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Original Citation

Ali, Maythem and Lucas, Gary (2013) Optimisation of an Analogue Signal Conditioning Circuit for a Novel Imaging Electromagnetic Flow meter. In: Proceedings of Computing and Engineering Annual Researchers' Conference 2013 : CEARC'13. University of Huddersfield, Huddersfield, p. 227. ISBN 9781862181212

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Optimisation of an Analogue Signal Conditioning Circuit for a Novel Imaging Electromagnetic Flow meter

Maythem Ali*, Gary Lucas
University of Huddersfield, Queensgate, Huddersfield HD1 3DH, UK

*Corresponding author: maythem.ali@hud.ac.uk

ABSTRACT

This poster describes the optimisations conducted on an existing signal conditioning circuit to allow its use in a novel imaging electromagnetic flow meter. This flow meter is a multi-electrode device that can be used to reconstruct a velocity profile in both single and multiphase flow applications. Voltages are induced on the boundary of the conductive fluid flowing through the flow meter section due to the interaction of the fluid and a locally generated AC magnetic field. The induced voltages are detected by an array of electrodes and measured by a multi-channel system, based on the signal conditioning circuit described in this paper. The original signal conditioning circuit design had several drawbacks. The circuit occasionally exceeded its operational dynamic range. It also had a very long settling time and steady-state error. These drawbacks were overcome in the optimised design.

Keywords

multi-electrode electromagnetic flow meter, induced voltage, signal conditioning