A QUALITATIVE ANALYSIS OF BIOMASS FLOW SENSING BEHAVIOR USING CAPACITIVE TECHNIQUE

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Abstract

Flowsensing technology from today's application perspective has gained significant research interest over the past few years. Among the existing sensing techniques, electrostatic and capacitive sensing techniques have proven promising although cable capacitance and stray capacitance cause inaccuracy while measuring very small capacitances. The existing measurement circuit model is complicated and has flawed electrode arrangement. By sensing very small capacitive variation, the developed capacitive technique has proven capable of reducing the stray and residual capacitance effect by using an interface sensing circuit based on circular and semicircular shaped electrode and modified capacitive bridge. The proposed interface circuit is simulated via PSPICE for realizing the small capacitive variation with permittivity variation. Hardware implementation is carried out using a flow sensing set up that senses two kinds of biomass flow variation as a change of dielectric permittivity under room conditions. The output voltage has been reproduced as a representative of the flow. Moreover, a comprehensive investigation into experimental data shows an agreeable level of consistency with the simulation results.

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