HIOKI

CT7631
CT7636
CT7642

AC/DC
CURRENT SENSOR

Instruction Manual

EN

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HIOKI E. E. CORPORATION

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Warranty Certificate

Model	Serial No.	Warranty period Three (3) years from date of purchase (___ /___)

This product passed a rigorous inspection process at Hioki before being shipped.

In the unlikely event that you experience an issue during use, please contact the distributor from which you purchased the product, which will be repaired free of charge subject to the provisions of this Warranty Certificate. This warranty is valid for a period of three (3) years from the date of purchase. If the date of purchase is unknown, the warranty is considered valid for a period of three (3) years from the product's date of manufacture. Please present this Warranty Certificate when contacting the distributor. Accuracy is guaranteed for the duration of the separately indicated guaranteed accuracy period.

1. Malfunctions occurring during the warranty period under conditions of normal use in conformity with the Instruction Manual, product labeling (including stamped markings), and other precautionary information will be repaired free of charge, up to the original purchase price. Hioki reserves the right to decline to offer repair, calibration, and other services for reasons that include, but are not limited to, passage of time since the product's manufacture, discontinuation of production of parts, or unforeseen circumstances.
2. Malfunctions that are determined by Hioki to have occurred under one or more of the following conditions are considered to be outside the scope of warranty coverage, even if the event in question occurs during the warranty period:
   a. Damage to objects under measurement or other secondary or tertiary damage caused by use of the product or its measurement results
   b. Malfunctions caused by improper handling or use of the product in a manner that does not conform with the provisions of the Instruction Manual
   c. Malfunctions or damage caused by repair, adjustment, or modification of the product by a company, organization, or individual not approved by Hioki
   d. Consumption of product parts, including as described in the Instruction Manual
   e. Malfunctions or damage caused by transport, dropping, or other handling of the product after purchase
   f. Changes in the product's appearance (scratches on its enclosure, etc.)
   g. Malfunctions or damage caused by fire, wind or flood damage, earthquakes, lightning, power supply anomalies (including voltage, frequency, etc.), war or civil disturbances, radioactive contamination, or other acts of God
   h. Damage caused by connecting the product to a network
   i. Failure to present this Warranty Certificate
   j. Failure to notify Hioki in advance if used in special embedded applications (space equipment, aviation equipment, nuclear power equipment, life-critical medical equipment or vehicle control equipment, etc.)
   k. Other malfunctions for which Hioki is not deemed to be responsible

*Requests
• Hioki is not able to reissue this Warranty Certificate, so please store it carefully.
• Please fill in the model, serial number, and date of purchase on this form.

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Introduction

Thank you for purchasing the Hioki CT7631, CT7636, CT7642 AC/DC 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

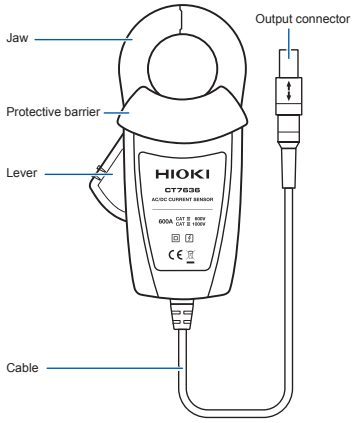
If the device seems to be malfunctioning, contact your authorized distributor.

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.

Parts Names

Example: CT7636



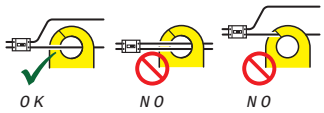
Measurement Methods

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 distributor.

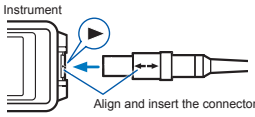
Check Items	Remedy
Is the jaw cracked or damaged?	If there is any damage, electric shock may result. Discontinue use and contact your authorized Hioki distributor or reseller.
Is the cable insulation torn?	
Is the cable broken at the base (of the connector or grip)?	Broken connections will make proper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

- Attach the clamp 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 a measurement.



- When a conductor to be measured is clamped in the center of the jaw, measurement is performed the most accurately, with no effect of the conductor position.
- To measure low current levels, multiple windings may be used to increase relative sensitivity (10 windings multiplies the measured current by a factor of 10). However, in this case, the windings should be made radially, with a diameter of at least 20 cm.
- The reading may show a measurement greater than the actual value due to magnetic-field interference. The amount of interference varies depending on the sensor. For details, see "Magnetic-field interference" in Specifications.
- For more information about instrument operation and settings, see the instrument's instruction manual.

1 Connect the device to the instrument.

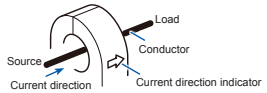


Align the arrow on the device's output connector with the ▶ on the compatible instrument's sensor input connector and insert the connector.

2 Perform zero-adjustment. (DC measurement)

Perform zero-adjustment under no-input conditions.

3 Clamp the conductor



Gripping the lever to open the jaw, align the current direction indicator with the direction of the current in the conductor, and close the jaw with the conductor roughly centered in the jaw.
If the phase is not an issue during AC measurement, the direction of current flow in the wire relative to the current direction indicator may be ignored.

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.

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

When disconnecting the device from the instrument, grip the tip of the output connector (the part with the arrow) and pull the connector straight out.

Pulling forcibly on the base of the connector may damage the device.

Specifications

General Specifications

	CT7631	CT7636	CT7642
Operating environment	Indoors, pollution degree 2, altitude up to 2000 m (6562 ft.)		
Operating temperature and humidity	−25°C to 65°C (−13.0°F to 149.0°F), 80% RH or less (no condensation)		
Storage temperature and humidity	−25°C to 65°C (−13.0°F to 149.0°F), 80% RH or less (no condensation)		
Dustproof and waterproof (EN60529)	Jaw, barrier, grip: IP40	Jaw, barrier: IP50 Grip: IP54 (when measuring an insulated conductor only) Risk of electric shock from the conductor being measured increases when wet.	
Standards	Safety: EN61010 EMC: EN61326		
Dielectric strength	7.4 kV AC for 1 minute (between jaw and grip, between jaw and output connector)		
Power consumption category	Sensor power consumption category: 1 (See the continuous operating time for the instrument to which the device is to be connected.)		
Dimensions	(Not including dimensions of protruding parts, lever, or jaw)		
	Approx. 58W × 132H × 18D mm (2.28"W × 5.20"H × 0.71"D)	Approx. 64W × 160H × 34D mm (2.52"W × 6.30"H × 1.34"D)	Approx. 64W × 195H × 34D mm (2.52"W × 7.68"H × 1.34"D)

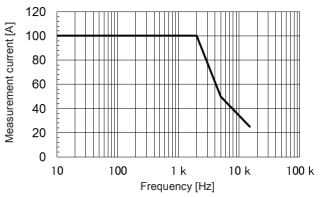
	CT7631	CT7636	CT7642
Jaw dimensions	Approx. 66W × 13D mm (2.60"W × 0.51"D)	Approx. 69W × 14D mm (2.72"W × 0.55"D)	Approx. 92W × 18D mm (3.62"W × 0.71"D)
Mass	Approx. 250 g (8.8 oz.)	Approx. 320 g (11.3 oz.)	Approx. 510 g (18.0 oz.)
Cable length	Approx. 2.5 m (98.43")		
Product warranty period	3 years		
Accessories	Instruction Manual, Current Sensor Operating Precautions		

Output Specifications and Measurement Specifications

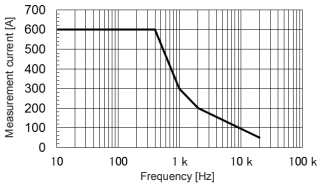
(1) Basic specifications

	CT7631	CT7636	CT7642
Output connector	Hioki PL14		
Rated measurement current	100 A AC/DC	600 A AC/DC	2000 A AC/DC
Output rate	1 mV/ A	1 mV/ A	0.1 mV/ A
Maximum measurement current	RMS value, continuous: see "Frequency deratings" below.		
	Peak value (under the RMS value conditions described above.):		
	150 A peak	900 A peak	2840 A peak
Frequency band	DC to 10 kHz (−3 dB)		
Measurable conductor diameter	ϕ33 mm (ϕ1.30") or less	ϕ33 mm (ϕ1.30") or less	ϕ55 mm (ϕ2.17") or less
Maximum rated voltage to earth	600 V AC/DC (Measurement category III)	1000 V AC/DC (Measurement category III) 600 V AC/DC (Measurement category IV)	
	Anticipated transient overvoltage: 8000 V		

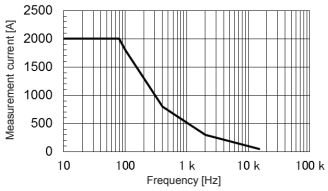
CT7631 Frequency derating



CT7636 Frequency derating



CT7642 Frequency derating



(2) Accuracy specifications

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

	CT7631	CT7636	CT7642
Conditions of guaranteed accuracy	Guaranteed accuracy period:	3 years	
	Guaranteed accuracy period after adjustment made by Hioki:	3 years	
	Opening and closing of the jaw:	30000 times or less	
	Accuracy guarantee for temperature and humidity:	23°C±5°C (73°F±9°F), 80% RH or less	
	After performing zero-adjustment with the instrument to which the device is connected		
	Accuracy of AC measurement guaranteed for sine wave inputs		
Measurement accuracy	See separate table.		
Temperature coefficient	In the operating temperature range, add 0.1 × specified accuracy/°C (at temperatures other than 23°C±5°C).		
Effect of radiated radio-frequency electromagnetic field	15% f.s. at 10 V/m		
Effect of conducted radio-frequency electromagnetic field	10% f.s. at 3 V		
Effect of conductor position (deviation from center)	Within ±1.5%	Within ±2.0%	Within ±1.0%
Effect of external magnetic field (400 A/m, DC)	Within ±1.5% f.s.	Within ±0.5% f.s.	Within ±0.2% f.s.
Maximum cord extension length	100 m (Depends on the instrument to which the device is to be connected.)		

CT7631 Measurement accuracy

Frequency		DC	45 ≤ f ≤ 66 (Hz)	DC < f < 45, 66 < f ≤ 500 (Hz)
Amplitude (A)	I ≤ 80	±1.0% rdg. ±0.5% f.s.	±1.0% rdg. ±0.5% f.s.	±2.0% rdg. ±0.5% f.s.
	80 < I ≤ 100			±2.5% rdg. ±0.5% f.s.
Peak (A peak)	|I peak| ≤ 110	±1.0% rdg. ±2% f.s.	±1.0% rdg. ±2% f.s.	±2.0% rdg. ±2% f.s.
	110 < |I peak| ≤ 150			±2.5% rdg. ±2% f.s.
Phase		–	±1.8 deg.	DC < f < 45 (Hz): ±1.8 deg. 66 < f ≤ 500 (Hz): Not defined.

CT7636 Measurement accuracy

Frequency		DC	45 ≤ f ≤ 66 (Hz)	DC < f < 45, 66 < f ≤ 1 k (Hz)
Amplitude (A)		±2.0% rdg. ±0.5% f.s.	±2.0% rdg. ±0.5% f.s.	±3.0% rdg. ±0.5% f.s.
Peak (A peak)	|I peak| ≤ 600	±2.0% rdg. ±0.7% f.s.	±2.0% rdg. ±0.7% f.s.	±3.0% rdg. ±0.7% f.s.
	600 < |I peak| ≤ 900	±4.0% rdg. ±0.7% f.s.	±4.0% rdg. ±0.7% f.s.	±5.0% rdg. ±0.7% f.s.
Phase		–	±1.8 deg.	DC < f < 45 (Hz): ±1.8 deg. 66 < f ≤ 1 k (Hz): Not defined.

CT7642 Measurement accuracy

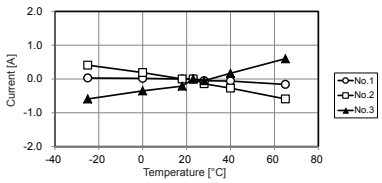
Frequency		DC	45 ≤ f ≤ 66 (Hz)	DC < f < 45, 66 < f ≤ 1 k (Hz)
Amplitude (A)	I ≤ 1800	±1.5% rdg. ±0.5% f.s.	±1.5% rdg. ±0.5% f.s.	±2.5% rdg. ±1.0% f.s.
	1800 < I ≤ 2000		±2.0% rdg. ±0.5% f.s.	
Peak (A peak)	|I peak| ≤ 2300	±1.5% rdg. ±1.0% f.s.	±1.5% rdg. ±1.0% f.s.	±2.5% rdg. ±1.0% f.s.
	2300 < |I peak| ≤ 2840	±6.0% rdg. ±1.5% f.s.	±6.0% rdg. ±1.5% f.s.	±7.0% rdg. ±1.5% f.s.
Phase		–	±2.3 deg.	DC < f < 45 (Hz): ±2.3 deg. 66 < f ≤ 1 k (Hz): Not defined.

"Peak input" is only available in conjunction with the CM7290 Display Unit. For more information about the combination accuracy with the instrument, see the instrument's instruction manual.
Amplitude accuracy design value is DC < f < 5 Hz. Phase accuracy design value is DC < f < 10 Hz.

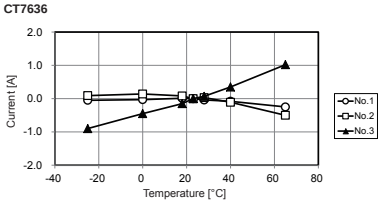
Zero-point Temperature Characteristics

Hall elements are subject to individual variation, and it is not possible to specify the magnitude or tendency of that variation. When using the sensor in an operating environment characterized by large temperature variations, it is recommended to observe variation in the zero-point under no-input conditions. Zero-point variation affects DC offset by not AC mode operation. Reference examples are provided below to illustrate zero-point variation (23°C reference) relative to temperature variations for each sensor. (There is also a significant level of variation in characteristics among individual products.) The operating temperature range is −25°C to 65°C (−13°F to 149°F).
(See below for example characteristics.)

CT7631



CT7636



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