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LUKE®

0/i200s

rrrent Clamp

uction Sheet

Introducing the i200/i

The i200 is a single range 200A cl. current output via safety shrouded The i200s is a dual range 20A and Clamp with voltage output via a sa A dual banana to BNC adapter is s connected to multimeters with ban

Our Current Clamp box:

M9081 (only with i200s)

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the clamp jaws; these er foreign matter.

ltages higher than 600

otect against transients tallations, such as rt branch circuits, and

and bare conductors or uld result in electric

Read First: Saf

To ensure safe operation and current clamp, follow these i

Read the operating instruction instructions.

Use the Current Clamp only as instructions, otherwise the clar protect you.

Adhere to local and national s; equipment must be used to pri where hazardous live conduct

Do not hold the Current Clamp barrier, see Figure 1.

Before each use, inspect the C missing portions of the clamp I insulation. Also look for loose r particular attention to the insul

Check the magnetic mating su should be free of dust, dirt, rus

Never use the clamp on a circi V CAT III.

- CAT III equipment is desig in equipment in fixed equi; distribution panels, feeder; lighting systems in large bi

Use extreme caution when wo bus bars. Contact with the con 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.

ELECTRICAL SPECIFICATIONS

All Electrical Specifications are valid at the following reference conditions:

Ambient temperature

Relative Humidity

Frequency

Continuous external field

Load impedance

23±3°C (73±3°F)

20 to 75%

48 to 65 Hz

< 40 A/m

i200: 0.2Ω ...15Ω

i200s: >1 MΩ // 100 pF

The current may not contain any DC component

No influence from adjacent currents

The conductor must be centered within the jaw aperture

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

20A Range (i200s only)		
Measuring range	0.1 to 24A	
Maximum current	24A	
Crest factor *	< 3	
Maximum non-destructive current	200A (Frequency ≤ 1 kHz and crest factor < 3)	
Output signal	100 mV/A	
Output impedance	≤ 20 Ω @ 1 kHz	
Basic accuracy		
48 Hz to 65 Hz	≤ 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	i200	i200s
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	i200	i200s
Load on output	0.2...15 Ω	>1 MΩ // < 100 pF
Load Influence	Current: < 1%	-
	Phase: < 1°	-
Bandwidth	-1.5 dB -3dB	40 Hz to 10 kHz 40 kHz
Additional errors		
With temperature	≤ 0.15 % / 10 K	
With position of conductor in the clamp aperture	≤ 0.5 % @ 50 Hz	
With adjacent conductors	≤ 15 mA / 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 MΩ, 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 0.2Ω ...15Ω
 - 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 oscill.
 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 oscill.

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.

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

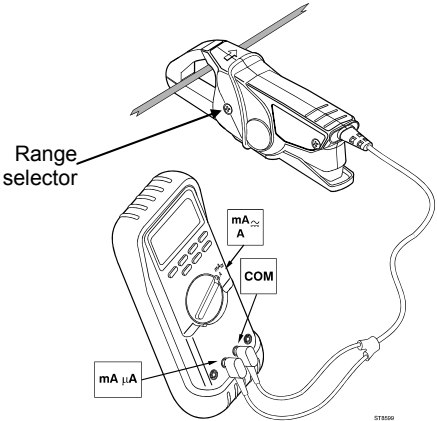


Figure 2. Measurement Setup for i200

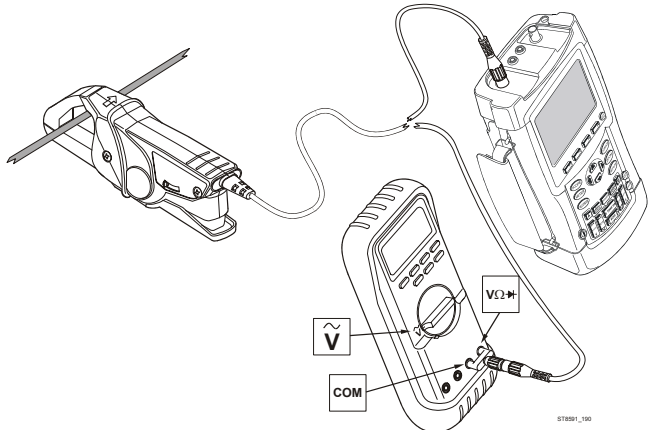


Figure 3. Measurement Setup for i200s



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.

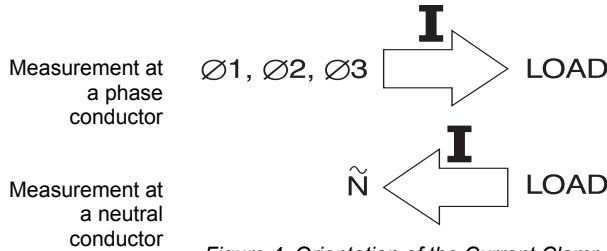


Figure 4. Orientation of the Current Clamp

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.

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<http://www.fluke.com>

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