Semi-Automatic Safety Sensor System for a Conventional Bench Lathe Machine

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Abstract

This study focuses on the Semi-Automatic Safety Sensor System for a conventional bench lathe machine that monitors operator proximity and machine status in real time and automatically stops the lathe machine when a hazard is detected. The system uses sensors such as proximity, infrared, or laser and distance to detect human presence within predefined danger zones and connects to a hardware control unit, such as an Esp32, which cuts power to the lathe motor when a risk is identified. It is designed for manual or semi-automatic lathe machines commonly used in educational workshops and small-scale industrial machine shops settings, particularly in academic laboratories and vocational training centers where operators may have limited experience. The objective of this study is to develop a semi-automatic safety sensor for a conventional bench lathe machine. Descriptive method of research was used on this research to acquire a more reliable and dependable results with the survey questionnaire as the data gathering instrument. The Instructors from the College of Industrial Technology of Eulogio "Amang" Rodriguez Institute of Science and Technology rated the criteria as **Very Acceptable** with weighted means of 4.71, 4.27, 4.64, 4.52, and 4.63 with an overall weighted mean of 4. 55. On the other hand, the Industry Technicians rated the criteria as **Very Acceptable** with weighted means of 4.56, 4.32, 4.60, 4.35, and 4.47 with an overall weighted mean of 4.66. it can be interpreted that the prototype **Semi-Automatic Safety Sensor System for a Conventional Bench Lathe Machine** is **Very Acceptable.** There is no significant difference between the assessments of Instructors and Technicians regarding the Semi-Automatic Safety Sensor for a Conventional Bench Lathe Machine, based on the test of significant difference. These means that both two group of respondents gave favorable assessments on the developed system prototype.

Keywords: [safety sensor]; [conventional bench lathe machine]; [proximity]; [infrared]; [Esp32]

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