

气比例阀高压驱动与低压PWM的双压控制模式

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关键词: 电一气比例阀 高速开关阀 双压控制模式

摘要: 为了保证电一气比例阀具有良好的线性度和提高高速开关阀的响应速度, 提出对高速开关阀采用高压驱动与低压双脉宽调制(PWM)相结合的双压控制模式, 即通过高压(24 V)缩短阀的开启时间, 低压PWM(6 V)按照PID方法控制脉宽, 用于降低阀体功耗和缩短关断时间。设计了以ATmega8L单片机为控制核心的电〔CD*2〕气比例阀, 并进行了试验。测试结果表明, 高压驱动与低压PWM的控制模式使得高速开关阀的开启时间缩短为0.8 ms, 关闭时间为0.3 ms, 调压阀的总功耗仅为2.18 W, 明显低于国外同类产品。 With the aim to insure the better linear degree of electro-pneumatic proportional valve and raise the response speed of its speed on-off valves, a doubled-voltage control mode with high voltage driving and low voltage PWM was proposed. In the mode, the high voltage (24 V) could shorten the open time, and the low voltage PWM (6 V) could reduce the power loss and shorten the closing time according to the pulse width controlled by PID. An electro-pneumatic proportional pressure valve controlled by a MCU ATmega8L was designed based on the mode. The tested results show that, using the mode of high voltage driving and low voltage PWM, the open time of the high speed on-off valve is reduced to 0.8 ms, the turnoff time is 0.3 ms, and the total power consumption is 2.18 W.

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