마이크로 스핀들 자기베어링 시스템 설계

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Magnetic Bearing Design for Micro Spindle System

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Key Words: Magnetic Bearing(자기베어링), Eddy Current Sensor(와전류 센서), μ-factory(마이크로팩토리)

Abstract : A micro magnetic bearing system with five degrees of freedom active control has been designed for a miniature spindle to be used in a μ-factory. A shaft of the micro spindle is suspended by five set of hybrid magnetic bearings at each side of the shaft. Permanent magnets produce bias magnetic flux for the magnetic bearings and an electric motor(Φ24,70W) is set between the magnetic bearings. Five eddy current sensors are used to measure the shaft position. An analytical model of the system is developed for the design purpose. This model is verified through 3-D finite element analysis. A prototype spindle is designed and shown below.

A Study of the 3D Absolute Coordinate Analysis Using the Multiple Unmanned Surveying Systems

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다중 무인측량시스템에 의한 3차원 절대좌표 해석에 관한 연구

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Key Words: Unmanned Surveying(무인측량), Auto Tracking(자동추미), Planned Course(계획경로), Coordinate Analysis(좌표해석)

Abstract : Semi-shield tunneling is one of the propulsion construction methods used to lay pipes underground. However, unavoidable curved sections are present in small-sized pipe lines, which are laid after implementation of a road system. Therefore, if the planned course has a curved section, it is difficult to survey the course. The multiple unmanned surveying system (USS) are disposed to where each USS can detect the LED target at the other USS or the base point or the tunneling machine. And the accurate relative positions between each USS and target are calculated from measured data. This research proposes the relative and absolute coordinate analysis algorithm by using three USS to measure a curved course with 1m diameter and 20m curvature at 30m maximum distance, and verified the algorithm experimentally.