

Low Power Consuming Electromagnetic Actuators for Pulsed Pilot Stages

Authors : M. Honarpardaz, Z. Zhang, J. Derkx, A. Trangård, J. Larsson

Abstract : Pilot stages are one of the most common positioners and regulators in industry. In this paper, we present two novel concepts for pilot stages with low power consumption to regulate a pneumatic device. Pilot 1, first concept, is designed based on a conventional frame core electro-magnetic actuator and a leaf spring to control the air flow and pilot 2 has an axisymmetric actuator and spring made of non-oriented electrical steel. Concepts are simulated in a system modeling tool to study their dynamic behavior. Both concepts are prototyped and tested. Experimental results are comprehensively analyzed and compared. The most promising concept that consumes less than 8 mW is highlighted and presented.

Keywords : electro-magnetic actuator, multidisciplinary system, low power consumption, pilot stage

Conference Title : ICMCES 2017 : International Conference on Mechatronics, Control and Embedded Systems

Conference Location : Rome, Italy

Conference Dates : May 04-05, 2017