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ZHONGNAN DAXUE XUEBAO(ZIRAN KEXUE BAN)

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液压自动增压阀的结构设计与应用

喻 胜, 彭先珍, 蒋受宝

(中南大学机电工程学院, 湖南长沙 410083)

摘 要: 设计水压系统和供水系统时, 都是按照水压系统的最高压力选择水泵. 高压水泵结构复杂, 对精度要求高, 成本高, 效率很低, 随着压力的升高, 泵的效率更低, 能源浪费严重. 1个水压系统中有不同压力的工作机构, 如果通过选取高压泵、降低压力以满足低压工作机构的要求, 会进一步浪费能源. 因此, 需研制结构简单、成本低、效率高的水压自动增压阀. 通过研究发现, 利用低压大流量水泵泵出的部分低压水流推动增压阀, 可全自动地将泵出的大流量低压水增压到工作机构对压力的不同要求. 研究表明: 利用低压大流量水泵结合水压自动增压阀增压, 达到了显著增效、节能的效果.

关键字: 高压泵; 低压泵; 水压自动增压阀; 效率

Structure design and application of hydraulic automatic pressure-increasing valve

YUSheng, PENG Xian-zhen, JIANG Shou-bao

(College of Mechanical and Electrical Engineering, Central South University, Changsha 410083, China)

Abstract: It is usual to select water pump according to the highest pressure in designing the system of water pressure and providing water. The high pressure pump's structure is complicated, and demands high accuracy, so its cost is high and efficiency is about 50%. If the user selects high pressure pump, he must lower the pressure to satisfy the different demands of working mechanism, therefore causing great waste of energy. To change this situation, the authors research into hydraulic automatic pressure-increasing valve whose structure is simple and efficiency is high. In comparison with high pressure water pumps, low pressure water pumps have the characteristics of simpler structure, lower price, higher efficiency and bigger quantity of flow. Because of the features above, our research has resulted in the development and production of an automatic pressure-increasing valve. It can automatically increase the pressure of the liquid of the big quantity of flow and that of the low pressure from the low pressure water pump to satisfy different demands of working mechanism for pressure. Its higher efficiency can increase the efficiency of the system and save energy.

Key words: high pressure pump; low pressure pump; automatic pressure-increasing valve; efficiency

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地址：湖南省长沙市中南大学 邮编：410083

电话：0731-88879765 传真：0731-88877727

电子邮箱：zngdxb@mail.csu.edu.cn 湘ICP备09001153号