HIOKI

CT7126, CT7131, CT7136

AC CURRENT SENSOR

Instruction Manual

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Please visit our website at www.hioki.com for the following:
- 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 CT7126, CT7131, CT7136 AC Current Sensor. To obtain maximum performance from the device, please read this manual first, and keep it handy for future reference.

Be sure to also read the separate booklet “Current Sensor Operating Precautions” before use.

Troubleshooting

If the device seems to be malfunctioning, contact your authorized Hioki distributor or reseller.

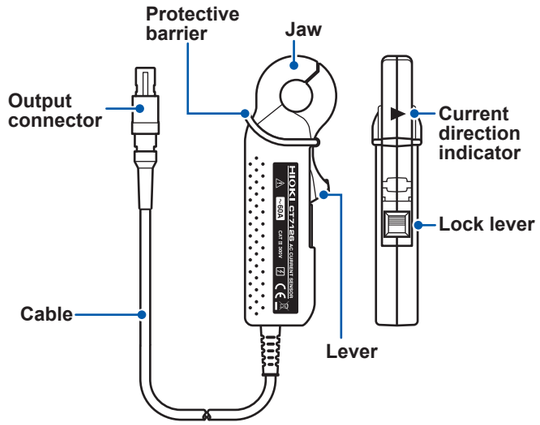
Overview

This current sensor has a Hioki PL14 output connector, enabling it to be automatically recognized when connected to a compatible instrument for simple setup.
The sensor has the adequate frequency characteristics (amplitude) and temperature characteristics for not only current measurement but also high-accuracy power measurement.

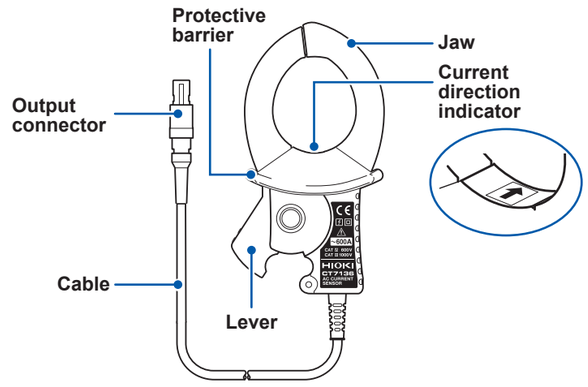
Parts Names

CT7126, CT7131

The model illustrated below is Model CT7126.



CT7136



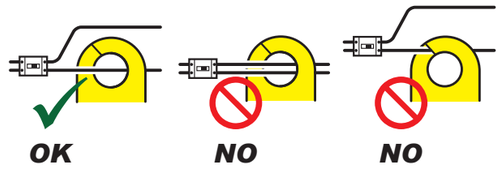
Measurement Methods

Inspection Before Use

Verify that the device operates normally to ensure that no damage occurred during storage or shipping. If you find any damage, contact your authorized Hioki distributor or reseller.

Check Items	Remedy
Is the jaw cracked or damaged?	If there is any damage, electric shock may result. Discontinue use and contact your authorized Hioki distributor or reseller.
Is the cable insulation torn?	
Is the cable broken at the base (of the connector or grip)?	Broken connections will make proper measurement impossible. Discontinue use and contact your authorized Hioki distributor or reseller.

IMPORTANT
Attach the jaw around only one conductor. If you clamp single-phase (2-wire) or three-phase (3-wire) conductors together, the device will not be able to make measurement.



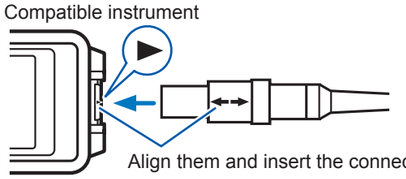
Close the tips of the jaw completely before performing measurement. If the output cable is caught on the jaw or the jaw is forced into the measurement location, it may not close completely. If this occurs, it will not be possible to obtain an accurate measurement.

Procedure

CT7126, CT7131

1 Connect the device to the compatible instrument.

Compatible instrument

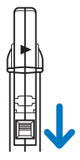


Align them and insert the connector

Align the arrow on the device’s output connector with the mark ▶ on the compatible instrument’s sensor input connector and insert the connector.

2 Unlock the lever. (LOCK is not displayed.)

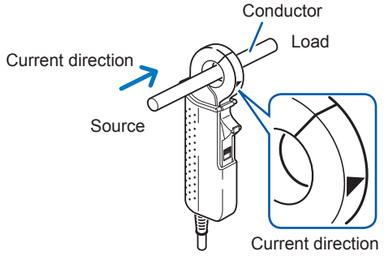
Pull the lock lever.



3 Open the jaw.

Pull the lever while pressing it inward.

4 Attach the jaw around only one of the conductors so as to position it at the center of the jaw.

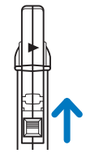


If attached with the current direction indicator pointed in the opposite direction of the current, the phase is displayed deviating by 180 degrees.

5 Make sure the jaw is firmly closed.

6 Lock the lever. (LOCK is displayed.)

Push the lock lever.

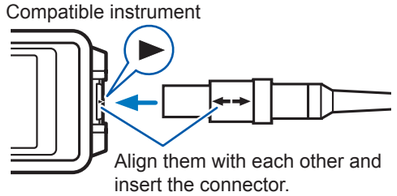


7 Once measurement is complete, remove the device from the conductor and disconnect it from the instrument.

CT7136

1 Connect the device to the compatible instrument.

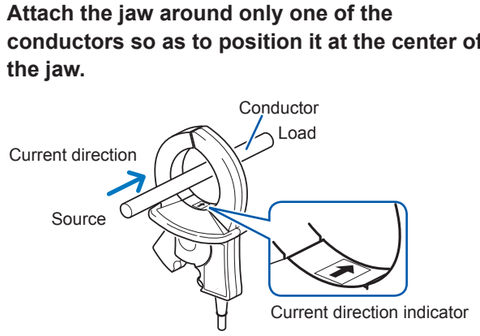
Compatible instrument



Align them with each other and insert the connector.

Align the arrow on the device’s output connector with the mark ▶ on the compatible instrument’s sensor input connector and insert the connector.

2 Attach the jaw around only one of the conductors so as to position it at the center of the jaw.



If the clamp is attached with the current direction indicator pointed in the opposite direction of the current, the phase is displayed deviating by 180 degrees.

3 Make sure the jaw is firmly closed.

4 Once measurement is complete, remove the device from the conductor and disconnect it from the instrument.

To Extend the Cable

Use of only the optional Model L0220 series is allowed. The cable is extendable by up to 10 m. The device can operate under the following conditions: however, no performances of the device are guaranteed.
- Two or more extension cables are connected in series.
- The cable is extended by more than 10 m.

See “Measurement Specifications” for more details about the effect.

Specifications

CT7126

General Specifications

Operating environment	Indoors, Pollution Degree 2, altitude up to 2000 m (6562 ft.)
Operating temperature and humidity	−10°C to 50°C (14°F to 122°F) 80% RH or less (no condensation)
Storage temperature and humidity	−20°C to 60°C (−4°F to 140°F) 80% RH or less (no condensation)
Dustproofness and waterproofness	IP40 (EN60529) (with sensor connected and jaw closed)
Standards	Safety: EN61010 EMC: EN61326
Dielectric strength	4.29 kV AC (sensed current: 1 mA) for 1 minute (between jaw and grip, between jaw and output connector)
Power supply	Not required
Dimensions	Approx. 46W × 135H × 21D mm (1.81″W × 5.31″H × 0.83″D)
Mass	Approx. 190 g (6.7 oz.)
Cable length	Approx. 2.5 m (98.43″)
Product warranty period	1 year
Accessories	Instruction Manual, Current Sensor Operating Precautions
Options	Model L0220-01 Extension Cable (2 m) Model L0220-02 Extension Cable (5 m) Model L0220-03 Extension Cable (10 m)

Output Specifications / Measurement Specifications

Output connector	Hioki PL14 Connector	
Rated measurement current	60 A AC	
Output rate	10 mV/A	
Maximum measurement current	RMS value, continuous	Within the frequency derating curve stated separately
	Peak value (under the RMS value conditions described above)	100 A peak
Measurable conductor diameter	ϕ15 mm or less	
Maximum rated voltage to earth	300 V AC (Measurement category III) Anticipated transient overvoltage: 4000 V	

Conditions of guaranteed accuracy

- Guaranteed accuracy period: 1 year
- Guaranteed accuracy period after adjustment made by Hioki: 1 year
- Opening and closing of the jaw: 10000 times or less
- Accuracy guarantee for temperature and humidity: 23°C±5°C (73.4°F±9°F), 80% RH or less
- Accuracy of AC measurement is guaranteed for sine wave inputs

Measurement accuracy *

Frequency	Amplitude	Phase
40 Hz ≤ f < 45 Hz	±0.8% rdg. ±0.01% f.s.	–
45 Hz ≤ f ≤ 66 Hz	±0.3% rdg. ±0.01% f.s.	±2.0 deg.
66 Hz < f ≤ 1 kHz	±1.0% rdg. ±0.01% f.s.	±2.0 deg.
1 kHz < f ≤ 5 kHz	±1.0% rdg. ±0.02% f.s.	±2.0 deg.
5 kHz < f ≤ 20 kHz	±2.0% rdg. ±0.04% f.s.	±2.0 deg.

Temperature coefficient	In the operating temperature range, add 0.02% rdg./°C (at temperatures other than 23°C±5°C).
Effect of conductor position (deviation from center)	Within ±0.3% (for the input of a current of 60 A, f ≤ 100 Hz, flowing through a 5-mm-diameter or thicker wire)
Effect of external magnetic field (400 A/m, 50 Hz/60 Hz)	0.1 A or less
Maximum extendable length	By 10 m (depends on the instrument to which the device is to be connected.) Add ±0.1% rdg. to amplitude of sensor measurement accuracy; and ±(0.05 × f kHz) deg. to phase.

CT7131

General Specifications

Operating environment	Indoors, Pollution Degree 2, Altitude up to 2000 m (6562 ft.)
Operating temperature and humidity	−10°C to 50°C (14°F to 122°F) 80% RH or less (no condensation)
Storage temperature and humidity	−20°C to 60°C (−4°F to 140°F) 80% RH or less (no condensation)
Dustproofness and waterproofness	IP40 (EN60529) (with sensor connected and jaw closed)
Standards	Safety: EN61010 EMC: EN61326
Dielectric strength	4.29 kV AC (sensed current: 1 mA) for 1 minute (between jaw and grip, between jaw and output connector)
Power supply	Not required
Dimensions	Approx. 46W × 135H × 21D mm (1.81″W × 5.31″H × 0.83″D)
Mass	Approx. 190 g (6.7 oz.)
Cable length	Approx. 2.5 m (98.43″)
Product warranty period	1 year
Accessories	Instruction Manual, Current Sensor Operating Precautions
Options	Model L0220-01 Extension Cable (2 m) Model L0220-02 Extension Cable (5 m) Model L0220-03 Extension Cable (10 m)

Output Specifications / Measurement Specifications

Output connector	Hioki PL14 Connector	
Rated measurement current	100 A AC	
Output rate	1 mV/A	
Maximum measurement current	RMS value, continuous	Within the frequency derating curve stated separately
	Peak value (under the RMS value conditions described above)	200 A peak
Measurable conductor diameter	ϕ15 mm or less	
Maximum rated voltage to earth	300 V AC (Measurement category III) Anticipated transient overvoltage: 4000 V	

Conditions of guaranteed accuracy

- Guaranteed accuracy period: 1 year
- Guaranteed accuracy period after adjustment made by Hioki: 1 year
- Opening and closing of the jaw: 10000 times or less
- Accuracy guarantee for temperature and humidity: 23°C±5°C (73.4°F±9°F), 80% RH or less
- Accuracy of AC measurement is guaranteed for sine wave inputs

Measurement accuracy *

Frequency	Amplitude	Phase
40 Hz ≤ f < 45 Hz	±0.8% rdg.±0.02% f.s.	±1.5 deg.
45 Hz ≤ f ≤ 66 Hz	±0.3% rdg.±0.02% f.s.	±1.0 deg.
66 Hz < f ≤ 1 kHz	±0.8% rdg.±0.02% f.s.	±1.0 deg.
1 kHz < f ≤ 5 kHz	±1.0% rdg.±0.04% f.s.	±1.0 deg.
5 kHz < f ≤ 20 kHz	±2.0% rdg.±0.05% f.s.	±2.0 deg.

Temperature coefficient	In the operating temperature range, add 0.02% rdg./°C (at temperatures other than 23°C±5°C).
Effect of conductor position (deviation from center)	Within ±0.3% (for the input of a current of 100 A, f ≤ 100 Hz, flowing through a 5-mm-diameter or thicker wire)
Effect of external magnetic field (400 A/m, 50 Hz/60 Hz)	0.1 A or less
Maximum extendable length	By 10 m (depends on the instrument to which the device is to be connected.) Add ±0.1% rdg. to amplitude of sensor measurement accuracy; and ±(0.05 × f kHz) deg. to phase. Furthermore, up to 2% f.s. effect is expected under the condition of conducted radio-frequency electromagnetic field of 10 V.

CT7136

General Specifications

Operating environment	Indoors, Pollution Degree 2, altitude up to 2000 m (6562 ft.)
Operating temperature and humidity	−10°C to 50°C (14°F to 122°F) 80% RH or less (no condensation)
Storage temperature and humidity	−20°C to 60°C (−4°F to 140°F) 80% RH or less (no condensation)
Dustproofness and waterproofness	IP40 (EN60529) (with sensor connected and jaw closed)
Standards	Safety: EN61010 EMC: EN61326
Dielectric strength	8.54 kV AC (sensed current: 1 mA) for 1 minute (between jaw and grip, between jaw and output connector)
Power supply	Not required
Dimensions	Approx. 78W × 152H × 42D mm (3.07″W × 5.98″H × 1.65″D)
Mass	Approx. 350 g (12.3 oz.)
Cable length	Approx. 2.5 m (98.43″)
Product warranty period	1 year
Accessories	Instruction Manual, Current Sensor Operating Precautions
Options	Model L0220-01 Extension Cable (2 m) Model L0220-02 Extension Cable (5 m) Model L0220-03 Extension Cable (10 m)

Output Specifications / Measurement Specifications

Output connector	Hioki PL14 Connector	
Rated measurement current	600 A AC	
Output rate	1 mV/A	
Maximum measurement current	RMS value, continuous	Within the frequency derating curve stated separately
	Peak value (under the RMS value conditions described above)	900 A peak
Measurable conductor diameter	ϕ46 mm or less	
Maximum rated voltage to earth	1000 V AC (Measurement category III) 600 V AC (Measurement category IV) Anticipated transient overvoltage: 8000 V	

Conditions of guaranteed accuracy

- Guaranteed accuracy period: 1 year
- Guaranteed accuracy period after adjustment made by Hioki: 1 year
- Opening and closing of the jaw: 10000 times or less
- Accuracy guarantee for temperature and humidity: 23°C±5°C (73.4°F±9°F), 80% RH or less
- Accuracy of AC measurement is guaranteed for sine wave inputs

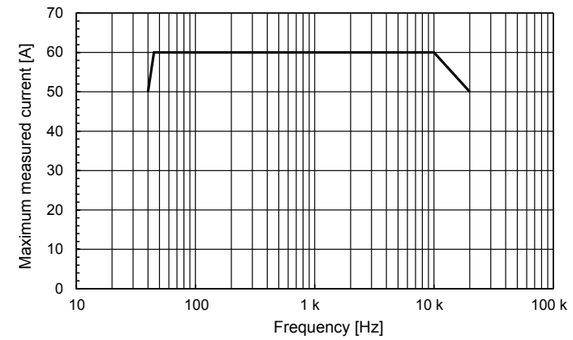
Measurement Accuracy *

Frequency	Amplitude	Phase
40 Hz ≤ f < 45 Hz	±0.8% rdg. ±0.01% f.s.	±1.0 deg.
45 Hz ≤ f ≤ 66 Hz	±0.3% rdg. ±0.01% f.s.	±0.5 deg.
66 Hz < f ≤ 1 kHz	±0.8% rdg. ±0.02% f.s.	±0.5 deg.
1 kHz < f ≤ 5 kHz	±1.0% rdg. ±0.02% f.s.	±0.5 deg.
5 kHz < f ≤ 20 kHz	±2.5% rdg. ±0.04% f.s.	±2.0 deg.

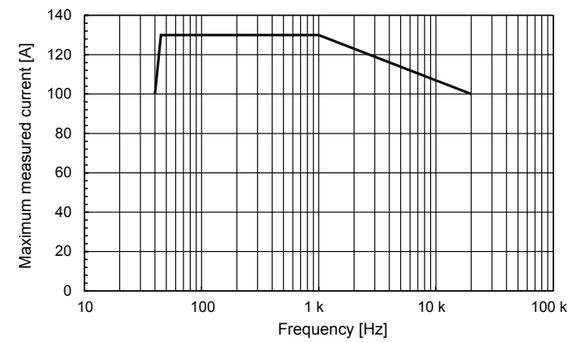
Temperature coefficient	In the operating temperature range, add 0.02% rdg./°C (at temperatures other than 23°C±5°C).
Effect of conductor position (deviation from center)	Within ±0.5% (for the input of a current of 100 A, f ≤ 100 Hz, flowing through a 5-mm-diameter or thicker wire)
Effect of external magnetic field (400 A/m, 50 Hz/60 Hz)	0.1 A or less
Maximum extendable length	By 10 m (depends on the instrument to which the device is to be connected.) Add ±0.1% rdg. to amplitude of sensor measurement accuracy; and ±(0.05 × f kHz) deg. to phase. Furthermore, up to 1% f.s. effect is expected under the condition of conducted radio-frequency electromagnetic field of 10 V.

Frequency Derating Characteristics

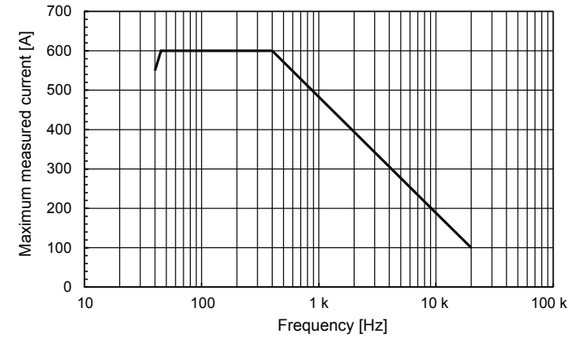
CT7126 Frequency Derating Characteristics



CT7131 Frequency Derating Characteristics



CT7136 Frequency Derating Characteristics



Notes Common to All Models

* Specified for sine wave inputs and with the conductor positioned at the center of the jaw. Not including any effects.
Amplitude accuracy (Specified for currents of not exceeding the rated value and within the derating curve.)
Phase accuracy (Specified for currents not exceeding the rated value or currents within the derating curve, whichever are smaller.)

f.s.: The rated measurement current.
rdg.: The value currently being measured and indicated on the measuring instrument.