HIOKI

9695-02, 9695-03

CLAMP ON SENSOR

Instruction Manual

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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 one (1) year 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 9695-02/03 CLAMP ON SENSOR. To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Overview

The 9695-02/03 are voltage-output, clamp-on sensors used for 50 A (9695-02) and 100 A (9695-03) rated AC measurement.
The 9695-02/03 sensors are designed to measure alternating currents on a hot conductor without disconnecting it from the power line. Both sensors are easy to operate and suitable for electric current and power measurement in various fields.

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.

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. Pack the product 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.

Specifications

(Accuracy guaranteed for one year at 23°C±5°C(73°F±9°F), 80%RH or less.
Endurance number of the jaw opening and closing part: 10000 times)

Rated primary current	9695-02: 50 A AC, 9695-03: 100 A AC
Output voltage	9695-02: 10 mV AC/A, 9695-03: 1 mV AC/A
Amplitude accuracy	±0.3% rdg.±0.02%f.s. (f.s.:50 A (9695-02)/ 100 A (9695-03), 45Hz to 66Hz, at jaw center)
Phase accuracy	9695-02: Within ±2° (45 Hz to 5 kHz) 9695-03: Within ±1° (45 Hz to 5 kHz)
Amplitude frequency characteristics	Within ±1% at 40 Hz to 5 kHz (deviation from 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 permissible input	60 A continuous (9695-02)/ 130 A continuous (9695-03) (at 45 to 66 Hz, ambient temperature 50°C)
Temperature coefficient	0.02%rdg./°C
Dielectric strength	3536 V ACrms for 15 sec (between electric circuit and jaw)
Maximum rated voltage to earth	300 V ACrms or lower (Insulated conductor)
Operating Temperature &Humidity	0 to 50°C (32 to 122°F), 80%RH or lower (non-condensating)
Storage Temperature &Humidity	-10 to 60°C(14 to 140°F), 80%RH or lower (non-condensating)
Operating Environment	Indoors, up to 2000 m (6562-ft.) ASL
Standards applying	Safety EN61010 Measurement Category III, Pollution Degree 2 (Anticipated Transient Overvoltage: 4000 V) EMC EN61326
Measurable conductor diameter	15 mm (0.59") or less
Output terminals	M3 terminal (Maximum outside diameter: 6.5 mm/0.26", inside diameter: 3.2 mm/0.13")
Cable length	3 m or less
Dimensions	Approx. 50.5W x 58.0H x 18.7D mm (1.99"W x 2.28"H x 0.74"D) (excluding protrusions)
Mass	Approx. 50 g (1.8 oz.)
Accessory	Instruction Manual
Option	9219 CONNECTION CABLE, 9238 CLAMP SENSOR CABLE

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.

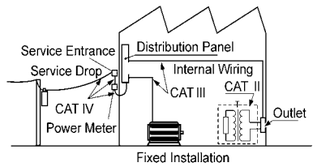
DANGER

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

This product conforms to the safety requirements for CAT III measurement products.
To ensure safe operation of measurement products, IEC 61010 establishes safety standards for various electrical environments, categorized as CAT II 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 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.
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.

Safety Symbol

⚠	Indicates cautions and hazards. When the symbol is printed on the instrument refer to a corresponding topic in the Instruction Manual.
⧈	Indicates a double-insulated device.
~	Indicates AC (Alternating Current).
⊗	Wear appropriate protective insulation (insulating rubber gloves and boots, helmet and etc.) when connecting and disconnecting from live electric circuits.

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, or over bare conductors.**
- **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.**

CAUTION

- Note that the product may be damaged if the applied current exceeds the measurement range.
- 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 clamps or otherwise subjecting them to mechanical shock, which could damage the mating surfaces of the core and adversely affect measurement.
- Keep the jaw free from foreign objects, which could interfere with clamping action.
- Keep the jaw closed when not in use, to avoid accumulating dust or dirt on the mating jaw, which could interfere with clamp performance.
- Do not fix the output terminal screws too tightly. The torque about 0.5N•m is recommended.

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.
- When connecting the cables to the output terminal, twist the cables together as close to the terminal as possible to avoid the influence of an external magnetic field
- Use the 9219 CONNECTION CABLE to connect this product to the HIOKI clamp wattmeter. (The connector of the 9219 is a solderless terminal to BNC.)

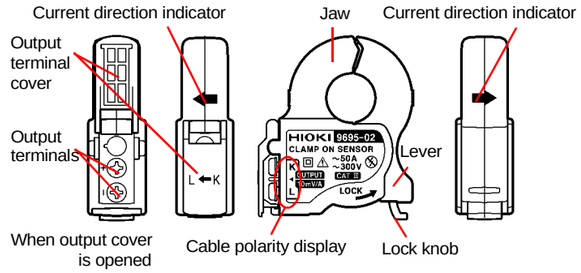
Preliminary Checks

WARNING

Before using the product, make sure 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.

Before using the product the first time, verify that it operates normally to ensure that the no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.

Parts Names



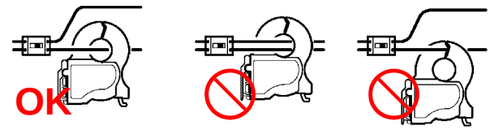
Measurement Procedures

CAUTION

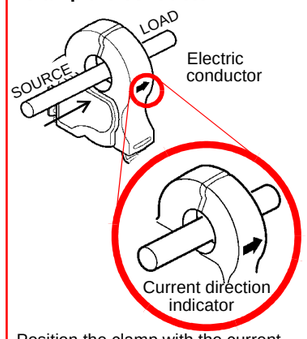
- Do not disconnect the output cable when the tester connected to the clamp-on sensor is on or with the sensor clamped on a conductor to measure. This prevents the 9695-02/03 main unit and sensor from malfunctioning.
- M3x5 screws and a spring washer assembly should be used for the 9695-02/03 terminals. When using another type of screw (especially longer ones), be careful with the tightening torque. Tightening a screw too much may damage the 9695-02/03.

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.

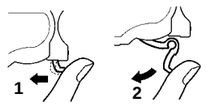


Clamp the conductor.



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

Unlock the lever



1. Confirm that the tester connected to the clamp-on sensor is powered off.
2. Open the terminal cover and connect the cable to the terminal of the 9695-02/03. Make sure that the polarities match.
3. Connect the cable to the input terminal of the tester.
4. Turn on the tester.
5. If the lever is locked, unlock it.
6. Open the jaw. Orient the current direction indicator to the load side and clamp one conductor at the center of the jaw.
7. Close the jaw and lock it. Be sure to lock the clamp core since it has no spring.

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