RCTi ROGOWSKI CURRENT TRANSDUCERS MEASURE INTERFERENCE & HARMONIC CURRENTS

A commonly encountered electrical engineering problem is the measurement of small high-frequency interference currents, or low-strength higher-order harmonics in the presence of a large fundamental current. However, the RCTi Rogowski current transducer from Power Electronic Measurements Ltd (PEM) has been successfully used to solve these and other typical problems in the power control and traction industries.

Traditionally in current measurement, the primary transducer (often a CT or hall effect device) has to be of sufficient size not to be saturated by the fundamental component. This adds bulk which makes it more expensive, and in combination with the power analyser or oscilloscope, cannot provide the resolution to accurately measure small high-frequency currents.

The RCTi Rogowski transducer offers an economic solution with the coil size specified independently of the measured current. The Rogowski coil does not suffer from magnetic saturation and cannot be affected or damaged by the fundamental current component. In addition, tuning the RCTi bandwidth is a simple procedure, which attenuates the fundamental components, enhancing sensitivity to provide a larger signal-to-noise ratio at the frequencies of interest. The RCTi also has a sufficiently high (-3dB) cut-off to measure accurately into the 100's kHz range.

Successful applications by PEM in the traction industry have included a European rail customer where the RCTi transducer was used to monitor the motor drive harmonics interfering with the pantograph. In addition it has been applied to facilitate EMC assessment for a new national railway in the Far East where the railway signalling system passed coded messages between a trackside cable and the train antenna at 10's kHz. The EMC issue concerned the traction harmonic currents in the third rail and running rails which can couple inductively into the signalling cable causing interference at the antenna. To provide a certain signal-to-noise ratio for transmitted data, an optimised RCTi transducer was used. This is flexible and can be easily secured around the rail track. The low-frequency cut-off is optimised at 4.2 kHz with a flat response at 10 kHz but -40dB of attenuation at 1 kHz. The RCTi effectively measure small interference currents in the rail of the order of a few mA's at 10's kHz, yet rejecting much larger components (of the order of A's) from power frequency sources.

Further information is available from:

Power Electronic Measurements Ltd,

164 Lower Regent Street, Beeston, Nottingham NG9 2DJ

Telephone: 0115 925 4212

Fax: 0115 967 7685

e-mail: info@pemuk.com

www.pemuk.com