

**PERANCANGAN SISTEM *PROTEKSI* MOTOR INDUKSI 3  
FASA TERHADAP GANGGUAN *UNBALANCE VOLTAGE*  
BERBASIS MIKROKONTROLLER MENGGUNAKAN  
METODE A-NN**

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***ABSTRACT***

*Three-phase motors often experience unbalanced voltage disturbances, which can cause system damage, reduced efficiency, and a shorter service life. To overcome this problem, this research aims to design a three-phase motor protection system against unbalanced voltage disturbances using a mini PC microcontroller serially communicated with an Arduino Mega and the Artificial Neural Network (ANN) method. The designed system is capable of detecting unbalanced conditions based on the classification of voltage and current data from each phase. ANN is used as an algorithm to produce accurate decisions from disturbance patterns and provide fast and precise protection responses. Based on the ANN classification test results conducted by the system, the ANN was able to detect disturbances with a high accuracy of up to 93.33% and an error rate of 6.67% during testing. By understanding the patterns of unbalanced voltage and current disturbances, the classification results are then used to activate the protection system assisted by a relay and thermal overload as triggering devices to provide effective protection against damage to three-phase motors caused by unbalanced voltage. In addition, a buzzer alarm is used as a warning indicator of disturbances in the three-phase system.*

**Keywords:** *Artificial Neural Network (ANN), Three-Phase Motor, Voltage Protection.*