function Description
1	**Power Button**	Turns the Earth Tester ON/OFF. Automatically powers down after a period of inactivity to conserve battery life.
2	**Test Button**	Initiates the earth resistance measurement is performed only while this button is pressed once.
3	**Mode Button**	Selects the measurement mode, such as Earth Resistance (Ω) or Earth Voltage (V).
4	**Range Button**	Manually selects the measurement range or switches between auto-range and manual range modes.
5	**BL (Backlight) Button**	Activates or deactivates the LCD backlight for improved visibility in low-light environments.
6	**Load / Save Button**	Short press: Save function. Long press: Load stored readings.
7	**Up Button**	Navigates upward through stored reading values.
8	**Down Button**	Navigates downward through stored reading values.
9	**Terminal (V, E, P, C)**	Measurement terminals: • **E** – Earth electrode under test • **P** – Potential probe • **C** – Current probe • **V** – Voltage measurement terminal

3.4 Display Layout – Symbols and Indicators



Sr. No.	Display Symbol / Indicator	Description
1	**SAVE / LOAD Indication**	Indicates saving or recalling of stored measurement data
2	**Earth Resistance Indication (R_E)**	Indicates earth resistance measurement mode
3	**Earth Voltage Indication (E_V)**	Indicates earth voltage measurement mode
4	**Analog Bar Graph**	Provides a visual representation of the measured value
5	**Measurement Mode & Probe Method Selection**	Displays selected test method (2P or 3P measurement)
6	**Measured Value Display**	Main digital display showing measured resistance or voltage
7	**Test Signal Frequency**	Indicates test signal frequency (e.g., 820 Hz)
8	**Selected Measurement Range**	Shows selected resistance range (20 Ω / 200 Ω / 2000 Ω)
9	**Measurement Units**	Displays measurement units (mV, kΩ, Ω)
10	**Battery Status Indicator**	Indicates remaining battery level
11	**Calibration Mode (CAL)**	Indicates instrument is in calibration mode
12	**Display HOLD Indication**	Indicates the displayed reading is held/frozen

3.5 Auto Power-Off and Backlight

- The EarthLite includes an auto power-off function to conserve battery life.
- If no key operation occurs for approximately 2 minutes, the instrument automatically shuts down.
- The Backlight function may be activated by pressing the HOLD / BL key.
- The backlight will automatically turn off after 15 seconds to prevent battery drain.

Auto power-off is disabled during an active measurement cycle.

CHAPTER 4
OPERATIONS

This chapter describes basic operation of the EarthLite Digital Earth Resistance Tester, including power control, mode selection, range selection, display functions, and memory operations

4.1 Power ON/OFF and Battery Indication

- Press the POWER key once to switch the instrument ON.
- On power-up, the LCD performs a self-test and displays the Earth Resistance mode.
- The battery status indicator appears on the display. Replace batteries when a low-battery indication is shown.
- Press the POWER key again to switch the instrument OFF.

Note: The instrument automatically powers OFF after approximately 2 minutes of inactivity to conserve battery life.

Battery Indication:

Battery Icon	Battery Voltage Level	Status
■■■■	**> 8.2 V**	Battery full
■■■	**7.9 V – 8.2 V**	Battery good
■■	**7.5 V – 7.9 V**	Battery medium
■	**7.0 V – 7.5 V**	Battery low
□	**6.8 V – 7.0 V**	Battery very low – replace batteries

Fig: Low Bat Indication

4.2 Mode Selection

Use the MODE key to cycle through available test modes:

Model	Available Modes
EarthLite	2P → 3P → Earth Voltage

- The currently selected mode is shown on the LCD via symbols and labels.

- Always ensure proper test lead connections before starting a measurement.

Fig: 2P

Fig: 3P

Fig: Ev

4.3 Range Selection (20 Ω / 200 Ω / 2000 Ω)

- Press the RANGE key to select the desired measurement range.
- Available full-scale ranges:
    - 20 Ω (High accuracy for low resistance measurements)
    - 200 Ω (Accuracy for low resistance measurements)
    - 2000 Ω (Higher range for poor or dry soil conditions)

Fig: 20 Ω

Fig: 200 Ω

Fig: 2000 Ω

4.4 Test Frequency and Measurement Time

- EarthLite uses internally generated test current with automatic 820 Hz frequency selection to reject electrical noise and ensure stable measurements.
- Typical measurement time is up to 10 seconds, depending on soil conditions and probe spacing.
- If readings are unstable, increase probe spacing or reposition the electrodes.

4.5 HOLD and Backlight Function

- Press HOLD / BL briefly to freeze the displayed reading; the HOLD symbol appears on the LCD.
- Press again to release the hold.
- The same key activates the LCD backlight for low-light conditions.
- The backlight turns OFF automatically after 15 seconds to conserve battery power.

Fig: HOLD

4.6 SAVE / LOAD Function (50 Readings Memory)

- Press SAVE after a measurement to store the reading; the memory index increments automatically.
- Press and hold LOAD to recall stored data, and use UP / DOWN keys to browse records.
- Press SAVE / LOAD again to exit recall mode.
- Stored readings are retained even after the instrument is powered OFF.

Fig: SAVE Log

4.7 Display Backlight Operation

- Press the HOLD / BL to activate the LCD backlight for viewing in low-light environments.
- The backlight automatically turns off after approximately 15 seconds to conserve battery power.

CHAPTER 5
SET-UP AND CONFIGURATION

This chapter explains site preparation, interference reduction, probe layout, and memory management to ensure accurate and reliable measurements.

5.1 Site Preparation and Soil Conditions

- Ensure clear soil access for auxiliary stakes (for 3P testing).
- Avoid buried metallic structures, pipes, or fences near probes.
- For dry or rocky soil, lightly wet the area to improve contact.
- Insert stakes firmly (minimum **20–30 cm** depth).
- Maintain recommended spacing between electrodes (see Chapter 6).

> **Note:** Soil resistivity and moisture significantly affect readings. Multiple measurements may be required.

5.2 Interference & Noise Rejection Guidelines

To minimize electrical interference:

- Keep test leads away from power cables and transformers.
- Increase probe spacing if readings fluctuate.
- Avoid testing during lightning or near energized grounding conductors.
- Start with the highest resistance range.

Signs of interference:

- Rapidly changing readings
- Intermittent “OL” indication
- Unstable bar-graph display

5.3 Memory Handling (Save, Recall, Clear)

- Up to **50 readings** can be stored.
- Stored data remains intact even after battery removal.
- To clear memory: hold **SAVE** for 5 seconds in memory mode and confirm when prompted.

5.4 Recommended Test Lead Layouts

Proper lead placement ensures accurate measurement of performance. Always install electrodes in a straight line and maintain recommended distances.

Basic 3-Pole (3P) Layout

C ---------- P ---------- ES
Red Lead **Yellow Lead** **Green Lead**

2-Pole (2P) Layout

E (Earth Electrode) ---------- Reference Earth P+C

Green Lead Yellow Lead

General Guidelines:

- Place C at the farthest distance possible from E.
- Place P at approximately 20–50% of the spacing between E and C.
- Keep all three stakes aligned on a straight path to avoid ground loop influence.
- If results vary significantly when repositioning P, increase spacing and repeat test.

Use the standard spacing ranges recommended in Section 6 for professional testing result validation.

CHAPTER 6
MEASUREMENT PROCEDURES

This chapter provides step-by-step instructions for earth voltage and earth resistance measurements.

6.1 Earth Voltage Measurement

Purpose: Measure AC potential difference between earth electrodes.

Connections:

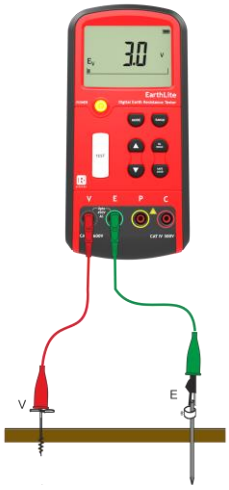


Fig: Earth Voltage

Terminal	Connection
E	Earth electrode under test
V	Reference ground

Procedure

1. Insert reference stake 10–15 m away.
2. Select **Earth Voltage Mode**.
3. Voltage is displayed automatically in **V~**.

Warning: Do not connect to Line (L) or Neutral (N).

Interpretation Guide

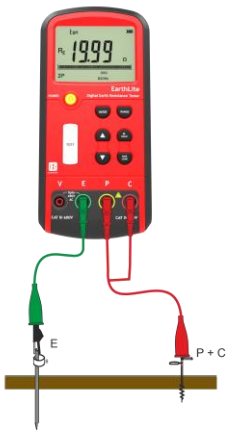
Warning: Do not connect test leads to AC supply Line or Neutral.

Earth Voltage Level (V AC)	Condition	Recommended Action
0 – 1 V	Normal	No action required
1 – 5 V	Acceptable	Monitor grounding condition periodically
> 5 V	Abnormal	Investigate for leakage, neutral imbalance, or grounding issues
> 25 V	Dangerous	Stop work immediately and inspect the grounding system

6.2 Two-Pole (2P) Earth Resistance Measurement

This method measures the earth resistance using only two connections and is useful when installing stakes is impractical.

Connection:



Terminal	Connection
E	Earth electrode under test
P	Secondary ground reference (pipe, neutral earth, buried conductor)

Procedure

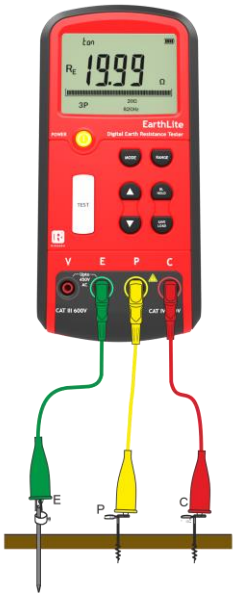
1. Select **2P Mode** using the **MODE** key.
2. Connect the test leads to the terminals and reference ground.
3. Press the **TEST** key to start measurement.
4. Read the result displayed in **Ω (Ohms)**.

The measured value includes the resistance of the reference ground.
Use this method only when the reference ground is known to be low resistance, as results may otherwise be inaccurate.

6.3 Three-Pole (3P) Earth Resistance Measurement

The **3P method** provides more accurate and independent measurement by using auxiliary probes.

Connection:



Terminal	Connection
E	Ground electrode under test
P	Potential test probe
C	Current test probe

Typical spacing:

- E → P: **5–10 m**
- P → C: **10–20 m**

Procedure

1. Insert test stakes in a straight line.
2. Connect test leads according to the diagram.
3. Select **3P Mode** with **MODE** key.
4. Press **TEST** to start measurement.
5. Wait for measurement to stabilize and read the value.

Tip: If readings fluctuate, increase stake distance or improve soil contact.

6.4 Using Existing Ground as Reference (Simple Method)

Used when field stake installation is restricted (concrete, pavement, compact areas).

Steps

1. Bond ES terminal electrode under test.
2. Connect second lead from **V/E** terminal to verified low-resistance reference ground (pipe or building earth).
3. Select **2P mode** and press **TEST**.

6.5 Interpreting Measurement Results

Measured Ground Resistance (Ω)	**Interpretation**	**Recommendation**
0 – 1 Ω	Excellent	Ideal for critical systems (transformers, substations)
1 – 5 Ω	Very Good	Suitable for industrial grounding
5 – 10 Ω	Acceptable	Normal for residential distribution
10 – 25 Ω	Weak	Improve soil treatment / install additional rods
> 25 Ω	Poor / Unsafe	Grounding upgrade required

Actual acceptable values may vary according to standards (e.g., **IS 3043**, **IEEE 142**, **IEC 60364**).

Additional Testing Good Practices

- Perform multiple readings at **different probe distances** and ensure stability before finalizing results.
- Avoid measurement near buried metallic structures or power lines.
- If interference is suspected, increase electrode spacing or increase soil moisture.
- Compare results with site grounding design requirements and regulatory standards.

CHAPTER 7
CALIBRATION & PERFORMANCE

7.1 Measurement Principle (Ohm's Law – V/I)

- Earth resistance measurement is based on the fall-of-potential method.

- The instrument injects a known AC test current (I) into the earth system and measures the resulting voltage drop (V) across the electrode under test. Earth resistance is calculated using Ohm's Law:

$$R=V/I$$

- The use of AC test current minimizes the influence of stray DC voltages present in soil and improves measurement stability under varying soil and environmental conditions.

7.2 Earth Resistance Measurement – Accuracy & Performance

- Measurement Method: 2-Pole (2P) and 3-Pole (3P)

- Measurement Range: 20 Ω / 200 Ω / 2000 Ω

- Resolution:
  - 0.01 Ω (20 Ω range)
  - 0.1 Ω (200 Ω range)
  - 1 Ω (2000 Ω range)

- Accuracy:
  - ± (1.5% of reading + 10 digits) @ 20 Ω
  - ± (1.5% of reading + 5 digits) @ 200 Ω
  - ± (1.5% of reading + 5 digits) @ 2000 Ω

- Test Current Injection:
  - 3.3 mA AC @ 20 Ω range
  - 1.9 mA AC @ 200 Ω range
  - 1.9 mA AC @ 2000 Ω range

- Test Frequency: 820 Hz

- Open-Circuit Voltage: Maximum 47 V

- Typical Measuring Time: Up to 10 seconds

- Interference Rejection: 50 Vpp

7.3 Earth Voltage Accuracy & Reference Conditions

- Voltage Range: Up to 450 V AC

- Measuring Frequency: 50 / 60 Hz

- Resolution:
  - 0.1 V (up to 199.9 V)

- 1 V (up to 450 V)

- Accuracy: ± (1.5% of reading + 5 digits)
- Reference Conditions:
  - Pure sinusoidal AC waveform
  - Ambient temperature: 23 °C ± 5 °C

7.4 Reference & Environmental Conditions

Unless otherwise stated, accuracy specifications are valid under the following conditions:

- Ambient temperature: **23 °C ± 5 °C**
- Relative humidity: **≤ 85% RH (non-condensing)**
- No external electromagnetic interference
- Correct test lead configuration (2P or 3P as applicable)
- Adequate electrode spacing during 3P measurements

Temperature Coefficient: ± **1% of applicable accuracy per 10°C**

7.5 Open Circuit, Lead Error and Overload Indications

- **Open-Circuit / Lead Error Indication:**
  Display shows **"---"** or unstable readings when the test circuit is incomplete, leads are loose, or connections are incorrect.

Fig: Open Circuit Indication

- **Overload Indication:**
  "OL" is displayed when the measured resistance or voltage exceeds the allowable measurement range.

Fig: Overload Indication

The instrument automatically limits test current and protects internal circuitry during overload conditions.

CHAPTER 8
SPECIFICATIONS

Earth Resistance Measurement (2P / 3P)

Parameter	Specification
Measurement Range	20 Ω, 200 Ω, 2000 Ω
Resolution	0.01 Ω (20 Ω), 0.1 Ω (200 Ω), 1 Ω (2000 Ω)
Test Current Injection	3.3 mA @ 20 Ω range1.9 mA @ 200 Ω range1.9 mA @ 2000 Ω range
Test Frequency	820 Hz
Accuracy	±(1.5% of reading + 10 digits) @ 20 Ω±(1.5% of reading + 5 digits) @ 200 Ω & 2000 Ω
Open Circuit Voltage	Max. 47 V
Measuring Time	10 seconds
Interference Rejection	50 Vpp
Overload Indication	“OL” is displayed

Earth Voltage Measurement

Parameter	Specification
AC Voltage Range	Up to 450 V AC
Accuracy	±(1.5% of reading + 5 digits)
Resolution	0.1 V (199.9 V), 1 V (450 V)
Measuring Frequency	50 / 60 Hz
Overload Indication	“OL” is displayed

Environmental Specifications

Parameter	Specification
Operating Temperature	–5 °C to +60 °C
Storage Temperature	–30 °C to +70 °C (without battery)
Relative Humidity	Up to 85% RH (non-condensing)
Temperature Coefficient	±1% of applicable accuracy per 10 °C

Power Supply

Parameter	Specification
Battery	6 × AAA standard size
Battery Type	1.5 V Alkaline batteries
Service Life	Typically 10 sec × 1200 operations

Mechanical Specifications

Parameter	Specification
Dimensions (W × H × D)	97 mm × 205 mm × 45 mm
Weight	Approx. 495 g (with batteries)
Enclosure Protection	IP40
Connector Protection	IP20
Case	Rugged portable handheld device

Display

Parameter	Specification
Display Type	3½ digit LCD with backlight
Main Character Height	17.53 mm
Sub-Character Height	6.61 mm
Display Count	1999 counts (per mode & range)

CHAPTER 9
MAINTENANCE & SERVICE

9.1 General Maintenance & Cleaning

- Disconnect test leads before cleaning.
- Clean the enclosure with a soft cloth lightly dampened with mild detergent.
- Avoid solvents, benzene, or abrasive materials.
- Inspect leads periodically for cuts, corrosion, or loose terminals.

9.2 Battery Replacement Procedure

1. Ensure the instrument is **switched OFF**.
2. Remove the back battery compartment cover using a screwdriver.
3. Replace batteries with **new alkaline cells (e.g., 1.5 V AAA × 6)**.
4. Verify polarity and reseal the cover.
5. Power on the device and check the battery indicator.

9.3 Storage & Transport

- Store in a dry place away from corrosive gases.
- Ensure that the tester and accessories are packed in the supplied carrying case.
- Remove batteries if stored > 3 months.
- Avoid impacts, vibration, or direct sunlight.

9.4 Service, Repair and Warranty

- Only authorized service centers should perform repairs.
- Opening or tampering with calibration seals voids warranty.
- Standard warranty: 12 months from date of purchase (may vary by region).
- Annual calibration recommended for accuracy compliance.

CHAPTER 10
ANNEXURES

10.1 Display Content Reference Table

Display Symbol	Meaning
Ω	Earth resistance mode
Ev	Earth voltage mode
C / P / E	Terminal indicators
- - -	Lead open/error
OL	Over-range
Battery Icon	Battery status

10.2 Quick Connection Diagrams (2P / 3P / Earth Voltage)

2-Pole (2P) Test

- Connect **P (S)** and **C (H)** together to the earth electrode.
- Short test leads for simple ground rod checks.

3-Pole (3P) Test

- **C** → Current probe
- **P** → Potential probe
- **E** → Earth electrode under test

Earth Voltage Measurement

- Set meter to **V** mode.
- Connect across **C** and **P**.
- No test current injection occurs.

10.3 Accessories List

- Earth tester instrument
- Test leads (C/P/E) – 10 m, 10 m, 20 m
- Auxiliary earth rods (2 pcs)
- Carrying case
- User manual
- Batteries (AAA × 6)

- Manual QR

10.4 Glossary of Terms

- **Earth Resistance:** Resistance offered by soil and electrodes to the flow of fault current.
- **Fall-of-Potential Method:** Method using spaced electrodes to measure grounding resistance.
- **Test Current:** AC current injected by the tester to determine ground impedance.
- **Touch Voltage:** Voltage appearing between conductive surfaces under fault condition.
- **Over-Range (OL):** Value beyond instrument capability.

10.5 Revision History

Version	Date	Description
Rev 1.0	Initial Release	Full manual data issued