PERFORMANCE TEST OF DC ELECTRIC MOTORS

By

Eric Santosa
11501005

BACHELOR'S DEGREE
in

MECHANICAL ENGINEERING – MECHATRONICS CONCENTRATION
FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

SWISS GERMAN UNIVERSITY
The Prominence Tower
Jalan Jalur Sutera Barat No. 15, Alam Sutera
Tangerang, Banten 15143 - Indonesia

July 2019

Revision after the Thesis Defense on July 16, 2019.

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

Eric Santosa

Student Date

Approved by:

Benny Widjaja, S.T, M.T.

Thesis Advisor Date

Edward Boris Manurung, M. Eng.

Thesis Co-Advisor Date

Dr. Maulahikmah S.Kom., M. Sc.

Dean Date

ABSTRACT

PERFORMANCE TEST OF DC ELECTRIC MOTORS

By

Eric Santosa
Benny Widjaja, S.T, M.T, Advisor
Edward Boris Manurung, M. Eng, Co-Advisor

SWISS GERMAN UNIVERSITY

The main purpose of this research is to develop a bench test to find the real-world specification of the Electric DC Motors. The main focus of this project is to find the efficiency of the DC electric motors. The project begins with make the program for run the motor and for run the sensors. After that applying the PID control to make a system that is able to maintaining the speed at certain Setpoint. Tuning the PID parameters is an important thing to develop a stable speed control system. After get the parameters that suitable for the PID, the data taking can be done. The sensors take the data, and the data process using Microsoft Excel. The features in Microsoft Excel is really helpful, such as the Trendline options to help the data processing. The Logarithmic Transform function also use to support the PID program for avoiding the Exponential function. Then, the data of Voltage, Current, Speed, and Torque of the motor will be determined. For the result, the efficiency of the motor will be determined.

Keywords: Efficiency, PID Controls, Trendline Equation, Logarithmic Transform

DEDICATION

I dedicate this works for my family and my future career.

ACKNOWLEDGEMENTS

I wish to express my gratitude to Mr. Benny Widjaja and Mr. Edward Boris Manurung that always guide me throughout my work; giving me support and ideas, also never get bored if I ask some questions related to my project. My colleagues, especially Arie Dwinarko who worked with me during this project, has also been a great support for me when I had a problem about my project.

Throughout my colleagues in university, Michael Charles, Thomas Tri Putra, Dean Febrius and Imelda Adhitama that always motivated and cheer me up during this project. Then, my partner at Physics' Laboratory, Felicia Kristy, Steven Jonathan, Tan Giovani, and Stefanus Michael that always support me when there was problem.

Finally, I would like to thanks to God because of His relief, I was able to did this project from the beginning until the end.

TABLE OF CONTENTS

Page