



WHITE PAPER

APPLICATION OF ACCUENERGY CURRENT TRANSFORMERS IN MEDIUM-VOLTAGE SYSTEMS

Engineering Considerations, Dielectric Coordination, and Best Practices

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Window-type current transformers are commonly installed in Medium-Voltage (MV) equipment such as metal-clad switchgear, power circuit breakers, transformer bushings, generator terminals, and insulated bus systems.

The Accuenergy product range for current transformers include solid-core, split-core, and flexible Rogowski coil designs engineered for metering, monitoring, and protection applications. Offered in 600 V and 720 V voltage class and tested to withstand specified dielectric and Basic Impulse Level (BIL), AcuCT products are used in industrial and utility environments that require current measurement within properly designed insulated assemblies.

USE IN MEDIUM-VOLTAGE SYSTEMS

To some extent, the IEEE C57.13-2016 addresses the use of 600 V voltage class current transformers in systems with higher voltage ratings through the new normative Annex B, particularly about the application considerations and dielectric performance. MV systems include features such as insulated and shielded cables, bushings, barriers, and switchgear structures that maintain the required creepage, clearance, and air-gap distances. Under the required conditions, the sole function of the current transformer is current measurement, whereas the dielectric insulation and voltage containment are provided by the overall equipment design. The application of the current transformers in a medium-voltage system is determined by the insulation coordination and dielectric integrity of the complete assembly, not by the enclosure of the current transformer.

TYPICAL MV APPLICATIONS

The current transformers from Accuenergy are commonly installed around fully insulated MV cables, on insulated busbars inside switchgear, at the grounded shank of transformer bushings, within Isolated Phase Bus (IPB) enclosures, and inside MV switchgear compartments required to meet air clearances.

In installations that involve fully insulated MV cables with grounded outer shields, voltage stress is contained within the cable insulation system, resulting in minimal dielectric stress across the current transformer window.

For an air-insulated bus system, the required phase-to-ground and phase-to-phase clearances must be maintained in accordance with the applicable standards.

IMPORTANT CONSIDERATIONS

In medium-voltage systems, Accuenergy current transformers must not be used as primary insulation for bare MV conductors or replace the required phase-to-phase and phase-to-ground clearances. The required air clearances must always be maintained, and suitable application depends on the insulation design of the complete equipment assembly.

PRODUCT INSULATION RATINGS

Accuenergy Product	Form Factor	Rated Voltage	Dielectric Withstand	Impulse Withstand Voltage (BIL)
Solid-Core Current Transformers	Solid-Core	600 V	3 kV, 1 mA, 1 min	10 kV
AcuCT R Series	Split-Core	600 V	5 kV, 1 mA, 1 min	10 kV
AcuCT 5A Series	Split-Core	600 V	3 kV, 1 mA, 1 min	10 kV
AcuCT A Series	Split-Core	600 V	5 kV, 1 mA, 1 min	10 kV
AcuCT G Series	Solid-Core	720 V	3 kV, 1 mA, 1 min	10 kV

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Figure 1: Installation of AcuCT-3147A on Insulated MV Bus Conductors in Switchgear Panel

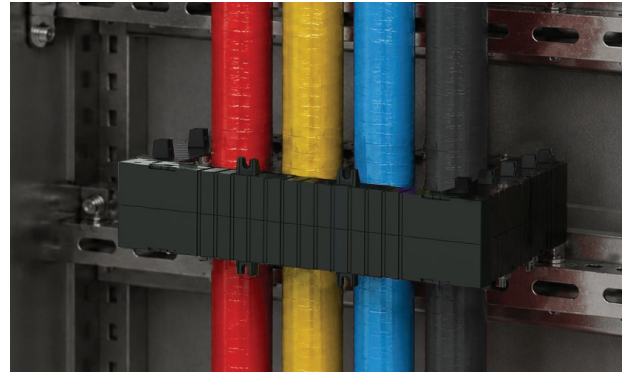


Figure 4: Installation of AcuCT G Series around Insulated Phase Conductors and Neutral for Residual Current Measurement

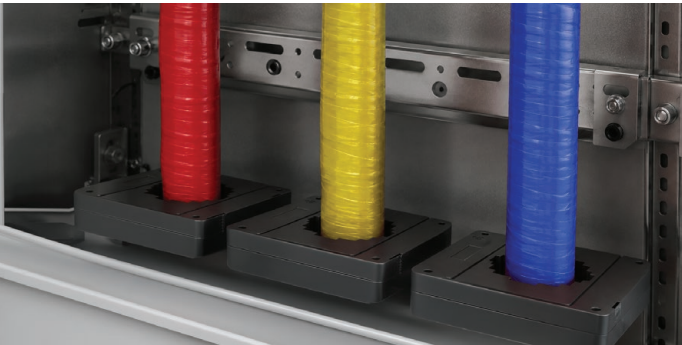


Figure 2: Installation of AcuCT-S335 Series on Insulated MV Busbars inside a Metal-Enclosed Switchgear Assembly

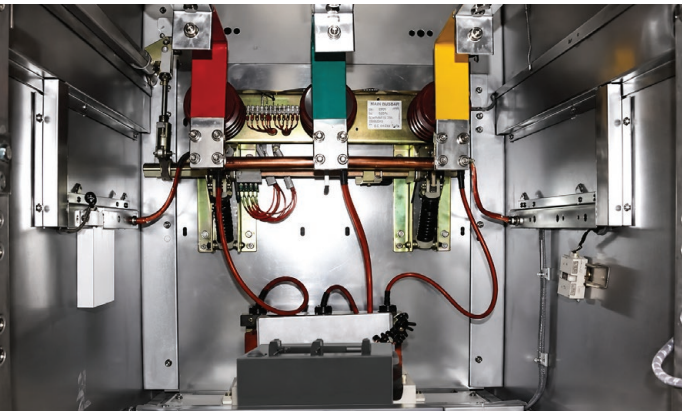


Figure 3: Incoming Medium Voltage Busbar to be Passed through AcuCT-4153A

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TF: 1-877-721-8908
INT: +1-416-497-4100
440 Comstock Road
Toronto, ON M1L 2H6, Canada

