Introduction

Thank you for purchasing the HIOKI "9010, 9010-10 CLAMP ON PROBE". To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Overview

The 9010, 9010-02, and 9010-10 are voltage output type clamp on probes, which are applicable to 500A AC current measurements. The instrument can be used to measure alternating current on a live power line without the need to cut the wire. Easy operation and connection make them useful for measuring alternating current and power in various fields.

Inspection

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.

Preliminary Checks

- 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.
- Before using the product, make sure that the insulation on the test leads and probes 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.

Safety

⚠ DANGER

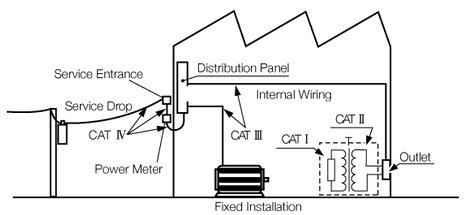
This product is designed to conform to IEC 61010 Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the product. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from product defects.

Overvoltage categories (CAT)

This product conforms to the safety requirements for CAT III measurement products.
To ensure safe operation of measurement products, IEC 60664 establishes safety standards for various electrical environments, categorized as CAT I to CAT IV, and called overvoltage 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 product designed for CAT III environments can endure greater momentary energy than one 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.



Safety symbols

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.

⚠	• 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. • In the manual, the ⚠ symbol indicates particularly important information that the user should read before using the product.
~	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 product.
NOTE	Advisory items related to performance or correct operation of the product.

Notes on Use

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

⚠ DANGER

- **To avoid short circuits and potentially life-threatening hazards, never attach the clamp to a circuit that operates at more than the 600 Vrms, or over bare conductors.**
- **Clamp-on probe 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.**
- **Before measurement, check the position of the range switches. The unit may be damaged it current at levels in excess of the measurement limit is applied for a long time.**
- **Current measurements exceeding 500 A, 1 kHz should be of short duration. Heat builds up in the core proportionate to the current value, and will reach a dangerous level over a long period of time.**

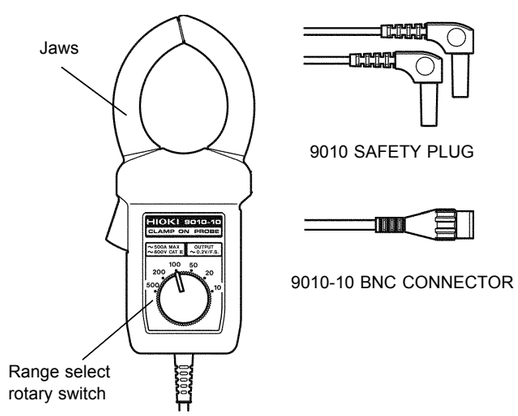
⚠ CAUTION

- 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.
- To avoid damage to the product, protect it from vibration or shock during transport and handling, and be especially careful to avoid dropping.

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.

Part Names



Measurement Procedure (AC A)

⚠ CAUTION

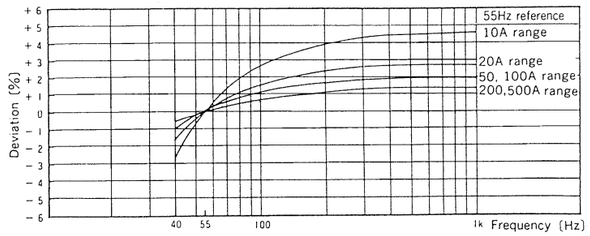
- To prevent damage to the product and sensor, never connect or disconnect a sensor while the power is on.
- When disconnecting the BNC connector, be sure to release the lock before pulling off the connector. Forcibly pulling the connector without releasing the lock, or pulling on the cable, can damage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

When input to our recorder or tester, use 0.2 VAC range.

1. Connect the safety plug (banana plug, BNC connector) to the input terminal. When using the BNC connector, align the BNC connector with the connector guide notch on the current input connector. While pushing the connector in, turn it to the right to lock it.
2. When input the unknown amount of measuring current, set the range to the largest one (500 A).
3. Open the jaws and clamp the conductor.
4. Confirm whether the core tip connection part is closed certainly.
5. Set the proper range of the clamp on probe according to the measurement value. Do not set the range from the measurement equipment (the recorder etc.)

NOTE

Make sure that only one conductor is in the core. Single-phase (2-wire) and three-phase (3-wire) lines clamped together will not produce reading.



Frequency characteristics Reference data

Specifications

Accuracy is guaranteed for 1 year at 23±5℃ (73±9℉) and 80%RH.
(Opening and Closing of the Sensor: Maximum 10000 times)

Measuring range	AC 10/20/50/100/200/500 A	
Output voltage	0.2 V AC f.s. (The output resistance is approx. 150Ω: in the range of 10 A)	
Amplitude accuracy	±3%f.s. (45 to 66 Hz, at the clamp core center)	
Frequency characteristics	At 40 to 1000 Hz (deviation from 55 Hz) Within±6% (in10/20 A range) Within±3% (in 50/100/200/500 A range)	
Effect of conductor position	Within ±2% everywhere in the core.	
Effect of external magnetic field	1 A or less for 400 A/m external magnetic field.	
Maximum rated voltage to earth	Max. 600 Vrms	
Maximum input current (in 45 to 66 Hz)	10/20/50 A range: 150 A continuous 100/200 A range: 400 A continuous 500 A range: 650 A continuous, 1400 A for a minute	
Withstand voltage	5550 VAC: For a minute (between electric circuit and core, between case and core)	
Operating temperature and humidity range	0 to 40℃ (32 to 104℉), Max. 80%RH (no condensation)	
Storage temperature and humidity range	-10 to 50℃ (14 to 122℉), Max. 80%RH (no condensation)	
Location for use	Indoor, altitude up to 2000 m (6562 feet)	
Diameter of measurable conductors	Less than 46 mm (1.81") Possible to use the 50 mm (1.97") wide 20 mm (0.79") deep busbar	
Cord length	Approx. 3 m (118.11")	
External dimensions and mass	Approx. 74W×184H×37D mm (2.91"W×7.24"H×1.46"D) (excluding protrusions) Approx. 400 g (14.1 oz.)	
Accessories	Instruction manual	
Applicable standards	Safety	EN61010-2-032:1995 Overvoltage Category III Pollution Degree 2 (Anticipated transient overvoltage 6000 V)
	EMC	EN61326:1997+A1:1998+A2:2001

Maintenance and Service

Cleaning the unit

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.

Service

- 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.

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