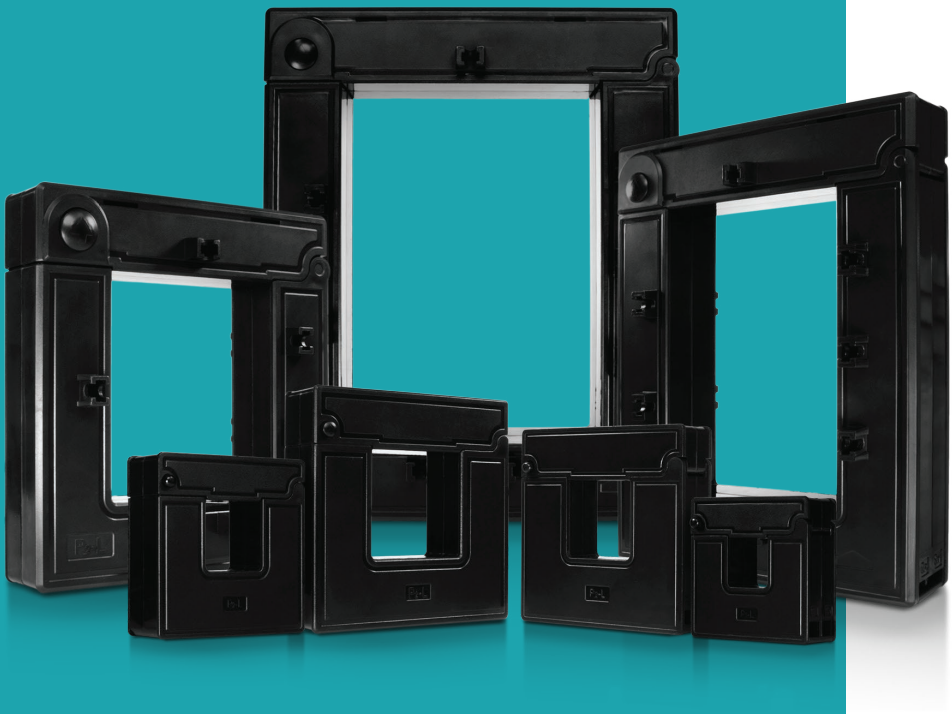
AcuCT R Series

Revenue Grade Split-Core Current Transformer Installation Guide



RoHS COMPLIANT

ACCUENERGY

Please read this installation guide carefully before installation, operation, and maintenance of the AcuCT R Series current transformers.

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 appear throughout this documentation and on the AcuCT R Series, in addition to the electrical warning of danger or safety risk during the installation and operation of the current transformers.

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.

Info: An advance notice to provide additional information before an action is taken by the user.

Installation and maintenance of the AcuCT R Series 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 installation and/or operation.

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Safety and Critical Handling Requirements

Electrical Hazard

Do Not Leave the Secondary Current Transformer Circuit Open on Energized Conductors.
For 1 A, 5 A, 80 mA, 100 mA, and 200 mA output of the CTs, the secondary circuit must be connected to a compatible meter / relay input or safely short-circuited before the primary conductor is energized. An open secondary can develop hazardous voltage and may damage equipment or create a shock hazard.

Current Transformer Installation Safety

- De-energize the primary conductor whenever possible before installing, removing, or repositioning the CT.
- Use lockout / tagout, arc-flash PPE, and site-approved live-work procedures where applicable.
- Confirm that the CT rated voltage, current ratio, secondary output type, burden/resistance, and environmental ratings are suitable for the installation.
- Inspect the CT before installation. Do not use a CT with cracked housing, damaged latch, contaminated core faces, damaged secondary leads, or signs of overheating.
- Ensure the maximum current of the conductor does not exceed the rated current of the CT.
- Install indoors only unless the datasheet for the exact model and configuration states otherwise.
- Do not modify the CT housing, core mating surfaces, lead wires, mounting hardware, or insulation system.
- Ensure CTs installed around conductors do not occupy more than 75% of the available wiring space cross-sectional area, in accordance with applicable electrical codes.

Installation Requirements and Operating Limits

Parameter	Specifications	Operating Limits
Rated Voltage	600VAC, CAT III	Do not use above the approved circuit voltage rating.
Frequency Range	50 / 60 Hz	Confirm the frequency of the monitored system is within range.
Operating Temperature	-25°C to 70°C (-13°F to 158°F)	Confirm ambient conditions inside the enclosure.
Humidity	0% to 95% RH, Non-Condensing	Prevent condensation and water ingress.
Current Range	5% to 120% of Rated Current	Select CT ratio that matches the expected operating current.
Secondary Output	5 A, 1 A, 80 mA, 100 mA, 200 mA, or 333 mV, depending on model	Use only with compatible current or voltage inputs and ensure correct burden or output resistance depending on model.

Pre-Installation Safety Checks

Condition	Current Transformer Secondary Output	
	5 A, 1 A, 80 mA, 100 mA, 200 mA	333 mV
Open-Circuit Risk	High open-circuit risk. Do not leave the secondary circuit open while primary current is flowing.	Low open-circuit risk. The voltage CT output is limited, it still must be connected only to a compatible voltage input.
Shorting Requirement	Short the secondary when disconnecting from the meter or relay as the primary conductor may be energized.	Shorting is not required during normal handling.
Installation Priority	Terminate the secondary leads before latching the CT around an energized conductor.	Terminate the secondary leads before commissioning and verify the meter input range.

Introduction

Overview

The AcuCT R Series is a revenue-grade split-core current transformer family intended for retrofit or new installations where the primary conductor can pass through the CT window without disconnecting the conductor. The AcuCT R Series supports multiple current-output and voltage-output secondary options depending on the model.

Model	Rated Primary Current Options	Rated Secondary Output Options	Window Size	Exterior Dimensions	Installation or Mounting Type
AcuCT-075R	50A, 75A, 100A, 150A	80mA, 100mA, 200mA, 333mV	19mm x 19mm (0.75" x 0.75")	58mm x 58mm x 22mm (2.30" x 2.30" x 0.90")	Cable / Conductor
AcuCT-100R	100A, 150A, 200A, 250A	1A, 80mA, 100mA, 200mA, 333mV	25mm x 25mm (1.00" x 1.00")	65mm x 65mm x 22mm (2.60" x 2.60" x 0.90")	Cable / Conductor
AcuCT-125R	100A, 150A, 200A, 250A, 300A, 400A	1A, 80mA, 100mA, 200mA, 333mV	32mm x 32mm (1.25" x 1.25")	82mm x 82mm x 22mm (3.20" x 3.20" x 0.90")	Cable / Conductor
AcuCT-200R	400A, 500A, 600A, 800A, 1000A	1A, 80mA, 100mA, 200mA, 333mV	51mm x 51mm (2.00" x 2.00")	111mm x 111mm x 32mm (4.40" x 4.40" x 1.25")	Cable / Conductor
AcuCT-3135R	600A, 800A, 1000A, 1200A, 1500A	5A, 1A, 80mA,100mA, 200mA, 333mV	80mm x 90mm (3.10" x 3.50")	144mm x 154mm x 32mm (7.00" x 6.10" x 1.25")	Cable, Conductor, or Busbar; Supports Busbar Clamping and Mounting Brackets
AcuCT-4161R	600A, 800A, 1000A, 1200A, 1600A, 2000A, 2500A, 3000A, 4000A, 5000A	5A,1A, 80 mA, 100mA, 200mA, 333mV	105mm x 155mm (4.10" x 6.10")	185mm x 235mm x 45mm (7.30" x 9.30" x 1.80")	Cable, Conductor, or Busbar; Supports Busbar Clamping and Mounting Brackets
AcuCT-5170R	1000A, 1600A, 2000A, 3000A, 4000A, 5000A	5A, 1A, 80mA, 100mA, 200mA, 333mV	130mm x 180mm (5.10" x 7.00")	210mm x 260mm x 45mm (8.30" x 10.20" x 1.80")	Cable, Conductor, or Busbar; Supports Busbar Clamping and Mounting Brackets

CT Orientation, Polarity, and Wiring Identification

Proper orientation is required for accurate real power measurement, correct power factor sign, and correct phase relationship between current and voltage inputs.

Info

CT Polarity Should Not be Inferred.
If commissioning shows negative power, reversed power factor, or incorrect phase angle, verify CT orientation and voltage phase assignment. Swap S1/S2 or reverse the CT after confirming the wiring diagram and metering configuration.

Markings	Installation Instructions
P1 / K / Source Side	Primary conductor enters the CT from the P1 / K side. P1 / K should normally face the source side of the circuit.
P2 / L / Load Side	Primary conductor exits toward P2 / L. The direction arrow points toward the load.
S1 / Positive Secondary	Connect the white secondary lead to the positive or high current or voltage terminal of the meter.
S2 / Negative Secondary	Connect the black secondary lead to the negative or return input of the meter.
Core Mating Faces	Keep clean and fully closed. Any gap or contamination can cause ratio error and phase error.
Press-Open Latch	Press the two side buttons to release the split-core CT assembly. Close the CT until the latch clicks and the core faces are fully seated.

Standard Split-Core Installation Procedure

Recommended Installation Tools and Materials

- Use appropriate insulated hand tools for the enclosure and voltage class.
- Approved CT shorting block or shorting terminal for current-output models, if required by the installation standard.
- Cable ties or clamps for secondary lead strain relief.
- Mounting brackets, studs, nuts, washers, or panel hardware as required by the selected mounting method.
- Multimeter and commissioning meter or software for final verification.

Split-Core CT Installation

Step 1: System Preparation

De-energize the circuit where possible, apply lockout / tagout, and verify absence of voltage according to site procedures.

Step 2: Verify CT and Conductor

Confirm the current transformer model, current ratio, secondary output type, conductor phase, conductor direction, and available window clearance before opening the CT.

Step 3: Connect CT Secondary Leads

Check the meter wiring diagram to connect the secondary leads, as meter CT terminals vary by model and manufacturer. Terminate the CT leads before clamping the CT onto live conductors.

Info

Ensure proper secondary lead routing. Route CT secondary leads away from sharp edges, moving parts, high-temperature surfaces, and high-noise conductors. Keep the secondary wiring as short as practically possible to reduce burden and noise pickup.

Step 4: Open the Split-Core CT

Simultaneously press the two side buttons on the upper housing and fully open the split-core assembly as depicted in the Figure 1 and 2. Do not force the hinge or contaminate the core mating faces.

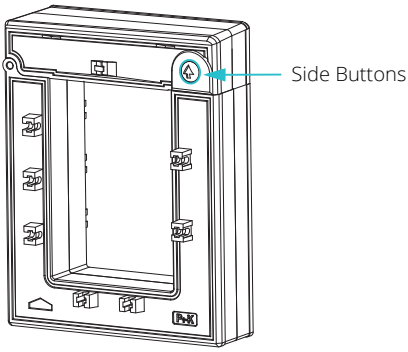

Figure 1 Side Button to Open the CT Latch

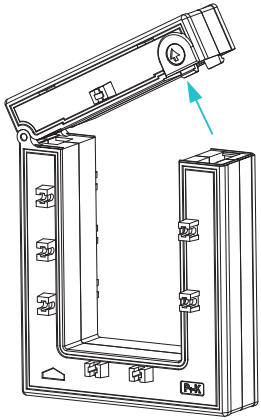

Figure 2 Fully Open CT Before Positioning Around Conductor

Step 5: Conductor Position

Place the CT so that the primary conductor enters from P1/K and exits toward P2/L as illustrated in Figure 3. Ensure the arrow on the label points toward the load or the direction of current flow.

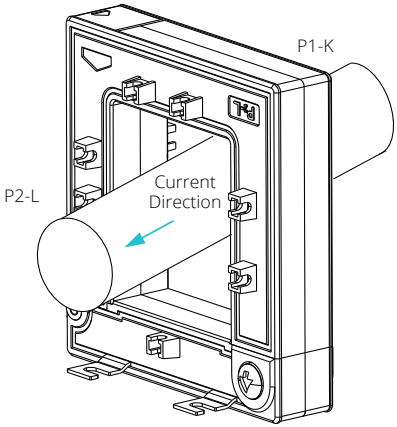

Figure 3 Conductor or Cable Passing through the CT Window

Step 6: Center the Conductor

Keep the conductor or busbar centered in the CT window where practical. Avoid any contact that pushes the core halves apart. The CT should not be used to support the mechanical weight of the conductor or busbar.

Step 7: Close and Secure the CT

Close only after confirming that the secondary leads are connected to the current or voltage input of the meter or safely shorted for current-output models. Close until the latch fully clicks into place and the mating faces are seated, as shown in Figure 4.

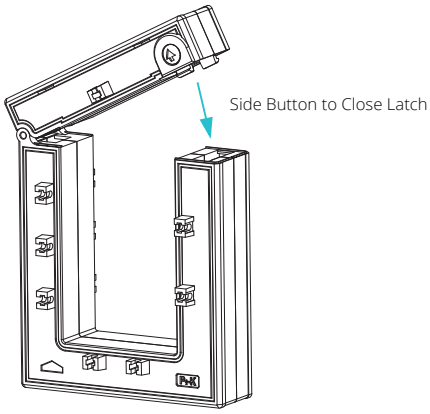

Figure 4 Closing the Latch of the CT

Info

Even a small air gap between the core halves can significantly reduce measurement accuracy. Re-open and re-close the CT if the latch does not click properly.

Mounting Bracket Installation (If Applicable)

Optional mounting kit is available to secure the AcuCT-3135R, AcuCT-4161R, and AcuCT-5170R to a panel, backplate, or support structure independently from the conductor or busbar. The mounting base plate has 6 mm elongated holes for M5 or M6 screws and bolts. Mounting hardware should be selected as per requirement or site standards.

Step 1: Install Mounting Brackets

1. Position the current transformer on the mounting surface and as shown in Figure 8, insert

the mounting clips into the slots, located near the removable top section.

2. Secure the mounting base plate using four M5 or M6 screws and tighten until the current transformer is securely mounted. Refer to Figure 8 for mounting clip dimensions and hardware clearance requirements.

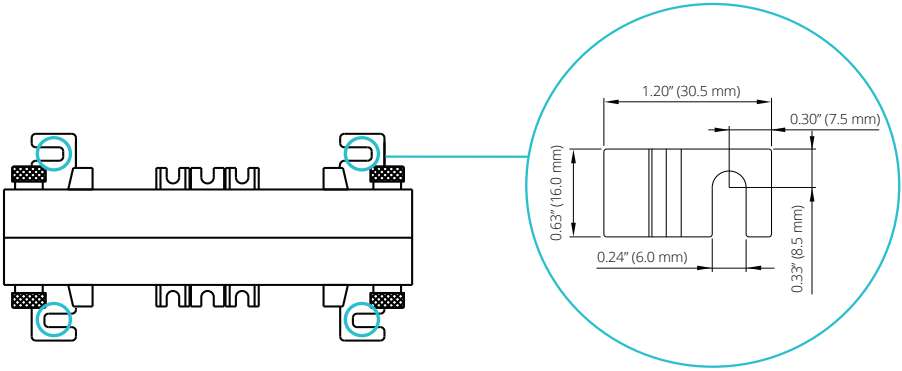

Figure 8 Top-View of the CT and Mounting Brackets with Dimensions of the Mounting Clips

Info The brackets are intended to support and stabilize the CT. They must not be used to force the CT onto an oversized conductor or to compensate for incorrect CT sizing.

Info For normal phase-current measurement, install the CT around one phase conductor or one phase busbar only. Do not pass both line and neutral, or multiple different phases, through the same CT.

Busbar Clamp Installation (If Applicable)

For AcuCT-3135R, AcuCT-4161R, and AcuCT-5170R, clamping hardware is used to secure the cable or busbar inside the window of the current transformer.

Step 1: Install Clamping Screws

1. Place the busbar in the current transformer window and insert the clamping screws from both sides through the CT and seat the clamp blocks or retainers in molded pockets as depicted in Figure 5.
2. Keep the round pressure washers on the busbar side as shown in Figure 6. Tighten the screws evenly until the busbar is secure and cannot move. Figure 7 depicts the view of the CT after installation when the busbar is clamped and the wiring is connected.

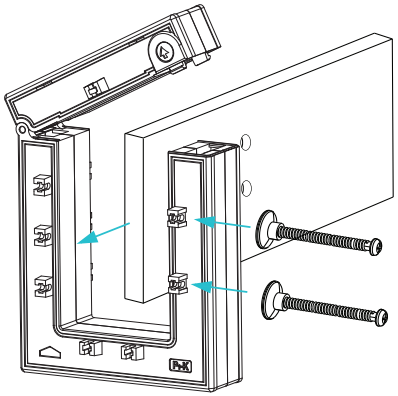

Figure 5 Busbar Clamping Arrangement in the CT

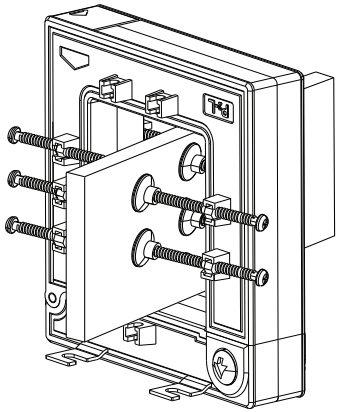

Figure 6 Clamping Screw and Pressure Washer Placement

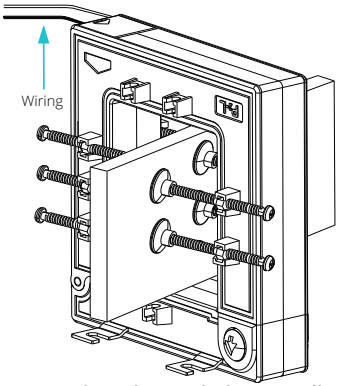

Figure 7 Busbar Clamped after Installation

Safety Warning

Avoid mechanical stress. The CT must not carry the weight of unsupported busbars or cables. Provide independent mechanical support for the conductor or busbar where required. Excess mechanical stress may loosen connections, cause insulation damage, or result in conductor movement under fault conditions, which can lead to electric shock or arc-flash.

Warnings and Installation Considerations

Incorrect Installation Risk

Improper installation may result in inaccurate measurements, negative or reverse readings, reducing system reliability.

Common Installation Errors

Frequent errors observed are installing the CT backwards with incorrect polarity or simultaneously clamping the CT around multiple different phase conductors or mixing current and voltage phases. If the latch is not properly closed, it leaves the CT partially open leading to incorrect readings.

Best Practices

Accuracy Optimization

To achieve optimal performance, keep the CT core clean and fully closed. The AcuCT R Series meets accuracy specifications but place the conductor in center within the window to ensure maximum accuracy. Use cable ties to hold the CT in position and align the conductor. Maintain correct phase alignment with voltage inputs.

Wiring Practices

Route the CT secondary leads away from high-voltage conductors and avoid unnecessary lead extensions. To avoid noise interference, use twisted shielded wiring.

Installation Consistency

Maintain a consistent CT orientation across all measured phases and clearly label the CT, such as Phase A, B, C or R, Y, B. If possible, complete the wiring prior to CT installation.

CT Secondary Safety

Condition	333 mV Secondary	1 A, 5 A, 80 mA, 100 mA, 200 mA Secondary
Open-Circuit Risk	Low	High
Shorting Required	No	Yes
Connect Leads Before Installation	Recommended	Recommended

Commissioning Checklist

Check	Acceptance Criteria	Result
Mechanical Closure	• CT core fully closed • Latch clicked into place • No visible air gap	Pass / Fail
Orientation	• P1 / K faces source • P2 / L and arrow points towards load	Pass / Fail
Secondary Polarity	• White lead connected to positive / high input • Black lead connected to negative / return input	Pass / Fail
Meter Input Type	• Meter input matches CT secondary output: 5A, 1A, 80mA,100mA, 200mA output, or 333mV voltage output	Pass / Fail
Ratio Setting	• Meter ratio matches CT order code and primary current rating	Pass / Fail
Phase Mapping	• Current phase correctly corresponds to voltage phase	Pass / Fail
Reading Magnitude	• Current reading matches expected load current within tolerance	Pass / Fail
Power Sign	• kW and power factor signs are correct under normal load	Pass / Fail
Lead Strain Relief	• Secondary leads secured and protected from sharp edges, moving parts, and high-noise conductors	Pass / Fail
Abnormal Condition	• No abnormal heat, vibration, smell, noise, or visible damage	Pass / Fail

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