CONVENTIONAL CT'S
VS.
ROGOWSKI COILS

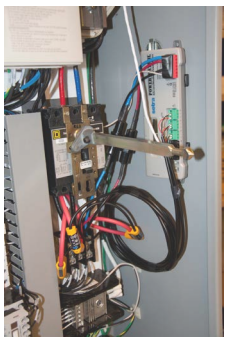
Understanding specific job requirements, such as performance, installation, amperage load and environmental factors are critical to selecting the proper current transformers for an application. Conventional CT's, typically offered with 5A, mA or mV output, have long been the standard in current measurement applications due to their simplicity and reliability. Conventional CT's do come with their limitations in that they are sometimes difficult to install and have limitations in performance and measurement range. Increased focus on energy efficiency has driven the demand for facility submetering, requiring more applications to measure large current loads. In most applications where amperage loads are in excess of 200A, Rogowski coils have significant advantages over conventional split-core CT's from an installation, cost and performance standpoint.

Simple Mounting

Busbars and irregular shaped cable bundles are common in applications with high power requirements. In these challenging installations, CT's typically are not able to fit around the monitored conductor leading to an exhausting and time intensive installation. The flexibility of Rogowski coils can save the installer a significant amount of time and physical exertion because of how easily they surround a conductor. Selecting a Rogowski coil instead of a conventional split-core CT can save the installer over two hours per meter point in a challenging installation, which could be the difference between making and losing money on a job.

Benefits of Rogowski Coils

over Conventional Split-Core CT's



- Lightweight
- Easy to install
- Improved linearity
- High frequency response
- Easy to order (size vs. range)
- Not impacted by electromagnetic fields

Wide Current Range = Reduced Shipping Costs

A technical limitation of conventional CT's is the narrow range of current it can measure vs. the size of the CT; as the current range increases the size and weight of the CT required increases dramatically. A typical 100A CT weighs 2lbs, however as the current range expands to 400A and 3,000A the average weight can increase from 5lbs to 20lbs. Considering three CT's are required to monitor a 3-phase motor, certain applications could require up to 65lbs of shipping weight per meter point; is a serious waste of shipping dollars. Rogowski coils have a current range of 5-5,000A (depending on the max current rating of the meter), which means that any Rogowski coil can be installed in any application regardless of the monitored amperage load. Rogowski coils are typically 1lb or less; the lighter shipping weight will help reduce costs

Improved Linearity

Conventional CT's are wound over a magnetic iron core, which makes them more susceptible to saturation leading to linearity error. In order to account for this error, engineers and contractors must adjust the phase shift of the meter to compensate in order to achieve an accurate reading. Rogowski coils are wound over a

non-magnetic core, giving them perfect linearity and improved accuracy over wide current ranges, saving time on installation. The air core of Rogowski coil's eliminates the negative effect of magnetic fields which pose a serious issue to conventional CT's in similar environments.

Not All Rogowski Coils Are Created Equally

Setra's Patrol Flex Rogowski Coils offer high measurement accuracy and a wide operating range. The Patrol Flex has advantages for measuring high currents because of its small size and easy installation, while conventional CT's are too big and heavy. The Patrol Flex Rogowski Coils are offered in 12" 24" and 36" lengths and are the highest performing Rogowski coils in submetering today with .5% accuracy for Revenue Grade Metering.

Advantages of Using Patrol Flex Rogowski Coils:

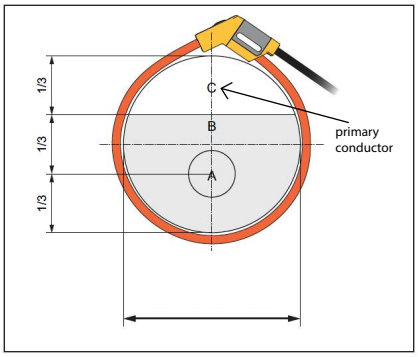
- Light weight: <.27 lbs.
- Wide current range: 5-5,000+ A
- Accuracy: <1% including meter
- Position sensitivity: <.2% error

Setra performed lab studies to see how the Patrol Flex compares to the leading competition, take a look at the results.

1. Position Sensitivity - primary conductor not in the center

Maximum Value:
Leading Competitor: 1005A
Setra: 1001.5A

Minimal Value:
Leading Competitor: 990A
Setra: 998.5A
Result: Setra <0.2% position influence, 5 times better than leading competitor



2. External Voltage Influence

w/ 15mm Bus simulator & 1000V/50Hz external voltage:
Leading Competitor: 0.415
Setra: 0.024 mA
Result: Setra is 17 times better than leading competitor

3. Impact on Cable from External Magnetic Field

Leading Competitor: 5A
Setra: 2.3A
Result: Setra is 2 times better than leading competitor

In an effort to design the best submetering solution available, Setra partnered with Fluke to deliver the Patrol Flex CT; the highest performance Rogowski coil in submetering. Due to the number of variables that go into designing a Rogowski coil for a specific application, a great deal of expertise and tribal knowledge is required. Fluke, the leader in test & measurement diagnostic tools, is the most experienced and advanced company in the world when it comes to the design of Rogowski coils. Fluke and Setra have a history of collaboration, which made the partnership a natural fit given Fluke's experience and expertise.

The results above speak for themselves. Fluke and Setra have combined to deliver the best combination of versatility and performance available in submetering today.