HIOKI

3244-50

CARD HiTESTER

INSTRUCTION MANUAL

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Introduction

Thank you for purchasing the HIOKI Model 3244-50 CARD HiTESTER. To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference.

Overview

The 3244-50 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.

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.
- Before using the instrument, make sure that the insulation on the test leads and probes is undamaged and that no bare conductors are improperly exposed. Using the instrument in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

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 AC (Alternating Current).
⎓	Indicates DC (Direct Current).
⏚	Indicates a grounding terminal.

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.

Symbols for Various Standards

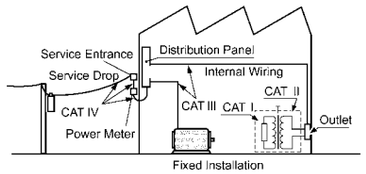
CE	This symbol indicates that the product conforms to safety regulations set out by the EC Directive.
	WEEE marking: This symbol indicates that the electrical and electronic appliance is put on the EU market after August 13, 2005, and producers of the Member States are required to display it on the appliance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

Measurement categories (Overvoltage categories)

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

CAT I: Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device.
CAT II: Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)
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.



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.
- Before using the instrument, make sure that the insulation on the test leads is undamaged and that no bare conductors are improperly exposed. 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 dustproof. 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"W × 4.29"H × 0.37"D, Approx. 2.1 oz).
Accessories	Instruction Manual, carrying case, Battery (supplied with this product for monitor)
Power supply	Battery CR2032 (3 VDC) × 1
Dielectric strength	3.7 kVrms sin (50/60Hz 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	Measurement Category III (300 V) Measurement Category II (600 V), (Anticipated Transient Overvoltage: 4000 V)
(50/60 Hz) Noise rejection ratio	NMRR:40 dB or more [⎓V] 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 x 0.15 /°C (except 23°C±5°C)
Standards accuracy	Safety :EN61010 EMC :EN 61326

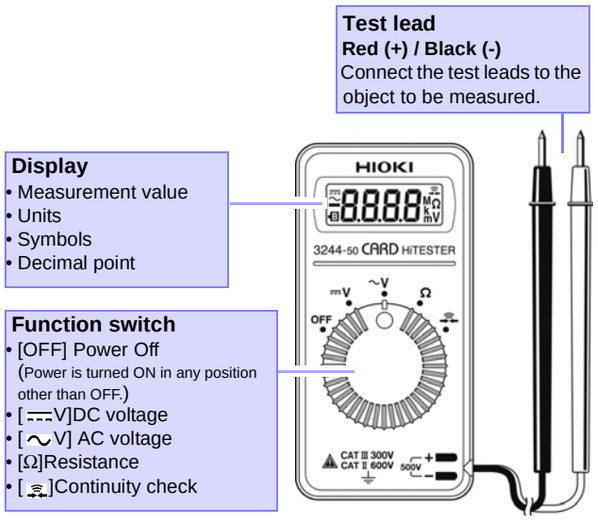
Accuracy

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) or 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]		50 to 500 Hz *2		
	4.200 V	±2.3% rdg.±8 dgt.	Approx. 11 MΩ*1	
	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	
Ω	420.0 Ω	±2.0% rdg. ±4 dgt.	3.4 V or less*3	500 V DC/ ACrms (sin) (one minute)
	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.)	
	42.00 MΩ	±10.0% rdg. ±4dgt.	0.5 V (typ.)	
Continuity	420.0 Ω	±2.0% rdg. ±4 dgt.	3.4 V or less*3 50 Ω ±40 Ω*4	

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

Names and Functions of Parts



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

1. Move the function switch from the OFF position to the (continuity check) position before all display segments appear.
2. While all display segments appear (about one second), move the function switch from to Ω. APS → OFF 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 [W], 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.

Measurement Method ⚠

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

Before using the instrument check that the body of the instrument is not damaged. Also make sure that the insulation on the test leads is undamaged and that no bare conductors are improperly exposed. Using the instrument in such conditions could cause an electric shock accident may occur, 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

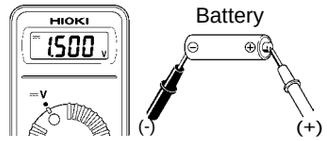
Periodic calibration and inspecton is necessary in order to ensure that this instrument operates according to its product specifications.

⚠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 x 10^6•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.

Measuring DC Voltage [⎓V]

1. Set the function switch to ⎓V.
2. Connect the test leads to the object to be measured.
3. Read the display.

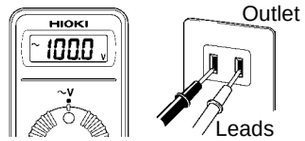


NOTE

Connecting the leads of negative and positive side oppositely, "-" is displayed.

Measuring AC Voltage [~V]

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

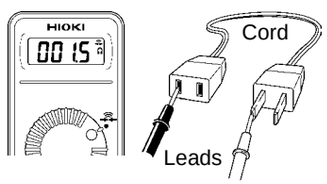


Measuring Resistance [Ω]

1. Set the function switch to Ω.
2. Connect the test leads to the object to be measured.
3. Read the display.

Continuity Check [ ]

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

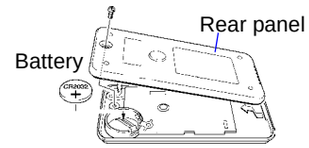


Replacing Battery ⚠

⚠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.

1. Remove the test leads from the test item, and power the instrument off.
2. Remove the instrument from the case, and remove the screws on the rear panel.
3. Remove the used battery.
4. Being careful about the polarity, insert the new battery (CR2032) of the specified type.
5. 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

HIOKI

DECLARATION OF CONFORMITY

Manufacturer's Name: HIOKI E.E. CORPORATION
Manufacturer's Address: 81 Koizumi, Ueda, Nagano 386-1192, Japan
Product Name: CARD HiTESTER
Model Number: 3244-50

The above mentioned product conforms to the following product specifications:
Safety: EN61010-1: 2001
EN61010-031:2002
EMC: EN61326-2-2:2006
ClassB equipment
Portable test, measuring and monitoring equipment used in low-voltage distribution systems

Supplementary Information:
The product herewith complies with the requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

HIOKI E.E. CORPORATION
19 June 2009
Atsushi Mizuno
Director of Quality Assurance
3244E999-00