Studi pengaruh variasi perancangan payung gigi stator pada kinerja motor bldc 12 alur 10 kutub = Study on the effect of the size umbrella of tooth stator design variations on the performance of 12 slot 10 pole bldc motor

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Abstrak

[ABSTRAK
Sejak teknologi magnet permanen ini mulai banyak dikembangkan, motor BLDC telah digunakan untuk berbagai aplikasi . Motor BLDC dengan kapasitas daya yang besar banyak digunakan untuk penggerak utama mobil listrik, sepeda listrik, mesin penggerak pada industri-industri. Bentuk atau geometri serta dimensi dari bagian-bagian motor adalah salah satu topik yang umum dibahas dan diteliti dalam riset pengembangan perancangan motor BLDC. Motor BLDC menggunakan magnet permanen pada rotornya sebagai sumber medan magnet. Aliran fluks mempengaruhi torque ripple. Salah satu yang paling mempengaruhi aliran fluks magnet pada motor BLDC adalah bentuk dari stator. Stator sendiri dapat divariasikan bentuknya yang dapat mengatur aliran fluks dari magnet. Pada penelitian ini divariasikan perancangan bentuk stator untuk perancangan rotor yang sama. Variasi yang dilakukan adalah variasi ukuran lebar gigi dan yoke. Pada penelitian ini ditemukan bentuk ukuran yang optimal dari enam variasi yang digunakan adalah bentuk perancangan payung lengkungan stator yang memiliki lebar gigi 10 mm, ukuran lebar yoke 125 mm dan ukuran lebar alur bukaan sebesar 2.4 mm. Pada penelitian ini ditemukan bahwa dengan perancangan ukuran yang tepat dan dengan memberikan lengkungan pada bagian kaki stator dapat mengurangi daerah saturasi, sehingga pada daerah yang terdapat saturasi dapat diminimalisir panas pada bagian daerah stator motor tersebut dan dapat memperkecil nilai torsi ripple hingga persentase sebesar 2.31% dengan rata-rata torsi ripple sebesar 0.579770359 Nm.
ABSTRACT
Since the permanent magnet technology is starting much developed, BLDC motors have been used for various applications. BLDC motors with high power capacity widely used for main propulsion electric vehicles, electric bike, the engine of the industries. Shape or geometry and dimensions from parts of motors is one of the general topics discussed and studied in the research design development BLDC motor. BLDC motors use permanent magnets in the rotor as the source of the magnetic field. Flux flow affects the torque ripple. One of the most affecting the flow of magnetic flux in BLDC motors is the shape of the stator. Stator can be varied forms which can regulate the flow from magnetic flux. In this research designs varied forms of stator for the same rotor design. A variation performed are wide variations tooth thickness and yoke. This research found optimal size form of the six variations used is a forms of umbrella design opening stator which has a tooth width of 10 mm, 125 mm widths yoke and the size of the slot opening width of 2.4 mm. In this research it was found that the design of the right size and by providing fillet on the legs stator can reduce the saturation region, so that the area contained saturation can be minimized heat in the area of the motor stator and can reduce torque ripple to a percentage value of 2.31% with an average of 0.579770359 Nm of torque ripple., Since the permanent magnet technology is starting much developed, BLDC motors have been used for various applications. BLDC motors with high power capacity widely used for main

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