

# i430-Flexi-TF-II

## *6000 A Flexible AC Current Probe*

### *Instructions*

#### ***Introduction***

The i430-Flexi-TF-II (the Probe or Product) is a flexible AC current probe for use with the Fluke 430 series I and II Power Quality Analyzers and other dedicated test tools. The i430-Flexi-TF-II is optimized for current measurement on thick and hard to reach conductors. Check the user documentation of your test tool for compatibility before you use this current sensor.

Available versions are:

- i430-Flexi-TF-II            61 cm (24 inch)
- i430-Flexi-TFII-48        122 cm (48 inch)

#### ***Contacting 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
- Anywhere in the world: +1-425-446-5500

## Safety

Read this section carefully. It will familiarize you with the most important safety instructions for handling the Product.

A **Warning** identifies hazardous 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 possible electrical shock, fire, or personal injury:

- Read all safety information before you use the Product.
- Carefully read all instructions.
- The Probe is only to be used and handled by qualified personnel.
- Do not work alone.
- Always connect the Product to the test tool before it is installed around a conductor.
- Use the Product 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.
- Limit operation to the specified measurement category, voltage, or current ratings.
- De-energize the circuit or wear personal protective equipment in compliance with local requirements before you apply or remove the Product.
- Do not touch voltages >30 V ac, 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 operates incorrectly.
- Do not use a current measurement as an indication that a circuit is safe to touch. A voltage measurement is necessary to know if a circuit is hazardous.
- Do not use the Product if it is damaged.
- Disable the Product if it is damaged.
- Do not use the Product if it has damaged insulation, exposed metal, or if the wear indicator is visible. Do not use if the flexible jaw wear indicator shows wear indicated by a contrasting color on the inner insulation. Examine the output lead for damaged insulation, exposed metal, or wear indication.
- 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 exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.
- High voltages and currents can be present in adjacent circuits under test.
- Do not use the Product above its rated frequency.
- Use the Product only on insulated conductors. Use caution around bare conductors or bus bars. Do not touch the conductor.

## Symbols

The table below is a list of the symbols used on the Probe and in the instructions.

Symbol	Description
	WARNING - RISK OF DANGER. Consult user documentation.
	WARNING. HAZARDOUS VOLTAGE. Risk of electric shock.
	Do not apply around or remove from uninsulated hazardous live conductors without taking additional protective measures.
	Double Insulated
<b>CAT II</b>	Measurement Category II is applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low-voltage MAINS installation.
<b>CAT III</b>	Measurement Category III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.
<b>CAT IV</b>	Measurement Category IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.
<b>CE</b>	Conforms to European Union directives.
	Certified by CSA Group to North American safety standards.
	Conforms to relevant Australian safety and EMC 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.

## Instrument Compatibility

The i430-Flexi-TF-II series is used with the Fluke 430-series and Fluke 430-II series Power Quality Analyzers specifically or with other test tools that explicitly state compatibility. Refer to user documentation of the test tool for information about compatibility.

Maximum measurement range on all models is 6000 A.

Minimum measurement range on Fluke 433/434/435 is 30 A.

## Unpack

These items are included in the shipment:

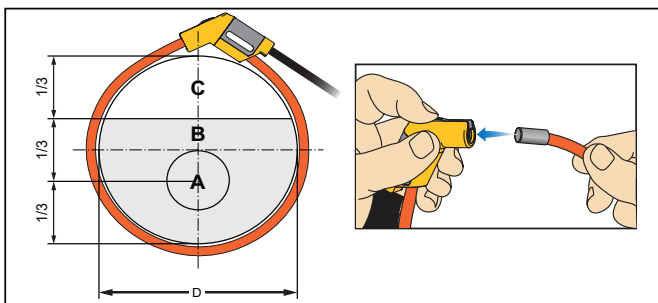
- i430-Flexi-TF-II Current Probe(s)
- Instructions (this paper)

Check the contents of the shipment for completeness. If something in the box is damaged or missing, contact your distributor or the nearest Fluke sales or service office.

## How to Use the i430-Flexi-TF-II

To use the i430-Flexi-TF-II, follow these instructions:

1. Connect the BNC connector of the i430-Flexi-TF-II to the input on the Fluke 430 series Power Quality Analyzer.
2. Wear protective equipment or de-energize the circuit before you connect the flexible probe around the conductor. See Figure 1.



hcf157.eps

Figure 1.

3. Re-energize the circuit if not energized.
4. Center the conductor perpendicularly inside the flexible probe area. If this is not possible, an additional measurement error of  $\pm 2\%$  of reading can occur. See *Electrical Specifications*.
5. Avoid taking measurements close to other current-carrying conductors if possible.
6. Make sure that the arrow marked on the probe coupling points toward the correct orientation for correct phase display on the instrument. See also the setup screen of the instrument.
7. Keep the probe coupling more than 2.5 cm (1 inch) away from the conductor.
8. Observe the current value and waveform on the instrument display.

9. Observe the safety instructions when you connect and use the i430-Flexi-TF-II.
10. Wear protective equipment or de-energize the circuit before you disconnect the flexible probe.

### **Warning**

**To prevent false and misleading readings on the instrument, the setup for the current probe in the 430-series Power Quality Analyzer must be the i430 Flex (on Fluke 430 series I) or i430-Flexi-TF-II (on Fluke 430 series II).**

## ***Maintenance***

Before each use to assure continued safety, inspect the Probe and its latching system for any damage. Pay particular attention to the insulation surrounding the Probe. A Probe under warranty will be promptly repaired or replaced (at Fluke's discretion) and returned at no charge.

### **Warning**

**To prevent possible electrical shock, fire, or personal injury:**

- **Remove the input signals before you clean the Product.**
- **Have an approved technician repair the Product.**

The flexible probe and its latching system require no special care.

For routine maintenance:

1. Ensure that no foreign body obstructs the latching mechanism.
2. Clean the Probe with a damp cloth and a mild detergent. Do not use abrasives, solvents, or alcohol.
3. Do not immerse the Probe in liquids.

## ***If the i430-Flexi-TF-II does not work***

If the Probe does not perform properly, use the following steps to help isolate the problem:

1. Inspect the coupling system for any damage.  
If any foreign material is present, the coupling system will not close properly and errors will result.
2. Inspect the cable between the flexible probe and the Power Quality Analyzer for any damage.
3. Check if the i430-Flexi-TF-II is the selected current probe on the Power Quality Analyzer (Clamp i430-Flexi-TF-II).
4. Verify that the function and range selection on the Power Quality Analyzer is correct.

## Specifications



The i430-Flexi-TF-II complies with:

- IEC 61010-1: Pollution degree 2
- IEC 61010-2-032: CAT IV 600 V / CAT III 1000 V

## Electrical Specifications

Measuring range	0.5 A ac to 6000 A ac
Maximum non-destructive current	100 kA (50/60 Hz)
Output signal	86.6 mV at 1000 A/50 Hz (on 1 M $\Omega$ ) 85.0 mV at 1000 A/50 Hz (on 50 k $\Omega$ )
Basic accuracy	$\pm 1$ % of reading at 25 °C, 50 Hz with conductor placed at the center of the probe
Linearity	$\pm 0.2$ % of reading at 10 % to 100 % of range
Noise	<1 mV rms at 10 Hz to 10 kHz
Additional errors:	
<ul style="list-style-type: none"> <li>• temperature coefficient over operating temperature range -for 24 inch model -for 48 inch model</li> <li>• with position of conductor in the probe window (see Figure 1): Zone A Zone B Zone C</li> <li>• 0.5 to 30 A</li> </ul>	0.02 % of reading / °C (0.011 % / °F) 0.035 % of reading / °C (0.02 % / °F)  $\pm 0.5$ % of reading $\pm 1.0$ % of reading $\pm 2.0$ % of reading $\pm 1$ count or 0.1 A (whichever is greater)
External magnetic field rejection in reference to external current	40 dB (with cable >100 mm from the head coupling and r-coil)
Phase shift (fundamental frequency)	< $\pm 1^\circ$
Bandwidth (-3 dB)	10 Hz to 10 kHz
Frequency derating	$I \times f \leq 385$ kA Hz

## General Specifications

	i430-Flexi-	
	TF-II	TF-II-48
Transducer length	61 cm (24 in)	122 cm (48 in)
Weight	153 g	200 g
Transducer diameter	7.5 mm (0.3 in)	
Minimum bending radius	38 mm (1.5 in)	
Cable length from transducer to BNC	2.5 m (98.4 in)	
Temperature, operating	-20 °C to +70 °C (-4 °F to +158 °F) Temperature of conductor under test shall not exceed 80 °C (176 °F)	
Temperature, non-operating	-40°C to + 80 °C (-40 °F to +176 °F)	
Relative Humidity, operating	15 % to 85 %, noncondensing	
Altitude, operating	2 000 m (6 500 ft); for use up to 4000 m derate to 300 V CAT IV, 600 V CAT III, 1000 V CAT II.	
Altitude, storage	12 km (40 000 ft)	
Ingress protection	IP40	

### 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.

Fluke Corporation  
P.O. Box 9090  
Everett, WA 98206-9090  
U.S.A.

Fluke Europe B.V.  
P.O. Box 1186  
5602 BD Eindhoven  
The Netherlands