i3000s

AC Current Clamp

Instruction Sheet

Introducing the i3000s

The i3000s is a clamp-on AC Current Clamp for use with oscilloscopes and multimeters with banana input using the supplied Dual Banana to BNC Adapter. The clamp is optimized for measurement on power distribution systems.

Unpacking

The following items should be included in your Current Clamp box:

- Current Clamp
- Dual Banana to BNC Adapter (model PM9081/001)
- Instruction Sheet (this paper)

Check the contents of the shipping box for completeness. If something in the box has been damaged or missing, contact your distributor or the nearest FLUKE sales or service office immediately.

Safety Information

Read First: Safety Information.

To ensure safe operation and service of the current clamp, follow these instructions:

- Read the operating instructions before use and follow all safety instructions.
- Use the Current Clamp only as specified in the operating instructions, otherwise the clamp’s safety features may not protect you.
- Adhere to local and national safety codes. Individual protective equipment must be used to prevent shock and arc blast injury where hazardous live conductors are exposed.
- Do not hold the Current Clamp anywhere beyond the tactile barrier, see Figure II.
- Before each use, inspect the Current Clamp. Look for cracks or missing portions of the clamp housing or output cable insulation. Also look for loose or weakened components. Pay particular attention to the insulation surrounding the jaws.
- Check the magnetic mating surfaces of the clamp jaws; these should be free of dust, dirt, rust and other foreign matter.
- Never use the clamp on a circuit with voltages higher than 600 V CAT III.
- CAT III equipment is 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.

Specifications

SAFETY

- Input jaws & Output float voltage

CE Conformity

EN/IEC 61010-02-032

ELECTRICAL SPECIFICATIONS

All Electrical Specifications are valid at the following reference conditions:

- Ambient temperature: 23±5°C (73.4°F)
- Relative Humidity: 0 to 85%
- Frequency: 48 to 65 Hz
- Continuous external field: < 40 A/m
- Load impedance: 1 MΩ/47 pF
- The current may not contain any DC component
- No influence from adjacent currents
- The conductor must be centered within the jaw aperture

- This is the maximum permissible ratio between the peak value of a superimposed transient and the ac rms value.
- Bandwidth (-3dB) (see Figure 7 for derating) 10 Hz to 100 kHz

GENERAL

- Clamp Dimensions: 310 x 120 x 48 mm
- Weight: 1200 g (42.3 oz)
- Cable length: 2.1 m (62.6 in)
- Maximum conductor size: ≤ 64 mm (2.5 in)
- Maximum Jaw Opening: 90 mm (3.5 in)
- Temperature Operating: -10 to +60°C (+14 to +122°F)
- Non-operating: -40 to + 85°C (-40 to +185°F)
- Relative Humidity Operating: 0 to 85%, up to +35°C (+95°F)
- Non-operating: 0 to 75%, up to +35°C (+95°F)
- Altitude Operating: to 2000 m (6600 ft)
- Non-operating: to 12000 m (40000 ft)

FREQUENCY RESPONSE

Figure 1. Frequency Response @ 10A

Figure 2. Frequency Response @ 10A

Figure 3. Frequency Response @ 100A

Figure 4. Frequency Response @ 10A

Figure 5. Frequency Response @ 10A

Figure 6. Frequency Response @ 10A
PHASE SHIFT

Example 2: Current Clamp set to 10 mV/A, Multimeter displays 0.285V. Actual current = display value \times sensitivity Current Clamp

Actual current = 0.285V \times 285 mV/A = 82.5A

Observe the following guidelines when making measurements:

- On the Current Clamp, select the most appropriate range for the current being measured to get the best accuracy.

Tactile barrier

Warning

If the sensitivity setting (mV/A) of the ScopeMeter test tool or oscilloscope does not correspond with the setting of the Current Clamp, the instrument may display a much lower current than the actual value. This may cause misinterpretation and as a consequence incorrect handling.

Example 1: Current Clamp set to 0.1 mV/A, ScopeMeter test tool set to 1 mV/A. The ScopeMeter test tool displays 50A. The real current value can be calculated with the following formula:

Actual current = display value \times sensitivity instrument \div sensitivity Current Clamp

Actual current = 50 \times 1 mV/A \div 500 A = 0.1 mV/A

Instrument Compatibility

The i3000s is compatible with any Fluke ScopeMeter test tool, Power Harmonics Analyzer, Oscilloscope, Multimeter, or other voltage measurement device that has the following features:

- BNC input connector. The Dual Banana to BNC Adapter included in the package, can be used to connect to standard inputs on multimeters. For the 120 series ScopeMeters, use the BB120 Shielded Banana to BNC Adapter.
- Input accuracy of 2% or better to take full advantage of the accuracy of the Current Clamp.
- Input impedance of greater than or equal to 1 MΩ, and for full bandwidth and accuracy, a maximum input capacity of 47 pF.
- A passband of more than four times the frequency of the waveform to be measured.

Using the Current Clamp

To use the Current Clamp, follow these instructions:

1. Connect the i3000s Current Clamp to the desired input on the measuring instrument. When you are using a multimeter, use the Dual Banana to BNC Adapter (PM5001/001) to connect the Current Clamp to the input. (See Figure 8.)
2. On the Current Clamp, select the least sensitive range (0.1 mV/A).
3. Select the appropriate clamp sensitivity on your ScopeMeter test tool or oscilloscope.
4. Position the Current Clamp perpendicularly and centered around the conductor. Make sure that the arrow marked on the clamp jaw points toward the correct orientation for correct phase display on the oscilloscope. (See Figure 9.)
5. Use the markings on the jaws to center the conductor.
6. Observe the current value and waveform on the instrument’s display.
7. If desired, select a lower range on the Current Clamp and set the corresponding sensitivity (mV/A) setting on the ScopeMeter test tool or oscilloscope.

If the corresponding sensitivity is not available on the ScopeMeter or oscilloscope, select the closest setting and calculate the actual current value from the displayed.

Measurement Considerations

Observe the following guidelines for positioning the Current Clamp jaws:

- Center the conductor inside the clamp jaws.
- Make sure that the arrow marked on the jaw of the Current Clamp points toward the correct direction.
- Make sure that the clamp is perpendicular to the conductor.

Observe the following guidelines when making measurements:

- If the Current Clamp is not used properly, refer to the following steps to help isolate the problem:
  - Inspect the jaw mating surface for cleanliness. If any foreign material is present, the jaws will not close properly and errors will result.
  - Verify that the function selection on the ScopeMeter test tool or oscilloscope is correct, i.e., the display vertical resolution is not too low or too high.

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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 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, send your defective product to the nearest Fluke Authorized Service Center with a description of the problem.

This Fluke product is covered by one of the following:

- U.S.A. warranty:
  - 1-888-993-5853 in U.S.A. and Canada
  - +1-425-446-5500 from other countries

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