

DESCRIPTION

MFC150 Series flexible current transducers operate based on the Rogowski principle. These coils are available in four standard sizes and can also be supplied according to customer’s design by special order. Due to their design-specific features, Rogowski coils are an extremely flexible solution for current measurement and can be used in a number of cases where a traditional current transducer is not an option.

The MFC150 coil is provided with a shield that negates the influence of external magnetic fields allowing for ideal accuracy from low currents to hundreds of kiloamps.



5 YEAR WARRANTY

FEATURES



- High linearity
- Wide dynamic range
- Very useful with large wire bundles or awkwardly-shaped conductors, or in places with limited access.
- Cannot be damaged by large overloads.
- Light weight - can be suspended on the conductor being measured.

APPLICATIONS

- Measuring devices, lab instrumentation
- Power monitoring & control systems
- DC ripple measurement
- Harmonics and transients monitoring
- Very high current monitoring, including pulse current

Rogowski coils have been used for the detection and measurement of electric currents for several decades. They are based on a simple principle: an “air-cored” coil is placed around the conductor in a toroidal fashion and the magnetic field produced by the current induces a voltage in the coil. The voltage output is proportional to the rate of change of current. This voltage is integrated, thus producing an output proportional to the current.

By using precision winding techniques specially developed for the purpose, the coils are manufactured so that their output is not influenced by the position of the conductor within the toroid.

Rogowski coil current transducers are used for AC measurement applications.

They can be used similarly to current transformers but for many applications they have considerable advantages:

The transducer does not measure DC, but unlike a current transformer it can carry out accurate measurement of AC components even if there is a large superimposed DC component. This feature is particularly useful for measuring ripple currents in battery charging circuits.

BENEFITS

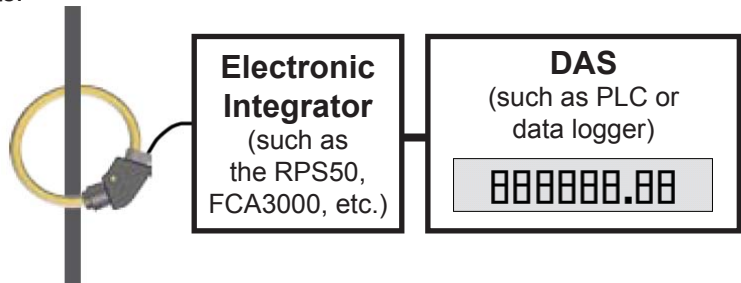
- By design, flexible Rogowski coils allow for installation over various conductor sizes or grouped cables.
- The coil output gives a low voltage signal; therefore there is no danger from an open-circuited secondary. This feature makes Rogowski transducers extremely suitable for temporary measurements.
- Unlike traditional current transformers with magnetic cores, the Rogowski coil is a non-intrusive transducer. Since it has no magnetic core, it draws no power from the main circuit carrying the current to be measured.
- The absence of a magnetic core allows for a wide frequency response up to hundreds of kHz. This makes the MFC150 Series particularly suitable for measurement of harmonic content and transients.

ORDERING INFORMATION

Example: 35” coil with 100mV/1kA output for use with an RPS50.

17645

A Rogowski coil current measuring system consists of the combination of a coil and conditioning electronics. Rogowski coils must be connected to an electronic integrator for 90° phase shift compensation and frequency equalization.





MODEL SELECTION

STANDARD OUTPUT MODELS						
Part Number	Rogowski Coil Length* in inches (cm)	Approx. ID in inches (cm)	Output (@50Hz)	Accuracy (typical)	Coil Resistance	Frequency Range
17644	23.6 (60)	6.5 (16.5)	100mV/1kA	< ±1%	20-140Ω	40Hz-20kHz
17645	35.4 (90)	10.5 (26.7)	100mV/1kA	< ±1%	20-140Ω	40Hz-20kHz
17646	47.2 (120)	14.0 (35.6)	100mV/1kA	< ±1%	20-140Ω	40Hz-20kHz
17647	70.9 (180)	21.5 (54.6)	100mV/1kA	< ±1%	20-140Ω	40Hz-20kHz

The standard connection lead length on each Rogowski coil is approximately 6.6 feet (200cm). Custom lead lengths by request.
 *Custom coil lengths from 10 to 118 inches (25 to 300cm) available - Consult factory.

SPECIFICATIONS

TRANSDUCER

Length 10 in. to 118 in. (25 to 300cm)
 Coil Diameter 0.33 in. ±0.008 in. (8.4 ±0.2mm)
 Fastener Type Bayonet holder
 Net Weight approx. 0.33 to 1.1 lb (150 to 500g)
 Material Thermoplastic rubber UL94-V0

ELECTRICAL CHARACTERISTICS

Output Level (RMS) (1) std. 100mV/1kA@50Hz
 Output Permissible Load >15kΩ for best accuracy
 Coil Resistance 70-900Ω
 Accuracy (2) <±1% Rdg., typical
 Frequency Range (3) approx. 40Hz to 20kHz
 (range depends upon coil length)
 Working Voltage 1000VRMS, CAT III,
 600VRMS, CAT IV, Pollution Deg. 2
 Test Voltage 7400VRMS/1min

STANDARDS COMPLIANCE

Safety: EN61010-1, EN61010-031, EN61010-2-031, and
 EN61010-2-032 Standards

CONNECTION LEAD

Lead Wires.. 2-conductor, 34-35AWG (0.15mm), plus shield
 Length approx. 6.6ft (2m) standard
 Material UL approved, 80°C, 1000V

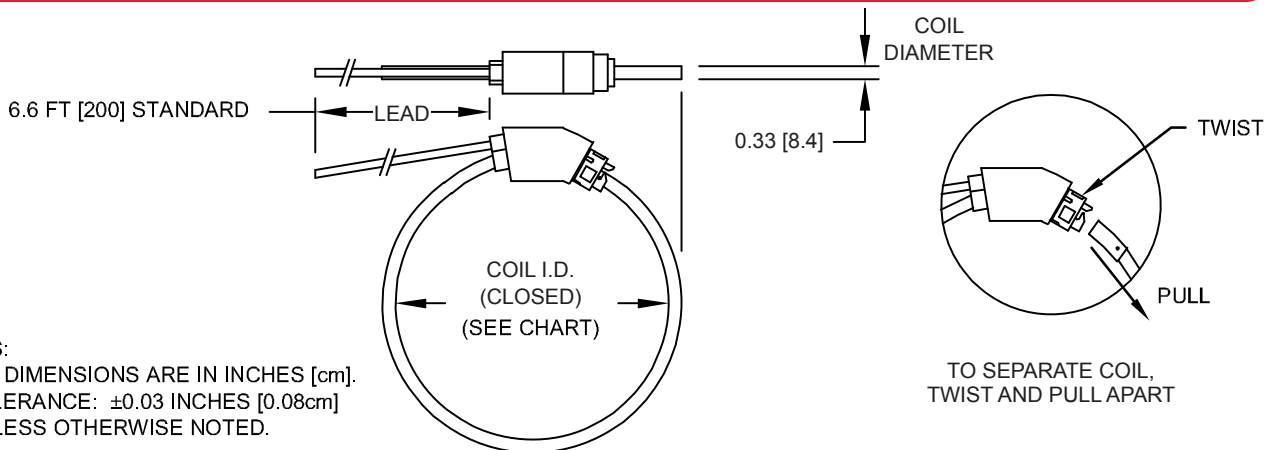
ENVIRONMENTAL CONDITIONS

Operating Temperature Range -30°C to 80°C
 Storage Temperature Range -40°C to 80°C
 Relative Humidity 95% max., non-condensing
 Protection Degree IP67

NOTES:

- (1) The Rogowski coil output is proportional to the rate of change of current. The calculation formula is:
 Amperes(RMS) x Hertz x K x 10⁻⁶, where K depends on manufacturing. The K value is 2 for 100mV models
- (2) All accuracies are specified at 23°C (±2°C) with the conductor carrying the current centered in the coil.
- (3) The low limit is approximate and is determined by noise effect on very low signals.

DIMENSIONS & CONNECTION DIAGRAM



NOTES:

1. ALL DIMENSIONS ARE IN INCHES [cm].
2. TOLERANCE: ±0.03 INCHES [0.08cm] UNLESS OTHERWISE NOTED.

Dwg# 0902-00901-B Rev B (mod.)