

i400s-EL AC Current Clamp

Instructions

Introduction

The i400s-EL (the Product) is an ac current clamp that is compatible with Fluke 173x Power Loggers and 174x Power Quality Loggers.

How to Contact Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-6799-5566
- China: +86-400-921-0835
- Brazil: +55-11-3530-8901
- 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>.

To view, print, or download the latest manual supplement, visit <http://us.fluke.com/usen/support/manuals>.

Safety Information

A **Warning** identifies conditions and procedures that are dangerous to the user. A **Caution** identifies conditions and procedures that can cause damage to the Product or the equipment under test.

⚠️ Warning

To prevent electrical shock, fire, or personal injury:

- **Read all safety information before you use the Product.**
- **Do not alter the Product and use only as specified, or the protection supplied by the Product can be compromised.**
- **Comply with local and national safety codes. Use personal protective equipment (approved rubber gloves, face protection, and flame-resistant clothes) to prevent shock and arc blast injury where hazardous live conductors are exposed.**
- **Do not exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.**
- **Before each use, examine the Product. Look for cracks or missing pieces of the clamp housing or output cable insulation. Also look for loose or weakened components. Carefully examine the insulation around the jaws.**
- **Use caution around bare conductors or bus bars. To prevent electrical shock, do not touch the conductor.**
- **Hold the Product behind the tactile barrier.**
- **Do not touch voltages >30 V ac rms, 42 V ac peak, or 60 V dc.**
- **Do not use the Product around explosive gas, vapor, or in damp or wet environments.**
- **Do not use the Product if it is altered or damaged.**
- **Do not make connections on hazardous live conductors in damp or wet environments.**
- **Limit operation to the specified measurement category, voltage, or amperage ratings.**









Measurement Considerations

Observe the following guidelines when making measurements (see Table 1):

- Center the conductor inside the Product.
- Make sure the Product is perpendicular to the conductor.
- For optimal reading, make sure the conductor is positioned between the alignment marks on the jaws of the Product.
- Avoid taking measurements close to other current-carrying conductors.

Symbols

The table below is a list of symbols used on the Product and in this document.

Symbol	Description
	WARNING - RISK OF DANGER. Consult user documentation.
	WARNING. HAZARDOUS VOLTAGE. Risk of electric shock.
	Consult user documentation.
	Double Insulated
	Application around and removal from uninsulated hazardous live conductors is permitted.
CAT III	Measurement Category III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.
CAT IV	Measurement Category IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.
	Conforms to European Union directives.
	Certified by CSA Group to North American safety standards.
	This product complies with the WEEE Directive marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste.

Operation

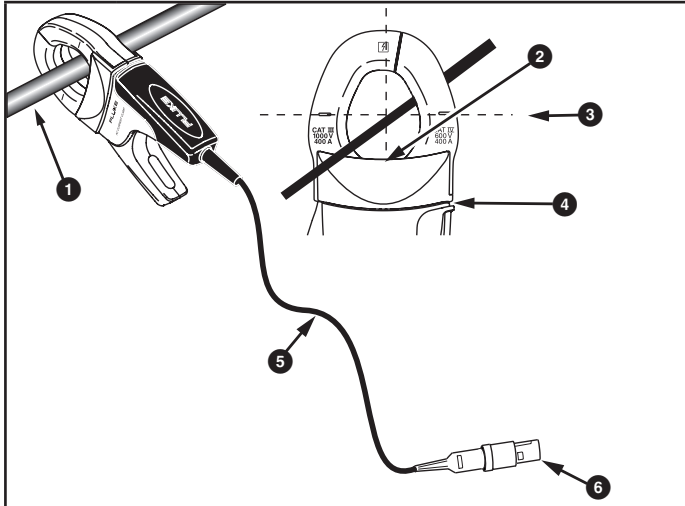
To use:

1. Connect the clamp cable to the current inputs on the measurement instrument. The instrument automatically recognizes the clamp and selects the default range of the instrument for the probe.
2. Make sure the measurement instrument is set to the correct range.
3. Connect the jaws around the conductor to be measured.

⚠️ Warning

To prevent electrical shock, fire, or personal injury, hold the Product behind the tactile barrier. See Table 1.

Table 1. i400s-EL Setup



Item	Description
1	Single Current Carrying Conductor
2	Load Direction Arrow
3	Alignment Marks
4	Tactile Barrier
5	2 m (6.6 ft) Output Cable
6	Connector

Maintenance

⚠️ Warning

To prevent electrical shock, fire, or personal injury:

- Before each use, examine the Product. Look for cracks or missing pieces of the clamp housing or output cable insulation. Also look for loose or weakened components. Carefully examine the insulation around the jaws.
- Do not use the Product if it is altered or damaged.

If the Current Clamp does not work or perform properly:

1. Inspect the jaw mating surface for cleanliness. If any foreign material is present, the jaw will not close properly and measurement errors will result.
2. Verify that the function selection and range on the measurement instrument are correct and adjusted to the sensitivity of the Current Clamp.

Cleaning

Periodically wipe the case with a damp cloth and mild detergent.

⚠️ Caution

To avoid damaging the Current Clamp, do not use abrasives or solvents to clean the clamp.

Open the jaws and wipe the magnetic pole pieces with a lightly oiled cloth. Do not allow rust or corrosion to form on the magnetic core ends.

Specifications

Measuring Range 400 mA ac to 40 A ac / 4 A ac to 400 A ac

Crest Factor..... ≤3

Accuracy at Reference

Condition^[1]..... ±0.5% of reading

[1] Reference Condition:

- 400 A 50/60 Hz
- Environmental: 23 °C ±5 °C, no external electrical/magnetic field, RH 65 %
- Primary conductor in center position

Accuracy 174x + Clamp

400 A range..... ±(0.7 % of reading + 0.1 % of range)

40 A range..... ±(2 % of reading + 0.2 % of range)

Phase Shift

<400 mA..... unspecified

400 mA to 1 A..... < ±3.5°

1 A to 2 A..... < ±2.5°

2 A to 10 A..... < ±1.5°

10 A to 400 A..... < ±1°

Temperature Coefficient over

Operating Temperature Range 0.01 % of reading / °C

0.0056 % of reading / °F

Influence of Adjacent Conductor..... ≤9 mA/A (@ 50/60 Hz)

Influence of Conductor Position

in Jaw Opening..... ±1.0 % of reading + 0.05 A

Bandwidth..... 10 Hz to 2.5 kHz

Safety

General IEC 61010-1: Pollution Degree 2

Measurement..... IEC 61010-2: CAT III 1000 V / CAT IV 600 V

Size (H x W x L)..... 150 mm x 70 mm x 30 mm
(6 in x 2.8 in x 1.2 in)

Maximum Conductor Size 32 mm (1.2 in)

Output Cable Length 2 m (6.6 ft)

Weight 272 g (9.6 oz)

Temperature

Operating 0 °C to 50 °C (32 °F to 122 °F)

Non-operating -20 °C to +60 °C (-4 °F to +140 °F)

Relative Humidity, operating..... 10 °C to 30 °C: 95 %

30 °C to 40 °C: 75 %

40 °C to 50 °C: 45 %

Operating Altitude..... 2000 m (6500 ft) up to 4000 m (13 000 ft) derate
to CAT II 1000 V / CAT III 600 V / CAT IV 300 V

Storage Altitude 12 km (40 000 ft)

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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