

**AN AUTOMATED MECHANICAL ENDURANCE TEST EQUIPMENT
USING PROGRAMMABLE LOGIC CONTROLLER (PLC)
FOR MICROWAVE OVEN DOOR SYSTEM**

**Thesis is presented to fulfil the requirement
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Abstract

This project is to design and develop A Mechanical Endurance Test Equipment using Programmable Logic Controller (PLC) and Pneumatic System. This endurance test equipment is used for testing of the microwave oven doors system. The microwave oven doors system must be tested to open and close at a maximum travel for 100,000 cycles continuously to ensure that they are safe and reliable to the consumers.

The Mechanical Endurance Test Equipment using the concept that employ the combination of electrical and pneumatic system is developed. This system is intergrated with the used of PLC. The PLC is used to transmit and process the electrical signals. The software routine known as ladder diagram is developed. This software is used in the PLC to control the testing equipment.

CONTENTS

DEDICATION	i
ACKNOWLEDGEMENT	ii
APPROVAL	iii
ABSTRACT	iv
SYMBOLS	v
CHAPTER 1	
INTRODUCTION	
1.1 Introduction	1
1.2 Scope of Project	2
CHAPTER 2	
THEORY AND APPLICATION OF ELECTROPNEUMATIC CONTROL SYSTEM	
2.1 Introduction	3
2.2 Programmable Logic Controller (PLC)	3
2.3 Pneumatic System	7
2.4 Controlling of the Double Acting Pneumatic Cylinder	7
2.5 Speed Regulation of the Double Acting Pneumatic Cylinder	11

CHAPTER 1

INTRODUCTION

1.1 Introduction

The increasing availability and usage of consumer electrical appliances to the general public raises the concern on safety aspects and reliability of these products amongst the manufacturers and consumers. Manufacturers and Testing Agencies are responsible for performing tests such as Overload Protection Test, Endurance Test and Abnormal Operation Test to ensure the safety and reliability characteristics of these products. This project deals with the development of one type of test equipment for a mechanical endurance test.

In ensuring the safety and reliability of these products, tests such as protection against electrical shock, heating, endurance and mechanical strength should be conducted by testing agencies and manufacturers. The endurance test on the microwave oven door-system should be carried out to ensure the reliability and safety of the microwave oven against radiation to the consumers.

A Mechanical Endurance Test Equipment of the microwave oven door-system was designed and developed using Programmable Logic Controller (PLC) and Pneumatic Activation System. A Samsung Classic Collection microwave oven was chosen as a model for this project. The Mechanical Endurance Test Equipment was designed and developed to withstand a continuously test duration of 277.78 hours or 11.574 days to complete 100,000 cycles operation as required by IEC 335-2-25: Clause 18:1988 as shown in Appendix A.