

Studi pengaruh variasi rancangan ukuran bukaan alur pada kinerja motor bldc 12 alur 10 kutub = Study on the effect of the size of slot opening design variations on the performance of 12 slot 10 pole bldc motor

Desca Fazrani, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20421583&lokasi=lokal>

Abstrak

[ABSTRAK

Motor BLDC menjadi motor yang sangat banyak digunakan sekarang karena kelebihanannya dibandingkan dengan motor lainnya dalam hal efisiensi, kecepatan dan torsi yang lebih baik, serta umur yang cenderung lebih panjang. Banyak dilakukan penelitian untuk meningkatkan kinerja dari motor BLDC. Penelitian ini bertujuan untuk mencari rancangan motor yang paling optimal, dengan membuat rancangan yang divariasikan pada bagian stator. Penelitian ini dilakukan dengan simulasi motor tanpa beban dan dengan beban.

Pada penelitian ini dibuat empat variasi bukaan alur yang dilakukan pada simulasi tanpa beban dan berbeban. Variasi yang dilakukan adalah membuat lengkungan pada alur dan memvariasikan ukuran bukaan alur pada stator. Pada penelitian ini didapatkan nilai-nilai flux linkage, Back EMF kemudian diolah untuk mendapat K_e pada keadaan tanpa beban dan torsi ripple pada keadaan berbeban untuk dibandingkan agar dapat mengetahui rancangan mana yang memiliki performa terbaik. Pada penelitian ini ditemukan bahwa dengan rancangan ukuran yang tepat pada bagian bukaan alur di 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 6.78% dengan rata-rata torsi ripple sebesar 0.583596818 Nm.

ABSTRACT

BLDC motors which becoming very widely used now because of its advantages compared to other motor in terms of efficiency, speed and better torque and life tend to be longer. Many research to improve the performance of the BLDC motor. This study aims to find the most optimal motor design, to create designs that varied in the stator. This research was conducted by simulating the motor no load and load.

In this study is made of four variations of slot opening performed on the no load and load simulation. Variations to do is make the fillets in the slot opening and varying the size of the slot opening in the stator. In this study obtained values of flux linkage, Back EMF and then processed to obtain K_e in the load simulation

and torque ripple at the load simulation of each design are compared to determine which designs that have the best performance. This research found that the design of the right size in the slot opening in the stator can reduce the saturation region, so that in the area there is saturation can be minimized heat in the area of the motor stator and can minimize torque ripple value up to a percentage of 6.78% with an average of 0.583596818 Nm of torque ripple.

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