

磁致伸缩液位传感器的电路设计及性能分析

作者: 颜庆伟, 赵玉龙, 蒋庄德

单位: 西安交通大学机械工程学院

基金项目:

摘要:

介绍了磁致伸缩液位传感器的结构、工作机理以及电路模块化的实现方法, 研究实现了脉冲电流发射、回波接收、差模电压放大、脉宽调制、电压调整电路的模块化设计。分析了影响传感器精度和稳定性的可能因素, 给出了液位传感器的实验数据, 测试结果表明, 这种模块化的液位传感器, 可灵活调整电路参数和实现同时多点测量, 具有很好的动静态特性, 提高了传感器的整体性能, 使传感器更加智能化。

关键词: 磁致伸缩; 脉宽调制; 扭转弹性波; 液位传感器

Circuit Design and Performance Analysis of Magnetostrictive Liquid Level Sensor

Author's Name: YAN Qing-wei, ZHAO Yu-long, JIANG Zhuang-de

Institution: School of Mechanical Engineering, Xi'an Jiaotong University

Abstract:

The structure, circuit module and the principle of the magnetostrictive liquid level sensor are introduced. This sensor utilizes the magnetostrictive effect and inverse magnetostrictive effect of giant magnetic material, the liquid level can be measured by the time interval between interrogation pulse and the echo pulse. The interrogation pulse module, echo pulse module, PWM module, voltage adjust circuit are designed. Then, we analyzed the factors of affecting precision and stability. The experiment data indicate that the modularized level sensor has excellent dynamic and static performance and can adjust circuit parameter flexibly. Therefore, the transducer has been more intelligent and the whole performance was improved.

Keywords: magnetostrictive; PWM; torsion elastic wave; liquid level sensors

投稿时间: 2010-04-12

[查看pdf文件](#)