

Flexible Rogowski coil

Art. no: EK-ROG-...



Datasheet STEKROG_EN

Sensor for detection and measurement of electric currents to be used in combination with an ekinex network analyzer EK-ME1-MD (ENH version).



Description

EK-ROG is a flexible current transducer based on Rogowski principle, particularly suitable for measurement in combination with portable devices. EK-ROG coils are available in different sizes and can be supplied according to customer's design, therefore they can be used in all those applications, in which traditional transducers are not fitting due to its size and/or weight. Due to its specific features, flexible Rogowski coil is an extremely comfortable solution for current measurement and can be used in a number of cases where traditional current transducer is not the adequate solution. EK-ROG coil is provided with a shield against the influence of external magnetic fields, therefore it grants a stable measurement from low currents to hundreds of kA. The Rogowski coils must be connected to an electronic integrator for 90° phase shift compensation and frequency equalization. The panel meters can interface Rogowski coils directly without the need of the external integrators. This is an advantage because there is no external boxes or any power supply with consequent ease of use. The particular features of the Rogowski coils combined with the extremely flexible input programming of our portable meters, allow to carry out measurement by all applications.

Versions

Art. no.	Coil length [cm]
EK-ROG-30	30
EK-ROG-45	45
EK-ROG-70	70

Rogowski sensors

Rogowski coils have been used for the detection and measurement of electric currents for 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, especially developed for the purpose, the coils are manufactured so that their output is not influenced by the position of the conductor within the toroid, and to reject interference from external magnetic fields caused, for example, from nearby conductors. Basically, a Rogowski coil current measuring system consists of a combination of a coil and conditioning electronics. Rogowski coil current transducers are used for the AC measurement. They can be used in similar circumstances to current transformers but for many applications they have considerable advantages:

- Wide dynamic range. The same coil can be used to measure currents from mA to hundred of kA, it is enough to change the RC value in the integrator
- High linearity. According to the manufacturing (size, inductance value, ...) the maximum measurable frequency can range up to hundreds of kHz and in some special models also MHz
- Very useful with large size or awkward shaped conductors or in places with limited access. Thanks to the structure without hard core, the coil can be easily manufactured according to the application or to the available space
- Unlike traditional current transducers, there is no danger from open-circuited secondaries
- They cannot be damaged by large overloads
- They are non-intrusive. They draw no power from the main circuit carrying the current to be measured
- They are also light weighted and in some applications are light enough to be suspended on the conductor being measured.

The transducer does not measure direct currents but, unlike a current transformer, it can carry out accurate measurements of AC component even if there is a large superimposed DC component, since there is no iron core causing saturation. This feature is particularly useful for measuring ripple currents for example in battery charging systems.

Applications

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

Advantages

- Due to its structure, flexible Rogowski coils allows • to embrace conductors or grouped cables, which are large and difficult to reach, without any hazard
- The coil output gives a low voltage signal, therefore there is no danger from open-circuited secondary. This makes Rogowski transducers extremely suitable for temporary measurements, for example in combination with portable analysers
- Unlike traditional current transformer with magnetic core, the Rogowski coil is a non-intrusive transducer. Since it has no hard core, it draws no power from the main circuit carrying the current to be measured

- The absence of magnetic core grants a wide frequency response. This makes MFC150 particularly suitable for measurement of harmonic content and transients

Main characteristics

- Suitable to measure currents from mA to hundreds of kA
- High linearity
- Wide dynamic range
- Very useful with large size or awkward shaped conductors or in places with limited access
- No danger from open-circuited secondary
- Not damaged by large overloads
- Non-intrusive, no power drawn from the main
- Thanks to its light weight, it can be changed on the measured conductor
- Totally shielded
- UL file n. E231725-A1

Technical data

Transducer

- Coil length: 30, 45 or 70 cm
- Coil diameter: 8.3 ± 0.2 mm
- Fastening: bayonet holder
- Weight: from 150 to 500 g
- Material: thermoplastic UL94-V0

Electrical characteristics

- Output level (RMS): 100 mV / 1 kA @50Hz (standard)
- Coil resistance: from 70 to 900 Ω
- Positioning error: better than $\pm 1\%$ of reading (with 15 mm diameter cable)
- Frequency range: approx 40 Hz to 20 kHz
- Working voltage: 1000 VRMS CAT III
600 VRMS CAT IV
pollution degree 2
- Test voltage: 7400 VRMS / 1 min

Connection cable

- Type: 2 x 0.15 mm + shield
- Length: 300 cm

Environmental conditions

- Operating temperature: from -30°C to $+80^{\circ}\text{C}$
- Storage temperature: from -40°C to $+80^{\circ}\text{C}$
- Protection degree: IP67

Compliance

- Safety: EN 61010-1, EN 61010-031, EN 61010-2-031, EN 61010-2-032

Document

This datasheet refers to ekinex® components EK-ROG-30, EK-ROG-45 and EK-ROG-70 and is available for download at www.ekinex.com as a PDF (Portable Data Format) file.

Warnings

- Installation and electrical connection can only be carried out by qualified personnel in compliance with the applicable technical standards and laws of the respective countries
- Opening the housing of the device causes the immediate end of the warranty period
- In case of tampering, the compliance with the essential requirements of the applicable directives, for which the device has been certified, is no longer guaranteed
- ekinex® KNX defective components must be returned to the manufacturer at the following address: EKINEX

S.p.A. Via Novara 37, I-28010 Vaprio d'Agogna (NO) Italy

Other information

- This datasheet is aimed at installers, system integrators and planners
- For further information on the product, please contact the ekinex® technical support at the e-mail address: support@ekinex.com or visit the website www.ekinex.com
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