

Measurement Procedures

Pre-Operation Inspection

Check the following before using the instrument.

Checkpoints	In case of failures
Check whether the cladding of the test lead is not torn and the white or red portion (insulation layer) inside the cable is not exposed.	When damage is found, replace with the specified new test leads Model L9208. Failure to do so may result in electric shock.
Check whether the clamp sensor or the case is free of damage.	If damage has occurred, avoid using the instrument. Use of the instrument under these conditions may result in electric shock.
Make sure that the mating portion of the clamp sensor tip is mate properly.	If the mating portions do not mate properly, accurate measurements cannot be guaranteed. Gently wipe off any dirt with a soft cloth found on the surface of the mating portions. If the sensors do not mate properly, repair is necessary.
Make sure there are no missing display of the LCD panel.	If missing, repair is necessary.
Make sure that the display of the LCD panel is not dim or faint.	If the display is dim or faint, the environmental condition may be low temperature (lower than 0°C) or battery may be exhausted. In case of battery exhaustion, replace battery. If the display remains dim even after the battery is replaced, repair is necessary.
Make sure that the battery indicator "B" does not light up when power is turned on.	If the indicator is on, the measurement accuracy cannot be guaranteed. Replace battery immediately.
Check whether the reading is around 0 A when no measurements are being made in current measurement mode.	If not, confirm that the "B" indication does not appear in the display or confirm that the test leads are not disconnected.
Check whether the reading is around 0 V while the test leads are short-circuited in voltage measurement mode.	If no problems for the above, the instrument is possibly being damaged. (See Troubleshooting)
Check whether the reading is around 0 Ω while the test leads are short-circuited in resistance measurement mode.	

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, or Continuity 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.
- Test leads and this product should only be connected to the secondary side of a breaker, so the breaker can prevent an accident if a short circuit occurs. Connections should never be made to the primary side of a breaker, because unrestricted current flow could cause a serious accident if a short circuit occurs.

CAUTION

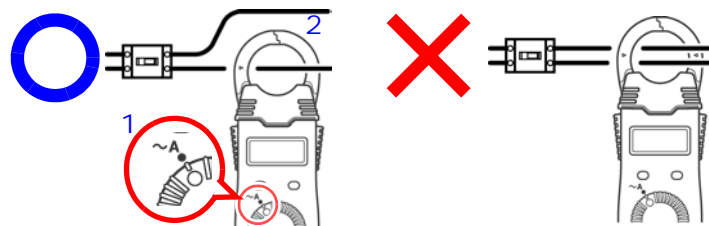
- Removable sleeves are attached to the metal pins at the ends of the test leads. To prevent a short circuit accident, be sure to use the test leads with the sleeves attached when performing measurements in the CAT III measurement category. Remove the sleeves from the test leads when performing measurements in the CAT II measurement categories. 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.
- The tips of the metal pins are sharp, so take care not to injure yourself.

AC Current Measurement [~ A]

DANGER

To avoid short circuits and potentially life-threatening hazards, never attach the instrument in current measurement mode to a circuit that operates at more than the maximum rated voltage to earth CAT III 600 V.

- Set the function switch to ~A.
- Clamp the tester on the conductor, so that the conductor passes through the center of the clamp core. Clamp the tester on one lead only.



Voltage Measurement

DANGER

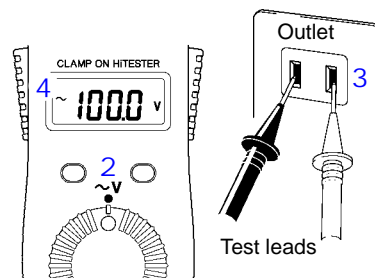
- The maximum input voltage is 600 VDC/AC. Attempting to measure voltage in excess of the maximum input could destroy the instrument and result in personal injury or death.
- To avoid electrical shock, be careful to avoid shorting live lines with the test leads.
- In voltage measurement mode, the maximum rated voltage between input terminals and ground is CATIII 300 V or CATII 600 V. Do not measure voltages exceeding these CATIII 300 V or CATII 600 V with respect to ground. The attempt may damage the instrument and result in personal injury.

NOTE

Make sure that the test lead plug is inserted into the measurement terminal of the instrument correctly.

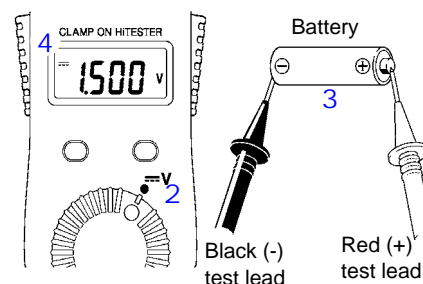
Measuring AC Voltage [~V]

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



Measuring DC Voltage [=V]

- Plug the test leads into measurement terminal.
- Set the function switch to =V.
- Connect the test leads to the object to be measured.
- Read the display.

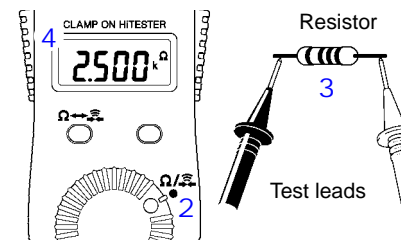


NOTE

Reversing the polarity of the test leads displays a negative value.

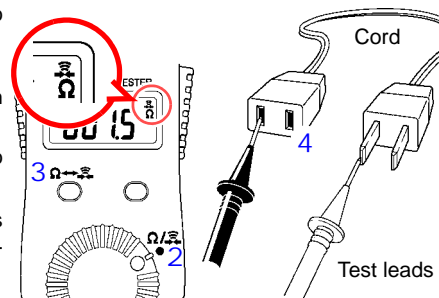
Resistance Measurement [Ω]

- Plug the test leads into the measurement terminal.
- Set the function switch to Ω/Ω.
- Connect the test leads to the object to be measured.
- Read the display.



Continuity Test []

- Plug the test leads into the measurement terminal.
- Set the function switch to Ω/Ω.
- Press Ω↔ key to display " " indication.
- Connect the test leads to the object to be measured. Conductivity is good when the buzzer sounds.



Replacing Battery

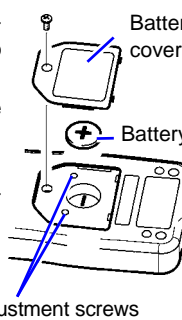
WARNING

- If the instrument is connected to a line that is to be measured, dangerous voltage levels may be applied to the terminals, and removing the case may expose live components. To avoid electric shock when replacing the battery, first disconnect the test leads from the object being measured. Also, after replacing the battery, always replace the cover and tighten the screw before using the instrument.
- Use only CR2032 (Panasonic or MAXELL) lithium battery. Use of any other battery may result in explosion.
- Be careful to observe battery polarity during installation. Otherwise, poor performance or damage from battery leakage could result.
- 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.

NOTE

- The "B" indicator lights up when the remaining battery capacity is low. In this case, the instrument's reliability is not guaranteed. Replace the battery immediately.
- The test battery is built in this instrument. The usable time depends on the battery. When the test battery is exhausted, replace a new battery.
- CR2032 lithium batteries (Panasonic or MAXELL) can be purchased at electronics and appliance stores where specialized batteries are sold.
- Do not turn the adjustment screws as this may disrupt the measurement values.

- Disconnect the test leads from the object to be measured and then switch the function selector to [OFF].
- Remove the instrument from the case, and remove the screws on the battery cover.
- Remove the used battery.
- Being careful about the polarity, insert the new battery of the specified type. (CR2032 lithium battery: Panasonic or MAXELL)
- Replace the battery cover 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

Accuracy

- Guaranteed accuracy period is 1 year (Opening and closing of the Clamp sensor 10,000 times, whichever comes first).
- Accuracy guarantee for temperature and humidity: 23±5°C (73°F±9°F) and 80% RH or less (no condensation, battery warning indicator is not lighting)
- AC measurement: mean value measurement.

Function	Range (Accuracy range)	Accuracy*	Max. input current
ACA [-A]	42.00 A (4.00 to 41.99 A) 420.0 A (40.0 to 419.9 A) 1000 A (100 to 1000 A)	±1.5%rdg. ±5dgt. (Frequency range 50 -60 Hz)	AC 2000 Arms continuous

- Effect of conductor position: within±5.0%(in any direction from sensor center)
- Zero suppress: 5-count

Function	Range (Accuracy range)	Accuracy*	Input impedance	Max. input voltage
ACV [-V]	4.200 V (0.400 to 4.199 V) 42.00 V (4.00 to 41.99 V) 420.0 V (40.0 to 419.9 V) 600 V (400 to 600 V)	±2.3%rdg. ±8dgt. (Frequency range 50 -500 Hz)	11 MΩ ±5% 10 MΩ ±5% 10 MΩ ±5% 10 MΩ ±5%	AC 600 Vrms
DCV [=V]	420.0 mV (40.0 to 419.9 mV) 4.200 V (0.400 to 4.199 V) 42.00 V (4.00 to 41.99 V) 420.0 V (40.0 to 419.9 V) 600 V (400 to 600 V)	±1.3%rdg. ±4dgt.	100 MΩ and over 11 MΩ ±5% 10 MΩ ±5% 10 MΩ ±5% 10 MΩ ±5%	DC 600 V

Function	Range (Accuracy range)	Accuracy*	Open terminal voltage	Overload protection
Resistance [Ω]	420.0 Ω (40.0 to 419.9 Ω)	±2.0%rdg. ±4dgt.	3.4 V or less	250 V AC/DC
	4.200 kΩ (0.400 to 4.199 kΩ)	±2.0%rdg. ±4dgt.	0.7 Vtyp. 3.4 V or less	
	42.00 kΩ (4.00 to 41.99 kΩ)	±2.0%rdg. ±4dgt.	0.47 Vtyp. 3.4 V or less	
	420.0 kΩ (40.0 to 419.9 kΩ)	±2.0%rdg. ±4dgt.	0.47 Vtyp. 3.4 V or less	
	4.200 MΩ (0.400 to 4.199 MΩ)	±5.0%rdg. ±4dgt.	0.47 Vtyp. 3.4 V or less	
	42.00 MΩ (4.00 to 41.99 MΩ)	±10.0%rdg. ±4dgt.	0.47 Vtyp. 3.4 V or less	

Function	Range	Accuracy*	Threshold level (beep sound)	Open terminal voltage	Overload protection
Continuity []	420.0 Ω	±2.0%rdg. ±6dgt.	Less than 50 Ω ±40 Ω	3.4 V or less	250 V AC/DC

* rdg.: reading or displayed value, dgt.: resolution

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.

Troubleshooting

When the instrument is not functioning properly and if you have not performed the pre-operation inspection, please do so now. If you cannot find a problem in the pre-operation inspection, please refer to the following symptoms before contacting your dealer or the nearest Hioki representative. When you send the unit for repair, please pack the unit carefully so that it will not be damaged during transport, and write a detailed description of the problem. Hioki cannot bear any responsibility for damage that occurs during shipment.

Symptom	Description
The measured value of current or voltage is different from the measured value with other clamp-on tester.	<ul style="list-style-type: none"> Waveform containing components out of the frequency property range cannot be measured accurately. In the case that the sample to be measured is a distorted waveform, the measured value with the 3280-10 (Average value rectified, effective value display) and that with another clamp-on tester using the True RMS method are different. For measuring a distorted waveform, we recommend using a true RMS clamp-on tester. In the case that the sample to be measured is the waveform with both AC and DC components, half or full-wave rectified waveform, accurate measurement is not possible due to the large margin of error. We recommend using another instrument with AC+DC mode.
The measured current value is smaller than expected.	The measurement value is not correct, if the measurement is performed leaving the clamp jaws open.
The measured current value is larger than expected. (current value is displayed even with no input.)	Accurate measurement is not possible in the presence of strong magnetic fields, such as transformers and high-current conductors, or in the presence of strong electromagnetic fields such as radio transmitters.