

i800 AC Current Clamp Instruction Sheet

Introduction









The i800 AC Current Clamp, the Clamp, has been designed for use with multimeters, recorders, power analyzers, safety testers, etc., for accurate non-intrusive ac current measurement.

Using the latest transformer technology, the Clamp measures currents from 100 mA to 800 A.

The Clamp complies with the safety standards EN61010-2-032 for input and output circuits.

Symbols

The table below lists the symbols used on the Clamp and/or in this manual.

| Symbol | Description |
|---|--|
|  | Do not dispose of this product as unsorted municipal waste. Go to Fluke's website for recycling information. |
|  | Important Information. See manual. |
|  | Hazardous Voltage. Risk of electric shock. |
|  | Double insulation. |
|  | Application around and removal from HAZARDOUS LIVE conductors is permissible. |
|  | Conforms to Canadian Standards Association. |
|  | Complies with the relevant European standards. |
|  | Conforms to Australian standards. |
| CAT III | Equipment designed to protect against transients in equipment in fixed-equipment installations, such as distribution panels, feeders and short branch circuits, and lighting systems in large buildings. |

Safety Instructions

Please read this section carefully. It will make you familiar with the most important safety instructions for handling the Clamp. In this instruction sheet, a **Warning** identifies conditions and actions that pose hazard(s) to the user. A **Caution** identifies conditions and actions that may damage the Clamp or the test instruments.

Warning

The Clamp may only be used and handled by qualified personnel. To avoid electric shock or personal injury, follow these precautions:

- **Do not use the Clamp if damaged. Always connect to display device before it is installed around the conductor.**
- **If the Clamp is not used as specified by the manual, protection provided by the Clamp may be impaired.**
- **Do not clamp around a conductor before connecting clamp output to the measuring equipment.**
- **Do not disconnect the output from the measuring equipment while the Clamp is still around a conductor.**
- **Connect the Clamp output to measuring equipment having safety receptacles.**
- **Do not use prior to consulting local and national safety codes and use of protective equipment is recommended.**
- **Do not hold the Clamp beyond the tactile barrier.**
- **Before each use, inspect the Clamp. Look for cracks or missing portions of the housing or output cable insulation. Also look for loose or weakened components. Pay particular attention to the insulation surrounding the jaws. Open and close the Clamp, noting detent action indicating proper mechanical operation of SIAC™ anti short circuit feature.**
- **Use caution when working with voltages above 60 V dc, 30 V ac rms or 42 V ac peak. Such voltages pose a shock hazard.**
- **Do not use Clamp in wet environments or in locations that hazardous gases exist.**

SIAC™ (Security Internal Anti Short Circuit)

SIAC™ (Security Internal Anti Short Circuit), patent applied for, provides protection against short circuits between adjacent primary conductors when clamped around conductors. This mechanism ensures that the magnetic circuit separates at the bottom of the jaw prior to the jaw opening at the top.

A detent action produced by SIAC™ can be felt when opening the jaws. This detent action should always be present in use. If the jaws open smoothly, service is indicated and the Clamp should be inspected at the nearest Fluke Service Center. See “Contacting Fluke”.

Operating Instructions

Warning

To avoid electric shock or personal injury when using the Clamp:

- **Ensure that your fingers are behind the tactile barrier as shown in Figure 1.**
- **Do not use the Clamp if any part, including the lead and connector(s), appears to be damaged or if a malfunction of the instrument is suspected.**
- **Clamp around the current carrying conductor ensuring good contact between the jaw faces. Center the cable between the Clamp jaws.**

Note

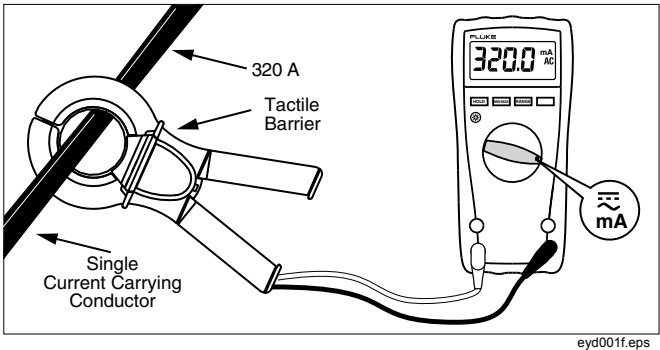
The arrow on the labels shows the direction of the current flow from the source to the load. In order to have a correct phase relationship between the primary current and the clamp output, care must be taken regarding the direction of current flow.

1. Connect the Clamp output connectors between the common and the appropriate current input jack of a suitable meter, then switch the meter on.
2. Select a 20 mA ac or greater current range.
3. Clamp the probe around the current-carrying conductor to be measured (see Figure 1). Make sure the probe jaws are tightly closed around the conductor.

Note

Wire size and the position of the wire within the probe jaws does not affect measurement accuracy.

- Multimeter readings displayed in milliamps (mA) can be read directly as amperes of conductor current. Readings displayed in amperes (A) must be multiplied times 1000 to obtain the amperes of conductor current.



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Figure 1. Current Measurement

Meter Readings

When the Clamp is connected to a compatible current meter and clamped around a single current-carrying conductor, the meter reading will be one 1000th of the actual current in the conductor. For example, a 5 A input current will be transformed into a 5 mA output current (see Figure 1). When measuring current in an ac line cord, the jaws should be clamped around only one conductor (the black or hot wire in a three wire cord). If the jaws are clamped around both current carrying conductors, the currents will cancel and produce a zero reading. If the probe is clamped around two wires carrying current in the same direction, the sum will be read. Reversing one of the wires causes the difference to be read.

Low-Level Current Measurement

The Clamp is specified to measure currents of 100 mA or greater. Currents less than 100 mA will produce meter readings that are below the true value. Low-level currents can be measured by looping the input wire through the jaws so that the sum of the current through the jaws is greater than 100 mA. The actual current can then be calculated by dividing the meter reading by the number of turns looped through the jaws. For example, to measure a current of 40 mA (0.04 A), form a 10-turn loop and clamp the jaws around all 10 turns. The meter reading will be 0.4 mA, which corresponds to a primary current of 0.4 A (400 mA). The actual current in the conductor is 400 mA divided by 10-turns, or 40 mA.

Note

The probe output is equal to 1 mA per amp of primary current. Since the primary current is equal to 400 mA (40 mA x 10 and the probe divides it by 1000) the meter reading will be 0.4 mA, which represents 400 mA.

Maintenance

Performance Test

Verify Probe accuracy by measuring the output of a 20 A ($\pm 0.15\%$), 60 Hz current source (Fluke 5520A or equivalent). When used with a compatible DMM with $\pm 0.35\%$, or better, ac current accuracy (Fluke 8808A or equivalent), the probe should measure 20.000 A ± 0.400 A (20.000 mA, ± 0.400 mA). There are no calibration adjustments in the Clamp.

Cleaning

Clean the case periodically by wiping it with a damp cloth and detergent. Do not use abrasive cleaners or solvents. Do not immerse the Clamp in liquids.

Contacting Fluke

To contact Fluke, call:

USA: 1-888-993-5853

Canada: 1-800-363-5853

Europe: +31 402-675-200

Japan: +81-3-3434-0181

Singapore: +65-738-5655

Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.

To register your product, visit <http://register.fluke.com>.

Specifications

Electrical Characteristics

| | |
|--|---|
| Specified Current Range | 100 mA to 800 A rms |
| Overload Capability for 1 Hour, 33 % Duty Cycle | 1500 A rms (50/60 Hz) |
| Output Sensitivity | 1 mA / A |
| Turns Ratio | 1000:1 |
| Accuracy | $\pm 2\%$ of reading, 50 Hz to 1 kHz, $\pm 3\%$ of reading (typical), 30 Hz to 50 Hz or 1 kHz to 10 kHz (Maximum load $\leq 10\ \Omega$) |
| Load Impedance | $\leq 20\ \Omega$ |
| Phase Shift at 2 kHz | ± 1 degree typical |
| Bandwidth | 30 Hz to 10 kHz (-3 dB) |
| Working Voltage (see Safety Standards section) | 600 V ac rms or dc |

General Characteristics

| | |
|-----------------------------|-------------------|
| Maximum Conductor Size | 54 mm diameter |
| Output Connection | 4 mm safety plugs |
| Operating Temperature Range | -10 to +55 °C |
| Storage Temperature Range | -40 to +70 °C |

| | |
|---------------------|---|
| Operating Humidity | 15 % to 85 % (non condensing) |
| Weight | 650 g |
| Cable Length | 1.6 meters |
| Overload Conditions | Operation above 1200 A should be limited to frequencies below 1 kHz |
| Duty Cycle | 1500 A at 50 / 60 Hz for 1 hour, 33 % duty cycle (20 min ON, 40 min OFF). |

Safety Standards

EN 61010-1: 2001

EN 61010-2-032: 2002

EN 61010-031: 2002

600 V rms, Category III, Pollution Degree 2

Use of the clamp on uninsulated conductors is limited to 600 V ac rms or dc and frequencies below 1 kHz.

CAT III equipment is designed to protect against the transients in the equipment in fixed equipment installations, such as distribution panels, feeders and short branch circuits, and the lighting systems in large buildings.

EMC Standards

EN 61326 :1998 +A1, A2, & A3

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

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