

3030-10

HiTESTER

Instruction Manual EN

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HIOKI

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- Regional contact information
- The latest revisions of instruction manuals and manuals in other languages.
- Declarations of Conformity for instruments that comply with CE mark requirements.

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.

Introduction

Thank you for purchasing the HIOKI 3030-10 HiTESTER. To obtain maximum performance from the instrument, please read this manual first, and keep it handy for future reference. 60014966B

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

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

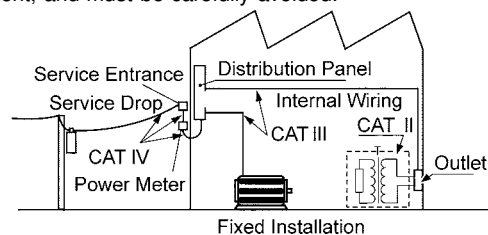
CAT II: Primary electrical circuits in equipment connected to an AC electrical outlet by a power cord (portable tools, household appliances, etc. CAT II covers directly measuring electrical outlet receptacles.

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.



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.

■ 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 grounding terminal.
□	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.

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

⚠ DANGER

- Observe the following precautions to avoid electric shock. Always verify the appropriate setting of the range selector switch before connecting the test leads. Disconnect the test leads from the measurement object before switching the range selector switch.
- Before taking a measurement, check the position of the range switch. Do not measure voltage outside the set voltage range or voltage at levels in excess of the measurement limit. Doing so may damage the instrument or cause an accident resulting in injury or death.
- Do not input voltage to the current measurement, resistance measurement, and battery test ranges. Doing so may damage the instrument or cause an accident resulting in injury or death.

NOTE: The built-in fuse prevents a short-circuit in a power line resulting from a malfunction or misuse of the instrument. However, this built-in fuse protection is effective for up to 250 VAC commercial power input.

- If the end of a test lead short-circuits lines with a voltage between them, this is very dangerous and can lead to a serious accident. Exercise great care when measuring voltage.

⚠ WARNING

To prevent electric shock, do not allow the instrument to become wet and do not use the instrument when your hands are wet.

⚠ CAUTION

- If the protective functions of the instrument are damaged, either remove the instrument from service or post warnings to prevent others from using the instrument inadvertently.
- Note that the instrument may be damaged if voltage or current in excess of the measurement range is input.
- Do not store or use the instrument where it will be exposed to direct sunlight, high temperatures, high humidity, or condensation. If exposed to such conditions, the instrument may be damaged, the insulation may deteriorate, and the instrument may no longer satisfy its specifications.
- After use, always turn OFF the power.

NOTE

- If the meter pointer is not positioned in the 0 scale value, use the zero adjuster to adjust it correctly.
- If the fuse is blown, or the test leads are damaged, any range does not operate. To check the test leads wiring and fuse blowing, refer to “3. Fuse and Test Leads Continuity Check” in Battery and Fuse Replacement.
- If the meter cover becomes electrostatically charged, values may display incorrectly because of attractive forces on the needle. In this case, apply anti-static treatment to inhibit electrostatic charge buildup. The efficacy of such electrostatic treatments dissipates over time, so the treatment may need to be reapplied periodically.

Measurement Procedure

Pre-Operation Inspection

To avoid the possibility of electric shock or incorrect measurement, check the following items before using the instrument.

⚠ WARNING

- Use only the supplied Model L9207-30 TEST LEAD.
- Before using the instrument, make sure that the insulation on the test leads is undamaged and that the white or red portion (insulation layer) inside the cable is not exposed. Using the instrument in such conditions could cause an electric shock, so contact your dealer or Hioki representative for replacements. (Model L9207-30 TEST LEAD)

- For voltage measurement, short the test leads and check that 0 V is indicated.
- For resistance measurement, short the test leads and adjust the reading to zero using the zero ohm adjuster (0 Ω ADJ knob).
- Measure a test item with a known value (battery, AC supply, resistor, etc.) to check that the instrument is functioning correctly.

Voltage Measurement (AC, DCV)

⚠ DANGER

The maximum input voltage is 600 V DC/AC. Attempting to measure voltage in excess of the maximum input could destroy the instrument and result in personal injury or death.

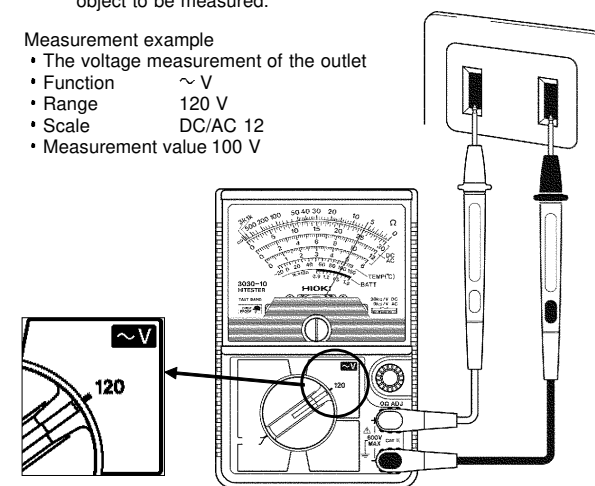
⚠ CAUTION

Removable sleeves are 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. When performing measurements with the sleeves attached, be careful to avoid damaging the sleeves. If the sleeves are inadvertently removed during measurement, be especially careful in handling the test leads to avoid electric shock.

1. Set the range switch to the ACV or DCV range proper for the voltage to be measured.
NOTE: If the voltage value is unclear, initially set the range switch to the 600 V range, and after obtaining a reading in this range, change to the range proper for the voltage value.
 2. Connect the black test lead to the - terminal, and the red one to the + terminal.
 3. Connect the test leads to the circuit to be measured in parallel, then read the results on the AC/DC scale. When the DCV is selected, if connecting the red test lead to the positive side, and the black one to the negative side, then the pointer deflects normally.
- NOTE:** When changing the range, disconnect the test leads from the object to be measured.

Measurement example

- The voltage measurement of the outlet
- Function ~ V
- Range 120 V
- Scale DC/AC 12
- Measurement value 100 V



Current Measurement (DCmA, 60 μADC)

⚠ DANGER

Do not apply a voltage while a current range is selected. Applying a voltage may result in damage to the instrument, or a serious accident.

⚠ WARNING

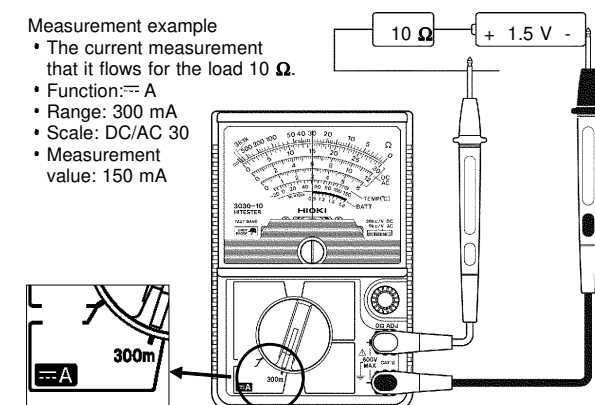
- To avoid electrical shock, do not use the instrument to measure current in circuits of 250 V or greater. The current function overload protection trips at 250 Vrms.
- To prevent electrical accidents, turn the power off before connecting the test leads and then take measurements.

1. Set the range switch to the DCmA or 60 μA range.
NOTE: If the current value is unclear, initially set the range switch to the 300 mA DC range, and after obtaining a reading in this range, change to the range proper for the current value.
 2. Connect the black test lead to the - terminal, and the red one to the + terminal.
 3. Connect the instrument to the electrical line to be measured in series (to the cut off line). Connect it so that current flows from the red test lead to the black one. (If connecting it reversely, the pointer deflects in the reverse direction.)
- NOTE:** When changing the range, disconnect the test leads from the object to be measured.

4. Read the result on the AC/DC scale.

Measurement example

- The current measurement that it flows for the load 10 Ω.
- Function: --- A
- Range: 300 mA
- Scale: DC/AC 30
- Measurement value: 150 mA



** DANGER**

Do not input voltage to the resistance measurement functions. Doing so may damage the instrument or cause an accident resulting in injury or death.

Turn off the power and discharge the capacitors before measuring resistance in a circuit.

- Function Ω
 - Scale
 - Measurement value 5.1 k Ω
-
- The diagram illustrates the correct setup for measuring resistance with a digital multimeter. The multimeter's dial is set to the resistance function, indicated by the Ω symbol. The LCD display shows a reading of 5.1 k Ω . The test leads are connected to the terminals labeled 'COM' and 'RES'. An inset provides a detailed view of the bottom-left corner of the device, showing the 'x10 (LED)' range selector and the Ω function button.

1. Set the range switch to the $\Omega \times 10$ (LED) range.
2. Connect the test leads to both sides of the LED to be tested.
3. The LED has polarity, so unless it light in 2., try reversing the test leads connections.
4. When it lights, the pointer deflect, however a reading has no meaning.

NOTE: The internal battery of the Ω meter has positive polarity in the - terminal. Therefore, it is right to connect the red (+) test lead to the cathode side of the LED, and the black (-) one to the anode side.

1. Set the range switch to the Ω function, R x 10 (TEMP) range.
2. Connect the two black plugs of the three plugs of the temperature probe to the + and - terminals.
3. Use the zero ohm adjuster (0 Ω ADJ knob) to adjust the pointer to the 0 Ω scale.
4. After 0 Ω adjustment, change the plug in the + terminal to the red plug.
5. Connect the temperature probe tip to the measurement place, and read the value from the temperature scale.

Be careful to avoid touching the removed plug with any other objects.

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⚠ DANGER
Do not apply a over-voltage while a BATT 1.5 V range is selected. Applying a over-voltage may result in damage to the instrument, or a serious accident.

- Function BATT
 - Scale BATT
 - Measurement value 1.5 V
-
- The diagram illustrates the multimeter's battery test function. The main image shows the multimeter with the 'BATT' function selected. The display shows 'BATT 1.5V'. The meter is connected to a 1.5V battery source. An inset shows a close-up of the battery symbol on the display.

To avoid electric shock when replacing the batteries and fuse, first disconnect the test leads from the object to be measured. Also, after replacing the batteries, fuse, always replace the case before using the instrument.

part.

3. Replace the batteries and fuse.

- Insert the batteries with the polarity correct as per the battery indication

FUSE

Spare fuse

A good one should always

1. Fit the nail on the edge of the lower part.

Specifications (*mark: shared range)	
DCV	*0.3/3/12/30/120/300/600 V, 20 kΩ/V (0.3 V:16.7 kΩ/V), ±2.5% of f.s. reading
ACV	12/30/120/300/600 V, 9 kΩ/V, ±2.5% of f.s. reading (12 V: ±4%)
DCA	*60 μA, 30/300 mA, internal voltage drop (nominal value) 300 mV, ±3% of f.s. reading
Ω	0 to 3 kΩ, central scale 30 Ω, R x 1/R x 10/R x 100/R x 1 k, ±3% of scale length
BATT	0.9 to 1.8 V, load resistance 10Ω, ±6% of f.s. reading
Temperature scale	-20 to 150°C (standard), -20 to 300°F (for USA only), ±3% of scale length (with the optional 9021-01 THERMISTOR TEMPERATURE PROBE)
Protective system	Short circuit protection of power line by fuse (up to 250 VAC commercial power input) NOTE: This system is not for protecting the instrument from damage but for securing safety. Overload protection of meter device by diode
Meter	Internally magnetized taut band
Fuse	F0.5 AH/250 V, 20 mm x 5 mm dia. (non-arcing type), Internal resistance Approx. 0.866 Ω
Drop proof	One meter to concrete
Standards applying	Safety EN 61010 Measurement Category III (anticipated transient overvoltage 6000 V), Pollution Degree 2 EMC EN 61326

- Meter Nomenclature
- | | | | |
|---------------------------|--------------------------|------------------|---------------|
| 1. Panel | 2. Pointer | 3. Case back | 4. Face plate |
| 5. Range selector switch | 6. Scale plate | 7. Zero adjuster | |
| 8. Zero ohm adjuster | 9. Positive (+) terminal | | |
| 10. Negative (-) terminal | | | |