

HIOKI

9290-10

CLAMP ON ADAPTER

INSTRUCTION MANUAL

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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 ADAPTER
Model Number: 9290-10

The above mentioned product conforms to the following product specifications:
Safety: EN61010-2-032:2002

Supplementary Information:
The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC, is not applicable to the EMC Directive 89/336/EEC.

HIOKI E.E. CORPORATION
7 September 2005
Tatsuyoshi Yoshiike
President
9290B999-01

Introduction

Thank you for purchasing the HIOKI "9290-10 CLAMP ON ADAPTER". To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Overview

The Model 9290-10 is a clamp-on adapter rated for 1500A AC, with a 10:1 CT ratio. In addition to the larger clamping capability, broad frequency characteristics and good phase characteristics reliably provide clamp-on Power HiTesters with expanded range and large current measurements.

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.

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.

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.

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: 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 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.

Fixed Installation

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 600V.
- 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.
- To avoid electric shock, do not touch the portion beyond the protective barrier during use.

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.

Preliminary Checks

⚠ WARNING

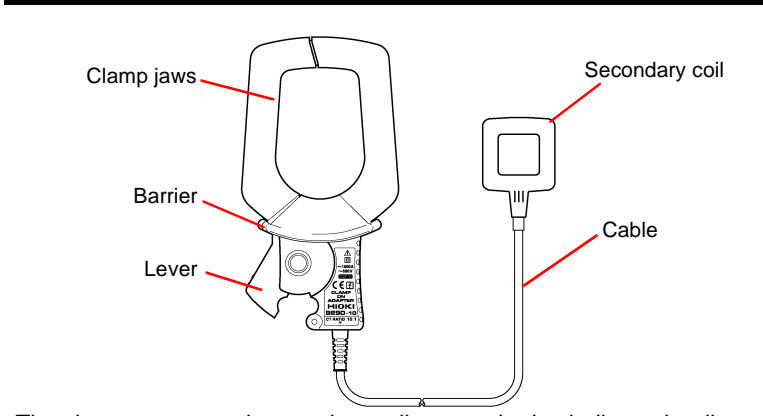
Before using the product, make sure that the insulation on the cables is undamaged and that no bare conductors are improperly exposed. Using the product in such conditions could cause an electric shock, so contact your dealer or Hioki representative for repair.

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.

Specifications

Rated primary current	1500 A AC
CT ratio	10 : 1
Operating temperature and humidity for guaranteed accuracy	23±5°C (73±41°F), 80%RH or less (non-condensating)
Period of guaranteed accuracy	1 year
Amplitude accuracy	±1.5% rdg. (at 45 - 66 Hz)
Amplitude frequency characteristics	Within ±2% rdg. at 20 Hz - 5 kHz (deviation from accuracy)
Phase accuracy	Within ±1.0° (at 45 - 66 Hz)
Phase frequency characteristics	Within ±1.0° at 20 Hz - 5 kHz (deviation from accuracy)
Effect of conductor position	Within ±1.5% (deviation from center)
Effect of external electromagnetic field	1 A equivalent or less (in an AC electromagnetic field of 400 A/m)
Maximum input current	1000 A continuous, 1500 A AC (5 minutes)
Temperature coefficient	0.02%/rdg./°C
Operating Temperature & Humidity	0 to 50°C (32 - 122°F), 80%RH or less (non-condensating)
Storage Temperature & Humidity	-10 to 60°C (14 - 140°F), 80%RH or less (non-condensating)
Operating Environment	Indoors, <2000 m (6562-ft.) ASL
Dielectric strength	5312 V AC rms for 15 seconds (between case and core)
Maximum rated voltage to earth	600 V AC rms or less
Standards applying	Safety EN61010-2-032:2002, Type A current sensor Measurement Category III, Pollution Degree 2 (Anticipated Transient Overvoltage: 6000 V)
Measurable conductor diameter	φ55 mm (2.17") or less 80 X 20 mm, Buss bars
Secondary coil inside diameter	Approx. 27 mm X 27 mm (1.06" X 1.06")
Cable length	Approx. 3 m (118.11")
Size	Approx. 99.5W X 188H X 42D mm (3.92"WX7.40"HX1.65"D) (excluding protrusions)
Weight	Approx. 580 g (20.5 oz.)
Accessory	Instruction Manual (1), Mark band (6, 3 sets)
rdg.:reading value (The value currently being measured and indicated on the measuring product)	

Parts Names

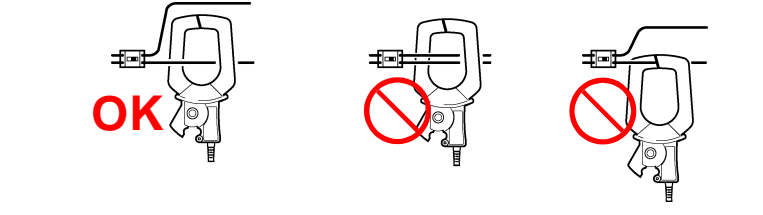


The clamp sensor and secondary coil are marked to indicate the direction of current flow, to ensure that the measurement current and output current have the same phase.

Measurement Procedures

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.

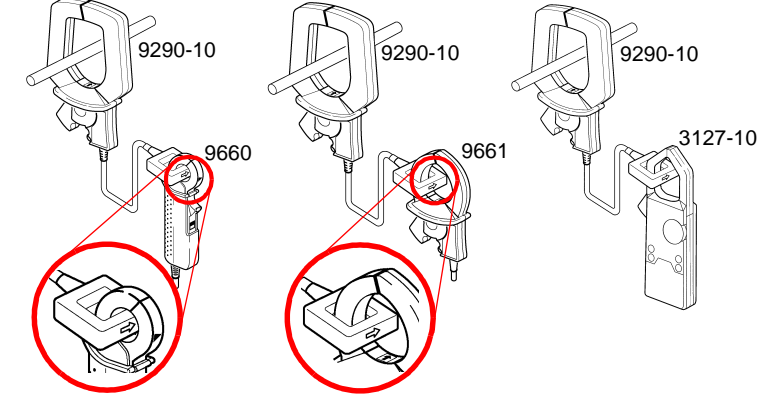


Clamp the conductor.

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

- Open the clamp sensor, align the current direction indicator arrow toward the load side, and clamp around one conductor.
- Make sure the clamp sensor jaws are firmly closed. Clamp the smaller clamp sensor through the opening of the secondary coil.
- In this case, be sure to align the current direction indicator arrow on the secondary coil with the indicator on the clamp sensor.
- Remember that the actual current in the circuit being measured is ten times that indicated by the measuring instrument.

Example of Combining Clamp Sensors or Clamp Meters



NOTE

The effect of conductor positioning of the clamp sensor clamped to the secondary coil should be considered. Please verify the specifications of the clamp sensor being used.