9279

UNIVERSAL CLAMP ON CT

INSTRUCTION MANUAL

Contents

Introduction

Thank you for purchasing the HIOKI "9279 UNIVERSAL CLAMP ON CT". To obtain maximum performance from the product, please read this manual first, and keep it handy for future reference.

Inspection

When you receive the product, inspect it carefully to ensure that no damage occurred during shipping. In particular, check the accessories. If damage is evident, or if it fails to operate according to the specifications, contact your dealer or Hioki representative.

Preliminary Checks

- 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.
- 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.

Safety Notes

DANGER

This product is designed to conform to IEC 348 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 symbols

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.

- 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.
- In the manual, the ⚠ symbol indicates particularly important information that the user should read before using the product.

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.

Accuracy

The specifications in this manual include figures for "measurement accuracy" when referring to digital measuring instruments, and for "measurement tolerance" when referring to analog instruments.

f.s.	(maximum display or scale value, or length of scale) Signifies the maximum display (scale) value or the length of the scale (in cases where the scale consists of unequal increments or where the maximum value cannot be defined). In general, this is the range value (the value written on the range selector or equivalent) currently in use.
rdg.	(displayed or indicated value) This signifies the value actually being measured, i.e., the value that is currently indicated or displayed by the measuring instrument.

Notes on Use

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

DANGER

- **To avoid short circuits and potentially life-threatening hazards, never attach the UNIVERSAL CLAMP ON CT to a circuit that operates at more than the 600 Vrms, or over bare conductors.**
- **UNIVERSAL CLAMP ON CT 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.**

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.**

⚠ CAUTION

- Note that the product may be damaged if current exceeding the selected measurement range is applied for a long time
- 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.
- To avoid damage to the product, protect it from vibration or shock during transport and handling, and be especially careful to avoid dropping.
- Measurements are degraded by dirt on the mating surfaces of the clamp-on sensor, so keep the surfaces clean by gently wiping with a soft cloth.
- Avoid stepping on or pinching the cable, which could damage the cable insulation.
- Keep the cables well away from heat sources, as bare conductors could be exposed if the insulation melts.
- To avoid damaging the cables, do not bend or pull the cables.
- This product should be installed and operated indoors only, between 0 and 40℃. However, it can be safely operated down to -10℃.
- When measuring the high-frequency large current, over-heating of the core may occur. Note that the input never exceed the maximum permissible input range. See the figures in Chapter 3,"Specifications".

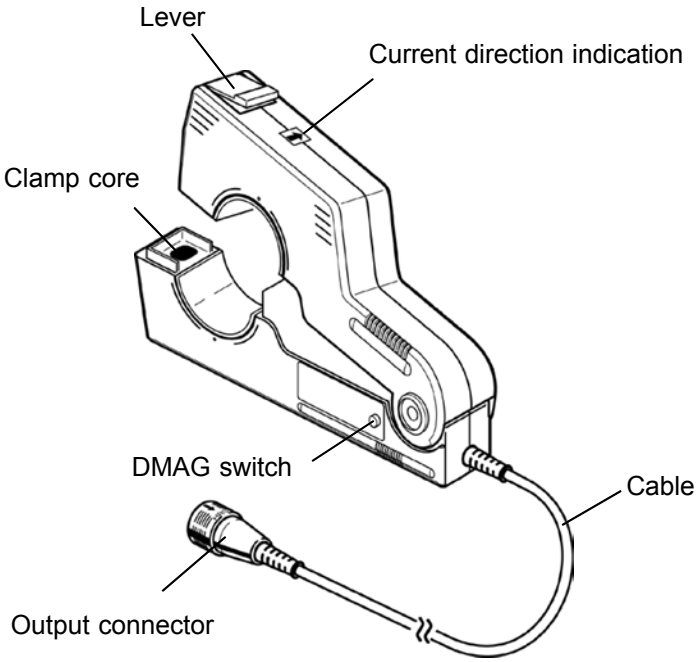
NOTE Accurate measurement may be impossible in the presence of strong magnetic fields, such as near transformers and high-current conductors, or in the presence of strong electromagnetic fields such as near radio transmitters.

Chapter 1
Overview

1.1 Product Overview

The 9279 was developed for to provide a 500 A clamp sensor corresponding to AC/DC current. The 9279 makes it possible to measure AC/DC current in live power lines without cutting into the lines. The sensor features good frequency response (amplitude and phase), good temperature response (sensitivity and offset), and dielectric strength and is easy to connect and use. Its versatility will find application in a wide variety of fields dealing with current and power measurement.

1.2 Names of Parts



Chapter 2
Measurement Procedure

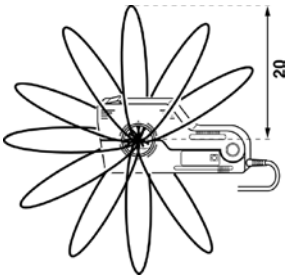
2.1 Measurement Procedure

⚠ CAUTION

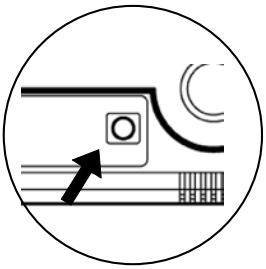
- To avoid damaging the output cable, grasp the connector, not the cable, when unplugging the cable.
- To prevent damage to the product and sensor, never connect or disconnect a sensor while the power is on.
- The maximum continuous input range is based on heat that is internally generated during measurement. Never input current in excess of this level. Exceeding the rated level may result in damage to the cable.
- The maximum continuous input range varies according to the frequency of the current being measured. See the figures in Chapter 3, "Specifications"

NOTE

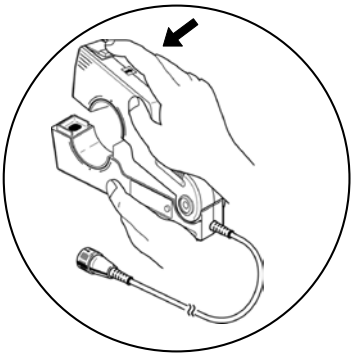
- To measure small current levels, multiple windings may be used to increase the relative sensitivity. 10 windings multiplies the measured current by about a factor of 10. However, in this case the diameter of the winding should be 20 cm or more, and radial.



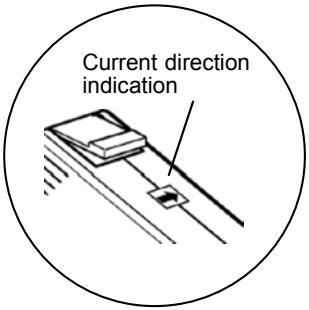
- This product has a resistance in series with the signal output circuits. Therefore, if measuring an output signal directly, ensure that the input resistance of the measuring instrument is sufficiently high.



1. Close the clamp jaws when the clamp jaws are opened.
2. Make sure that the unit's power switch is OFF.
3. Connect the clamp-on CT connector to the unit.
4. Turning the power on the unit.
5. Press the DMAG switch to magnetize.
   (See 2.2 Demagnetizing (DMAG))



6. Lightly press the lever and spread the tips of the clamp with both hands.



7. Align the sensor so that the current direction indication corresponds to the direction of current flow through the conductor to be measured, and clamp so that the conductor is in the center of the sensor aperture.

NOTE

- Grip the clamp lightly so that the lever snaps securely shut. At that time, avoid to subjecting the facing surface of the core to shock.
- Make sure that only one conductor is in the core. Single-phase (2-wire) and three-phase (3-wire) lines clamped together will not produce reading.

2.2 Demagnetizing (DMAG)

After measuring rush current or similar of AC or DC current measurement, micro voltage is output even if there is no input on the clamp. This is caused by the core characteristic using the clamp and magnetic is remained in the core. This remanent cause measuring error, but it can be removed by pressing DMAG with no input onto the clamp.

NOTE

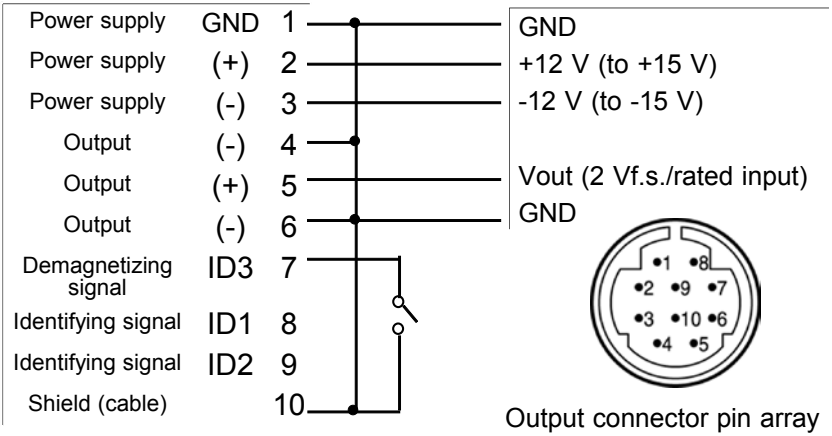
- After powering on, press DMAG.
- It is possible to magnetize even if pressing DMAG during input.
- Always make sure that the clamp jaws are completely closed during demagnetising.
- Demagnetization occurs for about 3 seconds.
- If an excessive amount of current was input so that one attempt at demagnetization does not completely rid of the remanence, open the clamp jaws and press DMAG, then close the clamps, and press DMAG again.
- In case of closing the clamp and if the facing surface of the core is subjected to shock, offset maybe output. In this case, press the DMAG switch with no input on the clamp.
- When measuring DC current and applying exceed continuous the maximum permissible input, the malfunction may occur. Press the DMAG switch with no input on the clamp, to return to normal.
- If it does not return to normal condition, or even pressing DMAG, the magnetic is remained in the core, contact your dealer or Hioki representative.

Chapter 3 Specification

Rated current (AC/DC)	500 A f.s.
Output voltage (AC/DC)	2 V/500 A
The maximum permissible input range (DC to 3 kHz)	650 Arms (920 Apeak)
Input resistance (DC)	0.001 mΩ or less
Output resistance	50 Ω
Basic accuracy 23±3℃ (73±5°F) Period of guaranteed accuracy	DC and 45 Hz to 66 Hz, 30 min or more warming-up after degaussing Amplitude: ±0.5% rdg. ±0.05% f.s. Phase: within ±0.2° (DC has no provision) 1 year
Amplitude-frequency characteristic (deviation from accuracy)	DC to 1 kHz within ±1.0% 1 k to 10 kHz within ±2.5% 10 k to 20 kHz within ±5.0%
Phase-frequency characteristic	DC to 1 kHz within ±0.5° 1 k to 10 kHz within ±2.5° 10 k to 20 kHz within ±5.0°
Temperature coefficient	Sensitivity: within ±0.05% rdg. /℃ Offset: within ±0.005% f.s. /℃
Operating temperature and humidity range	0 to 40℃ (32 to 104°F), Max. 80%RH (no condensation)
Storage temperature and humidity range	-10 to 50℃ (14 to 122°F), Max. 80%RH (no condensation)
Effect of conductor position	Within ±1.5% (DC, 55 Hz)
Effect of external magnetic field (400 A/m, 55 Hz and DC)	Max. 2 A

Dielectric strength	2200 Vrms for 1 min. (between electric circuit and case, between electric circuit and core)
Insulation resistance	500 V DC 100 MΩ or more (between electric circuit and case, between electric circuit and core)
Maximum rated voltage to earth	600 Vrms (850 Vpeak) insulated conductor
Diameter of measurable conductors	40 mm (1.57") or less
Supply voltage	±12 V to ±15 V (with accuracy guaranty but tracking)
Power supply capacity	±90 mA (with no load) ±250 mA (with rated input)
Supply consumption	Max. 7.2 W (with rated input)
Dimensions and mass	Approx. 220W×103H×43.5D mm (8.66"W×4.06"H×1.71"D) Approx. 470 g (16.6 oz.)
Cord length	Approx. 3 m (9.84 feet)
Accessories	9375 CARRYING CASE 1 Instruction manual 1 Markband 6 (3 set)

Output connector pin array



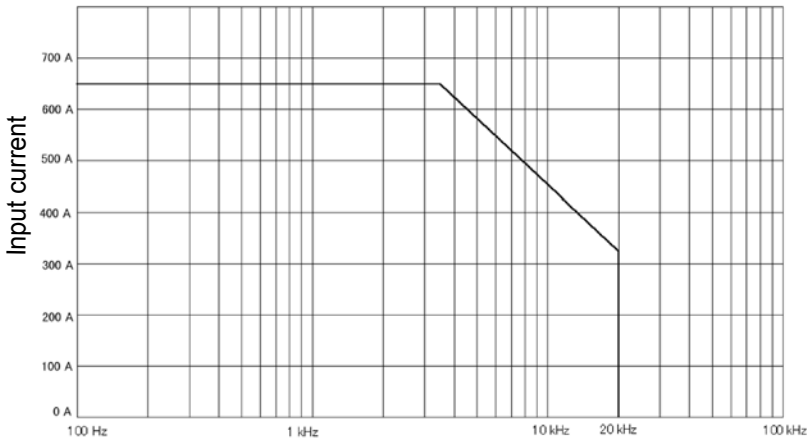
Output connector pin array

	9279
ID1	N.C
ID2	Connect to GND

Mating receptacle
RM515ERB-10SD (HIROSE)

⚠ CAUTION

- Be careful to avoid connecting voltage improperly, as the internal circuitry may be destroyed.
- The capacity of the power supply is at least ±0.5 A.
- Demagnetization occurs after pin 7 is shorted to ground and then opened.



9279 The maximum permissible input range (continuous)

Chapter 4 Maintenance and Service

4.1 Maintenance

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.

4.2 Service

- 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.

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