

# 9290-10

## CLAMP ON ADAPTER

### Instruction Manual

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# HIOKI

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http://www.hioki.com.

The Declaration of Conformity for instruments that comply to CE  
mark requirements may be downloaded from the HIOKI website.

#### 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 informa-  
tion on warranty provisions.

#### 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 character-  
istics 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, alco-  
hol, 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 Stan-  
dards, and has been thoroughly tested for safety prior to ship-  
ment. 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 inju-  
ries not resulting directly from product defects.

#### Safety Symbol

|  |  |
|--|--|
|  | In the manual, the  symbol indicates particularly important infor-<br>mation that the user should read before using the product.<br>The  symbol printed on the product indicates that the user<br>should refer to a corresponding topic in the manual (marked with<br>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<br>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 haz-  
ard 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

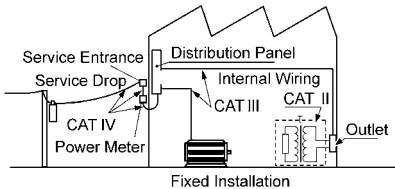
This product complies with CAT III safety requirements. To ensure safe opera-  
tion of measurement products, IEC 61010 establishes safety standards for var-  
ious electrical environments, categorized as CAT II to CAT IV, and called  
measurement categories.

**CAT II:** Primary electrical circuits in  
equipment connected to an AC  
electrical outlet by a power cord  
(portable tools, household appli-  
ances, etc.)  
**CAT II** covers directly measuring  
electrical outlet receptacles.

**CAT III:** Primary electrical circuits  
of heavy equipment (fixed installa-  
tions) connected directly to the dis-  
tribution 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 care-  
fully avoided.



## Usage Notes



This manual contains information and warnings essential for safe  
operation of the product and for maintaining it in safe operating condi-  
tion. 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 oper-  
ates at more than the 600V.
- This product should only be connected to the sec-  
ondary 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 surfac-  
es 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 pres-  
ence 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 improv-  
erly exposed. Using the product in such conditions could cause  
an electric shock, so contact your dealer or Hioki representative  
for repair.

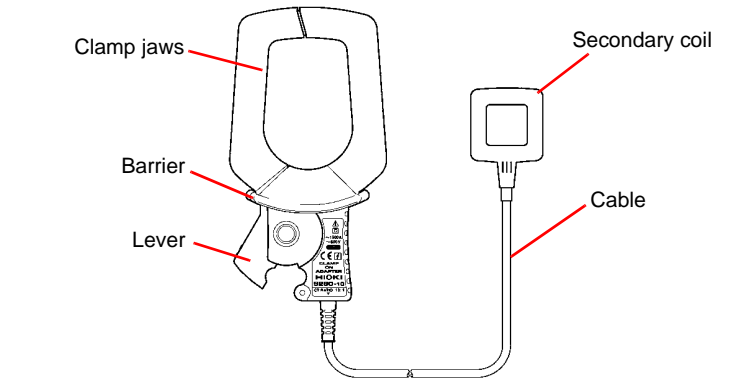
Before using the product the first time, verify that it operates normally  
to ensure that the no damage occurred during storage or shipping. If  
you find any damage, contact your dealer or Hioki representative.

## Specifications

|  |  |
|--|--|
| Rated primary current  | 1500 A AC  |
| CT ratio   | 10 : 1   |
| Operating tempera-<br>ture and humidity for<br>guaranteed accuracy | 23±5°C (73±41°F), 80%RH or less (non-condensating)   |
| Period of guaranteed<br>accuracy                                   | 1 year   |
| Amplitude accuracy   | ±1.5% rdg. (at 45 - 66 Hz)   |
| Amplitude frequency<br>characteristics                             | Within ±2% rdg. at 20 Hz - 5 kHz (deviation from accu-<br>racy)  |
| Phase accuracy   | Within ±1.0° (at 45 - 66 Hz)   |
| Phase frequency<br>characteristics                                 | Within ±1.0° at 20 Hz - 5 kHz (deviation from accuracy)  |
| Effect of conductor<br>position                                    | Within ±1.5% (deviation from center)   |
| Effect of external<br>electromagnetic field                        | 1 A equivalent or less<br>(in an AC electromagnetic field of 400 A/m)  |
| Maximum input current  | 1000 A continuous, 1500 A AC (5 minutes)   |
| Temperature coeffi-<br>cient                                       | 0.02%/rdg./°C  |
| Operating Temperature<br>& Humidity                                | 0 to 50°C (32 - 122°F), 80%RH or less<br>(non-condensating)  |
| Storage Temperature<br>& Humidity                                  | -10 to 60°C (14 - 140°F), 80%RH or less<br>(non-condensating)  |
| Operating Environment  | Indoors, <2000 m (6562-ft.) ASL  |
| Dielectric strength  | 5312 V AC rms for 15 seconds (between case and<br>core)  |
| Maximum rated volt-<br>age to earth                                | 600 V AC rms or less   |
| Standards applying   | Safety EN61010 Type A current sensor<br>Measurement Category III, Pollution Degree<br>2<br>(Anticipated Transient Overvoltage: 6000 V) |
| Measurable conductor<br>diameter                                   | φ55 mm (2.17") or less<br>80 X 20 mm, Buss bars  |
| Secondary coil inside<br>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<br>(3.92"W X 7.40"H X 1.65"D)<br>(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

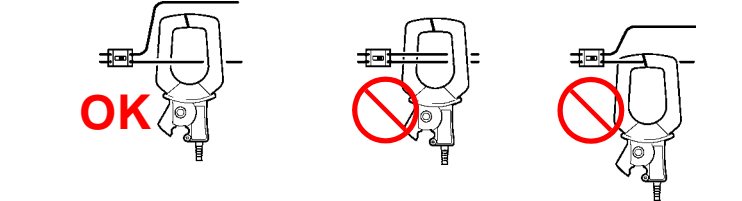


The clamp sensor and secondary coil are marked to indicate the direc-  
tion of current flow, to ensure that the measurement current and out-  
put current have the same phase.

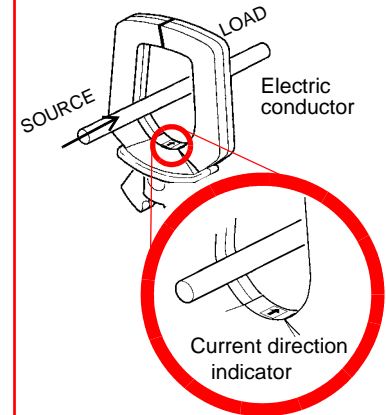
## Measurement Procedures

#### **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.



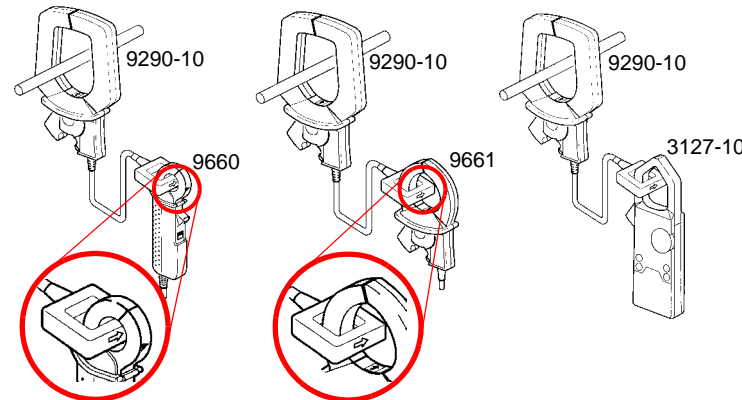
#### Clamp the conductor.



Position the clamp with the current direc-  
tion 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 indica-  
tor 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.