

HIOKI

3244

CARD HiTESTER

INSTRUCTION MANUAL

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Introduction

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

Accuracy

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

| Function | Range | Accuracy ⁺⁵ | Remarks | Over load protection |
|-------------------------------------|---------------------|------------------------|----------------------------------|----------------------------|
| DCV [$\overline{\text{---}}$ V] | 420.0 mV | ±2.0% rdg. ±4 dgt. | *1 100 MΩ or over | 500 V DC/ ACrms (sin) |
| | 4.200 V | ±0.7% rdg. ±4 dgt. | 11 MΩ approx. | |
| | 42.00 V | ±1.3% rdg. ±4 dgt. | 10 MΩ approx. | |
| | 420.0 V | ±1.3% rdg. ±4 dgt. | 10 MΩ approx. | |
| | 500 V | ±1.3% rdg. ±4 dgt. | 10 MΩ approx. | |
| ACV [\sim V] | 4.200 V | ±2.3% rdg. ±8 dgt. | *2 50 to 500 Hz | 3 x 10 ⁶ V · Hz |
| | 42.00 V | ±2.3% rdg. ±8 dgt. | 11 MΩ approx. | |
| | 420.0 V | ±2.3% rdg. ±8 dgt. | 10 MΩ approx. | |
| | 420.0 V | ±2.3% rdg. ±8 dgt. | 10 MΩ approx. | |
| | 500 V | ±2.3% rdg. ±8 dgt. | 10 MΩ approx. | |
| Ω | 420.0 Ω | ±2.0% rdg. ±4 dgt. | *3 3.4 V or less | 250 V DC/ ACrms (sin) |
| | 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. ±4 dgt. | 0.5 V (typ.) | | |
| Continuity | 420.0 Ω | ±2.0% rdg. ±6 dgt. | *3 3.4 V or less *4 50 Ω±30 Ω | |

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

Safety Symbols

| | |
|--|---|
| | 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. |
| | In the manual, the symbol indicates particularly important information that the user should read before using the instrument. |
| | Indicates a double-insulated device. |
| | Indicates DC (Direct Current). |
| | Indicates AC (Alternating Current). |

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 instrument. |
| | NOTE Indicates advisory items related to performance or correct operation of the instrument. |

Specification

| | |
|--|--|
| Measurement method | Double integration |
| Display | 3-1/2 digits, LCD, 4199 count max. |
| Battery low display | |
| Range switching | Auto-range |
| Sampling rate | 2.5 times/second |
| 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 0.1 / °C |
| (50/60 Hz) | NMRR:40 dB or more [$\overline{\text{---}}$ V] (50 or 60 Hz [\sim V]) |
| Noise rejection ratio | CMRR:100 dB or more [$\overline{\text{---}}$ V], 60 dB or more [\sim V] |
| Power supply | Battery CR2032 (3 VDC) x 1 |
| Continuous operating time | Approx. 150 hours [$\overline{\text{---}}$ V] |
| Rated power | 4.0 mW [$\overline{\text{---}}$ V], 0.15 mW [Auto-power Save] (Maximum rated power: 15 mVA continuity test at short-circuit) |
| Dielectric strength | 3.7 kVrms sin (for one minute) between input and case |
| Dimensions and mass | Approx. 55W x 109H x 9.5D mm, Approx. 60 g (Approx. 2.17"W x 4.28"H x 0.37"D, Approx. 2.1 oz.) |
| Maximum input voltage (for 1 minute) | 500 VDC/ACrms (sin) or 3 x 10 ⁶ V · Hz [$\overline{\text{---}}$ V, \sim V] |
| Accessories | Instruction Manual, carrying case |
| Standards accuracy Safety | EN 61010-1:2001, EN61010-031:2002 Pollution Degree 2, Measurement Category 500V (anticipated transient overvoltage 4 kV) |
| EMC | EN 61326:1997+A1:1998+A2:2001+A3:2003 |

Safety

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. 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.

■ Measurement categories (Overvoltage categories)

This instrument complies with CAT II (500V) 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. These are defined as follows.

CAT I : Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device.

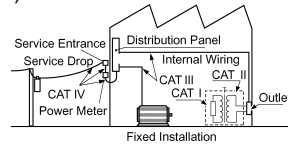
CAT II : Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)

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).

Higher-numbered categories correspond to electrical environments with greater momentary energy. So a measurement device designed for CAT III environments can endure greater momentary energy than a device designed for CAT II.

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. Never use a CAT I measuring instrument in CAT II, III, or IV environments. The measurement categories comply with the Overvoltage Categories of the IEC60664 Standards.



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.

Precautions

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

Preliminary Checks

• 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. This may cause an electric shock.
- 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

- This instrument should be installed and operated indoors only, between 0 and 40°C and 35 to 80% RH. However, it can be safely operated down to -10°C.
- 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.
- Do not use the instrument near a source of strong electromagnetic radiation, or near a highly electrically charged object. These may cause a malfunction.
- To avoid damage to the instrument, protect it from physical shock when transporting and handling. Be especially careful to avoid physical shock from dropping.

Functions and Display

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.

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 . 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 [$\overline{\text{---}}$ V], AC voltage [\sim 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

1. Display
 2. Function switch
OFF Power Off
(Power is turned ON in any position other than OFF.)
Display : Measured value
Units
Symbols
Decimal point
 3. Red test lead (+)
 4. Black test lead (-)
-

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.
- The maximum input voltage is 500V DC/ACrms or 3 x 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 500 V DC/ACrms. Attempting to measure voltages exceeding 500 V with respect to ground could damage the instrument and result in personal injury.
- Never apply voltage to the test leads when the Resistance measurement, Continuity test 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.

Voltage Measurements

Measuring DC Voltage [$\overline{\text{---}}$ V]

1. Set the function switch to $\overline{\text{---}}$ V.
 2. Connect the test leads to the object to be measured.
 3. Read the display.
-

Measuring AC Voltage [\sim V]

1. Set the function switch to \sim 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 Test

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.
-

Maintenance

CAUTION

- Adjustments and repairs should be made only by technically qualified personnel.
- If the protective functions of the instrument are damaged, either remove it from service or mark it clearly so that others do not use it inadvertently. They may cause discoloration or damage.

NOTE: To avoid corrosion from battery leakage, remove the battery from the instrument if it is to be stored for a long time.

- 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, confirm that the battery is not discharged, and that the test leads is not open circuited before contacting your dealer or Hioki representative. Pack the instrument carefully so that it will not be damaged during shipment, and include a detailed written description of the problem. Hioki cannot be responsible for damage that occurs during shipment.

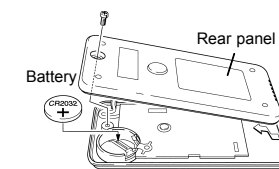
Replacing Battery

WARNING

- To avoid electric shock when replacing the battery, first disconnect the test leads from the object to be measured. After replacing the battery, 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 battery only with the specified type.
- To avoid the possibility of explosion, do not short circuit, disassemble or incinerate battery.
- Keep battery away from children to prevent accidental swallowing.
- Handle and dispose of battery in accordance with local regulations.

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 of the specified type.
5. Replace the rear panel and fasten the screws.

NOTE: When the battery is exhausted, the "indication appears in the display. Battery is not included in the basic price of this instrument. (For testing purposes, battery is inserted into the instrument, but if it should be exhausted it is not replaced free of charge.)



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HIOKI
HIOKI E.E. CORPORATION
INSPECTION CERTIFICATE

HIOKI E.E. CORPORATION hereby certifies that the under-mentioned product(s) has been tested and inspected in accordance with applicable HIOKI calibration procedures, and proven to meet or exceed published measurement specifications. We also certify that the measurement standards and instruments used in the calibration procedure are traceable to the national standards organization.

Product Name: CARD HiTESTER
Model Number: 3244

The above mentioned product conforms to the following product specifications:

Safety: EN61010-1:2001
EN61010-031:2002
EMC: EN61326:1997+A1:1998+A2:2001+A3:2003
Class B equipment
Portable test, measuring and monitoring equipment used in low-voltage distribution systems

Model: 3 2 4 4

S/N: _____

INSPECTOR
T. Kito
T. Kito

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

The above mentioned product conforms to the following product specifications:

Safety: EN61010-1:2001
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Class B 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 73/23/EEC and the EMC Directive 89/336/EEC.

15 September 2006
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President
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