

0/i200s

urrent Clamp

uction Sheet

Introducing the i200/i

The i200 is a single range 200A clamp current output via safety shrouded banana. The i200s is a dual range 20A and 200A. Clamp with voltage output via a safety shrouded banana. A dual banana to BNC adapter is supplied and connected to multimeters with banana leads.

Unpacking

The following items should be included:

- Current Clamp
- Dual Banana to BNC Adapter
- Instruction Sheet (this paper)

Check the contents of the shipping box to make sure that everything in the box has been distributed by the distributor or the nearest FLUKE sales office.

Safety Information



  **Read First: Safety**
To ensure safe operation and correct use of the current clamp, follow these instructions:

- Read the operating instructions and safety instructions.
- Use the Current Clamp only as instructed in the instructions, otherwise the clamp will not protect you.
- Adhere to local and national safety regulations. Safety equipment must be used to protect against hazards where hazardous live conductors are present.
- Do not hold the Current Clamp against the body or barrier, see Figure 1.
- Before each use, inspect the Current Clamp for missing portions of the clamp or missing insulation. Also look for loose conductors. Pay particular attention to the insulation on the conductors.
- Check the magnetic mating surfaces. The surfaces should be free of dust, dirt, rust or other contaminants.
- Never use the clamp on a circuit with a rating above V CAT III.
 - CAT III equipment is designed for use on equipment in fixed equipment distribution panels, feeder systems, and lighting systems in large buildings.
- Use extreme caution when working on energized bus bars. Contact with the conductors can cause a severe electric shock.

- 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.

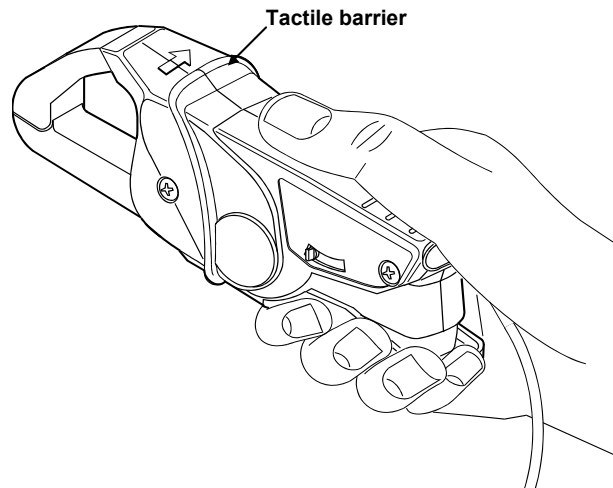


Figure 1. Safely holding the Current Clamp

Symbols

	May be used on HAZARDOUS LIVE conductors.
	Product is protected by double insulation.
	Risk of Danger. Important information. See Instruction Sheet.
	Risk of Electric Shock.
	Conforms to relevant European standards.
	Earth ground.

Specifications

SAFETY



Input jaws & output floating
voltage to ground

Complies with American industry standards UL61010B-1 & UL61010B-2-032 and European standards EN/IEC 61010-1 2nd Edition & EN/IEC 61010-02-032 for 600V CAT III, pollution degree 2.

EMC

Complies with standards
EN/IEC 50081-1 &
EN/IEC 50082-2

ELECTRICAL SPECIFICATIONS

All Electrical Specifications are valid at the following reference conditions:

- Ambient temperature $23 \pm 3^\circ\text{C}$ ($73 \pm 3^\circ\text{F}$)
- Relative Humidity 20 to 75%
- Frequency 48 to 65 Hz
- Continuous external field $< 40 \text{ A/m}$
- Load impedance $i200: 0.2\Omega \dots 15\Omega$
 $i200s: >1 \text{ M}\Omega // 100 \text{ pF}$
- The current may not contain any DC component
- No influence from adjacent currents
- The conductor must be centered within the jaw aperture

20A Range (i200s only)

Measuring range	0.1 to 24A
Maximum current	24A
Crest factor *	< 3
Maximum non-destructive current	200A (Frequency $\leq$ 1 kHz and crest factor < 3)
Output signal	100 mV/A
Output impedance	$\leq 20 \Omega$ @ 1 kHz
Basic accuracy	
48 Hz to 65 Hz	$\leq 2\% + 0.5A$
Additional error:	
40 Hz to 48 Hz and	+ < 10%
65 Hz to 1 kHz	
1 kHz to 10 kHz	+ < 15%
Phase shift	Unspecified

200A Range

Measuring range	0.5 to 240A	0.5 to 240A
Maximum current	240A	240A
Crest factor *	< 3	< 3
Maximum non-destructive current	@ Frequency ≤ 1 kHz and crest factor < 3	
Continuous		200A
10 min ON /30 min OFF		240A
Output signal	1 mA/A	10 mV/A
Output impedance	-	≤ 10 Ω @ 1 kHz
Basic accuracy		
48 Hz to 65 Hz		
0.5A to 10A	≤ 3% + 0.5A	≤ 3.5% + 0.5A
10A to 40A	≤ 2.5% + 0.5A	≤ 3% + 0.5A
40A to 100A	≤ 2% + 0.5A	≤ 2.5% + 0.5A
100A to 240A	≤ 1% + 0.5A	≤ 1.5% + 0.5A
Additional error:		
40 Hz to 48 Hz and 65 Hz to 1 kHz	+ < 3%	+ < 3%
1 kHz to 10 kHz	+ < 12%	+ < 12%
Phase shift		
0.5A to 10A	Unspecified	Unspecified
10A to 40A	≤ 5 °	≤ 6 °
40A to 100A	≤ 3 °	≤ 4 °
100A to 240A	≤ 2.5 °	≤ 3 °

All ranges

Load on output	0.2...15 Ω	> 1 M Ω // < 100 pF
Load Influence	Current: < 1%	-
	Phase: < 1°	-
Bandwidth	-1.5 dB	40 Hz to 10 kHz
	-3dB	40 kHz
Additional errors		
With temperature		$\leq 0.15\%$ / 10 K
With position of conductor in the clamp aperture		$\leq 0.5\%$ @ 50 Hz
With adjacent conductors		$\leq 15\text{ mA} / \text{A}$ @ 50 Hz

* This is the maximum permissible ratio between the peak value of a superimposed transient and the ac rms value.

GENERAL

Clamp Dimensions	135 x 50 x 30 mm (5.3 x 2 x 1.2 in)
Protection index	IP40
Jaw Opening	21 mm (0.82 in)
Height of open Jaws	69 mm (2.7 in)
Maximum conductor size	Ø 20 mm (0.8 in) or busbar 20 x 5 mm (0.8 x 0.2 in)
Weight	180 g (6.4 oz)
Cable length	i200 1.5 m (59 in) i200s 2m (79 in)
Temperature	
Operating	-10 to +55°C (+14 to +131°F)
Non-operating	-40 to + 70°C (-40 to +158°F)
Relative Humidity	
Operating	85%, up to +30°C (+86°F) 75%, up to +55°C (+131°F)
Altitude	
Operating	to 2000 m (6500 ft)
Non-operating	to 12000 m (40000 ft)
EMC	EN/IEC 50081-1 EN/IEC 50082-2 (3V/m, 2.74V/yd)

Instrument Compatibility

The i200s 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 $1\text{ M}\Omega$, and for full bandwidth and accuracy, a maximum input capacity of 100 pF .
- A pass- band of more than four times the frequency of the waveform to be measured.

The i200 is compatible with any Fluke Multimeter or any other current measurement device that has the following features:

- Banana inputs.
- Input accuracy of 2% or better to take full advantage of the accuracy of the Current Clamp.
- Input impedance of $0.2\Omega \dots 15\Omega$
- A pass-band of more than four times the frequency of the waveform to be measured.

Using the Current Cla

- To use the Current Clamp, follow t
1. Connect the i200/i200s Curre the measuring instrument. i200: See Figure 2. i200s: See Figure 3. When yc Dual Banana to BNC Adapter Clamp to the input.
 2. i200s: On the Current Clamp, (10 mV/A).
 3. i200s: Select the appropriate ScopeMeter test tool or oscilli.
 4. Position the Current Clamp p around the conductor.
 5. Make sure that the arrow mar toward the load for phase me load (toward the source) for n Figure 4.)
 6. Observe the current value an display.
 7. i200s: If desired, select a low and set the corresponding se ScopeMeter test tool or oscilli.

Example with multimeters for i2 Current Clamp sensitivity = 1 mA/

Actual current =

$$\frac{\text{display value}}{\text{sensitivity Current Clamp}} = \frac{168 \text{ m}}{1 \text{ mA/}}$$

Example with multimeters for i2 Current Clamp set to 10 mV/A. Mu

Actual current =

$$\frac{\text{display value}}{\text{sensitivity Current Clamp}} = \frac{1.85}{10 \text{ mV}}$$

ructions: to the desired input on

ng a multimeter, use the 1) to connect the Current

e least sensitive range

nsitivity on your

ilar to and centered

ie clamp jaw points nts or away from the asurements. (See

rm on the instrument's

on the Current Clamp nV/A setting) on the

eter displays 168 mA.

l displays 1.85V.

$$\frac{3 \text{ mV}}{1 \text{ V/A}} = 185 \text{ A}$$

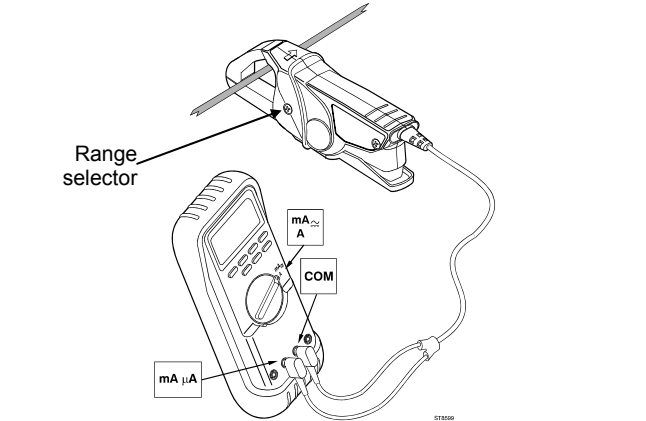


Figure 2. Measurement Setup for i200

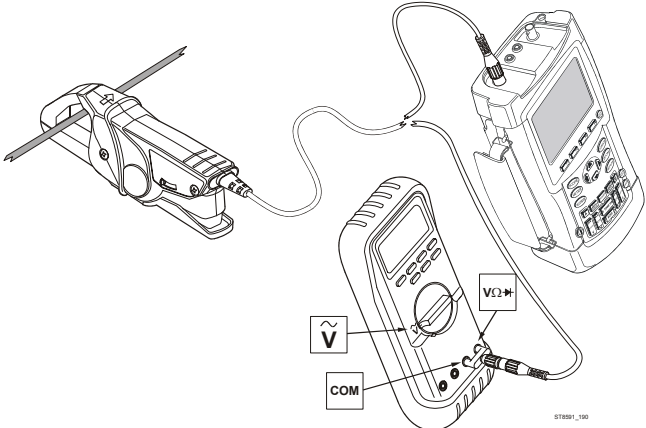


Figure 3. Measurement Setup for i200s



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 ScopeMeter test tool or oscilloscope may display a much lower current than the actual value. This may result in a false and misleading reading and, as a consequence, incorrect measures to be taken.

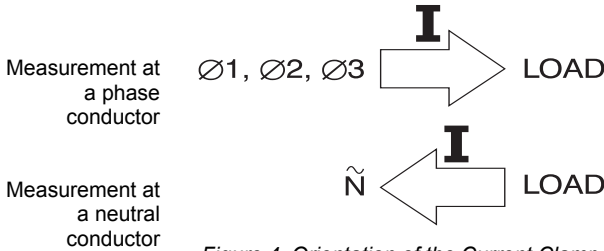


Figure 4. Orientation of the Current Clamp

Measurement Considerations

Observe the following guidelines for positioning the Current Clamp Jaws:

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

Observe the following guidelines when making measurements:

- Avoid taking measurements close to other current-carrying conductors.
- On the i200s Current Clamp, select the most appropriate range for the current being measured to get the best accuracy.

Maintenance

Before each use, inspect the clamp. Look for cracks or missing portions of the clamp housing and output cable insulating cover and for loose or weakened components. Pay particular attention to the insulation surrounding the clamp jaws. Do not use a damaged clamp. If a clamp is damaged, tape it shut to prevent unintended operation. A damaged clamp under warranty will be promptly repaired or replaced (at Fluke's discretion) and returned at no charge.

Cleaning and Storage

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents. 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.

If your Current Clamp does not work

If the Current Clamp does not perform properly, use 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 and range on the Multimeter, ScopeMeter test tool or oscilloscope are correct and adjusted to the sensitivity of the Current Clamp.

LIMITED WARRANTY & 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 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 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.

Fluke Corporation P.O. Box 9090 Everett WA 98206-9090, USA	Fluke Industrial B.V. P.O. Box 90 7600 AB Almelo The Netherlands
---	---

SERVICE CENTERS

To locate an authorized service center, visit us on the World Wide Web:

<http://www.fluke.com>

or call Fluke using any of the phone numbers listed below:

+1-888-993-5853 in U.S.A. and Canada

+31-40-267-5200 in Europe

+1-425-446-5500 from other countries