



3244-60


卡片型万用表 CARD HiTESTER

使用说明书

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中国电子信息产品污染防治管理办法-对应 电子信息产品污染控制指示表

【3244-60 卡片型万用表】

	有毒有害物质及元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr ⁶⁺)	多溴联苯 (PBB)	多溴联苯醚 (PBDE)
主机部分						
实装电路板	×	○	○	○	○	○
电阻器	×	○	○	○	○	○
单旋可变电阻计	×	○	○	○	○	○
振荡器	×	○	○	○	○	○
测试线	×	○	○	○	○	○

○: 对应部件的所有均质材料中, 相对应的有毒有害物质的含量均低于 SJ/T 11363-2006 标准规定的限值。
×: 至少此部件的均质材料中, 相对应的有毒有害物质的含量高于 SJ/T 11363-2006 标准规定的限值。

环境保护使用期限

 此标志中的年数, 列于2006年2月28日公布的【电子信息产品污染防治管理办法】, 是基于 SJ/T 11364-2006【电子信息产品污染控制标识要求】、在中华人民共和国制造进口的电子信息产品适用的环境保护使用期限。只要遵守使用说明书上记载的、此产品安全与使用方面的注意事项, 从制造日算起的此年限内, 就不会发生由于使用产品引起有害物质外泄、突然变异, 而对使用者身体及财产造成严重影响的事件。【环境保护使用期限】不是安全使用期限。产品不适合继续使用, 需要废弃时, 请遵守电子信息产品回收, 再利用相关的法律 规定, 感谢您的配合。
注: 此年数为【环境保护使用期限】, 并非产品的品质保证期限。与电池等附属品一同包装的情况下, 产品与附属品的环境保护使用期限可能会有所不同。

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检查与维护

检查
本仪器送到您手上时, 请检查在运输途中是否发生异常或损坏后再使用。万一有损坏或不能按照参数规定工作时, 请与销售店(代理店)或距您最近的营业所联系。

维护与服务

- 去除本仪器的脏污时, 请用柔软的布蘸少量的水或中性洗涤剂之后, 轻轻擦拭。请绝对不要使用汽油、酒精、丙酮、乙醚、甲酮、稀释剂、以及含汽油类的洗涤剂。否则可能会产生变形和变色。
- 认为有故障时, 请与销售店(代理店)或距您最近的营业所联系。
- 请用运输时不会破损的包装, 同时写明故障内容。对于运输所造成的破损我们不加以保证。
- 为了防止因电池泄漏液体产生腐蚀以及本仪器损坏等现象, 长时间不用时, 请取出电池。

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关于安全

本使用说明书中记载了安全操作本仪器, 保持仪器的安全状态所需要的信息和注意事项。在使用本仪器前请认真阅读下述与安全有关的事项。

⚠ 危险

本仪器是按照 IEC61010 安全标准进行设计和测试, 并在安全的状态下出厂的。如果测量方法有误, 有可能导致人身事故和仪器的故障。另外, 按照本使用说明书记载以外的方法使用本仪器时, 可能会损坏本仪器所配备的用于确保安全的功能。请熟读使用说明书, 在充分理解内容后进行操作。万一发生事故, 除了本公司产品自身的原因以外概不负责。

安全记号

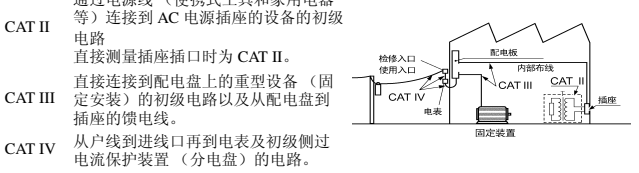
	表示使用者必须阅读使用说明书中有 ⚠ 记号的地方并加以注意。 使用者对于仪器上标示 ⚠ 记号的地方, 请参照使用说明书上 ⚠ 记号的相应位置说明, 操作仪器。
	表示通过双重绝缘或强化绝缘进行保护的仪器。
	表示直流电 (DC)。
	表示交流电 (AC)。

使用说明书的注意事项, 根据重要程度有以下标记。

⚠ 危险	表示如果产生操作或使用错误, 有导致使用者死亡或重伤的极高危险性。	CE	表示符合欧共体部长级理事会指令 (EC 指令) 所示的安全限制。
⚠ 警告	表示如果产生操作或使用错误, 有导致使用者死亡或重伤的危险性。		欧盟各国有关电子电气设备废弃的法规 (WEEE 指令) 的标记。
⚠ 注意	表示如果产生操作或使用错误, 有可能导致使用者受伤或仪器损坏。		
📌 注记	表示产品性能及操作上的建议。		

关于测量分类

本仪器适合于 CAT III (300 V), CAT II (600 V) 基准。为了安全地操作测量仪器, IEC 61010 制定了适合不同电子环境的安全标准, 划分为测量分类 CAT II ~ CAT IV。其定义如下所述。



在大数字类别环境中使用标定于小数字类别的测量仪器将会导致严重事故, 因此必须小心避免。

利用没有分类的测量仪器, 对 CAT II ~ CAT IV 的测量分类进行测量时, 可能会导致重大事故, 因此请绝对避免这种情况。

使用注意事项

- 为了您能安全地使用本仪器, 并充分运用其功能, 请遵守以下注意事项。
- 使用前的确认**
- 在使用前, 请先确认没有因保存和运输造成的故障, 并在检查和确认操作之后再使用。确认为有故障时, 请与销售店(代理店)或距您最近的营业所联系。
 - 请在使用前确认导线的外皮有无破损, 内部是否露出白色部分(绝缘层)。如果有损伤, 则可能会导致触电事故, 请与销售店(代理店)或距您最近的营业所联系。

⚠ 警告

- 请不要淋湿本仪器, 或者用湿手进行测量。否则会导致触电事故。
- 请勿在产生腐蚀性气体, 爆炸性气体的场所中使用。否则, 可能会导致本仪器损坏或引发爆炸事故。

⚠ 注意

- 请不要在阳光直射, 潮湿, 结露的环境中保存和使用。否则会引起变形和绝缘老化, 从而无法满足规格要求。
- 本仪器不是防尘和防水结构。请勿在灰尘较多或淋水的环境中使用。否则会导致故障。
- 在变压器或大电流电路等强磁场区域以及无线电设备等强电场区域附近, 可能无法正确测量。
- 为了防止本仪器损坏, 在搬运及使用时应避免震动, 碰撞。尤其要注意因掉落而造成的碰撞。

规格

测量方式	二重积分方式
测量功能	直流电压 [V], 交流电压 [V], 电阻 [], 检测导通 []
最大测量计数值	3 1/2 位 [4199] (500 V 量程除外) 3 位 [549] (500 V 量程)
电池使用寿命警告显示	标记点亮
采样率	2.5 次 / 秒

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尺寸与重量	约 55W × 109H × 9.5D mm, 约 60 g
附件	使用说明书, 携带盒, 监视器电池 (主机内置)
电源	电池 CR2032 (3 VDC) × 1
耐电压	外壳 - 输入之间 AC4.29 kVrms sin (50/60Hz, 1 分钟)
最大输入电压	500V DC/AC rms (sin) 或 3 × 10 ⁶ V · Hz (DCV/ACV)
最大同相电压	安装盖子时: CAT III 300 V 未装盖子时: CAT II 600 V 预计过渡过电压 4000 V
噪音除去比 (50/60 Hz)	NMRR : V... 40dB 以上 CMRR : V... 100dB 以上 (1k Ω unbalance) ~ V... 60dB 以上 (1k Ω unbalance)
最大额定功率	15mVA
连续使用时间	约 150 小时 [V]
使用场所	室内, 污染度 2, 海拔高度 2000m 以下
使用温, 湿度范围	0 °C ~ 40 °C, 80%RH 以下 (没有结露)
保存温, 湿度范围	-20 °C ~ 60 °C, 70%RH 以下 (没有结露)
温度特性	加上测量精度 × 0.15 / °C (23 °C ± 5 °C 以外)
适用标准	安全 : EN 61010 EMC : EN 61326

精度表
在 23 °C ± 5 °C 80%RH 以下的条件下, 精度保证期为 1 年 (没有结露, 标记不点亮)

功能	量程	测量精度*5	备注
DCV [V]	420.0 mV	± 2.0% rdg. ± 4 dgt.	^{#1} 100 M Ω 以上
	4.200 V	± 0.7% rdg. ± 4 dgt.	约 11 M Ω
	42.00 V	± 1.3% rdg. ± 4 dgt.	约 10 M Ω
	420.0 V	± 1.3% rdg. ± 4 dgt.	约 10 M Ω
	500 V	± 1.3% rdg. ± 4 dgt.	约 10 M Ω
ACV [V]	4.200 V	± 2.3% rdg. ± 8 dgt.	^{#1} 约 11 M Ω
	42.00 V	± 2.3% rdg. ± 8 dgt.	约 10 M Ω
	420.0 V	± 2.3% rdg. ± 8 dgt.	约 10 M Ω
	500 V	± 2.3% rdg. ± 8 dgt.	约 10 M Ω
	Ω	420.0 Ω	± 2.0% rdg. ± 4 dgt.
4.200 k Ω		± 2.0% rdg. ± 4 dgt.	0.7 V (typ.)
42.00 k Ω		± 2.0% rdg. ± 4 dgt.	0.5 V (typ.)
420.0 k Ω		± 2.0% rdg. ± 4 dgt.	0.5 V (typ.)
4.200 M Ω		± 5.0% rdg. ± 4 dgt.	0.5 V (typ.)
42.00 M Ω		± 10.0% rdg. ± 4 dgt.	0.5 V (typ.)
导通检测	420.0 Ω	± 2.0% rdg. ± 4 dgt.	^{#2} 3.4 V 以下 ^{#4} 50 Ω ± 40 Ω

*1: 输入阻抗 *2: 频率范围 *3: 开路端子电压 *4: 蜂鸣音的阈值
*5: rdg. 读取值, dgt. 分辨率

功能

自动省电 (省电功能)

- 进行最后一次操作约 30 分钟之后, 自动进入省电状态。
- 打开电源之后, 省电功能自动启动。需要从省电状态返回时, 请将功能开关设为 OFF。

注记
使用之后, 请将功能开关设为 OFF。自动省电状态下, 只有很少的电池消耗。

- 自动省电功能的解除方法**
- 将功能开关设为 OFF 之后, 在显示全部点亮之前设为 。
 - 显示全部点亮期间 (约 1 秒), 将功能开关从 设为 Ω。显示区中会显示 “APS” → “OFF”, 自动省电功能被解除。
- 一旦将功能开关设为 OFF, 则在通常的电源接通时, 自动省电功能为有效状态。

自动量程功能

测量直流电压 [V], 交流电压 [V] 与电阻 [] 时, 自动将量程设为最佳量程。(没有手动量程的设定。)

上溢显示

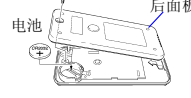
输入超出测量范围时, 显示区中会显示 “OF”。

更换电池

⚠ 警告

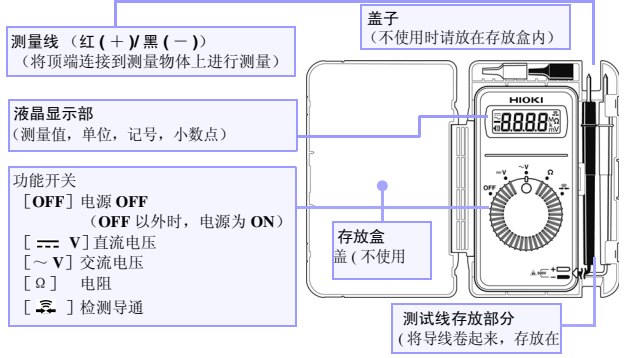
- 为了避免触电事故, 请在将测量线从被测物体上拆下之后, 打开外壳, 更换电池。更换之后, 请务必盖上盖子, 并用螺丝固定之后再使用。
- 请注意 +, - 极性, 请勿反向插入。否则可能会导致性能降低或液体泄漏。请务必更换为指定电池。
- 请勿将电池进行短路, 充电, 拆开或投入火中。否则可能会导致破裂, 非常危险。
- 请按各地区规定处理电池。
- 取出电池时, 请将电池保管在儿童够不到的地方以防止意外吞入。

- 从被测物体上拆下测量线, 然后关闭本仪器的电源。
- 将本仪器从携带盒中取下, 拆下后面板的螺丝。
- 取出用后的电池。
- 请注意极性, 更换为指定电池 (CR2032)。
- 安装后面板, 并可靠地拧紧螺丝。



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各部分的名称与功能



关于盖子的使用

⚠ 危险

测试线顶端的金属针可安装能够拆卸的盖子。为了防止发生短路事故, 在测量分类 CAT III 下进行测量时, 请务必装上盖子使用。在 CAT II 下进行测量时, 请拆下盖子使用。有关测量分类, 请参阅使用说明书中的 “关于测量分类”。

- 注意**
- 金属针顶端锋利, 请注意不要受伤。
 - 装上盖子进行测量时, 请注意不要损伤盖子。
 - 测量期间盖子意外脱落时, 请小心使用以免触电。

测量方法

⚠ 危险

- 为了防止触电事故, 请遵守下述事项。
- 测量之前, 请务必确认功能开关的位置。切换功能开关时, 请从被测物体上拆下测量线。
 - 为电阻测量或检测导通功能时, 请勿输入电压。否则, 可能会导致本仪器损坏, 造成人身伤害事故。为防止发生电气事故, 请在切断测量电路的电源之后再行测量。
 - 最大输入电压为 DC/AC 500 Vrms 或 3 × 10⁶ V · Hz。如果超出该最大输入电压, 则可能会造成本仪器损坏, 导致人身伤害事故, 因此请勿在这种状态下测量。
 - 为了防止发生触电事故, 请勿将测量线顶端与施加有电压的线路发生短路。
 - 为了确保安全, 请务必将测量线连接在断路器的次级侧上进行测量。
 - 最大同相电压为 CAT III (300 V), CAT II (600 V)。请勿进行超出对地电压的测量。否则, 可能会导致本仪器损坏, 造成人身伤害事故。

测量前的检查
为了防止触电事故及误测量, 使用前请确认以下事项。确认工作状态, 发现异常时请立即中止检查, 不要继续使用本仪器。

⚠ 警告

使用前请确认本体是否有损伤之处, 及测试线的绝缘层是否破损、从内部是否有白色部分 (绝缘层) 露出。如果有测试线内部的白色露出, 请不要使用。有破损时, 可能会导致触电事故, 所以请与销售店 (代理店) 或最近的营业所联系。

- 电压测量时, 测试线短路状态的显示为 0V。
- 电阻测量、导通检测时, 测试线短路状态的显示为 0 Ω。
- 测试已知的试料 (电池、工频电源、电阻器等), 显示值为规定值。

注记 确认本仪器是否按技术规格工作, 需要定期点检、校正。

直流电压测量 V

- 将功能开关设为 V。
- 将测量线连接到测量物体上。
- 读取显示部的测量值。

注记

- 如果反接导线的+, -, 显示区则会显示 “-” (负号)。
- 无输入时, 则可能是感应电压导致显示值出现偏差, 这并不是故障。

交流电压测量 V

- 将功能开关设为 V。
- 将测量线连接到测量物体上。测量交流时, 可随意连接+, -。
- 读取显示部的测量值。

电阻测量 []

- 将功能开关设为 Ω。
- 将测量线连接到测量物体上。
- 读取显示部的测量值。

检测导通

- 将功能开关设为 。“” 标记点亮。
- 将测量线连接到测量物体上。
- 处于导通状态时, 蜂鸣器鸣响。

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3244-60 CARD HITESTER

Instruction Manual

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Warranty
Warranty malfunctions occurring under conditions of normal use in conformity with the Instruction Manual and Product Precautionary Markings will be repaired free of charge. This warranty is valid for a period of three (3) years from the date of purchase. Please contact the distributor from which you purchased the product for further information on warranty provisions.

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For regional contact information, please go to our website at <http://www.hioki.com>.

The Declaration of Conformity for instruments that comply to CE mark requirements may be downloaded from the HIOKI website.

Introduction
Thank you for purchasing the HIOKI Model 3244-60 CARD HITESTER. To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference.

Overview

The 3244-60 is a card-shaped digital multimeter designed to measure DC/AC voltage and resistance, and Continuity check.

Inspection and Maintenance

Initial Inspection

When you receive the instrument, inspect it carefully to ensure that no damage occurred during shipping. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

Maintenance and Service

- To clean the instrument, wipe it gently with a soft cloth moistened with water or mild detergent. Never use solvents such as benzene, alcohol, acetone, ether, ketones, thinners or gasoline, as they can deform and discolor the case.
- If the instrument seems to be malfunctioning, contact your dealer or Hioki representative.
- Pack the instrument so that it will not sustain damage during shipping, and include a description of existing damage. We cannot accept responsibility for damage incurred during shipping.
- To avoid corrosion from battery leakage, remove the battery from the instrument if it is to be stored for a long time.

Safety

This manual contains information and warnings essential for safe operation of the instrument and for maintaining it in safe operating condition. Before using it, be sure to carefully read the following safety precautions.

⚠ DANGER

This instrument is designed to comply with IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the instrument. Using the instrument in a way not described in this manual may negate the provided safety features. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from instrument defects.

Safety Symbols

	In the manual, the ⚠ symbol indicates particularly important information that the user should read before using the instrument. The ⚠ symbol printed on the instrument indicates that the user should refer to a corresponding topic in the manual (marked with the ⚠ symbol) before using the relevant function.
	Indicates a double-insulated device.
	Indicates DC (Direct Current).
	Indicates AC (Alternating Current).

Symbols for Various Standards

	This symbol indicates that the product conforms to safety regulations set out by the EC Directive.
	WEEE marking: This symbol indicates that the electrical and electronic appliance is put on the EU market after August 13, 2005, and producers of the Member States are required to display it on the appliance under Article 11.2 of Directive 2002/96/EC (WEEE).

The following symbols in this manual indicate the relative importance of cautions and warnings.

⚠ DANGER

Indicates that incorrect operation presents an extreme hazard that could result in serious injury or death to the user.

⚠ WARNING

Indicates that incorrect operation presents a significant hazard that could result in serious injury or death to the user.

⚠ CAUTION

Indicates that incorrect operation presents a possibility of injury to the user or damage to the device.

NOTE

Indicates advisory items related to performance or correct operation of the product.

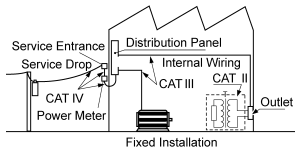
Measurement categories

This product complies with CAT III (300 V), CAT II (600 V) safety requirements. To ensure safe operation of measurement products, IEC 61010 establishes safety standards for various electrical environments, categorized as CAT II to CAT IV, and called measurement categories.

CAT II: Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.) CAT II covers directly measuring electrical outlet receptacles.

CAT III: Primary electrical circuits of heavy equipment (fixed installations) connected directly to the distribution panel, and feeders from the distribution panel to outlets.

CAT IV: The circuit from the service drop to the service entrance, and to the power meter and primary overcurrent protection device (distribution panel).



Using a measurement instrument in an environment designated with a higher-numbered category than that for which the instrument is rated could result in a severe accident, and must be carefully avoided.

Use of a measurement instrument that is not CAT-rated in CAT II to CAT IV measurement applications could result in a severe accident, and must be carefully avoided.

Usage Notes



Follow these precautions to ensure safe operation and to obtain the full benefits of the various functions.

Preliminary Checks

- Before using the instrument the first time, verify that it operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.
- To prevent an electric shock accident, confirm that the white portion (insulation layer) inside the cable is not exposed. If a color inside the cable is exposed, do not use the cable. Using the instrument in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

⚠ WARNING

- Do not allow the instrument to get wet, and do not take measurements with wet hands. The instrument may be damaged.
- Do not use the instrument where it may be exposed to corrosive or combustible gases. The instrument may be damaged or cause an explosion.

⚠ CAUTION

- Do not store or use the instrument where it could be exposed to direct sunlight, high temperature or humidity, or condensation. Under such conditions, the instrument may be damaged and insulation may deteriorate so that it no longer meets specifications.
- This instrument is not designed to be entirely water- or dust-proof. Do not use it in an especially dusty environment, nor where it might be splashed with liquid. This may cause damage.
- Correct measurement may be impossible in the presence of strong magnetic fields, such as near transformers and high-current conductors, or in the presence of strong electromagnetic fields such as near radio transmitters.
- To avoid damage to the instrument, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.

Specification

Measurement method	Double integration
Function	DC voltage (---V), AC voltage(~V), Resistance (Ω), Continuity check (⚡)
Display	3-1/2 digits, LCD, 4199 count max. (except 500 V range) 3 digits, LCD, 549 count max. (500 V range)
Battery low display	lights
Sampling rate	2.5 times/second
Dimensions and mass	Approx. 55W × 109H × 9.5D mm, Approx. 60 g (Approx. 2.17" × 4.29"H × 0.37"D, Approx. 2.1 oz.)
Accessories	Instruction Manual, carrying case, Battery (supplied with this product for monitor), Sleeves (red and black 1 piece for each)
Power supply	Battery CR2032 (3 VDC) × 1
Dielectric strength	4.29 kVrms sin (50/60 Hz for one minute) between input and case
Maximum input voltage	500 VDC/ 500 Vrms(sin) or 3 × 10 ⁶ V+Hz (DCV/ACV)
Maximum rated voltage to earth	When sleeve is installed: CAT III (300 V) When sleeve is uninstalled: CAT II (600 V) (Anticipated Transient Overvoltage: 4000 V)
(50/60 Hz)	NMRR: 40 dB or more (---V) Noise rejection ratio CMRR: 100 dB or more (---V), 60 dB or more (~V)
Maximum rated power	15 mVA
Continuous operating time	Approx. 150 hours (---V)
Operating Environment	Indoors, Pollution Degree 2, up to 2000 m (6562-ft.)

Operating temperature and humidity	0 to 40°C (32 to 104 °F), 80%RH max (no condensation)
Storage temperature and humidity range	-20 to 60°C (-4 to 140 °F), 70%RH max (no condensation)
Temperature characteristics	Measurement accuracy × 0.1 °/°C (except 23°C±5°C)
Standards accuracy	Safety :EN61010 EMC :EN 61326

Accuracy

Accuracy is guaranteed for 1 year at 23°C±5°C, 80%RH or less, and no condensation. Battery low display is off.

Function	Range	Accuracy *5	Remarks	Over load protection
DCV [--- V]	420.0 mV	±2.0% rdg. ±4 dgt.	100 MΩ or over ¹	500 V DC/ACrms (sin) 3 × 10 ⁶ V+Hz
	4.200 V	±0.7% rdg. ±4 dgt.	Approx. 11 MΩ	
	42.00 V	±1.3% rdg. ±4 dgt.	Approx. 10 MΩ	
	420.0 V	±1.3% rdg. ±4 dgt.	Approx. 10 MΩ	
	500 V	±1.3% rdg. ±4 dgt.	Approx. 10 MΩ	
ACV [~ V]	4.200 V	±2.3% rdg. ±8 dgt.	Approx. 11 MΩ ¹	500 V DC/ACrms (sin) 3 × 10 ⁶ V+Hz
	42.00 V	±2.3% rdg. ±8 dgt.	Approx. 10 MΩ	
	420.0 V	±2.3% rdg. ±8 dgt.	Approx. 10 MΩ	
	500 V	±2.3% rdg. ±8 dgt.	Approx. 10 MΩ	
	420.0 Ω	±2.0% rdg. ±4 dgt.	3.4 V or less ³	
4.200 kΩ	±2.0% rdg. ±4 dgt.	0.7 V (typ.)		
42.00 kΩ	±2.0% rdg. ±4 dgt.	0.5 V (typ.)		
420.0 kΩ	±2.0% rdg. ±4 dgt.	0.5 V (typ.)		
4.200 MΩ	±5.0% rdg. ±4 dgt.	0.5 V (typ.)		
Continuity	420.0 Ω	±10.0% rdg. ±4dgt.	3.4 V or less ³ 50 Ω ±40 Ω ⁴	

*1: Input impedance *2: Frequency range *3: Open terminal voltage *4: Threshold level (buzzer sound) *5: rdg. Displayed value, dgt. Resolution

Functions

Auto Power Save Function

- This function automatically switches to the power save state when 30 minutes have elapsed since the last operation.
- The auto power save function is activated automatically when the power is turned on. To restore from the auto power save state, turn the function switch to the OFF position once.

NOTE

To avoid battery depletion, turn the function selector OFF after use (the Auto Power Save feature consumes a small amount of current).

To Disable Auto Power Save

- Move the function switch from the OFF position to the (continuity check) position before all display segments appear.
- While all display segments appear (about one second), move the function switch from to . The is displayed, and the Auto Power Save function is disabled. Turning the function switch momentarily OFF and then back on reactivates Auto Power Save.

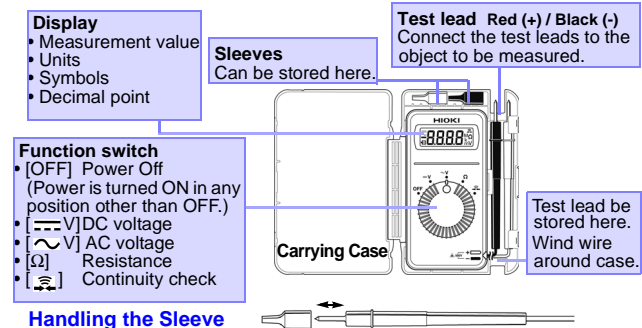
Auto-range Function

When measuring a DC voltage [---V], AC voltage [~V], or resistance [Ω], the measurement range is automatically set to the most appropriate range. Manual range setting is not possible.

Overflow Display

When the input exceeds the measurement range, "OF" is displayed.

Names and Functions of Parts



Handling the Sleeve

⚠ DANGER

Removable sleeves can be attached to the metal pins at the ends of the test leads. To prevent a short circuit accident, be sure to use the test leads with the sleeves attached when performing measurements in the CAT III measurement category. Remove the sleeves from the test leads when performing measurements in the CAT II measurement category. For details on measurement categories, see "Measurement categories" in the instruction manual.

⚠ CAUTION

- The tips of the metal pins are sharp, so take care not to injure yourself.
- When performing measurements with the sleeves attached, be careful to avoid damaging the sleeves.

⚠ CAUTION

- If the sleeves are inadvertently removed during measurement, be especially careful in handling the test leads to avoid electric shock.

Measurement Method



⚠ DANGER

Observe the following precautions to avoid electric shock.

- Always verify the appropriate setting of the function selector before connecting the test leads. Disconnect the test leads from the measurement object before switching the function selector.
- Never apply voltage to the test leads when the Resistance measurement, Continuity check functions are selected. Doing so may damage the instrument and result in personal injury. To avoid electrical accidents, remove power from the circuit before measuring.
- The maximum input voltage is 500 V DC/ACrms or 3 × 10⁶ V/Hz. Attempting to measure voltage in excess of the maximum input could destroy the instrument and result in personal injury or death.
- To avoid electrical shock, be careful to avoid shorting live lines with the test leads.
- For safety, test lead connections must always be made at the secondary side of a circuit breaker.
- The maximum rated voltage between input terminals and ground is CAT III (300 V), CAT II (600 V). Attempting to measure voltages exceeding 450 V with respect to ground could damage the instrument and result in personal injury.

Pre-Operation inspection

To avoid the possibility of electric shock or incorrect measurement, check the following items before using the instrument. If the operation check reveals any abnormalities, stop the check immediately and do not use the instrument.

⚠ WARNING

To prevent an electric shock accident, confirm that the white portion (insulation layer) inside the cable is not exposed. If a color inside the cable is exposed, do not use the cable. Using the instrument in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

- For voltage measurement, short the test leads and check that 0 V is displayed.
- For Measuring Resistance or Continuity Check, short the test leads and check that 0 Ω is displayed.
- Measure a test item with a known value (battery, AC supply, resistor, etc.) to confirm that the known value can be displayed.

NOTE Periodic calibration and inspection is necessary in order to ensure that this instrument operates according to its product specifi

Measuring DC Voltage [--- V]

- Set the function switch to ---V.
- Connect the test leads to the object to be measured.
- Read the display.

NOTE Connecting the leads of negative and positive side oppositely, "-" is displayed. The displayed value may sometimes fluctuate due to induction potential even when no power is supplied. This, however, is not a malfunction.

Measuring AC Voltage [~ V]

- Set the function switch to ~V.
- Connect the test leads to the object to be measured. When measuring AC voltage, the polarity of leads can be ignored.
- Read the display.

Measuring Resistance [Ω]

- Set the function switch to Ω.
- Connect the test leads to the object to be measured.
- Read the display.

Continuity Check [⚡]

- Set the function switch to . The indication appears.
- Connect the test leads to the object to be measured.
- Conductivity is good when the buzzer sounds.

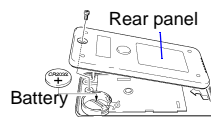
Replacing Battery



⚠ WARNING

- To avoid electric shock when replacing the batteries, first disconnect the test leads from the object to be measured. After replacing the batteries, replace the cover and screws before using the instrument.
- Be sure to insert them with the correct polarity. Otherwise, poor performance or damage from battery leakage could result. Replace batteries only with the specified type.
- Battery may explode if mistreated. Do not short-circuit, recharge, disassemble or dispose of in fire.
- Handle and dispose of batteries in accordance with local regulations.
- Keep batteries away from children to prevent accidental swallowing.

- Remove the test leads from the test item, and power the instrument off.
- Remove the instrument from the case, and remove the screws on the rear panel.
- Remove the used battery.
- Being careful about the polarity, insert the new battery (CR2032) of the specified type.
- Replace the rear panel and fasten the screws.



CALIFORNIA, USA ONLY
This product contains a CR Coin Lithium Battery which contains Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate