

Method of Controlling a Drive System, a Controller for Controlling a Drive System, a Drive System and an Assembly Comprising a Controller, a Drive System and a Permanent Magnet Synchronous Motor

 Energy & Environment

Smart Mobility and Electric Vehicle

Opportunity

Drive systems for N phase permanent magnet synchronous motors are integral to a variety of applications. The conventional approach involves inverters, which utilize a multitude of switches that are turned on and off in specific patterns to control the motor. This mode of control is computationally demanding, making it both intricate and costly to execute. Hence, while these prevalent methods manage to drive the motor, the inherent complexity has led to challenges in efficient and cost-effective implementation. The high computational needs limit the broader application of these drive systems, especially in scenarios where resource optimization and affordability are pivotal. Therefore, there exists a significant opportunity for an innovative approach that simplifies the control process, while ensuring optimal performance of the motor without burdening the computational aspects.

Technology

The invention introduces a streamlined method for controlling N phase permanent magnet synchronous motor drive systems. Leveraging consecutive duty cycles, it uses Proportional-Integral (PI) controllers to gauge rotor rotation and formulate reference currents and voltages. This structured, feedback-based method determines each duty cycle's switch pattern from a pre-established look-up table, bypassing intensive real-time calculations. This ensures a more efficient control process. Moreover, built-in temperature monitoring mechanisms ensure system stability and safety, adjusting parameters when needed. This novel approach addresses both the technical and operational challenges of traditional methods, offering a more efficient and user-friendly solution.

Advantages

- Significantly reduces computational burden and complexity
- Simplifies implementation and reduces costs
- Increases reliability of the drive system
- Allows for easy temperature regulation
- Improves the overall structure and efficiency of the drive system

IP Status

Patent filed



Technology Readiness Level (TRL) ?

5

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Applications

- Industrial automation
- Electric vehicles
- Renewable energy systems
- Robotics
- Aerospace and aviation

