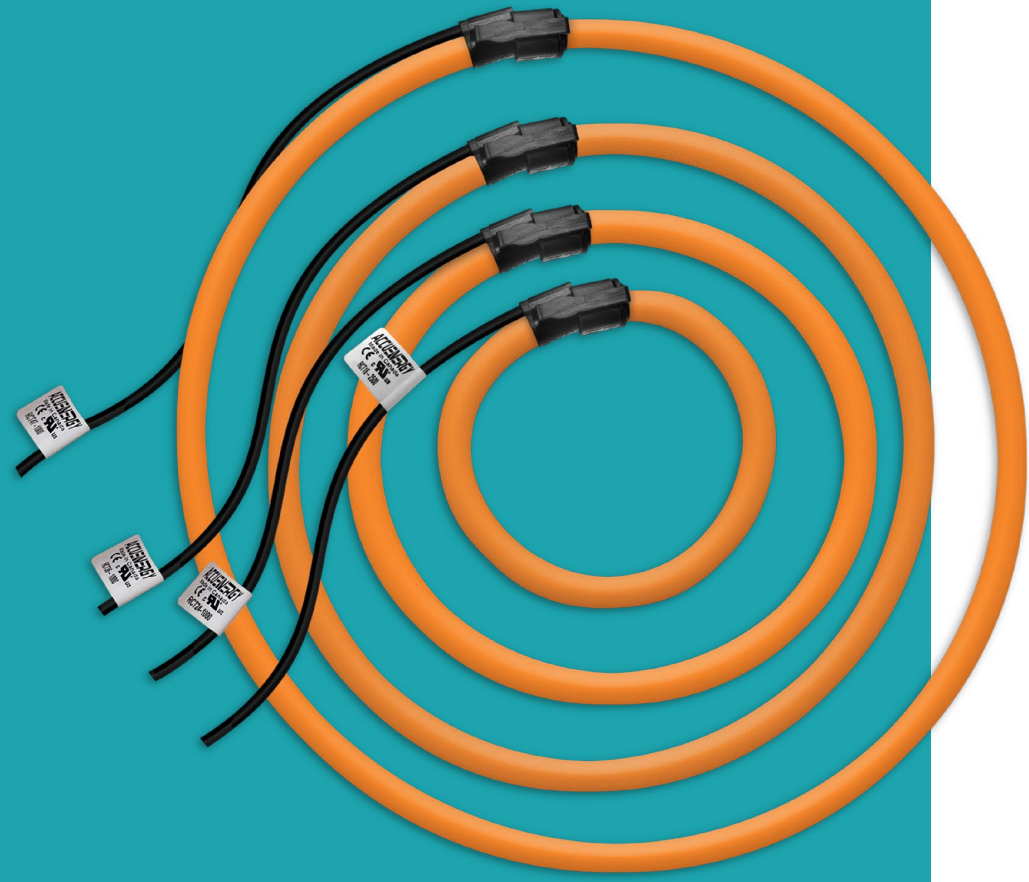
AcuCT Flex Series

Rogowski Coil Installation Guide



RoHS COMPLIANT

ACCUENERGY

Please read this manual carefully before installation, operation, and maintenance of the AcuCT Flex Series Rogowski Coil.

The information contained in this document is believed to be accurate at the time of publication, however, Accuenergy assumes no responsibility for any errors which may appear here and reserves the right to make changes without prior notice as part of continuing improvements. Please ask the local representative for the latest product specifications before ordering.

The following symbols in this manual appear throughout this documentation and on the AcuCT Flex Series Rogowski coil, in addition to the I/O modules to electrical warn of danger or safety risk during the installation and operation of the meters.

Electrical Shock Hazard: Contains information about procedures which must be followed to prevent the risk of electric shock and danger that can result in personal injury or death.

Safety Warning: Contains information about circumstances which if not considered may result in personal injury or death.

Installation and maintenance of the AcuCT Flex Series Rogowski coil shall only be performed by qualified, competent professionals who have received training and have experience with high voltage and current devices.

Accuenergy shall not be responsible or liable for any damage caused by improper coil installation and/or operation.

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Introduction

- The AcuCT Flex Series is a rope-style Rogowski coil current transformer (CT) that is used to safely measure alternating electrical current traveling through a primary conductor such as a cable or busbar in an electrical panel.
- As electrical current flows through the conductor, the Rogowski coil induces a voltage in proportion to the conductor's current and frequency.
- The rope style design allows AcuCT Flex to fit into tight panels or around large busbars where other rigid current transformers (CT) cannot fit. The coils can be contoured to fit around irregularly shaped conductors for easy integration.
- The AcuCT Flex has a simple latching connector that allows for fast efficient installation without disconnecting any electrical conductors.
- The AcuCT Flex is available in multiple lengths, sizes and offers a wide sensing range that can suit almost any application. Unlike regular CTs, the AcuCT Flex do not saturate beyond its rated current and can provide accurate high amperage measurement without saturating.
- The AcuCT Flex Rogowski coils are rated for 0.5% accuracy level and are ideal for applications that require high precision data. When paired with a revenue-grade power meter, you can achieve maximum results in commercial, industrial, or specialized applications.
- Rogowski coils are designed to quickly respond to changing current inputs, making them ideal for applications with rapidly fluctuating currents.

Technical Specifications

Rated Current

Current Range	5A to 50,000 A
Accuracy	0.5%

Mechanical & Environmental

Case Material	Orange thermoplastic rubber, UL 94V-0 rated flame retardant
Lead Wires	1000V UL Style 20940, 26AWG
Operating Temperature	-20°C to 70°C / -4°F to 158°F
Temperature Drift	+/- 0.07% per °C
Operating Humidity	Non-condensing, 0 to 95% RH
Installation Conditions	IP61

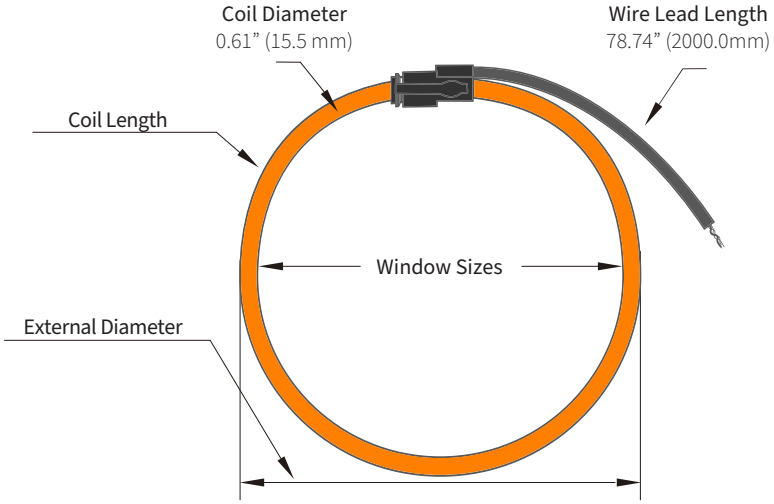
Electrical

Wire Polarity	White = Positive, Brown = Negative
Phase Orientation	Arrow pointing in direction of current flow (towards load)
Frequency Range	45Hz to 65Hz
Frequency Response	10Hz to 20kHz (How fast RCT responds to changes in current)

Safety / Compliance

Working Voltage	1000V CAT III, 600V CAT IV
Dielectric Strength	7400Vac @50/60Hz for 1 minute
Certifications	CE, RoHS, cURus (E359521)

Dimensions



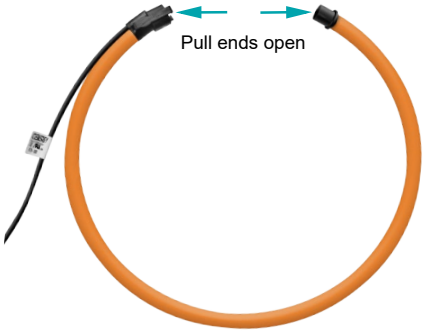
RCT Model	Window Size	External Diameter	Coil Length
RCT16	4.17", 106.0mm	5.63", 143.0mm	15.75", 400.0mm
RCT24	7.01", 178.0mm	8.13", 207.0mm	23.62", 600.0mm
RCT36	10.67", 271.0mm	11.89", 302.0mm	35.43", 900.0mm
RCT47	14.53", 369.0mm	15.66", 398.0mm	47.24", 1200.0mm

Installation

The AcuCT Flex has a latch that allows you to open and close the Rogowski coil. To open the AcuCT Flex, press inwards on the outer ribbed connector and pull the two ends apart to open it.

Step 1

Step 2

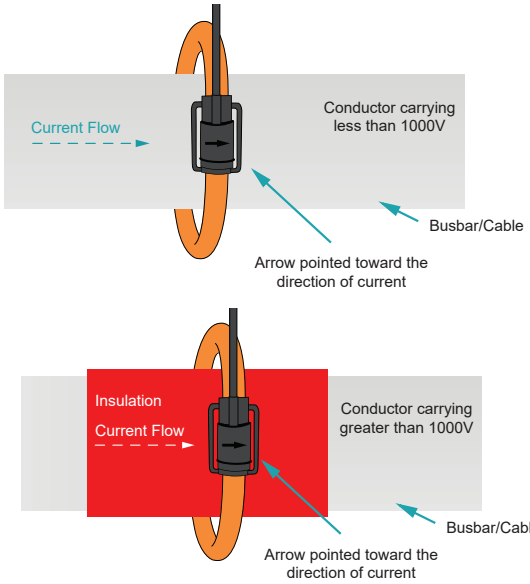


The AcuCT Flex has an arrow on the latch which indicates the direction of the current flow. Ensure that this arrow is pointed toward the load, see image below on where to locate the arrow.

The AcuCT Flex can be safely installed on busbars rated up to 1000V.

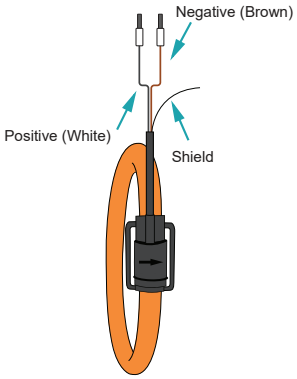
When installing the AcuCT Flex on busbars higher than 1000V, it is recommended to use insulation on the busbar to protect the Rogowski coil.

The AcuCT Flex can be rested on top of the busbar and will measure accurately if the coil is fully closed around the conductor.



Rogowski Coil Leads

There are three leads coming from the Rogowski coil, see image below.

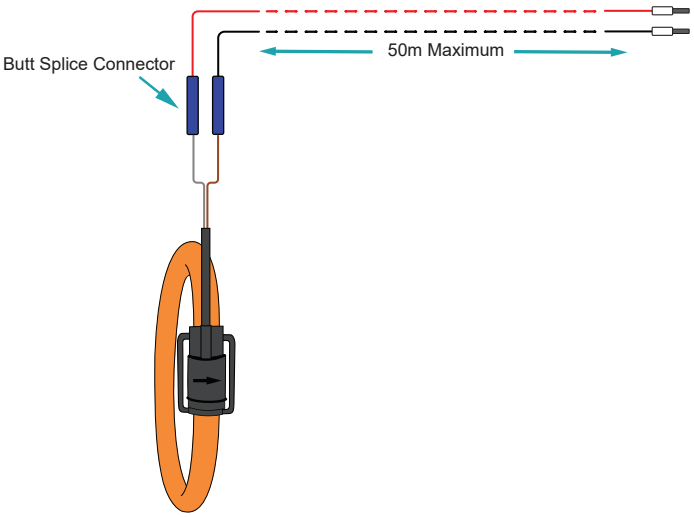


- White Lead – Positive
- Brown Lead – Negative
- Shield Wire – Should be left floating

WARNING: The shield wire on the AcuCT Flex should be left floating and should not be grounded.

Extending the Leads

The AcuCT Flex leads can be extended up to a maximum of 50 meters. We recommend using a butt splice method for the extension and recommend using the same wire gauge supplied with the specific RCT model (26AWG, shielded twisted pair).



NOTE: Smaller gauge wire can be used for the extension if 26AWG is not available, the recommended range is 18-26AWG.

Rogowski Coil Output

The output of the AcuCT Flex Rogowski coil will differ based on the model that you have.

The table below summarizes the output scaling.

RCT Model	OUTPUT per 1000A @ 50Hz	OUTPUT per 1000A @ 60Hz	RANGE CALIBRATED TO
RCTxx-200	500mV	600mV	1-240A
RCTxx-500	200mV	240mV	2.5-600A
RCTxx-1000	100mV	120mV	5-1200A
RCTxx-2500	40mV	48mV	12.5-3000A
RCTxx-5000	20mV	24mV	25-60000A
RCTxx-10000	10mV	12mV	50-12000A
RCTxx-50000	2mV	2.4mV	250-60000A
RCTxx-CUSTOM	Output any ratio signal per your requirement.		

NOTE: For custom outputs for the RCT please contact Accuenergy Sales for more information.

CT Ratio / Output Programming

Accuenergy Products

For Accuenergy meters the CT ratio must be programmed into the meter so it can correctly scale the secondary reading of the AcuCT Flex.

See table below for details.

Accuenergy Meter Model	Acuvim II	Acuvim L	AcuRev 1310	AcuRev 2100
Meter Display CT1	RCT Label Rating	RCT Label Rating	RCT Label Rating	-
Meter Display CT2 @50 hZ	100/50	100/50	100	-
Meter Display CT2 @60 hZ	120/60	120/60	100	-
Modbus CT1	RCT Label Rating	RCT Label Rating	RCT Label Rating	-
Modbus CT2	100	100	100	-
CT1 -18	-	-	-	RCT Label Rating
Current Transformer Type	-	-	-	RCT

NOTE: Accuenergy's AcuRev 2100 multi-circuit meter can have a mix of different rated RCT models, configure the CT rating according to the RCT model used for each circuit input channel.

Each RCT model will have a specific label rating used to program the CT ratio in Accuenergy meters, see image below.

Here the AcuCT Flex is rated for 2500A, the value 2500 will need to be programmed into the meter.

See table below using example of 2500A.

Accuenergy Meter Model	Acuvim II	Acuvim L	AcuRev 1310	AcuRev 2100
Meter Display CT1	2500	2500	2500	-
Meter Display CT2 @50 hZ	100/50	100/50	100	-
Meter Display CT2 @60 hZ	120/60	120/60	100	-
Modbus CT1	2500	2500	2500	-
Modbus CT2	100	100	100	-
CT1 -18	-	-	-	2500
Current Transformer Type	-	-	-	RCT

NOTE: The Accuenergy 's AcuRev 2100 multi-circuit meter can have a mix of different rated RCT models, configure the CT rating according to the RCT model used for each circuit input channel.

Third Party Devices

To interface the AcuCT Flex with third party devices, the mV output must be programmed into the device to scale the readings accordingly.

If using a controller/PLC to scale the values read by the AcuCT Flex RCT model, the following table will help understand the relationship between the primary current and secondary output.

RCT Model	OUTPUT per 1000A @ 50Hz	OUTPUT per 1000A @ 60Hz	OUTPUT @ FULL RANGE	MEASURABLE RANGE
RCTxx-200	0-500mV	0-600mV	100/120mV @200A	1-240A
RCTxx-500	0-200mV	0-240mV	100/120mV @500A	2.5-600A
RCTxx-1000	0-100mV	0-120mV	100/120mV @1000A	5-1200A
RCTxx-2500	0-40mV	0-48mV	100/120mV @2500A	12.5-3000A
RCTxx-5000	0-20mV	0-24mV	100/120mV @5000A	25-60000A
RCTxx-10000	0-10mV	0-12mV	100/120mV @10000A	50-12000A
RCTxx-50000	0-2mV	0-2.4mV	100/120mV @50000A	250-60000A

NOTE: Each RCT model can read 20% above its rating so the measurable range will show the max value (20% of rated).

Appendix

Troubleshooting & Measurement Verification

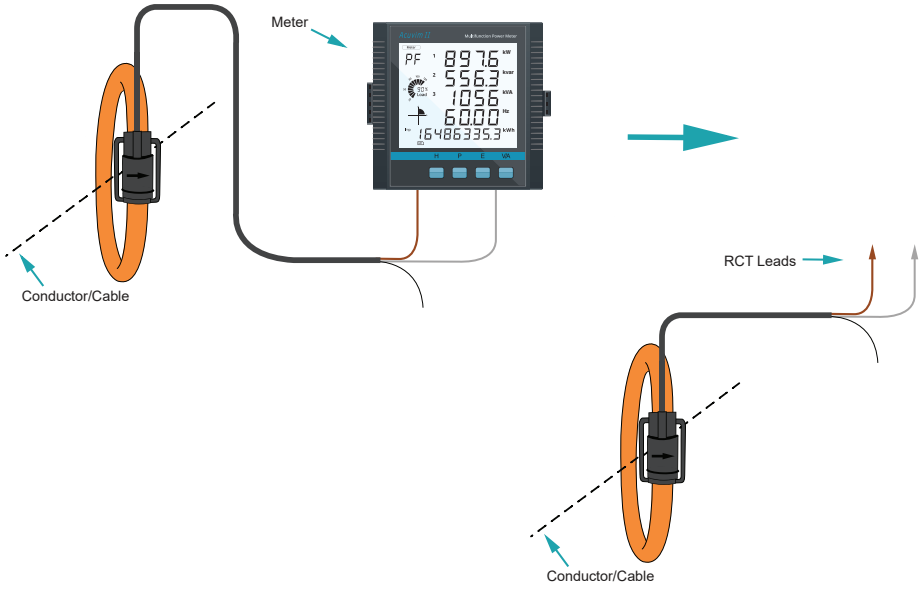
To troubleshoot and verify the measurements of the AcuCT Flex, users can measure the mV output of the Rogowski coil and compare the reading to the primary current measurement.

Depending on the model of the RCT, each coil will output 120mV at the full range of the current rating. See table below.

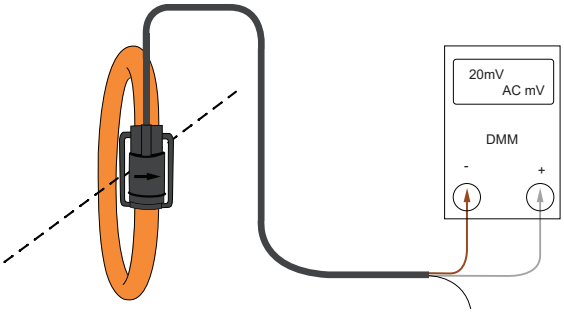
Standard Model	Output per 1000A @60Hz	Output per 1000A @50Hz	Range Calibrated to*
RCTxx-200	600mV	500mV	1-240A
RCTxx-500	240mV	200mV	2.5-600A
RCTxx-1000	120mV	100mV	5-1200A
RCTxx-2500	48mV	40mV	12.5-3000A
RCTxx-5000	24mV	20mV	25-6000A
RCTxx-10000	12mV	10mV	50-12000A
RCTxx-50000	2.4mV	2mV	250-60000A

1. Disconnect the RCT leads from the meter/device to take the measurements.

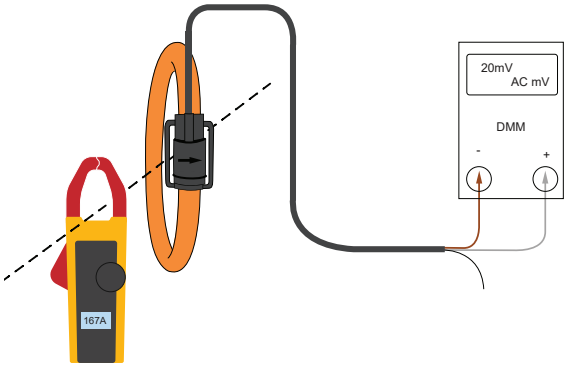
NOTE: Since the RCT outputs a small mV signal, it can be disconnected from the meter/device, and take the measurements while the system is running.



2. Next, use a multimeter that supports “AC mV” and connect the white lead from the AcuCT Flex RCT model to the positive of the multimeter, and connect the brown lead from the RCT to the negative of the multimeter.



3. Take the measurement from the multimeter and make note of it.
4. Next, use a clamp meter to verify the actual current being measured by the AcuCT Flex RCT model.



5. Double check the mV reading on the multimeter with the clamp meter reading.
   - Clamp meter reading = 167 A
   - DMM reading = 20mV

How to calculate the primary current using the measured mV output from multimeter:

NOTE: Assume RCTxx-1000A is used.

Primary Current = (20mV/120mV) x 1000A

Primary Current = 166.67A

How to calculate the secondary signal using the measured clamp meter reading:

NOTE: Assume RCTxx-1000A is used.

Secondary Signal = (167A/1000A) x 120mV

Secondary Signal = 20.04mV

This calculation and measurement method can be used to help verify the accuracy of the RCT and to ensure it's functioning correctly.

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Specs Subject To Change Without Notice.