

HIOKI E. E. CORPORATION

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Introduction

Thank you for purchasing the HIOKI "9660 CLAMP ON SENSOR." To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Initial Inspection

When you receive the product, 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 product 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 product, make sure that the insulation on the cables is undamaged and that no bare conductors are improperly exposed. Using the product in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

Maintenance and Service

- To clean the product, 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 product seems to be malfunctioning, contact your dealer or Hioki representative.

HIOKI	
DECLARATION OF CONFORMITY	
Manufacturer's Name: HIOKI E.E. CORPORATION	
Manufacturer's Address: 81 Koizumi, Ueda, Nagano 386-1192, Japan	
Product Name:	CLAMP ON SENSOR
Model Number:	9660
The above mentioned product conforms to the following product specifications:	
Safety:	EN61010-2-032:2002
EMC:	EN61326:1997+A1:1998+A2:2001+A3:2003 Class A equipment Equipment intended for use in industrial locations
Supplementary Information:	
The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.	
HIOKI E.E. CORPORATION	
15 September 2006 <i>T. Yoshiike</i> Tatsuyoshi Yoshiike President	
9660A999-03	

Specifications

Accuracy guaranteed for one year at 23±5°C (73±9°F), 80%RH or less., opening and closing of the sensor: maximum 10,000 times

Rated primary current	100 A AC
Output voltage	1mV AC/A
Amplitude accuracy	±0.3% rdg. ±0.02%f.s. (f.s.: 100 A, 45Hz - 66Hz, at core center)
Phase accuracy	Within ±1° (at 45Hz - 5kHz)
Amplitude frequency characteristics	Within ±1% at 40 Hz - 5 kHz (deviation from amplitude accuracy)
Effect of conductor position	Within ±0.5% (deviation from center)
Effect of external electromagnetic field	0.1 A equivalent or lower (in an AC electromagnetic field of 400 A/m)
Maximum input current	130 A continuous (at 45 - 66 Hz, ambient temperature 50°C)
Temperature coefficient	0.02%rdg/°C
Dielectric strength	3536 Vrms for 15 seconds (between electric circuit and core, between core and case)
Maximum rated voltage to earth	300 Vrms or lower
Operating Temperature & Humidity	0 to 50°C (32 - 122°F), 80%RH or lower (non-condensating)
Storage Temperature & Humidity	-10 to 60°C (14 - 140°F), 80%RH or lower (non-condensating)
Operating Environment	Indoors, altitude up to 2000 m (6562-ft.)
Applicable Standards	Safety EN61010-2-032:2002, Type A current sensor Measurement Category III, Pollution Degree 2 (Anticipated Transient Overvoltage: 4000 V)
	EMC EN61326:1997+A1:1998+A2:2001+A3:2003 (Class A)

Measurable conductor diameter	φ15 mm (0.59") or less
Cable length	Approx. 3 m (118.11")
Dimensions	Approx. 46W × 135H × 21D mm (1.81"W × 5.31"H × 0.83"D) (excluding protrusions)
Mass	Approx. 230 g (8.1 oz.)
Accessory	Instruction Manual

f.s.: maximum display value or scale length
rdg.: reading value (The value currently being measured and indicated on the measuring product)

Safety

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

⚠ DANGER

This product is designed to conform to 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 product. 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 product defects.

Measurement categories (Overvoltage categories)

This product complies with CAT III safety requirements. To ensure safe operation of measurement products, 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.

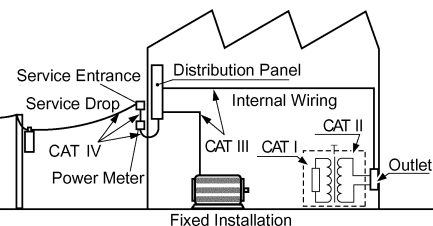
CAT I: Secondary electrical circuits connected to an AC electrical outlet through a transformer or similar device.

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

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 product in an environment designated with a higher-numbered category than that for which the product is rated could result in a severe accident, and must be carefully avoided. Never use a CAT I measuring product in CAT II, III, or IV environments. The measurement categories comply with the Overvoltage Categories of the IEC60664 Standards.



Safety Symbol

	In the manual, the ⚠ symbol indicates particularly important information that the user should read before using the product. The ⚠ symbol printed on the product 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 that the instrument may be connected to or disconnected from a live circuit

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 product
- NOTE** Advisory items related to performance or correct operation of the product.

Usage Notes

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

⚠ DANGER

- To avoid short circuits and potentially life-threatening hazards, never attach the product to a circuit that operates at more than the 300 V AC.
- 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.

⚠ WARNING

- To avoid electric shock, do not allow the product to get wet, and do not use it when your hands are wet.
- To avoid electric shock when measuring live lines, wear appropriate protective gear, such as insulated rubber gloves, boots and a safety helmet.
- Note that the product may be damaged if current exceeding the selected measurement range is applied for a long time.

⚠ CAUTION

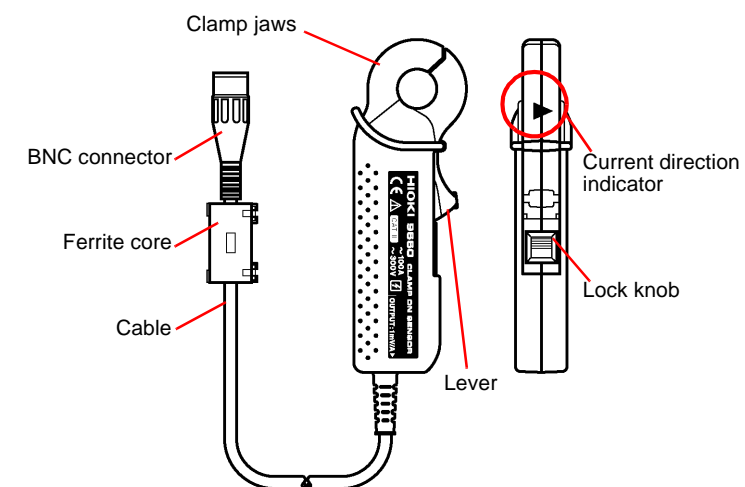
- Do not store or use the product where it could be exposed to direct sunlight, high temperature or humidity, or condensation. Under such conditions, the product may be damaged and insulation may deteriorate so that it no longer meets specifications.
- Be careful to avoid dropping the product or otherwise subjecting them to mechanical shock, which could damage the mating surfaces of the core and adversely affect measurement.
- Keep the clamp jaws and core slits free from foreign objects, which could interfere with clamping action.
- Keep the clamp closed when not in use, to avoid accumulating dust or dirt on the mating core surfaces, which could interfere with clamp performance.
- Avoid stepping on or pinching the cable, which could damage the cable insulation.
- To avoid damaging the cables, do not bend or pull the cables.

NOTE

Accurate 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.

Parts Names

The 9660 is a voltage-output-type clamp-on sensor.



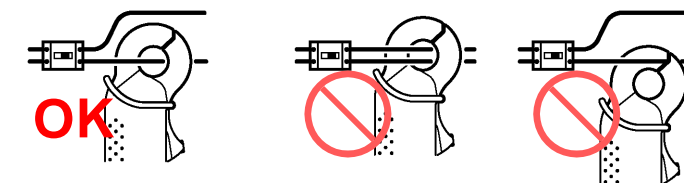
Measurement Procedures

⚠ CAUTION

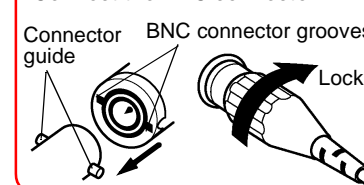
- When disconnecting the BNC connector, be sure to release the lock before pulling off the connector. Forcibly pulling the connector without releasing the lock, or pulling on the cable, can damage the connector.
- To prevent damage to the connected instruments and sensor, never connect or disconnect a sensor while the power is on.

NOTE

Attach the clamp around only one conductor. Single-phase (2-wire) or three-phase (3-wire) cables clamped together will not produce any reading.

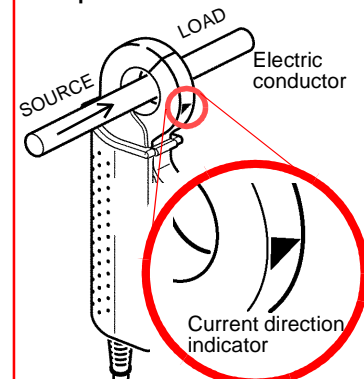


Connect the BNC connector.



1. Unlock the lever, if locked.
2. Engage the BNC connector grooves with the connector-guide projections, and turn the connector clockwise to lock the components.

Clamp the conductor.



3. Pull the lever toward you while pressing downward, and open the clamp.
4. Hold only one conductor at the clamp center with the current direction indicator pointing toward the load side.
5. Make sure the clamp core is closed.
6. Slide the lock knob to lock the clamp ("LOCK" is displayed).

Position the clamp with the current direction indicator pointing toward the load side. (If installed in the opposite direction, the phase deviates 180 degrees.)

To remove the BNC connector, turn the connector counter-clockwise and pull it out.