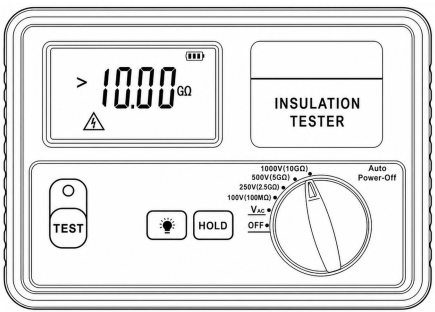
绝缘电阻测试仪

绝缘电阻测试 · 交流电压测量

INSULATION RESISTANCE TESTER · USER MANUAL

型号 / Model □ **IT1000** □ **IT2500B**



■ 2000 字大屏显示 · 自动量程 · CAT Ⅲ 600 V

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关于本说明书

本说明书介绍本仪器的安全操作、使用方法与技术规格。本仪器用于电气装置及设备的绝缘电阻测试，并可测量交流电压。

本说明书为通用版本，同时适用于 **IT1000** 与 **IT2500B** 两款绝缘电阻测试仪。两者的区别在于测试电压档位与标准配置：IT1000 为 100 / 250 /

500 / 1000 V，IT2500B 为 500 / 1000 / 1500 / 2500 V。具体参数以第 5 章技术规格表与第 8.1 节标准配置为准。请在封面勾选本机型号。

随机文件

使用说明书 × 1。若发现包装内物品缺失或仪器在运输中受损，请立即与供货方联系。

1 安全须知

1.1 符号含义

!	重要安全信息，使用前请完整阅读本说明书。
⚡	危险电压，存在触电风险。
⧈	双重绝缘 / 加强绝缘，II 类结构。
CE	符合适用的欧盟指令。
▭	低电量指示，屏幕显示时请尽快更换电池。
∼	交流（AC）。
⎓	直流（DC）。

1.2 基本安全规则

- 对地电压超过 **600 V** 的直流或交流电路上不得使用本仪器；任何两端子之间所加电压不得高于 600 V。
- 测量前确认被测电路已断电，相关负载已全部断开。
- 不得触碰测试线端头、鳄鱼夹、未用端子及裸露导电部件。
- 测试线绝缘须完好无损；发现破损、变形应立即更换。
- 不得在阳光直射、高温、高湿、易燃、易爆、蒸汽或粉尘环境中使用或存放。
- 不得用湿手操作，不得在潮湿环境中操作。

启动绝缘电阻测试时，仪器端子会输出**额定测试电压（IT1000 最高 1000 V DC，IT2500B 最高 2500 V DC）**，屏幕同步显示危险电压符号。

测试期间切勿触碰测试线、鳄鱼夹及任何与被测电路相连的金属部件，否则有触电危险。

1.3 测试过程中的注意

- 转动功能 / 量程旋钮前，须先停止测试并断开测试线。
- 被测电路带有外部电压时，不得进行绝缘电阻测量。
- 屏幕出现低电量符号时应及时更换电池。
- 发现仪器损坏、变形、漏液或显示不全，应立即停止使用。

1.4 预期用途

正确使用：测量电气设备与电气装置的绝缘电阻，以及测量交流电压。适用于绝缘材料、开关柜、变压器、电动机、电缆、电器及通信设备。

禁止使用：

- 潜在爆炸性环境或存在可燃气体的场所。
- 医疗、生命支持及安全关键场合。
- 擅自改装、拆解或自行维修；检修应由具备资质的人员进行。

2 部件与端子

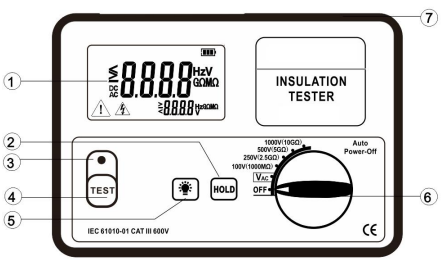


图 1　仪器前面板及按键布局

① 显示液晶　　⑤ 背光键

② HOLD 键（数据保持）　　⑥ 功能 / 量程旋钮

③ 测试电压指示灯　　⑦ 仪表保护套

④ TEST 键（启动测试）

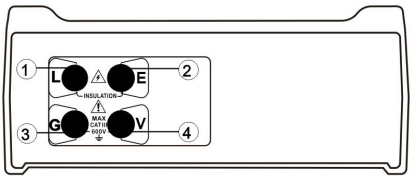


图 2　输入端子（顶视）

2.1 端子定义

L	线路端，接红色测试线
E	接地端，接黑色测试线
G	屏蔽端，用于消除表面泄漏电流干扰
V	交流电压测量输入端

3 快速上手

3.1 绝缘电阻测试（3 步）

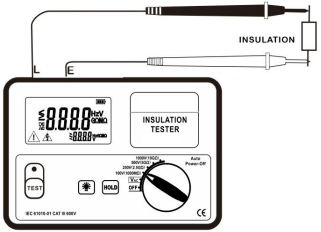


图 3　绝缘电阻测试接线（L / E / G）

1. 旋钮转到所需测试电压档：**IT1000** 为 100 / 250 / 500 / 1000 V，**IT2500B** 为 500 / 1000 / 1500 / 2500 V。
2. 红色测试线接 **L** 端、黑色接 **E** 端，另一端接至被测对象；两条线尽量分开，不要相互缠绕。
3. 按 **TEST** 键开始测试，读数稳定后读取；松开 TEST 键，对被测电路放电后将旋钮转回 OFF。

> 测试前必须确认被测电路已断电、负载已断开。G 端为屏蔽端，测量电缆或大电容设备时接屏蔽层可显著提高准确度。

3.2 交流电压测量（2 步）

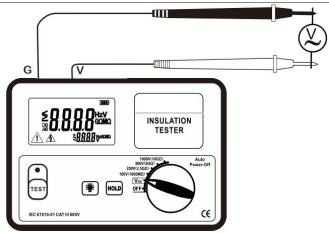


图 4　交流电压测量接线（V / G）

1. 旋钮转到 **VAC** 档。
2. 红色测试线接 **V** 端、黑色接 **G** 端，再接至被测电源两端，读取屏幕数值。

交流电压测量上限为 **600 V**。超过此限值可能引起触电、人身伤害或损坏仪器。

3.3 两个常用功能

HOLD	按一次锁定当前读数，屏幕显示保持符号；再按一次解除。
背光键	开启显示屏背光便于暗处读数；约 10 秒后自动熄灭以省电。

4 操作说明

4.1 选择测试电压

按被测设备的额定电压选择测试电压档位，并确认所选档位在本机可用范围内。无明确规定时，可参考下表：

IT1000（100 / 250 / 500 / 1000 V）

被测设备额定电压	建议测试电压
≤ 50 V	100 V
50 V – 250 V	250 V
250 V – 500 V	500 V
> 500 V	1000 V

IT2500B（500 / 1000 / 1500 / 2500 V）

被测设备额定电压	建议测试电压
≤ 250 V	500 V
250 V – 500 V	1000 V
500 V – 1000 V	1500 V
> 1000 V	2500 V

最终应以被测设备所属标准或制造商规定为准。

4.2 屏蔽端（G）的使用

测量电缆或表面受潮的设备时，表面泄漏电流会并入测量结果，使读数偏低。此时将 **G** 端接至被测对象的屏蔽层或保护环，可将该电流旁路，测得真实的体积绝缘电阻。

4.3 测试后放电

绝缘测试会对被测对象充电，尤其是电缆、电机绕组与电容器。测试结束后必须充分放电，再拆除测试线。

4.4 自动关机与背光

无操作约 10 分钟后自动关机，背光开启约 10 秒后自动熄灭。非连续使用时，仍建议将旋钮拨至 **OFF**。

5 技术规格

5.1 绝缘电阻测量

量程与分辨率（各电压档位通用）

测量范围	分辨率
0.000 – 2.000 MΩ	0.001 MΩ
2.00 – 20.00 MΩ	0.01 MΩ
20.0 – 200.0 MΩ	0.1 MΩ
0.200 – 2.000 GΩ	0.001 GΩ

各档位上限量程与精度

电压档位		上限量程	分辨率	精度
IT1000	100 V	200 – 1000 MΩ	1 MΩ	±(3 % + 5 字)
IT1000	250 V	2.00 – 2.50 GΩ	0.01 GΩ	±(5 % + 5 字)
IT1000	500 V	2.00 – 5.00 GΩ	0.01 GΩ	±(5 % + 5 字)
IT1000	1000 V	2.00 – 10.00 GΩ	0.01 GΩ	±(8 % + 5 字)
IT2500B	500 V	2.00 – 5.00 GΩ	0.01 GΩ	±(5 % + 5 字)
IT2500B	1000 V	2.00 – 10.00 GΩ	0.01 GΩ	±(8 % + 5 字)
IT2500B	1500 V	2.00 – 15.00 GΩ	0.01 GΩ	±(8 % + 5 字)
IT2500B	2500 V	2.00 – 20.00 GΩ	0.01 GΩ	±(10 % + 5 字)

上表为 IT1000 与 IT2500B 在各自全部电压档位（开路电压为直流）下的上限量程；100 V 档上限为 1000 MΩ，不使用 GΩ 行。请按本机型号取值。

精度表示为 ±（读数的 a % + 字数），在 (23 ± 5) °C、45 % – 75 % RH 条件下保证期为 1 年。测试电流 > 1 mA。

5.2 交流电压测量

量程	分辨率	精度
20 V – 600 V	1 V	±(2 % + 5 字)

频率响应 40 – 400 Hz；输入阻抗 10 MΩ；过载保护 600 Vrms。

5.3 通用规格

显示屏	LCD 69 × 42 mm，最大 2000 字
测量方式	自动量程
测试电压	IT1000：100 / 250 / 500 / 1000 V IT2500B：500 / 1000 / 1500 / 2500 V
自动关机	无操作 10 分钟后
背光	LED 背光
高压警告	有
低电量指示	有（屏幕符号）
测试电流	> 1 mA
电源	6 × 1.5 V 5 号（LR6）碱性电池
尺寸 / Dimensions	168（长）× 118（宽）× 70（高）mm
重量 / Weight	约 670 g（含电池）
海拔	≤ 2000 m
过电压类别	CAT Ⅲ 600 V

污染等级	2
绝缘	双重绝缘，Ⅱ 类
适用标准	IEC 61010-1、IEC 61557-1 / -2、IEC 61326-1、IEC 61000-4-2

尺寸与重量因型号而异，以实物或包装标识为准。本表所列规格为 IT1000 与 IT2500B 的共用项，差异项已在上表中标注。

6 维护与保养

6.1 更换电池

> 电池更换应由具备资质的人员进行。更换前务必将测试线从被测电路断开。

1. 将测试线从端子上取下，旋钮置于 **OFF**。
2. 拧下并取下电池盖。
3. 更换 6 节 1.5 V 5 号（LR6）电池，注意极性方向。
4. 装回并拧紧电池盖。

若长期不使用本仪器，请将电池全部取出，避免漏液损坏。

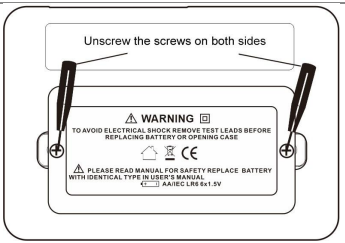


图 5　拧下两侧固定螺钉

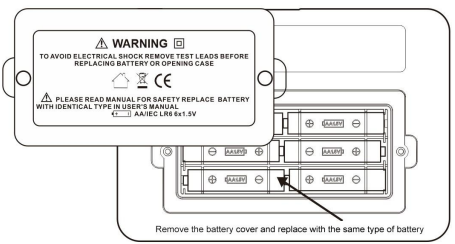


图 6　打开电池盖更换电池

6.2 清洁

用洁净、柔软、干燥的布擦拭外壳。不得使用湿布、溶剂或水；清洁前须先关机并断开所有测试线。

6.3 存放与运输

- 置于携带包内存放与运输，避免机械冲击。

▪ 在恶劣环境中长期存放后，使用前应待仪器恢复至正常状态。

6.4 环境条件

项目	范围
工作温度	−10 °C 至 50 °C
参考温度	23 °C ± 5 °C
工作湿度	45 % 至 75 % RH
存储温度	−20 °C 至 60 °C
存储湿度	< 70 % RH

7 故障排除

下表列出常见现象及处理措施。若按表中方法仍无法排除，请停止使用并联系具备资质的人员检修。

现象	可能原因 / 处理措施
无显示 / 黑屏	检查电池是否装好；电量低或耗尽时更换全部 6 节电池。
显示低电量符号	更换 6 节 1.5 V 5 号（LR6）电池。

绝缘测试无读数或读数不稳	确认被测电路已断电且负载已断开；检查测试线连接；保持两条测试线分离；必要时使用 G 端。
显示不全或外壳损坏	立即停止使用，由具备资质的人员检修。
交流电压读数异常跳动	确认被测电源在 40 – 400 Hz、20 V – 600 V 范围内；检查测试线及接触是否良好。

不得自行拆解或改装本仪器。擅自拆修将使保修失效，并可能造成触电危险。

8 标准配置与保修

8.1 标准配置

IT1000：仪表 × 1、红黑测试表笔 × 1 套、红黑迷你鳄鱼夹 × 1 套、1.5 V 5 号电池 × 6、便携包 × 1、中英文说明书 × 1。

IT2500B：仪表 × 1、红色高压测试棒 × 1、黑鳄鱼夹测试线 × 1、黑测试表笔 × 1、黑迷你鳄鱼夹 × 1、1.5 V 5 号电池 × 6、便携包 × 1、中英文说明书 × 1。

实际配置以包装清单为准。请按封面勾选的型号核对配件。

8.2 保修范围

正常使用情况下，对因材料及工艺缺陷导致的故障提供保修。自购买之日起一年内保证性能符合本说明书所列标准；保修期内可免费更换缺陷部件。

联系售后前，请先确认测试线与电源正常，并复核本说明书中的操作步骤。

8.3 不在保修范围内的情况

- 未经授权的维修、改装，或使用不符合规格的电池与配件。
- 未按本说明书或仪器规格使用，或因使用不当造成的故障。
- 因包装不当造成的运输损坏；返修运费由客户承担。

为持续改进产品，制造商保留在未事先通知的情况下修改规格与技术参数的权利。

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This manual is a generic version covering both the IT1000 and the IT2500B. The English section is identical in content and layout to the Chinese section.

1 Safety

1.1 Symbols

!	Important safety information. Read this manual completely before use.
⚡	Hazardous voltage. Risk of electric shock.
⧈	Double or reinforced insulation, Class II.
CE	Complies with applicable EU directives.
▭	Low battery. Replace the batteries promptly.
~	Alternating current (AC).

⎓ Direct current (DC).

1.2 Basic safety rules

- Do not use on circuits at more than **600 V** to earth, DC or AC. Never apply more than 600 V between any two terminals.
- Before measuring, verify that the circuit under test is de-energised and that all loads are disconnected.
- Do not touch test lead tips, alligator clips, unused terminals or exposed conductive parts.
- Test lead insulation must be intact. Replace leads that are damaged or deformed.
- Do not use or store in direct sunlight, or in high temperature, high humidity, flammable, explosive, vapour-laden or dusty atmospheres.
- Do not operate with wet hands or in damp conditions.

When an insulation test is started, the terminals deliver the **rated test voltage (up to 1000 V DC on the IT1000, up to 2500 V DC on the IT2500B)** and the display shows the hazardous voltage symbol.

Do not touch the test leads, alligator clips or any connected metal part during a measurement — risk of electric shock.

1.3 During measurement

- Stop the test and disconnect the test leads before turning the function / range switch.
- Do not measure insulation resistance on a circuit that carries an external voltage.
- Replace the batteries as soon as the low battery symbol appears.
- Stop using the instrument immediately if it is damaged, deformed, leaking, or the display is incomplete.

1.4 Intended use

Intended use: measuring the insulation resistance of electrical equipment and installations, and measuring AC voltage. Suitable for insulating materials, switchgear, transformers, motors, cables, appliances and telecommunications equipment.

Prohibited use:

- Potentially explosive atmospheres or locations with flammable gas.
- Medical, life-support and safety-critical applications.
- Unauthorised modification, disassembly or repair. Servicing must be carried out by qualified personnel.

2 Parts and terminals

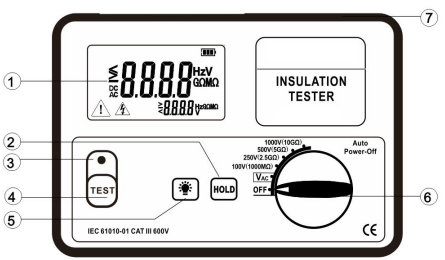


Fig. 1 Front panel and controls

① Display (LCD)
② HOLD key (data hold)
③ Test voltage indicators
④ TEST key (start test)
⑤ Backlight key
⑥ Function / range switch
⑦ Protective rubber holster

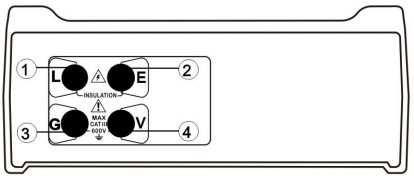


Fig. 2 Input terminals (top view)

2.1 Terminal definitions

L	Line terminal — connect the red test lead
E	Earth terminal — connect the black test lead
G	Guard terminal — eliminates surface leakage current
V	AC voltage measurement input

3 Quick start

3.1 Insulation resistance test (3 steps)

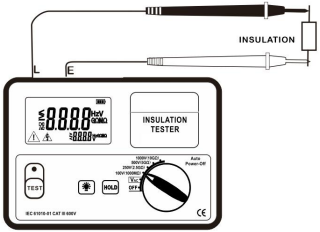


Fig. 3 Insulation resistance test connections (L / E / G)

1. Turn the switch to the required test voltage: 100 / 250 / 500 / 1000 V on the **IT1000**, or 500 / 1000 / 1500 / 2500 V on the **IT2500B**.
2. Connect the red test lead to **L** and the black lead to **E**, then to the object under test. Keep the two leads apart; do not twist them together.
3. Press **TEST** to start and read the value once it has settled. Release TEST, discharge the circuit under test, then return the switch to OFF.

> Before testing, confirm that the circuit is de-energised and all loads are disconnected. G is the guard terminal: connecting it to the shield of a cable or a large capacitive device markedly improves accuracy.

3.2 AC voltage measurement (2 steps)

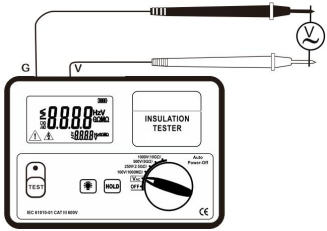


Fig. 4 AC voltage measurement connections (V / G)

1. Turn the switch to the **VAC** position.
2. Connect the red test lead to **V** and the black lead to **G**, then across the supply under test. Read the value on the display.

The AC voltage measurement limit is **600 V**. Exceeding it may cause electric shock, personal injury or damage to the instrument.

3.3 Two frequently used functions

HOLD	Press once to freeze the reading; the hold symbol appears. Press again to release.
Backlight	Switches on the display backlight for reading in dark locations. It switches off automatically after about 10 seconds to save battery.

4 Operation

4.1 Selecting the test voltage

Select the test voltage according to the rated voltage of the equipment under test, and confirm that the setting is available on your model. Where no value is specified, use the following tables as a guide.

IT1000 (100 / 250 / 500 / 1000 V)

Rated voltage of equipment	Recommended test voltage
≤ 50 V	100 V
50 V – 250 V	250 V
250 V – 500 V	500 V
> 500 V	1000 V

IT2500B (500 / 1000 / 1500 / 2500 V)

Rated voltage of equipment	Recommended test voltage
≤ 250 V	500 V
250 V – 500 V	1000 V
500 V – 1000 V	1500 V
> 1000 V	2500 V

The standard applicable to the equipment, or the equipment manufacturer's specification, always takes precedence.

4.2 Using the guard terminal (G)

When measuring cables or equipment with damp surfaces, surface leakage current is added to the measurement and the reading is too low. Connecting **G** to the shield or guard ring bypasses that current, so the true volume insulation resistance is measured.

4.3 Discharging after the test

An insulation test charges the object under test, particularly cables, motor windings and capacitors. Always discharge it fully before removing the test leads.

4.4 Auto power off and backlight

The instrument switches off automatically after about 10 minutes of inactivity and the backlight after about 10 seconds. When it is not in continuous use, still turn the switch to **OFF**.

5 Specifications

5.1 Insulation resistance measurement

Ranges and resolution (common to all voltage settings)

Measuring range	Resolution
0.000 – 2.000 MΩ	0.001 MΩ
2.00 – 20.00 MΩ	0.01 MΩ
20.0 – 200.0 MΩ	0.1 MΩ
0.200 – 2.000 GΩ	0.001 GΩ

Upper range and accuracy per voltage setting

Voltage setting		Upper range	Resolution	Accuracy
IT1000	100 V	200 – 1000 MΩ	1 MΩ	±(3 % + 5 d)
IT1000	250 V	2.00 – 2.50 GΩ	0.01 GΩ	±(5 % + 5 d)
IT1000	500 V	2.00 – 5.00 GΩ	0.01 GΩ	±(5 % + 5 d)
IT1000	1000 V	2.00 – 10.00 GΩ	0.01 GΩ	±(8 % + 5 d)
IT2500B	500 V	2.00 – 5.00 GΩ	0.01 GΩ	±(5 % + 5 d)
IT2500B	1000 V	2.00 – 10.00 GΩ	0.01 GΩ	±(8 % + 5 d)
IT2500B	1500 V	2.00 – 15.00 GΩ	0.01 GΩ	±(8 % + 5 d)

IT2500B	2500 V	2.00 – 20.00 GΩ	0.01 GΩ	±(10 % + 5 d)

The table lists the upper range for every DC voltage setting of both the IT1000 and the IT2500B. The 100 V setting is limited to 1000 MΩ and does not use the GΩ row. Use the values for the model you are operating.

Accuracy is stated as ±(a % of reading + digits), valid for one year at (23 ± 5) °C and 45 % – 75 % RH. Test current > 1 mA.

5.2 AC voltage measurement

Range	Resolution	Accuracy
20 V – 600 V	1 V	±(2 % + 5 d)

Frequency response 40 – 400 Hz; input impedance 10 MΩ; overload protection 600 Vrms.

5.3 General specifications

Display	LCD 69 × 42 mm, 2000 counts
Measurement	Auto ranging
Test voltage	IT1000: 100 / 250 / 500 / 1000 V IT2500B: 500 / 1000 / 1500 / 2500 V
Auto power off	After 10 minutes of inactivity
Backlight	LED backlight
High voltage warning	Yes
Low battery indication	Yes (on-screen symbol)
Test current	> 1 mA

Power supply	6 × 1.5 V alkaline batteries, type LR6 (AA)
Dimensions	168 (L) × 118 (W) × 70 (H) mm
Weight	Approx. 670 g including batteries
Altitude	≤ 2000 m
Overvoltage category	CAT Ⅲ 600 V
Pollution degree	2
Insulation	Double insulation, Class II
Applicable standards	IEC 61010-1, IEC 61557-1 / -2, IEC 61326-1, IEC 61000-4-2

Dimensions and weight vary by model; refer to the actual product or packaging. The specifications above are common to the IT1000 and the IT2500B; model-specific values are marked in the tables.

6 Maintenance

6.1 Replacing the batteries

> Batteries must be replaced by qualified personnel. Disconnect the test leads from the circuit before opening the instrument.

1. Remove the test leads from the terminals and set the switch to **OFF**.
2. Unscrew and remove the battery cover.
3. Fit six 1.5 V type LR6 (AA) batteries, observing the correct polarity.
4. Refit and tighten the battery cover.

If the instrument will not be used for a long period, remove all batteries to avoid damage from leakage.

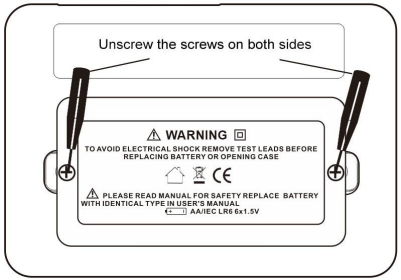


Fig. 5 Unscrew the two fixing screws

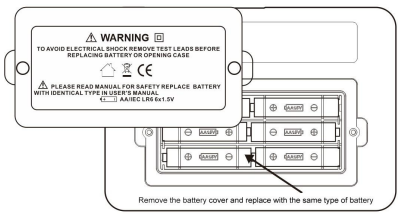


Fig. 6 Open the battery cover and replace the batteries

6.2 Cleaning

Wipe the case with a clean, soft, dry cloth. Do not use a damp cloth, solvents or water. Switch off and disconnect all test leads before cleaning.

6.3 Storage and transport

- Store and transport the instrument in its carrying case, protected from mechanical shock.
- After prolonged storage in harsh conditions, allow the instrument to return to normal condition before use.

6.4 Environmental conditions

Item	Range
Operating temperature	−10 °C to 50 °C
Reference temperature	23 °C ± 5 °C
Operating humidity	45 % to 75 % RH
Storage temperature	−20 °C to 60 °C
Storage humidity	< 70 % RH

7 Troubleshooting

If the fault cannot be cleared, stop using the instrument and contact qualified service personnel.

Symptom	Possible cause / action
No display / blank screen	Check that the batteries are fitted correctly. If they are low or exhausted, replace all six.
Low battery symbol shown	Replace the six 1.5 V type LR6 (AA) batteries.
No reading or unstable reading in insulation test	Confirm the circuit is de-energised and loads disconnected; check the lead connections; use the G terminal if necessary.
Incomplete display or damaged case	Stop using the instrument immediately and have it serviced by qualified personnel.

Abnormal fluctuation of the AC voltage reading	Confirm the supply is within 40 – 400 Hz and 20 V – 600 V; check the test leads and contact.

Do not disassemble or modify the instrument. Unauthorised repair voids the warranty and may create a risk of electric shock.

8 Standard accessories and warranty

8.1 Standard accessories

IT1000: Instrument × 1, red and black test probes × 1 set, red and black miniature alligator clips × 1 set, 1.5 V LR6 (AA) batteries × 6, carry pouch × 1, user manual × 1.

IT2500B: Instrument × 1, red high-voltage test probe × 1, black test lead with alligator clip × 1, black test probe × 1, black miniature alligator clip × 1, 1.5 V LR6 (AA) batteries × 6, carry pouch × 1, user manual × 1.

Contents are as listed on the packing slip. Check the accessories against the model marked on the cover.

8.2 Warranty coverage

Under normal use, the instrument is warranted against defects in materials and workmanship. Performance to the standards stated in this manual is guaranteed for one year from the date of purchase; defective parts are replaced free of charge within the warranty period.

Before contacting service, check that the test leads and power supply are in order and review the operating steps in this manual.

8.3 Exclusions

- Unauthorised repair or modification, or use of batteries and accessories that do not meet the specification.
- Failure caused by use contrary to this manual or to the instrument specification, or by misuse.
- Transport damage caused by inadequate packaging. Return freight is borne by the customer.

The manufacturer reserves the right to change specifications without prior notice.

9 合规性声明

9.1 废弃处置与环境保护（WEEE）

- 本产品受欧盟 WEEE（废弃电气电子设备）指令约束，达到使用寿命后须单独收集并送至经批准的回收处理机构，**不得与生活垃圾一同丢弃。**
- 电池须取出并按当地法规处置，切勿焚烧。
- 本产品制造过程符合欧盟 RoHS 指令 2011/65/EU 的要求。

Waste electrical and electronic equipment must be collected separately. Do not dispose of it with household waste. Remove the batteries and dispose of them in accordance with local regulations. This product complies with the EU RoHS Directive 2011/65/EU.

9.2 符合的指令与标准

指令 / 标准	编号

低电压指令（LVD）	2014/35/EU
电磁兼容指令（EMC）	2014/30/EU
安全——通用要求	EN 61010-1
绝缘电阻 / 通断	EN 61557-1 / -2
电磁兼容——通用抗扰度	EN 61326-1
限制有害物质指令（RoHS）	2011/65/EU

备注　Notes

可用于记录校准日期、测试数据与维护记录。For calibration dates, test results and service history.　版本 V1.0