

Maintenance and Service

- To clean the device, 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 gaso-line, as they can deform and discolor the case.
- Measurements are degraded by dirt on the mating surfaces of the jaws, so keep the surfaces clean by gently wiping with a soft cloth.
- If the device seems to be malfunctioning, contacting your dealer or Hioki representative.

NOTE

Pack the device so that it will not sustain damage during ship-ping, and include a description of existing damage. We do not take any responsibility for damage incurred during shipping.

Safety

This manual contains information and warnings essential for safe operation of the device and for maintaining it in safe oper-ating condition. Before using it, be sure to carefully read the fol-lowing safety precautions.



DANGER

- This device is designed to comply with IEC 61010 Safety Standards, and has been thor-oughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the device. Using the device in a way not described in this manual may negate the provided safety features. Be certain that you understand the instruc-tions and precautions in the manual before use. We disclaim a ny re sponsibility for a ccidents or injuries not resulting directly from device defects.
- To avoid short circuits and potentially life-threatening hazards, never attach the device to a circuit that operates at more than 600 V, or over bare conductors.

Safety Symbols

	Indicates cautions and hazards. When the symbol is printed on the device, refer to a corresponding topic in the Instruction Manual.
	Indicates that the device may be connected to or discon-nected from a live circuit.
	Indicates a double-insulated device.
	Indicates AC (Alternating Current).

The following symbols in this manual indicate the relative impor-tance 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 device.
	NOTE Indicates advisory items related to performance or cor-rect operation of the device.

Other Symbols

 This symbol indicates that the product conforms to regula-tions set out by the EC Directive.

 Indicates a prohibited action.

Measurement categories

To ensure safe operation of measuring instruments, IEC 61010 establishes safety standards for various electrical environ-ments, categorized as CAT II to CAT IV, and called measure-ment categories.



DANGER

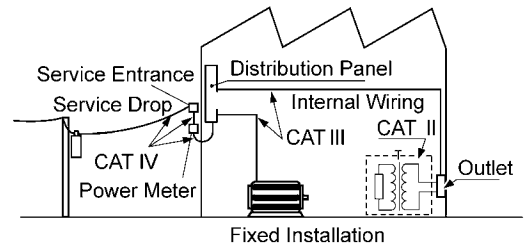
- Using a measuring device in an environment des-ignated with a higher-numbered category than that for which the device is rated could result in a severe accident, and must be carefully avoided.
- Using a measuring device without categories in an environment designated with the CAT II to CAT IV category could result in a severe accident, and must be carefully avoided.

This device complies with CAT III safety requirements.

CAT II :When directly measuring the electrical outlet recepta-cles of the primary electrical circuits in equipment con-nected to an AC electrical outlet by a power cord (portable tools, household appliances, etc.)

CAT III :When measuring the primary electrical circuits of heavy equipment (fixed installations) connected directly to the distribution panel, and feeders from the distribution panel to outlets

CAT IV : When measuring the circuit from the service drop to the service entrance, and to the power meter and pri-mary overcurrent protection device (distribution panel)



Instrument Installation

Storage temperature and humidity
: -10 to 60°C (14 to 140°F), 80%RH or less (no condensation)

Operating temperature and humidity
: 0 to 50°C (32 to 122°F), 80%RH or less (no condensation)

Avoid the following locations that could cause an accident or dam-age to the device.

 Exposed to direct sunlight Exposed to high tem-perature	 In the presence of corrosive or explosive gases
 Exposed to water, oil, other chemicals, or solvents Exposed to high humidity or conden-sation	 Exposed to strong electromagnetic fields Near electromagnetic radiators
 Exposed to high levels of particulate dust	 Near induction heating systems (e.g., high-frequency induction heating systems and IH cooking utensils)
 Subject to vibration	

Usage Notes

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



DANGER

- Clamp-on probe should only be connected to the secondary side of a breaker, so the breaker can pre-vent an accident if a short circuit occurs. Connec-tions 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

- Do not allow the device to get wet, and do not take measurements with wet hands. This may cause an electric shock.
- To avoid electric shock when measuring live lines, wear appropriate protective gear, such as insu-lated rubber gloves, boots and a safety helmet.
- Avoid measuring at frequencies in excess of the derating range, as this will generate heat in the jaws and is dangerous.

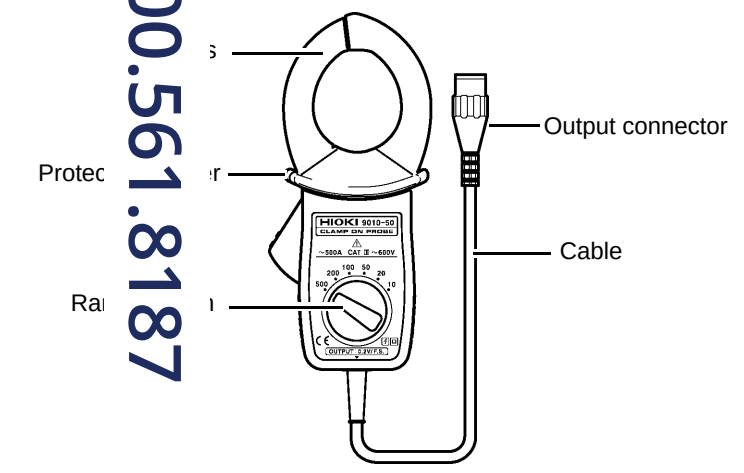


CAUTION

- Note that the device may be damaged if current exceeding the selected measurement range is applied for a long time.
- Be careful to avoid dropping the device or otherwise subject-ing them to mechanical shock, which could damage the mat-ing surfaces of the jaws and adversely affect measurement.
- Do not store or use the device where it could be exposed to direct sunlight, high temperature or humidity, or condensa-tion. Under such conditions, the device may be damaged and insulation may deteriorate so that it no longer meets specifications.
- Keep the jaws tip and core slits free from foreign objects, which could interfere with clamping action.
- Measurements are degraded by dirt on the mating surfaces of the jaws, so keep the surfaces clean by gently wiping with a soft cloth.
- To avoid breaking the cables, do not bend or pull them.
- Avoid stepping on or pinching cables, which could damage the cable insulation.
- Keep the cables well away from heat sources, as bare con-ductors could be exposed if the insulation melts.

NOTE

Correct measurement may be impossible in the presence of strong magnetic fields, such as near transformers and high-cur-rent conductors, or in the presence of strong electromagnetic fields such as near radio transmitters.



Measurement Procedure

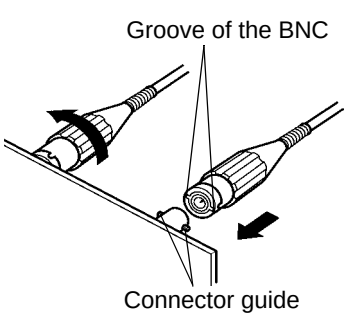
Prechecks
Before using the device for the first time, verify that it operates normally and that no damage occurred during storage or shipping. If you find any damage, contact your dealer or Hioki representative.

WARNING
Before using the device, make sure that the insulation of the conductor is undamaged and that no bare wires are improperly exposed. Using the device in these conditions could cause an electric shock. Contact your dealer or Hioki representative for more information.

CAUTION
When connecting the BNC connector, be sure to release the lock by pulling off the connector. Forcibly pulling the connector while releasing the lock, or pulling on the cable, can damage the connector.

When the device is being connected to (such as a recorder or computer) which can measure 0.2 V AC.

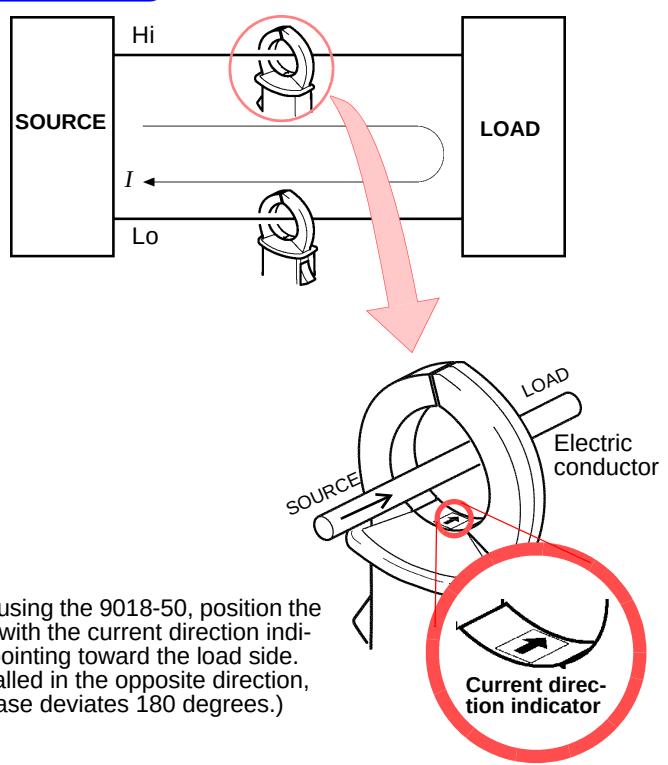
1. Align the BNC connector with the guide pins in the connection equipment input connector, then turn the connector clockwise to lock it. To release the lock, turn the BNC connector counterclockwise to release the lock, then pull it.



2. When the amount of measuring current is unknown, set the range to the largest one (500 A).

3. Open the jaws and clamp the conductor so that the conductor is approximately centered between the jaws. When also measuring waveform phase with a recorder or such product, use the 9018-50 and clamp in such a way that the direction of current flow matches the direction of the clamp section's current direction indicator arrow to ensure that the measured current and output voltage are in phase with one another. The 9010-50 is designed for level measurement and does not have a current direction mark.
4. Confirm whether the jaws tip connection part is closed certainly.
5. Set the proper range of the clamp on probe according to the measurement value.

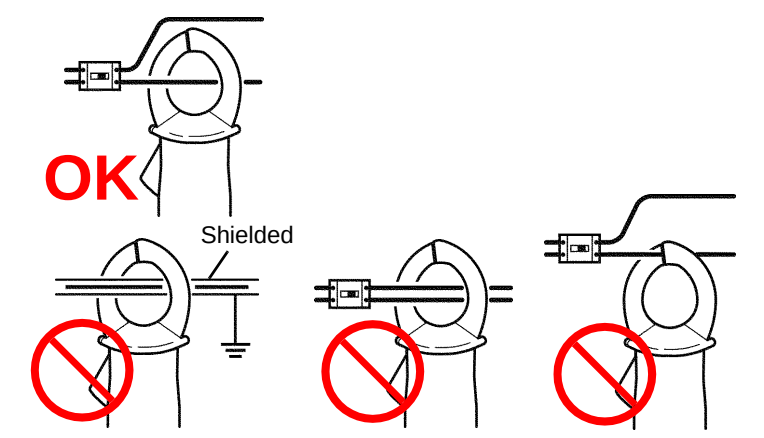
Wiring example



When using the 9018-50, position the clamp with the current direction indicator pointing toward the load side. (If installed in the opposite direction, the phase deviates 180 degrees.)

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.



- Note that a DC component will result in an erroneous reading.
- Ground-shielded conductors cannot be accurately measured.
- Ensure that the input resistance of the measuring instrument being combined with is sufficiently high (1 MΩ or greater is recommended).
- Also read the instruction manual for whichever product you connect to.

Specifications

f.s. : maximum display value or scale length (This is usually the maximum value of the currently selected range.)
rdg. : reading value (The value currently being measured and indicated on the measuring device.)

1. General Specifications

Operating environment	Indoors, Up to 2000 m (6562ft) ASL
Operating temperature and humidity	0 to 50°C (32 to 122°F), 80%RH max. (no condensation)
Storage temperature and humidity	-10 to 60°C (14 to 140°F), 80%RH max. (no condensation)
Maximum rated current	500 A rms
Maximum rated voltage to earth	600 V AC (50 Hz/60 Hz)
Dielectric strength	7060 V rms AC (Sensitive current 1 mA), 50 Hz/60 Hz, 1 minute, between the jaws and the output connector
Applicable Standards	Safety EN61010 Pollution degree 2 Measurement category III (anticipated transient overvoltage 6000 V) EMC EN61326

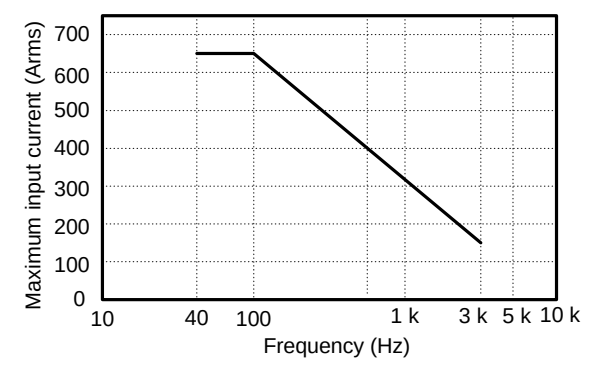
2. Specifications

Measuring range	10/20/50/100/200/500 A AC
Output voltage	0.2 V f.s.
Maximum input current	(50/60 Hz, continuous, Inside of derating range) 150 Arms (10/20/50 A range) 400 Arms (100/200 A range) 650 Arms (500 A range)
Conditions of guaranteed accuracy	Guaranteed accuracy period: 1 year Guaranteed accuracy period from adjustment made by Hioki: 1 year Opening and Closing of the jaws: Maximum 10000 times Temperature and humidity for guaranteed accuracy : 23°C±5°C (73°F±9°F), 80%RH or less

9010-50	Basic accuracy (45 Hz ≤ f ≤ 66 Hz)	(sine wave current input; jaws center position; common for all ranges; Inside of derating range) ±2% rdg. ±1% f.s.
	Frequency characteristics	(at 40 Hz ≤ f ≤ 1000 Hz, adds to the basic accuracy) ±6% rdg. (10/20 A range) ±3% rdg. (50/100/200/500 A range)
9018-50	Basic accuracy (45 Hz ≤ f ≤ 66 Hz)	(sine wave current input; jaws center position; common for all ranges; Inside of derating range) ±1.5% rdg. ±0.1% f.s.
	Frequency characteristics	(at 40 Hz ≤ f ≤ 3000 Hz, adds to the basic accuracy) Amplitude ±1% rdg. Phase ±2.5deg.

Temperature coefficient	Within ±0.05% rdg./°C
Effect of conductor position (at 100 A/55 Hz input, using with the conductor 10 mm diameter)	9010-50 Within ±2% 9018-50 Within ±0.5%
Effect of external magnetic fields (in an AC electromagnetic field of 400 A/m, 60 Hz)	9010-50 1 A equivalent or less 9018-50 100 mA equivalent or less
Output connector	BNC connector
Measurable conductor diameter	Less than 46 mm (1.81")
Dimensions	Approx. 78W×188H×35D mm (3.07"W×7.40"H×1.38"D) (Without protrusions, cord)
Mass	Approx. 420 g (14.8 oz.)
Cable length	Approx. 3 m
Accessories	Instruction manual

3. Derating



Option

9704 Conversion Adapter

This adapter changes the 9010-50 or 9018-50 output connector to a banana plug type. It is needed to connect to products with DMM or banana plug inputs.

NOTE

The banana plug has a safety cover attached and may therefore not be compatible with the shapes of the input connectors on some products.

